Enclosure 4.2.7-a : Casino Field Uncertainty Matrix - Dynamic Model Cases

Reservoir Uncertainty Sensitivities*

ID	Sensitivity	Case							Comments
1	**Aquifer Support**	**REFERENCE CASE**	**Case 1A**	**Case 1B**	**Case 1C**	**Case 1D**	**Case 1E**		
		Infinite Analytical Aquifer attached to SE Dip & Main Closures of Waarre C only. Average model permeability based on C3 welltest (445mD). Influence Angle & Radi to reflect most likely regional aquifer map. No analytical aquifer attached to Waarre A	No analytical aquifer attached to Waarre C or Waarre A. Aquifer only represented by gridblocks within model.	Infinite Analytical Aquifer attached to SE Dip & Main Closures of Waarre C only. Average kh (and therefore flux) increased upon Reference Case. Influence Angle/Radi to reflect most likely regional aquifer map. No analytical aquifer attached to Waarre A	As for Reference Case, except analytical aquifer not attached to SE dip closure	As for Reference Case for Waarre C. Analytical Aquifer attached to Wa A.	As for Reference Case but Fetkovich		
2	**Intrafield Fault Transmissibility**	**REFERENCE CASE**	**Case 2A**	**Case 2B**					Assumes water ingress only across faults where sand is justaposed upon sand (as identified by Allen Diagrams). Water is assumed not to migrate along fault planes where sand is NOT justaposed against sand.
		Fault Trans =1	Fault Trans=0.01	Increase Flt Trans for 'Splay Fault' to simulate the absence of this fault.					
3	**Waarre A Insitu Permeability Model**	**REFERENCE CASE**	**Case 3A**	**Case 3B**	**Case 3C**	**Case 3D**	**Case 3E**	**Case 3F**	
		Santos Perm Model	Santos Perm Model with x4 multiplier to PERMX, PERMY, PERMZ for Waarre A	Santos Perm Model with x0.25 multiplier to PERMX,PERMY & PERMZ for Waarre A	Santos Perm Model with x0.5 multiplier to PERMX, PERMY & PERMZ for Waarre A	Santos Perm Model with x0.125 multiplier to PERMX, PERMY & PERMZ for Waarre A	Santos Perm Model with x0.167 multiplier to PERMX, PERMY & PERMZ for Waarre A	Santos Perm Model with x0.25 multiplier to PERMX, PERMY & PERMZ for Waarre A. High Perm Streak in Layer 167 (LA1) where k=500mD and h=0.1m	
4	**Endpoint krw (at Sgr)**	**REFERENCE CASE**	**Case4A**	**Case4B**					
		Krw'=0.3. P50 of Krw' distribution. Weighting applied to each dataset (60% unsteady-state, 15% steady-state, 25% centrifuge)	Krw'=0.1. P10 of Krw' distribution. Weighting applied to each dataset (60% unsteady-state, 15% steady-state, 25% centrifuge)	Krw'= 0.45. P90 of Krw' distribution. Weighting applied to each dataset (60% unsteady-state, 15% steady-state, 25% centrifuge)					
5	**Residual Gas Saturation**	**REFERENCE CASE**	**Case 5A**	**Case 5B**					
		Sgr=18% for all SATNUM regions. Based on SS data	Sgr=12% for all SATNUM regions. Based on Centrifuge data	Sgr=24% for all SATNUM regions. Based on Unsteady-State data.					
6	**Inter Zone Transmissibility**	**REFERENCE CASE**	**Case 6A**						Case 6b attempts to model 'water conduit' scenairo where viscous dominated flow occurs resulting in water overrunning gas
		MULTZ=1	MULTZ=0						
7	**Intra Zone kv/kh**	**REFERENCE CASE**	**Case 7A**	**Case 7B**					
		kv/kh =0.1	kv/kh=0.5	kv/kh=0.01					
8	**Relative Perm Corey Expon**	**REFERENCE CASE**	**Case 8A**	**Case 8B**	**Case 8C**	**Case 8D**			
		Ng = 3, Nw=5.4 Based on Steady-State data	Ng=3, Nw=3	Ng=3, Nw=7	Ng=2, Nw=5.4	Ng=6.4, Nw=5.4			
9	**D-Factor**	**REFERENCE CASE**	**Case 9A**	**Case 9B**	**Case 9C**	**Case 9D**			
		D-Fac for Wa A Producer = 2.66E-06 . D-Fac for Wa C Producer = 3.81E-05. Assumes 50% of effective h for Waarre A and C Producers	D-Fac for Wa A Producer = 2.66E-06 . D-Fac for Wa C Producer = 9.52E-06. Assumes 50% of effective h for Waarre A Producer and 100 % for Waarre C Producer	D-Fac for Wa A Producer = 2.66E-06 . D-Fac for Wa C Producer = 1.52E-04. Assumes 50% of effective h for Waarre A Producer and 25 % for Warrre C Producer	D-Fac for Wa A Producer = 6.64E-07 . D-Fac for Wa C Producer = 3.81E-05. Assumes 100% of effective h for Waarre A Producer and 50% for Warrre C Producer	D-Fac for Wa A Producer = 1.07E-05. D-Fac for Wa C Producer = 3.81E-05. Assumes 25% of effective h for Waarre A Producer and 50 % for Waarre C Producer			D-Factor from 'Woodside' equation
10	**Waarre A Producer Well PI**	**REFERENCE CASE**	**Case 10A**						
		WPIMULT=2.4 PRODA kh =15 000mDft	WPIMULT = 1						

NOTES: "Reservoir Uncertainty" sensitivities are those which we have no control over and need to address by ensuring the range of scenarios modelled adequately addresses the possible "States of Nature" which may be encountered. As such the results of these scenarios are to be used to determine the range of field recovery factors for a given, fixed development scenario which can be controlled
Indicates combined sensitivities which need to be investigate, for example to understand the earliest predicted time to water breakthrough may require a combination of strong aquifer, high endpoint krw and high kv/kh.