

2/23/09	SUSPENSE	J. Warnell	2/23/09	IPI	PKAAD905452935
DATE IN		ENGINEER	LOGGED IN	TYPE	APP NO.

RECEIVED

ABOVE THIS LINE FOR DIVISION USE ONLY

603 FEB 23 PM 1 01

NEW MEXICO OIL CONSERVATION DIVISION

- Engineering Bureau -

1220 South St. Francis Drive, Santa Fe, NM 87505



30-005-20069 10523,
29021, 27985,
29028
Cano Petro NM
248802

ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Application Acronyms:

[NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]
[DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
[PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
[WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
[SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
[EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

IPI 315

[1] TYPE OF APPLICATION - Check Those Which Apply for [A]

[A] Location - Spacing Unit - Simultaneous Dedication
☐ NSL ☐ NSP ☐ SD

Check One Only for [B] or [C]

[B] Commingling - Storage - Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
☐ WFX ☐ PMX ☐ SWD ☒ IPI ☐ EOR ☐ PPR

[D] Other: Specify _____

2-9029-A

[2] NOTIFICATION REQUIRED TO: - Check Those Which Apply, or Does Not Apply

- [A] ☐ Working, Royalty or Overriding Royalty Interest Owners
- [B] ☐ Offset Operators, Leaseholders or Surface Owner
- [C] ☐ Application is One Which Requires Published Legal Notice
- [D] ☐ Notification and/or Concurrent Approval by BLM or SLO
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office
- [E] ☐ For all of the above, Proof of Notification or Publication is Attached, and/or,
- [F] ☐ Waivers are Attached

[3] SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.

[4] CERTIFICATION: I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

KEITH B. MASTERS, P.E.

Print or Type Name

(Keith B. Masters)

Signature

CONSULTANT

Title

02/23/09

Date

k_b_masters@mastersconsultingllc.com
e-mail Address

Masters Consulting, LLC
7500 Rialto Blvd., Ste. 180
Austin, TX 78735

Keith B. Masters, P.E.
President

email: k_b_masters@mastersconsultingllc.com

Phone: (512) 906-2016
Fax: (512) 906-2729

February 19, 2009

New Mexico Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, NM 87505

Re: Injection Pressure Increase
Cano Petro of New Mexico, Inc.
Cato San Andres Unit
Chaves County, NM

Ladies and Gentlemen:

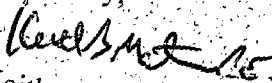
Cano Petro of New Mexico, Inc. ("Cano") hereby requests an increase in the authorized surface injection pressure for certain wells within the Cato San Andres Unit, Chaves County, New Mexico. The enclosed table entitled "Current & Proposed Maximum Injection Pressures" provides the requested pressure limitation on a well by well basis.

NMOCD Order No. R-9029-A, dated September 3, 2008, granted Cano authority to expand the Cato San Andres Unit Waterflood Project. Forty-three injection wells were permitted, and the maximum surface injection pressure was set at 650 psi. Injection was commenced on September 17, 2008. The current total injection rate is approximately 8,000 BWPD.

Step rate tests have been run in five of the permitted injection wells. The location of these wells is indicated on the enclosed map of the project area. A wellbore diagram for each well and the step rate test reports as received from the service company conducting the test are also enclosed.

Thank you for your assistance. Please direct any inquiries regarding this matter to the undersigned.

Sincerely,



Keith B. Masters, P.E.
for Cano Petro of New Mexico, Inc.

cc: Cano Petro of New Mexico, Inc.

CURRENT & PROPOSED MAXIMUM SURFACE INJECTION PRESSURES

CANO PETRO OF NEW MEXICO, INC.

CATO SAN ANDRES UNIT

		Well No.	API No.	Current Maximum Surface Injection Pressure (psia)	Surface Parting Pressure (psia)	Proposed Maximum Surface Injection Pressure (psia)	
<i>Top Part</i>							
<i>(from R-9029)</i>							
	<i>Perfs from Application</i>						
	3383	21	30-005-20069	650	1,415	1,400	1400 ✓
<i>3 1/2 line</i>	3478	23	30-005-10523	650	1,270	1,250	1220 ✓
	3300	50	30-005-29021	650	878	850	840 ✓
	3444	533	30-005-27985	650	1,862	1,850	1630 ✓
	3424	822	30-005-29028	650	1,586	1,550	1500 ✓

1. BH Gauge only ~~to~~ surface -
2. My calculation don't give me your answers
3. perft Tops only agree on well # 21
4. (533 package) page 2 data sheet is labeled well # 50 (Fresh & Lease Water)
5. why ~~do~~ you need such a big increase².
6. New well bore diagrams.

477

Fluid Gradient

Cal

Well No.	Top Perf	BHParting Pressure (measured)	Hydro Pressure .477 X TP	Surface Pressure (measured)	Surface Pressure (less 50)	Gradient <i>ASK FV</i>	
21	3383	2858	1614	1415	1365	<i>1400</i> 0.40	<i>1365</i>
23	3472	2850	1656	1270	1220	<i>1250</i> 0.35	<i>1220</i>
50	3496	2323	1668	878	828	<i>850</i> 0.24	<i>850</i>
533	3440	3080	1641	1862	1812	<i>1850</i> ^{.4} 0.53	<i>1380</i>
822	3424	3035	1633	1586	1536	<i>1550</i> ^{.4} 0.45	<i>1370</i>

Avg. Gradient 0.39

40 max gradient ? -

—	Well No.	Top Perf	BHParting Pressure	Hydro Pressure	Surface Pressure	Surface Pressure	Gradient
				.433 X TP	(W/O Friction)	(less 50)	
	21	3383	2858	1465	1393	1343	0.40
	23	3478	2850	1506	1344	1294	0.37
	50	3300	2323	1429	894	844	0.26
	533	3614	3080	1565	1515	1465	0.41
	822	3424	3035	1483	1552	1502	0.44
						Avg. Gradient	0.37

—	Well No.	Top Perf	BHParting Pressure	Hydro Pressure	Surface Pressure	Surface Pressure	Gradient
				.433 X TP	(W/O Friction)	(less 50)	
	21	3383	2858	1465	1393	1343	0.40
	23	3478	2850	1506	1344	1294	0.37
	50	3300	2323	1429	894	844	0.26
	533	3614	3080	1565	1515	1465	0.41
	822	3424	3035	1483	1552	1502	0.44
						Avg. Gradient	0.37

CANO PETROLEUM

CSAU #21
CHAVEZ COUNTY, NEW MEXICO

TEST DATE
10/29/2008

STEP RATE TEST

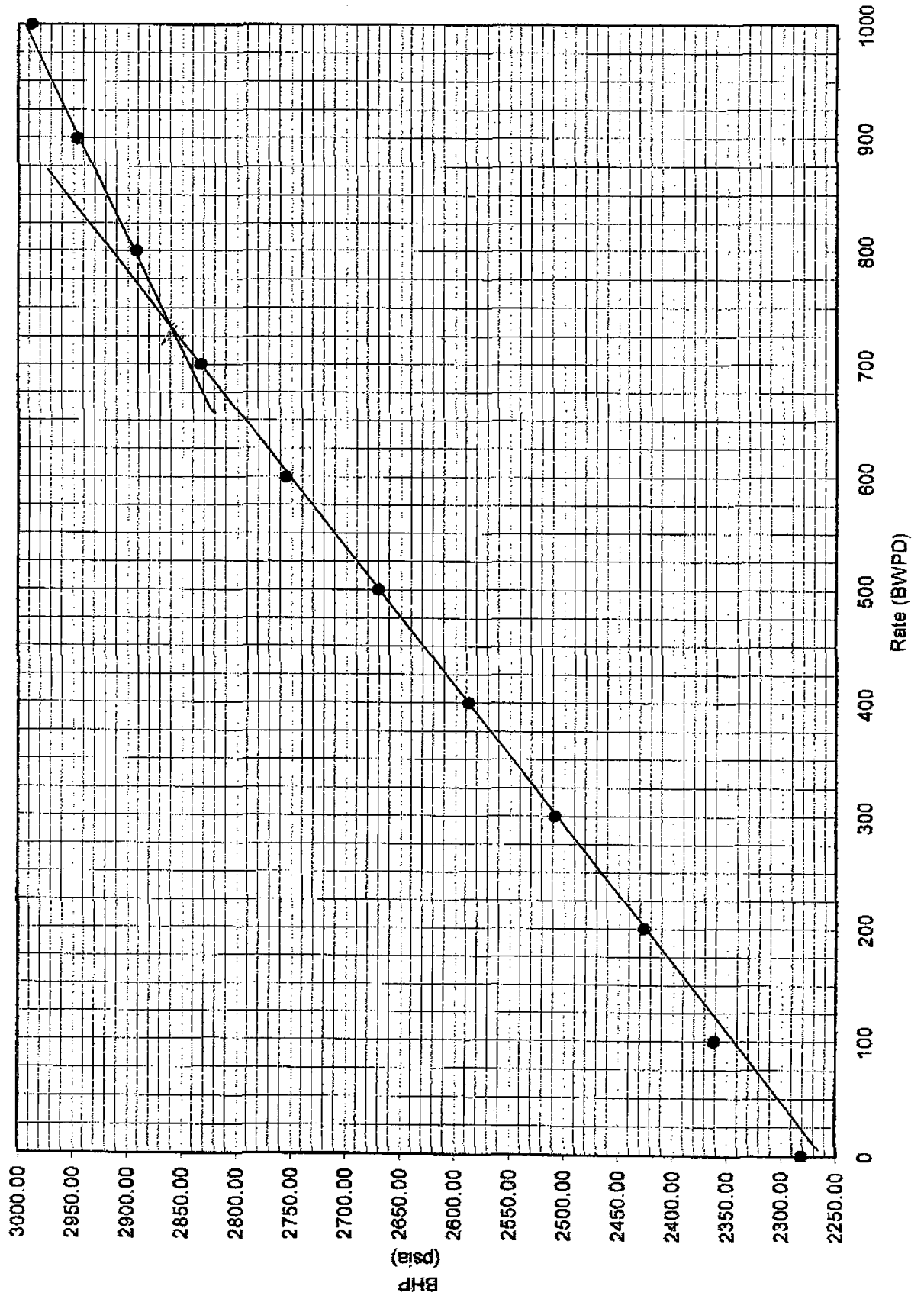
Ran step rate test with electric surface readout unit, 1 electronic pressure instrument @ run depth of 3,430' and surface pressure transducer.

TEST DATE 10/29/2008

STEP RATE TEST
CANO PETROLEUM
CSAU #21
10/28/2008

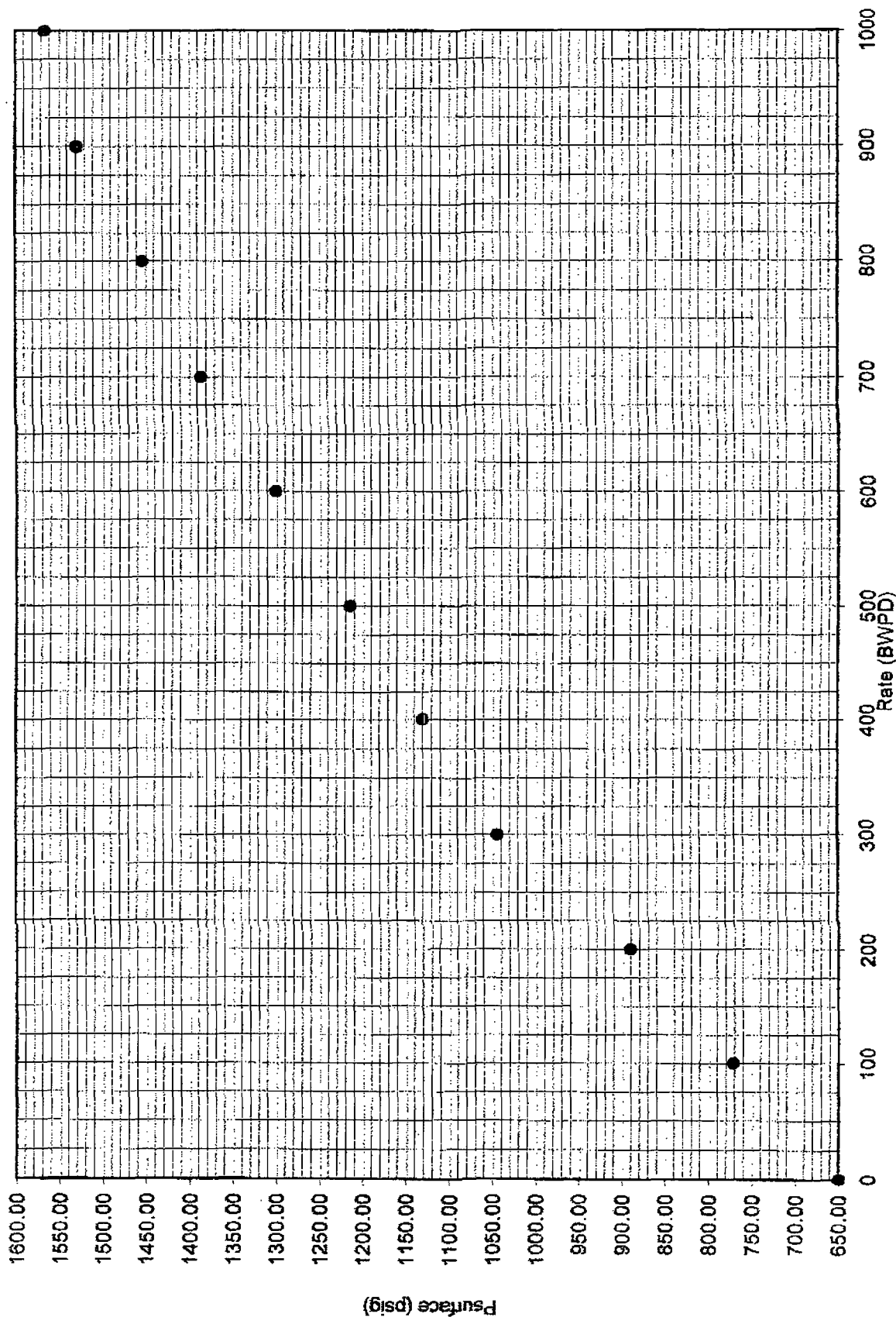
PRECISION
PRESSURE
DATA, INC.

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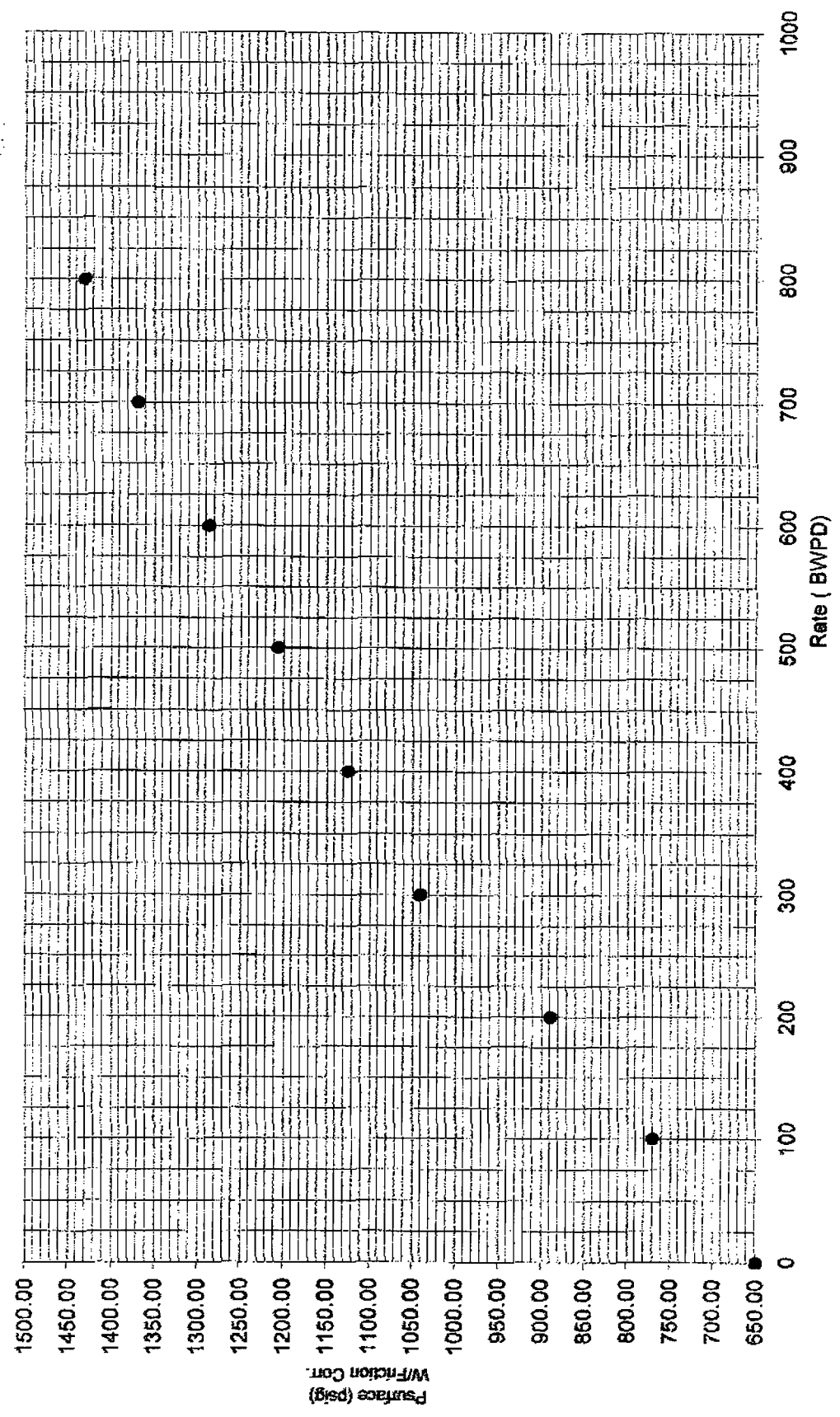
PRECISION
PRESSURE
DATA, INC.

STEP RATE TEST
CANO PETROLEUM
CSAU #21
10/21/2008



STEP RATE TEST
CANO PETROLEUM
CSAU #21
10/29/2008

PRECISION
PRESSURE
DATA, INC.



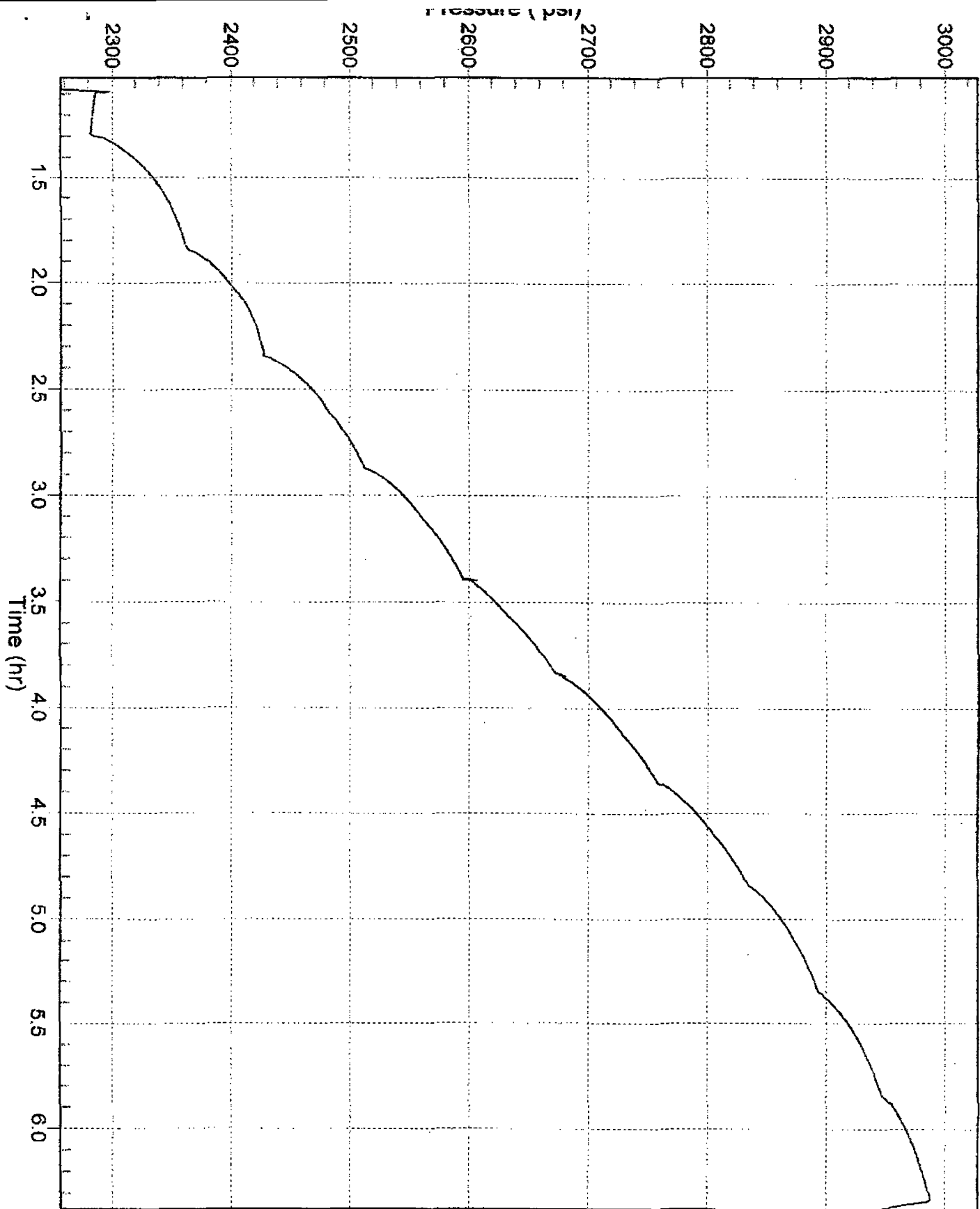
CANO PETROLEUM - CSAU #21

Step Rate Test

10/29/2008

Bottom Hole Pressure Data

Pressure



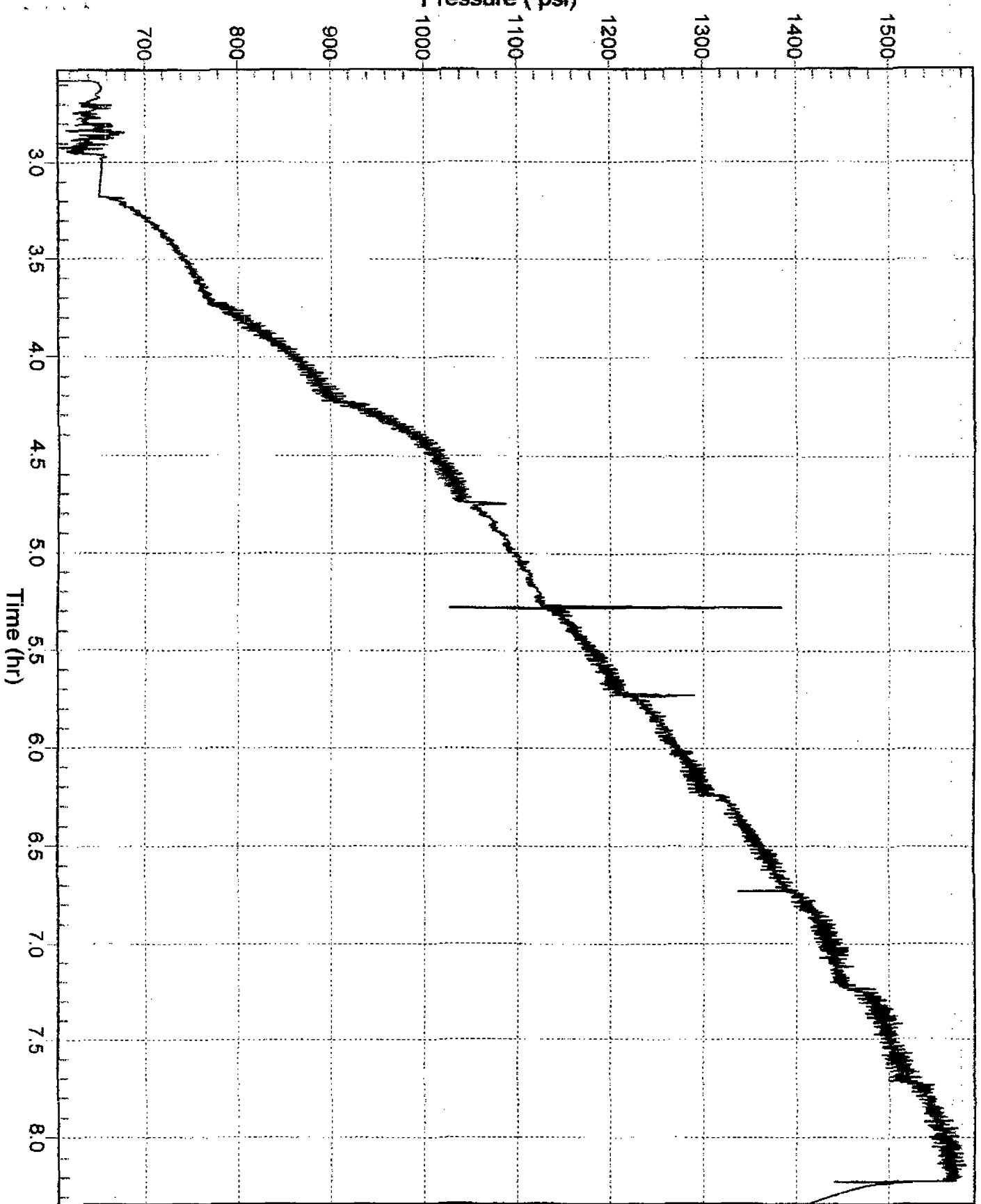
CANO PETROLEUM - CSAU #21

Step Rate Test

10/29/2008

Surface Pressure Data

Pressure





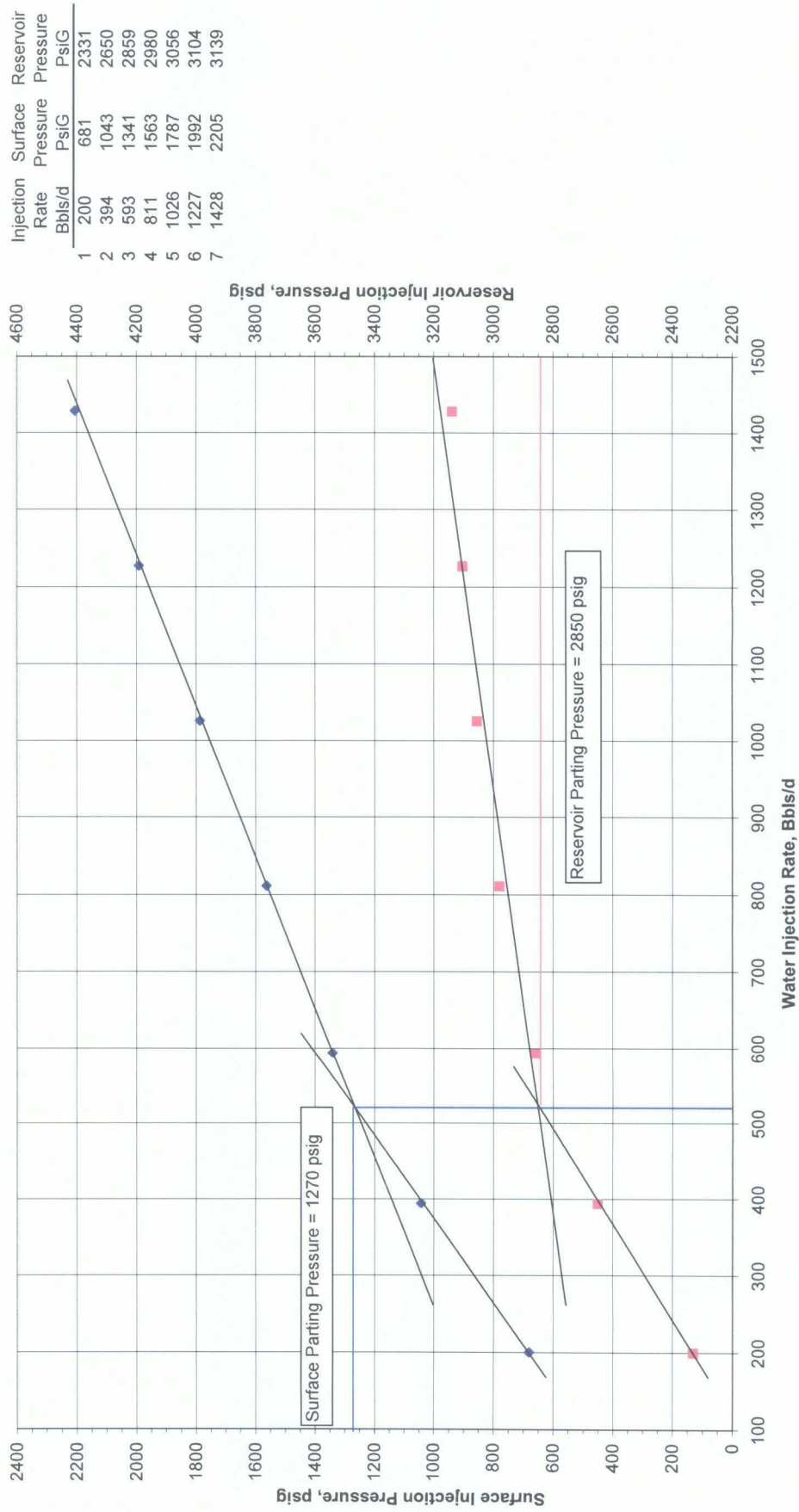
FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

STEP RATE INJECTION TEST

Company: Cano Petroleum, Inc.
Well: CSAU No. 23
Field: Chaves County, NM

Test Date: 2/17/2009
Perforations: 3472 - 3518, 3548 - 3559 ft
Gauge Depth: 3490 ft



Grid

Well No.	Top Perf	BHParting Pressure	Hydro Pressure .433 X TP	Surface Pressure (W/O Friction)	Surface Pressure (less 50)	
21	→ 3383	2858	1465	1393	1343	1340
23	3478	2850	1506	1344	1294	1290
50	3300	2323	1429	894	844	850
533	3614	3080	1565	1515	1465	1465
822	3424	3035	1483	1552	1502	1500

CANO PETROLEUM

CSAU #50
CHAVEZ COUNTY, NEW MEXICO

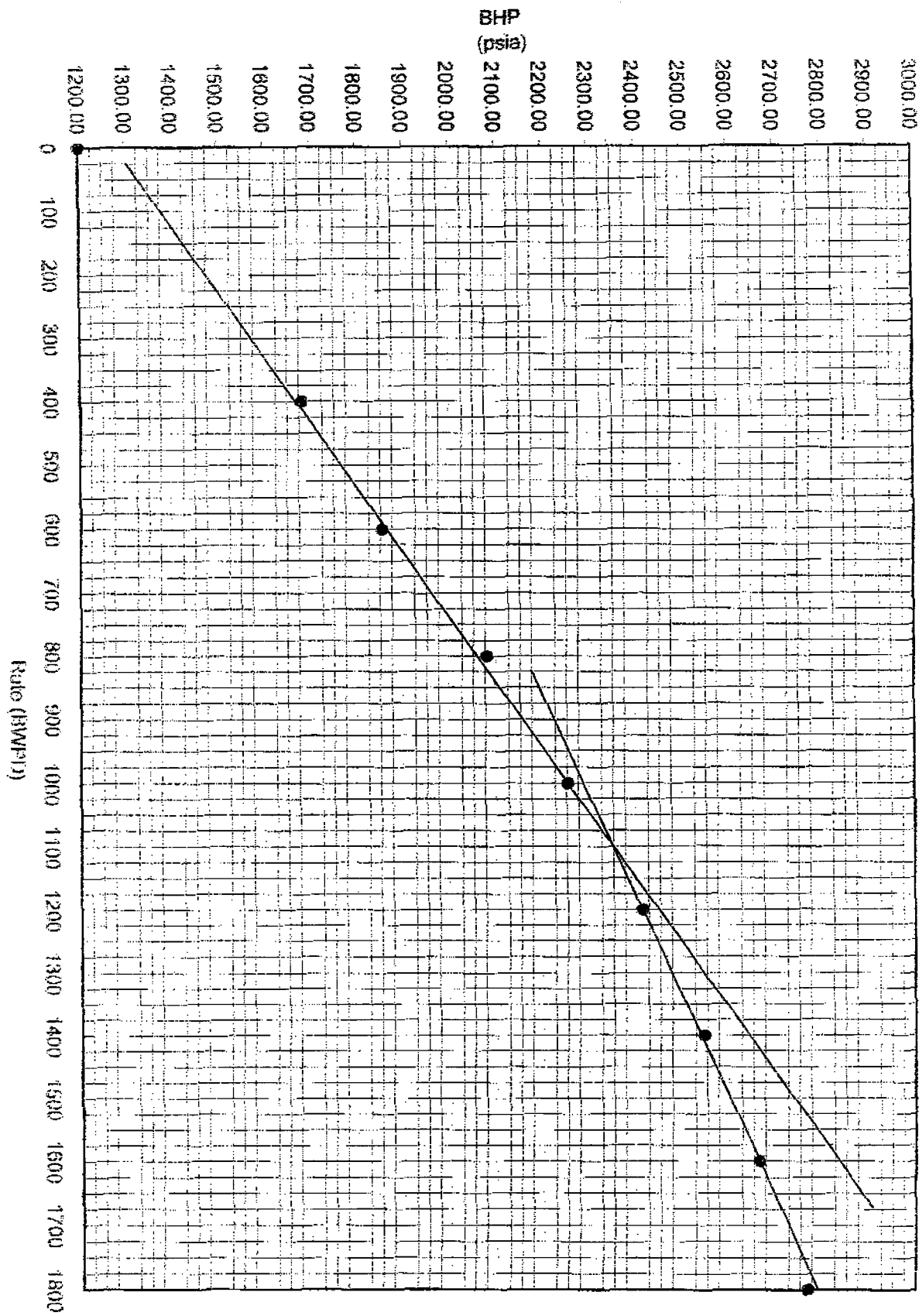
TEST DATE
10/30/2008

STEP RATE TEST

Ran step rate test with electric surface readout unit, 1 electronic pressure instrument @ run depth of 3,587' and surface pressure transducer.

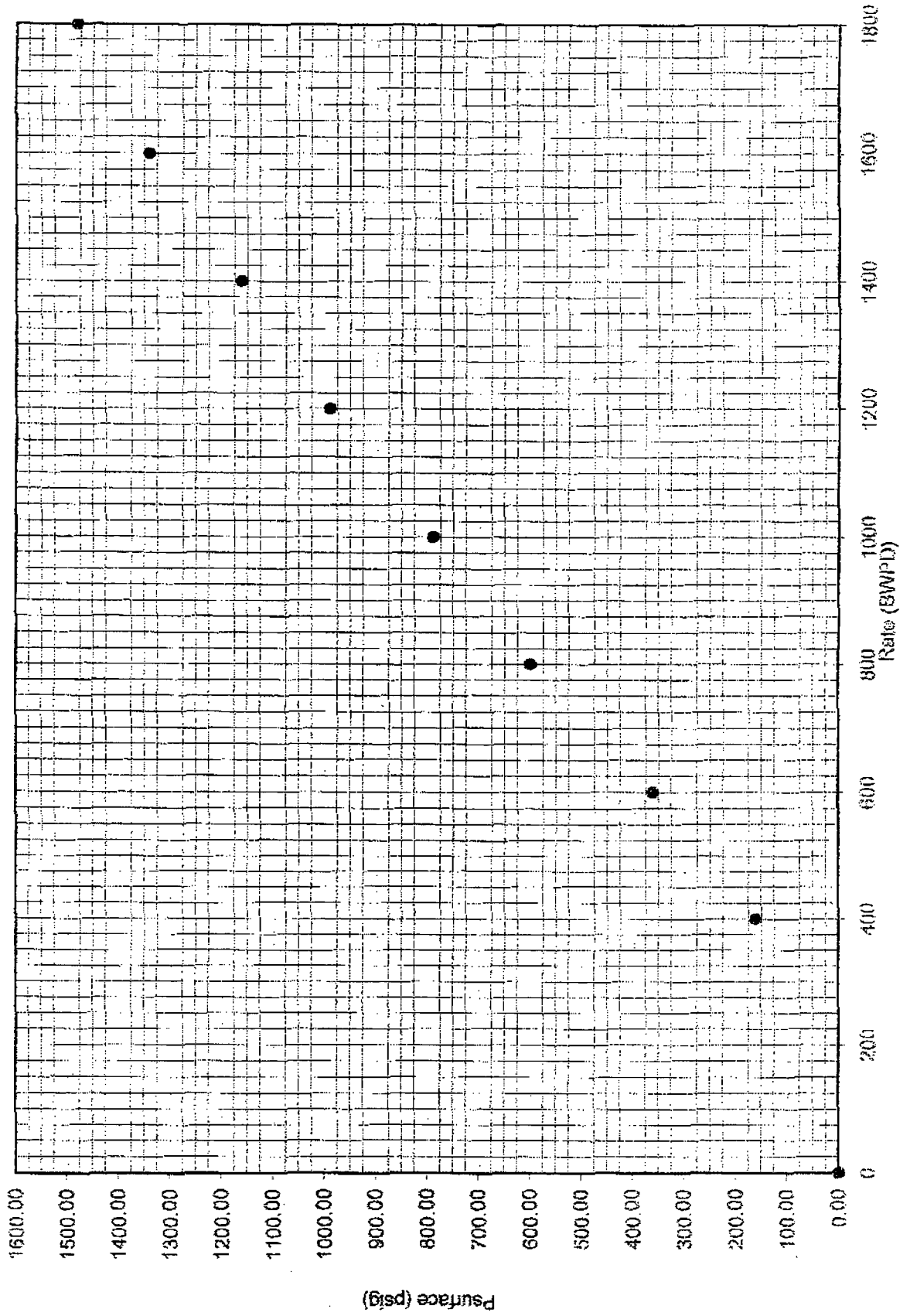
STEP RATE TEST
CANO PETROLEUM
CSAU #60
10/30/2008

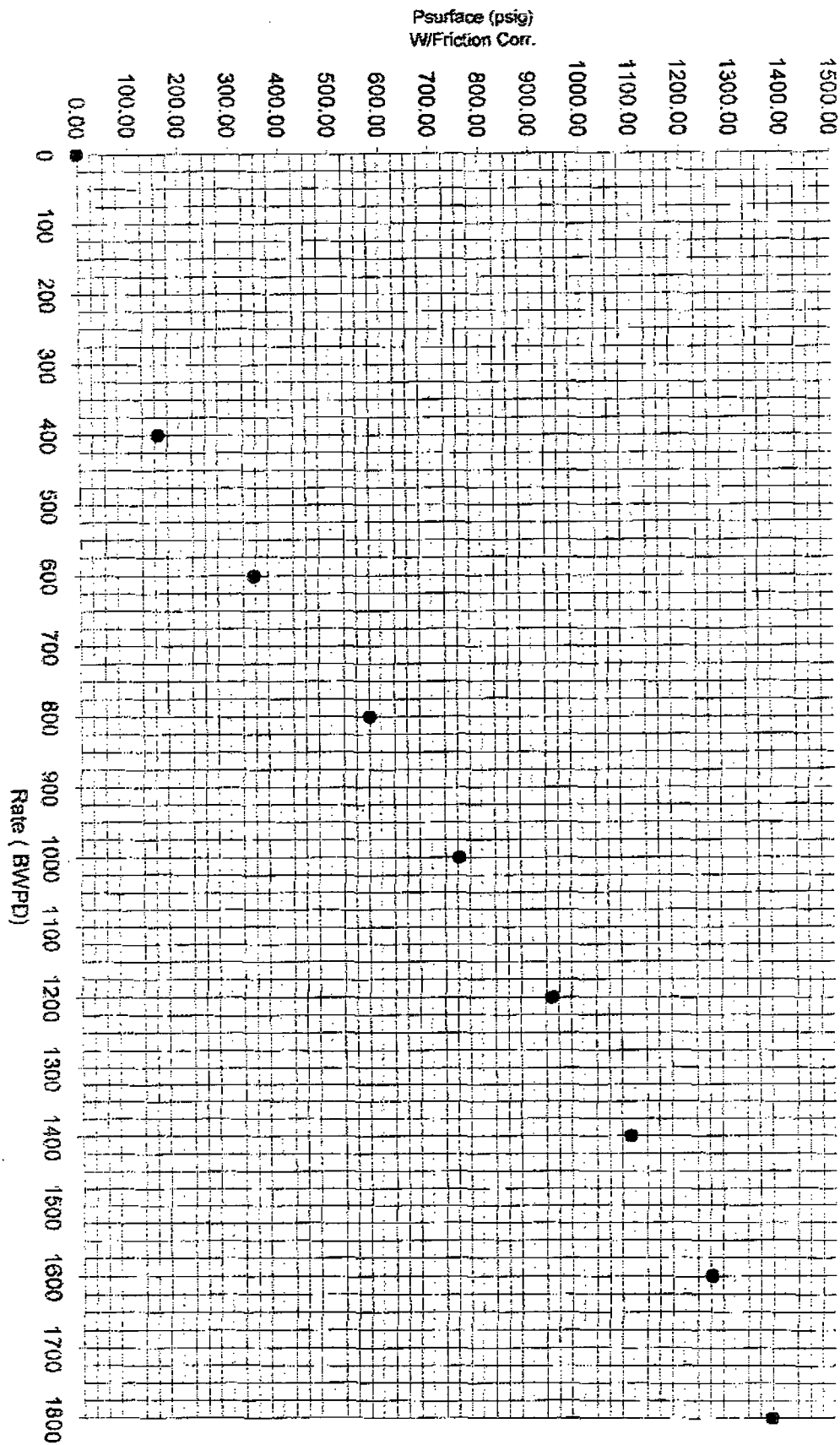
2500 PSIG
4400 PSIG
10000 PSIG



10/30/2008
10/30/2008
10/30/2008

STEP RATE TEST
CANO PETROLEUM
CSAU #50
10/30/2008





STEP RATE TEST
CANO PETROLEUM
CSAU #60
10/30/2008

10/30/2008
10:00:00
10/30/2008

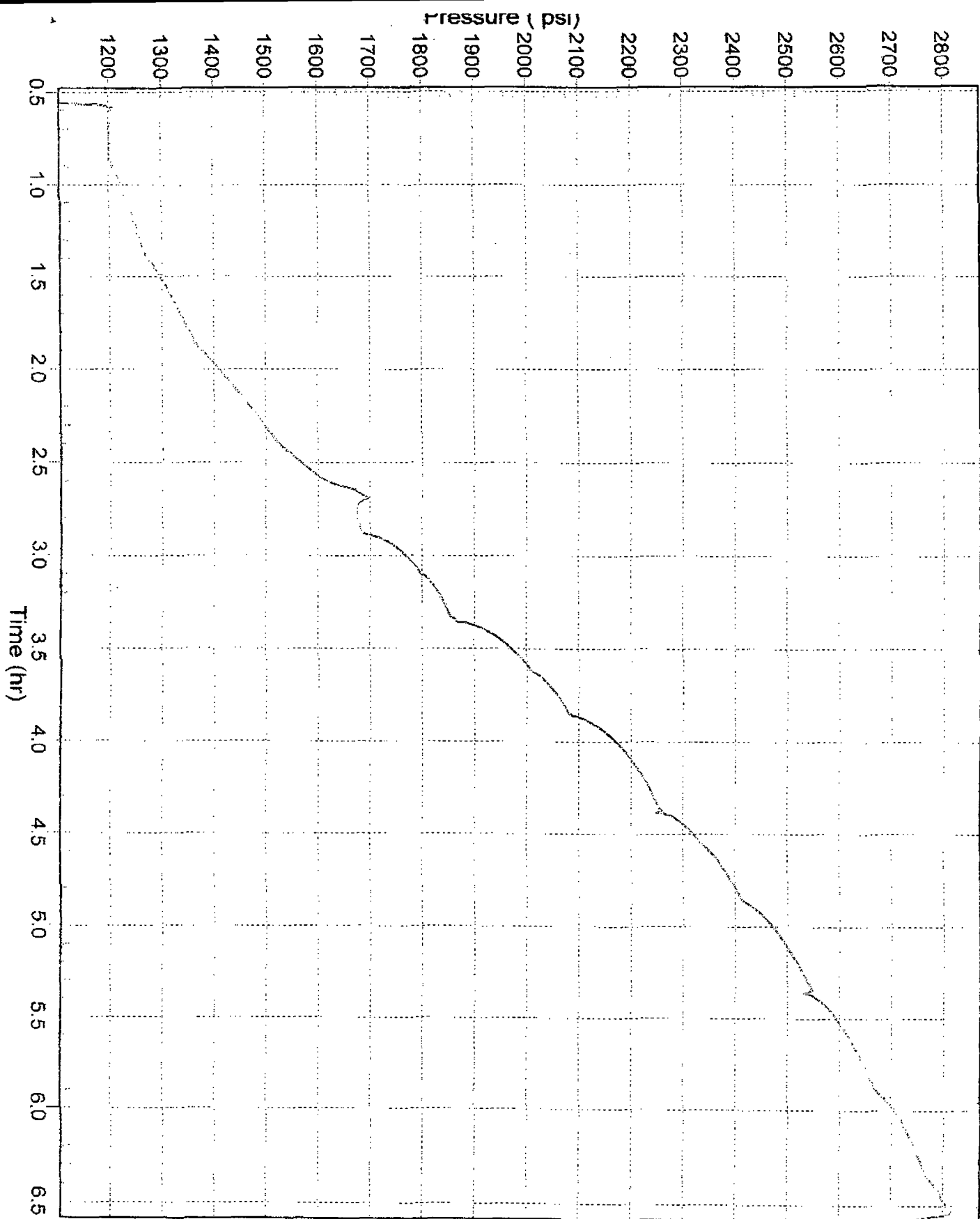
CANO PETROLEUM - CSAU #50

Step Rate Test

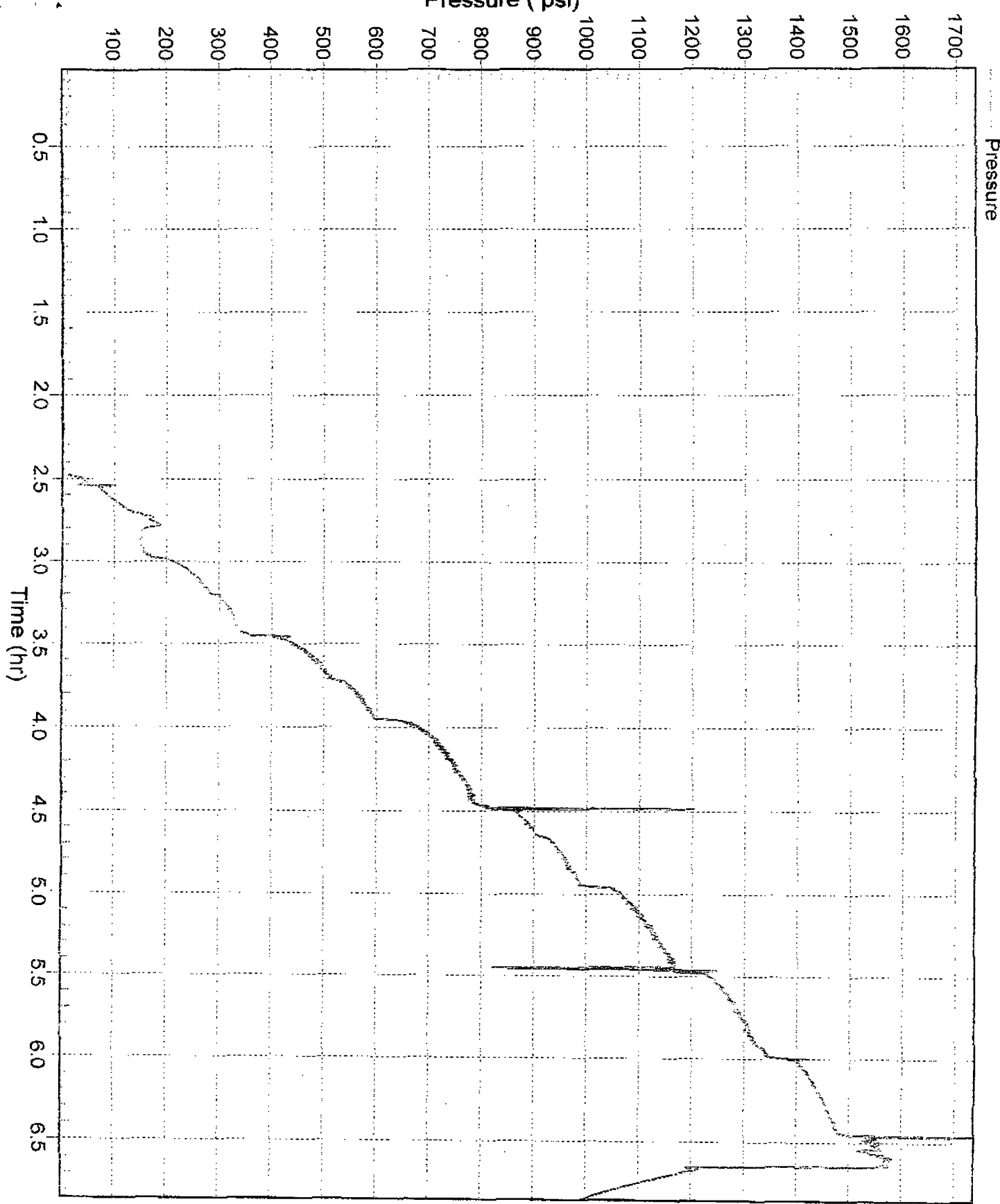
10/30/2008

Bottom Hole Pressure Data

Pressure



CANO PETROLEUM - CSAU #50
Step Rate Test 10/30/2008
Surface Pressure Data



CANO PETROLEUM

CSAU #533
CHAVEZ COUNTY, NEW MEXICO

TEST DATE
11/24/2008

STEP RATE TEST

Ran step rate test with electric surface readout unit, 1 electronic pressure instrument @ run depth of 3,537' and surface pressure transducer.

STEP RATE TEST

CANO PETROLEUM

CSAU #50

533?

TEST DATE 11/24/2008

Injection Rate (BWPD)	Psurface (psig)	B.H.P. (psia)	Psurface W/O FRICTION
0	697.30	2382.70	697.30
200	773.70	2391.70	770.70
400	888.20	2417.90	882.20
600	974.30	2474.50	962.30
800	1051.10	2538.30	1027.10
1000	1172.80	2622.50	1136.80
1200	1317.30	2715.30	1266.30
1400	1449.60	2813.40	1380.60
1600	1442.40	2916.80	1354.40
1800	1743.60	3020.20	1634.60
2000	1888.10	3093.10	1755.10
2200	1907.80	3175.90	1747.80
2400	2072.80	3248.30	1884.80

1.54

Run Depth: 3537

Formation: San Andres

Tubing Depth: 3350

Tested By: J. Chesshir

Perforations: 3440-3634

Total Depth: 3700

Pkr. Depth: 3350

Instrument #: 78298

$P_H = 1490$

$P_F = 291$

$P_S = 3080 - 1490 + 91$

$P_S = 1680$

- 50

1630

TEST RESULTS

Placed order for water at approximately 11:00am to get it to location by 2:00pm. At 2:15pm water had not shown up yet. Injection line was opened to stabilize well @ 1600 bwpd rate w/lease water from injection line. Pump truck rigged down and went to pick up another load of water. Pump truck returned in approximately 30 minutes w/load of fresh water. Rigged up and continued w/1800 bwpd rate. Other water truck finally showed up with load of lease water. +/- 75 barrels of this water was used at end of test.

Note: Gradient changes should be noted twice in surface pressure due to switches between fresh water and lease water.

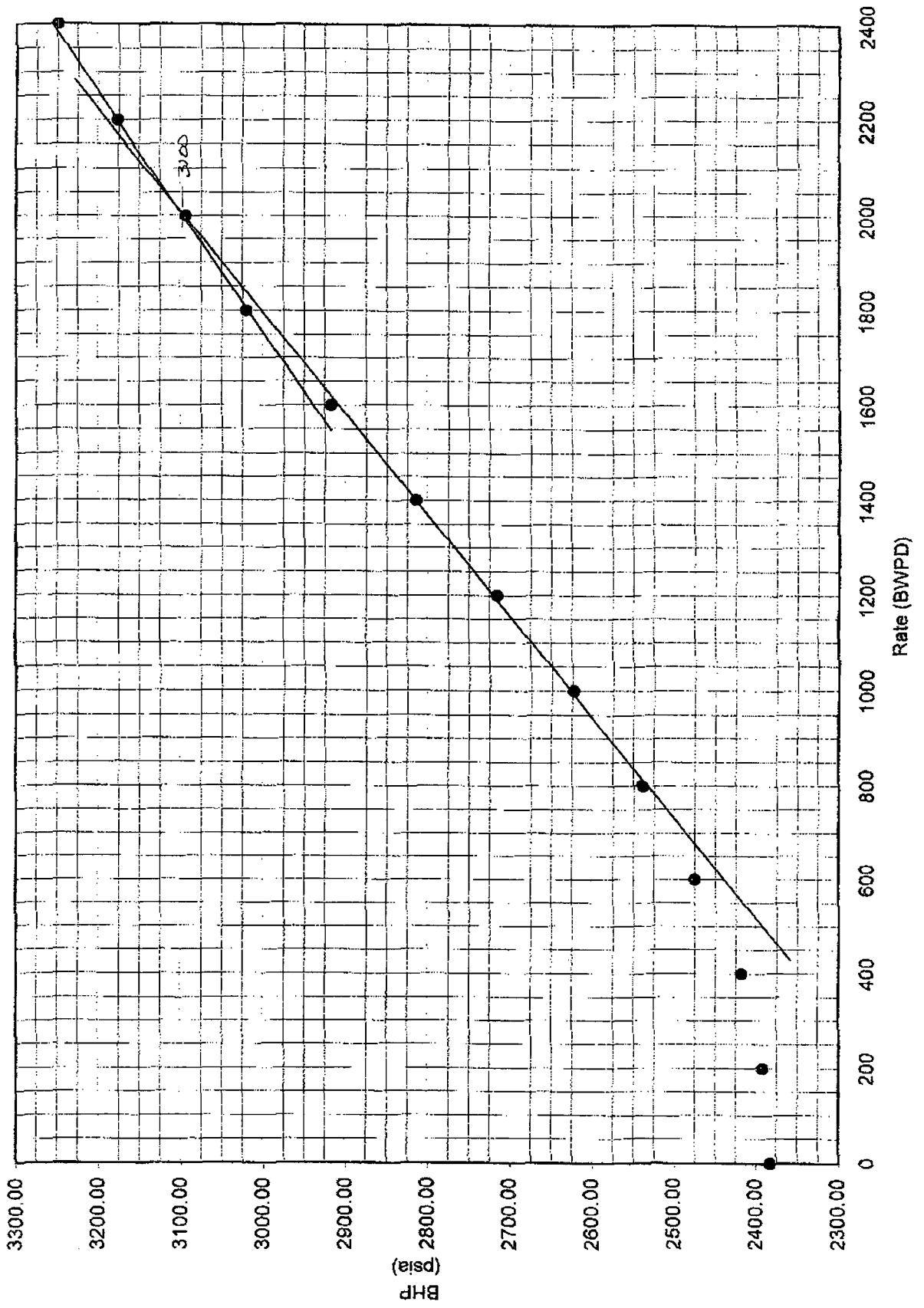
Parting Pressure @ 3080 BHP (psia) @ 2000 BWPD

1850 P_S 1630
↓

STEP RATE TEST
CANO PETROLEUM
CSAU #533
11/24/2008

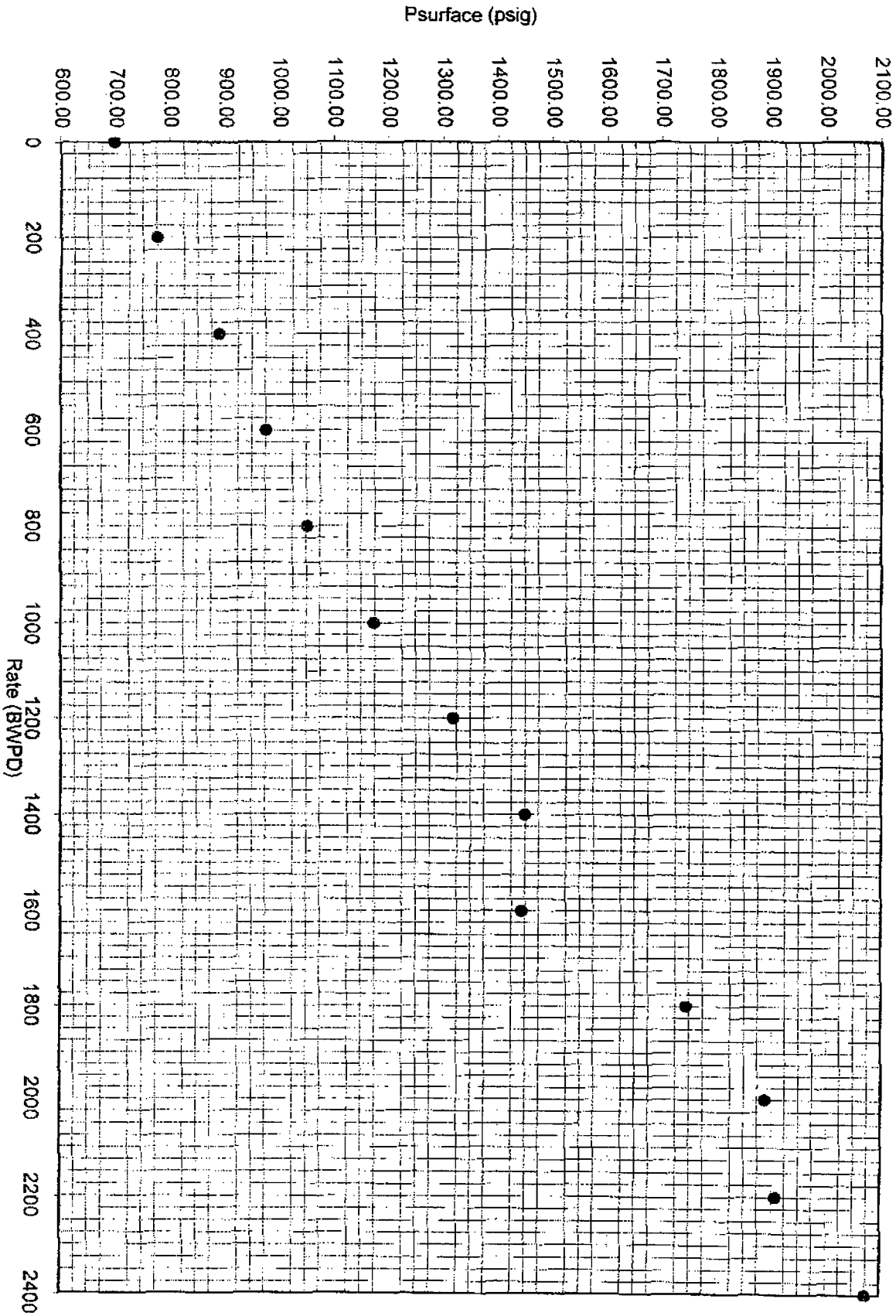
PRECISION
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DATA, INC.

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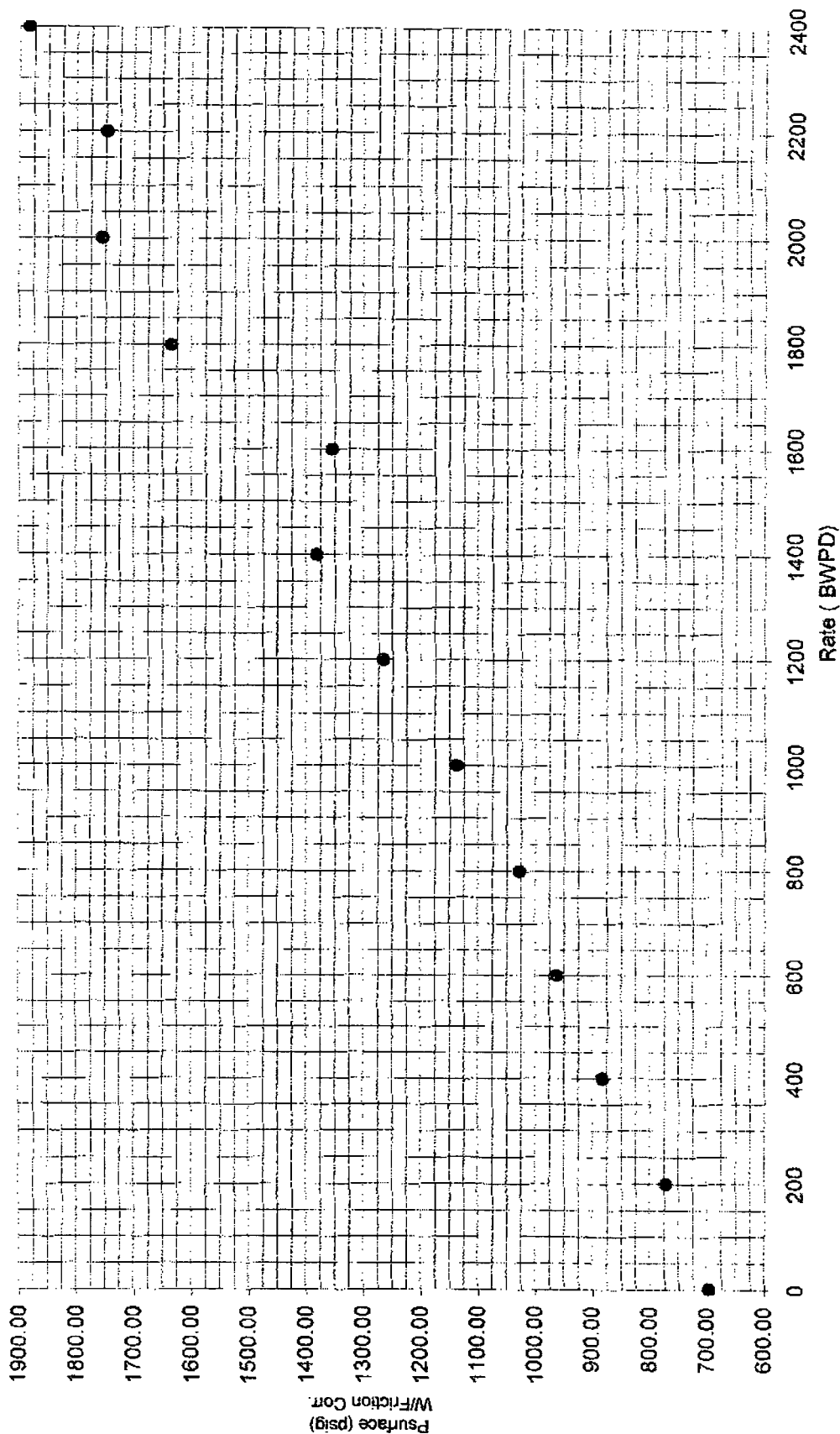
STEP RATE TEST
CANO PETROLEUM
CSAU #533
11/24/2008

PRECISION
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DATA, INC.



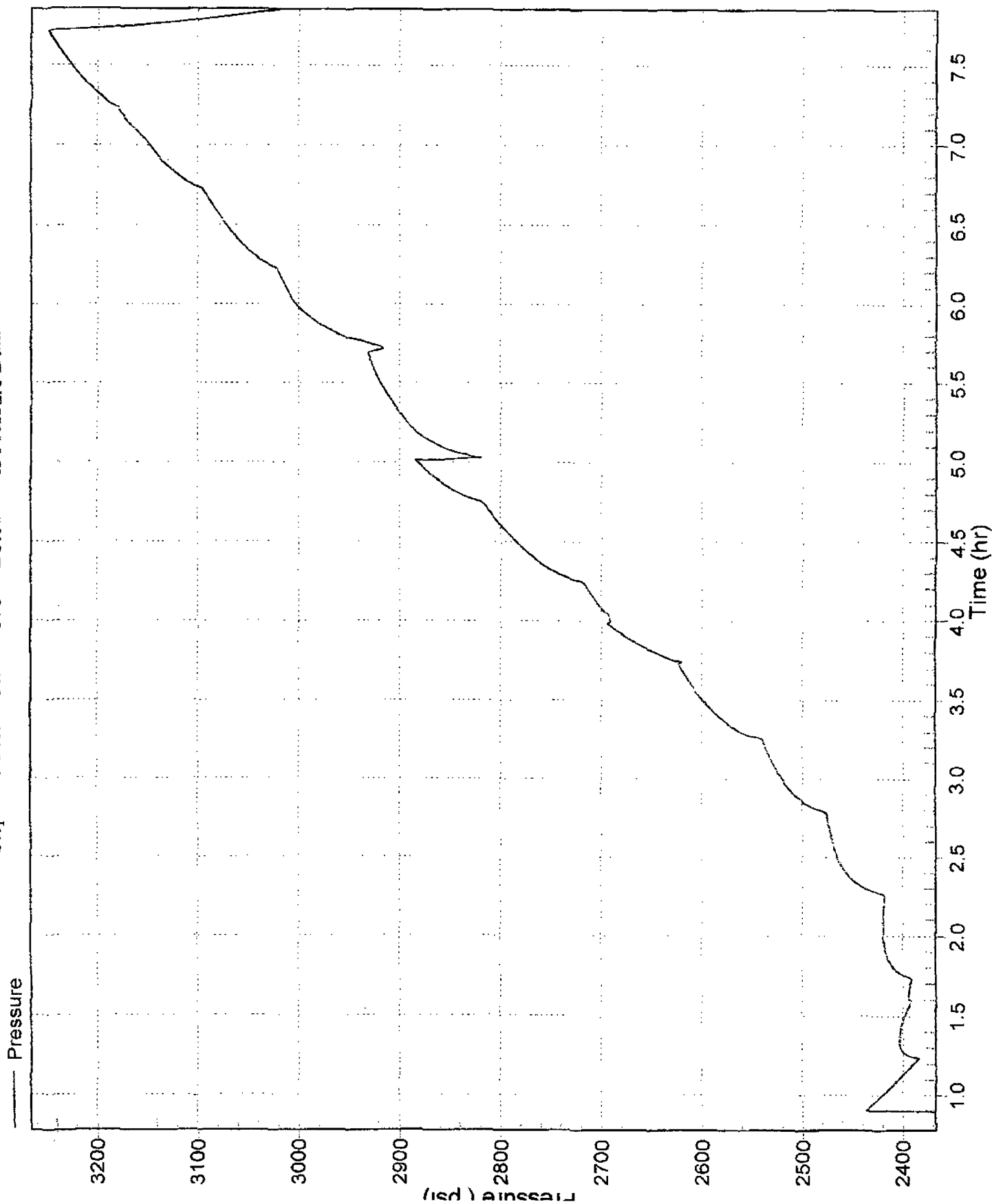
STEP RATE TEST
CANO PETROLEUM
CSAU #533
11/24/2008

PRECISION
PRESSURE
DATA, INC.



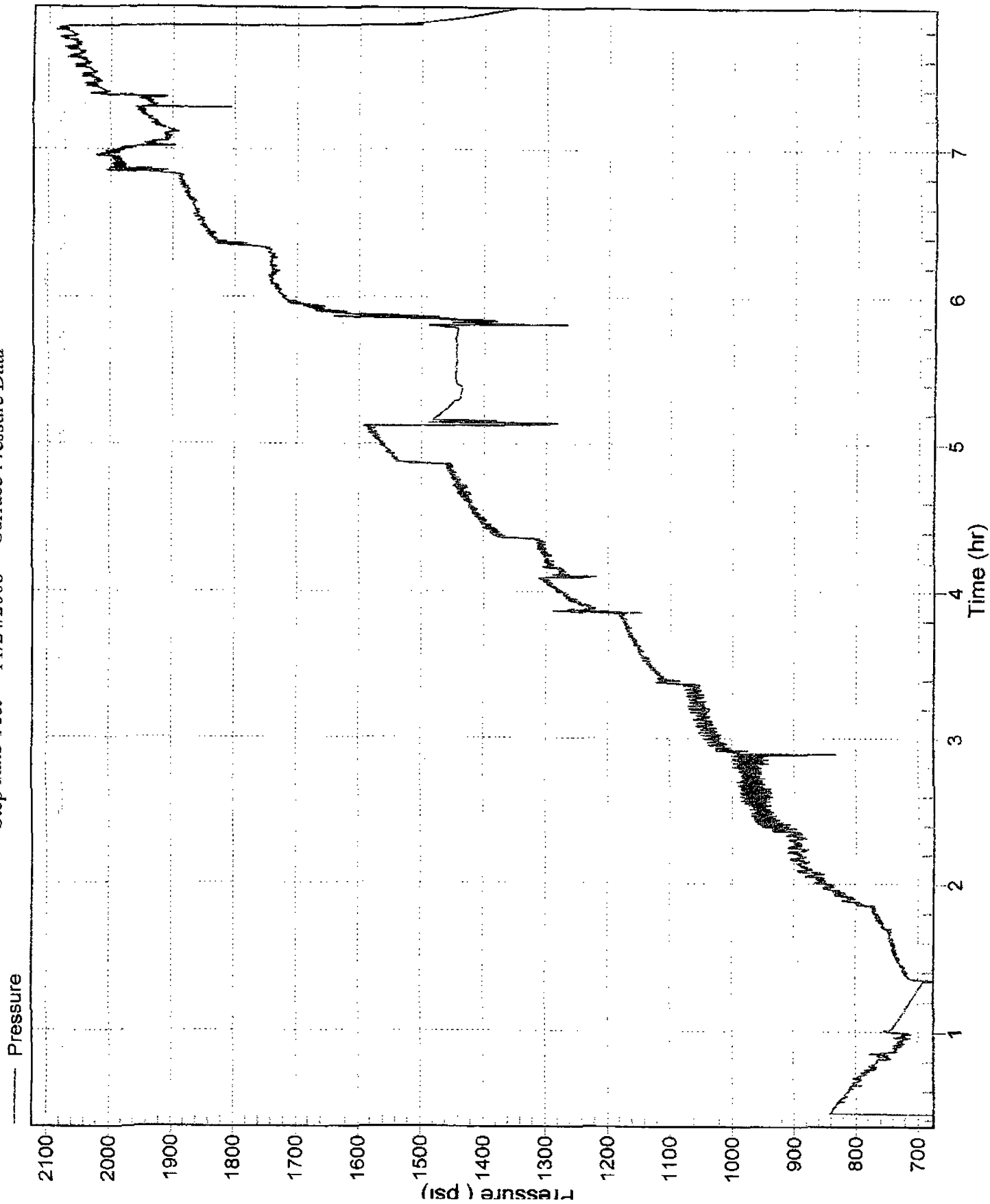
CANO PETROLEUM - CSAU #533

Step Rate Test 11/24/2008 Bottom Hole Pressure Data



CANO PETROLEUM - CSAU #533

Step Rate Test 11/24/2008 Surface Pressure Data



CANO PETROLEUM

CSAU #822
CHAVEZ COUNTY, NEW MEXICO

TEST DATE
11/25/2008

STEP RATE TEST

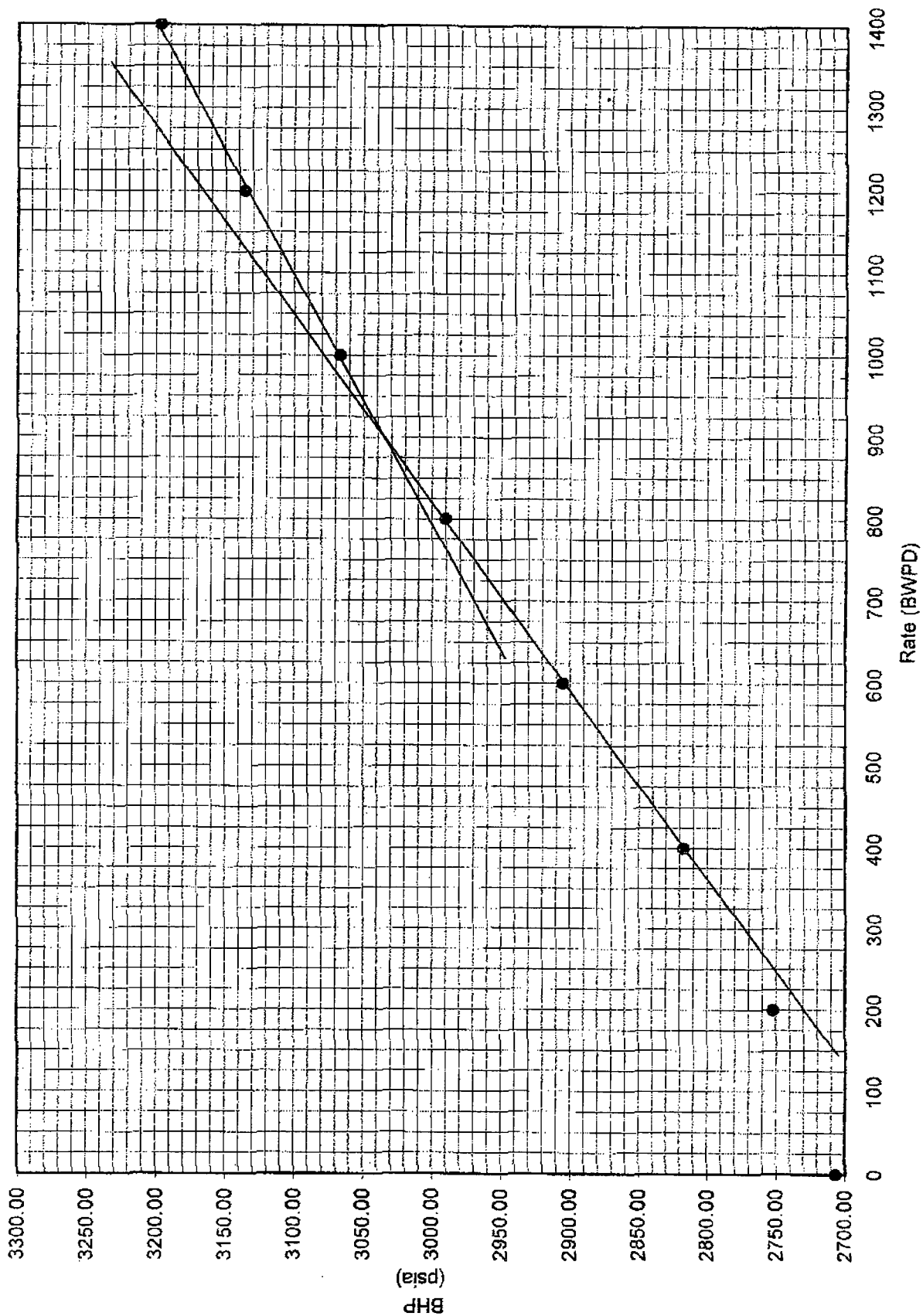
Ran step rate test with electric surface readout unit, 1 electronic pressure instrument @ run depth of 3,514' and surface pressure transducer.

TEST DATE 11/25/2008

Step Rate Test
Cano Petroleum
CSAU #822
11/25/2008

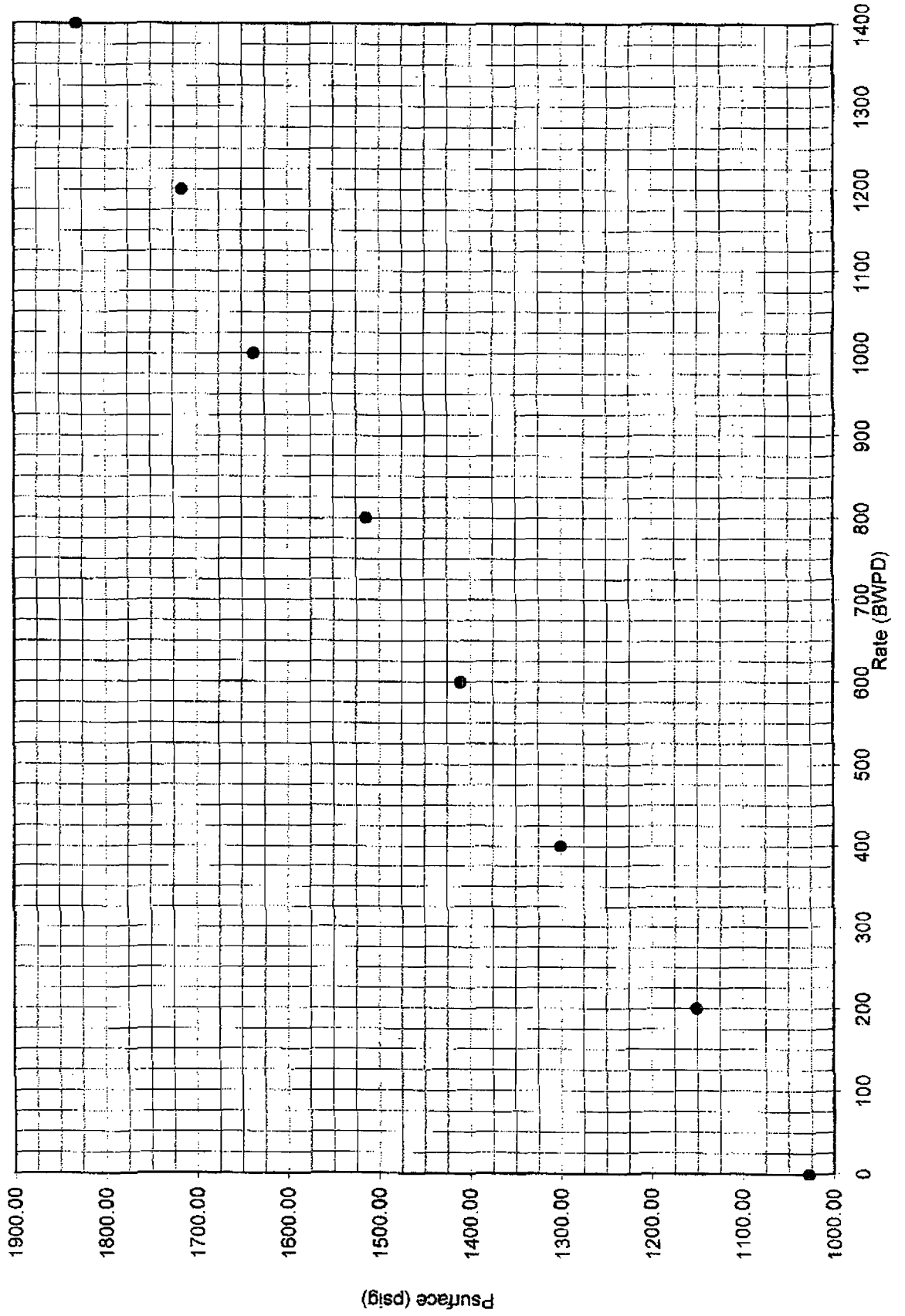
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DATA, INC.

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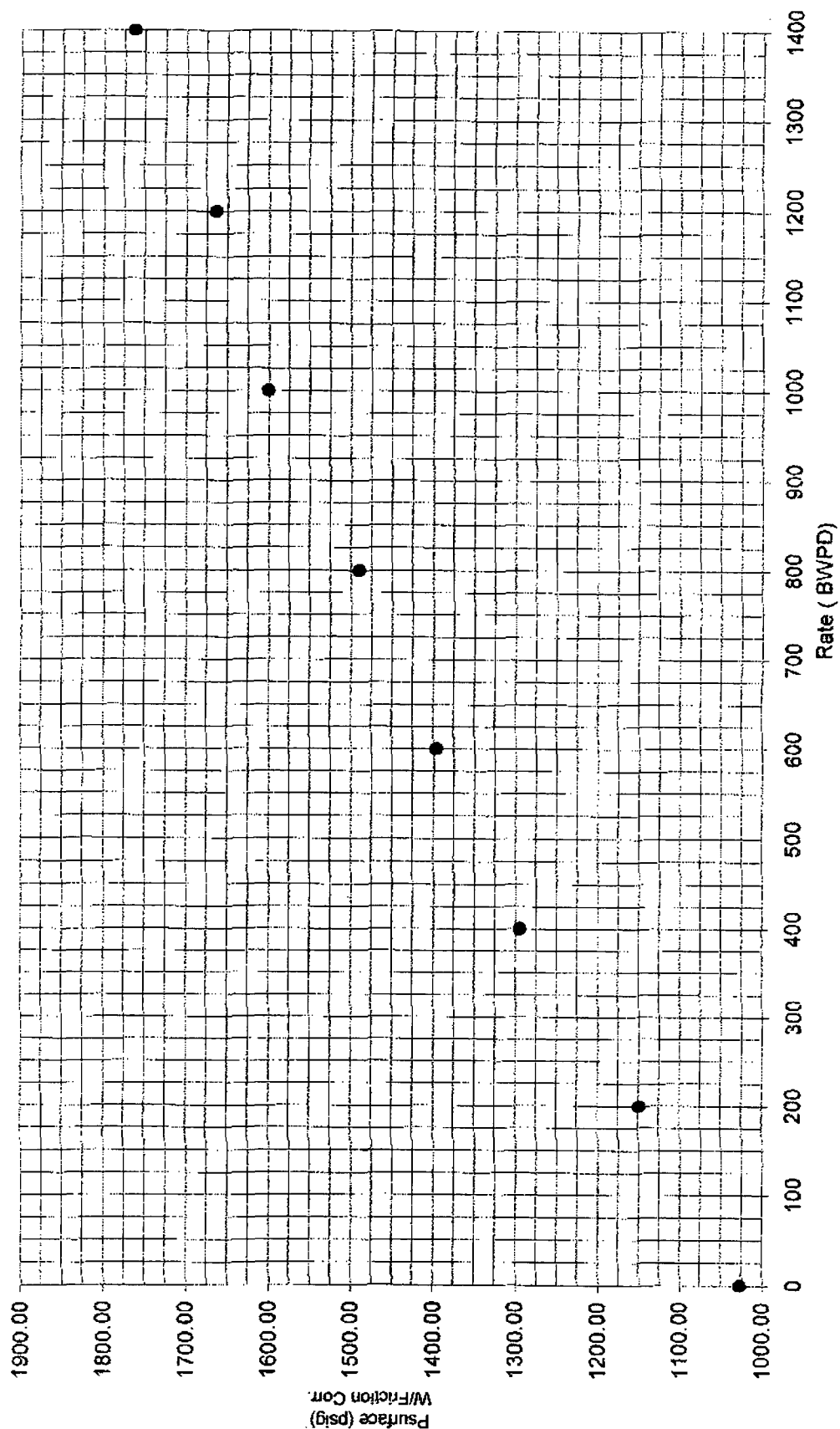
PRECISION
PRESSURE
DATA, INC.

STEP RATE TEST
CANO PETROLEUM
CSAU #822
11/25/2008



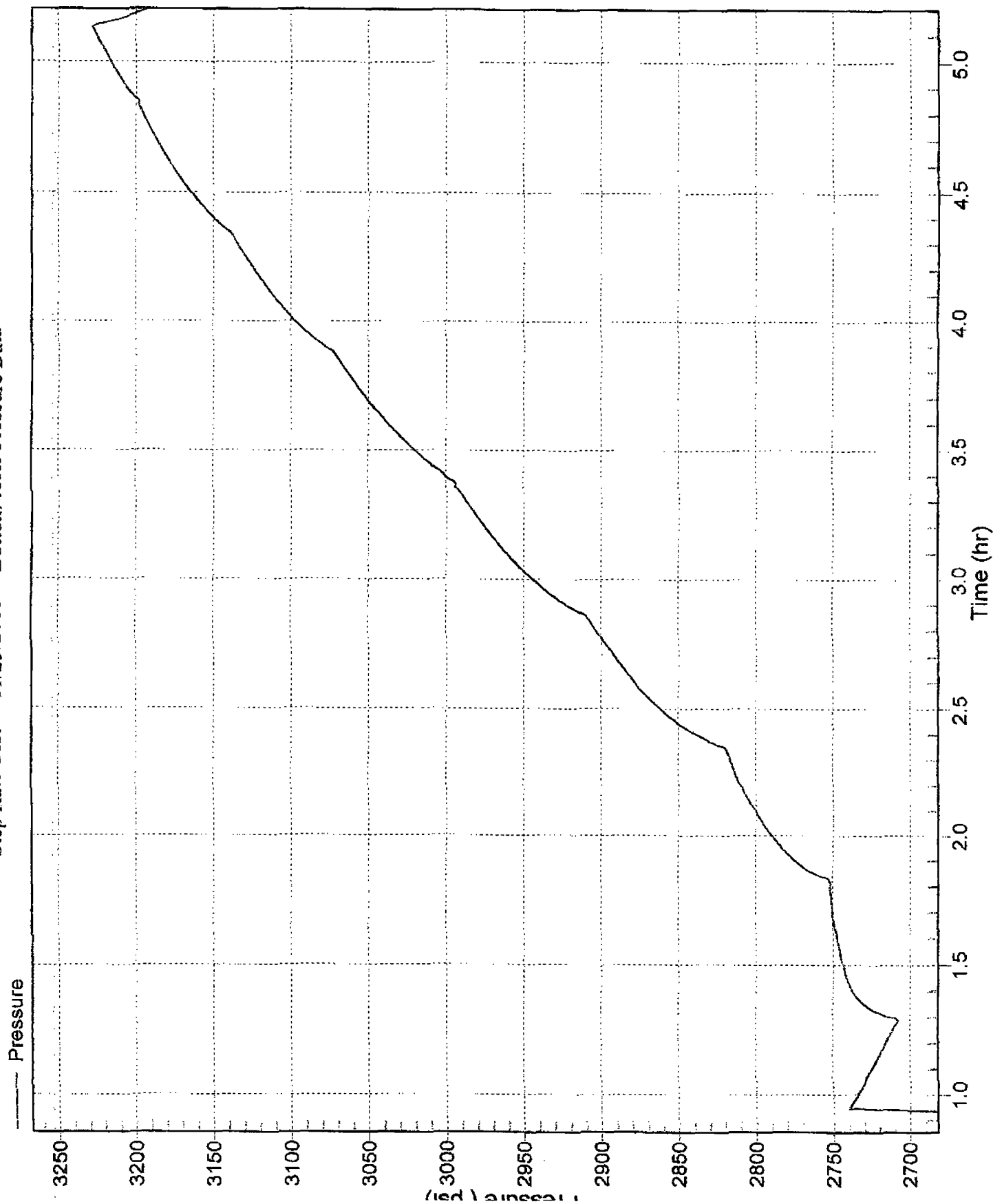
STEP RATE TEST
CANO PETROLEUM
CSAU #822
11/25/2008

PRECISION
PRESSURE
DATA, INC.



CANO PETROLEUM - CSAU #822

Step Rate Test 11/25/2008 Bottom Hole Pressure Data



CANO PETROLEUM - CSAU #822

Step Rate Test 11/25/2008 Surface Pressure Data

