

a decame at a Profestion

Matt. APL#

47-107-01186 D

1997

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

Permitting fice of Oil & Gas

Well Operator's Report of Well Work

Farm name:

Rawson, Karen & Roger

**Operator Well No.:** 

Buffington #1

LOCATION:

**Elevation:** 

823,99

Quadrangle:

Pond Creek

Used

in

**Drilling** 

331.50

2015.60

4534.93

4769

District:

Steele

County:

Casing

&

**Tubing** 

Size

9-5/8"

7``

4-1/2"

2-7/8"

Wood

Cement

Fill up

Cu. Ft.

110 sks

350 sks

130 sks

55 sks Class "A"

Left

in

Well

331.50

2015.60

4534.93

4769

Latitude: Longitude:

4,100 Feet South of 39 Deg. 5 Min. 0 Sec. 9.950 Feet West of 81 Deg. 37 Min. 30 Sec.

Company: Cabot Oil & Gas Corporation

400 Fairway Drive: Suite 400 Coraopolis, PA 15108-4308

Agent: John W. Abshire Inspector: Glen Robinson Permit Issued: 10/03/96 Well Work Commenced: 12/21/96 Well Work Completed: 2/24/97

Verbal Plugging

Permission granted on:

Rotary X Cable Rig Total Depth (feet) 4776 Fresh Water Depths (ft)

Salt Water Depths (ft)

Is coal being mined in area (Y / N)?

Coal Depths (ft)

N/A

### OPEN FLOW DATA

Producing formation	Marcellus		Pay zone depth (ft	) 4444*	4456	
Gas: Initial open flow	TSTM	MCF/d Oil:	Initial open flow	N/A	Bbl/d	
Final open flow	253	MCF/d	Final open flow	N/A	Bbl/d	
Time of open flow between initial and final tests						
Static rock pressure	775	psig (surface p	oressure after	72	Hours	

Second producing forma	tion	Brown Shale Pay zone depth		<b>(t)</b> 3544" - 3960"	
Gas: Initial open flow	TSTM	MCF/d Oil:	Initial open flow	N/A	Bbl/d
Final open flow 253 M		_ MCF/d	Final open flow	N/A	Bbl/d
Time of open flow	()	Hours			
Static rock pressure	775	_ psig (surface p	ressure after	72	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.

CABOT OIL & GAS CORPORATION

#### OPEN FLOW DATA:

Third producing format	ion	Oriskany	Pay zone depth (ft)	4670`-	4688
Gas: Initial open flow	84	MCF/d Oil:	Initial open flow	N/A	Bbl/d
Final open flow	2883	MCF/d	Final open flow	N/A	– Bbl/d
Time of open flo	4	 Hours			
Static rock pressure	1625	psig (surface p	ressure after	44	- Hours

2/12/81: Ran 1000 gals KCl -H2O and Cla-Sta. Perf'd Marcellus from  $4444^{\circ}$  -  $4456^{\circ}$  (48 holes). Ran Petro-Tech Stress frac. Broke down with 2600 psi. ATP = 2300 psi. AIR = 37,500 SCFM (47.4 bbls/min). Total N2 - 862,500 SCF. ISIP = 2000 psi. After 15 mins. = 1950 psi.

2/16/81: Perf d Brown Shale from 3544 - 3960 (25 holes).

2/17/81: Pumped 1000 gals of 15% HCl. Break down pressure = 1800 psi. Treated with 90,000# 20/40 mesh sand. AIR = 13.9 bpm with 24,000 SCFM N2. ATP = 2379 psi. Total fluid: 375 bbls. Sand laden: 325 bbls. Total N2: 648,000 SCF. ISIP = 1400 psi. After 15 mins. = 1225 psi.

Perf d Oriskany a, 4670' - 4688'. Broke down with 250 gals 15% HCl at 3850 psi. ISIP = 2310 psi. Frac with 30# gel H2O (data frac), 27,000# 20/40 mesh sand. AIR = 15 bpm. ATP = 4300 psi. ISIP = 2900 psi.

FORMATION	TOP	· BOTTOM
Sand/Shale	0	348
Sand	348	418
Shale	418	619
Sand	619	670
Shale	670	1153
Sand	1153	1190
Shale	1190	1274
Sand	1274	1335
Shale	1335	1366
Sand	1366	1705
Big Lime	1705	1796 .
Shale	1796	2224
Sunbury Shale	2224	2255
Berea	2255	2257
Shale	2257	2510
Sandy Shale	- 2510	2540
Shale	2540	3736
Huron	3736	3961
Shale	3961	4326
Marcellus	4326	4556 - original TD
Onondaga	4568	4590
Chert	4590	4660
Oriskany	4660	1691
Helderberg	4694	4776 - TD



IV-35 (Rev 8-81)

# State of West Wirginia Bepartment of Mines

Gil und Cas Bivision

Date February 17, 1982							
Operator's							
Well No. #1							
Farm Buffington							
API No. 47 - 107 - 1186							

FEB 2 2 1982

# WELL OPERATOR'S REPORT OF FRACTURING AND/OR STIMULATING, OR PHYSICAL CHANGE

WEIL TYPE: Oil / Gas XX/ Liquid Injection (If "Gas," Production / Undergrou	n_/Wast und Storag	ce Disposa ge/ Deep	1/ p/ Sha	llow <u>xx</u> /)
LOCATION: Elevation: 823.99' Watershed	Pond Creek	<b>:</b>		
District: Steele County Woo	d	Quadrangle	e Pond C	reek
COMPANY Cabot Oil & Gas Corporation				
ADDRESS P.O. Box 628, Chas., WV 25322	Casing	Used in	Left	Cement
DESIGNATED AGENT Richard P. Parsons	Tubing	Drilling		fill up Cu. ft.
ADDRESS P.O. Box 628, Chas., WV 25322	Size			
SURFACE OWNER F. R. Buffington	20-16			
ADDRESS Rt. 1, Belleville, WV 26133	Cond.			
MINERAL RIGHTS OWNER F. R. Buffington .	13-10"	331.50	331.50	110 sks
ADDRESS Rt. 1, Belleville, WV 26133	9 5/8	331.30	331.30	110 585
OIL AND GAS INSPECTOR FOR THIS WORK Deo	8 5/8			
Rt. 1, Box 65  Mace ADDRESS Sandridge, WV 25274	7	2015.60	2015.60	350 sks
PERMIT ISSUED November 9, 1981	5 1/2			
DRILLING COMMENCED November 30, 1981	4 1/2	4534.93	4534.93	130 sks
DRILLING COMPLETED December 5, 1981	2-3/8		4446.91	
IF APPLICABLE: PLUGGING OF DRY HOLE ON CONTINUOUS PROGRESSION FROM DRILLING OR REPORKING. VERBAL PERMISSION OBTAINED ON	Liners used			
GEOLOGICAL TARGET FORMATION Brown Shale		Prop Dept	h 4562	' feet
Depth of completed well 4556' feet I				
Water strata depth: Fresh feet;		<del></del>		*
Coal seam depths:			ed in the	area?
OPEN FLOW DATA  Producing formation Marcellus, Brown Shale	Mar Bro	cellus wn Shale	4444' - 3544' -	
Gas: Initial open flow TSTM Mcf/d				Bb1/d
Final open flow 253 Mcf/d		al open fl		Bbl/d
Time of open flow between initial	ial and fi	nal tests	hou	urs .
Static rock pressure 775# psig(surface	e measurem	ent) after	72 hour	s shut in
(If applicable due to multiple completion-	)			
Second producing formation	Pay	zone dept	:h	feet
Gas: Initial open flow Mcf/d				
Final open flow Mcf/d	Oil: Fin	al open fl	.ow	
Time of open flow between initial				
Static rock pressurepsig(surface			<del></del>	
-		(Cantin		٠

(Continue on reverse side)

(PEVERSE)

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

- 2/12/81 Ran 1000 gal KCL H<sub>2</sub>O & Cla-Sta. <u>Perforated Marcellus</u> from <u>4444' 4456'</u> (48 holes). Ran Petro-Tech Stress Frac. Broke down w/2600 PSI. Avg Treating Press: 2300#. Avg Injection Rate: 37,500 SCF/min (47.4 bbls/min). Total N<sub>2</sub>: 862,500 SCF. Instant Shut In Press: 2000#; after 15 min - 1950#.
- 2/16/81 <u>Perforated Brown Shale</u> from <u>3544' 3960</u>' (25 holes).
- 2/17/81 Pumped 1000 gals 15% HCL. Break down press 1800#. Treated w/90,000# 20/40 Sand.

  Avg Injection Rate: 13.9 BPM w/24,000 SCF/min of Nitrogen. Avg Treating Press: 2379#.

  Total fluid: 375 bbls. Sand laden: 325 bbls. Total Nitrogen 648,000 SCF.

  Instant Shut In Press: 1400#; after 15 min 1225#.

#### WELL LOG

			REMARKS
FORMATION COLOR HARD OR SOFT	TOP FEET	BOTTOM FEET	Including indication of all fres
		ļ	and salt water, coal, oil and ga
- 1 - 51 1		2.12	
Sand & Shale	0	348	
Sand	348	418	
Shale	418	619	
Sand	619	670	·
Shale	670	1153	
Sand	1153	1190	
Shale	1190	1274	
Sand	1274	1335	
Shale	1335	1366	
Sand	1366	1705	•
Big Lime	1705	1796	
Shale	1796	2224	
Sunbury Shale	2224	2255	
Berea	2255	2257	
Shale	2257	2510	
Sandy Shale	2510	2540	
Shale	2540	3736	
Huron	3736	3961	
Shale	3961	4326	
Marcellus	4326	4556	
		DTD 4556	
		LTD 4577	
1			
		,	
		1.	
			_
			-
•			
	ľ	1 1	

(Attach separate sheets as necessary)

CAB	OT OIL AND GAS CORPORATION	
Well	Operator	_
By:	im ason	
Date:	February 19, 1982	

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 and, encountered in the drilling of a well."

§ .	FORW	METAE [	)	*DRILL DE		107-118	•	Pageof
	<b>Enviro</b> ni	mental Protection	N STON OF F	STAT NVTRONMEN	TAL PROTEC	VIRGINIA TION. OFFI	CE OF OIL	AND GAS
•	JU:	_ j <u>198 j</u>	DION GI	WELL WO	RK PERMIT	APPLICATION	NO	7
	1) Pe	maktini Or	erator: 0	Cabot Oil & (	) Gas Corporat	49 1145	<b>©</b>	553
	Onica	of Oil & Gas				_	21.	
	2)	Operato	or's Well	Number:	Buffington #	1		Elevation: 823.99
	4)	Well ty	pe: (a)	oil/	or Gas	<u>x</u> /		10/03/98
			(b)	If Gas:	Production	X / Underg	round Store	
L	n		. (=)			$\frac{x}{x}$	Shal	low_/
,,,	r r	Propose	ed Target	Formation	<b>(S):</b> Oriska	nv 475		
Ċ	i							
		Propose	ed Total I	Depth: 490	00 .	_ reet		
		Approxi	mate fres	sh water s	trata dept	hs: None in	dicated on or	iginal drilling
	)	Approxi	mate salt	t water de	pths:N	lone		records
	9)	\nnrovi	mate coal	l seam dep	the• N	ione		
				_			• • •	
	10)	Does la	ind contain	in coal se	ams tribut	ary to act	ive mine?	Yes/ No_X_/
	11)	Propose	ed Well Wo	ork: Drill	existing wel	.1 from origi	nal depth of	4556' to 4990' and
	12)			comple	te the Orisk	any Formatio	n.	_
	12,	Existing	•	CASIN	G AND TUB	ING PROGRAM	<u> </u>	
	TYPE		9	SPECIFICAT	TONS	FOOTAGE 1	INTERVALS	CEMENT
	TYPE			SPECIFICAT	1	FOOTAGE 1		CEMENT
	TYPE	· · · · · · · · · · · · · · · · · · ·	Size		Weight	For	Left in	
					1	For	Left in	Fill-up
		uctor			Weight	For	Left in	Fill-up
	Cond				Weight	For	Left in	Fill-up
	Cond	uctor	Size		Weight	For	Left in	Fill-up
	Cond Fres	uctor h Water	<b>Size</b>		Weight	For drilling	Left in well	Fill-up (cu. ft.)
	Cond Fres	uctor	9 <sup>5</sup> /8"		Weight	For drilling  331.5' 2015.6'	331.5' 2015.6'	Fill-up (cu. ft.)
	Conduction Coal	uctor h Water	<b>Size</b>		Weight	For drilling	Left in well	Fill-up (cu. ft.)
	Conduction Coal	uctor h Water rmediate	9 <sup>5</sup> /8"		Weight	For drilling  331.5' 2015.6'	331.5' 2015.6'	Fill-up (cu. ft.)
	Condi Fresi Coal Inter Prodi	uctor h Water rmediate	9 <sup>5</sup> /8"		Weight	For drilling  331.5' 2015.6'	331.5' 2015.6'	Fill-up (cu. ft.)
	Condi Fresi Coal Inter Prodi Tubi	uctor h Water rmediate uction ng	9 <sup>5</sup> /8" 7" 4½"		Weight	For drilling  331.5' 2015.6'	331.5' 2015.6'	Fill-up (cu. ft.)
	Condi Fresi Coal Inter Prodi Tubi	uctor h Water rmediate uction ng rs	9 <sup>5</sup> /8" 7" 4½"		Weight	For drilling  331.5' 2015.6'	331.5' 2015.6'	Fill-up (cu. ft.)
	Condi Fresi Coal Inter Prodi Tubi	uctor h Water rmediate uction ng rs ERS : K:	9 <sup>5</sup> /8" 7" 4½"	Grade	Weight	For drilling  331.5' 2015.6'	331.5' 2015.6'	Fill-up (cu. ft.)
	Condi Fresi Coal Inter Prodi Tubi	uctor h Water rmediate uction ng rs ERS : K:	9 <sup>5</sup> /8" 7" 4½"	Grade	Weight per ft.	331.5' 2015.6' 4534.9'	331.5' 2015.6' 4534.9'	Fill-up (cu. ft.)
	Condinate of the condin	uctor h Water rmediate uction ng rs ERS : K:	9 <sup>5</sup> /8" 7" 4½"  ind izes epths set	Grade For Office	Weight per ft.	331.5' 2015.6' 4534.9'	331.5' 2015.6' 4534.9'	Fill-up (cu. ft.)  110 sks  350 sks  130 sks
	Condinate of the condin	uctor h Water rmediate uction ng rs ERS : K:	9 <sup>5</sup> /8" 7" 4½"  ind izes epths set	Grade For Office	Weight per ft.	331.5' 2015.6' 4534.9'	331.5' 2015.6' 4534.9'	Fill-up (cu. ft.)  110 sks  350 sks  130 sks
	Condinate of the condin	uctor h Water rmediate uction ng rs ERS : K:	9 <sup>5</sup> /8" 7" 4½"  ind izes epths set	For Office	Weight per ft.	331.5' 2015.6' 4534.9'	331.5' 2015.6' 4534.9'	Fill-up (cu. ft.)  110 sks  350 sks  130 sks
	Condinate of the condin	uctor h Water rmediate uction ng rs ERS : K: Si De	9 <sup>5</sup> /8" 7" 4½"  ind izes epths set	For Office	Weight per ft.	331.5' 2015.6' 4534.9'	331.5' 2015.6' 4534.9'	Fill-up (cu. ft.)  110 sks  350 sks  130 sks



# STATE OF WEST VIRGINIA OIL AND GAS CONSERVATION COMMISSION

#10 McJUNKIN ROAD NITRO, WEST VIRGINIA 25143-2506

October 2, 1996

Division of Environmental Protection Office of Oil and Gas Nitro, West Virginia

Re: Application for Permit #47-107-01186DD drill deep well.

COMPANY: CABOT OIL AND GAS CORPORATION

FARM: Patterson/Buffington & Rawson #1

COUNTY: Wood DISTRICT: Steele QUAD: Pond Creek

The application of the above company is <a href="Approved for Oriskany">Approved for Oriskany</a>.

(Approved or Disapproved)

Applicant has complied with the provisions of Chapter twenty-two, eight (22-8), of the Code of West Virginia, nineteen hundred and thirty-one (1931), as amended, Oil and Gas Conservation Commission as follows:

- 1.) Provided a certified copy of duly acknowledged and recorded consent and easement form from all surface owner; yes
- 2.) Provided a tabulation of all deep wells within one mile of the proposed location, including the Api number of the deep well, well name, and the name and address of operator and; none
- 3.) Provided a plat showing that the proposed location is a distance of 400+ feet from the nearest unit boundary and showing the following wells drilled to or capable of producing from the objective formation within 3,000 feet of the proposed location.

Sincerely,

Enginge

## F. R. BUFFINGTON #1

# **Deepening Procedure**

- 1. MIRU Nowsco Well Service coil tubing unit.
- 2. RIH with 2 7/8" motor and drill bit.
- 3. Drill 50' of rathole below the base of the Oriskany Sand. Est. 300' with a 4,877' TD. Gauge any natural flow.
- 4. If natural flow is 200 MCFD or greater, rig up 4 1/2" under-reamer to motor assembly and under-ream to TD. If less than 200 MCFD, rig up wireline company and run slimhole (1 11/16") gamma-ray, neutron or sonic porosity, and temperature logs.
- 5. If well was logged prior to under-reaming, determine if Oriskany is commercial. If so, rig up under-reamer and ream to TD. If not, set plug at base of 4 1/2" casing. If well had a sufficient "natural" to under-ream prior to logging, rig up wireline company and run, density, induction, and temperature suite.
- 6. If well is to be completed, run in hole with 1,700' of 2 7/8" IJ tubing on coil.
- 7. Cement liner in, release liner and TOOH with coil tubing, Wait on cement.
- 8. Perf and treat Oriskany as per recommendation from engineering.

(Revised 3-81)



		ffing					
API	#47	<b>-</b> 107	-	118	6		
Date		Nov	eml	ber	2,	1981	

# STATE OF WEST VIRGINIA OFFICE OF OIL AND GAS - DEPARTMENT OF MINES

# OFFICE OF OIL AND GAS - DEPARTMENT OF MINES

DIL AND GAS WELL	PERMIT APPLICATION
WELL TYPE: 0i1/ Gas_XX_/	
(If "Gas", Production/ Und	derground storage / Deep / Shallow XX /
LOCATION: Elevation: 823.99' Watersh	ned: Pond Creek
District: Steele County:	
WELL OPERATOR Cabot Oil & Gas Corporation	DESIGNATED AGENT Richard P. Parsons
Address P.O. Box 628	Address P.O. Box 628
Charleston, WV 25322	Charleston, WV 25322
OIL AND GAS	COAL OPERATOR NOT OPERATED
ROYALTY OWNER F. R. Buffington	
Address Rt. 1  Belleville, WV 26133	Address
Acreage 270	
	COAL OWNER(S) WITH DECLARATION ON RECORD:
SURFACE OWNER SAME AS ABOVE	NAME F. R. Buffington
Address	Address Rt. 1  Belleville, WV 26133
	NAME Belleville, WV 20133
Acreage	Address
FIELD SALE (IF MADE) TO:	Address
NAME	
Address	COAL LESSEE WITH DECLARATION ON RECORD:
	NAME
TO DE NOTIFIE	Address
OIL AND GAS INSPECTOR TO BE NOTIFIED:	
NAME Deo Mace	
Address Rt. 1, Box 65	MOV - 9 1981
Sandridge, WV	(404 × 1001
Telephone 304-655-8693	OIL AND GAS DIMICION WV DEPARTMENT OF MINUS
	7 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)
above location under a deed/ lease_Xi to the undersigned well operator from	ffice of the Clerk of County Commission of
Wood County, West Virginia, in	$^{699}$ Book at page $^{43}$ . A permit is
requested as follows:  PROPOSED WORK: Drill XX/ Drill Deeper  Plug off old formation	r/ Redrill/ Fracture or stimulate/ _/ Perforate new formation/ n well (specify)
nlanned as shown on the	he work order on the reverse side hereof.
The above named coal operator, coal owner(sobjection they wish to make or are required Department of Mines within fifteen (15) day Copies of this Permit Application and the mailed by registered mail or delivered by I	s), and coal lessee are hereby notified that any do to make by Code \$22-4-3 must be filed with the ys after receipt of this Application by the Deptenclosed plat and reclamation plan have been hand to the above named coal operator, coal ownay of the mailing or delivery of this Application
PLEASE SUBMIT COPIES OF ALL	
GEOPHYSICAL LOGS DIRECTLY TO:	CABOT OIL & GAS CORPORATION
	Well Operator
WEST VIRGINIA OIL AND GAS	By: R N // asson
3639	
CHARLESTON, WV 25311 BLANKET BOND 1. Telephone - 304/348-3092	ts: District Drilling Superintendent

rukm IV-4 (Reverse)

(Revised 3-81)

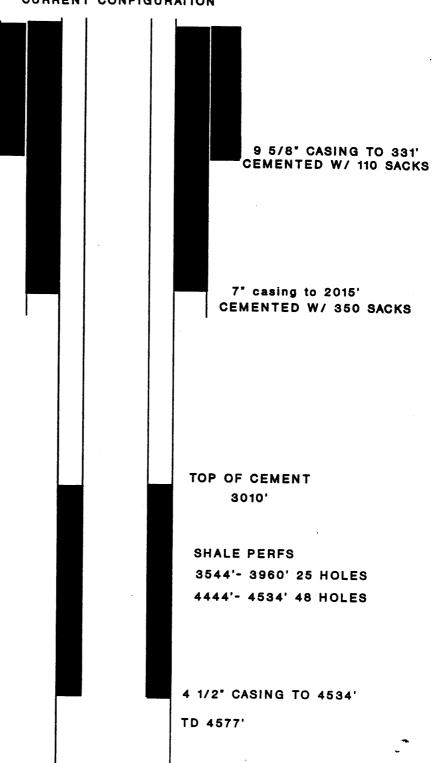
# PROPOSED WORK ORDER

# THIS IS AN ESTIMATE ONLY: ACTUAL INFORMATION MUST BE SUBMITTED ON FORM IV-35 UPON COMPLETION

DRILLING CO	NTRACTO	OR (IF	KNOWN)	Un	known				
		A	ddress_						
				,					
GEOLOGICAL  Estimated Approximated Approximated Is coal	d depth ate wat ate coa	n of conterstrain	mpleted ata dept depths:	well_ hs: Unkn	Fresh, lown	17 fee:	_feet; s	ry XX / Cab	le tools/ feet.
CASING AND	TUBING		M CIFICATI	ONS		IFOOTAGE	Intervals	CEMENT FILL	1 PACKER'S
CASING OR TUBING TYPE			Weight  per ft		•	For Dril		UP OR SACKS	1
Conductor	3126	ui aue	perit	HEW	USEU	Ting	MCII	cub/C TE	Kinds
Fresh water	9-5/8			Х		300	300	100	
Coal			<u> </u>	X	<del> </del>	2260	2260	350	Sizes
Intermed. Production	7   4-1/2		ļ	X	<del> </del>	4447	4447	170	Depths set
Tubing	4-1/2			<del>                                     </del>					l l
Liners	-			<del>                                     </del>	<del> </del>				Perforations:
				1	1				Top Bottom
				]					
822-4- requi- 822-4- posed A sepo- where Isough  All provided the Ventor for dri eperation	-12b ared by -8a from well. arate la fraction descriptions because the conditions because t	nd Regu Code 8 com the Form IV uring of is note ods, the h	lation 2 22-4-12a owner of -2 shall r stimul	not ating h Charles with Shall e-13-82	v) unity (v) i water be rec is to the Fo ELL SITE poroved expire if	less prevoif application well or a quired for part orm IV-2	iously paingle, the welling was fracture of the wo	consent requirithin 200 fe cing or stimul	ne well, the fee wired by Code eet of the pro- lating a well is a permit is
or con is to he undersign ocation has irea of the igned has n	ned co exami well lo o obje or has	see who sued wi al oper ned thi ocation toomplie	has rec thin fif  ator s propos , the we to the wo d with a	corded teen owr sed we sell lo	a dec (15) c W A I Der ell location copose	claration days of re VER / lessee cation. n has bee d to be d	under Codeceipt the  / of If a mine n added to	de \$22-4-20, ereof: the coal undo map exists to the mine mais location,	any coal owner if the permit  er this well which covers the ap. The underprovided the irginia Code and
Date:	<del></del>	, 19	)						
					В	y:			
•					lt	s:		use the fi	

# F. R. BUFFINGTON #1

### CURRENT CONFIGURATION



# F. R. BUFFINGTON #1

### FUTURE CONFIGURATION

