Downhole Commingling Extends Economic Limits Because of Reduced Costs and Yields Higher Gross Recovery of Reserves

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Allison Unit Development Strategy Assessment

	Single Completion for Each Wellbore	Dual	Commingle
Footprint	2 Surface Locations	1 Surface Location	1 Surface Location
Capital Costs Incurred by Each Zone	Highest Cost	Between	Lowest Cost
Artificial Lift	2 Pump Systems (FC/PC) 2 Plunger Lift Systems(MV/DK)	2 Pump Systems (FC/PC) Plunger Lift and Pump Systems(MV/DK)	Pump System (FC/PC) Plunger Lift System(MV/DK)
Operating Expenses for Each Productive Zone	Higher	Higher	Lowest
EUR	Lower	Lower	Highest
Abandonment Rate	Higher	Higher	Lowest

*Highlighted yellow boxes display most desirable characteristic

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Fruitland Coal Expenses

Fruitland Coal Single Completion			
Capital Expenses ($M)	Tangible	Intangible	Total
Total	219	647	866
Operating Expenses = $3162/ month			

Commingled Pictured Cliffs and Fruitland Coal			
Capital Expenses ($M)	Tangible	Intangible	Total
Total	112	341	452
Operating Expenses = $1581/ month			

*LOE does not include producing overhead

add additional zone

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Pictured Cliffs Expenses

Pictured Cliffs Single Completion			
Capital Expenses ($M)	Tangible	Intangible	Total
Total	149	647	796
Operating Expenses = $1916/ month			

Commingled Pictured Cliffs and Fruitland Coal Estimate			
Capital Expenses ($M)	Tangible	Intangible	Total
Total	112	341	452
Operating Expenses = $1581/ month			

Commingled Pictured Cliffs, Mesaverde and Dakota			
Capital Expenses ($M)	Tangible	Intangible	Total
Total	108	273	380
Operating Expenses = $349/ month			

*LOE does not include producing overhead

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Mesaverde Expenses

Mesaverde Single Completion			
Capital Expenses ($M)	Tangible	Intangible	Total
Total	319	908	1227
Operating Expenses = $1339/ month			

Commingled Mesaverde and Dakota			
Capital Expenses ($M)	Tangible	Intangible	Total
Total	187	522	709
Operating Expenses = $892/ month			

Commingled Pictured Cliffs, Mesaverde and Dakota			
Capital Expenses ($M)	Tangible	Intangible	Total
Total	223	328	551
Operating Expenses = $419/ month			

*LOE does not include producing overhead

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Dakota Expenses

Dakota Single Completion			
Capital Expenses ($M)	Tangible	Intangible	Total
Total	272	893	1165
Operating Expenses = $1320/ month			

Commingled Mesaverde and Dakota			
Capital Expenses ($M)	Tangible	Intangible	Total
Total	203	516	719
Operating Expenses = $595/ month			

Commingled Pictured Cliffs, Mesaverde and Dakota			
Capital Expenses ($M)	Tangible	Intangible	Total
Total	176	422	598
Operating Expenses = $279/ month			

*LOE does not include producing overhead

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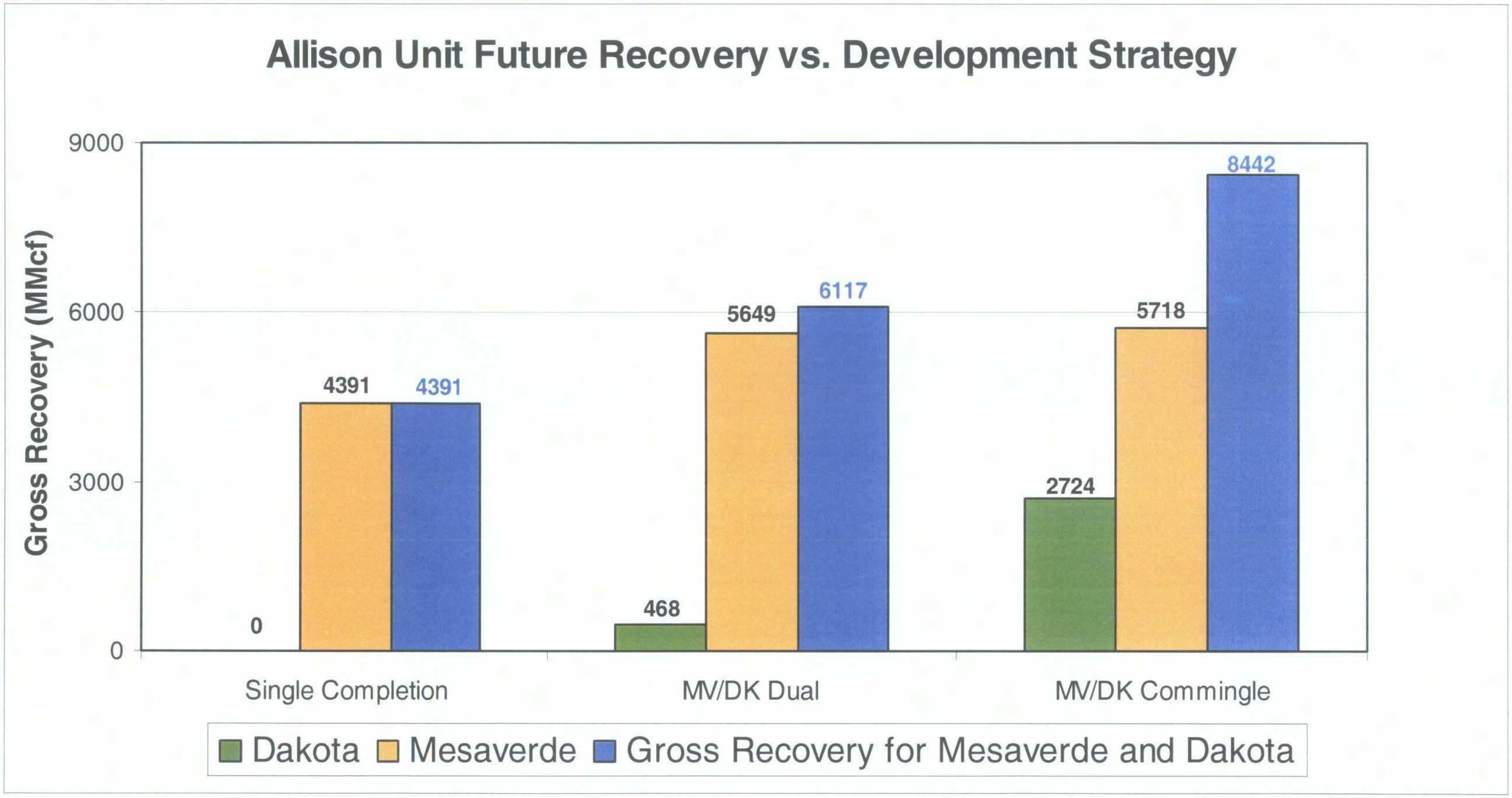

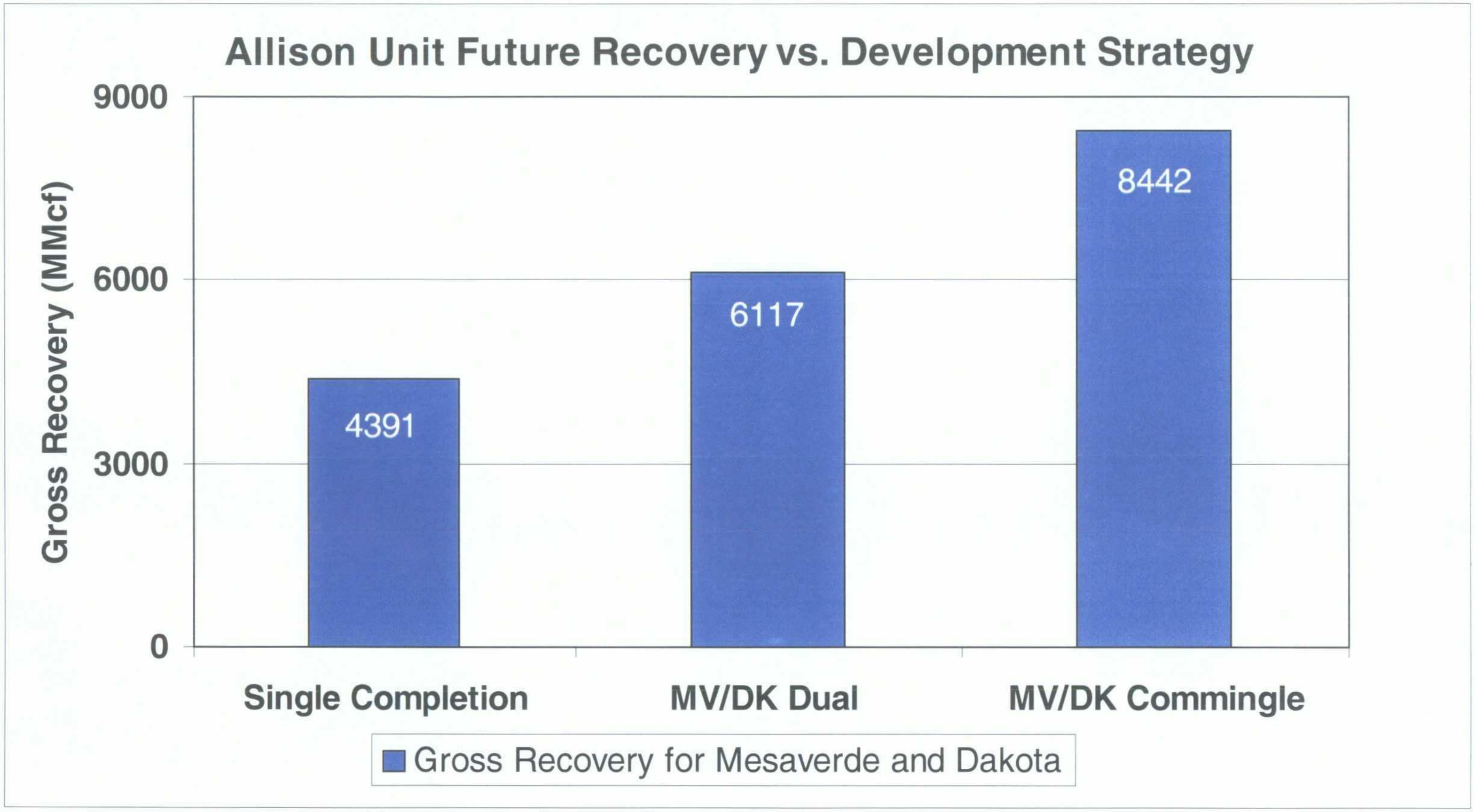

The same logic applies for all other scenarios. By commingling zones, capital and operating costs are reduced. As a result, the economic limits for wells are extended and this increases the gross recovery.