Susana Martinez Governor

David Martin Cabinet Secretary

Brett F. Woods, Ph.D. Deputy Cabinet Secretary Davld R. Catanach, Division Director Oil Conservation Division



July 28, 2015

Mr. Robbie Grigg Cross Timbers Energy, LLC 400 West 17th Street Fort Worth, TX 76102

RE: <u>Packer Setting Depth Exception</u>

Injection Authority: Administrative Order WFX-557 Pool: North Vacuum Abo Pool (Pool code 61760) North Vacuum Abo Unit No. 230 API 30-025-22344 Unit J, Sec 13, T17S, R34E, NMPM, Lea County, New Mexico

Mr. Grigg:

Reference is made to your request on behalf of Cross Timbers Energy, LLC (OGRID 298299; "Cross Timbers") received by the Division on July 1, 2015, for the above named well. Cross Timbers applied for exception for setting the packer within 100 feet of the top perforation in the injection interval.

It is our understanding that Cross Timbers has maintained the current packer setting depth based on prior setting depths used by the previous operator of the injection well. Cross Timbers has also stated in their application the poor quality of the casing's interior surface above the top perforation and the effects on obtaining a proper seal for the tubing packer in this portion of the casing. As a result, Cross Timbers requests an exception for the current packer depth at 8219 feet below surface. This location of the packer is approximately 309 feet above the shallowest perforation at 8528 feet, and is below the upper contact of the Abo formation at 8107 feet below surface.

For the reasons stated in the application and because it appears that correlative rights are protected, waste will not occur and this modification will not endanger any fresh water aquifer or the environment, the exception is granted. The packer location within this well shall not be set higher than 309 feet above the approved injection interval unless the operator receives written approval from the Division Director.

Packer Setting Depth Exception Cross Timbers Energy, LLC July 28, 2015 Page 2 of 2

The Division Director may rescind this exception if it becomes apparent that the injected fluid is not being confined to the permitted interval or is endangering any fresh water aquifer.

Sincerely,

DAVID R. CATANACH Director

DRC/prg

cc: Oil Conservation Division – Hobbs District Office WFX-557 Well File API 30-025-22344



North Vacuum Abo Unit No. 230 (API 30-025-22344) (New Mexico W State NCT-1 Well No. 3) Summary of Historical Packer Information from Well File

Summary of Historical Packer Information from well File

Compiled by P. Goetze, Engineering and Geological Sciences Bureau, OCD (11/05/2014)

- 1. Spud December 3, 1967; completed with double production casing string cemented in single borehole; production commenced November 26, 1967.
- <u>04/1970 Workover:</u> perfed from 10,185' to 10,201' (*Pennsylvanian/long string perfed 10,185 feet to 10,189 feet*); <u>Abo/short sting install CIBP at 10,106 feet with 20-foot cement cap</u>; Abo sting returned to production.
- <u>02/24 to 03/7/1987 Workover:</u> tagged bottom of Abo/short string with GR tool at 8650 feet; <u>run a mill bit through</u> soft fill (8650' to 8663'), hard fill (8663' to 8688'), and a <u>CIBP</u> <u>below 8688'</u>; perfs added, <u>now 8528 feet to 8781 feet</u>; (Pennsylvanian/long string is <u>P&A'd with three CIBPs: first at 10,400 feet with a 35-foot cement cap, the second CIBP</u> is at 10,100 feet with a 35-foot cement cap, and the third at 8687 feet with 350-foot cement cap (TOC tagged at 8346 feet) after perfing Abo string); Abo/short sting packer set at 8482 feet.
- <u>02/1988 Workover</u>: packer at 8482 feet test and lost pressure; move packer to 8475 feet test and lost pressure; stuck packer, but mill out; <u>Abo/short sting final packer at 8436 feet</u> following successful MIT.
- 5. <u>01/1989 Workover</u>: get permission to set packer above "<u>junked pkr. @ 8400</u>"; two additional re-seatings and failed tests (at 8393 feet and 8364 feet); SI well. *Possible packer set at 8436 feet nearly a year earlier (?). Based on this sundry, the well has a packer stuck at 8436 feet or 8430 feet.*
- 6. <u>03/1989 Workover</u>: sundry not clear on packer location but based on your attachment to the proposed workover plan either 8244 feet or 8184 feet; well online.
- 7. <u>05/1989 Workover</u>: (leak in packer gasket) set <u>Abo/short sting packer at 8287 feet</u>; well online.
- 8. 04/2001 Sundry: MIT with Abo/short sting packer at 8214 feet.
- 9. <u>06/2009 Workover</u>: tubing replacement; <u>packer at 8219 feet</u>; well online; sundry notes injection profile log and approval of OCD for this location of packer.
- 10. <u>09/2009 Injection Survey</u>: notes junked packer at 8492 feet and comment "channel check @ 8480' indicates 100% fluid moving below"; profile results inconclusive due to survey tool unable to advance past junked packer.
- 11. 04/2014 Sundry: MIT; Abo/short sting packer at 8219 feet. (309 feet above top perf).

CROSS TIMBERS ENERGY, LLC **RECEIVED OCD**

2015 JUL 13 P 2: 39

July 1, 2015

Phillip Goetz New Mexico EMNRD Oil Conservation Division 1220 South St. Francis Drive Santa Fe, New Mexico 87505

Re. Request for variance of packer setting depth NVAU #230 API No. 30-025-22344 Pool No. 61760 Vacuum;Abo, North Lea County, New Mexico

Cross Timbers Energy, LLC respectfully requests either 1) continuation of the variance for packer setting depth allegedly granted to Mobil circa 1988-1989; or 2) a new variance for packer setting depth. Either under the condition that a routine injection profile survey confirms that injection water is staying in the Abo formation.

A 1988 CCL log and subsequent attempts to perform a MIT's indicates the casing to be in poor condition below 8,219'. The top perf is 8,548' and the top of the Abo formation is 8,107'.

Attached are

8528' z/24 87

- the current wellbore schematic (the pdf format is a detailed schematic, the ppt format is a simplified format),
- a Mobil "well work recommendation" letter from the well file indicating the agreement between the NMOCD and Mobil regarding the granted variance and stipulation,
- the successful MIT on April 16, 2014, and
- the most recent braden head test.

Sincerely,

Robbie Grigg Cross Timbers Energy, LLC 817-334-7842 rgrigg@mspartners.com



MD (RKR)	Original Hole, 7/1/2015 11:12	13 AM	Well Name NORTH VACUUM ABO UNIT 2	API/UWI 30 3002522344	County State/Province Field Name
15.1	Cross Over; 2 3/8; 4.70; 15.0-15.3;	Casing Joints; 11 3/4; 47.00; J-55; 11.000;	Location Tow 1880 ESL & 2130 EEL 17	winship Range Section	Latitude (°) Latitude (°) 20° 40' 50 020" N 100° 20' 44 702" N
89.9	<u>6/24/2009</u>	Casing Joints, 16; 65:00; H-40; 15:250; 15:0- 272:0; 12/8/1967 SUBFACE1: 20: 15:0:314:0	Original KB Elevation (ft) Gr Elev (ft) 4,028.00	4,011.00	B-Ground Distance (ft) Spud Date 17.00
273.0	Tubing, IJ 10rd TK70 IPC: 2 1/16	Float Collar: 16: 272.0-273.0: 12/8/1967 Casing Joints: 16: 65.00: H-40: 15.250: 273.0-			
314.0	3.25; J-55; 15.3-8,214.0; 6/24/2009	313.0; 12/8/1967 Shoe: 16; 313.0-314.0; 12/8/1967	Jobs		
4 600 1	10,100.0; 3/1/1987	Surface Casing Cement; 15.0-314.0; 12/8/1967 Casing Joints; 10.3/4; 40.50; J-55; 10.050;	Type Cooling Drossure Test	Start Date	Summary
4,600.1	T2 On/off tool w 1.25" F profile; 2.78; 8,214.0-8,216.0; 6/24/2009	<u>190.0-4,758.0; 12/31/1967</u> INTRM1; 13 3/4; 314.0-4,800.0	Casing Pressure Test	1/20/1988	8457', tst csg to 320 psi 30", held gd, POOH RBP
4,758.9	AS1X pkr; 2.99; 8,216.0-8,219.0; 6/24/2009	Float Collar; 10 3/4; 4,758.0-4,759.0: 12/31/1967 Casing Joints; 10 3/4; 40.50; J-55; 10.050;			& pkr, RIH seal assy open, tst tbg, 2 lks, assy @ 8482', displ csg w pkr fluid, tst csg to 300 psi, lost
4,799.9	Rough csg; 3 1/2; 2.992; 8,350.0- 8,475.0; 12/3/1988; according to	4,759.0-4,799.0; 12/31/1967 Shoe; 10.3/4; 4,799.0-4,800.0; 12/31/1967 Intermediate Casing Cement: 3,430.0-4,800.0;			100 psi in 2", POOH, RIH pkr to 8482', tst csg to 500 psi, lost 50 psi in 30", set pkr 5' aby perm pkr.
8,215.9	Baker FA perm pkr; 2.99; 8,430.0-	12/31/1967 Casing Joints: 3 1/2: 9.30: J-55: 2.992: 15.0-			leak @ pkr or right above it. Tst csg w pkr @ 8475',
8,346.1	8,433.0; 12/2/1988 Casing leak; 3 1/2; 2,992; 8,475.0-	10,242.0; 1/1/1968 Casing Joints; 3 1/2; 9.30; J-55; 2.992; 15.0-			held, pkr @ 8447', 500# 30" OK. Rel pkr & seal
8,430.1	8,482.0; 1/26/1988; Tstd csg w plug & pkr, isolated to immediately above	PROD1; 9 1/2; 4,800.0-10,600.0			assy, POH, RIH 3-1/2 perm pkr, stuck, POH, mill on pkr, fell free, circ hole clean, rec pkr junk, RIH w
8,475.1	Baker FA perm pkr; 2.99; 8,482.0-	Perforated: 8.546.0-8.549.0: 12/6/1967			pkr, tst tbg, displ csg w pkr fluid, set pkr @ 8436', psi tst csg 300# 30" OK, RTI.
8,484.9	8,485.0; 3/8/1987 CIBP w 350' cmt; 2.99; 8,346.0-	Perforated; 8,554,0-8,562,0; 12/6/1967 Acidizing; 8,546.0-8,587.0; 12/7/1967; 3000 gal			
8,545.9	8,690.0; 3/6/1987	Acidizing: 8,546.0-8,587.0; 10/17/1970; 5000 gal 15% DS-30, 12 BS. Not sure if this is dwn	Repair Tbg/Pkr Failure	12/1/1988	PI tbg & pkr, RBIH att set, cannot psi tst, RD, WSI for study. Set perm pkr, GR-CCL log shows rough
8,554.1		Hydraulic Fracture; 8,546,0-8,587,0; -12/7/1967; 20k # 20/40 sand in 20k gal gelled			csg from 8350' down. TCA leak, pull seal and pkr mandrel came out, set retr pkr @ 8430', TCA leak,
8,565.9		Perforated; 8,566.0-8,579.0; 12/6/1967			move pkr UH to 8395, pkr slipped, att set @ 8364'.
8,585.0		Perforated: 8,585.0-8,587.0: 12/6/1967 Perforated: 8,528.0-8,781.0: 3/5/1987	Repair Tbg/Pkr Failure	12/22/1988	2 bad tbg collars, 8300'
8,690.0		15% HCL NEFE, 100 BS	Repair Tbg/Pkr Failure	3/22/1989	PI tbg&pkr, RTI.
8,780.8	Tight spot; 3 1/2; 2.875; 8,800.0- 8,801.0; 2/25/1987; Tagged w bit,	Perforated; 8,778.0-8,781.0; 3/4/1987	Repair Tbg/Pkr Failure	5/22/1989	PI tbg, rplc "gasket" (wellhead ring or on/off seal?), RTI.
8,800.9	CIBP w 20' cmt; 2.99; 10,086.0-		Upgrade Rods/Tubing	2/20/2001	1 tbg jt prtd, speared 220' FS, POH fish, RTI.
10,100.1	10,109.0; 4/2/1970 CIBP; 2.99; 10,100.0-10,103.0; 2/28/1987		Repair Tbg Failure	6/22/2009	1st tbg jt prtd, speared 216' ft from sfc, POH entire fish, RTI.
10,108.9		Perforated; 10,185.0-10,189.0; 4/1/1970; Communicated w Abo strg			
10,189.0	Tight spot: 3 1/2: 2.875: 10.192.0-	Perforated; 10,185.0-10,190.0; 4/1/1970			
10,191.9	10,193.0; 2/26/1987; Tagged w tapered mill, milled thru	Π			
10,193.9	Tight spot; 3 1/2; 2.875; 10,194.0- 10,195.0; 2/26/1987; Tagged w	Perforated: 10.197.0-10.201.0: 4/1/1970			
10,196.9	tapered mill, milled thru	Float Collar; 3 1/2; 10,242.0-10,243.0; 1/1/1/968			
10,242.1		Casing Joints; 3 1/2; 9.30; J-55; 2.992; 10,243.0-10,283.0; 1/1/1968 Shoe; 3 1/2; 10,283.0; 0.10,284.0; 1/1/1968			
10,278.9		PBTD; 10,279.0-10,284.0; 1/2/1968 Acidizing: 10,185.0-10,488.0; 10/17/1977; 528.aql 154.DS:30.50 BS. Not surve from			
10,284.1	CIBP w 35' cmt: 2,99: 10,365.0-	OCD report that this was dwn the Penn strg or Abo - suspect Penn.			
10,402.9	10,403.0; 2/28/1987	Perforated: 10.472.0-10.488.0; 12/6/1967] Acidizing: 10.472.0-10.488.0; 12/7/1967; 1500 gal 15% NEA acid. 30 BS			
10,487.9		Float Collar; 3 1/2; 10,555.0-10,556.0; 1/2/1968			
10,555.1		/ 10.556.0-10.596.0; 12/1968 / Shoe; 3.1/2; 10.596.0-10.597.0; 1/2/1968			
10,596.1		PBTD (Penn); 10,536.0-10,597.0; 1/2/1968 Production Casing Cement; 4,600.0-10,600.0; 1/2/1968			
10,600.1		TD - Original Hole; 10,600.0			Page 2 of 2



MOBIL EXPLORATION AND PRODUCING U. S. WELL WORK RECOMMENDATION

· · ·	CO. GROSS <u>77.85%</u>	NET <u>68.09</u> %
WELL HEADING		
LEASE <u>NVAU</u>	WELL NO. <u>230</u>	TYPE WIW
FIELD Vacuum Abo North	COUNTY Lea	STATE <u>N Mex</u>
PERMITS REQUIRED	• .	
REGULAR RULE 37 DUAL _X_ OTHERO_103	PI APPROVAL _	<u>x</u> yes no

WELL PROBLEM & PROPOSED WORK

NVAU #230 WIW has had several tubing/pkr leaks in the past month. It is recommended to replace the 2 1/16" tubing and attempt to reset the pkr and resume injection.

JUSTIFICATION

Three tubing/pkr leaks occurred in NVAU #230 during December. Each time the well was pulled, several joints of tubing were junked. It is recommended to replace the 2 1/16" tubing.

Each time the well was pulled in December, several attempts were required for the packer to set. A CCL was run to pick csg collars. The log was difficult to interpret since the recording showed rough casing, as might be seen when logging over perforations. The well has 3 1/2" casing. The NMOCD and UIC have granted permission to set the packer more than 100' above the top perf. In granting the exception, both groups have requested that injection profile logs be run every 3 years to check for packer leaks. Since there are 2 junk permanent packers in the wellbore, the NMOCD has agreed to profile logging down to the top of these packers (8430'). Once the packer is set, a letter will be drafted to the NMOCD and UIC notifying of the final packer set depth.

---Continued on Attached Sheet---

COST:	TOTAL <u>\$ 59 M</u>	TANGIBLE <u>\$ 38 M</u>	INTANGIBLE <u>\$ 21 M</u>
	MOBIL <u>\$ 46 M</u>	<u>\$ 30 M</u>	<u>\$ 16 M</u>

<u>RESERVES</u>	•		•		
X_ PROVED	PREPARED BY	D. G. Elwood	DATE_	1-12-89	<u> </u>
PROSPECTIVE	APPROVED BY	77Kbar	DATE_	2-1-19	

WELL WORK RECOMMENDATION <u>NVAU #230 WIW</u>

Should problems be encountered in this casing string, there is another 3 1/2" casing string in the wellbore. This string is TA'd with 350 ft of cement and a bridge plug. The estimated cost to re-enter this string and return to injection is \$ 26 M, excluding new tubing. The cost to plug and abandon the original string is estimated at \$ 20 M.

Presently, OJI is consulting with Texaco on the rights to the other casing string. Should work on the original casing string prove uneconomic, another AFE will be prepared to plug and abandon the original string and re-enter the second string for Abo injection.

WELL DATA

LEASE	NVAU		-	WELL N	10. <u>230 WI</u>	1
INITIAL	COMPLETION DATE	2-8-67	TD <u>10</u>	299'	PBTD10086	51
CURRENT	COMPLETION DATE 12	-8-67	CURRE	NT PBTD	10086'	
CURRENT	PRODUCING INTERVALS	Abo:	8528	- 8781'		,

CURRENT TESTS

DATE	12-88	11-88	10-88
METHOD	Injection	<u>Injection</u>	Injection
INJ BWPD	Shut In	175 BWPD	124 BWPD
TBG PRESS	·	4000 psi	<u> 3600 psi</u>

.

OFFSET WELL TESTS IN ZONE OF INTEREST

COMPANY	<u>Mobil</u>	Mobil	Mobil
LEASE/WELL	NVAU #254 -	NVAU #258	NVAU #253
DATE	12-88	12-88	12-88
METHOD	Rod Pump	Rod Pump	Rod Pump '
BOPD/BWPD	63/28	51/29	24/74
MCFPD	20	28	22

WELL HISTORY

----See attached sheet----

RECOMMENDED WORKOVER PROCEDURE

WELL: NVAU #230 WIW FLUIDS IN WELL: Fresh wtr STATUS: Shut in LAST TEST: 120 BWPD @ 3323 psi (12-88)

Notify engr prior to MIRU.

Production MIRU

- 1. MIRU workover unit. NU BOP, test.
- 2. Release pkr @ 8364'. Pull up 2 jts, set pkr @ <u>+ 8304'</u>, <u>+ 8244'</u>. Test annulus to 300 psi, 30 min each time.
- 3. If pkr holds @ either depth, release pkr, POOH w/pkr + tbg. Lay down old inj tbg. RIH w/new 2 1/16" tbg, redressed pkr. Set pkr @ last set depth. Test annulus to 300 psi, 30 min. Hang tbg, put on injection.
- If pkr fails @ both depths, POOH w/pkr + tbg. Lay down old inj tbg. Go to step 7.

Drilling MIRU

- 7. RIH w/new 2 1/16" inj tbg + redressed 3 1/2" Huskie pkr. Pull up 2 jts, attempt set pkr @ <u>+ 8184'</u>, <u>+ 8124'</u>, <u>+ 8064'</u>. Test annulus to 300 psi, 30 min each time.
- 8. If pkr holds @ any setting, hang tbg, RD, put on inj.
- 9. If pkr test fails @ all 3 depths, discuss w/engr. Will consider use of another pkr.

ASE 2-1-89 73/ 29



HOBBS OCD

MAR 1 7 2015

State of New Mexico Energy, Minerals and Natural Resources Department **Oil Conservation Division Hobbs District Office BRADENHEAD TEST REPORT**

PECEIVED

		Ci	Operator Name ross Timber Energ	y, LLC			³ API Number 30-025-22344	
	Property Name North Vacuum ABO Unit					Well No. 230		
				² Surface Location)			
UL - Lot J	Section 13	Township 17S	Range 34E	Feet from 1880	N/S Line FSL	Feet From 2130	E/W Line FEL	County , Lea
	•	_	······	Well Status		· · · · · · · · · · · · · · · · · · ·	· ·	

Well Status	SHUT-IN	PRODUCING	DATE	
Well Status		tin	3-4-15 ~	
			5 / /-	

OPEN BRADENHEAD AND INTERMEDIATE TO ATMOSPHERE INDIVIDUALLY FOR 15 MINUTES EACH

OBSERVED DATA

	(A)Surf-Interm	(B)Interm(1)-Interm(2)	 (C)Interm-Prod	(D)Prod Csng	(E)Tubing
Pressure	Opsi	· O psi		O psi	4250 051
Flow Characteristics				,	
Puff	Y IO	Y / Ø	¥/10 -	Y IO	-
Steady Flow	Y IO	Y/O	Y/N	Y / 🖉	1
Surges	Y/Ø	Y / 🕐	Y / N	Y/00	
Down to nothing	YØ	Y/O	Y / N	Y / Ø	
Gas or Oil	T Ø	Y /O	Y / N	Y IO	7
Water	Y IO	Y / (N)	Y / N	¥ / 🕅]

If bradenhead flowed water, check all of the descriptions that apply:

CLEAR	FRESH	SALTY	SULFUR	BLACK

Remarks:		INJECTING AT THIS TIME WTR, GAS,CO2					
	· .		BS	3/20/2015			
		• •	•				

Signation	OIL CONSERVATION DIVISION
Printed name: Kevin Benne II	Entered into RBDMS,
Tille Large Operatore	Re-test
E-mail Address: Kbennett act Field SUCS.Com	
Date: 3-4-15 Phone: 575-513-8156	·
Witness:	

