

11/2/87

45-2015'

LATITUDE 37° 42' 30"

LONGITUDE 81° 52' 30"

12,050'

NORTH

Geo. & Edith Ellis

Fred & Madeline McCoy Jr.

Edward M. Bragg  
Dorothy May Vance

Ross & Brenda Sue Grimmer  
Thurmond Goodman  
Donnie Edward Simms

Elbert & Blanche Grimmer

Bruce McDonald Holding Co.

Powellton Coal Co.  
Survey Coordinates  
N-39186.19  
E-35766.7433

Tax Map 137 Parcel 1  
W.W. McDonald Land Co.  
DB.39 PG.143  
5,990.47 Acs.

PROPOSED MCDONALD A-16  
ON 11/975

N25°30'W - 15.00'  
Offset from A-15

N38°38'W  
2553.90'

S8°27'E  
2412.13'

N72°30'E  
1300.00'

3 Hickories

S65°00'E  
500.0'

5.55  
2.63

Pt. on Line / 25° Oak

2.275  
0.37W

7.5' Topo

Marked Tree

WELL REFERENCE  
A-15 Well

LOGAN CO.  
MINGO CO.

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

FILE NO. \_\_\_\_\_  
DRAWING NO. \_\_\_\_\_  
SCALE 1"=1000'  
MINIMUM DEGREE OF ACCURACY 1:2,500  
PROVEN SOURCE OF ELEVATION McDonald Well A-15  
From Well Plat Elev. 888.45

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 ENERGY  
(SIGNED) Danaed J. Day  
R.P.E. \_\_\_\_\_ U.S. 247

PLACE SEAL HERE

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENERGY  
OIL AND GAS DIVISION



DATE Oct. 22, 19 87  
OPERATOR'S WELL NO. McDonald A-16  
API WELL NO. 47 045 1110  
STATE COUNTY PERMIT

WELL TYPE: OIL \_\_\_ GAS X LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_  
(IF "GAS,") PRODUCTION \_\_\_ STORAGE \_\_\_ DEEP \_\_\_ SHALLOW \_\_\_  
LOCATION: ELEVATION 888.55' WATER SHED Sandlick Br. of Guyandotte River  
DISTRICT Triadelphia 3 COUNTY Logan  
QUADRANGLE Man 7.5' 456 049 NC2 Gilbert  
SURFACE OWNER W.W. McDonald Land Co. ACREAGE 5,990.47 Acs.  
OIL & GAS ROYALTY OWNER W.W. McDonald Land Co. LEASE ACREAGE 6084 Acs. Pt. of 8666.505 Acs.  
LEASE NO. WV 409  
PROPOSED WORK: DRILL X CONVERT \_\_\_ DRILL DEEPER \_\_\_ REDRILL \_\_\_ 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 Devonian Shale ESTIMATED DEPTH 6500(MO), 5,090'(TVD) NOV 9 1987  
WELL OPERATOR Cities Service Oil & Gas Corp. DESIGNATED AGENT Paul D. Phillips  
ADDRESS P.O. Box 873, Charleston WV. 25323 ADDRESS P.O. Box 873, Charleston W.V. 25323

COUNTY NAME PERMIT



Date March 11, 1988  
 Operator's Well No. A-16X  
 Farm McDonald Land Co.  
 API No. 47 - 045 - 1110

**RECEIVED**  
 MAR 17 1988

State of West Virginia  
 DEPARTMENT OF ENERGY  
 Oil and Gas Division

DIVISION OF OIL & GAS  
 DEPARTMENT OF ENERGY

WELL OPERATOR'S REPORT  
 OF

DRILLING, FRACTURING AND/OR STIMULATING, OR PHYSICAL CHANGE

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

LOCATION: Elevation: 888' Watershed Sandlick Branch of Guyandotte River  
 District: Triadelphia County Logan Quadrangle Man 7.5'

COMPANY Cities Service Oil and Gas Corporation  
 ADDRESS P. O. Box 873, Charleston, WV 25323  
 DESIGNATED AGENT Paul D. Phillips  
 ADDRESS P. O. Box 873, Charleston, WV 25323  
 SURFACE OWNER W.W. McDonald Land Co.  
 ADDRESS P. O. Box 1170, Logan, WV 25601  
 MINERAL RIGHTS OWNER W.W. McDonald Land Co.  
 ADDRESS P. O. Box 1170, Logan, WV 25601  
 OIL AND GAS INSPECTOR FOR THIS WORK Arthur  
St. Clair ADDRESS P.O. Box 468, Brenton, WV  
 PERMIT ISSUED 11-3-87 24818  
 DRILLING COMMENCED 12-11-87  
 DRILLING COMPLETED 1-28-88  
 IF APPLICABLE: PLUGGING OF DRY HOLE ON  
 CONTINUOUS PROGRESSION FROM DRILLING OR  
 REWORKING. VERBAL PERMISSION OBTAINED  
 ON    

Casing & Tubing	Used in Drilling	Left in Well	Cement fill up Cu. ft.
Size 16" Cond.	40	40	15 cu ft CTS
11 3/4"	295	295	165 cu ft CTS
9 5/8"			
8 5/8"	2223 TVD 2439 MD	2223 TVD 2439 MD	621 cu ft CTS
7"			
5 1/2"	4678 TVD 5456 MD	4678 TVD 5456 MD	558 cu ft
4 1/2"			
3"			
2 3/8"	4490 TVD 5222 MD	4490 TVD 5222 MD	
Liners used			

GEOLOGICAL TARGET FORMATION Lower Huron Shale Depth 4085 TVD  
4734 MD feet  
 Depth of completed well 4701 TVD / 5485 MD feet Rotary X / Cable Tools      
 Water strata depth: Fresh 148 feet; Salt N/A feet  
 Coal seam depths: 113-117'; 194-198' Is coal being mined in the area? Yes

OPEN FLOW DATA

Producing formation Lower Huron Pay zone depth 4737-5239 MD feet  
 Gas: Initial open flow 452 Mcf/d Oil: Initial open flow     Bbl/d  
 Final open flow 377 Mcf/d Final open flow     Bbl/d  
 Time of open flow between initial and final tests 20 hours  
 Static rock pressure 545 psig (surface measurement) after 48 hours shut in  
 (If applicable due to multiple completion--)  
 Second producing formation     Pay zone depth     feet  
 Gas: Initial open flow     Mcf/d Oil: Initial open flow     Bbl/d  
 Final open flow     Mcf/d Oil: 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

MAR 18 1988

(Continue on reverse side)

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

Lower Huron: 5072-5239' MD, 20 holes

Frac with 65,000# 20/40 sand in 85-90% N2 Foam at 1, 2, 2.5 & 3 ppg sand concentration. Well screened off.

4737-4977' MD, 34 holes

Frac with 102,000# 20/40 sand in 80-90% N2 foam at 1, 2, 2.5 & 3 ppg sand concentration.

**RECEIVED**  
MAR 17 1988

WELL LOG

DIVISION OF OIL & GAS  
DEPARTMENT OF ENERGY

FORMATION	COLOR	HARD OR SOFT	TOP FEET	BOTTOM FEET	REMARKS Including indication of all fresh and salt water, coal, oil and gas
Sand, Clay			0	110	
Sand			110	140	Coal 113-117'
Clay, Shale			140	146	
Sand			146	168	Fresh Water 148'
Shale, Sand			168	203	Coal 194-198'
Sand			203	258	
Shale			258	289	
Sand			289	295	
Shale			295	320	
White Sand			320	402	
Shale			402	446	
White Sand			446	492	
Shale			492	600	
White Sand			600	639	
Shale			639	710	
Salt Sand			710	1089	
Shale			1089	1126	
Salt Sand			1126	1303	
Shale			1303	1616	
1st Maxon Sand			1616	1723	
Shale			1723	1872	
2nd Maxon Sand			1872	1949	
Shale			1949	2027	
3rd Maxon Sand			2027	2086	
Shale			2086	2122	
Little Lime			2122	2186	
Big Lime			2186	2476	
Sand, Shale			2476	2697	
Shale			2697	3052	
Berea Sand			3052	3077	
Devonian Shale			3077	4701	
<u>ALL DEPTHS TVD MEASUREMENTS</u>					
TD measured depth - 5485					

(Attach separate sheets as necessary)

Cities Service Oil and Gas Corporation  
Well Operator

By: Paul D. Phillips, Operations Manager

Date: March 11, 1988

Note: Regulation 2.02(i) 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."

6342

(Obverse)

7/85



**RECEIVED**  
OCT 30 1987

1) Date: October 28, 19 87  
 2) Operator's Well No. McDonald Land Co. A-16  
 3) API Well No. 47 045 1110  
 State County Permit

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

- 4) WELL TYPE: A Oil        / Gas X /  
 B (If "Gas", Production X / Underground storage        / Deep        / Shallow X /)
- 5) LOCATION: Elevation: 888' Watershed: Sandlick Creek of Guyandotte River  
 District: Triadelphia 3 County: Logan 045 Quadrangle: Man 456
- 6) WELL OPERATOR Cities Service 149 CODE: 9800 7) DESIGNATED AGENT Paul D. Phillips  
 Address P. O. Box 873 Address P. O. Box 873  
Charleston, WV 25323 Charleston, WV 25323
- 8) OIL & GAS INSPECTOR TO BE NOTIFIED 9) DRILLING CONTRACTOR:  
 Name Arthur St. Clair Name Unknown at this time  
 Address P. O. Box 468 Address         
Brenton, WV 24818
- 10) PROPOSED WELL WORK: Drill X / Drill deeper        / Redrill        / Stimulate X /  
 Plug off old formation        / Perforate new formation         
 Other physical change in well (specify) Planned high angle directional well
- 11) GEOLOGICAL TARGET FORMATION, Devonian Shale 40
- 12) Estimated depth of completed well, 6500 MD; 5090 TVD feet
- 13) Approximate trata depths: Fresh, 130' feet; salt, 900' feet.
- 14) Approximate coal seam depths: 80-82', 189-192' Is coal being mined in the area? Yes X / No         
From Logan 507, 855, 1099

15) CASING AND TUBING PROGRAM

CASING OR TUBING TYPE	SPECIFICATIONS					FOOTAGE INTERVALS		CEMENT FILL-UP OR SACKS (Cubic feet)	PACKERS
	Size	Grade	Weight per ft.	New	Used	For drilling	Left in well		
Conductor	16	H-40	65	X		45	45	15 <sup>65</sup> cu ft	Kinds <u>38CSR-18-11.3</u>
Fresh water	11-3/4	K-55	47	X		280	280	121 <sup>65</sup> cu ft	Sizes <u>38CSR-18-11.2, 2</u>
Coal									
Intermediate	8-5/8	K-55	32	X		2450 MD; 2140	TVD SAME	515 cu ft	Depths set <u>38CSR-18-11.1</u>
Production	5-1/2	K-55	17	X		6500 MD; 5090	TVD SAME	730 cu ft	
Tubing	2-7/8	J-55	65	X		6500 MD; 5090	TVD SAME		
Liners									

OFFICE USE ONLY  
 DRILLING PERMIT

Permit number 47-045-1110

November 3 19 87  
 Date

This permit covering the well operator and well location shown below is evidence of permission granted to drill in accordance with the pertinent legal requirements subject to the conditions contained herein and on the reverse hereof. Notification must be given to the District Oil and Gas Inspector, (Refer to No. 8) Prior to the construction of roads, locations and pits for any permitted work. In addition, the well operator or his contractor shall notify the proper district oil and gas inspector 24 hours before actual permitted work has commenced.)

The permitted work is as described in the Notice and Application, plat, and reclamation plan, subject to any modifications and conditions specified on the reverse hereof.

Permit expires November 3, 1989 unless well work is commenced prior to that date and prosecuted with due diligence.

Bond: <u>      </u>	Agent: <u>      </u>	Plat: <u>      </u>	Casing: <u>      </u>	Fee: <u>236</u> <u>22079</u>	WPOP: <u>      </u>	SEP: <u>      </u>	Other: <u>      </u>
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NOTE: Keep one copy of this permit posted at the drilling location.

        
 Director, Division of Oil and Gas

File

See the reverse side of the APPLICANT'S COPY for instructions to the well operator.