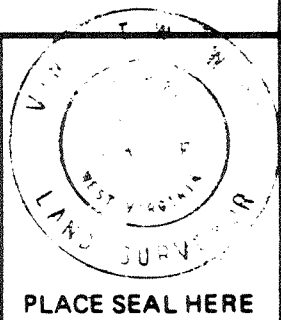


FILE NO. _____
 DRAWING NO. _____
 SCALE 1" = 500'
 MINIMUM DEGREE OF ACCURACY 1:200
 PROVEN SOURCE OF ELEVATION SPOT ELEV. 614 AT INTER. W.V. RT. 25 AND 9/19

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 MINES.
 (SIGNED) Vincent W Wood
 R.P.E. _____ L.L.S. 664



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS
 FORM IV-6 (8-78)



DATE MAY 19, 1982
 OPERATOR'S WELL NO. KEM 221
 API WELL NO. _____
47 - 107 - 1213
 STATE COUNTY PERMIT

STATE OF WEST VIRGINIA
 DEPARTMENT OF MINES
 OIL AND GAS DIVISION

WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
 (IF "GAS,") PRODUCTION ___ STORAGE ___ DEEP X SHALLOW ___
 LOCATION: ELEVATION 669 WATERSHED SHORT RUN
 DISTRICT HARRIS COUNTY WOOD
 QUADRANGLE POND CREEK Bellefonte 15' WC
 SURFACE OWNER THOMAS R. LOUGH ACREAGE 30
 OIL & GAS ROYALTY OWNER THOMAS R. LOUGH LEASE ACREAGE 75
 LEASE NO. 91-07-733
 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 ORISKANY ESTIMATED DEPTH 4408'
 WELL OPERATOR KAISER EXPLOR. & MIN. CO. DESIGNATED AGENT KAISER EXPLORATION AND MINING CO.
 ADDRESS P.O. BOX 8 ADDRESS P.O. BOX 8
RAVENS WOOD, W.V. 26164 RAVENS WOOD, W.V. 26164

JUN 28 1982



Date October 5, 1983
 Operator's Well No. KEM - 221
 Farm Thomas Lough
 API No. 47 - 107 - 1213

State of West Virginia
 Department of Mines
 Oil and Gas Division

WELL OPERATOR'S REPORT REVISED
 OF
DRILLING, FRACURING 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: 669' Watershed Short Run
 District: Harris County Wood Quadrangle Pond Creek

COMPANY KAISER EXPLORATION & MINING CO.

ADDRESS P. O. Box 8, Ravenswood, 26164

DESIGNATED AGENT R. A. Pryce

ADDRESS P. O. Box 8, Ravenswood, 26164

SURFACE OWNER Thomas R. Lough, et al

ADDRESS Rt. 1, Belleville, WV

MINERAL RIGHTS OWNER Same

ADDRESS

OIL AND GAS INSPECTOR FOR THIS WORK Deo

Mace ADDRESS Rt.1, Bx 65, Sandridge

PERMIT ISSUED 6/16/82

DRILLING COMMENCED 7/07/82

DRILLING COMPLETED 7/13/82

IF APPLICABLE: PLUGGING OF DRY HOLE ON CONTINUOUS PROGRESSION FROM DRILLING OR REWORKING. VERBAL PERMISSION OBTAINED ON Homer Dougherty

Casing & Tubing	Used in Drilling	Left in Well	Cement fill up Cu. ft.
Size 20-16 Cond.			
13-10"		253'	150 sx surface
9 5/8			
8 5/8			
7		1866'	65 sks
5 1/2			
4 1/2		4383'	225 sx
3			
2			
Liners used			

GEOLOGICAL TARGET FORMATION Oriskany Ss Depth 4216 feet

Depth of completed well 5422' feet Rotary X / Cable Tools

Water strata depth: Fresh -- feet; Salt -- feet Drilled on fluid Not known

Coal seam depths: None Is coal being mined in the area? No

OPEN FLOW DATA

Producing formation Oriskany Ss Pay zone depth 4302-4312 feet

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

Final open flow est. 350 (water) Mcf/d Final open flow -- Bbl/d

Time of open flow between initial and final tests -- hours

Static rock pressure 1675 psig (surface measurement) after -- hours shut in

(If applicable due to multiple completion--)

Second producing formation Devonian Brown Shale Pay zone depth 3456-3636 feet

Gas: Initial open flow N/A Mcf/d Oil: Initial open flow N/A Bbl/d

Final open flow 171 Mcf/d Oil: Final open flow N/A Bbl/d

Time of open flow between initial and final tests -- hours

Static rock pressure 900 psig (surface measurement) after 48 hours shut in

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

- 7/16/82 Oriskany Ss Perforation:
4302' - 4312' (KB)
2 shots/ft for a total of 20 shots
- 7/29/82 Oriskany Ss Frac: Treatment pressure: 2500 psig; ISIP = 1650 psig
15,000# of 80/100 sand; 30,000# of 20/40 sand; total
of 320,000 SCF of nitrogen used.
- 9/16/83 ^{Huron} Devonian Brown Shale perforations: Set permanent bridge plug in 4 1/2" at 3750';
shot selectively from 3456 to 3636 with 20 holes, .41" diameter.
- 9/20/83 Devonian Brown Shale fracture: 75 quality foam. Breakdown pressure: 2810 psig
with foam; 60,000# of 20/40 sand; treatment pressure: 2590-2830 psig with 10 BPM
and 30,000 SCF/min. Total sand laden fluid of 206 bbl and total fluid of
306 bbls. Total nitrogen of 810,000 SCF. ISIP = 1000 psig. 5 min. SI: 790 psig.

WELL LOG

FORMATION	COLOR	HARD OR SOFT	TOP FEET	BOTTOM FEET	REMARKS Including indication of all fresh and salt water, coal, oil and gas
Sandstone			0	50	
Shale			50	120	
Sandstone			120	175	
Sandstone and shale			175	405	
Sandstone			405	456	
Sandstone and shale			456	1570	
Shale			1570	1980	
Coffee shale			1980	2001	
Berea Ss			2001	2003	
Shale			2003	3152	
Brown shale			3152	3650	
Shale			3650	3991	
Marcellus			3991	4204	
Onondaga Ls			4204	4261	
Oriskany Ss			4261	4334	s/g at 4317
Helderberg			4334	4422	TD

3456
2003
1453

(Attach separate sheets as necessary)

KAISER EXPLORATION AND MINING COMPANY

Well Operator

By: R.A.P.

Date: October 5, 1983

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."

PROPOSED WORK ORDER

(12-81)

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

DRILLING CONTRACTOR (IF KNOWN) Clint Hurt & Associates, Inc.
Address P. O. Box 388
Elkview, WV 25071

GEOLOGICAL TARGET FORMATION, Oriskany

Estimated depth of completed well, 4408' feet Rotary X / Cable tools /

Approximate water strata depths: Fresh, 119 feet; salt, feet.

Approximate coal seam depths: Is coal being mined in the area? Yes / No /

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	10 3/4"					250'	250'	150 sks class A (to surface)	
Coal									Sizes
Intermediate	7"					1900'	1900'	65 sks 50/50 pozmix 100 sks Class A	
Production	4 1/2"					4408'	4408'	225 sks 50/50 pozmix set <u>Class A</u>	
Tubing									
Liners									Perforations:
									Top Bottom

NOTE: Regulation 7.02 of the Department of Mines provides that the original and four copies of Form IV-2 must be filed with the Department, accompanied by (i) a plat in the form prescribed by Regulation 11, (ii) a bond in one of the forms prescribed by Regulation 12, or in lieu thereof the other security allowed by Code § 22-4-2, (iii) Form IV-9, "Reclamation Plan", applicable to the reclamation required by Code § 22-4-12b and Regulation 23, (iv) unless previously paid on the same well, the fee required by Code § 22-4-12a, and (v) if applicable, the consent required by Code § 22-4-8a from the owner of any water well or dwelling within 200 feet of the proposed well.

A separate Form IV-2 shall not be required for fracturing or stimulating a well where fracturing or stimulating is to be part of the work for which a permit is sought and is noted as such on the Form IV-2 filed in connection therewith.

THIS PERMIT MUST BE POSTED AT THE WELL SITE.
ALL PROVISIONS BEING IN ACCORDANCE WITH CHAPTER 22,
ARTICLE 4 OF THE W. VA. CODE, THE LOCATION IS HEREBY
APPROVED FOR drilling. THIS PERMIT SHALL EXPIRE
IF OPERATIONS HAVE NOT COMMENCED BY 2-16-83
BY [Signature]

[Signature]

The following waiver must be completed by the coal operator and by any coal owner or coal lessee who has recorded a declaration under Code 22-4-20, if the permit is to be issued within fifteen (15) days of receipt thereof.

WAIVER

The undersigned coal operator / owner / lessee / of the coal under this well location has examined this proposed well location. If a mine map exists which covers the area of the well location, the well location has been added to the mine map. The undersigned has no objection to the work proposed to be done at this location, provided, the well operator has complied with all applicable requirements of the West Virginia Code and the governing regulations.

Date: , 19

By
Its