

WALLER C. HARDY, JR. ET AL  
(KAN. STATE FOR.)  
SURF.

WALLER C. HARDY, JR. ET AL

NOTE - ELEVATION TAKEN FROM U.S.G.S. "19JJS" ELEVATION 1126.2' MARMET - 2.5 MILES WEST OF MOUTH OF RUSH CREEK AT ; ALONG RUSH CREEK ROAD; 2.7 MILES SE OF MOUTH OF KANAWHA FORK OF DAVIS CREEK AT TOP OF HILL; IN CONCRETE POST, STANDARD TABLET STAMPED "19JJS 19J8 1126"

THE ACCURACY OF THIS SURVEY IS WITHIN THE LIMITS PRESCRIBED BY THE OIL AND GAS DIVISION OF THE DEPARTMENT OF MINES.

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS MAP IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY PARAGRAPH 6 OF THE RULES AND REGULATIONS OF THE OIL AND GAS SECTION OF THE MINING LAWS OF WEST VIRGINIA.

New Location...   
Drill Deeper.....   
Abandonment.....

Company Ashland Exploration  
 Address PO Box 391, Ashland, N.Y. 1101  
 Farm WALLER C. HARDY, JR. ET AL  
 Tract \_\_\_\_\_ Acres 9707.19 Lease No. CFWV-834  
 Well (Farm) No. 15 Serial No. GW-1531  
 Elevation (Spirit Level) 846.25  
 Quadrangle CHARLESTON East. 7.5  
 County KANAWHA District LOUDON  
 Engineer Wanda Moore  
 Engineer's Registration No. 2113  
 File No. \_\_\_\_\_ Drawing No. W-1-65  
 Date 4-JAN. 65 Scale 1" = 2000'

STATE OF WEST VIRGINIA  
DIVISION OF ENVIRONMENTAL PROTECTION  
OFFICE OF OIL & GAS  
NITRO, WEST VIRGINIA 25143

WELL LOCATION MAP

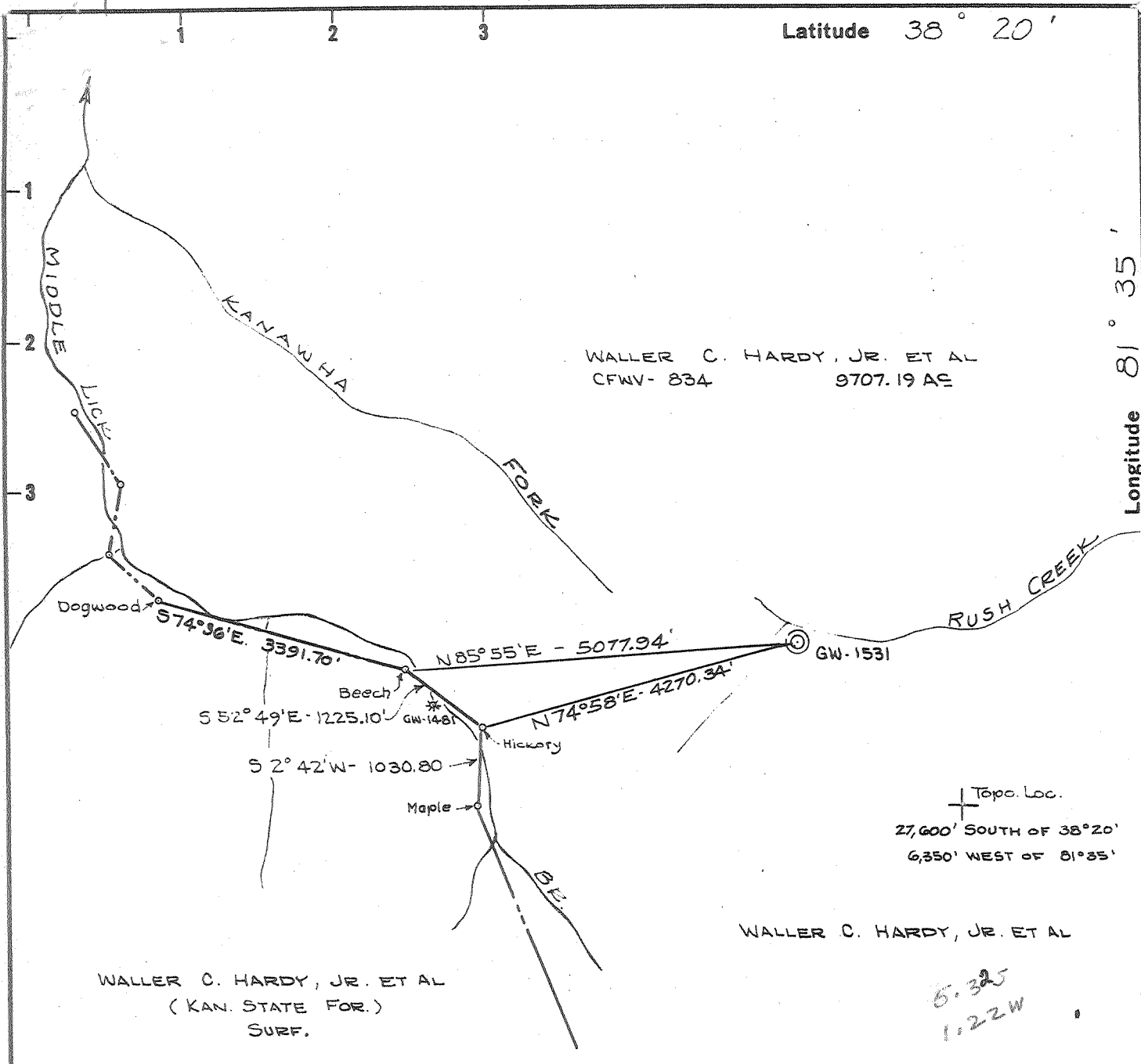
Oil Well No. 47-039-02030 W

+ Denotes location of well on United States Topographic Maps, scale 1 to 62500 latitude and longitude lines being represented by border lines as shown.

Permanent Plug Back Area Closures  
- Denotes one inch spaces on border line of original tracing

Shale Gas Layer. SEP 28 1965

DEEP WELL



NOTE - ELEVATION TAKEN FROM U.S.G.S. "19JJS" ELEVATION 1126.2'  
MARMET - 2.5 MILES WEST OF MOUTH OF RUSH CREEK AT ;  
ALONG RUSH CREEK ROAD: 2.7 MILES SE OF MOUTH OF  
KANAWHA FORK OF DAVIS CREEK AT TOP OF HILL: IN  
CONCRETE POST, STANDARD TABLET STAMPED  
"19JJS 19J8 1126"

5.30 S.  
1.21 W

THE ACCURACY OF THIS SURVEY IS WITHIN THE LIMITS PRESCRIBED  
BY THE OIL AND GAS DIVISION OF THE DEPARTMENT OF MINES.

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS MAP IS CORRECT TO THE  
BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION  
REQUIRED BY PARAGRAPHS 2 OF THE RULES AND REGULATIONS OF THE  
OIL AND GAS DIVISION OF THE MINING LAWS OF WEST VIRGINIA.

New Location   
Drill Deeper   
Abandonment

8 SE (T-52)

Company CITIES SERVICE OIL COMPANY  
 Address BOX 873 CHARLESTON, W.VA.  
 Farm WALLER C. HARDY, JR. ET AL.  
 Tract \_\_\_\_\_ Acres 9707.19 Lease No. CFWV-834  
 Well (Farm) No. 15 Serial No. GW-1531  
 Elevation (Spirit Level) 846.25  
 Quadrangle CHARLESTON 8 5530 W121  
 County KANAWHA District LOUDON  
 Engineer Wardell M. Moore  
 Engineer's Registration No. 2113  
 File No. \_\_\_\_\_ Drawing No. W-1-65  
 Date 4-JAN. 65 Scale 1" = 2000'

STATE OF WEST VIRGINIA  
DEPARTMENT OF MINES  
OIL AND GAS DIVISION  
CHARLESTON

WELL LOCATION MAP  
FILE NO. KAN-2030

REVISED LOCATION

+ Denotes location of well on United States  
Topographic Maps, scale 1 to 62500 lati-  
tude and longitude lines being represented  
by border lines as shown.  
- Denotes one inch spaces on border line  
of original tracing.

Samples Bay all 30-top 90'-5341' 6-6 305 Deep Well



STATE OF WEST VIRGINIA  
DEPARTMENT OF MINES  
OIL AND GAS DIVISION 10

Rotary   
Spudder   
Cable Tools   
Storage

Quadrangle Chas. 8 SW  
Permit No. KAN-2030

WELL RECORD

Oil or Gas Well Gas  
(KIND)

Company Cities Service Oil Company  
Address P. O. Box 873, Charleston, W. Va. 25323  
Farm W. C. Hardy, Jr., et al Acres 9707.19  
Location (waters) Rush Creek  
Well No. 15 - GW-1531 Gr. Elev. 845.07'  
District Loudon County Kanawha  
The surface of tract is owned in fee by B. F. McCabe  
P. O. Box 1692 Address Charleston, W. Va.  
Mineral rights are owned by W. C. Hardy, Jr., et al  
5100 2nd Avenue Address Vienna, W. Va.

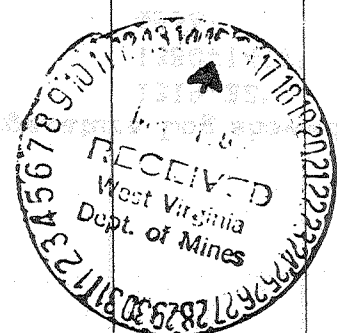
Drilling commenced 1-11-65  
Drilling completed 2-17-65  
Date Shot not shot From \_\_\_\_\_ To \_\_\_\_\_  
With \_\_\_\_\_  
Open Flow /10ths Water in \_\_\_\_\_ Inch  
/10ths Merc. in \_\_\_\_\_ Inch  
Volume 1,890,000 Cu. Ft.  
Rock Pressure \_\_\_\_\_ lbs. \_\_\_\_\_ hrs.  
Oil \_\_\_\_\_ bbls., 1st 24 hrs.  
WELL ACIDIZED see reverse side  
WELL FRACTURED not fractured

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
<del>xx</del> 20"	57'	pulled	Kind of Packer
13 3/8" 48#	159'	159'	<u>Anchor</u>
<del>xx</del> 9-5/8" 32#	1449'	1449'	Size of <u>4-1/2"</u>
8 1/2" 22#	4750'	468'	Depth set <u>5,246'</u>
<del>xx</del> 7" 23#	4750'	468'	
4-1/2" 11.6#	5382'	5382'	
3			Perf. top _____
2 3/8" 4#	5304'	5304'	Perf. bottom _____
Liners Used	<u>with cage</u>		Perf. top _____
			Perf. bottom _____

CASING CEMENTED \_\_\_\_\_ SIZE \_\_\_\_\_ No. Ft. \_\_\_\_\_ Date \_\_\_\_\_  
see reverse side  
COAL WAS ENCOUNTERED AT none FEET \_\_\_\_\_ INCHES  
\_\_\_\_\_ FEET \_\_\_\_\_ INCHES FEET \_\_\_\_\_ INCHES  
\_\_\_\_\_ FEET \_\_\_\_\_ INCHES FEET \_\_\_\_\_ INCHES

RESULT AFTER TREATMENT 9# thru 2" spring gauge = 2,190 MCF (Newburg)  
ROCK PRESSURE AFTER TREATMENT 79 hours tubing 2055#; B. H. 2060#  
Fresh Water 190' Feet \_\_\_\_\_ Salt Water 685' Feet \_\_\_\_\_

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth	Remarks
Clay & Gravel			0	70			
Shale			70	125			
Sand			125	170			
Shale			170	190	F. water	190'	show
Sand			190	240			
Shale			240	300			
Sand w/ Shale			300	385			
Shale			385	480			
White Sand			480	600			
Sand w/ Shale			600	663			
Sand - Salt			663	699	S. water	685'	show
White Sand - Salt			699	880			
Sand and Shale			880	930			
Shale			930	980			
White Sand			980	1000			
sand and Shale			1000	1010			
Red Rock			1010	1020			
Sand and Shale			1020	1100			
Sand - Meason			1100	1150			
Shale			1150	1180			
Lime - Big Lime			1180	1375			
Sand			1375	1390			
Lime w/ Shale 368			1390	1395			
Sand			1395	1420			
Shale 369			1420	1497			
Shale w/ Sand - 368			1497	1650			
Shale			1650	2085			



Formation	Color	Hard or Soft	Top /0	Bottom	Oil, Gas or Water	Depth Found	Remarks
Shale and Sand			2085	2320			
Shale			2320	4486			
Lime- <i>Corniferous</i> (Onondaga)			4486	4655			
Sand Oriskany			4655	4700	Onondaga 4484-4586 (log FC)		
Sand and Shale - H			4700	4835	Oriskany 4586-4596 ( " )		
Lime and Shale			4835	5025			
Sandy Shale			5025	5069			
Lime and Sand			5069	5095			
Lime			5095	5208			Temperature Log showed gas:
Lime and Shale			5208	5240			1319-32'
Lime			5240	5264			1380-1417'
Lime and Dolomite			5264	5276			4556'
Sand <i>newburg</i>			5276	5291			4579'
Sandy Dolomite			5291	5303			4593'
Shale			5303	5341' Rotary			5272-91'
Total depth-----				5341' Rotary=5338' Schl. Meas.			
Plugged back depth-----				5304'			
Schlumberger Log showed:							
Newburg			5272	5291'			
<b>CASING RECORD</b>							
1-14-65	Ran 13-3/8" 48# casing at 170' Rotary Table Measurement. Cemented by Dowell with 100 sacks regular cement mixed 3% Calcium Chloride. Pumped plug to 148'.						
1-28-65	Ran 9-5/8" 32.30# casing with guide shoe at 1450' Rotary Table Measurement. Ran centralizers on 2nd, 4th and 6th joints. Pumped 20 sacks Gel and 125# Gelflake ahead of 90 sacks regular cement-mixed 3% Calcium Chloride. Pumped plug to guide shoe at 1450'-good circulation. Cemented by Dowell.						
2-3-65	Ran 7" O.D. 23# J-55 casing at 4700' Rotary Measurement with Parmco Packer set at 4,542', R/L nipple at 4,237'. Centralizers on 1st, 3rd and 5th joints. Mixed and pumped 200 bbls. Gel with 250# Cello Flake. Cemented with 40 sacks regular cement with 3% Calcium Chloride. Pumped plug to 4,682'. Set packer and pressured. Pulled 4,282' later.						
2-19-65	Ran 4-1/2" 11.6# casing with Guide Shoe at 5,341' Rotary Table Measurement. Baker Float Insert at 5,304' - Anchor packer at 5,246'. Centralizers 5278', 5178', 5115', 5053', 4990' and 4890'. Pumped 400 gallons CW-7 (to cut wall cake) and 50# Flac mixed 155#. Displaced with mud to insert. Set packer and pressured.						
Perforated Newburg Sand 5273-77' and 5284-87' 4 shots/foot (by McCullough)							
<b>ACIDIZED NEWBURG SAND 2-26-65</b>							
Displaced mud with fresh water and Tergitol. Pumped 1500 gallons MCA and spotted opposite perforation. Pumped into formation at 2600#. Average injection pressure 2250#. Shut down pressure 1800#. Well died after acid job. Hooked on air compressor and pressured up casing to 350# and started to displace water. Well died - set booster and pumped to 800#. Started to flow - after 6 hours gauged 805 MCF.							
Final open flow 3-5-65 9# in 2" spring gauge = 2,190 MCF (Newburg)							
Ran Drill Stem Test #1 5281-5341'							
Ran Drill Stem Test #2 5269-5341' (Tested all Newburg Sand 5272-5291')							

Date March 12, 1965

APPROVED Cities Service Oil Company, Owner

By L. D. Todd, District Superintendent  
(Title)

STATE OF WEST VIRGINIA  
 DEPARTMENT OF ENERGY, DIVISION OF OIL AND GAS  
 WELL WORK PERMIT APPLICATION

Permitting Operator: Ashland Exploration, Inc. 0043 2750 (6) 389

- 1) Well Operator: Ashland Exploration, Inc.  
W. C. Hardy
- 2) Operator's Well Number A-15, Serial No. 130401 3) Elevation: 845.1
- 4) Well type: (a) Oil    / or Gas X /  
 (b) If Gas: Production X / Underground Storage    /  
Deep X / Shallow /
- 5) Proposed Target Formation(s): Newburg
- 6) Proposed Total Depth: 5341 feet *Permanent Plus to 4900'*
- 7) Approximate fresh water strata depths: 190'
- 8) Approximate salt water depths: 685'
- 9) Approximate coal seam depths: None
- 10) Does land contain coal seams tributary to active mine? Yes    / No X /  
 This well was drilled in 1965, however, it is proposed to perforate and
- 11) Proposed Well Work: stimulate the Oriskany/Chert, Rhinestreet, Lower Huron, and Big Injun formations. See attached recompletion prognosis.

Issued 09/26/95  
 Expires 09/26/97

**CASING AND TUBING PROGRAM**

TYPE	SPECIFICATIONS			FOOTAGE INTERVALS		CEMENT
	Size	Grade	Weight per ft.	For drilling	Left in well	Fill-up (cu. ft.)
Conductor	20		40	57		
Fresh Water	13 3/8		48	170	170	
Coal						
Intermediate	9 5/8		32	1449	1449	<i>Plat</i>
	7		23	4750	468	
Production	4 1/2		11.6	5382	5382	<i>WV Well Records</i>
Tubing	2 3/8		4	5304	5304	
Liners						

PACKERS: Kind \_\_\_\_\_  
 Sizes \_\_\_\_\_  
 Depths set \_\_\_\_\_

For Division of Oil and Gas Use Only

Fee(s) paid:  Well Work Permit  Reclamation Fund  
 Plat  WW-9  WW-2B  Bond  WPCP  Agent  
 (Type)

006158  
 41

**RECEIVED**  
WV Division of  
Environmental Protection  
**SEP 26 1995**

- 1) Date: September 25, 1995
- 2) Operator's well number  
W. C. Hardy A-15
- 3) API Well No: 47 - 039 - 02030 W  
State - County - Permit

Permitting  
Office of Oil & Gas

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENERGY, DIVISION OF OIL AND GAS

NOTICE AND APPLICATION FOR A WELL WORK PERMIT

- 4) Surface Owner (s) to be served:
  - (a) Name W. C. Hardy, Jr.  
Address P.O. Box 524  
Vienna, WV 26105
  - (b) Name Frank A. Hardy  
Address HC 40 Box 33  
Lewisburg, WV 24901
  - (c) Name \_\_\_\_\_  
Address \_\_\_\_\_
- 6) Inspector Carlos Hively  
Address 223 Pinch Ridge Road  
Elkview, WV 25071  
Telephone (304) - 965-6069

- 5) (a) Coal Operator:  
Name None  
Address \_\_\_\_\_
- (b) Coal Owner (s) with Declaration  
Name McCabe Land Company  
Address P.O. Box 1692  
Charleston, WV 25326  
Name \_\_\_\_\_  
Address \_\_\_\_\_
- (c) Coal Lessee with Declaration  
Name None  
Address \_\_\_\_\_

TO THE PERSON (S) NAMED ABOVE TAKE NOTICE THAT:

\_\_\_\_\_ Included is the lease or leases or other continuing contract or contracts by which I hold the right to extract oil and gas OR  
X Included is the information required by Chapter 22B, Article 1, Section 8(d) of the Code of West Virginia (see page 2)  
 I certify that as required under Chapter 22B of the West Virginia Code I have served copies of this notice and application, a location plat, and accompanying documents pages 1 through 2 on the above named parties, by:  
 \_\_\_\_\_ Personal Service (Affidavit attached)  
X Certified Mail (Postmarked postal receipt attached)  
 \_\_\_\_\_ Publication (Notice of Publication attached)

I have read and understand Chapter 22B and 38 CSR 11-18, and I agree to the terms and conditions of any permit issued under this application.  
 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, 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 and imprisonment.  
 Well Operator Ashland Exploration, Inc.  
 By: Bradley W. Fischer *BFischer*  
 It's: Vice President  
 Address P.O. Box 391  
Ashland, KY 41114  
 Telephone 606-329-5450

Subscribed and sworn before me this 25<sup>th</sup> day of Sept, 1995  
Vicki W. Nonta Notary Public  
 My commission expires November 23, 1998

RECEIVED

WR-25 WV Division of Environmental Protection

JAN 16 1996

Permitting Office of Oil & Gas

State of West Virginia Division of Environmental Protection Section of Oil and Gas

26-Sep-95 API # 47-039-02030 W

Well Operator's Report of Well Work

Farm Name: HARDY, W. C., JR., et al

Operator Well No.: W.C. Hardy A-15

Location: Elevation: 846.25

Quadrangle: CHARLESTON EAST

District: LOUDON

County: KANAWHA

Latitude: 12710 Feet South of 38 Deg. 17 Min. 30 Sec.

Longitude: 6550 Feet West of 81 Deg. 35 Min. 0 Sec.

Company: ASHLAND EXPLORATION, INC. P.O. BOX 391, AT-9 ASHLAND, KY 41114-0391

Agent: B. E. Widener

Inspector: CARLOS HIVELY
Permit Issued: 09-26-95
Well Work Commenced: 10-04-95
Well Work Completed: 01-04-96
Verbal Plugging
Permission granted on:
Rotary X Cable Rig
Total Depth (feet) 4660' PBSD
Fresh water depths (ft)
Salt water depths (ft)
Is coal being mined in area (Y/N)?
Coal Depths (ft):

Table with 4 columns: Casing & Tubing, Used in Drilling, Left in Well, Cement Fill Up Cu. Ft. Rows include sizes 13 3/8", 9 5/8", 7", 4 1/2", and 2 3/8" with corresponding drilling and cement data.

OPEN FLOW DATA Big Injun 1384-1399
Producing formation Lo Huron Pay zone depth (ft) 3335-3596
Gas: Initial open flow 207 MCF/d Oil: Initial open flow -- Bbl/d
Est. Final open flow 169 MCF/d Final open flow -- Bbl/d
Time of open flow between initial and final tests 3 Hours
Static Rock Pressure 370 psig (surface pressure) after 72 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

NOTE: ON BACK OF THIS FORM 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 ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE.

For: Ashland Exploration, Inc.

By: Scott A. Arnold Scott A. Arnold, Asst. Eng.
Date: 1/12/96 01-12-96



Base/Lee Fmt	1010'	
Pennington Fmt	1010 -	1132
Maxton	1100 -	1132
L. Lime	1132 -	1178
B. Lime	1178 -	1380
Borden Fmt	1380 -	1418
Injun	1380 -	1418
Sunbury Shale	1802 -	1824
Berea	1824 -	1828
Devonian Shale	1828 -	4486
Upper Shale/Chagrin	1828 -	2827
L. Huron	2827 -	3656
Java	3656 -	4076
Rhinestreet	4076 -	4458
Marcellus	4458 -	4486
Onondaga	4486 -	4586
Oriskany Sand	4586 -	4603
Helderberg	4603 -	4782
Newburg	5272 -	5291
LTD	5338	
DTD	5341	
Spud	1-11-65	
TP	2-17-65	

Perf L. Huron 3 1/8" SF 1 spf @ 3596, 3583, 3562, 3560, 3558, 3538, 3532, 3504, 3489, 3487, 3456, 3414, 3337, 3335, 14H total. Dump 200 gal 7 1/2% HCl-Fe acid & N<sub>2</sub> frac L. Huron using 833,000 scf N<sub>2</sub> @ 68,750 scf/m. BD @ 3399, MTP 4205, ATP 4142, ISIP 3010, 10 min 1551.

Perf Big Injun w/3 3/8" expendable HCG 4 spf 1384-1399 (61 holes total). Dump 200 gal 15% HCl-Fe acid & frac Big Injun, 75Q foam ramp using 69,400# 20/40 sand, 210,000 scf N<sub>2</sub> @ 8400 scf/m. BD @ 1959, ATP 2146 @ 20 BPM foam, MTP 2503, ISIP 1857, 10 min 1708, TF 129 bbl.