

BEFORE EXAMINER STOGNER

OIL CONSERVATION DIVISION

SOUTH BLANCO PICTURED CLIFFS POOL EXHIBIT NO. 17

CASE NO. 10521

Analysis of Material Balance

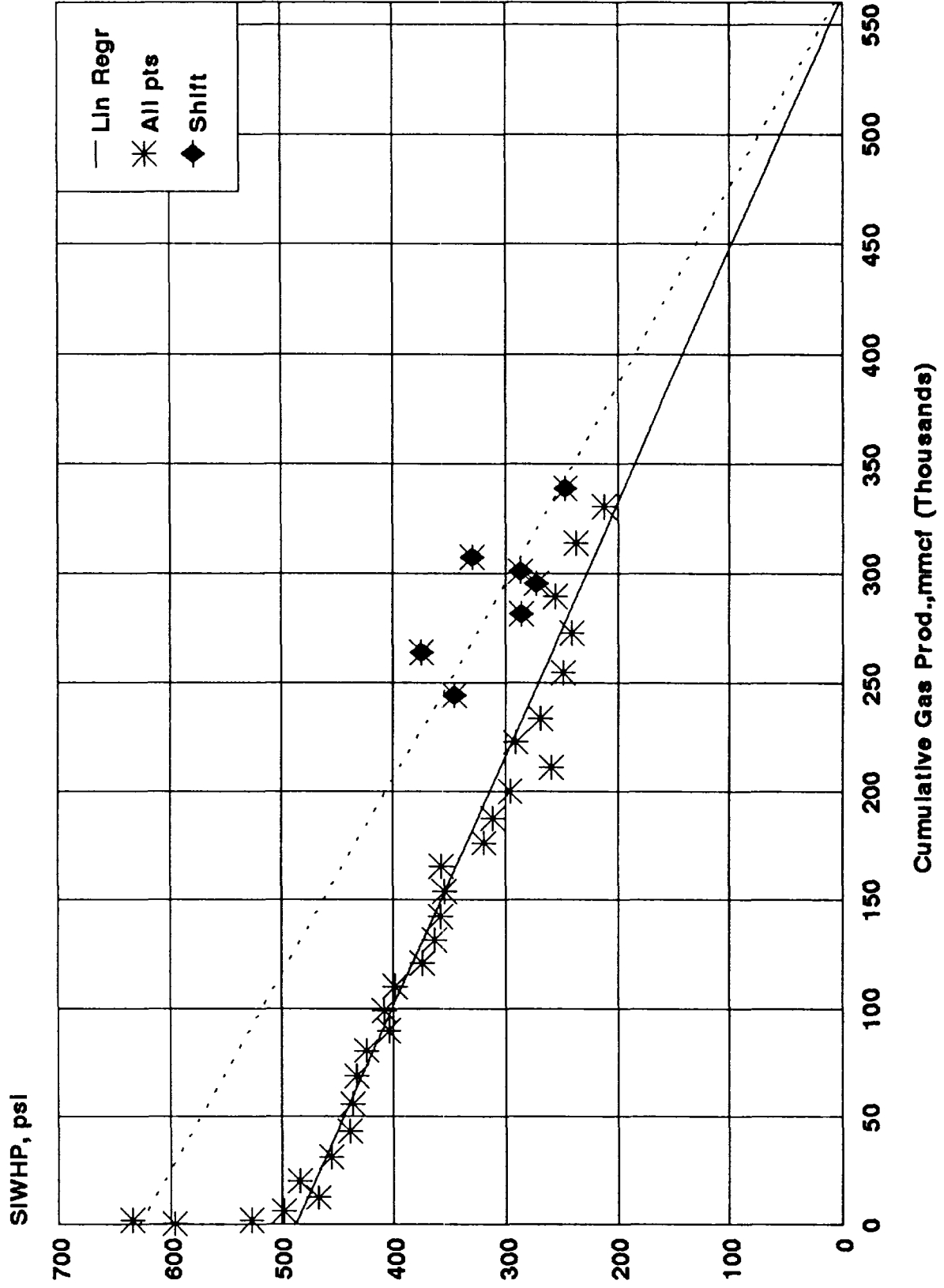
On each pressure - cumulative production plot in Exhibit 8 a linear regression line is fit through the data. Using this line to extrapolate to a shutin wellhead pressure of zero, results in an estimate of initial gas-in-place. The ratio of cumulative gas production to the initial gas-in-place yields a measure of depletion within the reservoir. Exhibit 8H is a table of the calculated initial gas-in-place values, the cumulative gas production for 1973 and 1991, and the ratio of production to gas-in-place or percent depletion.

The shift in the linear extrapolations on the attached exhibits is due to several reasons. First, the shutin time of seven days for a deliverability test is too short for a tight gas sand to buildup to the actual reservoir pressure. Therefore what is a measured reservoir pressure is actually only an average pressure over the radius of investigation during the 7 day test period.

But, more importantly, is the pressure behavior of this tight gas sand reservoir. In response to the method of measuring reservoir pressure, the values in Exhibit 8 have not reached the actual reservoir pressure. However, a higher reservoir pressure is confirmed by the early and late time pressure readings. At early time, when a small volume of gas has been produced and the number of wells is few, the reservoir is infinite-acting and the measured pressure within the test period can buildup to the actual reservoir pressure. Therefore, for all the Pictured Cliffs Pools the first several years of pressure data is higher and then declines rapidly when more volume is produced and more wells drilled.

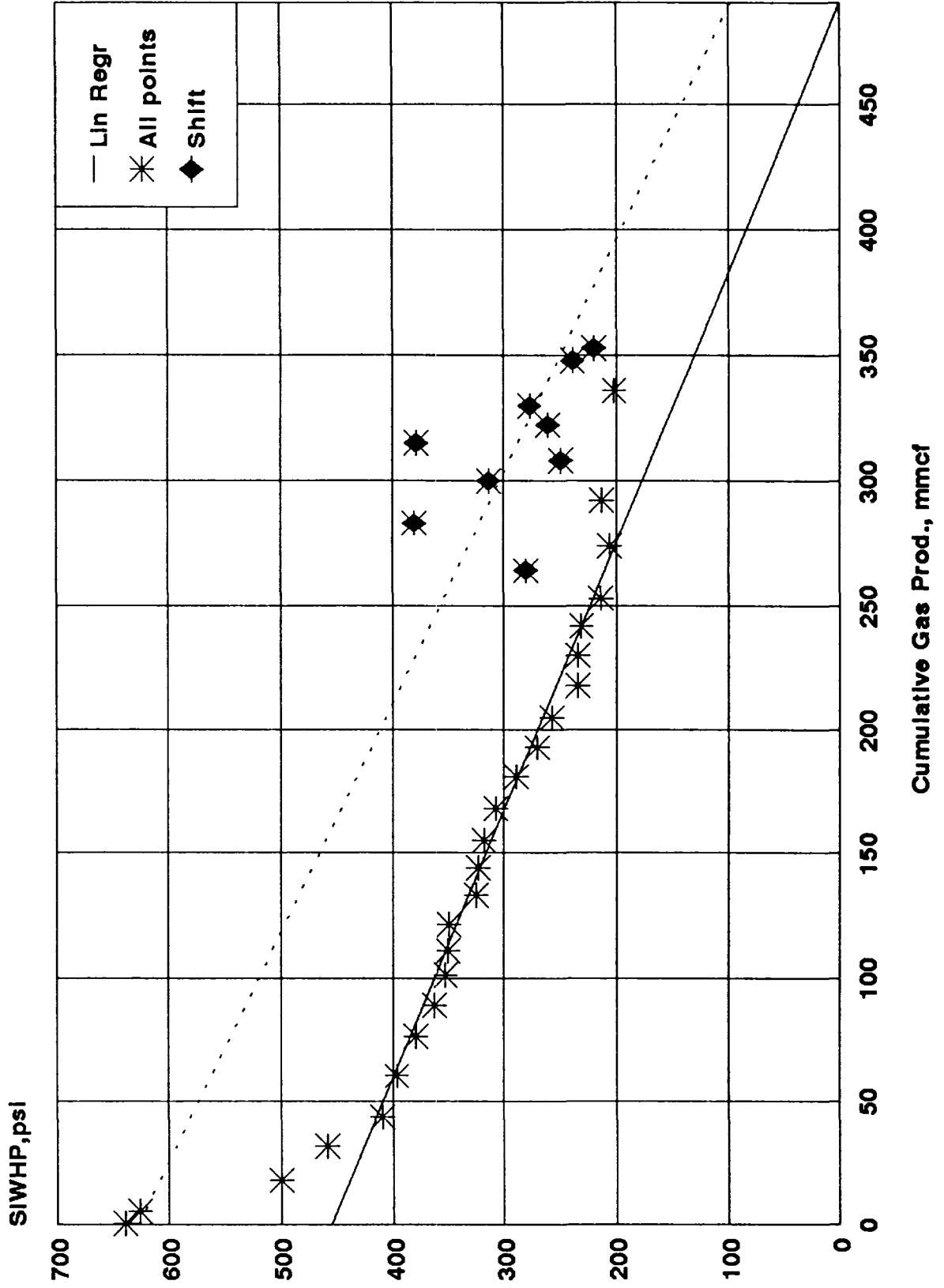
At late time, the reservoir pressure has fallen to a point where it now can be measured within the buildup period. Consequently, the measured pressure converges to the actual reservoir pressure. In other words, substantial pressure depletion has occurred to where the average pressure within the reservoir can be achieved within the test time. Also, as seen from these plots, a new well drilled typically encounters a higher reservoir pressure than those wells currently producing. This substantiates the low permeability and limited drainage area of this reservoir. Similar to before, this initial pressure will decline rapidly until equilibrium is reached with the rest of the reservoir. The net effect of the tight nature of this gas sand and the method of pressure measurement, is to increase the amount of gas-in-place. Therefore, a shift in the linear depletion curves is correct.

# Aztec Pictured Cliffs Pool



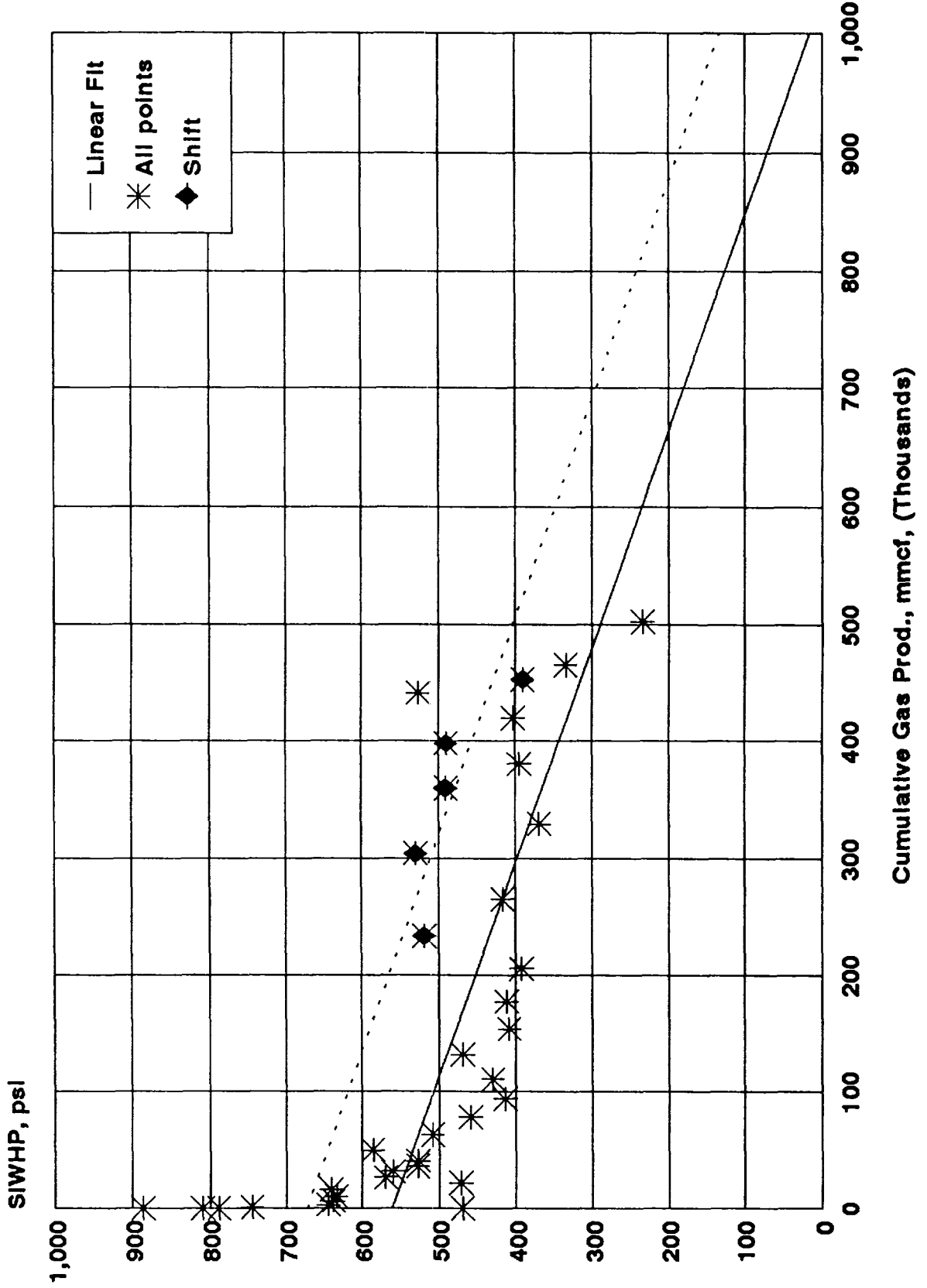
\* taken from N.M. Annual Reports

# Ballard Pictured Cliffs Pool



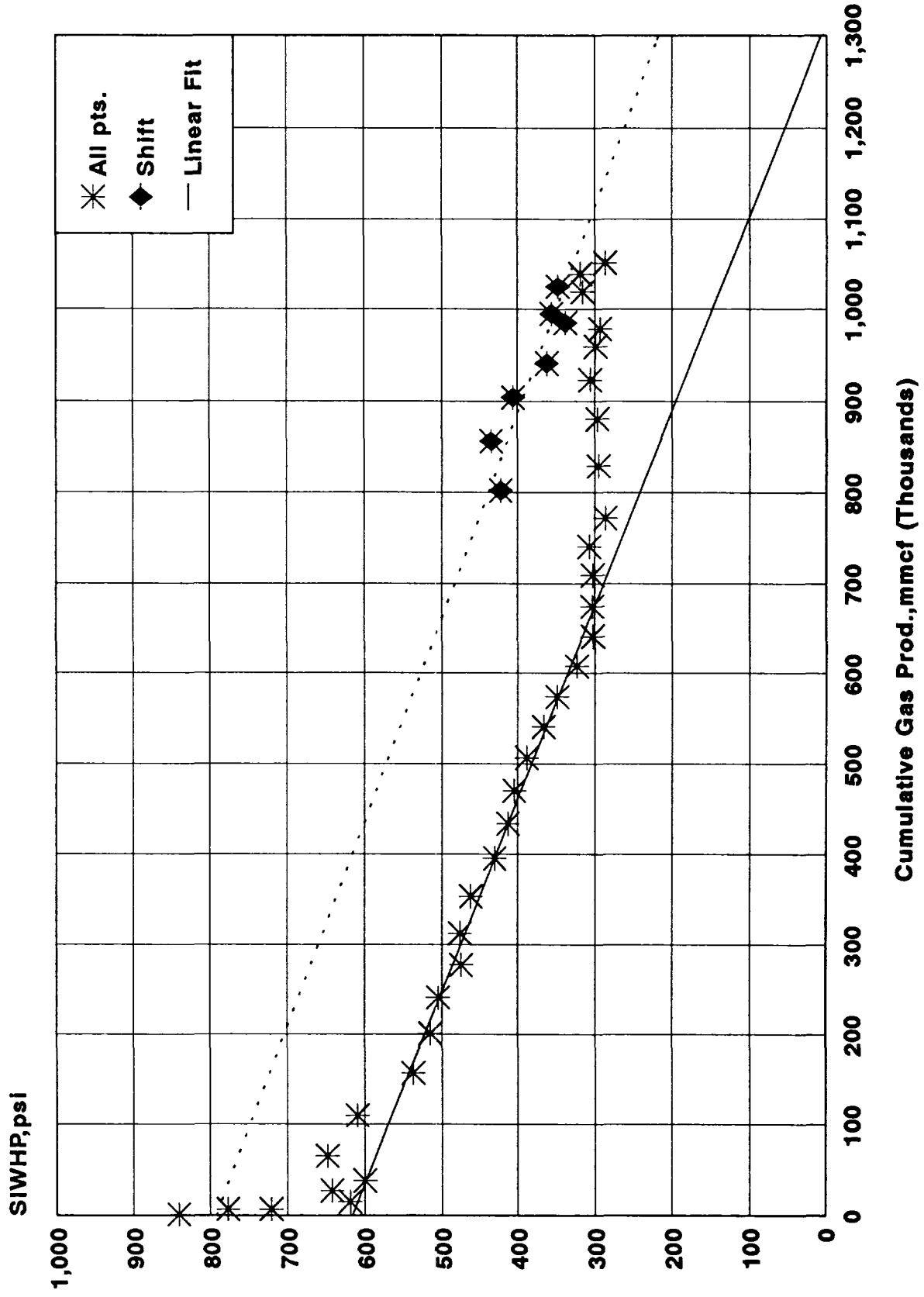
\* taken from N.M. Annual Reports

# Blanco Pictured Cliffs Pool



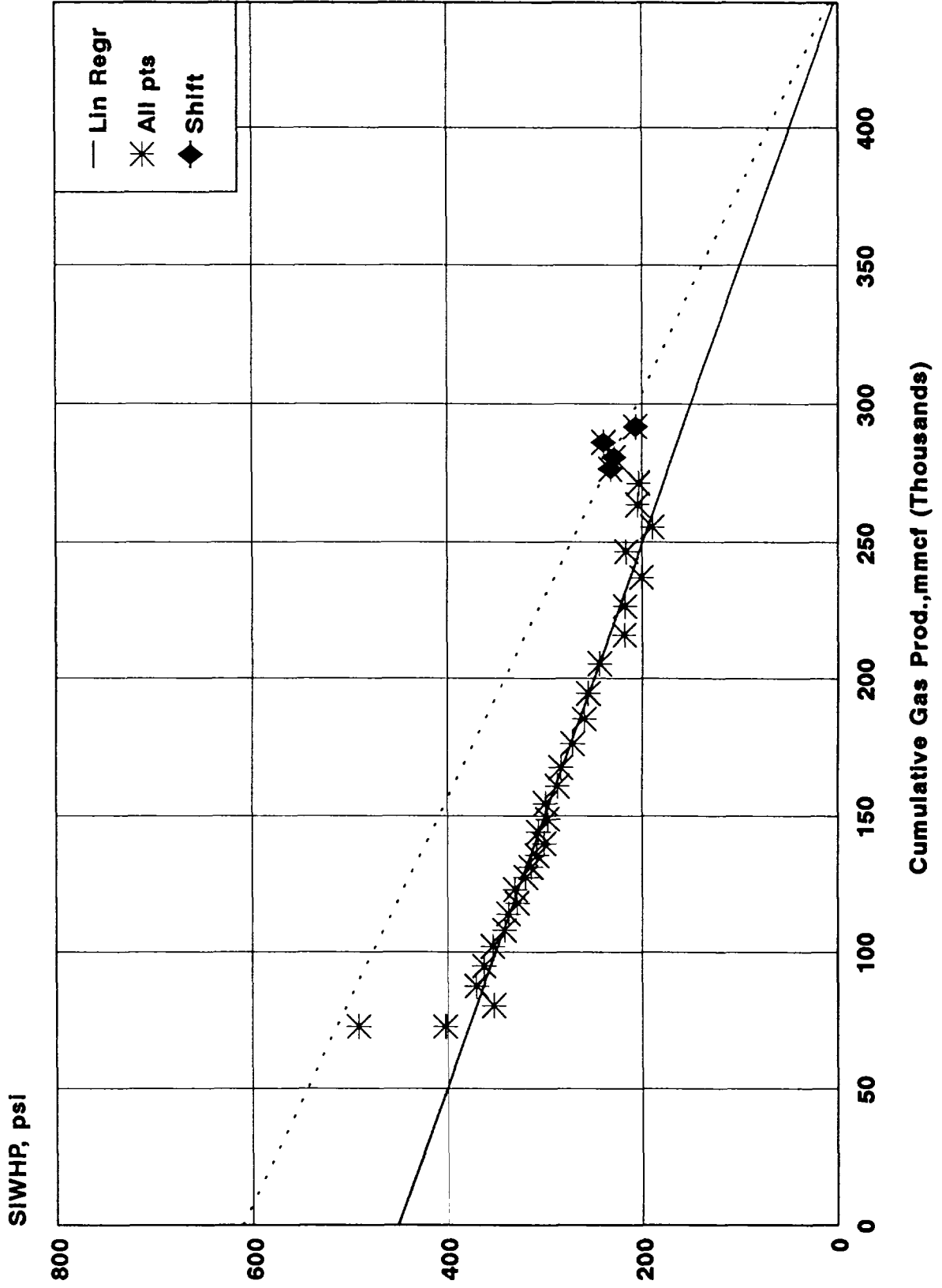
\* taken from N.M. Annual Reports

# South Blanco Pictured Cliffs Pool



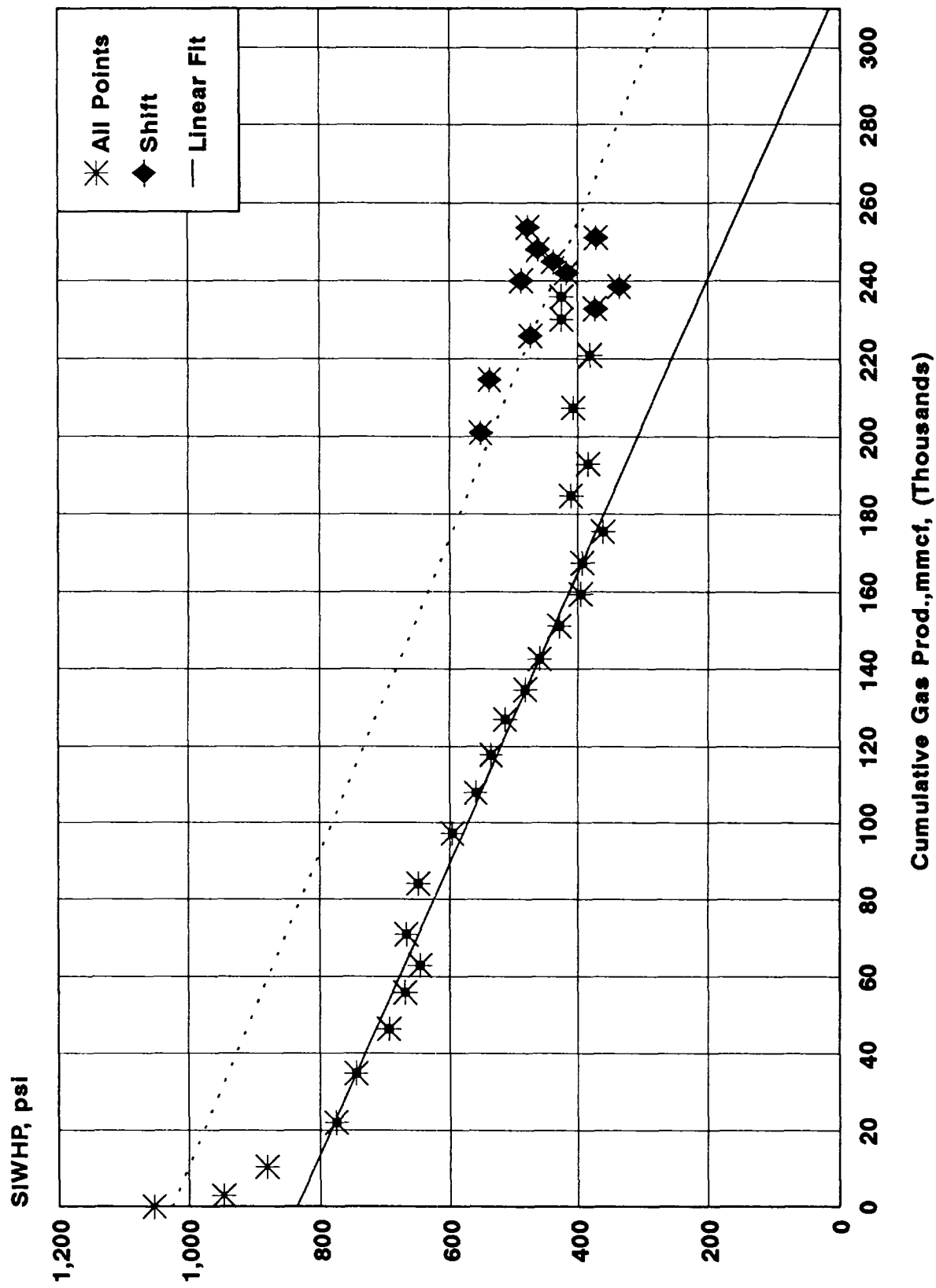
\* taken from N.M. Annual Reports

# Fulcher Pictured Cliffs Pool



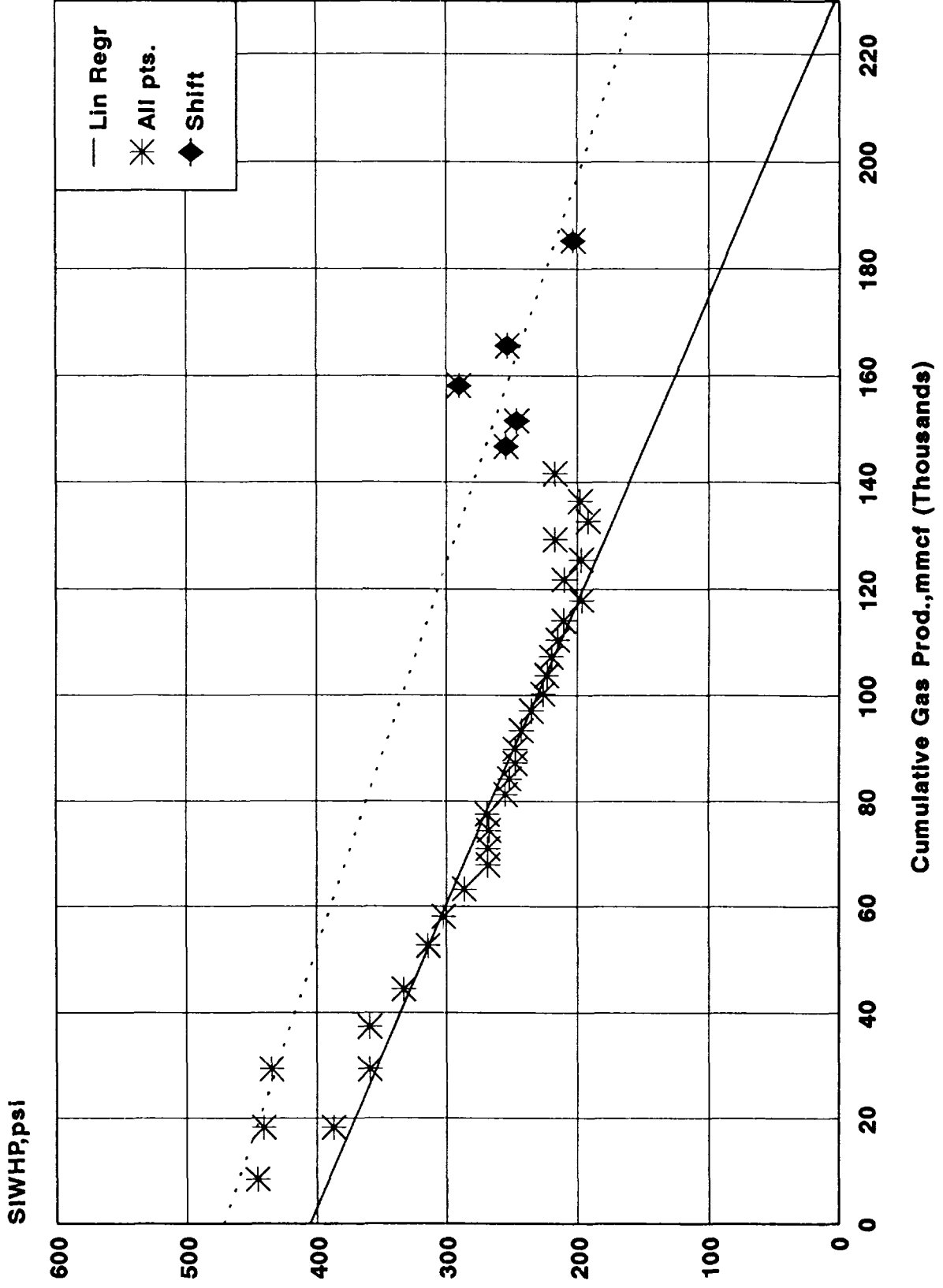
\* taken from N.M. Annual reports

# Tapacito Pictured Cliffs Pool



\* taken from N.M. Annual Reports

# West Kutz Pictured Cliffs Pool



\* taken from N.M. Annual Reports