MISSOURI OIL AND GAS COUNCIL

Form OGC - 3

APPLICATION FOR PERMIT TO DRILL, DEEPEN OR PLUG BACK

APPLICATION TO DRILL ☒ DEEPEN ☐ PLUG BACK ☐

NAME OF COMPANY OR OPERATOR DNR- Geol Survey DATE 1 March

P.O. Box 250 (Address) Rolla (City) MO (State)

DESCRIPTION OF WELL AND LEASE

Name of lease	Well number	Elevation (ground)
ERDA TS	16	997

WELL LOCATION (give footage from section lines)

25 ft. from (N) (S) sec. line 840 ft. from (E) (W) sec. line

WELL LOCATION Section 9 Township 32N Range 31W County BARTON

Nearest distance from proposed location to property or lease line: NA feet

Distance from proposed location to nearest drilling, completed or applied – for well on the same lease: NA feet

Proposed depth:	Rotary or Cable tools	Approx. date work will start
175	Rotary	4 March

Number of acres in lease: NA

Number of wells on lease, including this well, completed in or drilling to this reservoir: NA

Number of abandoned wells on lease: _____

If lease, purchased with one or more wells drilled, from whom purchased: Name NA Address _____

No. of Wells: producing _____ inactive _____ abandoned _____

Status of Bond

Single Well ☐ Amt. _____ Blanket Bond ☐ Amt. _____ ☐ ON FILE ☐ ATTACHED

Remarks: (If this is an application to deepen or plug back, briefly describe work to be done, giving present producing zone and expected new producing zone) use back of form if needed.

Proposed casing program:

amt.	size	wt./ft.	cem.
	NONE		

Approved casing – To be filled in by State Geologist

amt.	size	wt./ft.	cem.

I, the undersigned, state that I am the _____ of the _____ (company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

Signature _____

Permit Number: 20018

Approval Date: 1 March '77

Approved By: Wallace B. Howe

☐ SAMPLES REQUIRED

☐ SAMPLES NOT REQUIRED

WATER SAMPLES REQUIRED @:

_____

_____

Note: This Permit not transferable to any other person or to any other location.

Remit two copies to: Missouri Oil and Gas Council P.O. Box 250 Rolla, Mo. 65401

One will be returned.

Approval of this permit by the Oil and Gas Council does not constitute endorsement of the geologic merits of the proposed well nor endorsement of the qualifications of the permittee.

MISSOURI OIL AND GAS COUNCIL

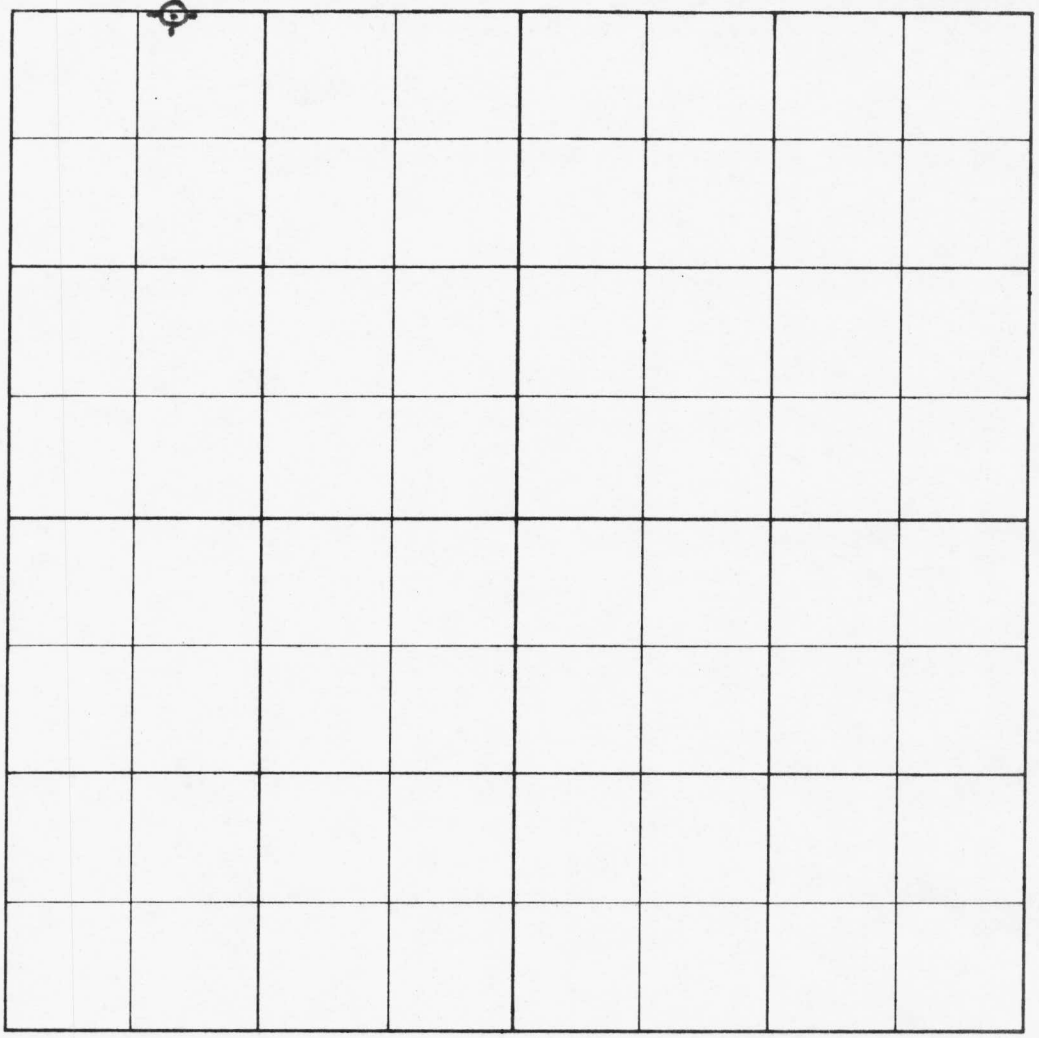
WELL LOCATION PLAT

Form OGC - 4

Owner: DNR - GEOL. SURVEY

Lease Name: ERDA TS No. 16 County, BARTON

25 feet from (N) - (S) line and 840 feet from (E) - (W) line of Sec. 9 Twp. 32N Range 31W



SCALE
1" = 1000'

REMARKS: _____

INSTRUCTIONS

On the above plat, show distance of the proposed well from the two nearest lease and section lines, and from the nearest well on the same lease completed in or drilling to the same reservoir. If the location requested is not in conformance with the applicable well-spacing rules, show all off-setting wells to the proposed well. Do not confuse survey lines with lease lines. See rule 7 - 3 (b) for survey requirements.

(SEAL)

Remit two copies to: Missouri Oil and Gas Council
P.O. Box 250 Rolla, Mo. 65401
One will be returned.

_____
Registered Land Surveyor

TEST BORING LOG

Project State of Missouri — Boring No. 16 C — Sheet 1 of 2

E.R.D.A. — Surface Elevation _____ — Offset _____

Address ~~Vernon~~ Barton County — Date Started 3/4/77 — Completed 3/8/77

City & State Nevada, Missouri — Driller J. Wright — Rig CME 750

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

Sec. 9, T. 32N., R. 31W.

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETROMETER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0.0'	10.0'	WB				Soil, brown silty clay
10.0'	20.0'	CW1			10.0'	Sandstone, brown silty
20.0'	30.0'	CW2			10.0'	Same
30.0'	40.0'	CW3			9.6'	Same
40.0'	42.0'	CW4			10.0'	Limestone, dark gray
42.0'	50.0'	CW4				Sandstone, gray, shale streaks
50.0'	60.0'	CW5			10.0'	Same
60.0'	70.0'	CW6			10.0'	Sandstone, gray, shale streaks
70.0'	80.0'	CW7			10.0'	Same
80.0'	90.0'	CW8			10.0'	Same
90.0'	100.0'	CW9			10.0'	Same
100.0'	108.0'	CW10			10.0'	Same
108.0'	109.0'					Coal, shaly
109.0'	110.0'					Underclay, light gray
110.0'	120.0'	CW11			9.8'	Shale, clayey w/sandstone stringers
120.0'	130.0'	CW12				Same
130.0'	140.0'	CW13			10.0'	Same

REMARKS: (Casing, Water Loss, Etc.) — Water Level — Time — Date

_____ _____ _____ _____ (Completion)

_____ _____ _____ _____

Layne-Western Company, Inc.

LW-59A

TEST BORING LOG

Project State of Missouri

Boring No. 16 C Sheet 2 of 2

Surface Elevation _____ Offset _____

Address _____

Date Started _____ Completed _____

City & State _____

Driller _____ Rig _____

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETROMETER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
140.0'	141.0'	CW14			10.0'	Coal, shaly
141.0'	150.0'	CW15			10.0'	Shale, dark gray w/pyrite & chert nodules
150.0'	158.0'	CW16			7.5'	Same
158.0'	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

Water Level	Time	Date	
			(Completion)

Layne-Western Company, Inc.

LW-59A

QUADRANGLE: Lamar North

ERDA-TS core hole 16
COUNTY: Barton

LOCATION: NW1/4 NW1/4 SEC. 9 T. 32N. R. 31W.

DATE: March 4-8, 1977

LOCATION DESCRIPTION: 25' FNL and 840' FWL.
3 miles north and 3 miles west of Lamar along south right-of-way of state road DD.

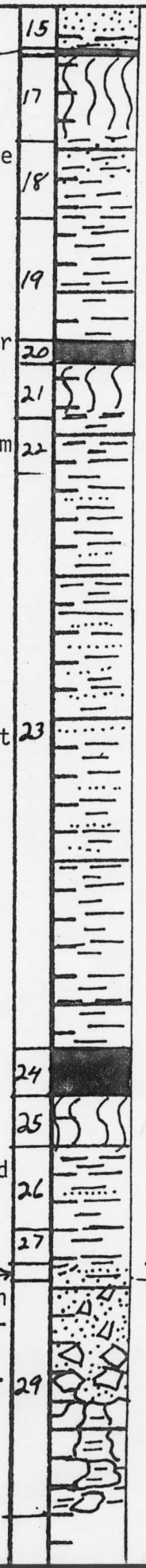
surface elev. 997.0 ; T.D. 158.0

DEPTH (FEET)		BED NO.	LITHOLOGY
0.0	10.0	1	no core
10.0	25.8	2	ss., brown; med. gray in bottom 4 ft., fine-grained, cross-bedded, micaceous; pieces charcoal forming imbricate structure in bottom 1 ft.
25.8	26.8	3	ss., soft, fragmented, clayey, micaceous; conglomeratic appearing with charcoal clasts
26.8	29.8	4	underclay, fossil root casts, med. gray grades into ss. at bottom
29.8	36.8	5	ss, massive to cross-bedded, micaceous; med. gray with specks of carbonaceous material that give salt and pepper appearance with quartz sand grains; lost core 30.6 to 31.6 ft.; .2 ft. thick congl. overlies and underlies lost core interval; clasts of dk. gray shale and tan plant material believed to be pith of Calamites
36.8	42.2	6	ss., lt gray, calc., compact, homogenous; bottom .4 ft. is a congl. with pieces shale and tan plant material
42.2	43.8	7	same as 29.8 to 36.8 ft. interval but contains pieces tan plant material
43.8	45.5	8	ss., lt gray, calc. but with few clasts of shale and tan plant material becoming concentrated in bottom .6 ft. to form congl. of lt. gray, dk. gray, and green shale and tan plant material clasts to .2 ft. dia.
45.5	46.0	9	ss., lt. gray, calc.
46.0	49.0	10	ss, salt and pepper appearance, gilsonite and specks coal non calc.

49.0	57.0	11	ss., fine-grained with pieces carbonaceous material; conglomeratic throughout interval; clasts of med. gray siltstone that appear to be locally derived; beds to .1 ft. thick with clasts aligned in imbricate structure some clasts of tan plant material; ss. is cross-laminated, salt and pepper appearance; some lt. gray steeply inclined ss. laminae; black laminae of fusain and mica intercalated with laminae of sand-sized quartz and siderite concretions at 57.0 ft.	11
57.0	101.0	12	ss., fine-grained (1/16 to 1/8 mm), med. gray (wet), salt and pepper appearance, Bits coal and gilsonite, massive, non calc; lt. gray (wet) below 72.5 ft; clay ironstone bed .05 ft thick at 79.7 ft and from 81.2 to 81.4 ft; Bits carbonaceous material below 73.0 ft; appears cross-bedded at 75.0 to 76.0 ft; .2 ft thick unit consisting of parallel laminae composed of pieces charcoal at 96.0 ft, micaceous, bottom 4 ft. cross-bedded contain Bits fusain	12
101.0	101.3	13	congl., clasts of plant material and dk. gray shale (possibly derived from underlying unit); discont., laminae of coal; lt gray, non calc. fine grained ss. matrix	
101.3	102.2	14	ss, lt. gray, cross laminated, ripples; flame structures intercalated with med. gray shale beds about .05 ft. thick	13 → 14 15

102.2	106.5	15	ss., lt. gray to tan med. gray shale beds to .05 ft thick at 102.5 ≒ 102.7 ft. and 106.0 ≒ 106.1 ft.
106.5	106.7	16	coal
106.7	109.8	17	underclay, carbonized root impressions; sand sized siderite concretions in bottom 1 ft.
109.8	112.5	18	shale, med. gray, sandy, quartzose; sand-sized siderite concretions; grades downward into dk. gray to black shale
112.5	116.7	19	shale, black, bits of pyritized wood
116.7	117.5	20	coal, bands vitrain; lenses pyrite to .05 ft thick near middle of coal
117.5	119.5	21	underclay, dk gray, carbonized roots, slickensided, pyrite
119.5	121.5	22	shale, med gray, sand-sized siderite concretions (.5 mm dia.)
121.5	141.6	23	shale, dk. gray to black at bottom; 1 or 2% of unit is lt. gray lenticular cross-laminated "starved" ripples to 127.5 ft increasing to 10% of unit lt. gray ss. ripples to 131.0 ft; then decreasing to 1 or 2% of unit to 135.0 ft
141.6	143.2	24	coal, pyritized wood; .1 ft. parting of conglomeratic clay about 2/3 of way from top
143.2	145.0	25	underclay, lt. gray, root impressions
145.0	148.0	26	shale, black; 1% of unit is lt. gray "starved" inclined ripples
148.0	149.2	27	shale, med. gray to greenish gray
149.2	149.6	28	shale, black, flaky; compressed squeezed appearance; sparse lt. greenish gray ss. laminae
149.6	158.0	29	ss., med. gray, argillaceous; pyrite lenses which contain a soft white mineral; pieces white chert increase down-section to comprise about 50% of unit at bottom; lt. gray with crinoid stem molds; cavities filled with med. gray clay and pyrite

T.D. 158.0



WILDCAT

FR & COMP

STATE MISSOURI 8-3-85 MAP NO. S-T-R 9-32N-31W S

OPER MISSOURI GEOL SURVEY SPOT APP NE NW NW INIT

P O BOX 250, ROLLA, MO CO BARTON S

WELL 16 ERDA-TS ELEV 997 GR FIN

CONTR LAYNE WESTERN 25' fnl, 840' fwl, Sec

FIELD WC

IP D&A

API 24-011-20018

SPUD 3-4-77, no surf csg

RTD 158, log

D&A FIRST REPORTED AND COMPLETED 3-8-77

GR SPL TOPS:

RIVERTON	105 + 892
GRAYDON	150 + 847
RTD	158 + 839

TD IN ~~CHEROKEE~~ Miss

COMP ISSUED 8-15-77

OILFIELD RESEARCH LABORATORIES

536 NORTH HIGHLAND - CHANUTE, KANSAS 66720 - PHONE (316) 431-2650

April 7, 1977

State of Missouri Department
of Natural Resources
Geological Survey
Buehler Park
Rolla, Missouri 65401

Gentlemen:

Enclosed herewith are the results of tests run on the Rotary core samples taken from the ERDA TS Lease, Well No. 16, Barton County, Missouri, and submitted to our laboratory on March 31, 1977.

This core was sampled by a representative of the client.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

James E. Russell

James E. Russell

by Larry L. Brigham

Geologist

JER:gb
5 c to Rolla, Missouri

Oilfield Research Laboratories

State of Missouri **GENERAL INFORMATION & SUMMARY**
Department of Natural Resources

Company Geological Survey Lease ERDA TS Well No. 16

Location 25'FNL & 840'FWL

Section 9 Twp 32N Rge 31W County Barton State Missouri

Name of Sand	Cherokee
Top of Core (Received)	42.0
Bottom of Core (Received)	61.5
Top of Sand (Received)	42.0
Bottom of Sand (Received)	61.5
Total Feet of Permeable Sand	5.0
Total Feet of Floodable Sand	

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 10	2.0	2.0
10 - 25	2.0	4.0
25 & above	1.0	5.0

Average Permeability Millidarcys	13.0
Average Percent Porosity	17.9
Average Percent Oil Saturation	21.4
Average Percent Water Saturation	57.4
Average Oil Content, Bbls./A. Ft.	294.
Total Oil Content, Bbls./Acre	1,469.
Average Percent Oil Recovery by Laboratory Flooding Tests	
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	
Total Calculated Oil Recovery, Bbls./Acre	
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	
Elevation, Feet (Ground Level)	997.

OILFIELD RESEARCH LABORATORIES

- LOG -

Company State of Missouri Department of Natural Resources
Geological Survey

Lease ERDA TS Well No. 16

Depth Interval, Feet	Description
42.0 - 61.5	Speckled gray carbonaceous fine grained sandstone.

Oilfield Research Laboratories

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company State of Missouri Department of Natural Resources Geological Survey Lease ERDA TS Well No. 16

Sample No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbls. / A Ft.	Perm., Mill.	Feet of Sand		Total Oil Content	Perm. Capacity Ft. X md.
			Oil	Water	Total			Ft.	Cum. Ft.		
1	42.7	15.7	28	47	75	341	1.7	1.0	1.0	341	1.70
2	46.2	16.3	24	51	75	304	2.3	1.0	2.0	304	2.30
3	57.1	21.4	18	55	73	299	34.	1.0	3.0	299	34.00
4	59.7	16.7	15	70	85	194	10.	1.0	4.0	194	10.00
5	61.0	19.4	22	64	86	331	17.	1.0	5.0	331	17.00