

6-12-91

A - FENCE POST PROPERTY CORNER

B - EXISTING WELL 20438

C - PROPOSED WELL 21981

A TO B = N 57° 05' E - 1300.12'

B TO C = S 05° 41' E - 304.30'

C TO A = S 75° 30' W - 1230.02'

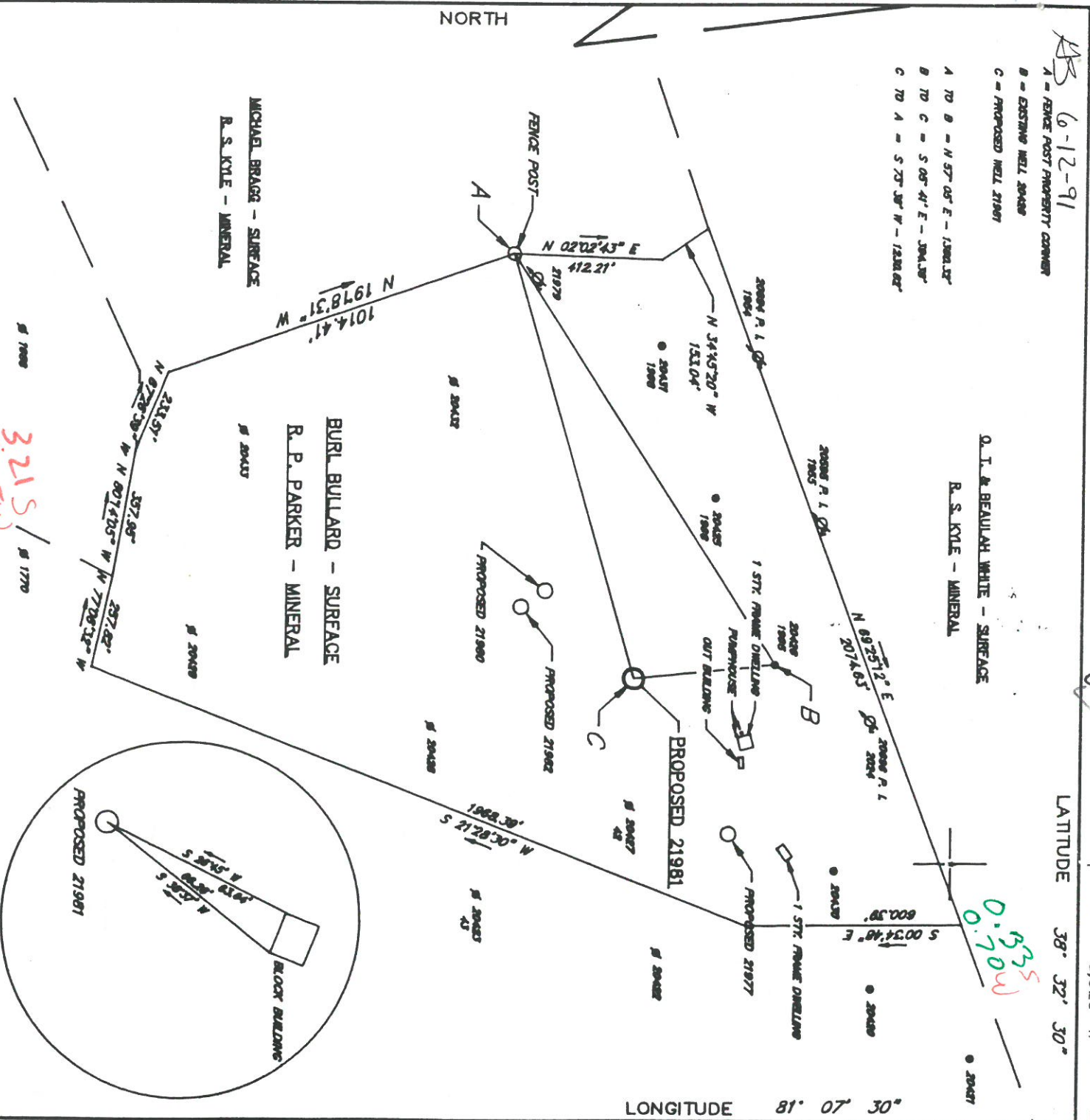
LATITUDE 38° 32' 30"

0.935
0.700

3,620' W

LONGITUDE 81° 07' 30"

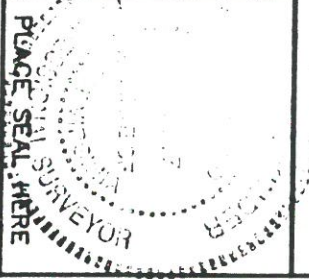
1,795' S



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

FILE NO. 21981 88-71
 DRAWING NO. _____
 SCALE 1" = 400'
 MINIMUM DEGREE OF ACCURACY 1: 2000
 PROVEN SOURCE OF ELEVATION U.S.G.S. BRASS DISK B24E4 NEAR OVAPA ELEV. 864.0

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAN 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) Richard C. Knudts
 R.P.E. _____ L.L.S. 817



STATE OF WEST VIRGINIA
 DEPARTMENT OF ENERGY
 OIL AND GAS DIVISION



DATE APRIL 15 1991
 OPERATOR'S WELL NO. 21981
 API WELL NO. 47 015 2509-71

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF "GAS,") PRODUCTION STORAGE DEEP SHALLOW _____
 LOCATION: ELEVATION 946.7' WATERSHED RIGHT FORK OF BIG SANDY CREEK
 DISTRICT HENRY COUNTY CLAY
 QUADRANGLE NEWTON 7.5' COUNTY CLAY
 SURFACE OWNER BURL BULLARD ACREAGE 55
 OIL & GAS ROYALTY OWNER R. P. PARKER ACREAGE 55
 PROPOSED WORK: DRILL & 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 BIG INJUN ESTIMATED DEPTH 1967'
 WELL OPERATOR COLUMBIA NATURAL RESOURCES DESIGNATED AGENT A. E. CAMPBELL
 ADDRESS P.O. BOX 6070, CHARLESTON WY. 25362 ADDRESS P.O. BOX 6070, CHARLESTON WY. 25362
 COUNTY NAME _____ PERMIT _____

JUN 25 1991

8-D Granny Creek-Stockley (200)

RECORDED
DEC 03 1991
DEPT. OF ENERGY

State of West Virginia
DEPARTMENT OF ENERGY
Division of Oil and Gas

Well Operator's Report of Well Work

Farm name: BULLARD, BURL

Operator Well No.: 21981

LOCATION: Elevation 946.70

Quadrangle: NEWTON

District: HENRY County: CLAY
Latitude: 1795 Feet South of 38 Deg. 32 Min. 30 Sec.
Longitude: 3620 Feet West of 81 Deg. 7 Min. 30 Sec.

Company: COLUMBIA NATURAL RESOURCES
P. O. BOX 6070
CHARLESTON, WV 25362-0070

Agent: JOSEPH E. CAMPBELL

Inspector: HOMER DOUGHERTY
Permit Issued: 06/17/91
Well Work Commenced: 07/15/91
Well Work Completed: 07/21/91
Verbal Plugging

Casing & Tubing	Used in Drilling	Left in Well	Cement Fill Up Cu. Ft.
11-3/4	44	44	31
8-5/8	266	266	266
4-1/2	2000	1980	203

Permission granted on: _____
Rotary Cable _____ Rig _____
Total Depth (feet) 2000
Fresh water depths (ft) _____
Salt water depths (ft) _____

Is coal being mined in area (Y/N)? N
Coal Depths (ft): _____

OPEN FLOW DATA Liquid Injection Well

Producing formation _____ Big Injun _____ Pay zone depth (ft) 2000
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

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: COLUMBIA NATURAL RESOURCES, INC
By: Joseph E. Campbell
Date: Dec 5 1991
53013 1991

WELL 21981



Perforations:

Stage 1, Hitwell select fire . 39 22 holes from 1859 - 1881

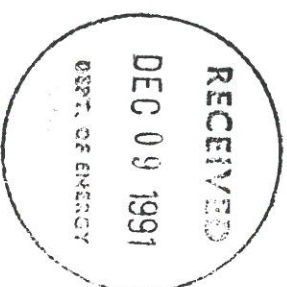
Stage: Pickled 4-1/2 Csg. w/8 Bbls Drip, 7 Bbls 15% HCL w/Penn 88
Dumped 150 Gal. 15% Fe Acid

1st stage from 1859 - 1881, 1350 gal. 15% FE Acid,
Fill-up Breakdown w N₂ @ - PSI, Avg. Rate 5 BPM,
ATP 650 PSI, Total H₂O - Bbl., Total sand,
- # Total N₂ - Scf.

015 2509

WELL 21981

FORMATIONS



0	-	1200	SS/SH
1200	-	1408	Salt Sand
1408	-	1456	SS/SH
1456	-	1580	Maxon
1580	-	1710	Red Rock
1710	-	1953	Greenbrier
1953	-	1982	Injun
		2000	DTD

12396

DEC 13 1991



STATE OF WEST VIRGINIA
NOTICE OF LIQUID INJECTION OR WASTE DISPOSAL WELL WORK PERMIT APPLICATION
for the

DEPARTMENT OF ENERGY, OIL AND GAS DIVISION

1) Date: May 6, 1991
 2) Operator's Well No. 21981
 3) SIC Code 47
 4) API Well No. 015
 5) UIC Permit No. UTC2R01502AP
 State West Virginia County Clay Permit 2509-LI

*Issued 06/17/91
Approved 06/17/93*

6) WELL TYPE: Liquid injection Gas injection (not storage) Waste disposal
 7) LOCATION: Elevation: 946.7 District: Henry 101A Watershed: Granny's Creek
 8) WELL OPERATOR: Columbia Natural Resources County: Clay Quadrangle: Newton
 Address P. O. Box 6070 Address P. O. Box 6070
Charleston, WV 25362-0070 Charleston, WV 25362-0070
 9) DESIGNATED AGENT: J. F. Campbell
 Address P. O. Box 6070
Charleston, WV 25362-0070
 10) OIL & GAS INSPECTOR TO BE NOTIFIED
 Name Homer Dougherty 11) DRILLING CONTRACTOR:
 Name Paul Jarvis
 Address Linden Rt. Box 3-A Address Culloden, WV
Looneyville, WV 25269

12) PROPOSED WELL WORK: Drill Plug off old formation deeper Redrill Stimulate
 Perforate new formation Convert

13) GEOLOGICAL TARGET FORMATION: Big Injun 371 Depth 1840 feet(top) to 1860 feet(bottom)
 14) Estimated depth of completed well, (or actual depth of existing well) 1960 ft.
 15) Approximate water strata depths: Fresh 100 feet; salt, 1220 feet.
 16) Approximate coal seam depths: 140
 17) Is coal being mined in the area? Yes No
 18) Virgin reservoir pressure in target formation 700 psig. Source Estimate
 19) Estimated reservoir fracture pressure 2100 psig (BHFP)
 20) MAXIMUM PROPOSED INJECTION OPERATIONS: Volume per hour: 2 Bbl Bottom hole pressure 1800
 21) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES: Salt Sand Water with Bacteriacide Roban 3999 Additive
 22) FILTERS (IF ANY): Hytrex 4 Micron
 23) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL: Chemical Corrosion Inhibitors

24) CASING AND TUBING PROGRAM

CASING OR TUBING TYPE	SPECIFICATIONS			FOOTAGE INTERVALS			CEMENT FILLUP OR SACKS (Cubic feet)	PACKERS
	Size	Gauge	Weight per ft.	New	Used	For drilling		
Conductor	1-3/4	J-35	54.5	X		60	60	Kind <u>8CSR11.2.2</u>
Fresh water	8-5/8	J-55	24	X		250	250	Size <u>11.3</u>
Coal								
Intermediate Production	4-1/2	J-55	10.5	X		1960	1960	Kind <u>8CSR-18-11.1</u>
Tubing								Perforations: Top Bottom
Liners								

25) APPLICANT'S OPERATING RIGHTS were acquired from R. P. Parker
 by deed lease other contract dated 6/24/19 Lease Clay County Clerk's office in Clay Book 8 19 , of record in the
 See the reverse side of the APPLICANT'S COPY for instructions to the well operator.

10401

1) Date May 15, 1991
Operator's 8
2) Well No. 21981
3) SIC Code _____
4) API Well No. 47 - 015 - 2509
State County Permit

STATE OF WEST VIRGINIA

NOTICE OF LIQUID INJECTION OR WASTE DISPOSAL WELL WORK PERMIT APPLICATION
for the

DIVISION OF OIL AND GAS, DEPARTMENT OF ENERGY

6) SURFACE OWNER(S) OF RECORD TO BE SERVED 7 (1) COAL OPERATOR _____
Address _____

(i) Name Burl Bullard 7 (ii) COAL OWNER(S) WITH DECLARATION ON RECORD:
Address Wallback, WV 25285 Name See attached list

(ii) Name _____ Address _____
7 (iii) COAL LESSEE WITH DECLARATION ON RECORD:
Name _____

(iii) Name _____ Address _____

TO THE PERSON(S) NAMED ABOVE: You should have received this Form and the following documents:

- (1) The Application for a Liquid Injection or Waste Disposal Well Work Permit on Form MW-3(B), which sets out the parties involved in the drilling or other work, and
- (2) The plat (surveyor's map) showing the well location on Form MW-6; and
- (3) The Construction and Reclamation Plan on Form MW-9 (unless the well work is only to plug a well), which sets out the plan for erosion and sediment control and for reclamation for the site and access road.

The date proposed for the first injection or waste disposal is September 30, 1991.

THE REASON YOU RECEIVED THESE DOCUMENTS IS THAT YOU HAVE RIGHTS REGARDING THE APPLICATION WHICH ARE SUMMARIZED IN THE "INSTRUCTIONS" ON THE REVERSE SIDE OF THE COPY OF THE APPLICATION (FORM MW-3(B)) DESIGNATED FOR YOU. HOWEVER, YOU ARE NOT REQUIRED TO TAKE ANY ACTION AT ALL.

Take notice that under Chapter 22B of the West Virginia Code, the undersigned well operator proposes to file or has filed this Notice and Application and accompanying documents for a Well Work Permit with the Director of the Division of Oil and Gas, West Virginia Department of Energy, with respect to a well at the location described on the attached Application and depicted on attached Form MW-6. Copies of this Notice, the Application, the plat, and the Construction and Reclamation Plan have been mailed by registered or certified mail or delivered by hand to the person(s) named above (or by publication in certain circumstances) on or before the day of mailing or delivery to the Director.

The person signing this document shall make the following certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document 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.

COLUMBIA NATURAL RESOURCES, INC.

Well Operator

By 

Its Vice President, Drilling & Production

Telephone 304/353-5000