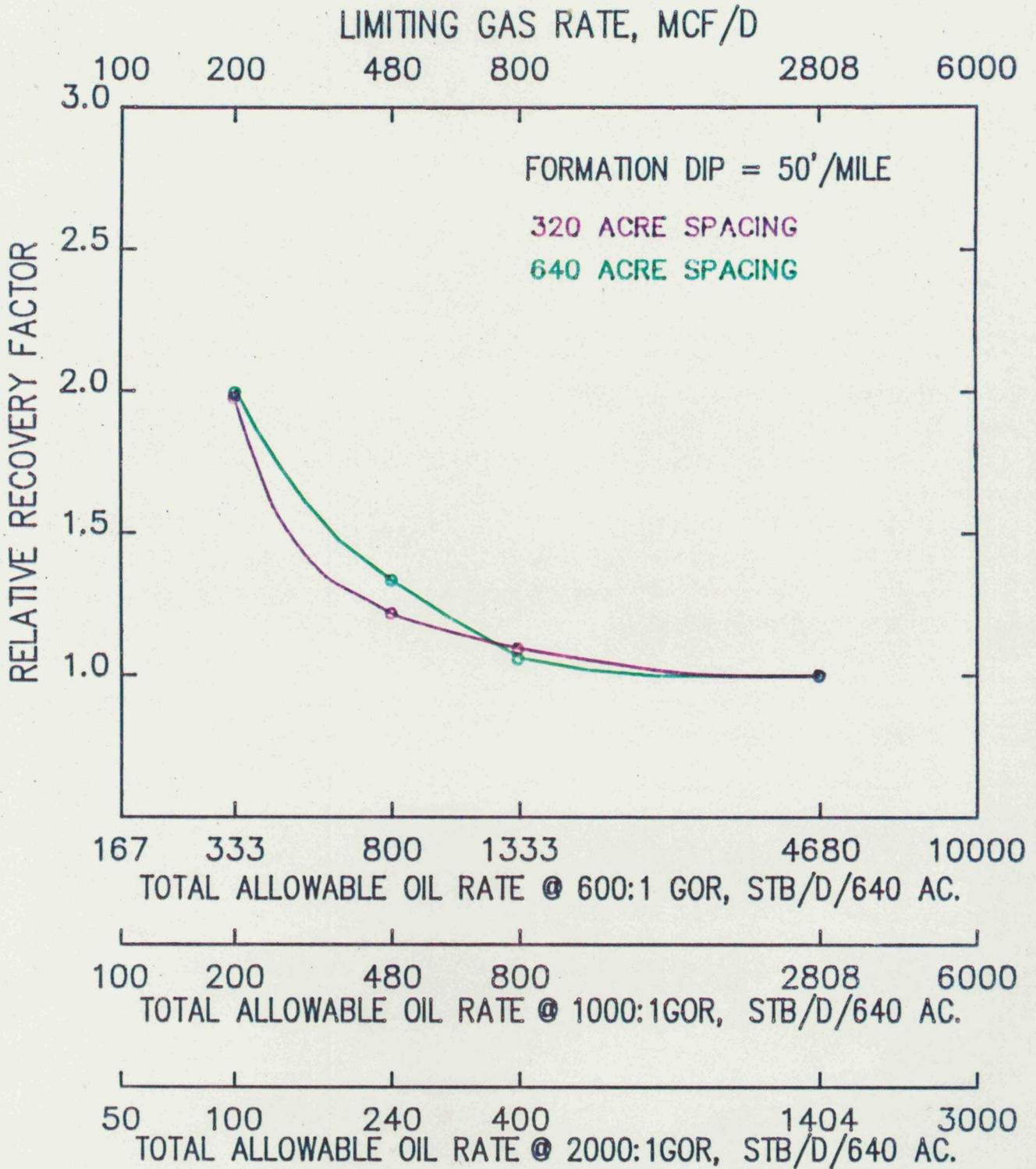
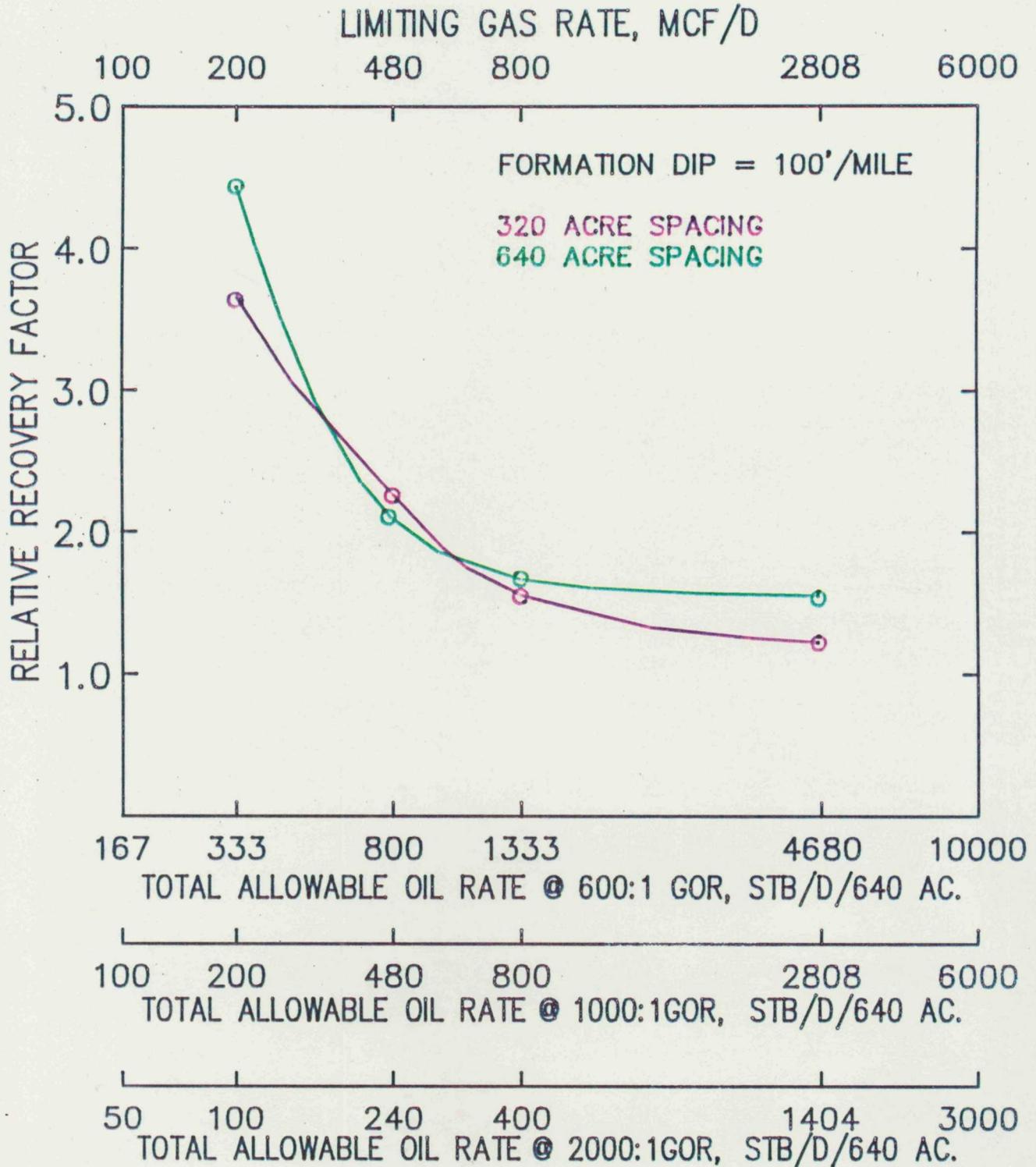


MANCOS POOL MODEL RESULTS



MANCOS POOL MODEL RESULTS



MANCOS POOL

Reservoir Simulation Study

RESULTS

Relative Recovery Factors
Dip= 50 Feet/Mile
(VS. 320 AC. Spacing, 1404 B/D Base Case)

<u>MCFD</u>	<u>640 ACRE UNIT CONSTRAINING RATE</u>		<u>320 ACRE SPACING</u>	<u>640 ACRE SPACING</u>
	<u>BOPD</u>	<u>GOR</u>		
200	200	1000	1.951	1.935
480	800	600	1.206	1.287
800	800	1000	1.087	1.054
2808	1404	2000	1.000	1.000

Relative Recovery Factors
(VS. Same Spacing)

<u>MCFD</u>	<u>640 ACRE UNIT CONSTRAINING RATE</u>		<u>320 ACRE SPACING</u>	<u>640 ACRE SPACING</u>
	<u>BOPD</u>	<u>GOR</u>		
200	200	1000	1.951	1.932
480	800	600	1.206	1.285
800	800	1000	1.087	1.052
2808	1404	2000	1.000	1.000

MANCOS POOL
Reservoir Simulation Study

RESULTS

Relative Recovery Factors
Dip= 100'/Mile
(VS. 320 AC. Spacing, 1404 B/D, 50'/Mile Dip. Base Case)

<u>MCFD</u>	<u>640 ACRE UNIT CONSTRAINING RATE</u>		<u>320 ACRE SPACING</u>	<u>640 ACRE SPACING</u>
	<u>BOPD</u>	<u>GOR</u>		
200	200	1000	3.168	4.406
480	800	600	2.238	2.100
800	800	1000	1.516	1.690
2808	1404	2000	1.206	1.514

Relative Recovery Factors
(VS. Same Spacing & DIP)

<u>MCFD</u>	<u>640 ACRE UNIT CONSTRAINING RATE</u>		<u>320 ACRE SPACING</u>	<u>640 ACRE SPACING</u>
	<u>BOPD</u>	<u>GOR</u>		
200	200	1000	3.000	2.910
480	800	600	1.856	1.387
800	800	1000	1.257	1.116
2808	1404	2000	1.000	1.000

MANCOS POOL

Reservoir Simulation Study

CONCLUSIONS

1. The current production rate from the wells in the Gavilan Mancos Pool is causing waste and will ultimately result in the loss of a vast amount of otherwise recoverable oil.
2. Oil recovery from the subject reservoir is very sensitive to the production rate regardless of the well spacing.
3. Recovery of oil from gravity drainage is significant at formation dips of 50 feet per mile. Sufficient reduction of the oil and gas producing rates will allow the more efficient gravity drainage recovery mechanism to overcome the currently dominant, less efficient solution gas drive mechanism. The average dip in the Gavilan Mancos Pool is 50 feet per mile.
4. The production constraints should be as low as possible in order to maximize oil recovery. Rates of approximately 400 STBO/D and a GOR of 600 SCF/STB (or a gas rate of 240 MCF/D) from a 640 acre proration unit are recommended to maximize oil recovery. This total allowable rate applies whether there is one or there are two wells producing from the 640 acre area.
5. The most efficient spacing pattern is 640 acres from both an oil recovery and an economic standpoint. A second well on 640 acres is unnecessary in both the current Gavilan Mancos Pool and the West Puerto Chiquito Pool.
6. The oil recovery will be greater in areas of higher formation dip. This effect will be significant in those areas in the Gavilan Pool which exceed 100 feet per mile of dip and in the area of the current Gavilan-West Puerto Chiquito boundary.