

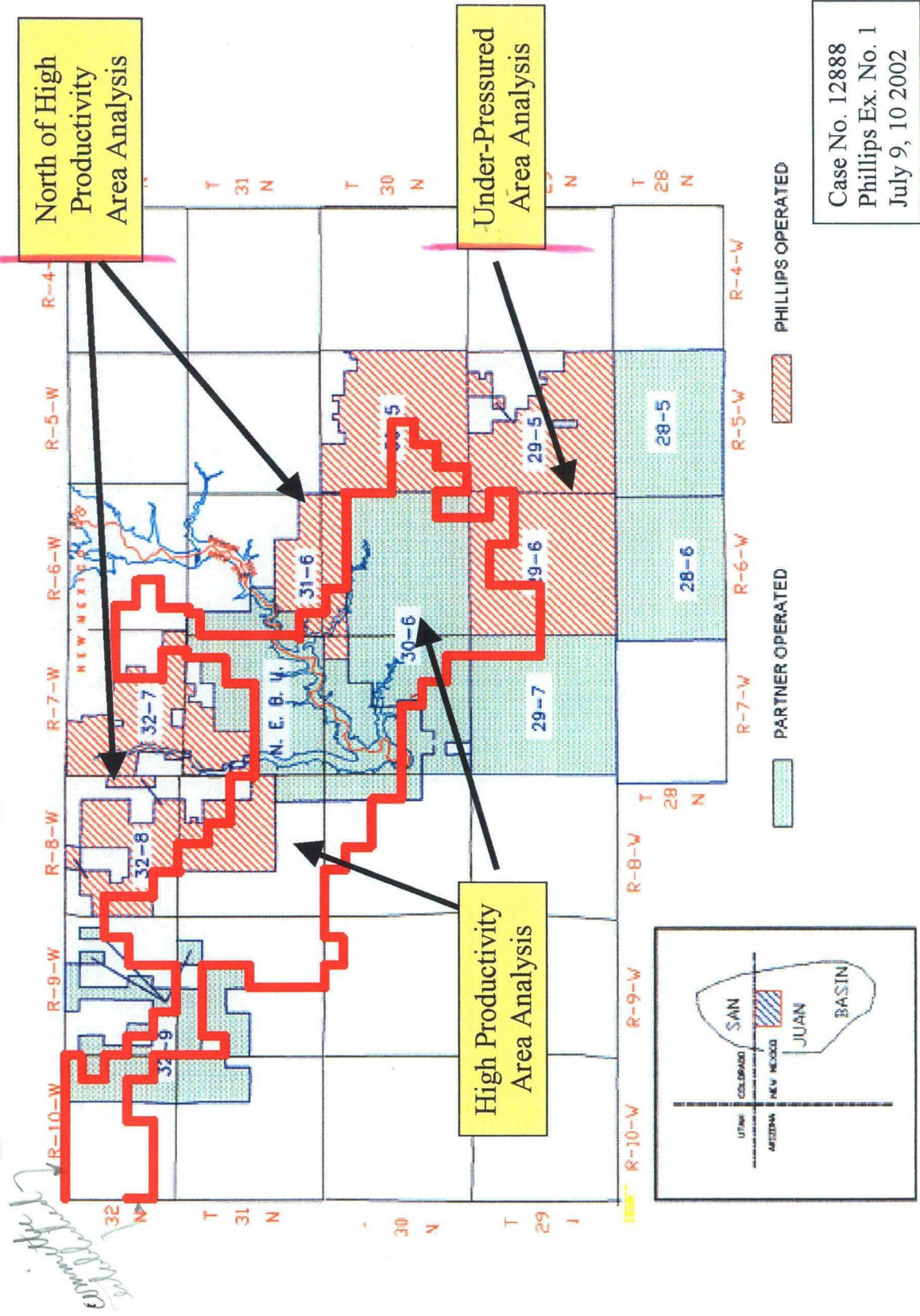
Fruitland Coal High/Low Productivity Area Infill Study

Phillips Petroleum

Steve Jones

Sr. Reservoir Engineer

Phillips' Participation in Federal Units



Under-Pressured Area

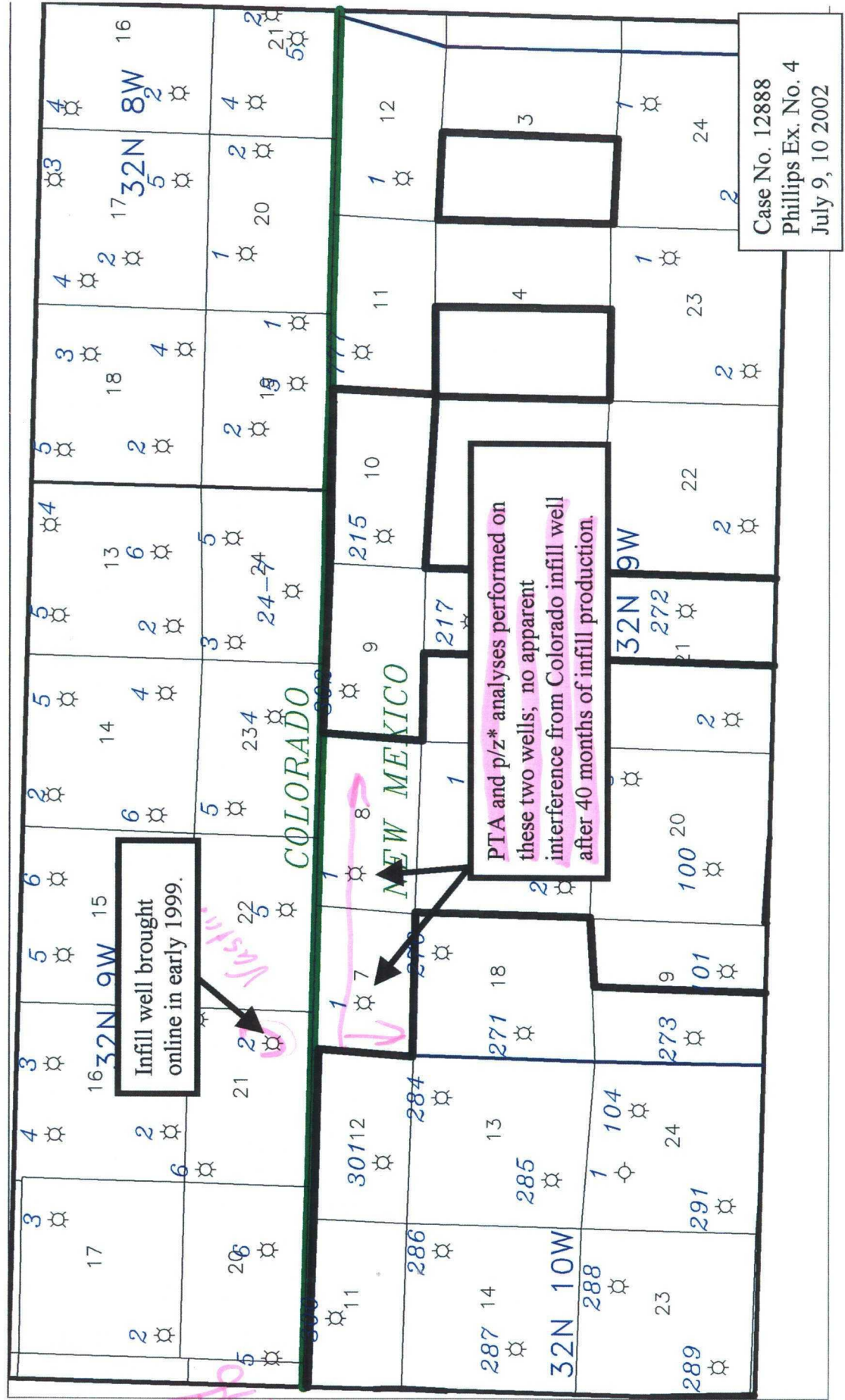
(South of Fairway)

- Average recovery to date from 27 wells is only 0.23 bcf per well.
- Estimated average ultimate recovery is 0.4 bcf per well.
- Average estimated drainage area 35 acres per well ($V_L = 500$ scf/tn) or 70 acres per well ($V_L = 250$ scf/tn).

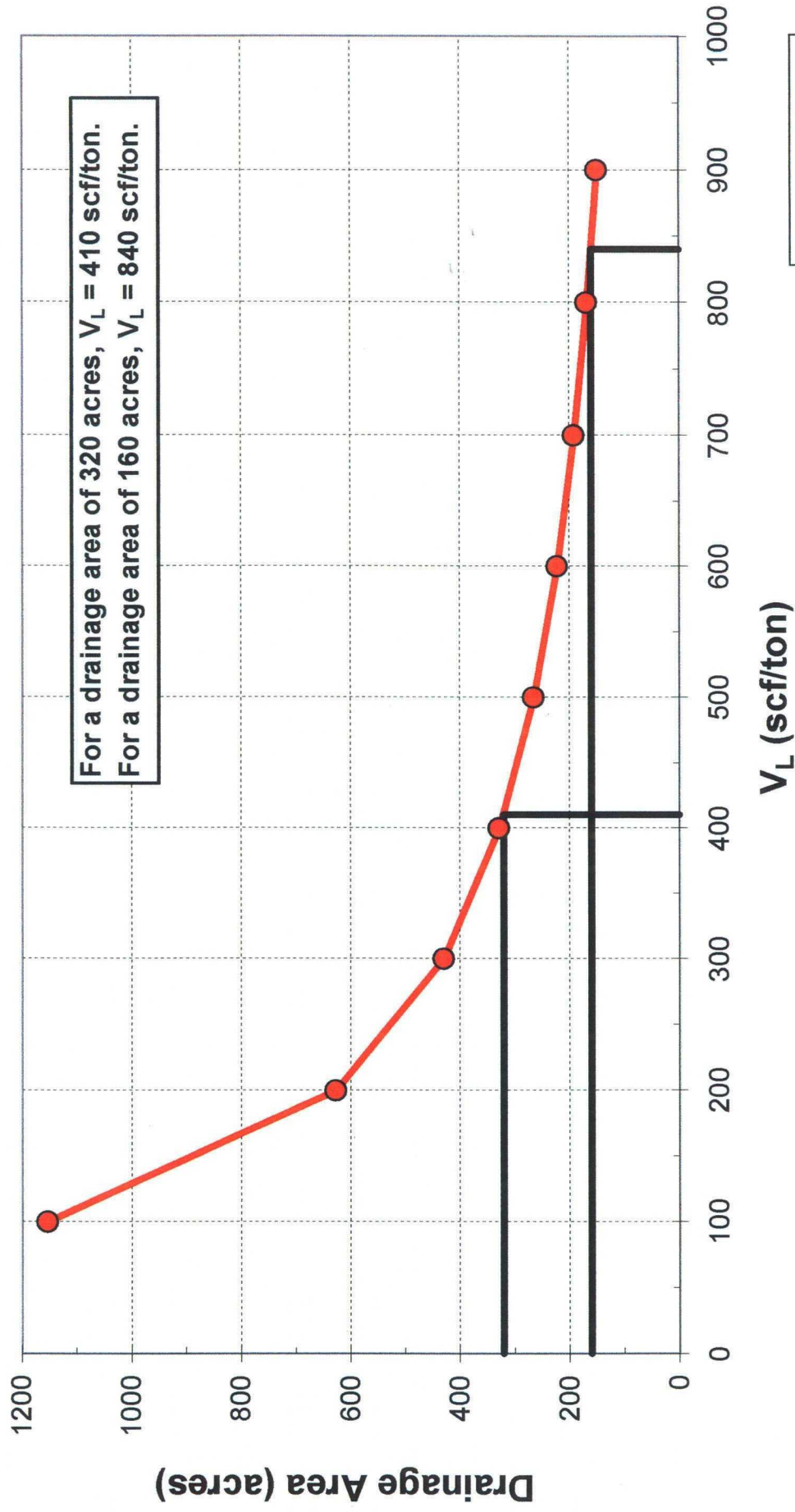
Analysis for Wells North of High Productivity Line

- Single & multi-well, multi-layer modeling shows incremental recovery can be as high as 15%.
- Analysis of wells that offset infill wells show no interference to date.
- Calculated drainage area for selected wells is between 160 and 320 acres in most cases.
- Phillips supports infill drilling in this area.

Affect of Colorado Infills

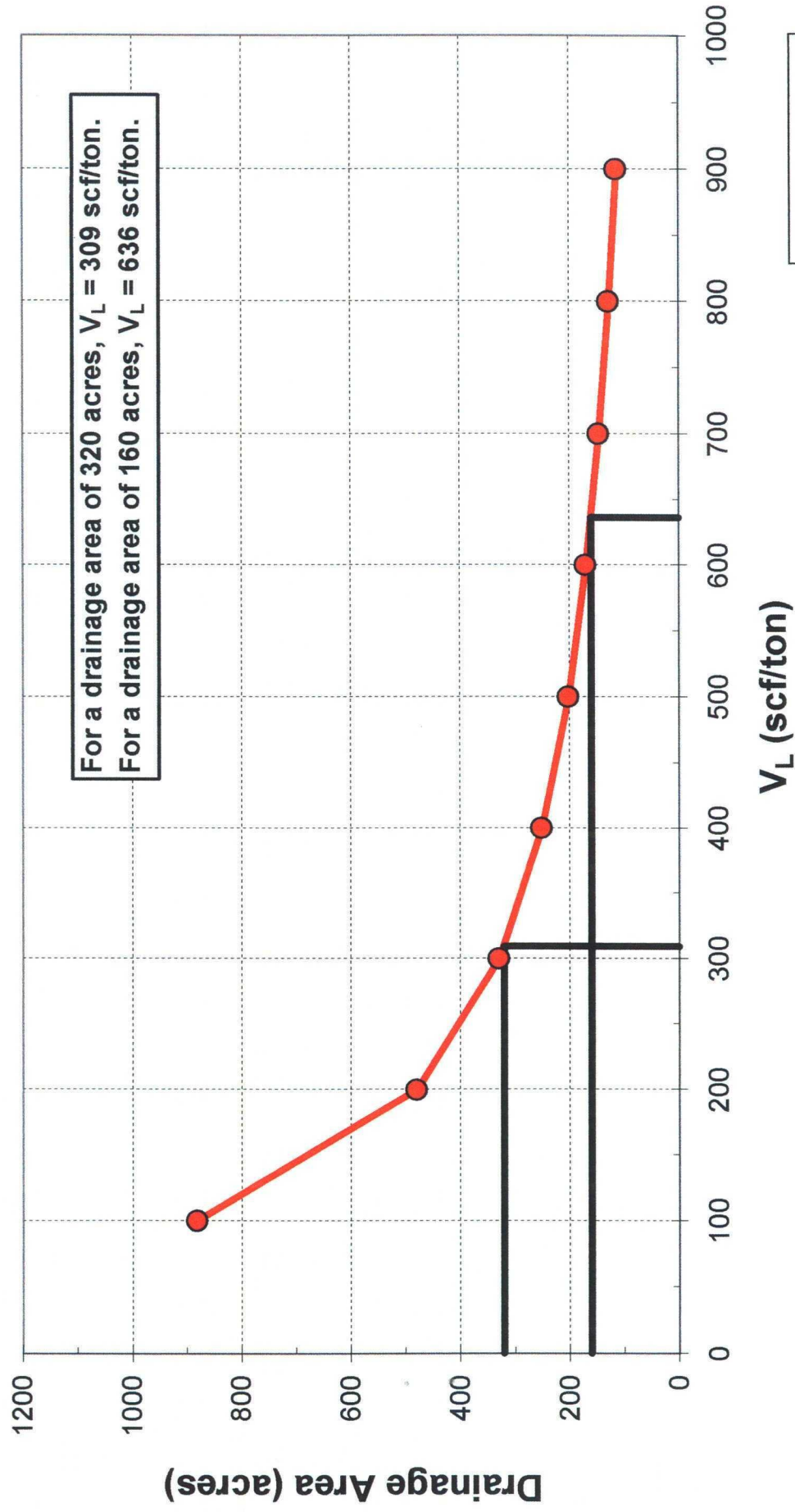


SJ 32 Fed 7 #1 Drainage Area as a Function of Langmuir Volume



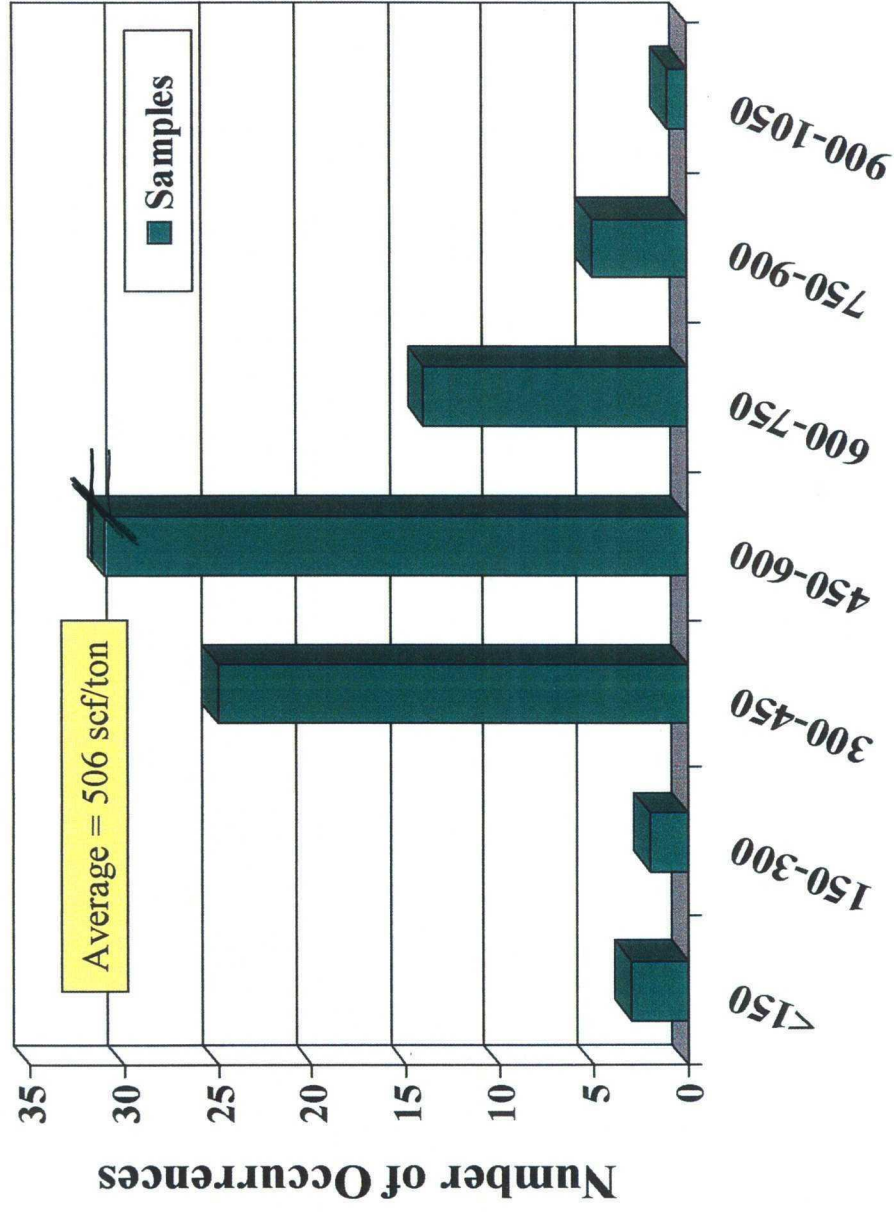
Case No. 12888
Phillips Ex. No. 5
July 9, 10 2002

SJ 32 Fed 8 #1 Drainage Area as a Function of Langmuir Volume



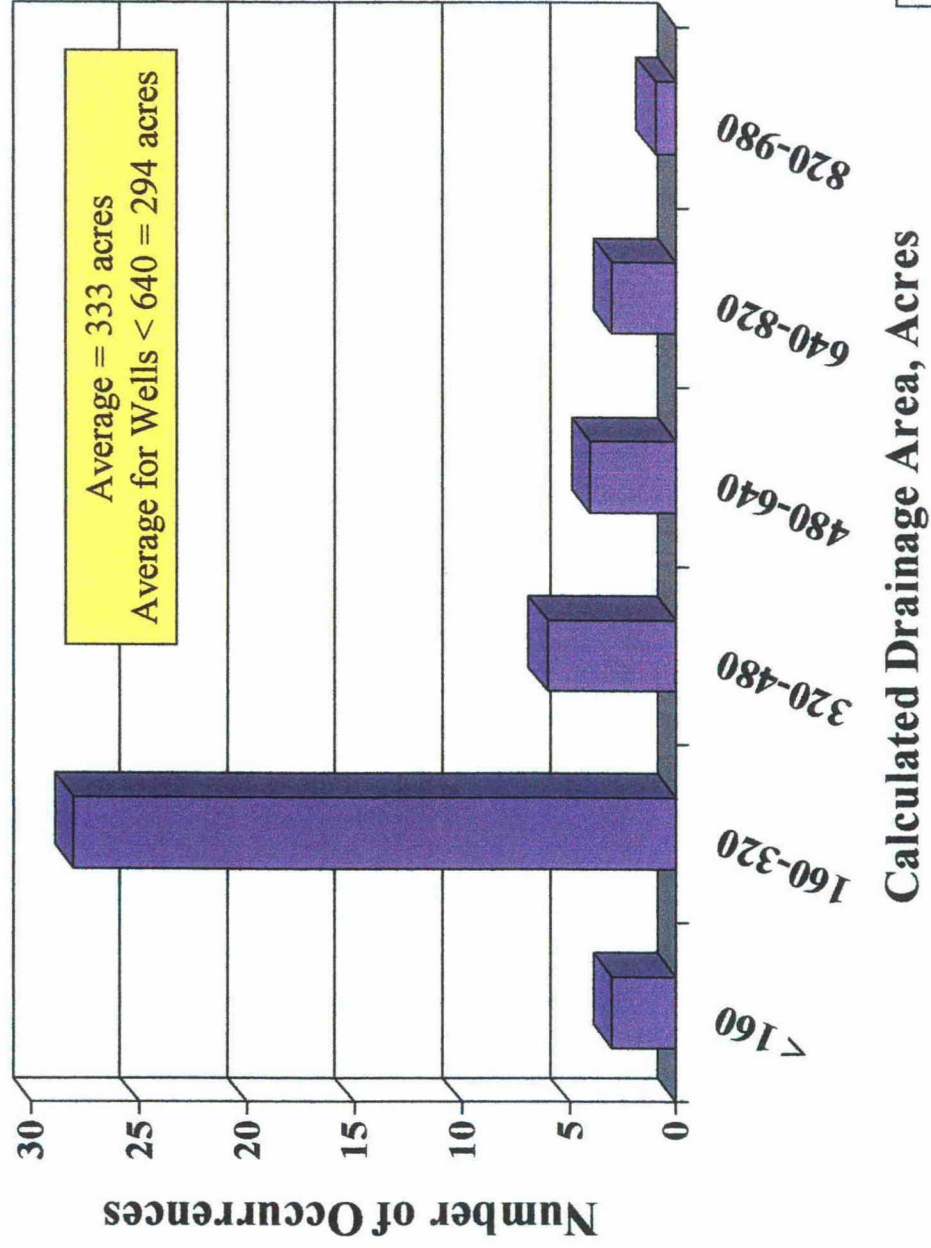
Case No. 12888
Phillips Ex. No. 6
July 9, 10 2002

Distribution of Langmuir Volume for 81 Coal Samples



As Received Langmuir Volume, scf/ton

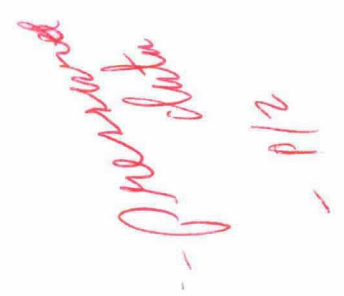
Distribution of Calculated Drainage Areas for Selected Wells North of the High Productivity Area (45 Wells)



High Productivity Area Analysis

- On average wells are draining at least 320 acres in the high productivity area.
- There is a significant distribution of wells with drainage areas falling between 160-320 acres.
- Pressure data analyzed show significant uniformity over a very large portion of the high productivity area.
- In selected areas within the high productivity area, infill drilling may be warranted.
- Notification process helps to address situations where wells may not be appropriate.

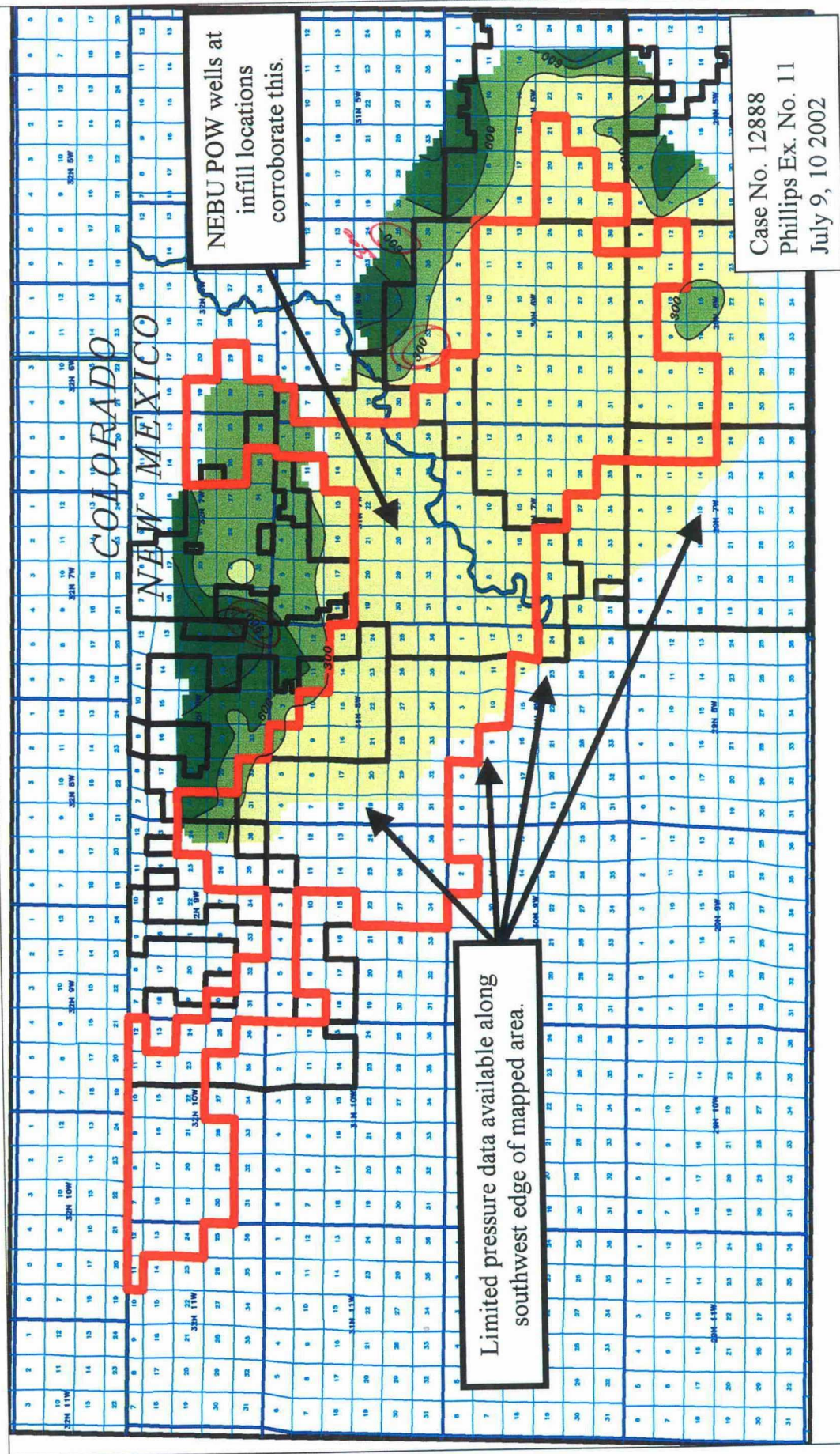
50507



Case No. 12888
Phillips Ex. No. 10
July 9, 10 2002

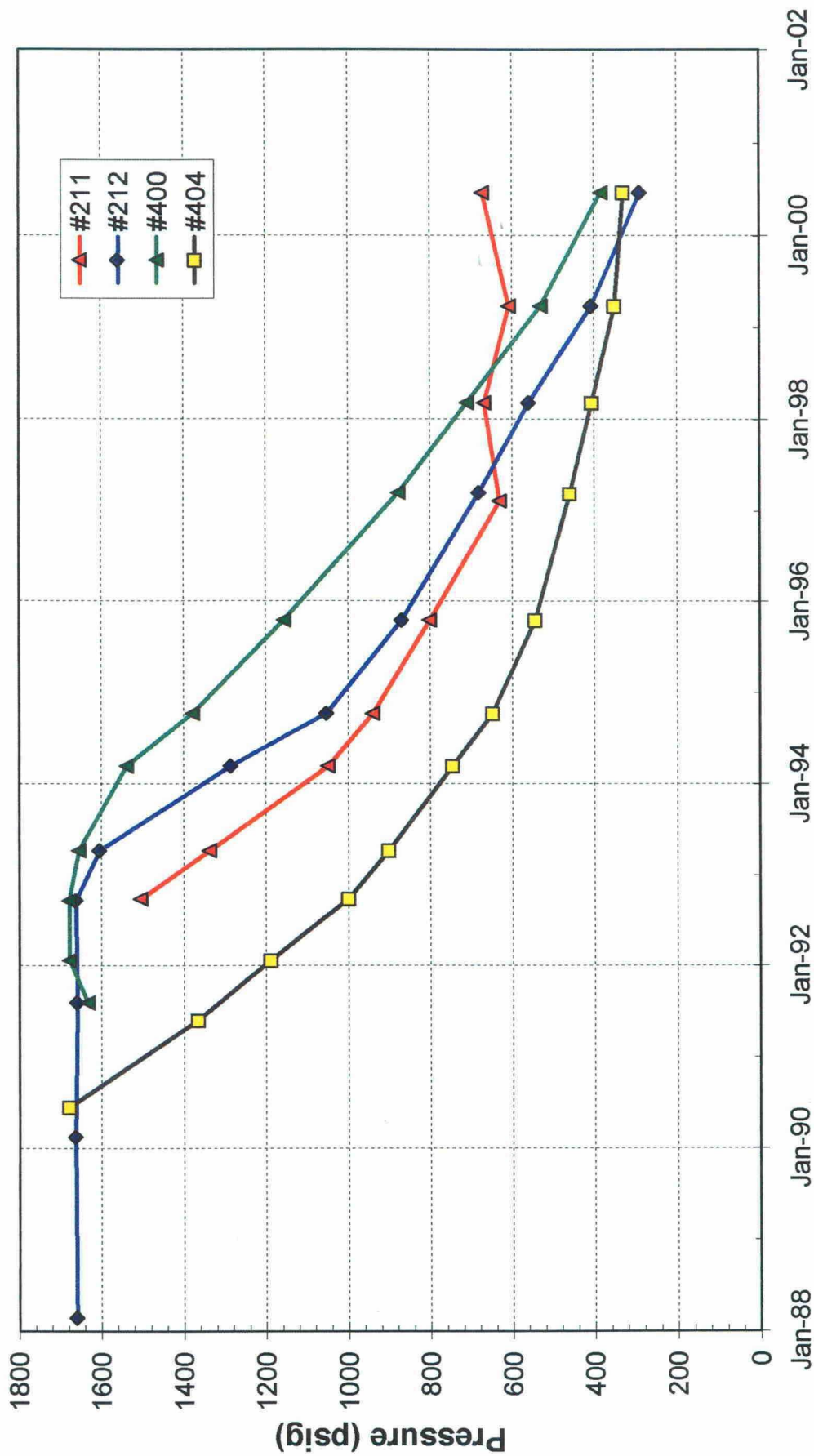
[illegible]

Estimated Reservoir Pressures Early 2002



Northeast Blanco Unit

Pressure Observation Wells



Case No. 12888
Phillips Ex. No. 12
July 9, 10 2002

San Juan 30-5 Unit

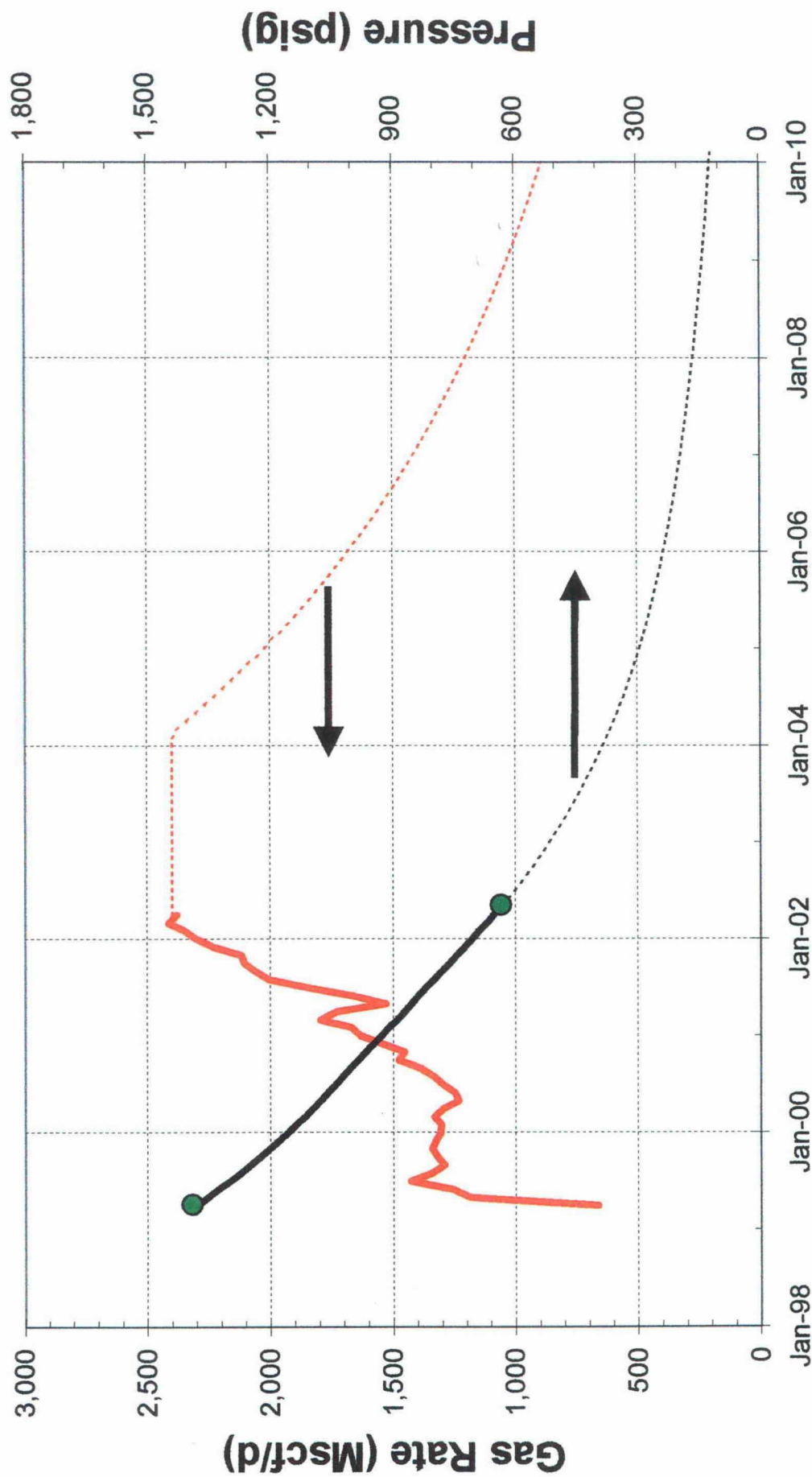
6	203	202	5	213 214 213R	4	237 219R 219	15	239	3	2	1
7	204 205	204	8	220 T&A 220R	9	215 264	16	243	10	11	12
18	206 207	206	17	224	18	218	24	255	257	261	262
19	201 208	209	20	216R	21	223	22	240	241	249	259
30	210	209	29	226	28	225	27	235	246	247	267
31	211	211	32	230	33	232 232R T&A	34	242	248	268	263

Paula Hernandez

Case No. 12888
Phillips Ex. No. 13
July 9, 10 2002

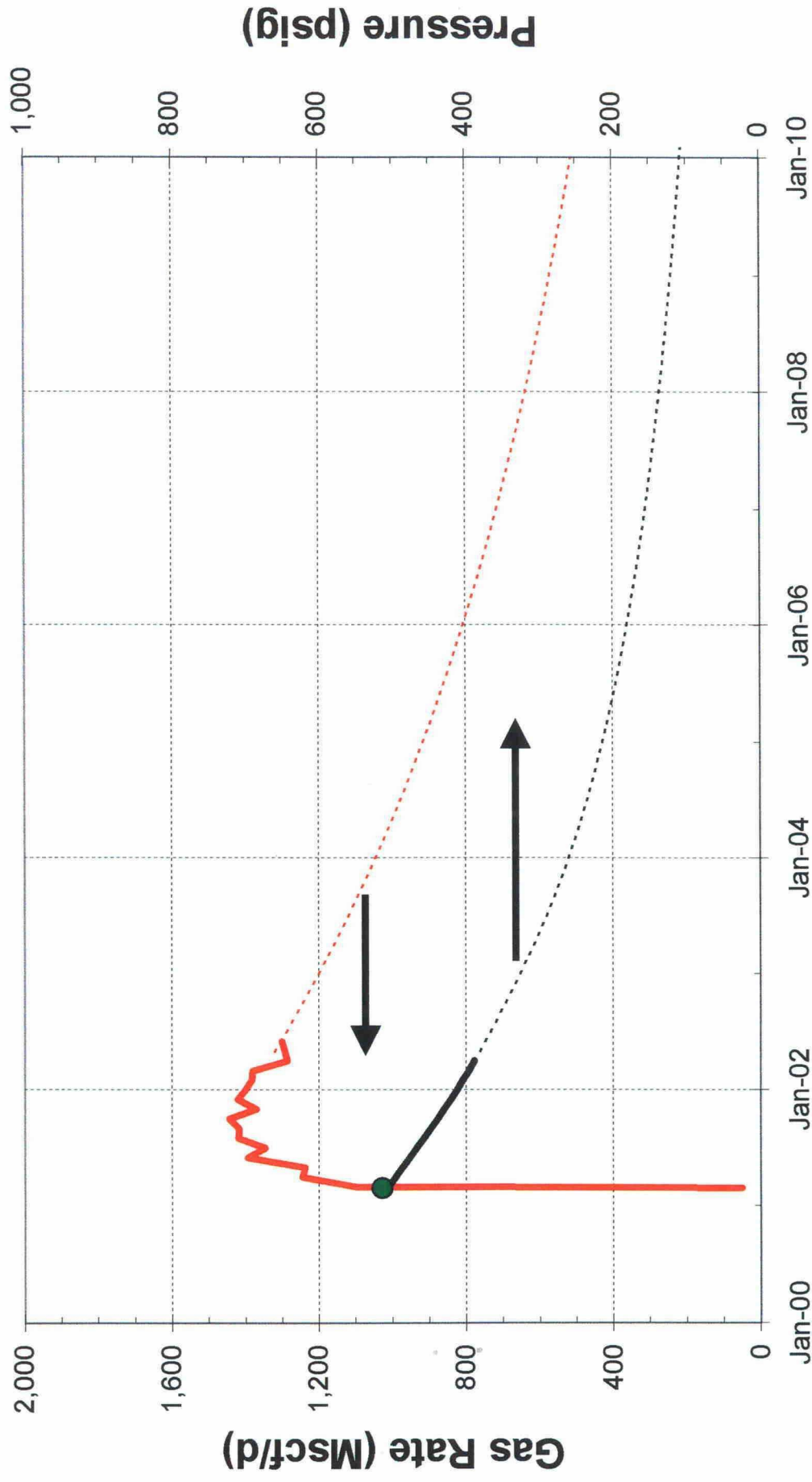
R - 5 - W

SJ 30-5 #264 Gas Production and Reservoir Pressure Forecasts



Case No. 12888
Phillips Ex. No. 14
July 9, 10 2002

SJ 30-5 #219R Gas Production and Reservoir Pressure Forecasts



Case No. 12888
Phillips Ex. No. 15
July 9, 10 2002

Notification Process within the High Productivity Area

- Intent was to simplify the process
- Problem when there is no one to notify
- Solution

“In the event the operator of the proposed optional infill well is also the operator of an existing adjoining GPU, then a copy of the APD shall be sent to all working interest owners in that GPU.”

Rule 7 (d) Well Density in the "High Productivity Area":

One optional infill well in the "High Productivity Area" may be drilled within a GPU in accordance with Rule 7(a) and 7(b) pursuant to the following procedures:

1. Operators of an existing GPU which contains an original coal gas well who desire to drill an optional infill well shall send a copy of its Application for Permit to Drill ("APD" including NMOCD form C-102 or Bureau of Land Management form 3160-3) to adjacent operators by certified mail-return receipt requested advising that they have twenty (20) days from receipt to file with the District Supervisor (OCD-Aztec) a written objection to the application.
2. An adjacent operator shall be any operator of a Basin-Fruitland Coal Gas GPU whose side boundary or corner adjoins the side boundary or corner of the quarter section in which the proposed optional infill well is to be located.

In the event the operator of the proposed optional infill well is also the operator of an existing adjoining GPU, then a copy of the APD shall be sent to all working interest owners in that GPU.

3. The District Supervisor may approve the APD, which has been filed upon expiration of the twenty (20) day notice period and certification by the applicant that all adjacent operators have received notification and no objections have been received within the twenty (20) day notice period.
4. In the event an objection is timely received, or upon the District Supervisor's own initiative, the application shall be set for a hearing before a Division Examiner.

Problems with Unconstrained Fairway Drilling & Proposed Solution

- Highly competitive reservoir
- Domino effect
- Prudent operators response
- Economic waste
- Correlative rights issues
 - Small interest owners & operators
 - High perm areas

✳➤ Solution: Operators can propose up to 3 pilot wells within the fairway

Summary

- Under-pressured area (south of fairway) requires additional wells.
- Data shows a significant difference between the reservoir inside and outside the high productivity area:
 - In wells sampled in the high productivity area, 64% of the wells had an average drainage area of 481 acres (i.e. 64% had $D_A > 320$).
 - In wells sampled north of the high productivity area, 69% of the wells had an average drainage area of 239 acres (i.e. 69% had $D_A < 320$).
 - Notification process addresses issues where infill wells in the high productivity area may not be warranted.
- In the high productivity area data suggests that in most cases current spacing is adequate. However, there may be selected cases where additional well(s) are necessary.