

New Location
 Drill Deeper
 Abandonment

Minimum Error of Closure 1 IN 200
 Source of Elevation U.S.G.S. Elev. 742' Road Intersection
 NORTH OF Well LOC.
 "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."

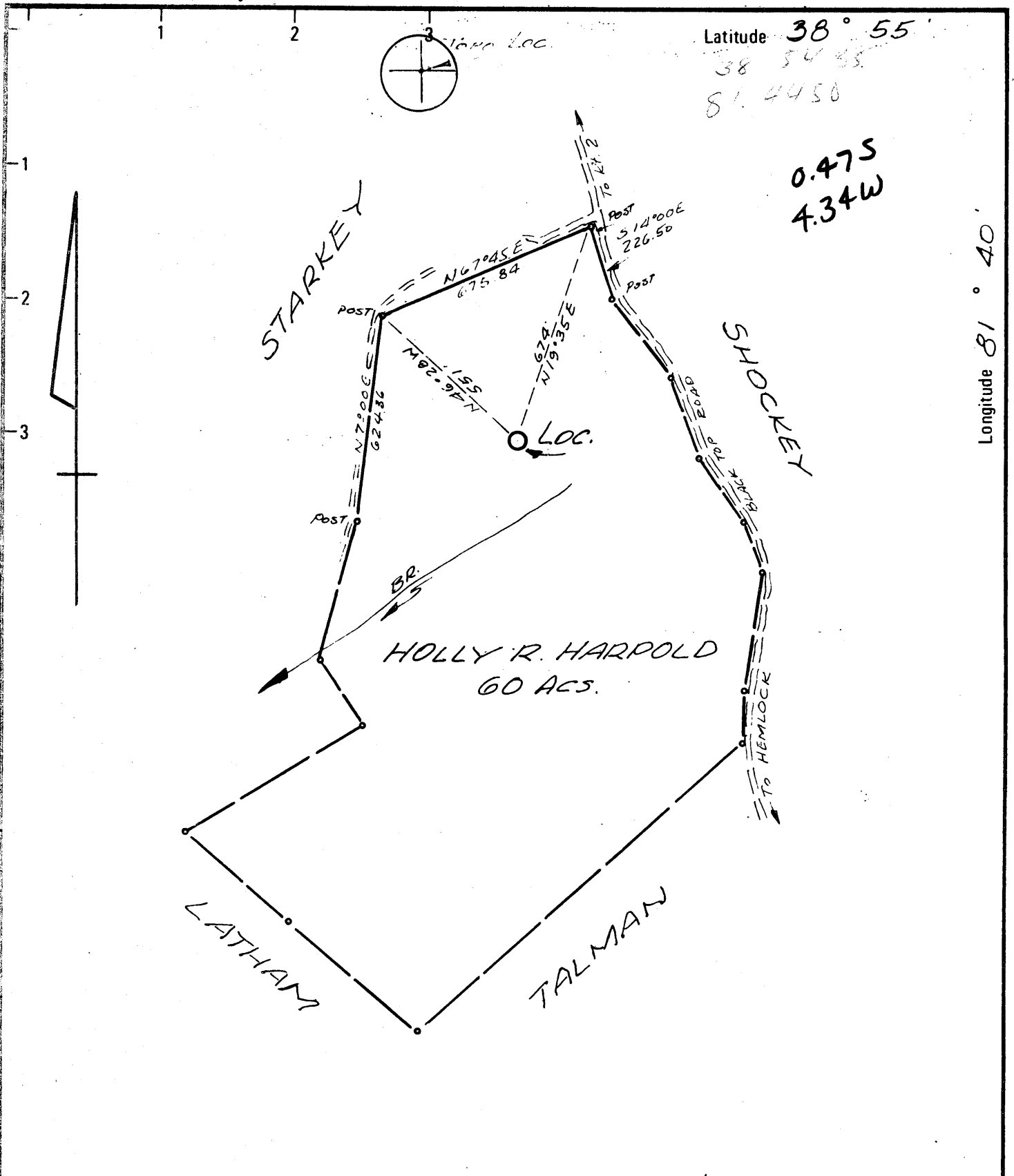
Company KAISER EXPL. & MINING COMPANY ⁴⁰⁵
 Address P.O. Box 98 RAVENSWOOD, W.VA. 26164
 Farm HOLLY R. HARPOLD
 Tract _____ Acres 60 Lease No. 2511
 Well (Farm) No. DEK #10 Serial No. _____
 Elevation (Spirit Level) 792'0
 Quadrangle RIPLEY/Sandyville ^{7.5} 598 112 Wcy
 County JACKSON District RAVENSWOOD
 Engineer N.L. Sefton
 Engineer's Registration No. 1832
 File No. _____ Drawing No. _____
 Date 8-6-76 Scale 1" = 400'

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

WELL LOCATION MAP
 FILE NO. JAC-1379 - Frac.

+ 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.
 MAY 11 1987
 - Denotes one inch spaces on border line of original tracing.

47-035



New Location
 Drill Deeper
 Abandonment

Minimum Error of Closure 1 IN 200
 Source of Elevation U.S.G.S. Elev 742' ROAD Intersection NORTH OF Well LOC.

"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."

Company KAISER EXPL. & MINING COMPANY
 Address P.O. Box 98 RAVENSWOOD, W. VA. 26164
 Farm HOLLY R. HARPOLD
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 Well (Farm) No. DEK #10 Serial No. _____
 Elevation (Spirit Level) 792' 0
 Quadrangle RIPLEY WC
 County JACKSON District RAVENSWOOD
 Engineer N. L. Sefton
 Engineer's Registration No. 1832
 File No. _____ Drawing No. _____
 Date 8-6-76 Scale 1" = 400'

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

WELL LOCATION MAP
 FILE NO. JAC-1379

+ 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.

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

47-035 NOV 18 1976



IV-35
(Rev 8-81)

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FEB 03 1988

State of West Virginia
Department of Mines
Oil and Gas Division

Date 8/24/87
Operator's
Well No. DEK#10
Farm Harpold
API No. 47 - 035 - 1379-F

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 X / Underground Storage / Deep / Shallow /)

LOCATION: Elevation: 792 Watershed Bar Run of Ohio River
District: Ravenswood County Jackson Quadrangle Ripley

COMPANY Kaiser Exploration & Mining Co.

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

DESIGNATED AGENT R. A. Pryce

ADDRESS Same

SURFACE OWNER Holly R. Harpold, et al

ADDRESS Rt. 1, Box 117, Ravenswood, WV

MINERAL RIGHTS OWNER Same as above

ADDRESS

OIL AND GAS INSPECTOR FOR THIS WORK Jerry

Tephabock ADDRESS Rt. 1, Ripley, WV 25271

PERMIT ISSUED

DRILLING COMMENCED November 13, 1976

DRILLING COMPLETED November 20, 1976

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"			
9 5/8			
8 5/8			
7			
5 1/2			
4 1/2	4683'	2339'	
3			
2			
Liners used			

GEOLOGICAL TARGET FORMATION Berea Sandstone Depth feet

Depth of completed well feet Rotary X / Cable Tools

Water strata depth: Fresh -- feet; Salt -- feet

Coal seam depths: N/A Is coal being mined in the area? NO

Drilled on fluid not known.

OPEN FLOW DATA

Producing formation Pay zone depth feet

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 measurement) after hours shut in

(If applicable due to multiple completion--)

Second producing formation Berea Sandstone Pay zone depth 2292-2296 feet

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

Final open flow 370 Mcf/d Oil: Final open flow -- Bbl/d

Time of open flow between initial and final tests 4 hours

Static rock pressure 175 psig (surface measurement) after 72 hours shut in

FEB 8 1988

(Continue on reverse side)

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

- 8/18/87 Halliburton spotted cement plug from 4540' to 3840' through tubing to plug the Oriskany and Marcellus Shale.
- 8/19/87 Young Wireline cut 4 1/2" at 2344' and pulled same. Perforated the Berea Sandstone from 2292' to 2296' with 16 .39" diameter holes.
- 8/21/87 NOWSCO foam fractured the Berea w/100,000# of 20/40 sand, 651,362 scf of nitrogen and 307 bbls of water at 2200 psig. ISIP: 1900 psig, 5 min SIP: 1900 psig.

WELL LOG

FORMATION	COLOR	HARD OR SOFT	TOP FEET	BOTTOM FEET	REMARKS Including indication of all fre and salt water, coal, oil and g
See Original					

(Attach separate sheets as necessary)

KAISER EXPLORATION AND MINING COMPANY
Well Operator

By: R. A. P.

Date: September 2, 1987

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 ¹⁷³ those encountered in the drilling of a well."



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STATE OF WEST VIRGINIA
DEPARTMENT OF MINES

OIL AND GAS DIVISION
WV DEPARTMENT OF MINES

Oil and Gas Division

WELL RECORD

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

Quadrangle Ripley

Permit No. JAC-1379 - Rev.

Company Kaiser Exploration & Mining Co.
Address Box 98, Ravenswood, WV
Farm Holly R. Harpold Acres 60
Location (waters) Bar Run of Ohio River
Well No. DEK #10 Elev. 792
District Ravenswood County Jackson
The surface of tract is owned in fee by _____
Holly R. Harpold, et al

Address Rt. 1, Box 117, Ravenswood WV
Mineral rights are owned by Same as above
Address _____

Drilling Commenced November 13, 1976
Drilling Completed November 20, 1976
Initial open flow Show cu. ft. -0- bbls.
Final production 75M cu. ft. per day -0- bbls.
Well open _____ hrs. before test 1100 RP.

Well treatment details:

Attach copy of cementing record.

Perforated 4 1/2" casing at 4601 1/2 to 4604 1/2 with 24 shots.

Fractured with 896 bbls water and 39,500# sand.

Open flow after frac = 75 MCF/day. Shut-in pressure = 1100 psi. Set RBP @ 4550'. Perforate 4 1/2" casing and Marcellus Shale from 4308' to 4506' with 26 shots. Broke down Marcellus and displaced 1,000 gal. of MCA Acid. Set RBP at 4000'. Perforated 4 1/2" casing and Brown Shale from 3705' to 3932' with 26 holes; fractured Brown Shale with 1210 bbls of treated water, 140,000 SC of nitrogen, 10,000 lbs. of 80/100 sand, 40,000 lbs. of 20/40 sand and 38,400 lbs. of 10/20 sand. Well treated at an average pressure of 1600 psig with an average injection rate of 48 BP. I.S.I.P = 150 psig. Pulled RBP, and new shut-in pressure was 600 psig.

Coal was encountered at _____ Feet _____ Inches
Fresh water _____ Feet Salt Water _____ Feet
Producing Sand Oriskany Sand, Devonian Shale Depth 4601 1/2 to 4604 1/2, 3705 to 4506

Formation	Color	Hard or Soft	Top Feet	Bottom Feet	Oil, Gas or Water	* Remarks
Red Shales			0	244		
Sand			244	316		
Shale			316	491		
Sand			491	544		
Red Rock			544	591		
Shale			591	633		
Sand			633	707		
Shale			707	747		
Sand			747	768		
Red Rock			768	794		
Shale			794	845		
Red Rock			845	923		
Shale			923	1033		
Salt Sand			1033	1151		
Shale			1151	1304		
Sand			1304	1325		
Shale			1325	1363		
Sand			1363	1370		
Shale			1370	1549		
Sand			1549	1597		
Shale			1597	1657		
Maxon			1657	1672		
Big Lime			1672	1816		
Shale			1816	1850		

(over)

* Indicates Electric Log tops in the remarks section.

MAY 10 1982

Formation	Color	Hard or Soft	Top Feet	Bottom Feet	Oil, Gas or Water	* Remarks
Injun Sand			1850	1958		
Shale			1958	2262		
Coffee Shale			2262	2284		
Berea Sand			2284	2290		
Shale			2290	3446		
Brown Shale			3446	3934		
Shale			3934	4370		
Marcellus Shale			4370	4508		
Onondaga L.S.			4508	4594		
Oriskany Sand			4598	4609		
Helderberg L.S.			4609	TD		
Log Total Depth				4702		

Date April 29 1982

APPROVED *Ed A. Poyner* Owner

By General Manager
(Title)



STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
Oil and Gas Division

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OCT 12 1977
OIL & GAS DIVISION
DEPT. OF MINES

WELL RECORD

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

Quadrangle Ripley

Permit No. JAC-1379

Company Kaiser Exploration & Mining Co.
Address Box 98, Ravenswood, WV
Farm Holly R. Harpold Acres 60
Location (waters) Bar Run of Ohio River
Well No. DEK #10 Elev. 792
District Ravenswood County Jackson
The surface of tract is owned in fee by _____
Holly R. Harpold, et al
Address Rt. 1, Box 117, Ravenswood WV
Mineral rights are owned by Same as above
Address _____
Drilling Commenced November 13, 1976
Drilling Completed November 20, 1976
Initial open flow Show cu. ft. -0- bbls.
Final production 75M cu. ft. per day -0- bbls.
Well open _____ hrs. before test 1100 RP.

Casing and Tubing	Used in Drilling	Left in Well	Cement fill up Cu. ft. (Sks.)
Size 20-16			
Cond. 13-10"			
9 5/8	200	200	100 Sax
8 5/8			
7	2342	2342	75 Sax
5 1/2			
4 1/2	4673	4673	110 Sax
3			
2		4597	
Liners Used			

Well treatment details:

Attach copy of cementing record.

Perforated 4 1/2" casing at 4601 1/2 to 4604 1/2 with 24 shots.
Fractured with 896 bbls water and 39,500# sand.
Open flow after frac = 75 MCF/Day. Shut in pressure = 1100 psi.

Coal was encountered at _____ Feet _____ Inches
Fresh water _____ Feet _____ Salt Water _____ Feet _____
Producing Sand Oriskany Sand Depth 4601 1/2 to 4604 1/2

Formation	Color	Hard or Soft	Top Feet	Bottom Feet	Oil, Gas or Water	* Remarks
Red Shales			0	244		
Sand			244	316		
Shale			316	491		
Sand			491	544		
Red Rock			544	591		
Shale			591	633		
Sand			633	707		
Shale			707	747		
Sand			747	768		
Red Rock			768	794		
Shale			794	845		
Red Rock			845	923		
Shale			923	1033		
Salt Sand			1033	1151		
Shale			1151	1304		
Sand			1304	1325		
Shale			1325	1363		
Sand			1363	1370		
Shale			1370	1549		
Sand			1549	1597		
Shale			1597	1657		
Maxon			1657	1672		
Big Lime			1672	1816		
Shale			1816	1850		

(over)

* Indicates Electric Log tops in the remarks section.

Formation	Color	Hard or Soft	Top Feet <i>W</i>	Bottom Feet	Oil, Gas or Water	* Remarks
Injun Sand			1850	1958		
Shale			1958	2262		
Coffee Shale			2262	2284		
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Shale			2290	3446		
Brown Shale			3446	3934		
Shale			3934	4370		
Marcellus Shale			4370	4508		
Onondaga L.S.			4508	4594		
Oriskany Sand			4598	4609		
Helderberg L.S.			4609	TD		
Log Total Depth				4702		

Date October 10, 1977

APPROVED Robert A. Payne Owner

By Staff Petroleum Geologist
(Title)

(Obverse) 7/85

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1) Date: April 20, 1987
2) Operator's Well No. DEK #10
3) API Well No. 47 035 1379-FRAC. State County 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 X
5) LOCATION: Elevation: 792 Watershed: Bar Run Sandsville
6) WELL OPERATOR: Kaiser Exploration Mining Company CODE: 25550
7) DESIGNATED AGENT: R. A. Pryce
8) OIL & GAS INSPECTOR TO BE NOTIFIED: Name Jerry Tephabock
9) DRILLING CONTRACTOR: Name KEMGAS Company Tools
10) PROPOSED WELL WORK: Drill deeper X
11) GEOLOGICAL TARGET FORMATION: Berea & treat Berea
12) Estimated depth of completed well, 4000 (PBDT) feet
13) Approximate trata depths: Fresh, N/A feet; salt, N/A feet.
14) Approximate coal seam depths: None Is coal being mined in the area? No X

15) CASING AND TUBING PROGRAM

Table with columns: CASING OR TUBING TYPE, SPECIFICATIONS (Size, Grade, Weight per ft., New, Used), FOOTAGE INTERVALS (For drilling, Left in well), CEMENT FILL-UP OR SACKS (Cubic feet), PACKERS (Kinds, Sizes, Depths set, Perforations: Top, Bottom)

OFFICE USE ONLY
DRILLING PERMIT

Permit number 47-035-1379-FRAC. Date May 4, 1987 19

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.

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 May 4, 1989 unless well work is commenced prior to that date and prosecuted with due diligence.

Table with columns: Bond, Agent, Plat, Casing, Fee (970059, 198), WPCP, S&E, Other

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

Director, Division of Oil and Gas

File

See the reverse side of the APPLICANT'S COPY for instructions to the well operator.



STATE OF WEST VIRGINIA
DEPARTMENT OF MINES

Oil and Gas Division

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NOV 5 1976

OIL & GAS DIVISION
DEPT. OF MINES

OIL AND GAS WELL PERMIT APPLICATION

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

DATE October 19, 1976

Surface Owner Holly R. Harpold, et al Company Kaiser Exploration & Mining Co.
 Address Rt. 1, Box 117, Ravenswood, W. Va Address Box 98, Ravenswood, WV 26164
 Mineral Owner Holly R. Harpold, et al Farm Holly R. Harpold, et al Acres 60 ac
 Address Rt. 1, Box 117, Ravenswood, W. Va. Location (waters) Bar Run of Ohio River 792'
 Coal Owner Holly R. Harpold, et al Well No. DEK #10 Elevation 800 KB
 Address Rt. 1, Box 117, Ravenswood, WV District Ravenswood County Jackson
 Coal Operator Not operated Quadrangle Ripley 15', Sandyville 7 1/2'
 Address _____

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 3-5-77.

INSPECTOR
TO BE NOTIFIED Richard Morris
ADDRESS Grantsville, W. Va.
PHONE 354-7259

[Signature]
Deputy Director - Oil & Gas Division

GENTLEMEN:

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 July 30, 19 76 by Holly R. Harpold, et al made to Devon Corp. & Eason Oil Co. and recorded on the 23rd day of September 19 76, in Jackson County, Book 141 Page 390

XXX 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.

PLEASE SUBMIT COPIES OF ALL
GEOPHYSICAL LOGS DIRECTLY TO:

WEST VIRGINIA GEOLOGICAL AND
ECONOMIC SURVEY
P. O. BOX 879
MORGANTOWN, WEST VIRGINIA 26505
AC-304 - 292-6331

Address
of
Well Operator

KAISER EXPLORATION & MINING CO.
Very truly yours,
(Sign Name) Ronald H. Lovell
Well Operator
D. H. Lovell, Resident Engineer
P. O. Box 98
Street
Ravenswood,
City or Town
West Virginia 26164
State

*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.

JAC-1379 PERMIT NUMBER

47-035

"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 Ronald H. Lovell

BLANKET

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

PROPOSED WORK ORDER TO XXX DRILL _____ DEEPEN _____ FRACTURE-STIMULATE _____
 DRILLING CONTRACTOR: (If Known) _____ RESPONSIBLE AGENT: _____
 NAME Ray Resources Corporation NAME Bill W. Backus
 ADDRESS 630 Commerce Square, Charleston, W. Va. ADDRESS Box 1433, Charleston, WV 25325
 TELEPHONE 344-8393 TELEPHONE 342-3171
 ESTIMATED DEPTH OF COMPLETED WELL: 4700 ROTARY XXX CABLE TOOLS _____
 PROPOSED GEOLOGICAL FORMATION: Oriskany
 TYPE OF WELL: OIL _____ GAS XXX 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	200	200	100 Sax
8 - 5/8			
7	2325	2325	75 Sax
5 1/2			
4 1/2	4700	4700	125 Sax
3			Perf. Top
2			Perf. Bottom
Liners			Perf. Top
			Perf. Bottom

APPROXIMATE FRESH WATER DEPTHS _____ FEET _____ SALT WATER _____ FEET _____
 APPROXIMATE COAL DEPTHS None Anticipated
 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