



NEW MEXICO ENERGY, MINERALS  
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION  
2040 South Pacheco Street  
Santa Fe, New Mexico 87505  
(505) 827-7131

April 20, 1998

CF 11807  
R-10921

Stevens & Tull, Inc.  
P.O. Box 11005  
Midland, Texas 79702-1005

Attn: Mr. Jerry A. Weant

**RE: Injection Pressure Increase,  
State 'BF' Well No.4  
Lea County, New Mexico**

Dear Mr. Weant:

Reference is made to your request dated February 24, 1998 to increase the surface injection pressure on the above referenced well. This request is based on a step rate test conducted on January 26, 1998. The results of the test have been reviewed by my staff and we feel an increase in injection pressure on this well is justified at this time.

You are therefore authorized to increase the surface injection pressure on the following well:

<i>Well and Location</i>	<i>Maximum Surface Injection Pressure</i>
State 'BF' Well No.4	1282 PSIG
Located in 'A' of Section 16, Township 20 South, Range 33 East, Lea County, New Mexico.	

The Division Director may rescind this injection pressure increase if it becomes apparent that the injected water is not being confined to the injection zone or is endangering any fresh water aquifers.

Sincerely,

  
Lori Wrotenbery,  
Director

LW/BES/kv

cc: Oil Conservation Division – Hobbs  
Kellahin and Kellahin, W. Thomas Kellahin  
Files: Case No.11807; PSI-X 4th QTR98

PS1-X N/R

**KELLAHIN AND KELLAHIN**

ATTORNEYS AT LAW

EL PATIO BUILDING

117 NORTH GUADALUPE

POST OFFICE BOX 2265

SANTA FE, NEW MEXICO 87504-2265

W. THOMAS KELLAHIN\*

\*NEW MEXICO BOARD OF LEGAL SPECIALIZATION  
RECOGNIZED SPECIALIST IN THE AREA OF  
NATURAL RESOURCES-OIL AND GAS LAW

JASON KELLAHIN (RETIRED 1991)

TELEPHONE (505) 982-4285  
TELEFAX (505) 982-2047

February 24, 1998

**HAND DELIVERED**

**RECEIVED**

FEB 24 1998

Oil Conservation Division

Mr. David R. Catanach  
Hearing Examiner  
Oil Conservation Division  
2040 South Pacheco  
Santa Fe, New Mexico 87505

Re: **Request for increased surface injection pressure**  
NMOCD Order R-10921 (Case 11807)  
Stevens & Tull Inc.'s State "BF" Well No. 4  
Unit A Section 16, T20S, R33E  
Salt Water Disposal Well, Lea County, New Mexico

Dear Mr. Catanach:

On behalf of Stevens & Tull, Inc., and in accordance with Order R-10921 (**See Enclosure 1**), we request that the Division authorize an increase in the surface injection pressure for the referenced well from the authorized rate of 632 psi to 1,332 psi and in support state:

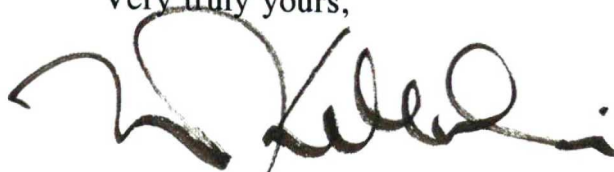
- (1) Stevens & Tull, Inc. has isolated the perforated interval from 3,374 feet to 3,394 feet with a CIBP packer at approximately 3,100 feet so that only the remaining perforated interval from 3,160 feet to 3,294 feet was available for injection;
- (2) the interval from the surface to 3,294 feet was satisfactorily pressure tested as required by the subject order;
- (3) injection at a surface pressure up to the previously approved 631 psi was attempted but Stevens & Tull, Inc. was unable to dispose of any volume of water;

Oil Conservation Division  
February 20, 1998  
Page 2.

(4) Stevens & Tull Inc. had West-Test, Inc. conducted a step rate test on this well which demonstrates that the fracture point of the reservoir is 1,332 psi. **See Enclosures 2 & 3.**

Accordingly, Stevens & Tull, Inc. request authorization from the Division for an injected surface injection pressure for the referenced well.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'W. Thomas Kellahin', with a large, stylized initial 'W' and a long horizontal stroke extending to the right.

W. Thomas Kellahin

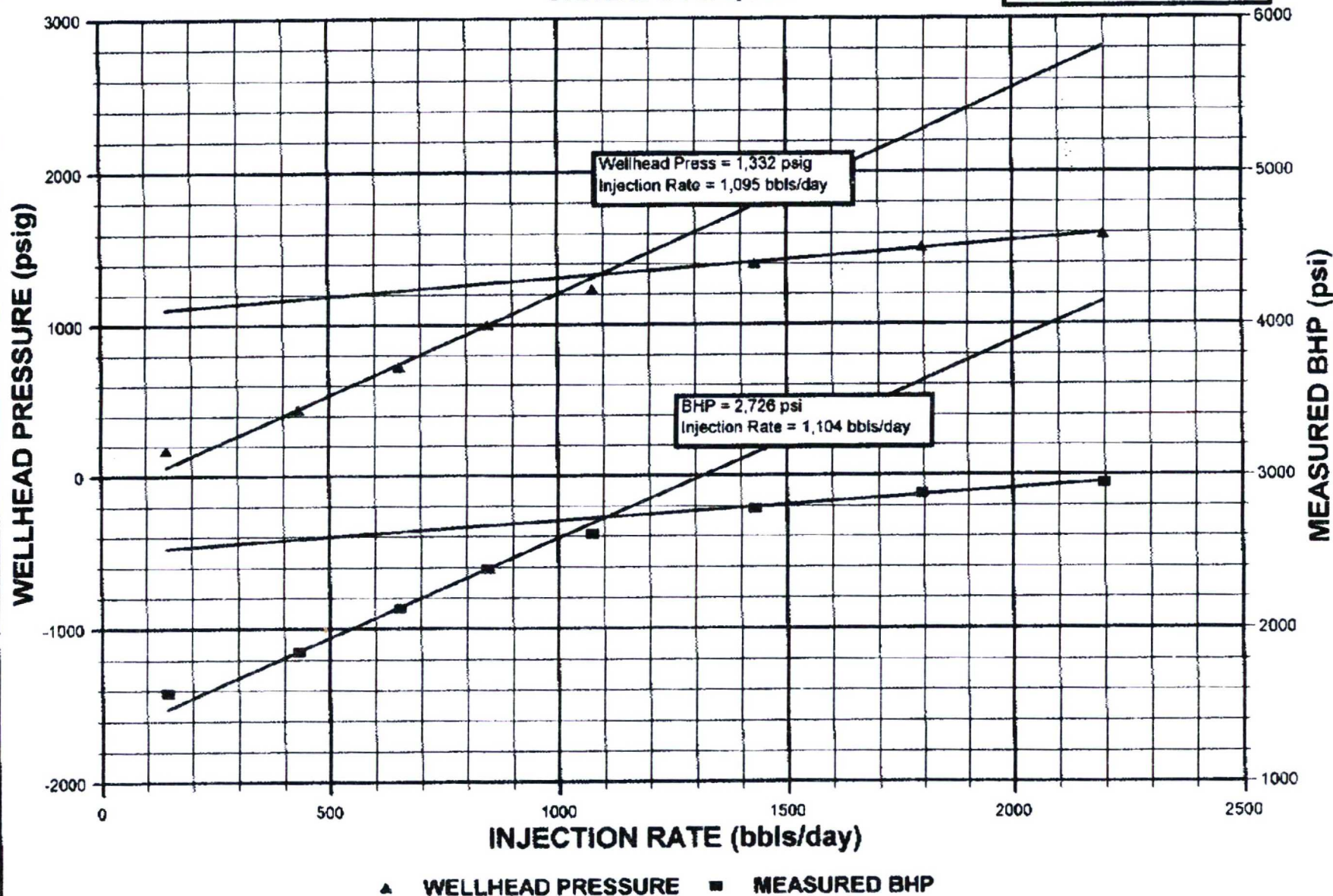
cc: Stevens & Tull, Inc.  
Attn: Jerry Weant



# STEP RATE INJECTION TEST

STEVENS & TULL, INC.

Well Name:  
B.F. State No. 4  
Lea County, New Mexico



## WEST-TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

## STEP RATE INJECTION TEST

CLIENT: STEVENS &amp; TULL, INC.

DATE: JANUARY 26, 1998

WELL NAME: B.F. STATE NO. 4  
LEA COUNTY, NEW MEXICO

WO#: 98-14-0111

PERFS = 3160-3294

PACKER DEPTH = 3100

BHP GAUGE DEPTH = 3227

STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRACTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1)-(4)	(6) INJECTION RATE (gpm) (3)/24.2837	(7) MEASURED BHP (psi)
	9:20	65.6				65.6		1470.5
	9:25	122.3	0.5	144.0	0.772	121.5	4.20	1531.2
	9:30	151.4	1.0	144.0	0.772	150.6	4.20	1558.5
1	9:35	179.3	1.5	144.0	0.772	178.5	4.20	1587.7
				144.0				
	9:40	315.0	3.0	432.0	5.892	309.1	12.60	1719.8
	9:45	392.4	4.5	432.0	5.892	386.5	12.60	1797.7
2	9:50	449.4	6.0	432.0	5.892	443.5	12.60	1854.5
				432.0				
	9:55	596.6	8.3	662.4	12.993	583.6	19.32	1993.6
	10:00	668.9	10.5	633.6	11.967	656.9	18.48	2074.5
3	10:05	731.1	12.8	662.4	12.993	718.1	19.32	2136.2
				652.8				
	10:10	865.6	15.7	835.2	19.951	845.6	24.36	2256.2
	10:15	939.1	18.6	835.2	19.951	919.1	24.36	2330.3
4	10:20	1002.6	21.6	864.0	21.242	981.4	25.20	2390.6
				844.8				
	10:25	1114.1	25.3	1065.6	31.311	1082.8	31.08	2503.4
	10:30	1181.3	29.0	1065.6	31.311	1150.0	31.08	2568.7
5	10:35	1237.1	32.8	1094.4	32.894	1204.2	31.92	2617.7
				1075.2				
	10:40	1344.9	37.7	1411.2	52.648	1292.3	41.16	2720.4
	10:45	1395.6	42.7	1440.0	54.653	1340.9	42.00	2773.8
6	10:50	1405.7	47.7	1440.0	54.653	1351.0	42.00	2786.7
				1430.4				
	10:55	1467.8	53.9	1785.6	81.366	1386.4	52.08	2837.3
	11:00	1494.4	60.1	1785.6	81.366	1413.0	52.08	2865.2
7	11:05	1513.3	66.4	1814.4	83.811	1429.5	52.92	2884.1
				1795.2				





STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psf)	(5) CORRECTED TUBING PRESS. (psf) (1) - (4)	(6) INJECTION RATE (gpm) (3)/34.2857	(7) MEASURED BHP (psf)
8  FALLOFF	11:10	1563.9	74.1	2217.6	121.486	1442.4	64.68	2921.4
	11:15	1582.9	81.7	2188.8	118.584	1464.3	63.84	2937.6
	11:20	1590.4	89.3	2188.8 2198.4	118.584	1471.8	63.84	2948.1
	11:21	1519.4				1519.4		2905.7
	11:22	1481.3				1481.3		2882.1
	11:23	1462.3				1462.3		2862.5
	11:24	1445.8				1445.8		2844.5
	11:25	1430.6				1430.6		2828.8
	11:30	1374.7				1374.7		2770.3
	11:35	1336.6				1336.6		2733.5

**STATE OF NEW MEXICO  
ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION**

**IN THE MATTER OF THE HEARING  
CALLED BY THE OIL CONSERVATION  
DIVISION FOR THE PURPOSE OF  
CONSIDERING:**

**CASE NO. 11807  
Order No. R-10921**

**APPLICATION OF STEVENS & TULL  
INC. FOR SALT WATER DISPOSAL,  
LEA COUNTY, NEW MEXICO.**

**ORDER OF THE DIVISION**

**BY THE DIVISION:**

This cause came on for hearing at 8:15 a.m. on September 4 and October 9, 1997, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 20<sup>th</sup> day of November, 1997, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

**FINDS THAT:**

(1) Due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof..

(2) The applicant, Stevens & Tull, Inc., seeks authority to utilize its State "BF" Well No. 4 located 330 feet from the North and East lines (Unit A) of Section 16, Township 20 South, Range 33 East, NMPM, Lea County, New Mexico, to dispose of produced salt water into the Yates formation through the perforated interval from approximately 3,160 feet to 3,418 feet.

(3) Division records and evidence and testimony presented by the applicant indicates that the State "BF" Well No. 4 was drilled in November, 1995 to a total depth of 3,470 feet to test the Yates interval, West Teas Yates-Seven Rivers Pool. The well was perforated in the lower Yates interval from 3,374 feet to 3,394 feet and tested 0 BOPD, 100 BWPD and a trace of gas. This interval was abandoned with a CIPB set at 3,365 feet and the well was perforated in the upper Yates interval from 3,160 feet to 3,294 feet. This interval IP'd at a rate of 6 BOPD, 50 BWPD and 6 MCFGD. The well is currently capable of producing approximately 2-3 BOPD.



(4) The applicant further testified that the subject well will be utilized as a replacement disposal well for its State "BF" Well No. 2, located in Unit K of Section 16, which has been plugged and abandoned due to mechanical failure. The State "BF" Well No. 2 was permitted as a disposal well by Division Order No. SWD-631 dated July 9, 1996. Injection was permitted into the Yates formation through the perforated interval from 3,094 feet to 3,209 feet.

(5) According to applicant's geologic evidence and testimony, the Yates formation is hydrocarbon productive within the West Teas Yates-Seven Rivers Pool. The Seven Rivers formation, which occurs at a depth of approximately 3,418 feet within the State "BF" Well No. 4, is not hydrocarbon productive within this pool.

(6) Applicant projects the Capitan Reef, a fresh water aquifer, to occur at a depth of approximately 3,495 feet within the State "BF" Well No. 4. According to this projection, the top of the Capitan Reef will be located approximately 77 feet below the lowermost proposed injection perforations (3,418 feet) and approximately 30 feet below the T.D. of the State "BF" Well No. 4 (3,465 feet).

(7) Applicant testified that based upon its geologic interpretation, the lower Yates/Seven Rivers interval (3,316' -3,418') within the State "BF" Well No. 4 is not in hydrologic connection with the Capitan Reef. Applicant further testified that injection into this interval should not pose a threat to any fresh water resources within the Capitan Reef.

(8) Applicant's evidence and testimony in this case is insufficient to demonstrate that:

- a) the lower Yates/Seven Rivers interval within the State "BF" Well No. 4 is hydrocarbon productive;
- b) the water within the lower Yates/Seven Rivers interval contains total dissolved solids in excess of 10,000 mg/l; and,
- c) injection into the lower Yates/Seven Rivers interval will not pose a threat to fresh water resources within the Capitan Reef.

(9) Injection into the Yates formation within the State "BF" Well No. 4 should be initially limited to the currently perforated interval from a depth of 3,160 feet to 3,294 feet.

(10) The Division Director should be authorized to administratively approve the expansion of the injection interval within the State "BF" Well No. 4 upon the presentation of additional geologic and engineering data by the applicant which would demonstrate that such injection will not pose a threat to fresh water resources within the Capitan Reef.

(11) No offset operator and/or interest owner appeared at the hearing in opposition to the application.

(12) Injection should be accomplished through 2 7/8 inch plastic-lined tubing installed in a packer located at approximately 3,100 feet; the casing-tubing annulus should be filled with an inert fluid; and a pressure gauge or approved leak detection device should be attached to the annulus in order to determine leakage in the casing, tubing or packer. The lower Yates/Seven Rivers perforated interval from 3,374 feet to 3,394 feet shall be isolated from injection with a CIBP which is currently set at a depth of 3,365 feet.

(13) Prior to commencing injection operations, the casing in the subject well should be pressure-tested throughout the interval from the surface down to the proposed packer setting depth, to assure the integrity of such casing.

(14) The injection well or system should be equipped with a pressure limiting switch or other acceptable device which will limit the surface pressure on the injection well to no more than 632 psi.

(15) The Director of the Division should be authorized to administratively approve an increase in the injection pressure upon a proper showing by the operator that such higher pressure will not result in migration of the injected fluid from the Yates formation.

(16) The operator should notify the supervisor of the Hobbs district office of the Division of the date and time of the installation of disposal equipment and of the performance of the mechanical integrity pressure test in order that the same may be witnessed.

(17) The operator should take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface.

(18) Approval of the subject application will prevent the drilling of unnecessary wells and otherwise prevent waste and protect correlative rights.

(19) The injection authority granted herein should terminate one year after the effective date of this order if the applicant has not commenced injection operations into the subject well, provided however, the Division, upon written request by the applicant, may grant an extension thereof for good cause shown.



**IT IS THEREFORE ORDERED THAT:**

(1) The applicant, Stevens & Tull, Inc., is hereby authorized to utilize its State "BF" Well No. 4 located 330 feet from the North and East lines (Unit A) of Section 16, Township 20 South, Range 33 East, NMPM, Lea County, New Mexico, to dispose of produced salt water into the Yates formation through the perforated interval from approximately 3,160 feet to 3,294 feet. The lower Yates/Seven Rivers perforated interval from 3,374 feet to 3,394 feet shall be isolated from injection with a CIBP which is currently set at a depth of 3,365 feet.

(2) The Division Director shall be authorized to administratively approve the expansion of the injection interval within the State "BF" Well No. 4 upon the presentation of additional geologic and engineering data by the applicant which would demonstrate that such injection will not pose a threat to fresh water resources within the Capitan Reef.

(3) Injection shall be accomplished through 2 7/8 inch plastic-lined tubing installed in a packer set at approximately 3,100 feet; the casing-tubing annulus shall be filled with an inert fluid and a pressure gauge or approved leak detection device shall be attached to the annulus in order to determine leakage in the casing, tubing or packer.

(4) Prior to commencing injection operations, the casing in the subject well shall be pressure-tested throughout the interval from the surface down to the proposed packer setting depth, to assure the integrity of such casing.

(5) The injection well or system shall be equipped with a pressure limiting switch or other acceptable device which will limit the surface pressure on the injection well to no more than 632 psi.

(6) The Director of the Division shall be authorized to administratively approve an increase in the injection pressure upon a proper showing by the operator that such higher pressure will not result in migration of the injected fluid from the Yates formation.

(7) The operator shall notify the supervisor of the Hobbs district office of the Division of the date and time of the installation of disposal equipment and of the performance of the mechanical integrity pressure test in order that the same may be witnessed.

(8) The operator shall take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface.



(9) The operator shall immediately notify the supervisor of the Division's Hobbs district office of the failure of the tubing, casing, or packer in said well or the leakage of water from or around said well and shall take such steps as may be timely and necessary to correct such failure or leakage.

(10) The applicant shall conduct disposal operations and submit monthly reports in accordance with Rules 702 through 706, 708 and 1120 of the Division Rules and Regulations.

(11) The injection authority granted herein shall terminate one year after the effective date of this order if the applicant has not commenced injection operations into the subject well, provided however, the Division, upon written request by the applicant, may grant an extension thereof for good cause shown.

(12) Jurisdiction is hereby retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION



WILLIAM J. LEMAY  
Director

S E A L