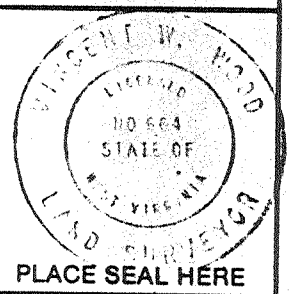


(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

N16 E 6

FILE NO. 6-76
 DRAWING NO. _____
 SCALE 1" = 500'
 MINIMUM DEGREE OF ACCURACY 1:200
 PROVEN SOURCE OF ELEVATION ROAD INTERSECTION
1200' SOUTH OF LOCATION, ELEV. = 604

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



STATE OF WEST VIRGINIA
 DEPARTMENT OF MINES
OIL AND GAS DIVISION



DATE OCTOBER 26, 1983
 OPERATOR'S WELL NO. 354
 API WELL NO. _____

WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
 (IF "GAS,") PRODUCTION X STORAGE ___ DEEP X SHALLOW ___
 LOCATION: ELEVATION 789 WATER SHED GILPEN RUN
 DISTRICT HARRIS 2 COUNTY WOOD
 QUADRANGLE LUBECK 449 009 004
 SURFACE OWNER JOHN A. KROUPA ET AL. ACREAGE 65
 OIL & GAS ROYALTY OWNER HARVEY WIGAL, ET AL. LEASE ACREAGE 65
 LEASE NO. 93-05-1310

COUNTY NAME
 PERMIT

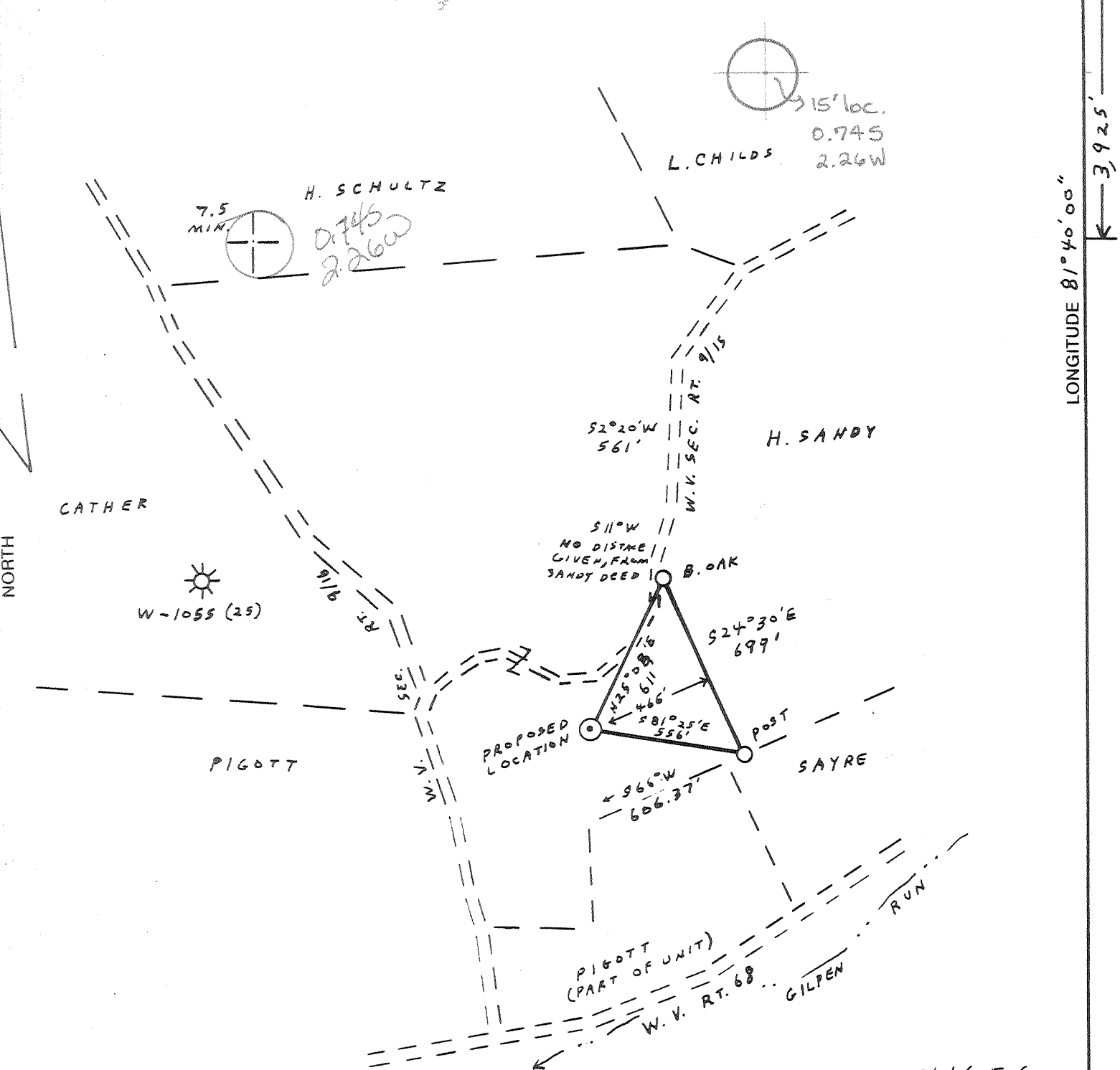
PROPOSED WORK: DRILL X CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE ___ PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) _____

MAR 24 1986

PLUG AND ABANDON ___ CLEAN OUT AND REPLUG ___
 TARGET FORMATION ORISKANY ESTIMATED DEPTH _____
 WELL OPERATOR KAISER EXPLORATION AND MINING CO. DESIGNATED AGENT KAISER EXPLOR. AND MINING CO.
 ADDRESS P.O. BOX 8, RAVENSWOOD, W. V. 26164 ADDRESS P.O. BOX 8, RAVENSWOOD, W. V. 26164

owwo 465 6-6 New England (296)

DEEP WELL



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

N 16 E 6

FILE NO. 6-76
 DRAWING NO. _____
 SCALE 1" = 500'
 MINIMUM DEGREE OF ACCURACY 1:200
 PROVEN SOURCE OF ELEVATION ROAD INTERSECTION
1200' SOUTH OF LOCATION, ELEV. = 604

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

PLACE SEAL HERE

STATE OF WEST VIRGINIA
 DEPARTMENT OF MINES
OIL AND GAS DIVISION

DATE OCTOBER 26, 19 83
 OPERATOR'S WELL NO. 354
 API WELL NO. _____

WELL TYPE: OIL _____ GAS X LIQUID INJECTION _____ WASTE DISPOSAL _____
 (IF "GAS,") PRODUCTION X STORAGE _____ DEEP X SHALLOW _____

LOCATION: ELEVATION 789 WATERSHED GILPEN RUN
 DISTRICT HARRIS COUNTY WOOD
 QUADRANGLE LUBECK Belleville 15' WC

SURFACE OWNER JOHN A. KROUPA, ET AL. ACREAGE 65
 OIL & GAS ROYALTY OWNER HARVEY WIGAL, ET AL. LEASE ACREAGE 65
 LEASE NO. 93-05-1310

PROPOSED WORK: DRILL X CONVERT _____ DRILL DEEPER _____ REDRILL _____ FRACTURE OR STIMULATE X 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 4410
 WELL OPERATOR KAISER EXPLORATION AND MINING CO. DESIGNATED AGENT KAISER EXPLOR. AND MINING CO.
 ADDRESS P.O. BOX 8, RAVENSWOOD, W.V. 26164 ADDRESS P.O. BOX 8, RAVENSWOOD, W.V. 26164

COUNTY NAME PERMIT

DEEP WELL 6-6 New England (296)



1) Date: November 17, 1983
 2) Operator's Well No. KEM #354
 3) API Well No. 47 -- 107 -- 1302
 State _____ County _____ Permit _____

STATE OF WEST VIRGINIA
 DEPARTMENT OF MINES, OIL AND GAS DIVISION
 APPLICATION FOR A WELL WORK PERMIT

- 4) WELL TYPE: A Oil _____ / Gas X /
 B (If "Gas", Production X / Underground storage _____ / Deep X / Shallow _____)
- 5) LOCATION: Elevation: 789 Watershed: Gilpen Run
 District: Harris County: Wood Quadrangle: Lubeck
- 6) WELL OPERATOR Kaiser Exploration and Mining Co. 7) DESIGNATED AGENT R. A. Pryce
 Address P. O. Box 8 Address _____
Ravenswood, WV 26164 Same
- 8) OIL & GAS INSPECTOR TO BE NOTIFIED Name Jerry Tephabock
 Address Rt. 1, Box 101A
Ripley, WV 25271
- 9) DRILLING CONTRACTOR: Name Clint Hurt
 Address P. O. Box 388
Elkview, WV
- 10) PROPOSED WELL WORK: Drill X / Drill deeper _____ / Redrill _____ / Stimulate _____
 Plug off old formation _____ / Perforate new formation _____
 Other physical change in well (specify) _____
- 11) GEOLOGICAL TARGET FORMATION, Oriskany
 12) Estimated depth of completed well, 4410 feet
 13) Approximate trata depths: Fresh, _____ feet; salt, _____ feet.
 14) Approximate coal seam depths: _____ Is coal being mined in the area? Yes _____ / No _____

RECEIVED
 DEC 1 - 1983
 OIL & GAS DIVISION
 DEPT. OF MINES

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	10 3/4"			X		250	250	150 sks class a	to surface
Coal									Sizes
Intermediate	7"			X		1800	1800	65 sks 50/50	pozmix/100 sks Class
Production	4 1/2"			X		4410	4410	225 sks 50/50	pozmix
Tubing									
Liners									Perforations: Top Bottom

OFFICE USE ONLY
 DRILLING PERMIT

Permit number 47-107-1302

December 22, 1983
 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 Dec. 22, 1985 unless well work is commenced prior to that date and prosecuted with due diligence.

Bond:	Agent: <u>ls</u>	Plat: <u>MLL</u>	Casing: <u>MLL</u>	Fee: <u>465-608</u>
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T.H.H.
 Administrator, Office of Oil and Gas

NOTE: Keep one copy of this permit posted at the drilling location.

RECEIVED

IV-35 (Rev 8-81) NOV 17 1984



CONFIDENTIAL

OIL & GAS DIVISION DEPT. OF MINES

State of West Virginia Department of Mines Oil and Gas Division

Date 12/10/84 Operator's Well No. KEM #354 Farm Wigal API No. 47 - 107 - 1302

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 x / Shallow /)

LOCATION: Elevation: 789 Watershed Gilpen Run District: Harris County Wood Quadrangle Lubeck

COMPANY Kaiser Exploration and Mining Company

ADDRESS P. O. Box 8 Ravenswood, WV 26164

DESIGNATED AGENT R. A. Pryce

ADDRESS Same

SURFACE OWNER John A. Kroupa

ADDRESS

MINERAL RIGHTS OWNER Harvey Wigal

ADDRESS

OIL AND GAS INSPECTOR FOR THIS WORK Glen Robinson Rt. 1 #6 Mt. Pleasant Estate, Mineralwells, WV 26150

PERMIT ISSUED 12/22/83

DRILLING COMMENCED 10/18/84

DRILLING COMPLETED 10/23/84

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

Table with 4 columns: Casing Tubing, Used in Drilling, Left in Well, Cement fill up Cu. ft. Rows include sizes 20-16, 10 3/4", 9 5/8, 8 5/8, 7, 5 1/2, 4 1/2, 3, 2, and Liners used.

GEOLOGICAL TARGET FORMATION Oriskany Sandstone Depth 4335-4340 feet

Depth of completed well 4420 feet Rotary x / 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? NO Drilled on fluid not known.

OPEN FLOW DATA

Producing formation Oriskany Sandstone Pay zone depth 4335-4340 feet

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

Final open flow 300 Mcf/d Final open flow -- Bbl/d

Time of open flow between initial and final tests 4 hours

Static rock pressure 1500 psig (surface measurement) after 48 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.

10/31/84 Young Wireline perf Oriskany Sandstone from 4335' to 4340'.
 11/02/84 BJ Hughes 75% foam frac Oriskany Sandstone with #30,000 of
 20/40 sand, 400,000 scf N₂, 209 bbl fluid, ISIP-1670 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
Soil and Shale			0	200	
Sand			200	250	
Shale and Siltstone			250	546	
Sand			546	620	
Shale and Siltstone			620	990	
Dunkard Sands			990	1208	
Shale			1208	1386	
Sand			1386	1450	
Shale			1450	1577	
Salt Sands			1577	1700	
Shale			1700	2036	
Coffee Shale			2036	2057	
Berea Sand			2057	2060	S/G
Shale			2060	3204	
Brown Shale			3204	3701	S/G @ 3685
Shale			3701	4034	
Marcellus Shale			4034	4204	S/G
Onondaga Limestone			4204	4324	
Oriskany Sandstone			4324	4370	S/G
Helderberg Limestone			4370	4448	
Total Depth			4448		

top
 2060
 3204
 Java 3701
 Angola 3851
 Rensselaer 4034

(Attach separate sheets as necessary)

Kaiser Exploration and Mining Company

Well Operator

By: RA P

Date: 12/10/84

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 ~~all~~ encountered in the drilling of a well."

FILE COPY
RECEIVED
FEB 27 1986



1) Date: January 31, 19 86
 2) Operator's Well No. KEM #354, Wiga1
 3) API Well No. 47 107 1302 Frac
 State County Permit

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

- 4) WELL TYPE: A Oil / Gas X /
 B (If "Gas", Production X / Underground storage / Deep / Shallow X /)
- 5) LOCATION: Elevation: 789 Watershed: Gilpen Run
 District: Harris County: Wood Quadrangle: Lubeck
- 6) WELL OPERATOR: Kaiser Exploration and Mining Company CODE: 2533-0
 Address: P. O. Box 8
Ravenswood, WV 26164
- 7) DESIGNATED AGENT: R. A. Pryce
 Address: Same
- 8) OIL & GAS INSPECTOR TO BE NOTIFIED: Name: Glenn Robinson
 Address: Rt. 1, #6 Mt. Pleasant Estates
Mineral Wells, WV 26150
- 9) DRILLING CONTRACTOR: Name:
 Address:
- 10) PROPOSED WELL WORK: Drill / Drill deeper / Redrill / Stimulate /
 Plug off old formation X / Perforate new formation X /
 Other physical change in well (specify): Plug Oriskany, frac Berea & Brown Shale
- 11) GEOLOGICAL TARGET FORMATION, 401 produce commingled
- 12) Estimated depth of completed well, feet
 13) Approximate strata depths: Fresh, N/A feet; salt, N/A feet.
 14) Approximate coal seam depths: N/A Is coal being mined in the area? Yes / No X
- 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	10 3/4	Mill	45.5	X		264'	264'	175 sks class A	Sizes
Coal		Reject							Depths set
Intermediate	7"	J-55	20	X		1825'	1825'	275 sks	
Production	4 1/2	J-55	10.5	X		4410'	4410'	250 sks pozni	
Tubing									Perforations:
Liners									Top 4335 Bottom 4340

OFFICE USE ONLY
 DRILLING PERMIT

Permit number 47-107-1302-Frac Date March 17 19 86

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 March 17, 1988 unless well work is commenced prior to that date and prosecuted with due diligence.

Bond: <u> </u>	Agent: <u>AO</u>	Plat: <u>MS</u>	Casing: <u>MS</u>	Fee: <u>969339</u>	WPCP FRAC TANK	S&E: <u>MS</u>	Other: <u> </u>
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NOTE: Keep one copy of this permit posted at the drilling location.

[Signature]
 Director, Division of Oil and Gas

File



IV-35
(Rev 8-81)

MAY 29 1986

State of West Virginia
Department of Mines
Oil and Gas Division

Date May 22, 1986
Operator's
Well No. KEM #354
Farm Wigal
API No. 47 - 107 - 1302 Frac

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 x /)

LOCATION: Elevation: 789 Watershed Gilpen Run
District: Harris County Wood Quadrangle Lubeck

COMPANY Kaiser Exploration and Mining Company

ADDRESS P. O. Box 8, Ravenswood, WV 26164

DESIGNATED AGENT R. A. Pryce

ADDRESS P. O. Box 8, Ravenswood, WV 26164

SURFACE OWNER John A. Kroupa

ADDRESS Rt. 1, Box 127A, Lubeck, WV

MINERAL RIGHTS OWNER Harvey Wigal

ADDRESS Rt. 1, Box 134, Belleville, WV

OIL AND GAS INSPECTOR FOR THIS WORK Glenn Robinson
ADDRESS Mineral Wells, WV

PERMIT ISSUED _____

DRILLING COMMENCED 10/17/84 05/01/86

DRILLING COMPLETED 10/23/84 05/06/86

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.			
10 3/4 13-10"	263	263	175 sks class A
9 5/8			
8 5/8			
7	1825	1825	175 50/50 poz 100 sks class A
5 1/2			
4 1/2	4409	4409	250 sks 50/50 poz mix
3			
2			
Liners used			

GEOLOGICAL TARGET FORMATION Oriskany Depth 4335-4340 feet

Depth of completed well 4448 feet Rotary x / Cable Tools _____

Water strata depth: Fresh feet; Salt _____ feet Drilled on fluid,

Coal seam depths: _____ Is coal being mined in the area? not known x

OPEN FLOW DATA

Producing formation Brown Shale Pay zone depth 3514'-3699' feet

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

Final open flow 200* Mcf/d Final open flow -- Bbl/d

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

Static rock pressure 800* psig (surface measurement) after 120 hours shut in
(If applicable due to multiple completion--)

Second producing formation Berea Sand Pay zone depth 2056'-2060' feet

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

Final open flow 200* Mcf/d Oil: Final open flow -- Bbl/d

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

Static rock pressure 800* psig (surface measurement) after 120 hours shut in

* Static rock pressures and final open flows are commingled (Continue on reverse side)

JUN 2 1986

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

- 5/01/86 McCullough perforated the shale from ^{Huron} 3514'-3699' with 19 shots.
- 5/06/86 Halliburton 75 quality foam fractured with 60,000# of 20/40 sand, 760,000 SCF nitrogen and 264 bbl fluid at average pressure of 2750 psig.
- 5/06/86 McCullough perforated the Berea from 2056'-2060' with 16 shots.
- 5/06/86 Halliburton 75 quality foam fractured with 60,000# of 20/40 sand, 765,000 SCF of nitrogen, and 263 bbl fluid at average pressure of 2000 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
See original OG-10					

(Attach separate sheets as necessary)

KAISER EXPLORATION AND MINING COMPANY

Well Operator

By: B A Ryce

Date: May 22, 1986

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."