NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

Oil Conservation Division

CF 10960
R-10151
10151-A

July 27, 1995

Mewbourne Oil Company
P.O. Drawer 7698
Tyler, Texas 75711-7698

Attn: Mr. Kevin Mayes

RE: Injection Pressure Increase Quercho Plains Queen Associated Waterflood Project in Lea County, New Mexico

Dear Mr. **Mayes**:

Reference is made to your request dated July 14, 1995 to increase the surface injection pressure on all ten wells which comprise the above referenced waterflood project. This request is based on a step rate tests conducted in May and June, 1995 as well as additional pressure data. The results of the test and inferences of the data have been reviewed by my staff and we feel an increase in injection pressure on these wells is justified at this time.

You are therefore authorized to increase the surface injection pressure on the ten initial wells in the Quercho Plains Queen associated Waterflood Project which were authorized by Division Order R-10151, to ***1350 psig for each well***. If the subject project is expanded to include additional wells by an administrative order in the future, those wells will be subject to the originally authorized injection pressure of 777 psig until such time that other data warrants a respective increase.

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,

William J. LeMay
Director

WJL/BES

cc: Oil Conservation Division - Hobbs
File: Case File No.10960; PSI-X 3rd QTR 95

PSI x N/R

MEWBOURNE OIL COMPANY

P.O. BOX 7698
TYLER, TEXAS 75711
903 - 561-2900
FAX 903 - 561-1870

July 14, 1995

New Mexico Oil Conservation Commission
2040 S. Pacheco
Santa Fe, New Mexico 87505

Attn: Mr. David Catanach

Re: Application for Increased Surface Injection Pressure
Querecho Plains Queen Associated Waterflood Project
Lea County, New Mexico

Mr. Catanach:

Mewbourne Oil Company requests administrative approval to increase surface injection pressure to 1350 psi at the referenced waterflood. In support of this request you should find attached: 1) Exhibit 25 from the original waterflood hearing which documents the ISIP of fracture treatments for all wells in the field, 2) Step rate tests, conducted in May/June 1995, from five of the ten existing injectors, and 3) Reference to Finding No. 9 from Division Order R-10151 suggesting the Division Director should have administrative authority to approve this increase. The attached step rate tests have water gravity, depth to top perforation, and friction pressure taken into account. In addition, diligent care was taken to keep the time period between each data point consistent throughout the tests.

I would also like to take this opportunity to remind the Division of our past conversations regarding the fact that water injection will increase pore pressure around a wellbore resulting in increased fracture gradients. Mewbourne Oil would like to preserve administrative approval for future increases in surface injection pressure if subsequent step rate testing dictates.

Thank you for your consideration in the above matters. Should you have any questions or comments please call me or Ken Calvert at (903) 561-2900.

Sincerely,

Kevin Mayes

Kevin Mayes, P.E.
Project Engineer

QUERECHO PLAINS QUEEN ASSOCIATED POOL

FRAC GRADIENT DATA

	QUEEN			PENROSE		
Well	**Perforations**	**ISIP (psi)**	**Flush Fluid**	**Perforations**	**ISIP (psi)**	**Flush Fluid**
F-2	3881'-3916'	2000	KCl water	4090'-4151'	1600	KCl water
H-1	3888'-3924'	1800	Gelled KCl	4124'-4154'	1600	Gelled fresh
C.L. 1	3927'-3949'	2100	Gelled water	4173'-4183'	1900	Fresh water
F-1				4132'-4163'	1700	Gelled KCl
Edith #2*	3958'-3987'	1950	Gelled water	4214'-4224'	1950	Gelled water
Marshall #1				4176'-4190'	1700	Gelled water
Marshall #2	3906'-3931'	2000	Gelled KCl	4106'-4160'	1500	Gelled water
Walker #1	3914'-3947'	1800	Gelled water	4214'-4220'	1500	Gelled water
E-7	3900'-3936'	2000	Gelled water	4151'-4171'	1800	Gelled water
E-6	3879'-3908'	1900	Gelled water	4135'-4154'	1700	Gelled water
E-5	3872'-3904'	2000	Gelled water	4130'-4150'	1600	Gelled water
E-3	3904'-3942'	1860	Gelled water	4148'-4178'	1700	Gelled water
E-2	3910'-4041'	1850	Gelled water			
E-8	3934'-3968'	2050	Gelled water	4170'-4198'	1700	Gelled water
Anad. #2	3888'-4026'	1600	Gelled fresh			
Anad. #3	3620'-4060'	1600	Gelled water			
E-9	3875'-3906'	2300	Gelled water	4128'-4152'	1900	Gelled water

Note: The calculation which generates the most conservative frac gradient is the Penrose treatment in the Marshall Federal No. 2 Well:

$G_f = ((4106*.438) + 1500) \div 4106 = .80$ psi/ft.

Given: Shallowest Penrose perf. in any proposed injector = 4084'**. Specific gravity of the injection water = .44 psi/ft.

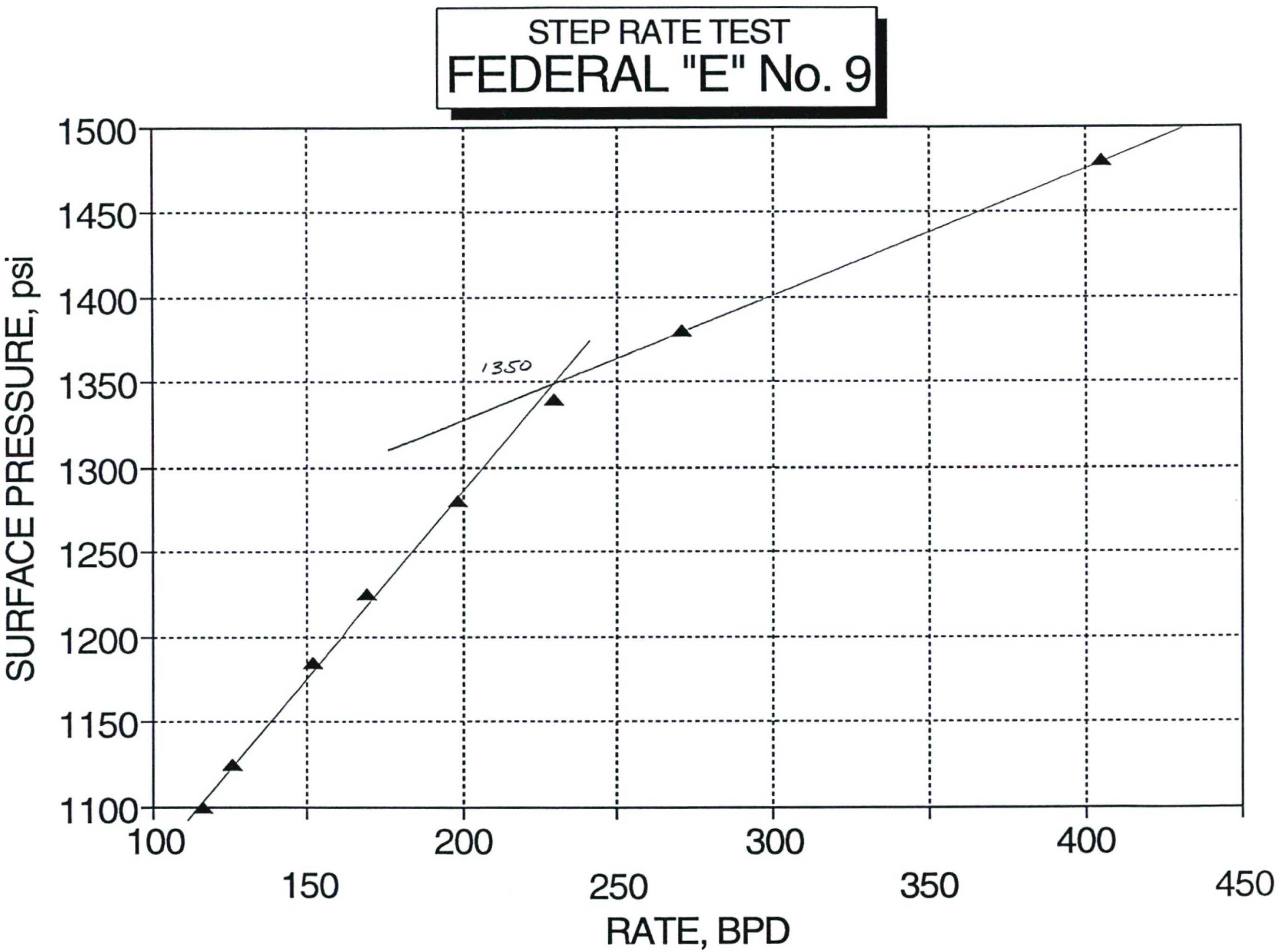
Recommend: Maximum Surface Injection Pressure = (.8-.44) * 4084' = 1470 psi

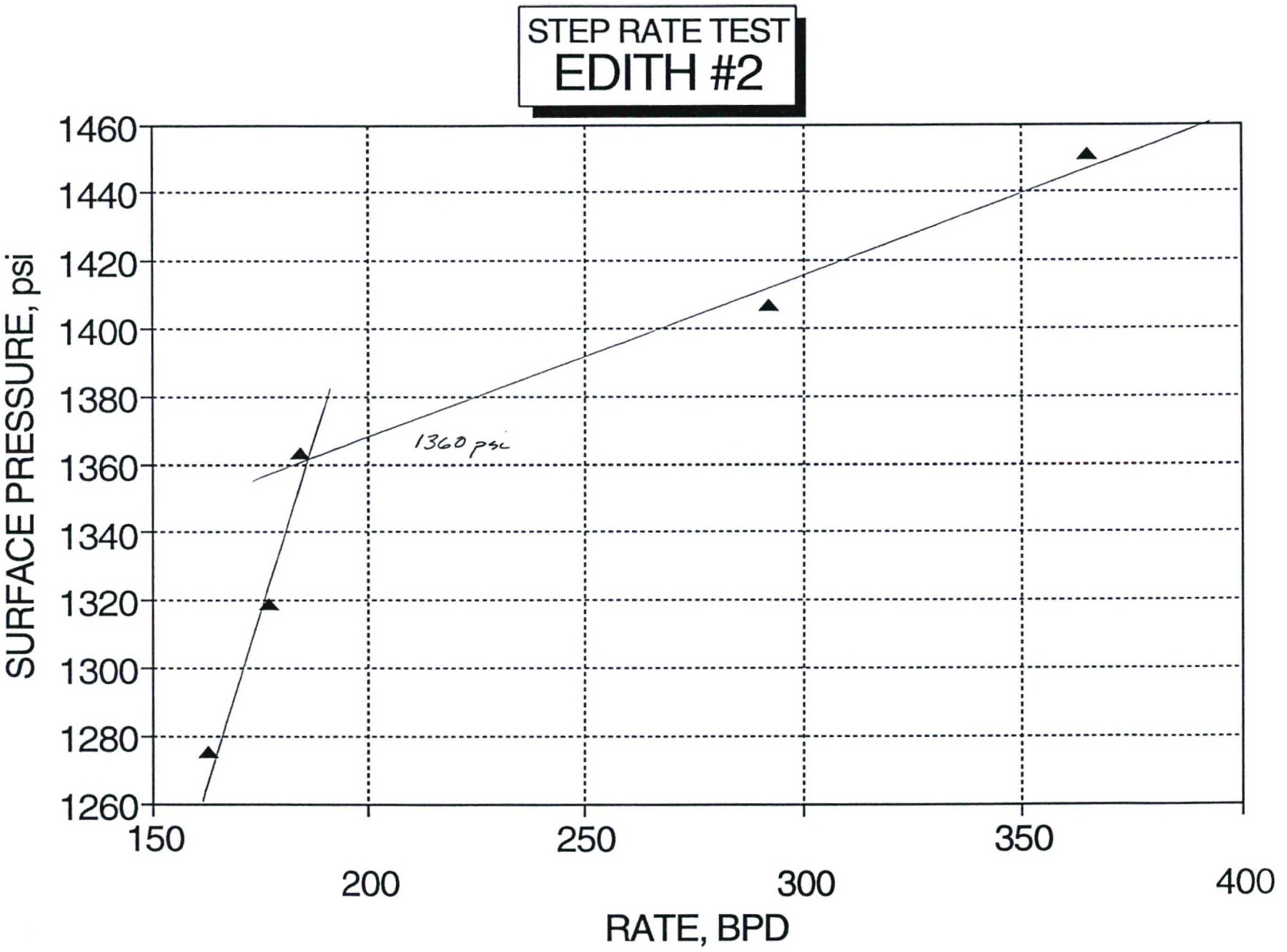
* Commingled Frac 2% KCl = 1.012 = .438
** Bennett Federal No. 5

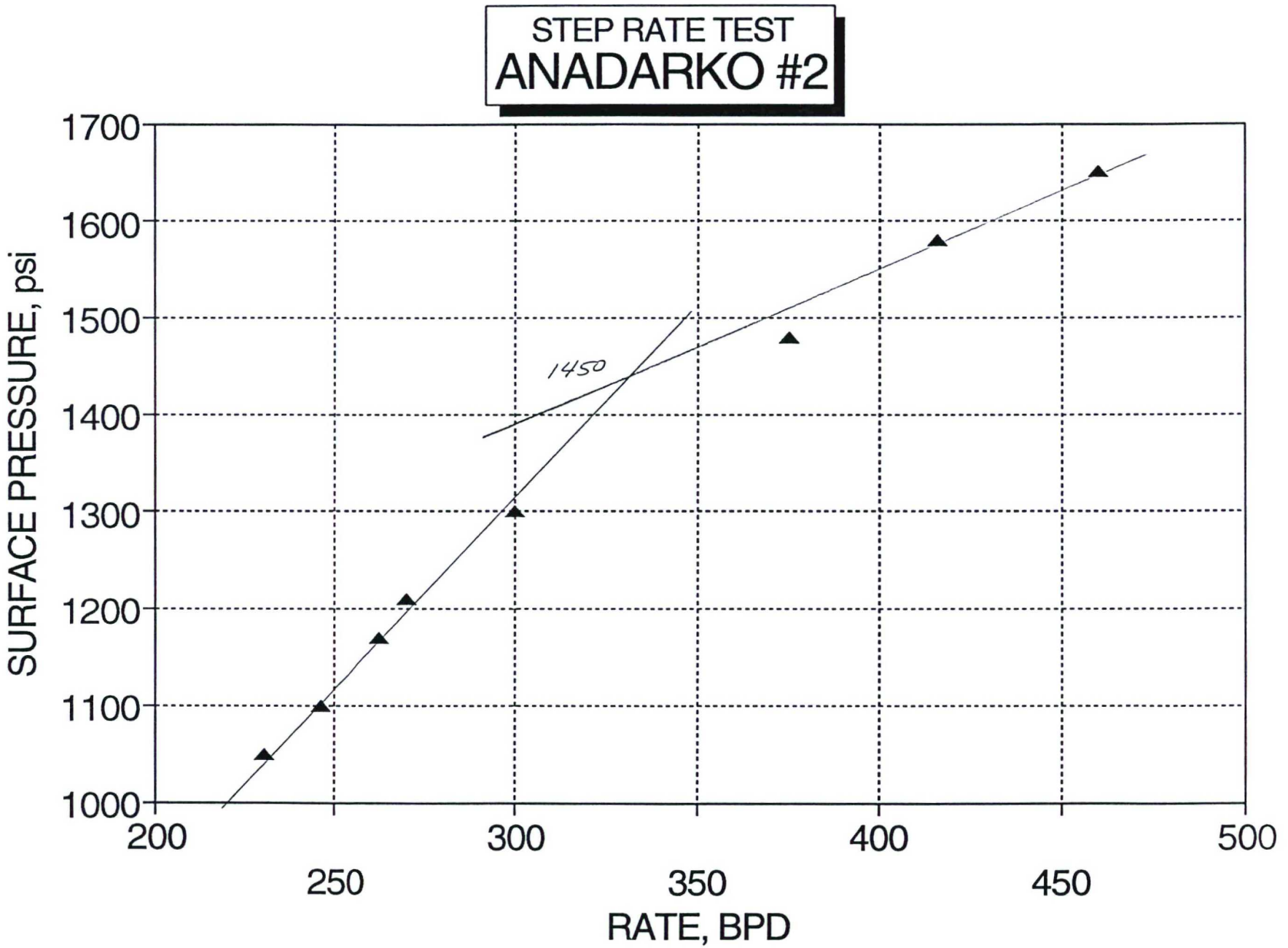
NEW MEXICO
OIL CONSERVATION DIVISION

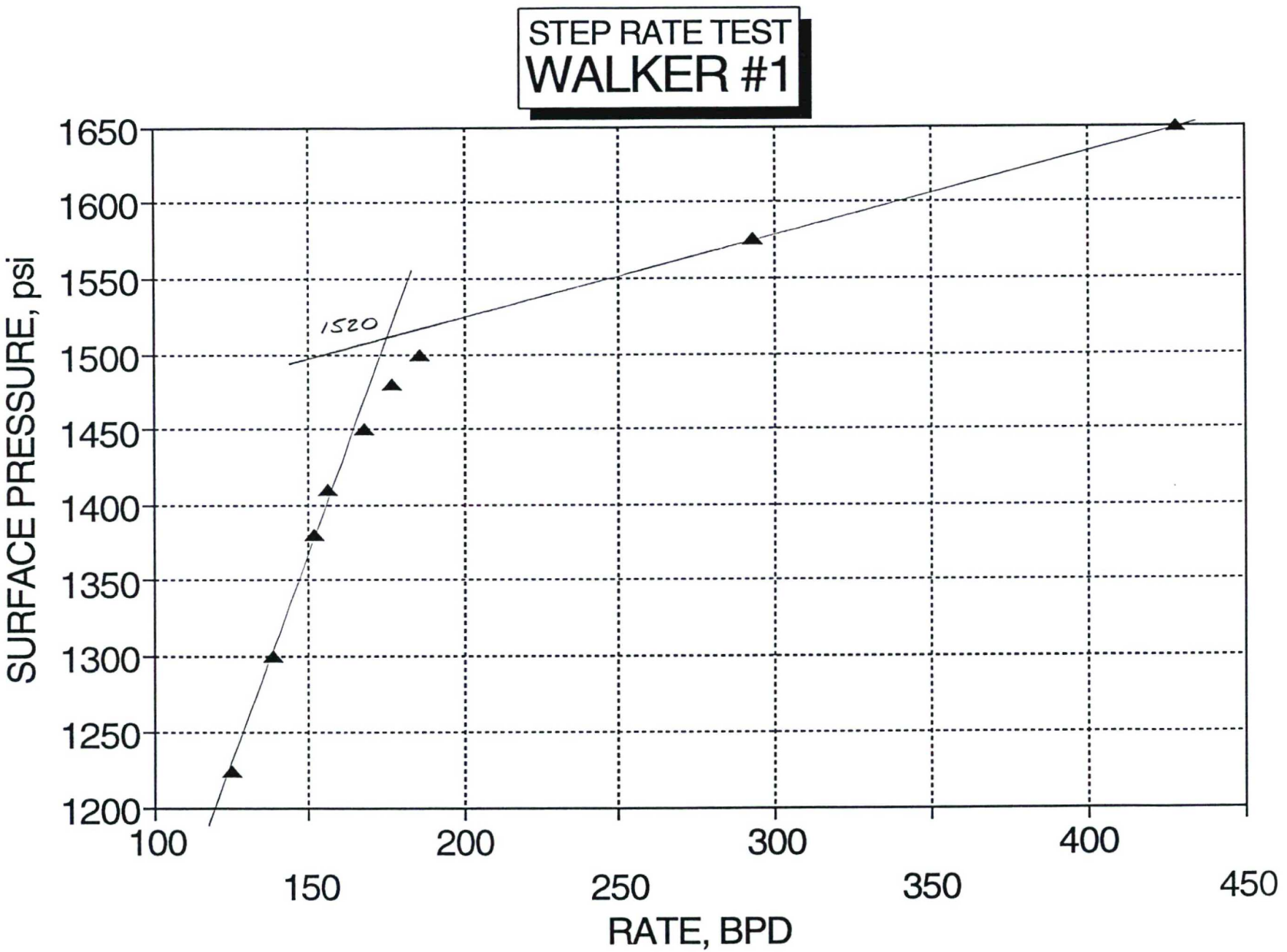
EXHIBIT 25

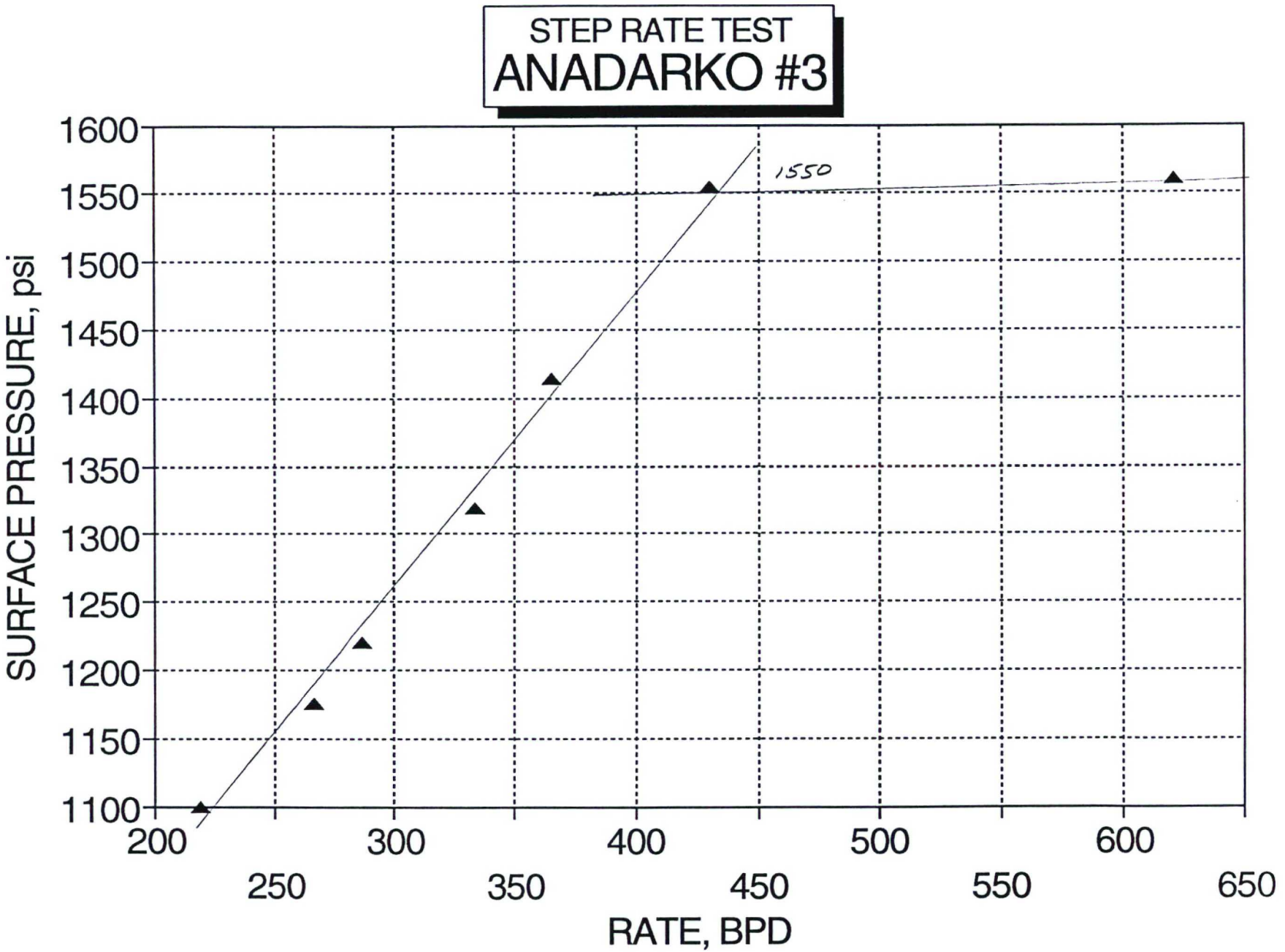
CASE NO. 10959 & 10960


STEP RATE TEST
FEDERAL "E" No. 9
SURFACE PRESSURE, psi
1500
1450
1400
1350
1300
1250
1200
1150
1100
1350
100
200
300
400
150
250
350
450
RATE, BPD


STEP RATE TEST
EDITH #2
SURFACE PRESSURE, psi
1460
1440
1420
1400
1380
1360
1340
1320
1300
1280
1260
1360 psi
150
200
250
300
350
400
RATE, BPD


STEP RATE TEST
ANADARKO #2
SURFACE PRESSURE, psi
1700
1600
1500
1400
1300
1200
1100
1000
1450
200
250
300
350
400
450
500
RATE, BPD


STEP RATE TEST
WALKER #1
SURFACE PRESSURE, psi
1650
1600
1550
1500
1450
1400
1350
1300
1250
1200
1520
100
200
300
400
150
250
350
450
RATE, BPD


STEP RATE TEST
ANADARKO #3
SURFACE PRESSURE, psi
1600
1550
1500
1450
1400
1350
1300
1250
1200
1150
1100
1550
200
250
300
350
400
450
500
550
600
650
RATE, BPD

(8) The injection wells or pressurization system should be initially equipped with a pressure control device or acceptable substitute which will limit the surface injection pressure to no more than 777 PSI because the increase in surface injection pressure as requested by the applicant was not supported with step rate tests.

(9) The Division Director should have the authority to administratively authorize a pressure limitation in excess of the above upon a showing by the operator that such higher pressure will not result in the fracturing of the injection formation or confining strata.

(10) The operator of the proposed Querecho Plains Queen Associated Sand Unit Waterflood Project should take all steps necessary to ensure that the injected water enters and remains confined to only the proposed injection interval and is not permitted to escape from that interval and migrate into other formations, producing intervals, pools or onto the surface from injection, production, or plugged and abandoned wells.

(11) The applicant submitted data concerning all plugged and producing wells within the area of review. There are five wells which may not be plugged in such a manner which will assure that their wellbores will not serve as a conduit for movement of injected fluid out of the injection interval. Three of the wells are located outside the zero contour lines of the Queen and Penrose porosity isopach maps and should pose no problem. The other two following described wells should be re-plugged in a manner which will assure that the wellbores will not serve as a conduit for migration of injection fluid to the satisfaction of the Hobbs District Supervisor.

Plugged Wells:

Oil Associates, Inc.
Edwards Well No. 1
660' FSL & 660' FWL (Unit M), Section 22;

H & S Oil Company
Anadarko Well No. 1-Y
1980' FNL & 1995' FWL (Unit F), Section 27.

(12) There are five active producing wells in the area of review which do not have cement covering the Queen-Penrose interval. These wells, and their casing program and calculated cement tops, are listed below. These wells will require remedial cement operations in a manner which will assure that the wellbores will not serve as a conduit for migration of injection fluid to the satisfaction of the Hobbs District Supervisor.