





IV-35 Rev 8-81)

Sinte of Mesi Birginia Bepartment of Mines Gil und Ges Phision

Date	10/01	L/86		
Operat	or's	- M #1	<u>01</u>	
	0K			
-	<u>William</u>			1605
API No	47	035		
			F	rac.

WELL OPERATOR'S REPORT

OF
DRILLING, FRACTURING AND/OR STIMULATING, OR PHYSICAL CHANGE

OCATION:	Elevation:	5881	Wate	rshed	Washingto	on Kun	Dontlan	4 UH/MŅ
	Elevation:_ District:_	Grant	Coun	ity Jacks	on (Magrandie	Porchain	
NAMANA V	ISER EXPLORAT	ION AND M	INING CO	MP AN Y				
OUDECC U	. 0. Box 8, R	avenswood	. WV 261	164	Caşing	Used in	Left	Cement fill up
	D AGENT R. A					Drilling	l .	
	Same				Size			
and the same of th	MNER W.D.				20-16			
	04 Sand Street				Cond. 13-10"	211	211	150 sks
	UGHIS OWNER				9 5/8	CII		
	Same				8 5/8			,
4454		non merro	י שים רשי	larry	7	4.720	1739_	65 sks
	ADDRESS	Rt. 1 Bo	x 101A NV 2527	71	5 1/2	1739		100 sks Class A
T PERMITTE	CCI IFI)						4168	225 SKS
	COMMENCED_	10/30/	81 5	15/36	4 1/2		7,00	
	COMPLETED_	11/05	/81 5	19186	. 2			
TO ADM T	CABLE: PLUG	TNG OF D	RY HOLE	ON	. 4			
CONTINCO	US PROGRESSIO	ON FROM D	RILLING	OR	Liners			
REWORKUN	G. VERBAL P	ERMISSION	OBTAIN	ED	used			
CR/			•			De	oth 41	53 fee t
ŒDIOGIO	CAL TARGET FO	rmation_	<u>Oriskan</u>	y Sandstor	Potential P	y / Cah	le Tools	Χ
Deg	oth of comple	ted well_	4176		c-14	fee	·+	
	ter strata de				Sair_	l boing mi		ne area?
(Co.	al seam depth	rs:			_ 18 coa	r rend we		
OPEN FL	ATAD WC		1	luron				
Pr	oducing form	ation Dev		C 1 - 3 -	P	ay zone de	epth 331	.8/3482 ree
Ga	e. Thitial	open flow	Zén	Mcf/d	OII: I	urcial ob	ar rrow	
	Final 00	en flow	No test	7Mcf/d	£	inal open	: row	
		-	£1 2 h	نحه حمد للم	frs fei+	final tes	ts <u>4</u>	hours
િ St	atic rock pr	essure 80	00	psig(surfa	ce measur	ement) af	ter 72 h	ours shut 1
NA JA C	If applicable	due to m	ultiple	completion	on)			· · · · · ·
white s	Tim atic rock pr of applicable and produci	ng format	ion_Be	rea Sandst	one I	Pay zone d	epth 188	2/1886 _fee
G	as: Initial	open ito	₩	LLI/Q	V	Initial of	eu itom	DUL!
	+ Final or	en flow !	۷o test ا	<pre>Mcf/d</pre>	Oil:	Final open	flow	BOT
		m of one	o flow h	etween in	itial and	final tes	its <u>4</u>	hours
	.1.71	ie or over						
S	tatic rock p	ressure 9	00	esig(surfa	ce measur	ement) aft	er 72 1	pours shut

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

See Previous IV-35

5/05/86 Young's Wireline perf Shale with 20 holes from 3318' to 3474'.

5/09/86 Halliburton foam frac Shale. Used; 60,000# 20/40 sand; total $^{\rm N}_2$: 650 MSCF; total fluid: 263 bbl; ISIP: 1210 psig: 5 MIN SIP: Young's Wireline perf Berea with 10 holes from 1882 to 1886.

Halliburton foam frac Berea. Used 60,000# 20/40 sand; total N₂:
662 MSCF; total fluid: 256 bbl; ISIP: 1220 psig; 5 MIN SIP:

1150 psig.

WELL LOG

			14.	ell Iog	
FORMATION	COLOR	HARD OR SOFT	TOP FEET	BOTTOM FEET	REMARKS Including indication of all freshand salt water, coal, oil and ga
SEE PREVIOU	IS TV_3	35			
SEE PREVIOU	72 14-7	, ,			
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(Attach separate sheets as necessary)

KAISER EXPLORATION AND MINING	3 COMPANY	
Well Operator		
By: Z. A. P		
Date: October 6, 1986		1. A
CONTROL CONTRO		the state of the s

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 that, encountered in the drilling of a well."

FORM			DF.	PARTHE:	t of Hines, oil A	iiD Cao Diiir		. KEM #101
[08-7					WELL OPERATOR'S F			47 - 035 - 160
		12.00			A Sept of Table On September of Common			
WELL TYPE:	,		las X	 / L17	ill Injection	/ %\r-n 3	7 oo o aga *	035-1605
	/	== 15°, 7:	roduction	. X /	in interpund st	389.22	X	
Location:					::n ? ~ = s n@d:			
								rtland OH - W
<u> </u>					· · · · · · · · · · · · · · · · · · ·			
					Mining Co.			
Addres			ood, W			N 21880		
				~V~V				•
SERVITED W	rai: Je		X / Ca	nyare	/ Drill deepe	* *** * * * * * * * * * * * * * * * *	7786	ture or stimulate X
	P 1	ug of	f old fo	rmation	/ Perforat	e new format	ion/	mecelviin
	Ot	her fl	nyaical	chinge	in well (specify)			
•		· ·					en de grande de Discours de Constantino de Constant	MAR 2 S 1984
PERMIT ISS	LED ON .	Augu	st 15		81	OTL & TAS IN.	PERTON FOR THIS	WORL & GAS DIVISION
(IF APPLICA	ABLE: P	L::G7E:	G OF DRY	!!!OLE '	- Communication of the Communi	Name Rich	ard Morris	DEPT. OF MINE
	NUOUS PRI KING. V					Aldress	P. O. Box 3	72
			. 19				Grantsville	,
:					skany Sandstone			
				2	feet Rot			
					feet; salt,		·	⇔
•	seam dep				Is coal be		the area? NO	
	•	- Contract	Manhaman (Manhan)	***************************************	0			
						•		
CASING AND	Tubing	Pro Gra	X					•
chethig or Chethig Typi			IFICATION IN THE INTERNATION OF THE ITEMS OF		FOOTAGE 1	ITERVALS	CEMENT FILL-TF	PACKERS
		<u>Grade</u>	Der ft	liew U	en For drilling	Left in well	(Subic Sees)	
e-neuetor								Finds NONE
Presh water	10 3/	<u>4 H</u>	32.75	X	211 (KB	211 (KE	150sx Class	A
2631								31:48
**** *********************************	<u>:c 7</u>	<u> </u>	20	Х	1739 (KB	1739 (KE	65sx Pozmix 100sx ClassA	
Perduction	4 1/2	<u> </u>	11.60	<u> </u>		4168 (KB	225sx Pozmix	Depths set
2:52:28								
nors								Perforations:
								Top Bottom
		•						4100 (KB) 4108 (K
OPEN PLON (DATA							
		nar lon		iskane	Sandstone	•	Fry zana dauth	4100-4108
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Market and the second s								

[08-78]

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

11/06/81: Basin Surveys on location; perforated Oriskany section from 4100'-4108(KB); 33 holes; 3 1/2" glass jets on strip

an interpretation of the services of the services

12/10/81: Halliburton, BJ Hughes hydrofractured the Oriskany with 1000 gal. 28% HCL acid; 15,000# 80/100 sand; 45,000# 20/40 sand; 306,000 scf of nitrogen, 780 bbl water; breakdown was 2000psig; avg. rate was 21.3 BPM; avg. pressure

was 2670 psig; instantaneous shut-in was 1900 psig. ·

WELL LOG

FORMATION	Color	Hard or	Top Feet	Bottom Feet	Remarks Including indication of all franchist water, coal, cil and
Soil			0	16	
Sand			16	66	
Shale			⁻ 66	104	
Sand	,		104	120	
Shale			120	178	
Sand			178	195	
Shale			195	260	
Sand			260	298	A PRINCIPAL STATE OF THE PRINCIPAL STATE OF T
Shale			298	378	
Sand			378	408	₩ ·
Shale			408	464	•
Sand			464	488	
Shale			488	688	
Sand			688	720	
Shale	·		720	940	•
Sand			940	954	
Shale			954		
Sand			1008	1008	•
Shale				1065	este est
Sand			1065	1306	
		-	1306	1380	· · · · · · · · · · · · · · · · · · ·
Big Lime (Greenbrier)			1380	1422	
Shale	system (1944)		1422	1872	
Coffee Shale (Sunbury)			1872	1890	
Berea Sand			1890	1894	Slight gas show @ 1892
Shale			1894	3025	
Brown Shale			3025	3484	la per la companya di salah d Barangan di salah di
Shale			3484	3806	
Marcellus Shale		•	3806	4002	Gas show @ 3898
Onondaga Lime			4002	4084	
Oriskany Sand		1	4084	4116	Gas show @ 4104
Helderberg Lime:		- 🖁	4116	4187	
Total Depth	1		4187		
		:			
	8			1	

(Attack separate sheets to complete as necessary)

KAISER EXPLORATION AND MINING COMPANY
Well Operator

By R. A.P

Its General Manager

NOTE: Resulation 2.02(i) provides as

"The term light or toell lugh chail mean a aperametry, detailed geologist record of all formations, including out, cuccuntered in the drilling of a well."

STATE OF WEST VINGINIA

DEPARTMENT OF MINES

RECEIVED

Oil and Gas Division

AUG 3 1 1981

OIL AND GAS WELL PERMIT APPLICATION

THE DEPARTMENT OF MINES.

Charleston, W. Va.	• . •	DATE August 25, 1981	•
urface Owner William D. Williamson	•		
odress 504 Sand Street, Ravenswood,	WV 26164	Company Kaiser Exploration	and Mining Compa
ineral Owner Same .		Address P. O. Box 8, Rayen	swood, WV 26164
		Farm William D. Williamson	Acres245
od Owner Same		Location (waters) Washington F	Run
ozl OwnerSame		Well No_KEM #101	Elevation 583
oal Operator None	-	Quadrangle_Portland-Ohio/WV	•
IS PERMIT MUST BE POSTED AT THE WELL provisions being in accordance with Chapter the W. Va. Code, the location is hereby appro	ŞITE		
drilling . This permit shall expirations have not commenced by 5-15-82	re if TO I	PECTOR SE NOTIFIED <u>Richard Morris</u>	
A Muzze		RESS P. O. Box 372, Grants	ville, WV
Deputy Director - Oil Deg Division	PHON	E 354-7259	
WILEMEN:	•		
he undersigned well operator is entitled to thereto, (or as the case may be) under gra	drill upon the abo	ove named farm or trust of land	
el Williamson made to hining Cou O, in <u>Jackson</u> County, Book	ration and management of the m	and recorded on the 28th	by William D. & day of April.
NEW WELLDRILL D	DEEPER	*** *** *** *** *** *** *** *** *** **	RE OR COVERN
OIL AND GAS WELL ORIGINALI	LY DRILLED BE	FORE JUNE 5, 1969	ME OR STIMULATE
ne enclosed plat was prepared by a registere been notified as of the above date.	ed engineer or lice	ensed land surveyor and all coal ow	mers and/or operators
ne above named coal owners and/or operator ske by Section 3 of the Code, must be recei	are hereby notifi- ived by, or filed w	ed that any objection they wish to	make, or are required
opies of this notice and the enclosed plat were all owners at their above shown respective a day with the mailing or delivery of this cop	in instilled by regist	ered mail, or delivered to the	
SE SUBMIT COPIES OF ALL HYSICAL LOGS DIRECTLY TO:		truly yours	;
VIRGINIA GEOLOGICAL AND PHIC SURVEY BOX 879	Address	Kaiser Exploration and P. O. Box 8	i Mining Company
ANTOWN, WEST VIRGINIA 26505 04 - 292-6331	Well Operator	Bavenswood City or Town	
	**************************************	. West Virginia 26164	- ANDER
		•	XV.
SECTION 3 If no objections are filed or found plat by the department of times, to raid propositions such plat, that no objections have been made by well operator authorized to proceed.	nd by the Departme ed location, the depa y the coal operators o	nt of mines, within said period of ten da etment shall forthwith usine to the well of or found thereto by the department and it	eys from the receipt of wrator a permit receiping

e of such plot, that no objections have been made by the coal operators or found thereto by the department and that the same is approved

47-035-1605

BLANKET BORD

proposed work order to	XDRILL	DEEPENF	RACTURE STIMULATE
DRILLING CONTRACTOR: 44	Known)	RESPONSIBLE AGENT	· •
vame_Clint_Hurt_&Associ	nter, Inc.	NAME Robert A. P.	ryce ·
ADDRESS P. O. Box 388, El	kview. WV 25071 '	ADDRESS P. O. Bo.	x 8, Ravenswood, WV 26164
TELEPHONE 273-5371		TELEPHONE273-5	371
STIMATED DEPTH OF COMPL	ETED WELL: 4153'	ROTARY X	CABLE TOOLS
			•
TYPE OF WELL: OIL_	GAS X C	OMBSTORAGI	DISPOSAL.
	ଏ ଲ୍	the state of the s	
PENTATIVE CASING PROGRAM	i: .	•	
	4 0	d ,	• •
CASING AND TUBING SIZE	DRILLING	. 1	CEMENT 1411, UP
0 - 16	and the state of t		
	250'	250'	
		•	
- 5/8			
	1788'	1788'	
			class A
14	4153'	4153'	225 sks 50/50 pozmix
			Perf. Top
iners			
PPROTILIATE FRESH WATER	DEALHG SEEM	CATE WAR	
	DDI TIIO FEEI _	SALT WATER_	FEET
	A1.	•	
SUBMIT FIVE (5) COPIES O	F OG - 1, SHOWING ORIGI	NAL PERMIT NUMBER AN	D PERFORMANCE BOND. ON
WELLS DRILLED PRIOR TO	O 1929, A PERMANENT CO	DPY OF THE PLAT AND T	HE ORIGINAL WELL RECORD
O FRACTURESTIMULATE:			
OIL AND/OR GAS WELL OR BOND, PERMANENT PLAT	IGINALLY DRILLED BEFOR	RE JUNE 5, 1929, FIVE (5) (COPIES OG - 1, PERFORMANCE
OIL AND/OR GAS WELL OR	IGINALLY DRILLED ON AN	D/OR AFTER JUNE 5, 192	9, FIVE COPIES OG - 1, SHOW-
Required forms must be filed			Inspector to be notified twenty-
four (24) hours in advance.	,		
			· Sandard Company Comp
(f) (i) (i) (ii) (ii) (ii) (ii) (ii) (ii			•
The following waiver must be	completed by the coal oper	rator if the permit is to be i	ssued within ten days of receipt
SIZE DRILLING WELL OR SACKS - CHUIC FT.			
this lease have examined	and place on our raine ma	or this proposed well bear	or Operator of the coal under
providing operator has co	mplied with all rules and regu	ave no objections to said we lations in Articles 4, 5, and 7	ell being drilled at this location, , Chapter 22 of the West Virginia
		. A.Z.	$q_{i_1} = q_{i_2} = q_{i_3} = q_{i_4} = q_{i_4} = q_{i_5} = q_{i$
	•	· · · · · · · · · · · · · · · · · · ·	
• •		- Andrewsking -	•
		A. The second se	Vilicial Title
•			

- 4		AC.				
FORM	WW-	2(B)	FILE	COPY		
(Obve	erse)	الوائي ويوسيدن	4 1	WI	line.
7/85		10)	E US	STATE OF THE PERSON NAMED IN	12.00	E.
			FFF	27	1980)
		ALL CON	Maria Cara	-		



1)	Date: February	18	13.	86
3)	Omerator's			

Well No._

3) API Well No. County

DIVISION OF OIL & GAS TIMENT OF ENERGY, OIL AND GAS DIVISION DEPARTMENT OF ENERGY APPLICATION FOR A WELL WORK

4)	WELL TYP					<u></u>			V		V
5)	LOCATIO	•	f ''Gas'', I vation:	Production 588		<u> </u>		orage Washington		/ Shallow	X/)
• /				Grant.	(m)	.4.5	County: Jā		Quadrangle: _	Portland	OH/WV
6)	WELL OPE		Kanski	ina XP of	nban.	Voncobe) DESIGNATED			
-,	Address			Box 8	, ,		College of the Colleg	Address	Same		
				v. WV	2527	71					
8)	OIL & GAS	SINSPEC	TOR TO	BE NOTIF	IED		 9	DRILLING CO	NTRACTOR:		
	Name _Je	erry Te	phabo	ck				Name	Kaiser Comp	anv Tools	
	Address	Rt.	1. Bo	ox 101	7				Same		
		Rin	leý. J	NV 25	271						
10)	PROPOSE	D WELL V	WORK:	Drill		_/ Drill	deeper	/ Redrill	/ Stimulate	Χ /	
				Plug of	f old i	formation_	/ Perfora	te new formation_	X /		4001
								ueeze 4 1/2"		rforate Br	own Shale
11)	GEOLOGI	CAL TAR	GET FOR	MATION.		Berea:	stimulate	zones; comm	ingle all 3	zones	
	12) Estima	ted depth o	of complet	ed well,	41	60'(KB)	feet		•		
	13) Appro				N/	Α	feet; salt,	N/A	feet.		
	14) Appro	ximate coa	l seam dep	ths:	No	ne	is coa	being mined in the	area? Yes	/ No	<u> </u>
15)	CASING A	ND TUBI	NG PRO	GRAM							
CA	ISING OR		SPEC	IFICATIONS	;	11	FOOTAGE IN	TERVALS	CEMENT FILL-UP	PACK	ERS
TL	IBING TYPE	Size	Grade	Weight per ft.	New	Used	For drilling	Left in well	OR SACKS (Cubic feet)		
Con	ductor									Kinds	
	h water	10 3/4	H-40	32.75	χ		211'(KB	211'(KB)	150 sks		
Coal	1							1 1		Sizes	
Inte	mediate	7"	K-55	20	χ		1739'(KB)	1739'(KB)	165 sks		
Proc	duction	4 1/2		11.6	Х		4168'(KB	777		Depths set	*
Tubi		***		Ph. No. 3. 32		1 1					-
Line										Perforations:	***************************************
				- Andrews						Top	Bottom

100.400.4100											
***************************************						C	FFICE USE O	NLY			
~~~					,	D	RILLING PE	RMIT			
_		17-0	195_1/	605-F:					3.0		19.0.0
Pen	mit number _	=1-0	135-16	<u> </u>	rac					arch 7	¹⁹ 86
Thi		nina tha se	ali amarat	ar and wal	Lloonti	an chaum b	alou ir auidamos o	f permission grante			rinont local va
quir	ements subje	ct to the co	en operan onditions	contained	herein	and on the	reverse hereof Nati	i permission grame firstion must be siv	u to utili ili accordi en to the District O	ii and Cas Inspec	tinem legal re-
¥o. 8	B) Prior to th	e construct	ion of ros	ids, locatic	ns and	pits for an	y permitted work.	fication must be giv In addition, the we	ll operator or his co	ontractor shall no	tify the proper
disti	rict oil and g	as inspecto	or 24 hour	s before a	ctual pe	ermitted wo	rk has commenced	.)			
	•	ork is as de	escribed ir	the Notic	e and A	Application	, plat, and reclama	tion plan, subject to	any modifications	and conditions s	pecified on the
	rse hereof.	Marc	·h 7	1988			3 73				
Pen	mit expires _	MICH	- 11 E	1000			uniess well	work is commenced	prior to that date an	id prosecuted with	i due diligence.
_	1				···		Garden en e				
1	Bond:	Agent	:   F	Plat:	Casi	ing   F	ee WPCP	S&E (	Othex		
do care ou de		12/3		MSI	M.	96	9366 16	I ASI	$A \setminus \{$	3	
<u></u>		- ,	<u> </u>	<u></u>	77.				<del>// / /</del> /	/ /	
								////	41/	A	
NO	TE: Keep o	ne conviot	this nern	nit posted :	at the c	irilling loca	tion.				
		<del></del>	perss	person (			non. Di	rector, div	ision of Oil	and Gas	File
			See	the revers	e side (	of the APP	LICANT'S COPY	for instruction to	He well operator.		