

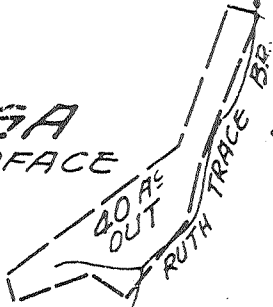
Janie 11/9/88

50

2,250'

Latitude 37° 47' 30"

COTIGA DEVELOPMENT CO. & MINERAL SURFACE



20223

STAKE & RIDGE BETWEEN 2 CHESTNUT OAKS
N69°00'W 8,817.0'
S47°15'W-646.0'

STAKE & HIGH KNOB-

FARM MAP X

MILLER

CREEK

PEG FORK
20674

N26°10'E
11,356.0'

S62°00'W
14,988.0'

Longitude 82° 15' 00"

COTIGA DEVELOPMENT CO.

5.58
0.42

2.70
0.42

STAKE ON HILLSIDE
12" CHESTNUT OAK AND
1/4" HICKORY WITNESS
N43°27'W-100.0'
24" RED OAK
N43°27'W-567.5'

BENCH MARK DESCRIPTION
SQUARE CUT IN END OF SOUTHWEST
WINGWALL OF RAILROAD BRIDGE
NO 933 OVER MILLER CREEK
ELEVATION 647.59'

REVISED
7-22-80

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 the rules and regulations of the oil and gas section of the mining laws of WEST VIRGINIA.
Minimum degree of accuracy is one part in 500

- New Location
- Storage
- Drill Deeper
- Abandonment
- Re-Drill/Fracture

Signed _____

REG. LAND SURVEYOR NO 16236E (PA.)
BOX 1273 CHARLESTON, W. VA.

Company COLUMBIA GAS TRANS. CORP.
 Address BOX 1273 CHARLESTON, W. VA.
 Farm COTIGA DEVELOPMENT CO.
 Lease 50052 Acres 9,638.37 AC
 Well Farm No. _____ Ser. No. 20223
 Elevation - Spirit Level 1502.84'
 Quadrangle NAUGATUCK, W. VA. 7 1/2 x 15'
 Township or District HARDEE
 County MINGO
 Sec., Lot, Qr. _____ T _____ R _____
 Coordinates LAT. 37° 25' 07" LONG. 82° 15' 28"
 File No. 26-17 Dwg. No. _____
 Date 2-14-80 Scale 1" = 2000'

FORM 1495 CE 4 (REV. 11-78)

COLUMBIA GAS SYSTEM
COLUMBIA GAS TRANSMISSION CORPORATION
WELL LOCATION MAP
STATE OF WEST VIRGINIA

(+) Denotes Values of Well On United States Topographic Maps

502
089
15'-SE q

059-0956 - Frac.

Scale 15'

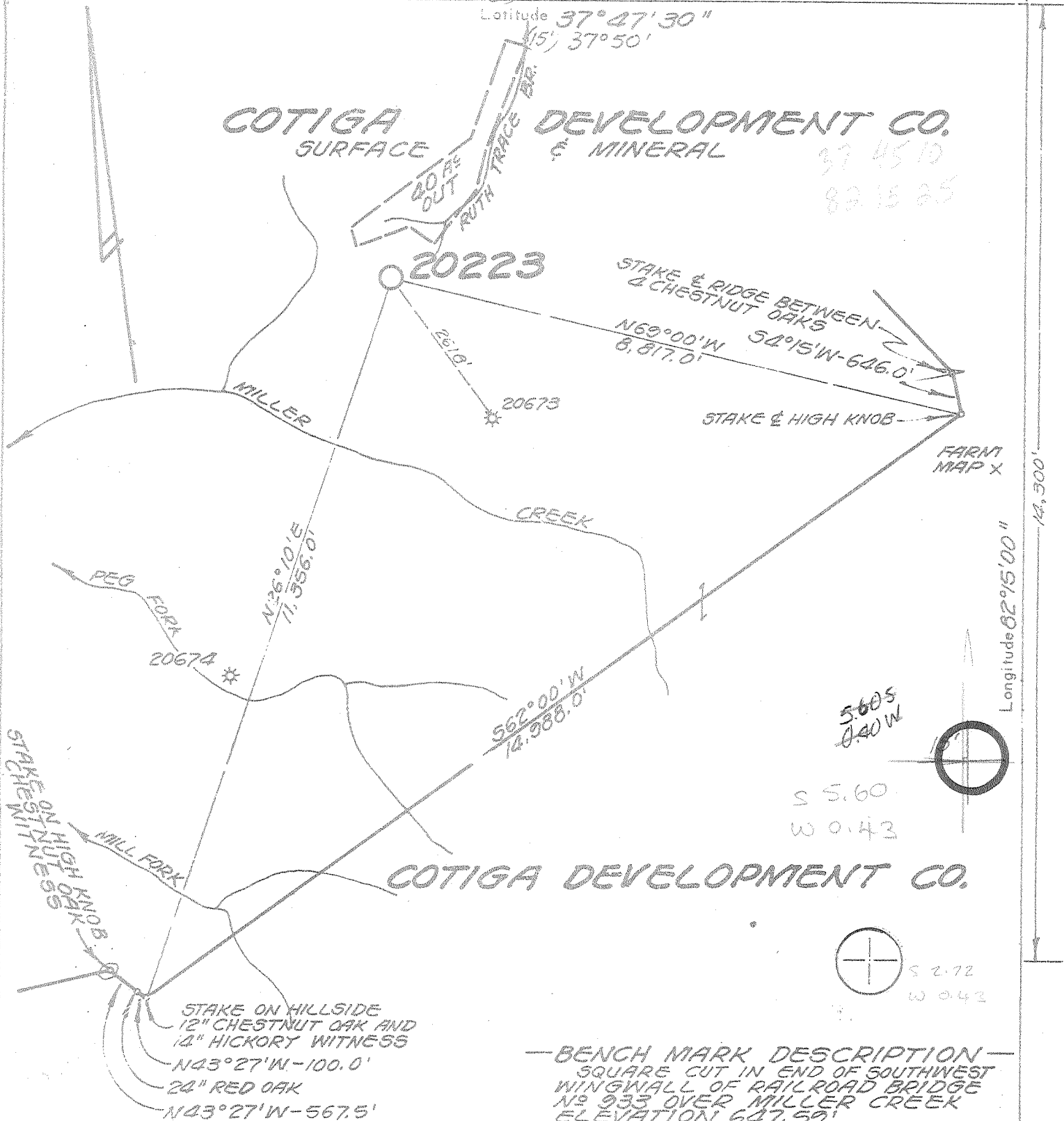
NOV 18 1988

4475 BEREA SHALE

OWWO DEEPWELL 6-6 Brecken Geels (243)

9-55 9-18-80

2250'



Latitude 37° 27' 30" (5' 37° 50')

Longitude 82° 15' 00"

COTIGA DEVELOPMENT CO.

5605 0.40 W

S 5.60 W 0.43

S 2.72 W 0.43

BENCH MARK DESCRIPTION
 SQUARE CUT IN END OF SOUTHWEST WINGWALL OF RAILROAD BRIDGE NO 933 OVER MILLER CREEK ELEVATION 627.50'

REVISED 7-22-80

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 the rules and regulations of the oil and gas section of the mining laws of WEST VIRGINIA
 Minimum degree of accuracy is one part in 200

- New Location
- Storage
- Drill Deeper
- Abandonment
- Re-Drill/Fracture

Signed _____
 REG. LAND SURVEYOR NO 16236 E (PA.)
 BOX 1273 CHARLESTON, W.VA.

FORM 1495 CE 4 CSD (REV. 11-78)

Company COLUMBIA GAS TRANS. CORP.
 Address BOX 1273 CHARLESTON, W.VA.
 Farm COTIGA DEVELOPMENT CO.
 Lease 50052 Acres 9.638.97 AC
 Well Farm No. _____ Ser. No. 20223
 Elevation - Spirit Level 1502.84'
 Quadrangle NAUGATUCK, W.VA. 7 1/2 15 SE
 Township or District HARDEE
 County MINGO
 Sec., Lot, Qr. _____ T. _____ R. _____
 Coordinates LAT. 37° 25' 07" LONG. 82° 15' 28"
 File No. 26-17 Dwg. No. _____
 Date 2-14-80 Scale 1" = 2000'

COLUMBIA GAS SYSTEM
 COLUMBIA GAS TRANSMISSION CORPORATION
 WELL LOCATION MAP
 STATE OF WEST VIRGINIA

(+) Denotes Values of Well On United States Topographic Maps

059-0956

Scale 15' 7-1/2'

4475 BEREA SHALE OCT 17 1980

6-6 BREWER CREEK DEEP WELL (243)



STATE OF WEST VIRGINIA
DEPARTMENT OF MINES

Oil and Gas Division
WELL RECORD

RECEIVED
MAY 18 1981

OIL & GAS DIVISION
DEPT. OF MINES

Quadrangle Naugatuck

Permit No. 47-059-0956

Rotary X Oil _____
Cable _____ Gas X _____
Recycling _____ Comb. _____
Water Flood _____ Storage _____
Disposal _____ (Kind) _____

Company Columbia Gas Transmission Corp.
Address P. O. Box 1273-Chas., W. Va.
Farm Cotiga Development Acres 9639
Location (waters) Miller Creek
Well No. 20223 Elev. 1503
District Hardee County Mingo
The surface of tract is owned in fee by _____
Cotiga Development Co.
Address 25 Darby Rd., Paoli, PA 19301
Mineral rights are owned by Cotiga Devel. Co.
Address Paoli, PA 19301
Drilling Commenced 10-28-80
Drilling Completed 11-9-80
Initial open flow Show cu. ft. _____ bbls.
Final production 60,000 cu. ft. per day _____ bbls.
Well open 6 hrs. Before test 206 RP.

Casing and Tubing	Used in Drilling	Left in Well	Cement fill up Cu. ft. (Sks.)
Size 20-16			
Cond. 13-10" 13 3/8	28'	28'	28' (18 sks)
9 5/8 11 3/4	77.9'	77.9'	78' (65 sks)
8 5/8	2444'	2444'	2444' (595sks)
7			
5 1/2			
4 1/2	4439'	4439'	470' (97 sks)
3			
2 3/8	4254' 4"	4254' 4"	
Liners Used			

Well treatment details: Attach copy of cementing record.
75 Quality foam fractured Br. Shale w/907 total barrels fluid; 340,000 Scf N₂;
29,000# 80/100 Sand & 28,000# 20/40 Sand

Coal was encountered at N/A Feet _____ Inches _____
Fresh water N/A Feet _____ Salt Water _____ Feet _____
Producing Sand Br. Shale Depth 4112 - 4384

Formation	Color	Hard or Soft	Top Feet	Bottom Feet	Oil, Gas or Water	* Remarks
Sand			0	105		
Sand & Shale			105	250		
Sand			250	300		
Sand & Shale			300	1490		
1st Salt Sand			1490	1703		
Shale			1703	1760		
2nd Salt Sand			1760	2328		
Shale			2328	2389		
Maxon			2389	2404		
Big Lime			2404	2598		
Shale			2598	2661		
Injun			2661	2670		
Shale			2670	2716		
Weir			2716	2940		
Shale			2940	3275		
Coffee Shale			3275	3309		
Berea			3309	3364		
Devonian Shale			3364	4112		
Br. Shale			4112	4384		
Devonian Shale			4384	4598		
Br. Shale			4598	4726		
				4726		

Onondaga. at 4704'
(elev. being 1513 K.b.)
T. D.

(over)

* Indicates Electric Log tops in the remarks section.



STATE OF WEST VIRGINIA
DEPARTMENT OF MINES

RECEIVED

SEP 17 1980

Oil and Gas Division

OIL & GAS DIVISION
DEPT. OF MINES

OIL AND GAS WELL PERMIT APPLICATION

TO THE DEPARTMENT OF MINES,
Charleston, W. Va.

DATE September 16, 1980
Company Columbia Gas Transmission Corp.
Address P. O. Box 1273, Charleston, WV
Farm Cotiga Development Co. Acres 9,638.97
Location (waters) Miller Creek
Well No. 20223 Elevation 1502.84
District Hardee County Mingo
Quadrangle Naugatuck

Surface Owner Cotiga Development Company
Address 25 Darby Rd., Paoli, PA 19301
Mineral Owner Same as above
Address _____
Coal Owner Same as above
Address _____
Coal Operator Marrowbone Development Company
Address P. O. Box 445, Kermit, WV 25674

THIS PERMIT MUST BE POSTED AT THE WELL SITE

All provisions being in accordance with Chapter 22,
of the W. Va. Code, the location is hereby approved
for Drilling. This permit shall expire if
operations have not commenced by 6-2-81

John B. ...
Deputy Director - Oil & Gas Division

INSPECTOR
TO BE NOTIFIED Arthur St. Clair
ADDRESS P. O. Box 157, Brenton, WV
PHONE 732-6227

GENTLEMEN:

The undersigned well operator is entitled to drill upon the above named farm or tract of land for oil and gas, having fee title thereto, (or as the case may be) under grant or lease dated 1/29 1952 by _____ made to _____ and recorded on the _____ day of _____ 19____, in Mingo County, Book 36 Page 208
 NEW WELL _____ DRILL DEEPER _____ REDRILL _____ FRACTURE OR STIMULATE
_____ OIL AND GAS WELL ORIGINALLY DRILLED BEFORE JUNE 5, 1969.

The enclosed plat was prepared by a registered engineer or licensed land surveyor and all coal owners and/or operators have been notified as of the above date.

The above named coal owners and/or operator are hereby notified that any objection they wish to make, or are required to make by Section 3 of the Code, must be received by, or filed with the Department of Mines within ten (10) days.

Copies of this notice and the enclosed plat were mailed by registered mail, or delivered to the above named coal operators or coal owners at their above shown respective address _____ day _____ before, or on the same day with the mailing or delivery of this copy to the Department of Mines at Charleston, West Virginia.

PLEASE SUBMIT COPIES OF ALL
GEOPHYSICAL LOGS DIRECTLY TO:

WEST VIRGINIA GEOLOGICAL AND
ECONOMIC SURVEY
P. O. BOX 879
MORGANTOWN, WEST VIRGINIA 26505
AC-304 - 292-6331

Address
of
Well Operator

Very truly yours,
(Sign Name) [Signature]
Well Operator
P. O. Box 1273
Street
Charleston
City or Town
West Virginia 25325
State

*SECTION 3 If no objections are filed or found by the Department of mines, within said period of ten days from the receipt of notice and plat by the department of mines, to said proposed location, the department shall forthwith issue to the well operator a permit reciting the filing of such plat, that no objections have been made by the coal operators or found thereto by the department and that the same is approved and the well operator authorized to proceed.

47-059-0956 _____ PERMIT NUMBER

"I have read and understand the reclamation requirements as set forth in Chapter 22, Article 4, Section 12-b and will carry out the specified requirements."

Signed by [Signature]
Director, Exploration & Development

NET BOND

THIS IS AN ESTIMATE ONLY
ACTUAL INFORMATION WILL BE SUBMITTED ON OG-10 UPON COMPLETION

PROPOSED WORK ORDER TO X DRILL _____ DEEPEN _____ FRACTURE-STIMULATE _____
 DRILLING CONTRACTOR: (If Known) _____ RESPONSIBLE AGENT: _____
 NAME _____ NAME Joe Campbell
 ADDRESS _____ ADDRESS P. O. Box 2946, Huntington, WV
 TELEPHONE _____ TELEPHONE 529-4173
 ESTIMATED DEPTH OF COMPLETED WELL: 4475' ROTARY X CABLE TOOLS _____
 PROPOSED GEOLOGICAL FORMATION: Berea Shale
 TYPE OF WELL: OIL _____ GAS X COMB. _____ STORAGE _____ DISPOSAL _____
 RECYCLING _____ WATER FLOOD _____ OTHER _____

TENTATIVE CASING PROGRAM:

CASING AND TUBING SIZE	USED FOR DRILLING	LIFT IN WELL	CEMENT SET UP OR SACKS - CUBIC FT.
20 - 16			
13 - 10x 3/8	600'		To surface
9 - 5/8			
8 - 5/8	2260'		To surface
7			
5 1/2			
4 1/2	4475'		
3			
2			Perf. Top
Liners			Perf. Bottom
			Perf. Top
			Perf. Bottom

APPROXIMATE FRESH WATER DEPTHS _____ FEET SALT WATER _____ FEET
 APPROXIMATE COAL DEPTHS _____
 IS COAL BEING MINED IN THE AREA? Yes BY WHOM? _____

TO DRILL:

SUBMIT FIVE (5) COPIES OF OG - 1, \$100.00 PERMIT FEE, PERFORMANCE BOND AND PERMANENT COPY OF PLAT.

TO DRILL DEEPER OR REDRILL:

SUBMIT FIVE (5) COPIES OF OG - 1, SHOWING ORIGINAL PERMIT NUMBER AND PERFORMANCE BOND, ON WELLS DRILLED PRIOR TO 1929, A PERMANENT COPY OF THE PLAT AND THE ORIGINAL WELL RECORD MUST ALSO BE SUBMITTED.

TO FRACTURE - STIMULATE:

OIL AND/OR GAS WELL ORIGINALLY DRILLED BEFORE JUNE 5, 1929, FIVE (5) COPIES OG - 1, PERFORMANCE BOND, PERMANENT PLAT AND ORIGINAL WELL RECORD.
 OIL AND/OR GAS WELL ORIGINALLY DRILLED ON AND/OR AFTER JUNE 5, 1929, FIVE COPIES OG - 1, SHOWING ORIGINAL PERMIT NUMBER, AND PERFORMANCE BOND.

Required forms must be filed within ninety (90) days of completion for bond release. Inspector to be notified twenty-four (24) hours in advance.

The following waiver must be completed by the coal operator if the permit is to be issued within ten days of receipt thereof.

WAIVER: I the undersigned, Agent for _____ Coal Company, Owner or Operator of the coal under this lease have examined and place on our mine maps this proposed well location.
 We the _____ Coal Company have no objections to said well being drilled at this location, providing operator has complied with all rules and regulations in Articles 4, 5, and 7, Chapter 22 of the West Virginia Code.

 For Coal Company

 Official Title

18

059-0956-F

Issued 11/18/88 Expires 11/18/90

Page 2 of 7

FORM WW-2B

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

- 1) Well Operator: Columbia Gas Transmission 10450, 1, 501
- 2) Operator's Well Number: 20223 3) Elevation: 1502.84
- 4) Well type: (a) Oil or Gas
(b) If Gas: Production Underground Storage
Deep Shallow
- 5) Proposed Target Formation(s): Devonian Shale
- 6) Proposed Total Depth: 4726 feet
- 7) Approximate fresh water strata depths: 105'
- 8) Approximate salt water depths: 1695'
- 9) Approximate coal seam depths: N/A
- 10) Does land contain coal seams tributary to active mine? Yes No
- 11) Proposed Well Work: Well was drilled and completed 4/14/81. Restimulate Shale formation.
- 12)

CASING AND TUBING PROGRAM

TYPE	SPECIFICATIONS			FOOTAGE INTERVALS		CEMENT
	Size	Grade	Weight per ft.	For drilling	Left in well	Fill-up (cu. ft.)
Conductor	13 3/8	H-40	54	28	28	30 18 SKS
Fresh Water	11 3/4	H-40	42	78	78	35 65 SKS
Coal						
Intermediate	8 5/8	K-55	24	2444	2444	853 5455 ACES
Production	4 1/2	K-55	10.5	4439	4439	Present-137 97 SKS Proposed-100
Tubing	2 3/8	J-55	4.6	---	4254	-----
Liners						

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NOV 02 1988

PACKERS : Kind None
Sizes _____
Depths set _____

DIVISION OF OIL & GAS
DEPARTMENT OF ENERGY

For Division of Oil and Gas Use Only

5014639

Fee(s) paid: Well Work Permit Reclamation Fund WPCP

Plat WW-9 WW-2B Bond 50 Blanket Agent

RECEIVED
NOV 02 1988

DIVISION OF OIL & GAS
DEPARTMENT OF ENERGY

Date: October 18, 1988
Operator's well number
20223
API Well No: 47 - 059 - 0956-FRAC
State - County - Permit

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 Cotiga Development Company
Address P. O. Box 27157
Wyndmoor, PA 19118
 - (b) Name _____
Address _____
 - (c) Name _____
Address _____
- 5) (a) Coal Operator:
- Name _____
Address _____
 - (b) Coal Owner(s) with Declaration
Name _____
Address _____
 - (c) Coal Lessee with Declaration
Name See Attached
Address _____
- 6) Inspector Arthur St. Clair
Address P. O. Box 468
Brenton, WV 24818
Telephone (304)-732-6227

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 _____ on the above named parties, by:

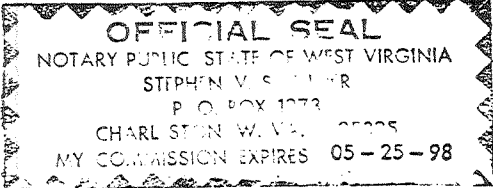
- _____ Personal Service (Affidavit attached)
- X Certified Mail (Postmarked postal receipt attached)
- _____ Publication (Notice of Publication attached)

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 Columbia Gas Transmission Corporation
By: [Signature]
Its: Director, Drilling and Maintenance
Address P. O. Box 1273
Charleston, WV 25325
Telephone (304)357-2000



Subscribed and sworn before me this 20 day of October, 1988

Stephen V. Snodder Notary Public
My commission expires May 25, 1998



IV-35
(Rev 8-81)

Date February 6, 1989
Operator's
Well No. 20223
Farm Cotiga Development
API No. 47 - 59 - 00956-F

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FEB 14 1989

State of West Virginia
Department of Mines
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 /)

LOCATION: Elevation: 1502.84' Watershed Miller Creek
District: Hardee County Mingo Quadrangle Nauquatuck, WV

COMPANY Columbia Gas Transmission Corp.

ADDRESS P. O. Box 1273, Charleston, WV 25325

DESIGNATED AGENT R. C. Weidner

ADDRESS P. O. Box 1273, Charleston, WV 25325

SURFACE OWNER Cotiga Development

ADDRESS 25 Darby Rd., Paoli, PA 19301

MINERAL RIGHTS OWNER Cotiga Development

ADDRESS 25 Darby Rd., Paoli, PA 19301

OIL AND GAS INSPECTOR FOR THIS WORK Tim

Bennet: ADDRESS

PERMIT ISSUED 11-18-88

DRILLING COMMENCED N/A 2/06/89

DRILLING COMPLETED N/A 2/06/89

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 XXXXX Cond. <u>13"</u>	<u>28'</u>	<u>28'</u>	<u>30</u>
12x10" <u>11"</u>	<u>78'</u>	<u>78'</u>	<u>35</u>
<u>9 5/8</u>			
<u>8 5/8</u>	<u>2444'</u>	<u>2444'</u>	<u>853</u>
<u>7</u>			
<u>5 1/2</u>			
<u>4 1/2</u>	<u>4439</u>	<u>4439</u>	<u>254</u>
<u>3</u>			
<u>2 3/8</u>	<u>---</u>	<u>3396</u>	<u>-----</u>
Liners used			

GEOLOGICAL TARGET FORMATION Cleveland Shale Depth 3500 feet

Depth of completed well 3494' feet Rotary / Cable Tools

Water strata depth: Fresh N/A feet; Salt N/A feet

Coal seam depths: N/A Is coal being mined in the area?

OPEN FLOW DATA

Producing formation Cleveland Shale Pay zone depth 3365-3428 feet

Gas: Initial open flow 0 Mcf/d Oil: Initial open flow Bbl/d

Final open flow 119 Mcf/d Final open flow Bbl/d

Time of open flow between initial and final tests 4 hours

Static rock pressure 240 psig (surface measurement) after 18 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

FEB 17 1989
(Continue on reverse side)

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

Set Model K Baker Plug (4 1/2") at 3950'. Shot cement holes at 3525'. Cemented Cleveland Shale with 117 cu.ft. Class A Cement. Set Halliburton 4 1/2" SV Cementing plug at 3494' and perforated Cleveland Shale from 3365-3428. Foam fractured Shale with 75 Quality Foam. Originally completed Shale interval had depleted, thus new T.D. is 3494'.

NOTE: While performing permitted fracturing work, the well was plugged back to 3494' as follows:
 Baker Model K Mechanical Plug set at 3950'
 Cement - 3525-3494'
 Halliburton SV Mechanical Plug set at 3494'

WELL LOG

FORMATION	COLOR	HARD OR SOFT	TOP FEET	BOTTOM FEET	REMARKS Including indication of all fresh and salt water, coal, oil and gas

John Buck & Frac

RECEIVED
FEB 14 1989

DIVISION OF OIL & GAS
DEPARTMENT OF ENERGY

(Attach separate sheets as necessary)

Well Operator _____
 By: *Joseph P. Bell*
 Date: *2-10-89*

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 _____, encountered in the drilling of a well."