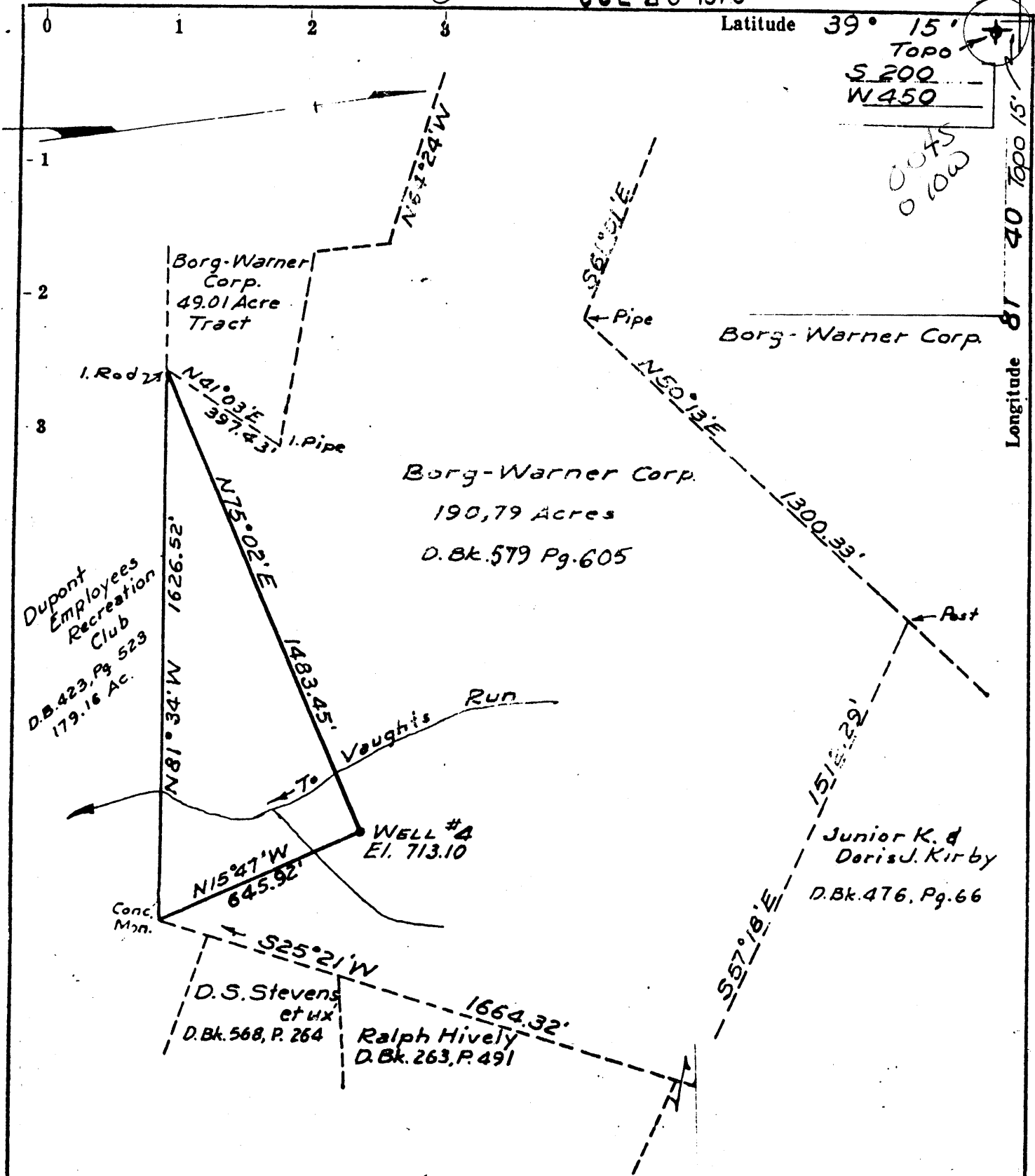


JUL 20 1976

Latitude 39° 15'

TOPO  
S. 200  
W. 450

Longitude 81° 40' 15"



- Fracture....
- Redrill....
- New Location
- Drill Deeper
- Abandonment

Source of Elevation Borg-Warner Mon. T, Elev. 644.337

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.

Minimum accuracy, one part in 200.

Company BORG-WARNER CORP. 105  
 Address PO Box 1868 Parkersburg W.V. 26101  
Woodmar Plant, Washington, W.V.  
 Farm Borg-Warner Corp.  
 Tract \_\_\_\_\_ Acres 190.79 Lease No. \_\_\_\_\_  
 Well (Farm) No. #4 Serial No. \_\_\_\_\_  
 Elevation (Spirit Level) 713.10  
 Quadrangle Lubeck 449 Bellefonte 009  
 County Wood District Lubeck 3  
 Surveyor or Engineer Arden L. Marshall LLS No 3  
 Surveyor's or Engineer's Registration No. 3  
 File No. \_\_\_\_\_ Drawing No. \_\_\_\_\_  
 Date May 6, 1976 Scale 1" = 400 Ft.

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

WELL LOCATION MAP

NW1 FILE NO. W00-755-F

+ Denotes location of well on United States Topographic Maps, scale 1 to 62,500, latitude and longitude lines being represented by border lines as shown.

DEC 8 1986

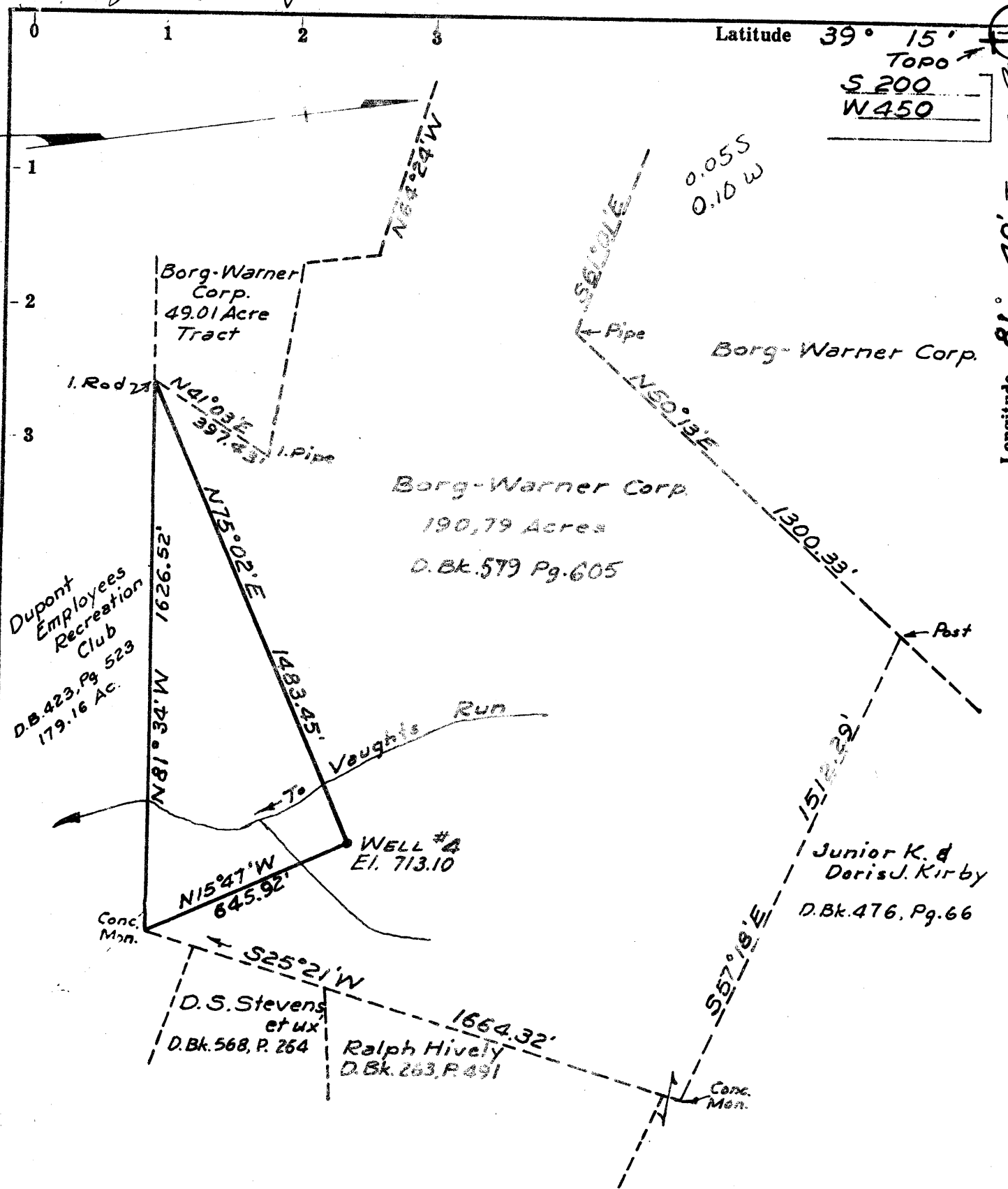
- Denotes one inch spaces on border line of original tracing.

DCS D Well... Washington Bottom (253)

Latitude 39° 15'

TOPO  
S 200  
W 450

Longitude 81° 40' Topo 15'



- Fracture.....
- Redrill.....
- New Location
- Drill Deeper
- Abandonment

Source of Elevation Borg-Warner Mon. #1, Elev. 644.337

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.

Minimum accuracy, one part in 200.

Company BORG-WARNER CORP.  
 Address PO Box 1868 Parkersburg WV 26101  
Woodmar Plant, Washington, W.Va  
 Farm Borg-Warner Corp.  
 Tract \_\_\_\_\_ Acres 190.79 Lease No. \_\_\_\_\_  
 Well (Farm) No. #4 Serial No. \_\_\_\_\_  
 Elevation (Spirit Level) 713.10 NW  
 Quadrangle 7 1/2 Lubeck; Belleville 15'  
 County Wood District Lubeck  
 Surveyor or Engineer Arden L. Marshall LLS No 3  
 Surveyor's or Engineer's Registration No. 3  
 File No. \_\_\_\_\_ Drawing No. \_\_\_\_\_  
 Date May 6, 1976 Scale 1" = 400 Ft.

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

WELL LOCATION MAP  
 FILE NO. W00-755

+ Denotes location of well on United States Topographic Maps, scale 1 to ~~62,500~~ 25,000 latitude and longitude lines being represented by border lines as shown.

— Denotes one inch spaces on border line of original tracing.

Deep well - 6-4 WASHINGTON BOTTOM 357

JUL 20 1976



IV-35  
(Rev 8-81)

Date January 8, 1988  
Operator's  
Well No. 4  
Farm Borg-Warner Chemicals  
API No. 47 - 107 - 0755-F

**RECEIVED**  
JAN 12 1988

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    / Underground Storage    / Deep    / Shallow    /)

LOCATION: Elevation: 713.10' Watershed Ohio River  
District: Lubeck County Wood Quadrangle Little Hocking

COMPANY Borg-Warner Chemicals, Inc.  
ADDRESS P.O. Box 1868, Parkersburg, WV 26102  
DESIGNATED AGENT Arthur T. Sandy  
ADDRESS P.O. Box 1868, Parkersburg, WV 26102  
SURFACE OWNER Borg-Warner Chemicals, Inc.  
ADDRESS P.O. Box 1868, Parkersburg, WV 26102  
MINERAL RIGHTS OWNER Same as above  
ADDRESS     
OIL AND GAS INSPECTOR FOR THIS WORK Glen P. Robinson ADDRESS Rt. #1 Mt. Pleasant Est. Mineral Wells, WV 26150  
PERMIT ISSUED 12/5/86  
DRILLING COMMENCED Recompletion started 12/15/86  
DRILLING COMPLETED Recompletion finished 1/5/87  
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 20-16 Cond.			
<del>11 3/4</del>	75'	75'	Cement to surface
9 5/8	2040'	2040'	"
8 5/8	NOTE: Permanent plug set @ 1980' in 8-5/8" casing.		
7	4220'	2194'	Cement top est. @ 4220'
5 1/2	NOTE: Permanent plug set @ 4190' and at 4117' in 7" casing.		
4 1/2			
3			
2			
Liners used			

GEOLOGICAL TARGET FORMATION Berea Sandstone Depth 1930-1934 feet  
Depth of completed well 1980 feet Rotary    / Cable Tools Service Rig  
Water strata depth: Fresh    feet; Salt    feet  
Coal seam depths: no coal encountered Is coal being mined in the area?   

OPEN FLOW DATA  
Producing formation Berea Sandstone Pay zone depth 1930-1934 feet  
Gas: Initial open flow Slight Mcf/d Oil: Initial open flow    Bbl/d  
show  
Final open flow (110) Mcf/d Final open flow    Bbl/d  
Time of open flow between initial and final tests 24 hours  
Static rock pressure 685 psig (surface measurement) after 96 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

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

Set permanent bridge plug at 4190' and at 4117' in 7" casing with one bag calseal on each plug. Cut 7" casing off at 2026'. Set permanent bridge plug at 1980' in 9-5/8" casing. Perforated 9-5/8" casing from 1931'-1933' with 16 holes x 0.49" diameter. Nowsco form fraced Berea Sandstone with 75% quality foam, 30,000 lbs. 20/40 sand and 11,500 lbs. 10/20 sand, and 352,800 SCF nitrogen. Well started taking fluid at 1860 psig and treated at 1750 psig. Total water used 173 bbls. Total foam treatment 692 bbls. ISIP 1890 psig. 5 min. SI 1680 psig.

Cleaned well up and ran 1950' 2" tubing in well. Well averaged 32 MCF/day for first month of production.

WELL LOG

FORMATION	COLOR	HARD OR SOFT	TOP FEET	BOTTOM FEET	REMARKS Including indication of all fresh and salt water, coal, oil and gas
Surface			0	10	
Shale			10	110	
Sand			110	150	
Shale, sand stringers			150	940	
Sand			940	990	
Shale			990	1090	
Sand			1090	1170	
Shale			1170	1250	
Sand			1250	1260	
Shale			1260	1320	
Sand			1320	1340	
Shale			1340	1435	
Sand			1435	1660	Hole Full Water - 1660'
Shale-siltstone			1660	1910	
Shale			1910	1932	
Sand			1932	1936	
Shale-siltstone			1936	4155	
Limestone			4155	4240	
Sand			4240	4280	Show gas 4250'
Limestone, dolomite			4280	4980	
Sand			4980	5350	
Shale			5350	5580	
Limestone			5580	5595	
Shale			5595	5640	
Sand, shale stringers			5640	5780	
Shale			5780	5824	
Sand			5824	5848	
Shale			5848	5902	T.D. 5902'

**RECEIVED**  
JAN 12 1988

DIVISION OF OIL & GAS  
DEPARTMENT OF ENERGY

(Attach separate sheets as necessary)

Borg-Warner Chemicals, Inc.

Well Operator

By: Arthur T. Sandy  
Arthur T. Sandy

Date: January 8, 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."



MADE 7-1977

STATE OF WEST VIRGINIA  
DEPARTMENT OF MINES

OIL & GAS DIVISION  
DEPT. OF MINES

Oil and Gas Division

WELL RECORD

Quadrangle Lubeck

Permit No. WOO-755

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

**CONFIDENTIAL**

Company Borg-Warner Corp.  
Address Woodmar Plant - Washington, W. Va.  
Farm Borg-Warner Corp. Acres 190.79  
Location (waters) Vaughts Run  
Well No. Four Elev. 713.10  
District Lubeck County Wood  
The surface of tract is owned in fee by Borg-Warner Corp.  
Address Woodmar Plant - Washington, W. Va.  
Mineral rights are owned by Same  
Address \_\_\_\_\_  
Drilling Commenced 10-19-76  
Drilling Completed 10-31-76  
Initial open flow -- cu. ft. -- bbls.  
Final production 270M cu. ft. per day -- bbls.  
Well open 1 hrs. before test 1450 RP.

Casing and Tubing	Used in Drilling	Left in Well	Cement fill up Cu. ft. (Sks.)
Size 20-16			
Cond. 13-10"	75	75	circulate to surface
9 5/8	2040	2040	circulate to surface
8 5/8			
7	4220	4220	cement to 4050'
5 1/2			
4 1/2			
3			
2			
Liners Used			

Well treatment details:

Attach copy of cementing record.

1047 bbl. water - 30,000# 20-40 mesh sand - 500 gal acid 15% Hcl  
Fractured 12-9-76

Coal was encountered at No coal Feet \_\_\_\_\_ Inches \_\_\_\_\_  
Fresh water None encountered Feet \_\_\_\_\_ Salt Water Hole Full Feet 1600  
Producing Sand Oriskany Depth 4240-4280

Formation	Color	Hard or Soft	Top Feet	Bottom Feet	Oil, Gas or Water	* Remarks
Surface			0	10		
Shale			10	110		
Sand			110	150		
Shale, sand stringers			150	940		
Sand			940	990		
Shale			990	1090		
Sand			1090	1170		
Shale			1170	1250		
Sand			1250	1260		
Shale			1260	1320		
Sand			1320	1340		
Shale			1340	1435		
Sand			1435	1660		Hole Full Water - 1660'
Shale-siltstone			1660	1910		
Shale			1910	1932		
Sand			1932	1936		
Shale-siltstone			1936	4155		
Limestone			4155	4240		
Sand			4240	4280		Show gas 4250'
Limestone, dolomite			4280	4980		

(over)

\* Indicates Electric Log tops in the remarks section.

Formation	Color	Hard or Soft	Top Feet	Bottom Feet	Oil, Gas or Water	* Remarks
Sand			4980	5350	4988-5005	Newb
Shale	Rose Hill		5350	5580	5348-5315	Kecfer
Limestone			5580	5595		Lockport 5112-5348
Shale			5595	5640		
Sand, shale stringers			5640	5780		Tuscarora
Shale			5780	5824		
Sand			5824	5848		
Shale	<del>HLDBG</del> Juniata		5848	5902	T.D. 5902'	

4155	4240	4280
713	713	713
3442	3527	3567

Date March 3, 19 77

APPROVED Borg-Warner Corporation, Owner

By Gordon P. Sandy  
 (Title)  
Group Purchasing Agent



STATE OF WEST VIRGINIA  
DEPARTMENT OF MINES

RECEIVED  
MAY 26 1976

Oil and Gas Division

AND GAS WELL PERMIT APPLICATION



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

Surface Owner Borg-Warner Corporation  
Attn: Arthur Sandy  
Address P.O. Box 1868, Parkersburg, WV 26101  
Mineral Owner Same  
Address \_\_\_\_\_  
Coal Owner None  
Address \_\_\_\_\_  
Coal Operator \_\_\_\_\_  
Address \_\_\_\_\_

DATE May 24, 1976  
Company Borg-Warner Corporation  
Address P.O. Box 1868, Parkersburg, WV 26101  
Farm Borg-Warner Corporation Acres 190.79  
Location (waters) Ohio River  
Well No. Four Elevation 713.10  
District Lubeck County Wood  
Quadrangle Little Hocking 7 1/2

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 11-7-76.

Robert B. Todd  
Deputy Director - Oil & Gas Division  
GENTLEMEN:

INSPECTOR TO BE NOTIFIED Paul Goodnight  
477-2455 ADDRESS Smithville, W.Va.  
PH: \_\_\_\_\_

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 Oct. 9, 1970 by Arthur O. Mollendick made to Borg Warner Corporation and recorded on the \_\_\_\_\_ day of \_\_\_\_\_ 19\_\_\_\_, in Wood County, Book 579 Page 605

\_\_\_\_\_  
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.

Very truly yours, Borg Warner Corporation  
(Sign Name) Arthur P. Sandy  
Well Operator

PLEASE SUBMIT COPIES OF ALL  
GEOPHYSICAL LOGS DIRECTLY TO:  
West Virginia Geological and Economic Survey  
P. O. Box 879  
Morgantown, W. Va. 26505

Address  
of  
Well Operator

P. O. Box 1868  
Street  
Parkersburg  
City or Town  
W. Va.  
State

BOND DRILL

\*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.  
"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: Arthur P. Sandy

WOOD-755 PERMIT NUMBER  
47-107

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

PROPOSED WORK ORDER TO  DRILL \_\_\_\_\_ DEEPEN \_\_\_\_\_ FRACTURE-STIMULATE \_\_\_\_\_  
 DRILLING CONTRACTOR: (If Known) \_\_\_\_\_ RESPONSIBLE AGENT: \_\_\_\_\_  
 NAME \_\_\_\_\_ NAME **Arthur Sandy**  
 ADDRESS \_\_\_\_\_ ADDRESS **P. O. Box 1868, Parkersburg, W. Va.**  
 TELEPHONE \_\_\_\_\_ TELEPHONE **485-1771**  
 ESTIMATED DEPTH OF COMPLETED WELL: **4250** ROTARY  CABLE TOOLS \_\_\_\_\_  
 PROPOSED GEOLOGICAL FORMATION: **Oriskany**  
 TYPE OF WELL: OIL \_\_\_\_\_ GAS \_\_\_\_\_ COMB.  STORAGE \_\_\_\_\_ DISPOSAL \_\_\_\_\_  
 RECYCLING \_\_\_\_\_ WATER FLOOD \_\_\_\_\_ OTHER \_\_\_\_\_

**TENTATIVE CASING PROGRAM:**

CASING AND TUBING SIZE	USED FOR DRILLING	LEFT IN WELL	CEMENT FILL UP OR SACKS - CUBIC FT.
20 - 16			
13 - 10			
9 - 5/8	<b>150</b>	<b>150</b>	<b>Surface</b>
8 - 5/8			
7	<b>1955</b>	<b>1955</b>	<b>500' to 1455'</b>
5 1/2			
4 1/2	<b>4185</b>	<b>4185</b>	<b>300' to 3885</b>
3			Perf. Top
2			Perf. Bottom
Liners			Perf. Top
			Perf. Bottom

APPROXIMATE FRESH WATER DEPTHS **40** FEET \_\_\_\_\_ SALT WATER \_\_\_\_\_ FEET \_\_\_\_\_  
 APPROXIMATE COAL DEPTHS **None** \_\_\_\_\_  
 IS COAL BEING MINED IN THE AREA? **No** 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



FILE COPY  
**RECEIVED**  
NOV 26 1986



1) Date: September 15, 1986  
 2) Operator's Well No. Borg-Warner # 4  
 3) API Well No. 47-107-0755-F  
 State W County W 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 XX /  
 B (If "Gas", Production XX / Underground storage        / Deep        / Shallow XX /)
- 5) LOCATION: Elevation: 713.1 Watershed: Vaught's run  
 District: Lubeck 1053 County: Wood 107 Quadrangle: Lubeck 449
- 6) WELL OPERATOR BORG-WARNER CORP CODE: 6500 7) DESIGNATED AGENT Arthur Sandy  
 Address P. O. Box 1868 Address P O Box 1868  
Parkersburg, WV 26101 Parkersburg WV
- 8) OIL & GAS INSPECTOR TO BE NOTIFIED 9) DRILLING CONTRACTOR:  
 Name Glen P. Robinson Name         
 Address RT 1, #6 Mt. Pleasant Est. Address         
Mineral Wells, WV 26150
- 10) PROPOSED WELL WORK: Drill        / Drill deeper        / Redrill        / Stimulate XX /  
 Plug off old formation        / Perforate new formation XX /  
 Other physical change in well (specify)
- 11) GEOLOGICAL TARGET FORMATION, Oriskany, Gordon, Berea 475
- 12) Estimated depth of completed well, 4290 feet  
 13) Approximate strata depths: Fresh,        feet; salt, 1660 feet.  
 14) Approximate coal seam depths:        Is coal being mined in the area? Yes        / No XX /

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									Kinds
Fresh water	13			XX		75	75	to surface	
Coal									Sizes
Intermediate	9 5/8			XX		2040	2040	to surface	
Production	7		23	XX		4220	4220	50 sx	Depths set
Tubing									
Lin...									Perforations:
									Top Bottom

OFFICE USE ONLY  
**DRILLING PERMIT**

Permit number 47-107-0755-F <sup>W</sup>        December 5 19 86  
 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 December 5, 1988 unless well work is commenced prior to that date and prosecuted with due diligence.

Bond: <u>      </u>	Agent: <u>AS</u>	Plat: <u>AS</u>	Casing: <u>AS</u>	Fee: <u>423827</u>	WPCP: <u>1ank</u>	S&E: <u>AS</u>	Other: <u>OK. MPR</u>
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NOTE: Keep one copy of this permit posted at the drilling location.

        
 Director, Division of Oil and Gas

File