Coal blend optimization and evaluation of Buller Plateau Continuation Project

Jon Gane

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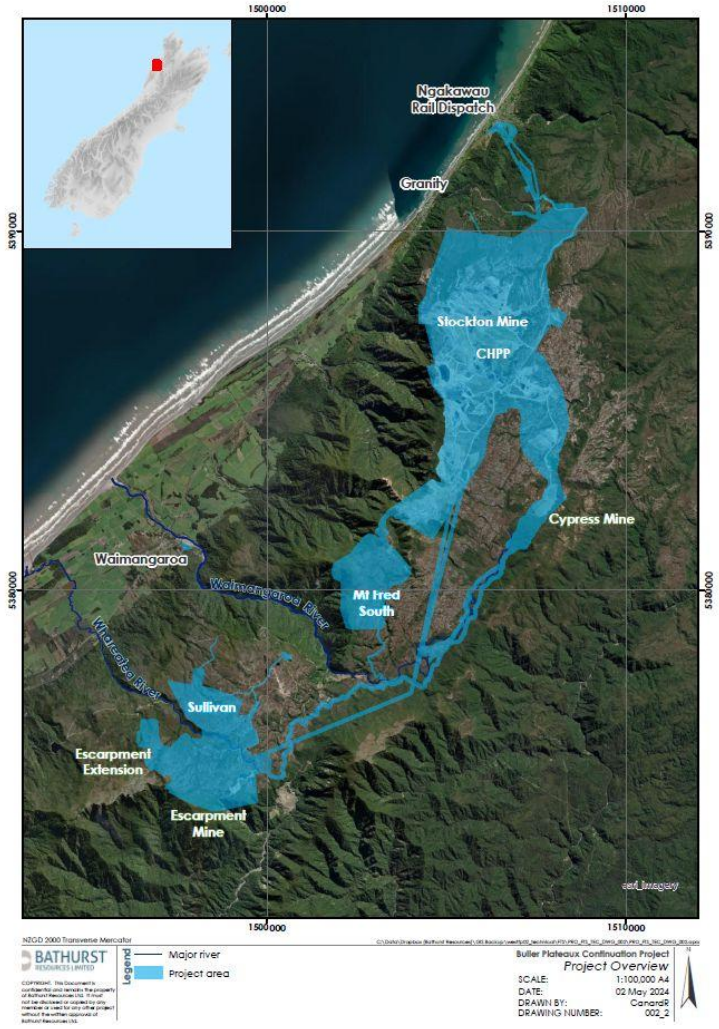
What is the Buller Plateau Continuation Project?



The Stockton Plateau and Denniston Plateau (near Westport) are identified as the Buller Coal Plateau Continuation Project (BCPC) (Figure 1). Bathurst Resources plans to mine 20 million tonnes of coking coal for export from the Buller Plateau (West Coast) over a 25-year timeframe to support and extend the mine life of the current Stockton Operations. The BCPC area covers the following geographical areas within:

- The Stockton Plateau -
  - Stockton Mine (including the aerial ropeway and Ngakawau Rail loadout area)
  - Upper Waimangaroa mine permit area (includes Mt Fred South and the Upper Waimangaroa Haul Road)
- and Denniston Plateau -
  - Escarpment Mine permit area
  - Whareatea West mine permit application area (Escarpment Extension)
  - Denniston Plateau area adjacent to the existing Escarpment mine
  - Sullivan Coal Mining License area.

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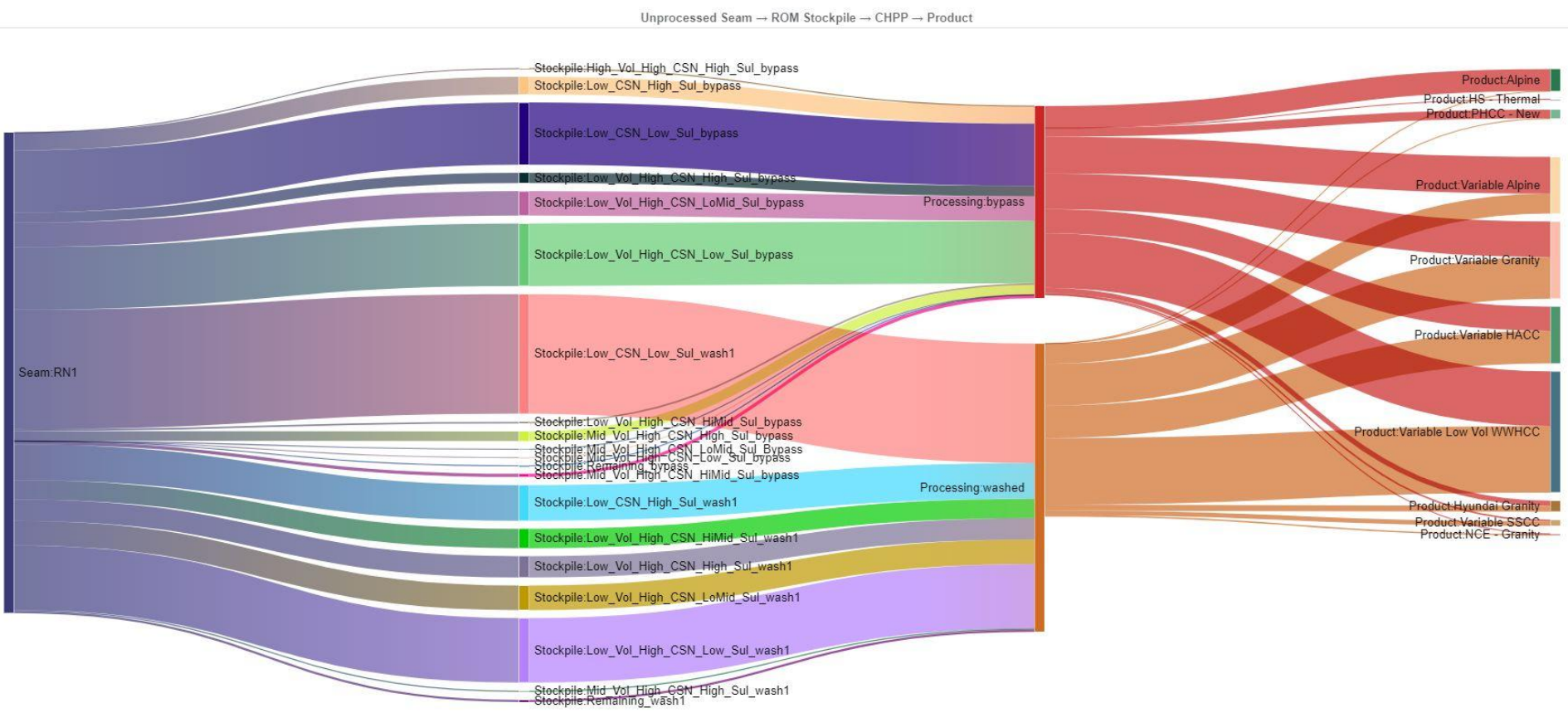
What is BlendOpt™



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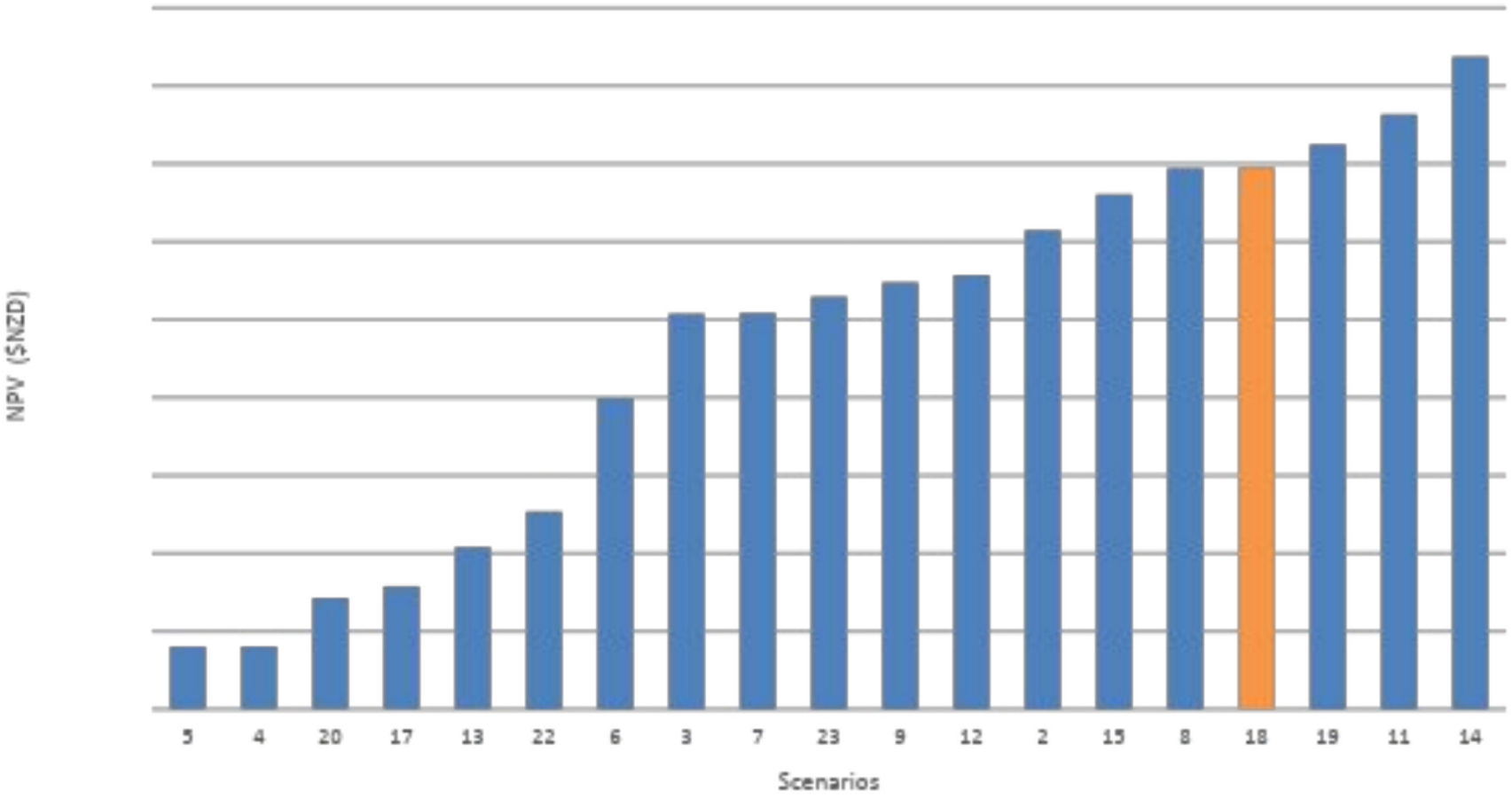
BlendOpt First Pass (23 Scenarios)



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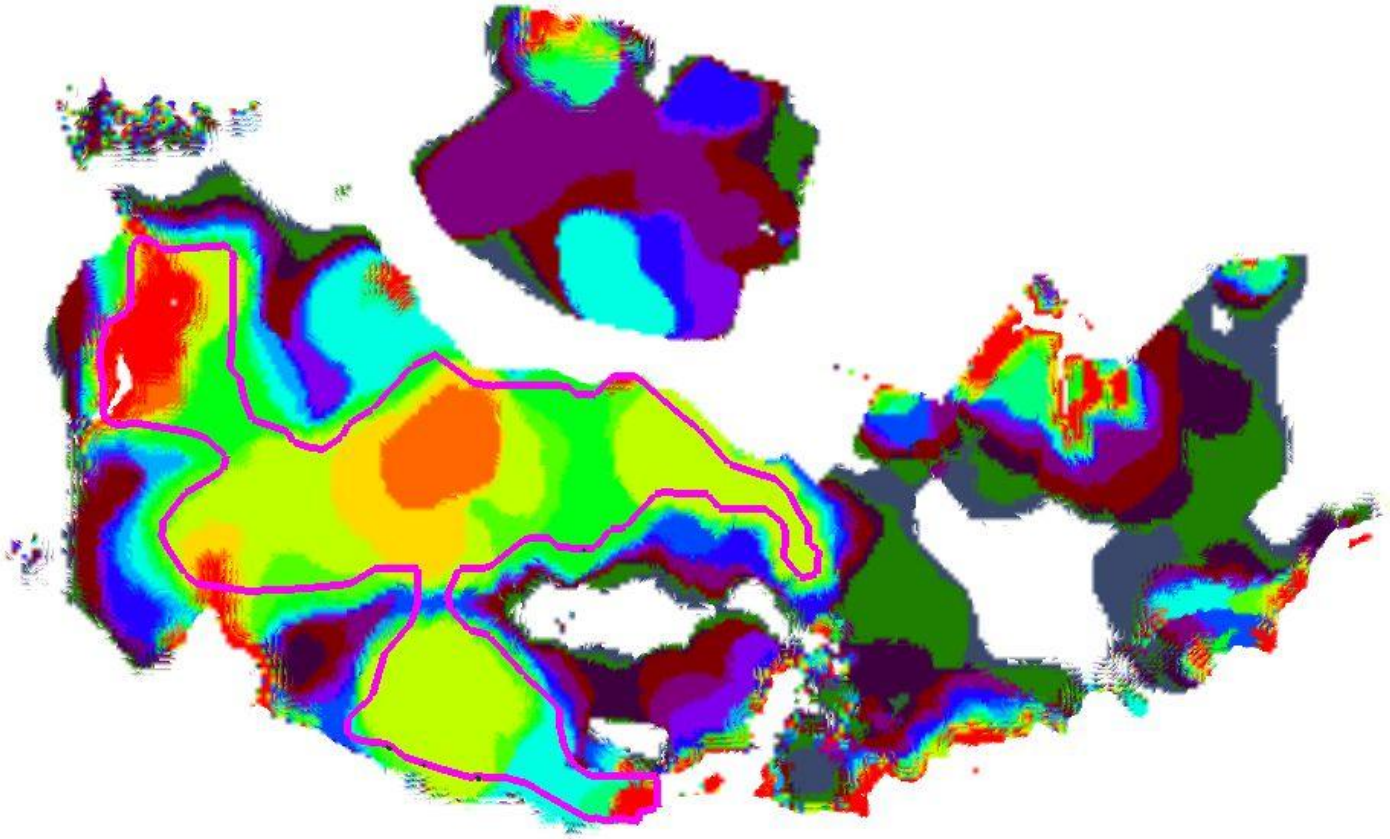
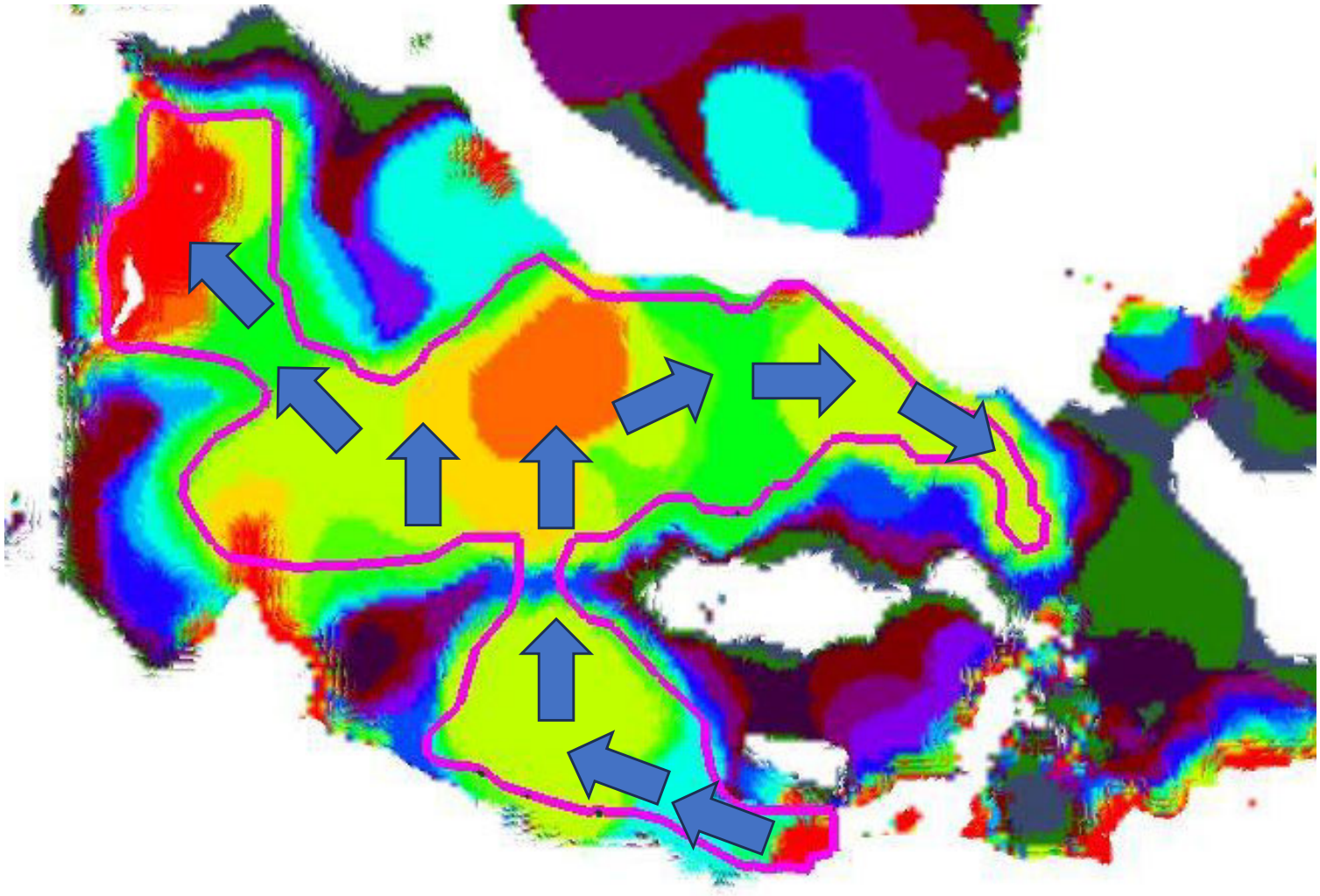
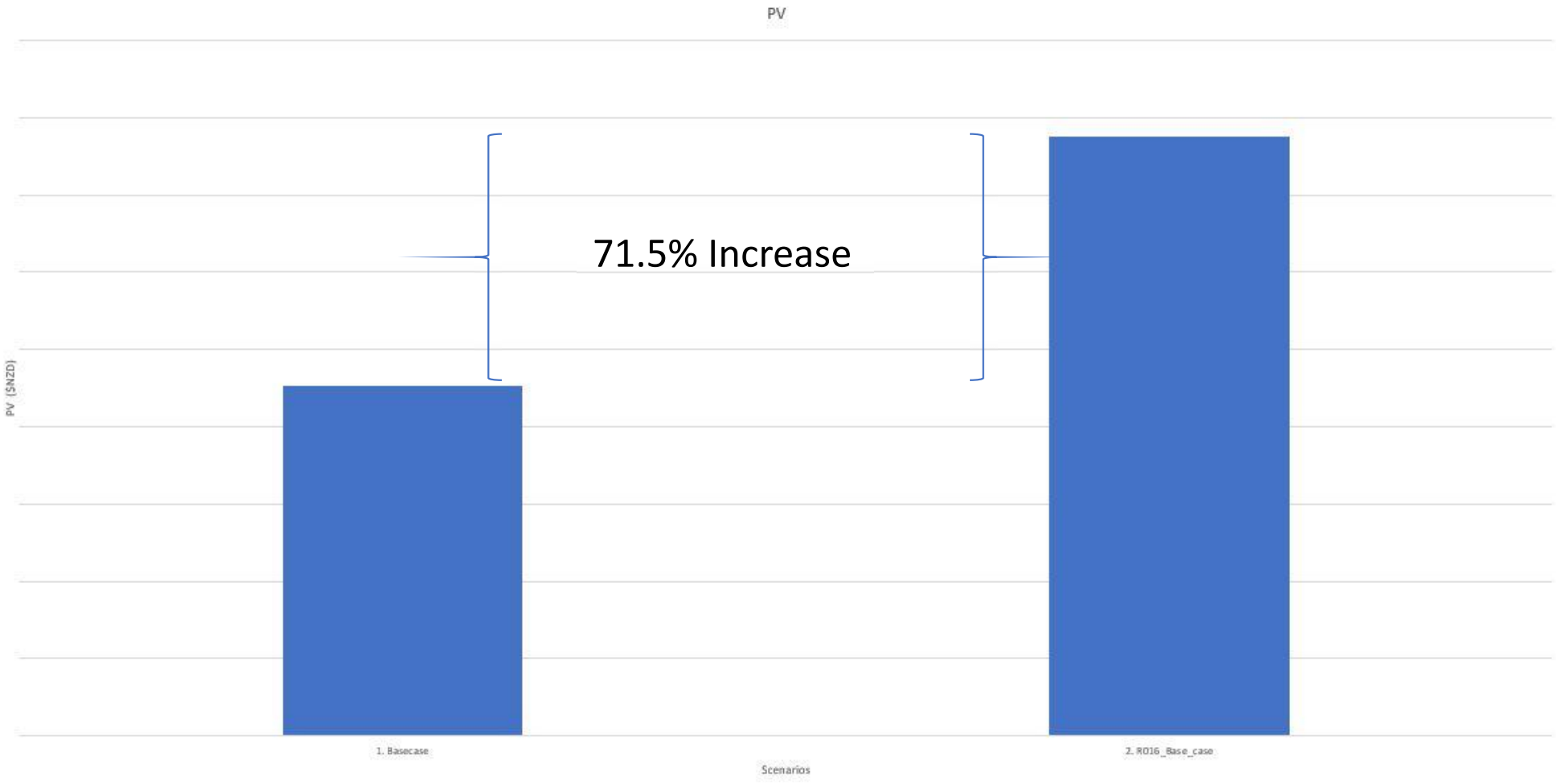
Pit Optimisation



First Draft Pit Sequence



First Concept Pit Shell Blend Optimisation



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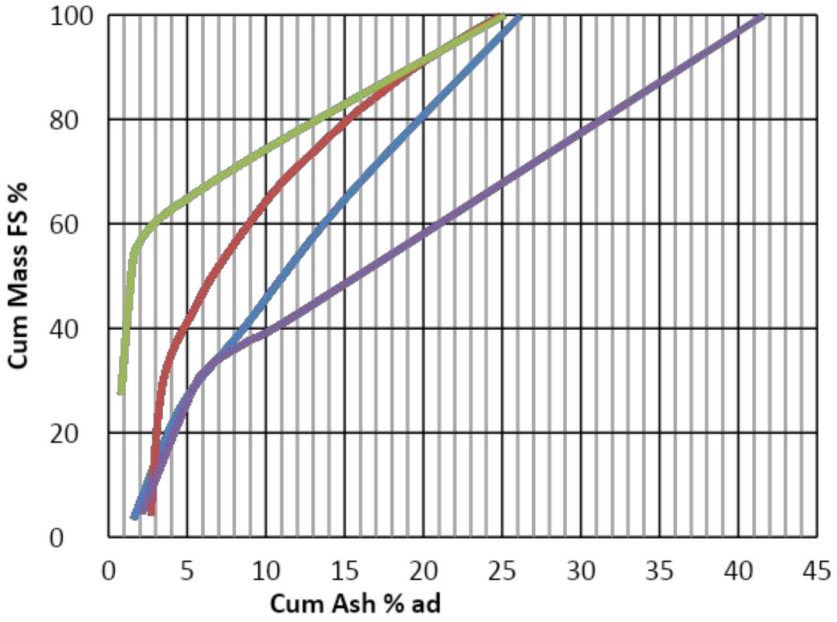
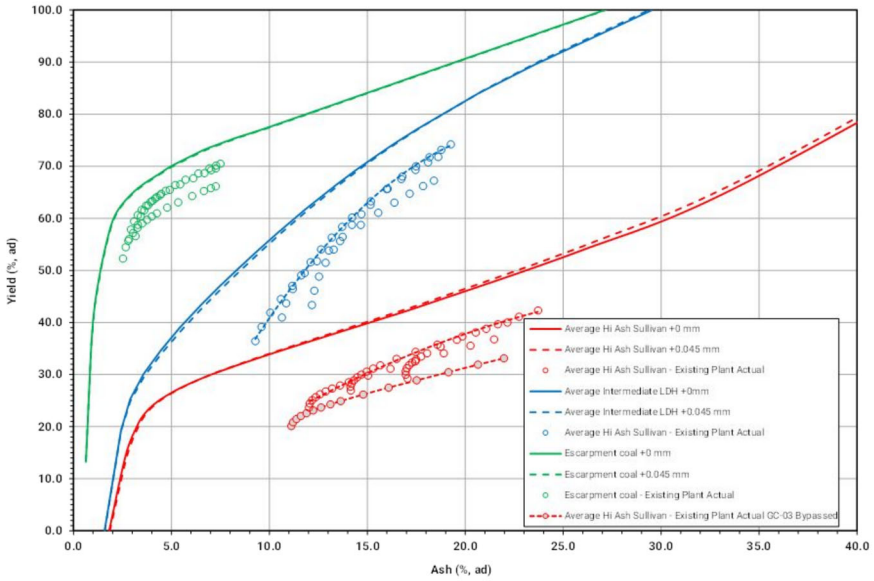
Variable Washability

Washability Samples



LIMN Washability Modelling



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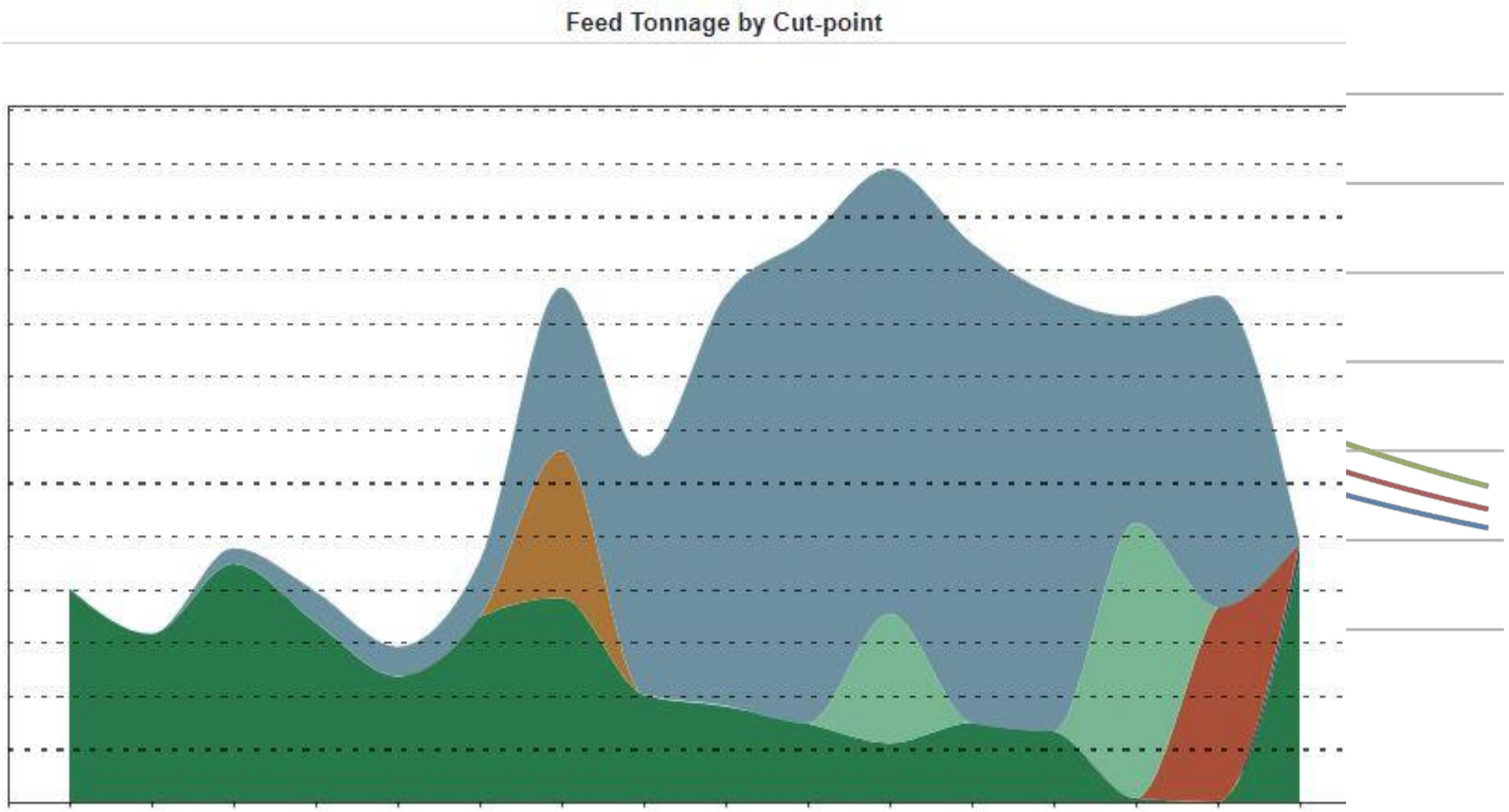
Differential Wash Curves



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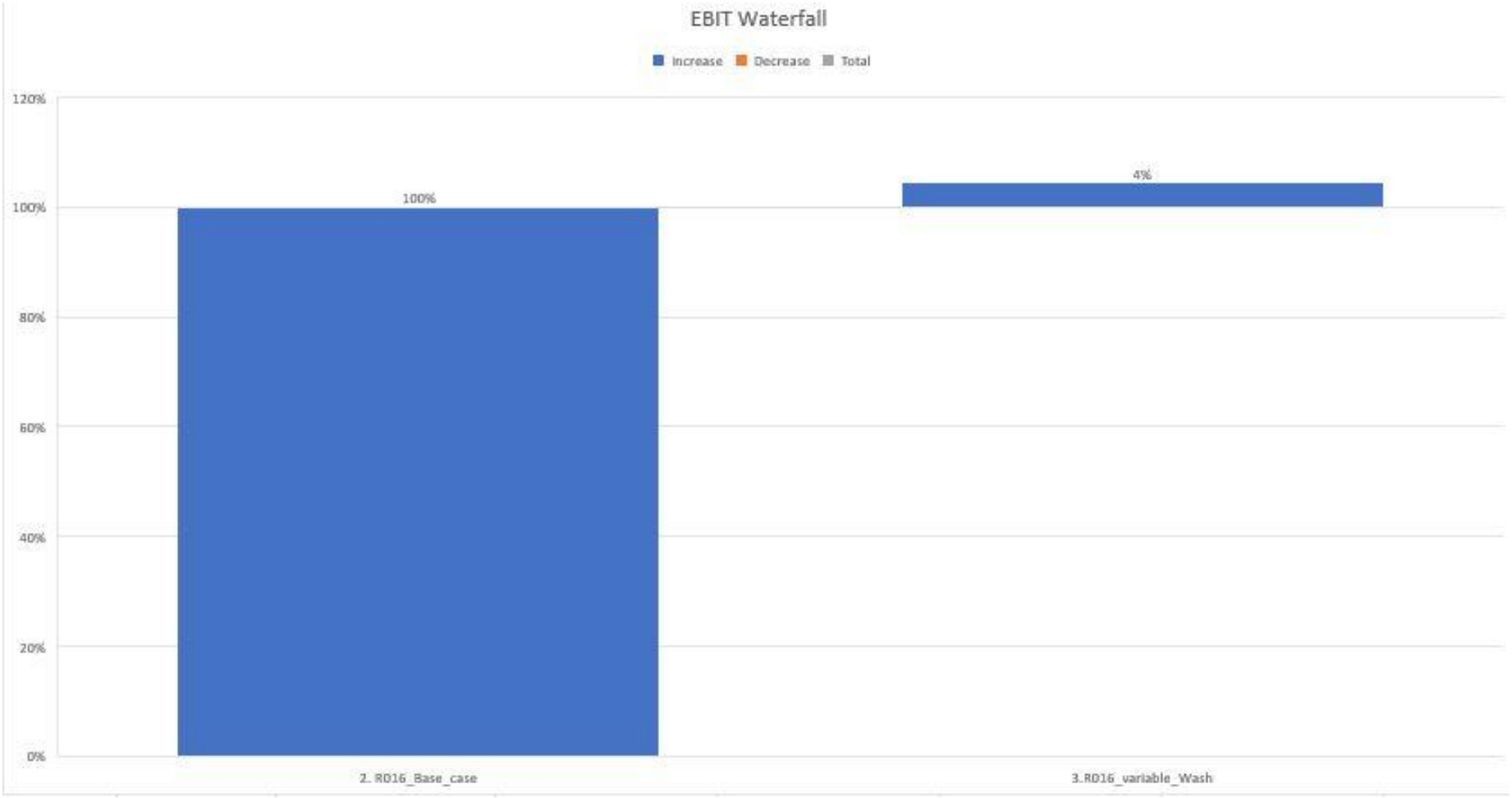
Differential Wash Curves Blend Optimisation



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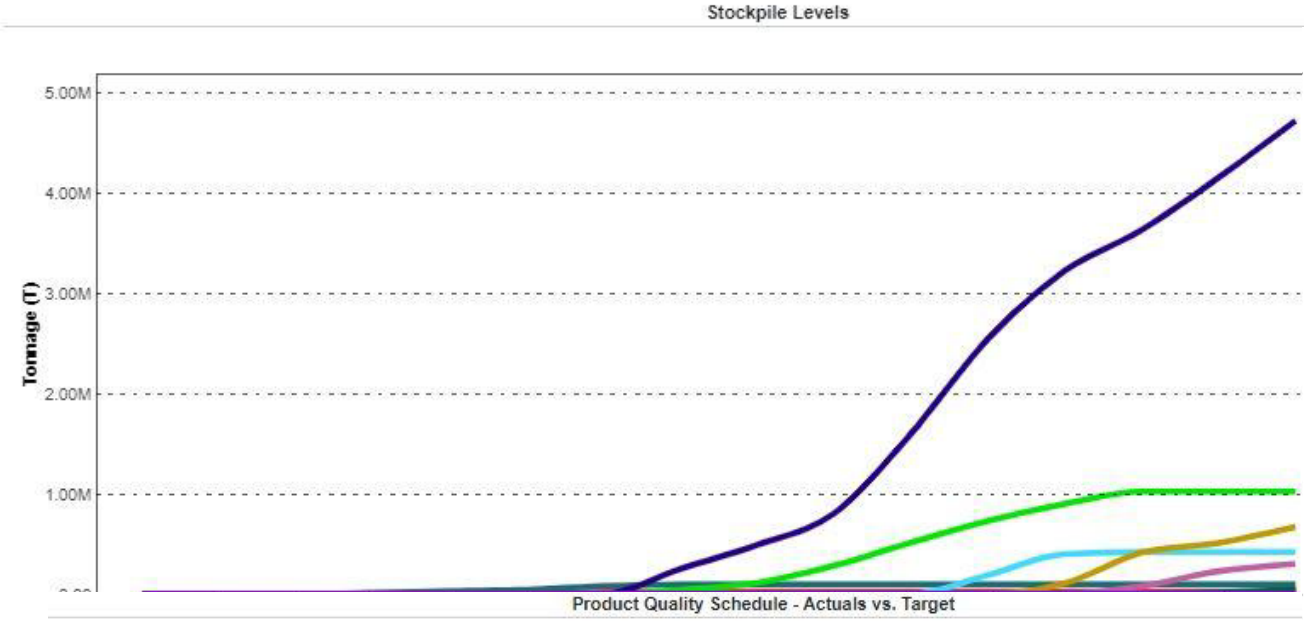
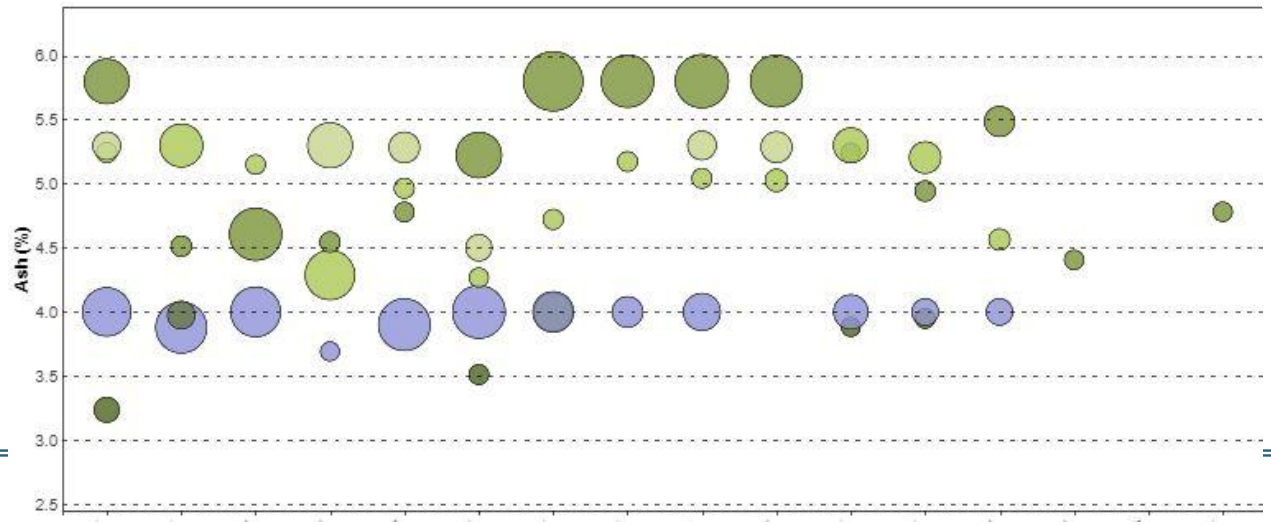
WHCC and Variable Pricing





- Good Result, but significant coal tonnage is left unallocated to the current blends
- Through BlendOpt output analysis we can determine, performance of current Products as well as Quality and tonnage of unused coals within the mining sequence

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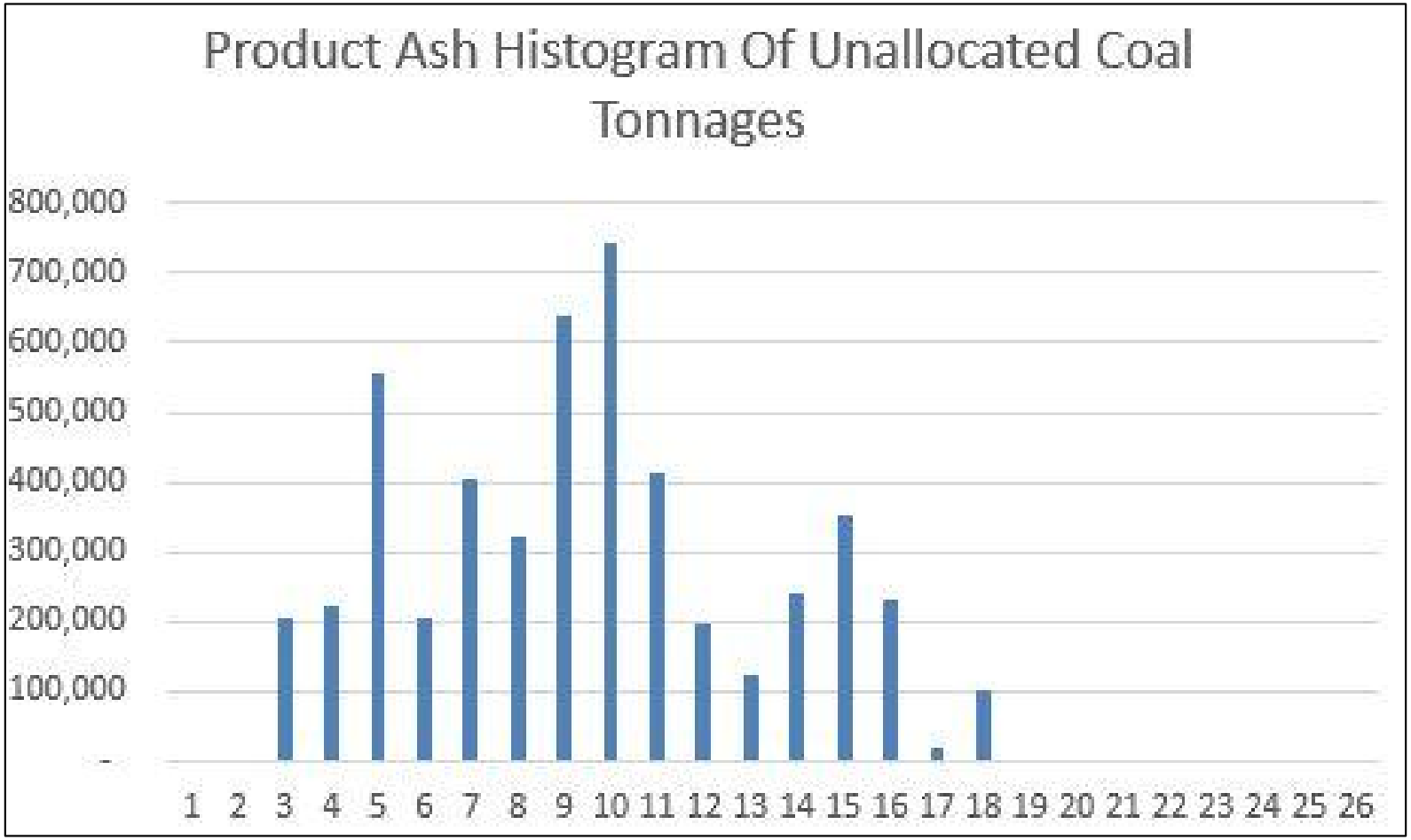
WHCC and Variable Pricing



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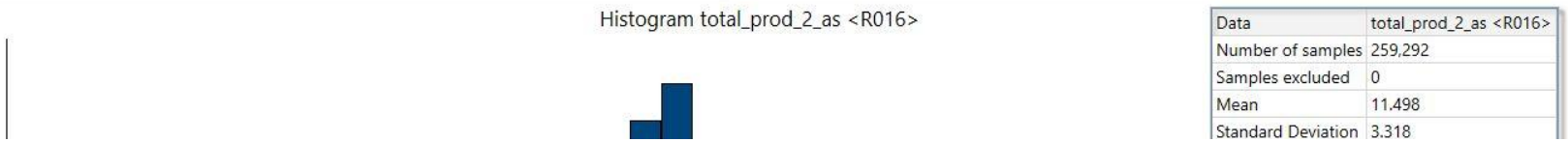
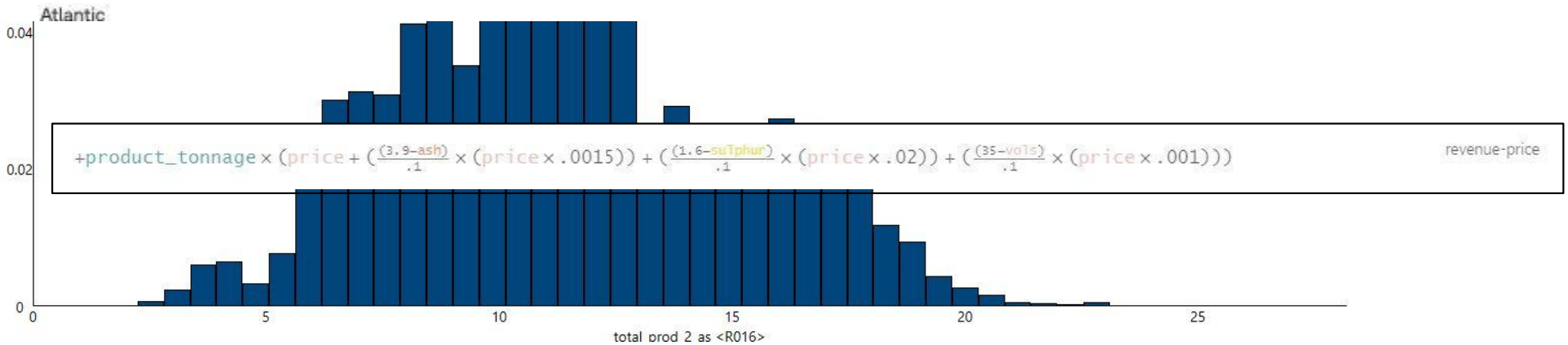
WHCC and Variable Pricing



Data	total_prod_2_as <R016>
Number of samples	259,292
Samples excluded	0
Mean	11.498
Standard Deviation	3.318

Penalties and Premia for Seaborne HCC

Assessment	CODE	Mavg	Type	Published	Page	Quality
Asia-Pacific						
CSR per 1% as % PLV FOB Australia	CPCSA00		Assessment	Daily	205	Penalty/premia applied for 67-74% Coal Strength After Reaction
CSR per 1% PLV $/Mt	CPCSP00		Calculation	Daily	205	Penalty/premia applied for 67-74% Coal Strength After Reaction
Sulfur per 0.1% as % PLV FOB Australia	CPSPA00		Assessment	Daily	205	Penalty/premia applied for 0.3-1% Sulfur
Sulfur per 0.1% PLV $/Mt	CPSPV00		Calculation	Daily	205	Penalty/premia applied for 0.3-1% Sulfur
VM per 1% as % PLV FOB Australia	CPVPA00		Assessment	Daily	205	Penalty/premia applied for 18-27% Volitile Matter
VM per 1% PLV $/Mt	CPVMP00		Calculation	Daily	205	Penalty/premia applied for 18-27% Volitile Matter
TM per 1% as % PLV FOB Australia	CPTPA00		Assessment	Daily	205	Penalty/premia applied for 8-11% Total Moisture
TM per 1% PLV $/Mt	CPTMP00		Calculation	Daily	205	Penalty/premia applied for 8-11% Total Moisture
Ash per 1% as % PLV FOB Australia	CPAPA00		Assessment	Daily	205	Penalty/premia applied for 7-10.5% Ash
Ash per 1% PLV $/Mt	CPPAP00		Calculation	Daily	205	Penalty/premia applied for 7-10.5% Ash



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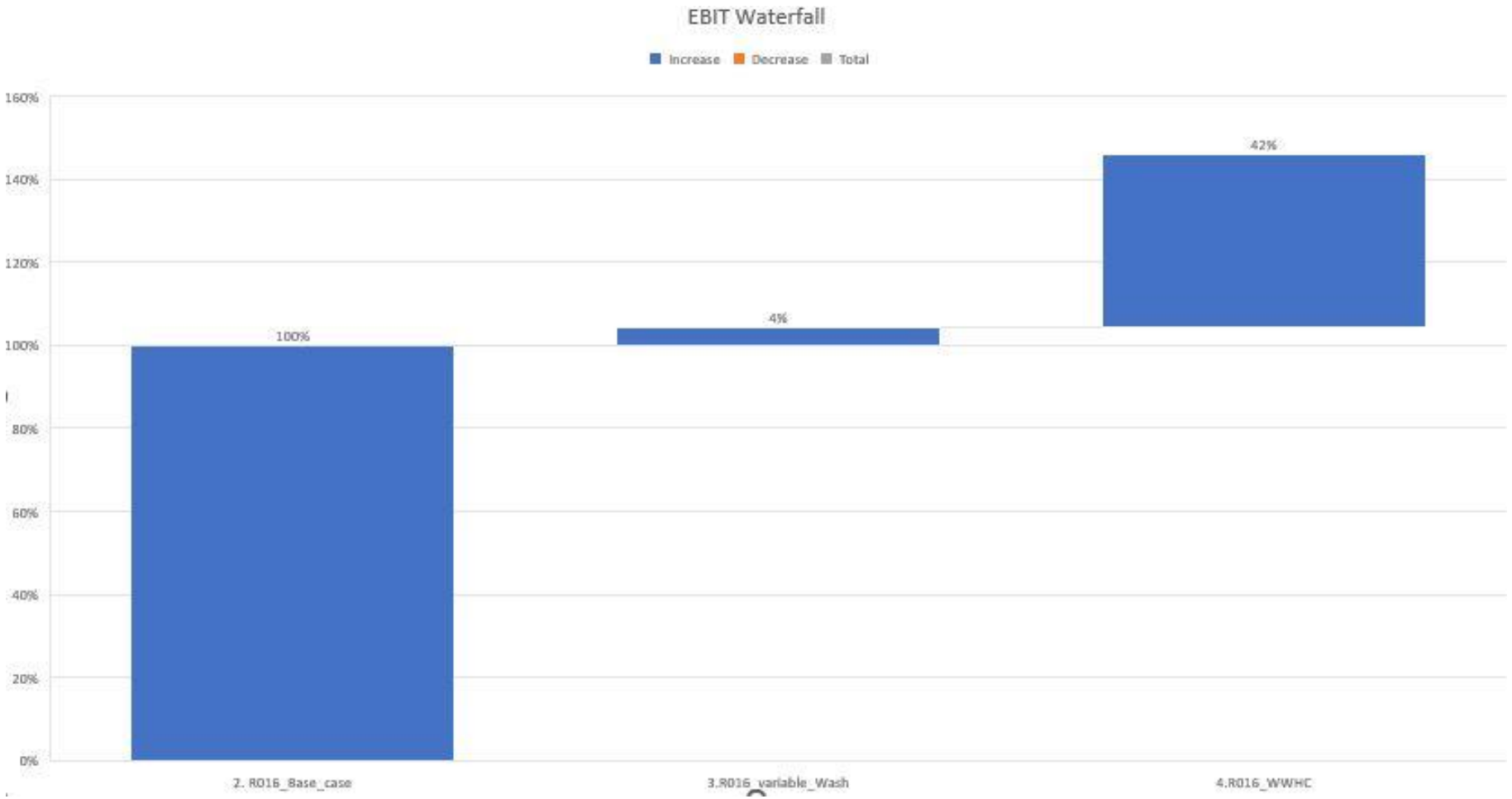
WHCC and Variable Pricing Blend Optimisation



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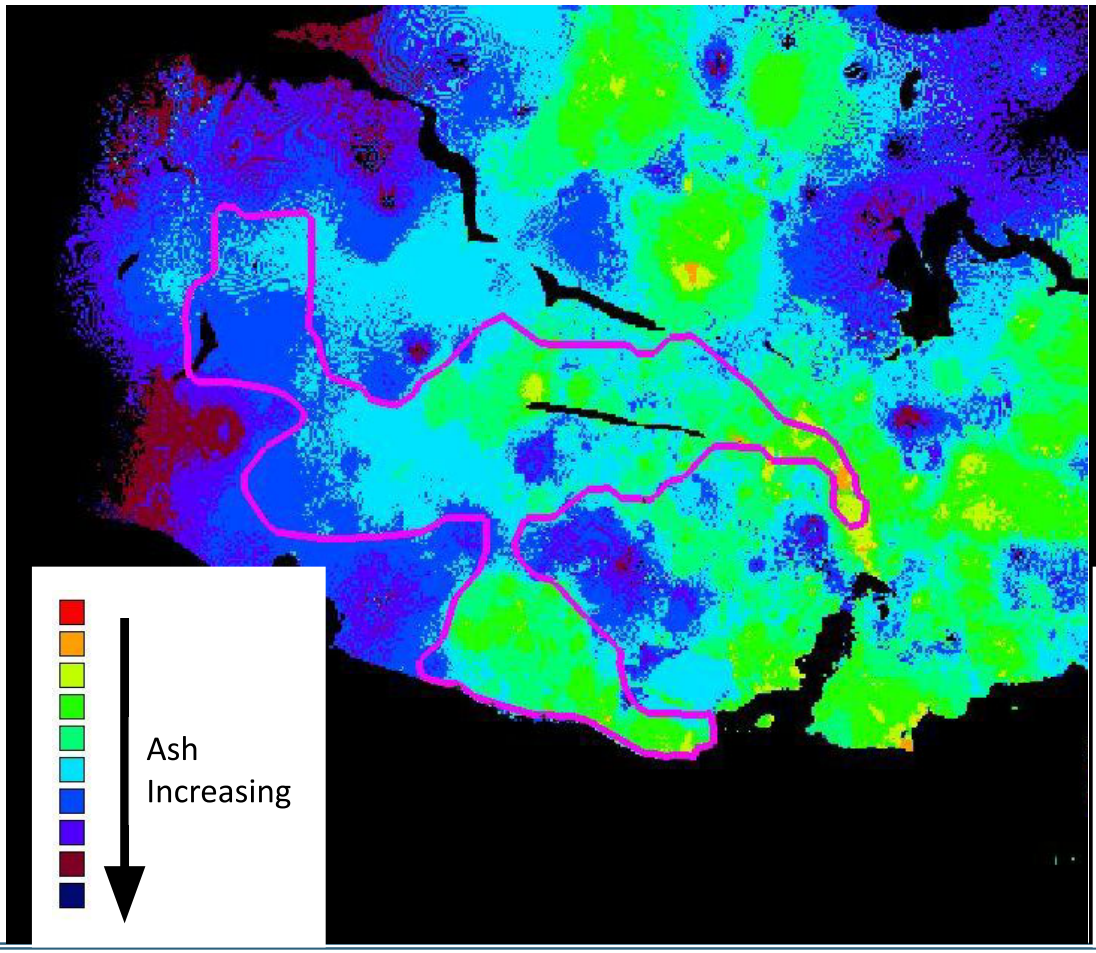
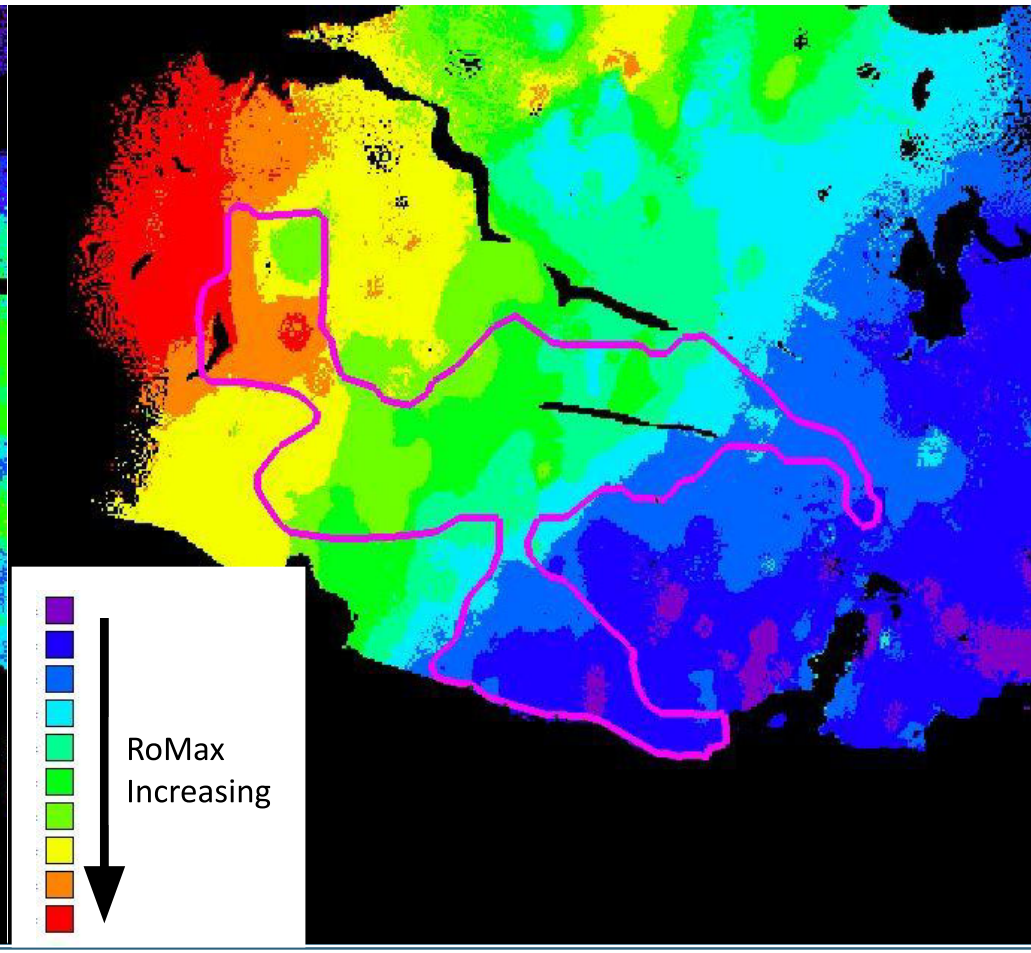
Quality Distribution

Ash Distribution

RoMax Distribution





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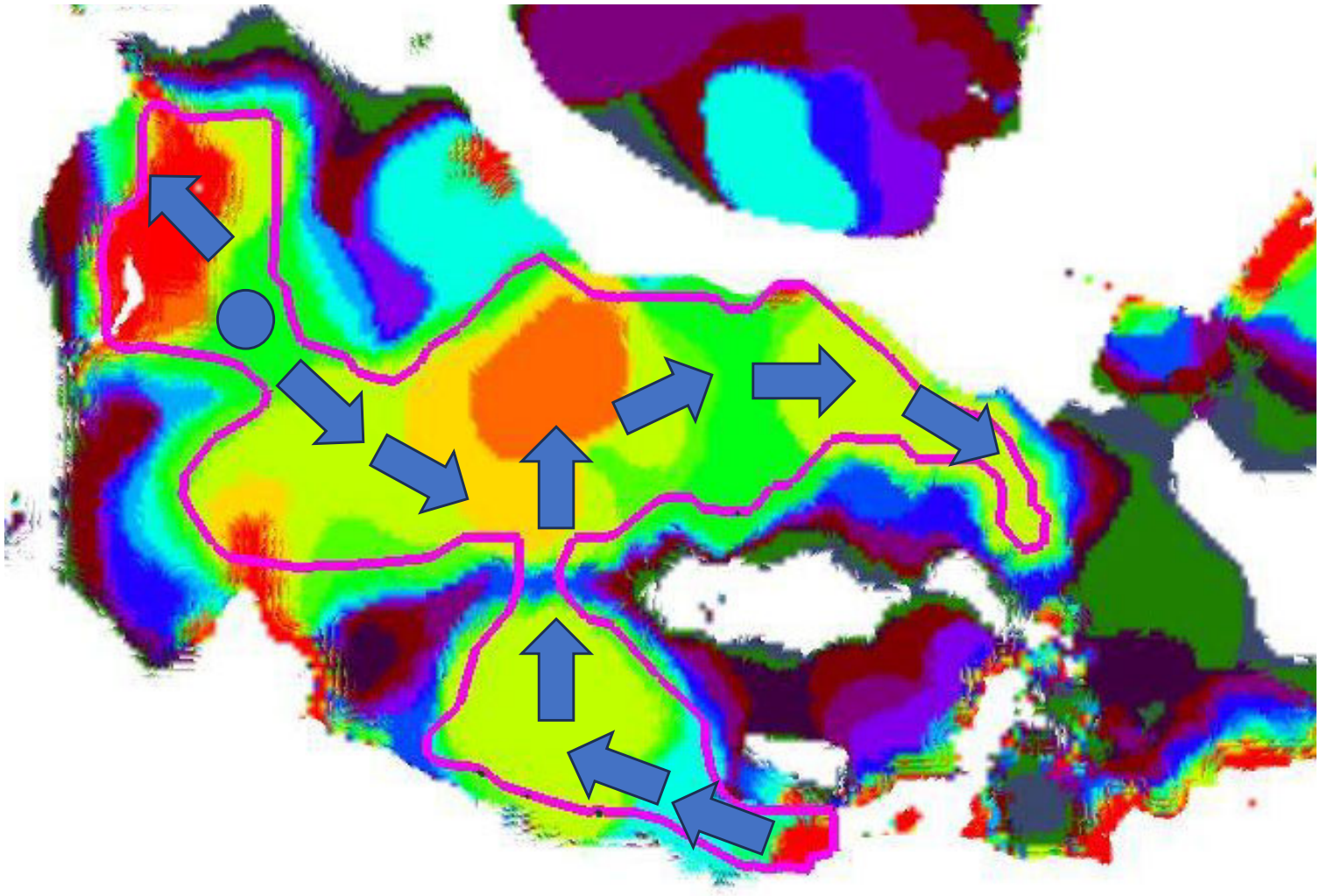
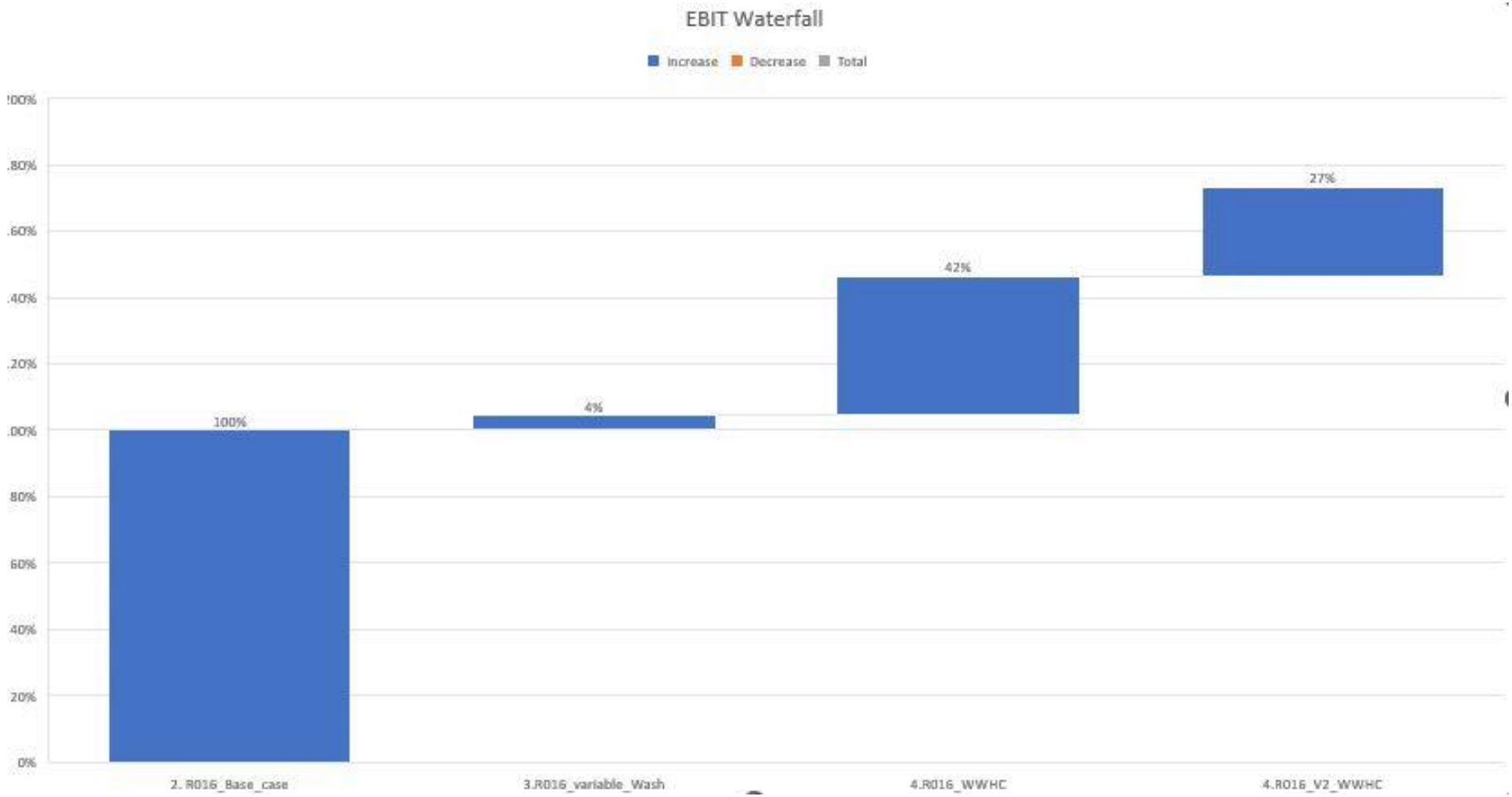
Second Draft Pit Sequence



Second Draft Pit Sequence Blend Optimization



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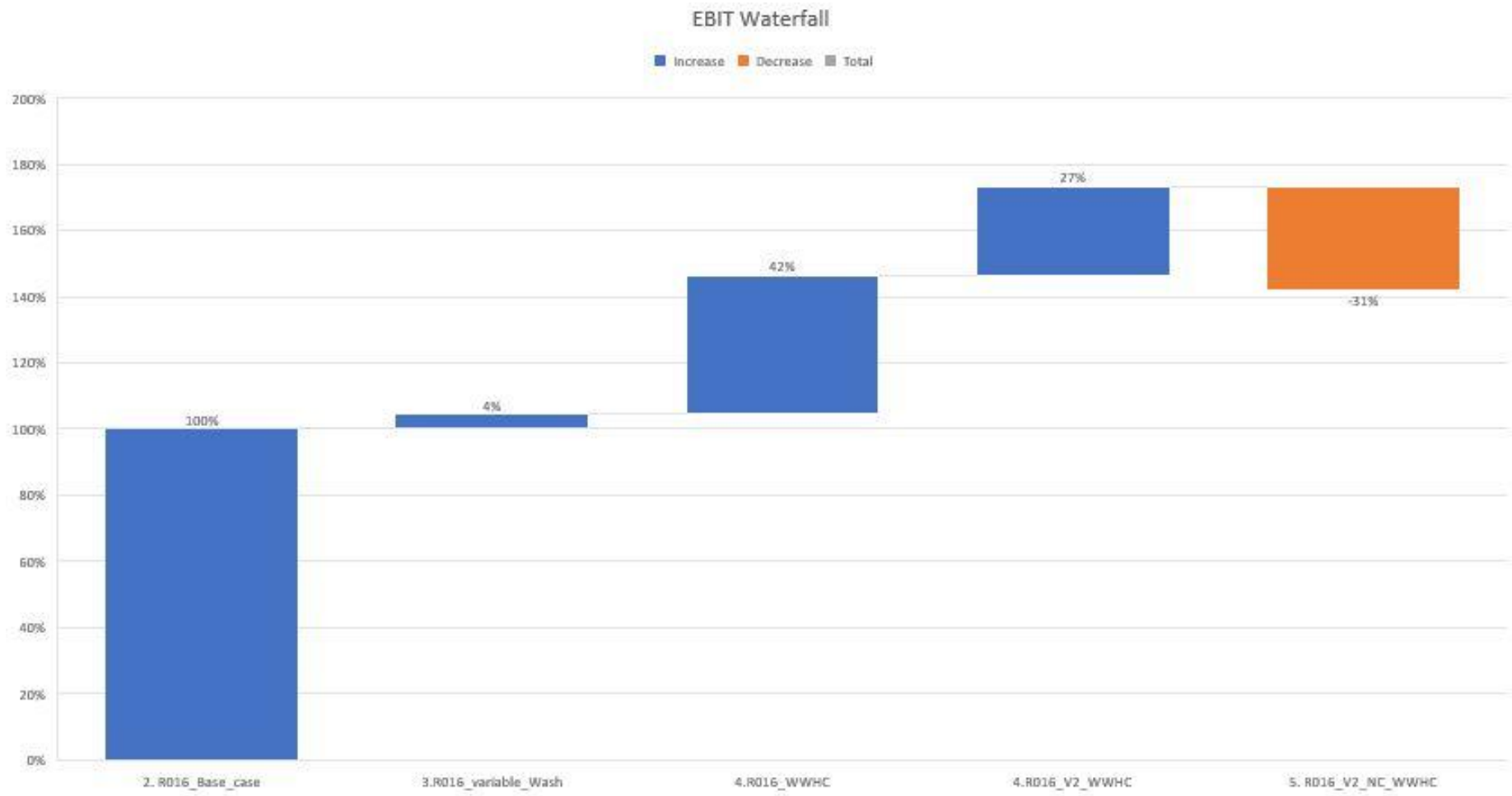
LIMN Washability Update Blend Optimisation



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Revised Pit Shell

- Current Pit Shell is showing amongst products further opportunity.
- Average Products are on the upper portion of allowable RoMax, and lower ranges of allowable Sulphur in blend.
- Could we find more Lower RoMax, Higher Sulphur coal?

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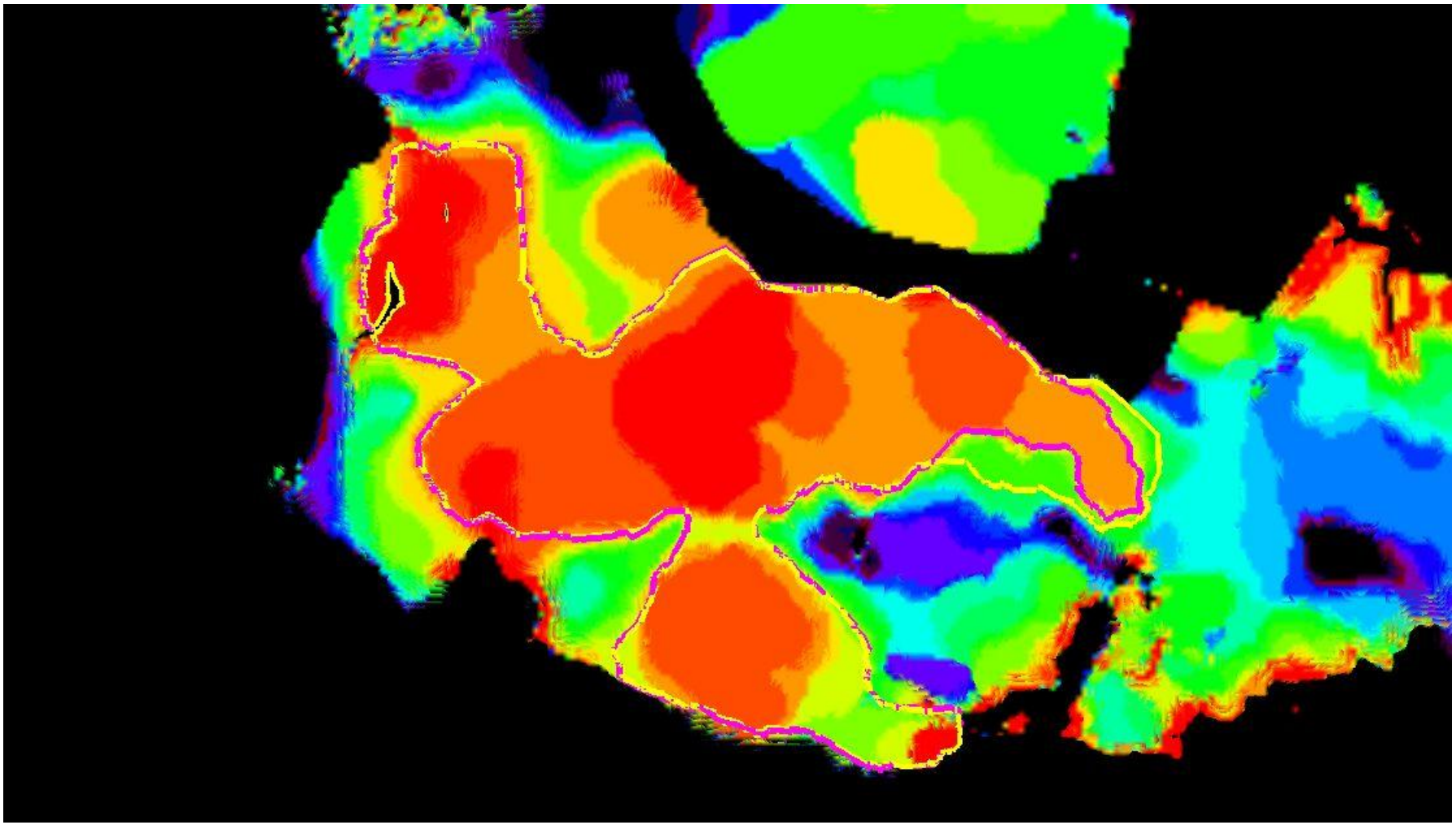
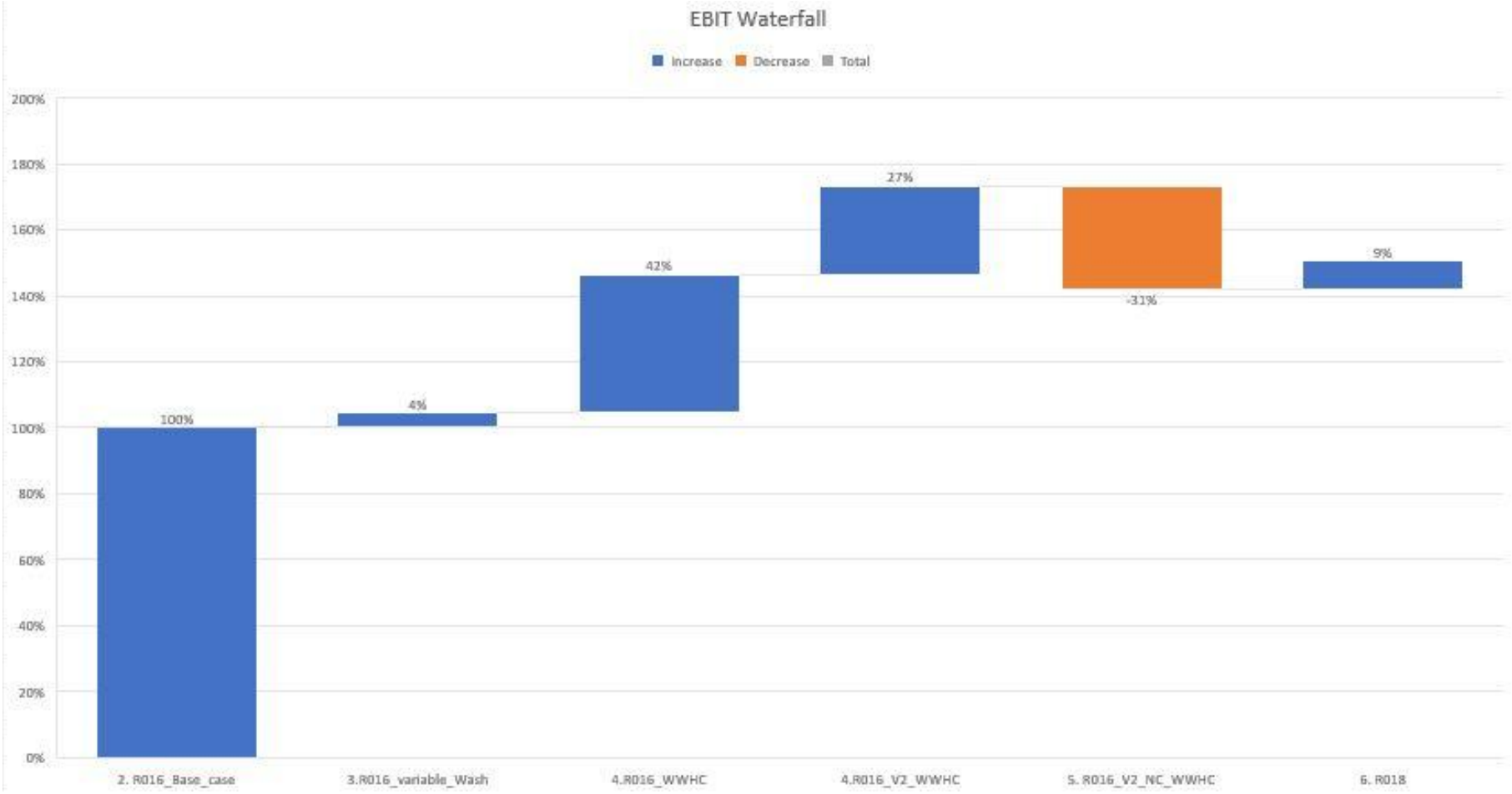
R018 Re-vised pit Shell



R018 Re-vised pit shell Blend Optimisation



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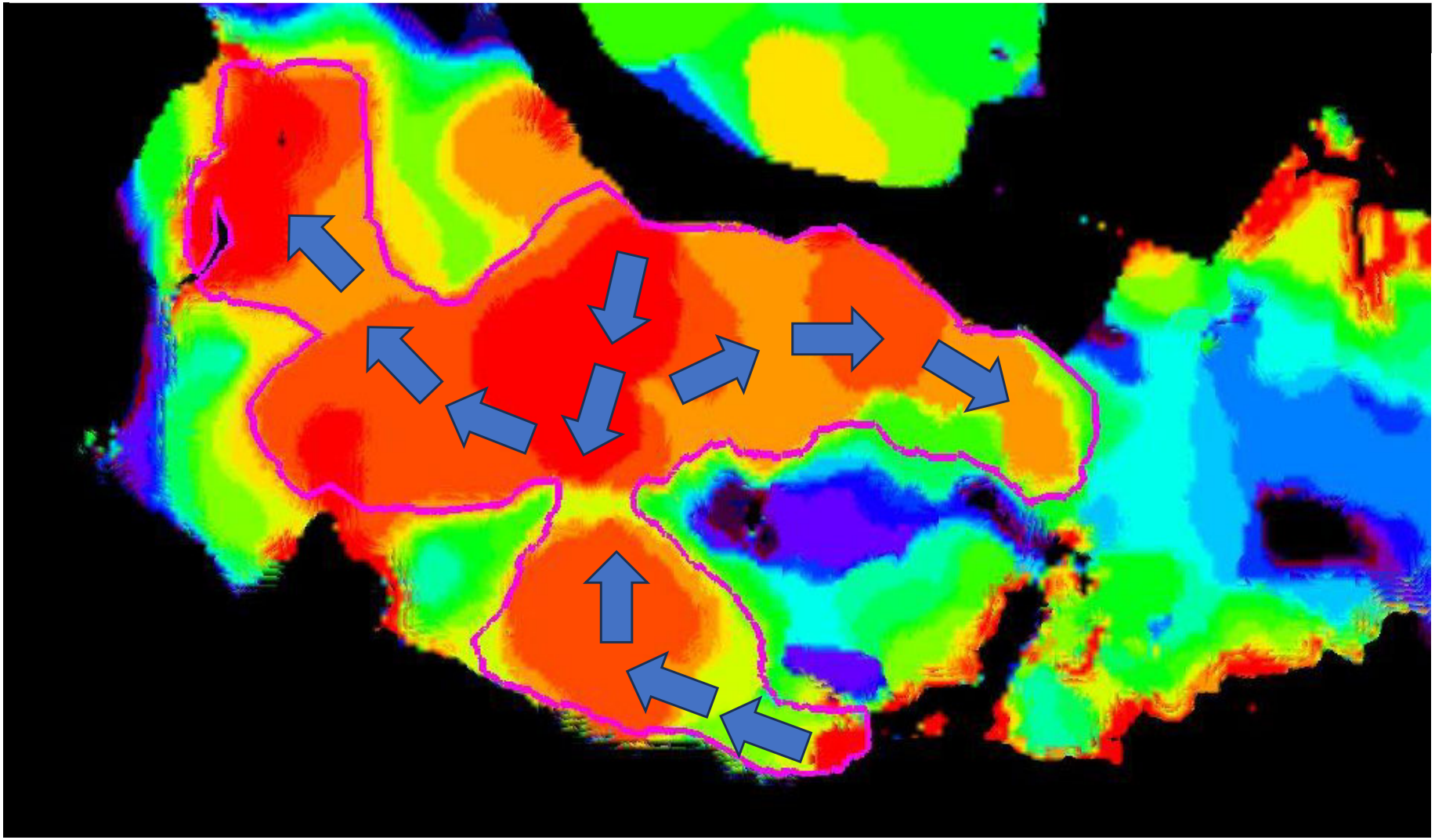
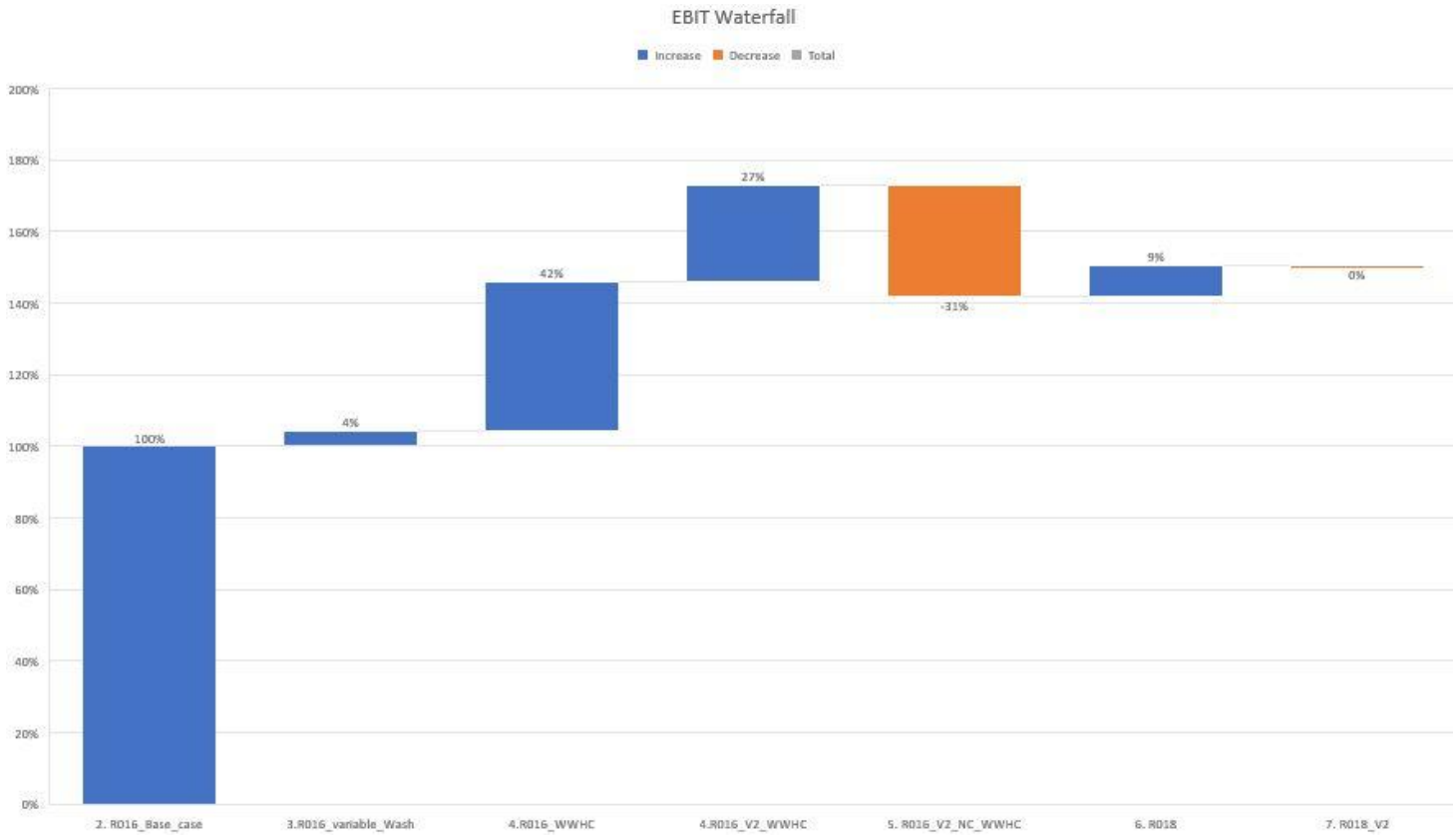
R018 Re-Sequence



R018 Re-Sequence Blend Optimisation



Good result, but with 5Mt Rom tonnes of coal uneconomic at end of mine life. With a 3 year shorter LOM. Is this future upside, or have we just de-risked the project?

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Result

- Created a Blend Optimisation utilising latest Geological models, washability analysis, and financial models.
- Variable settings with BlendOpt have created a goal find Optimisation solution, informing us :
  - What products we should be selling,
  - At what time,
  - What specification,
  - How we should manage CHPP operations,
  - And how all of these may change over time.
- An iterative to approach to mine design, sequencing, and blend optimisation with BlendOpt has resulted in a 50% increase in project EBIT and 28% increase in project NPV.

Many Thanks

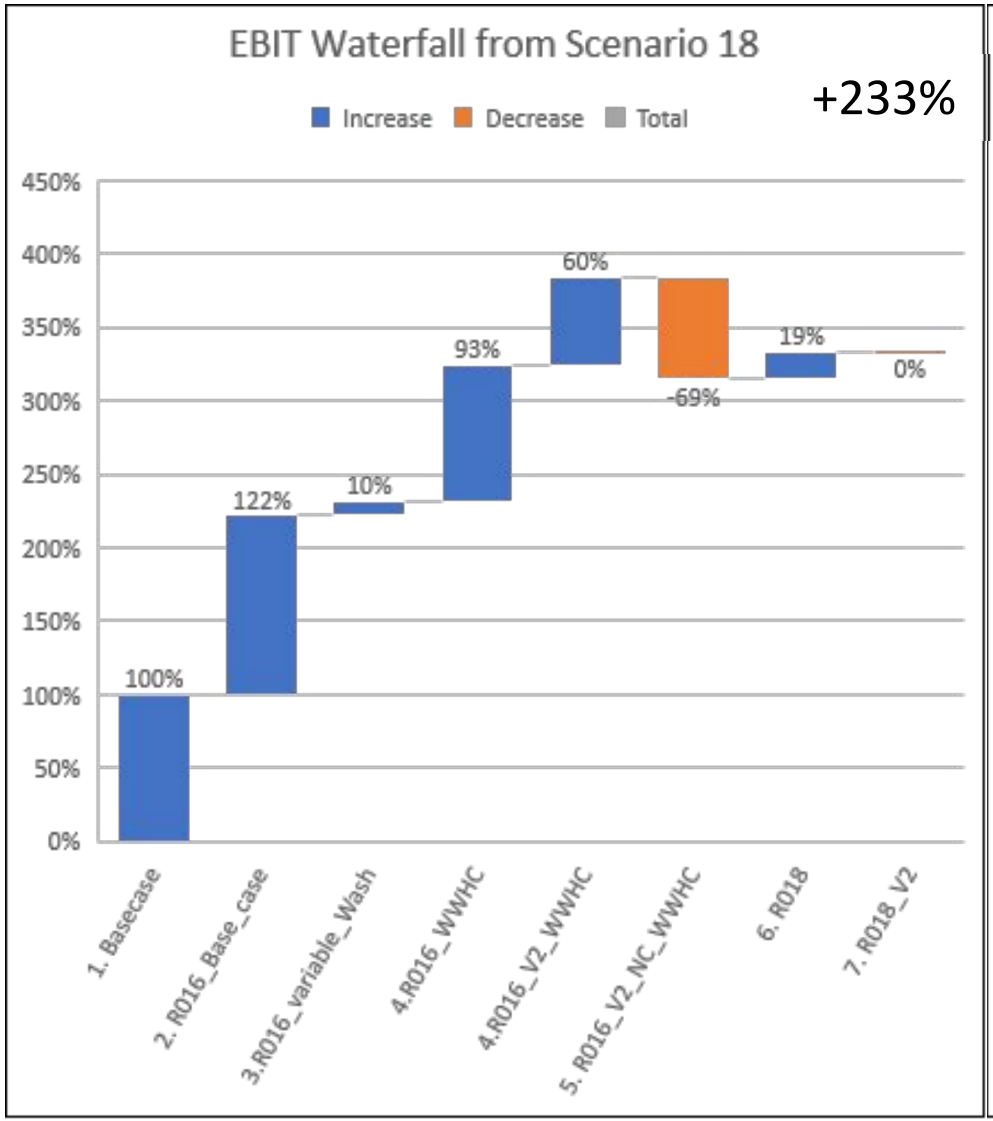
Bathurst Resources Limited

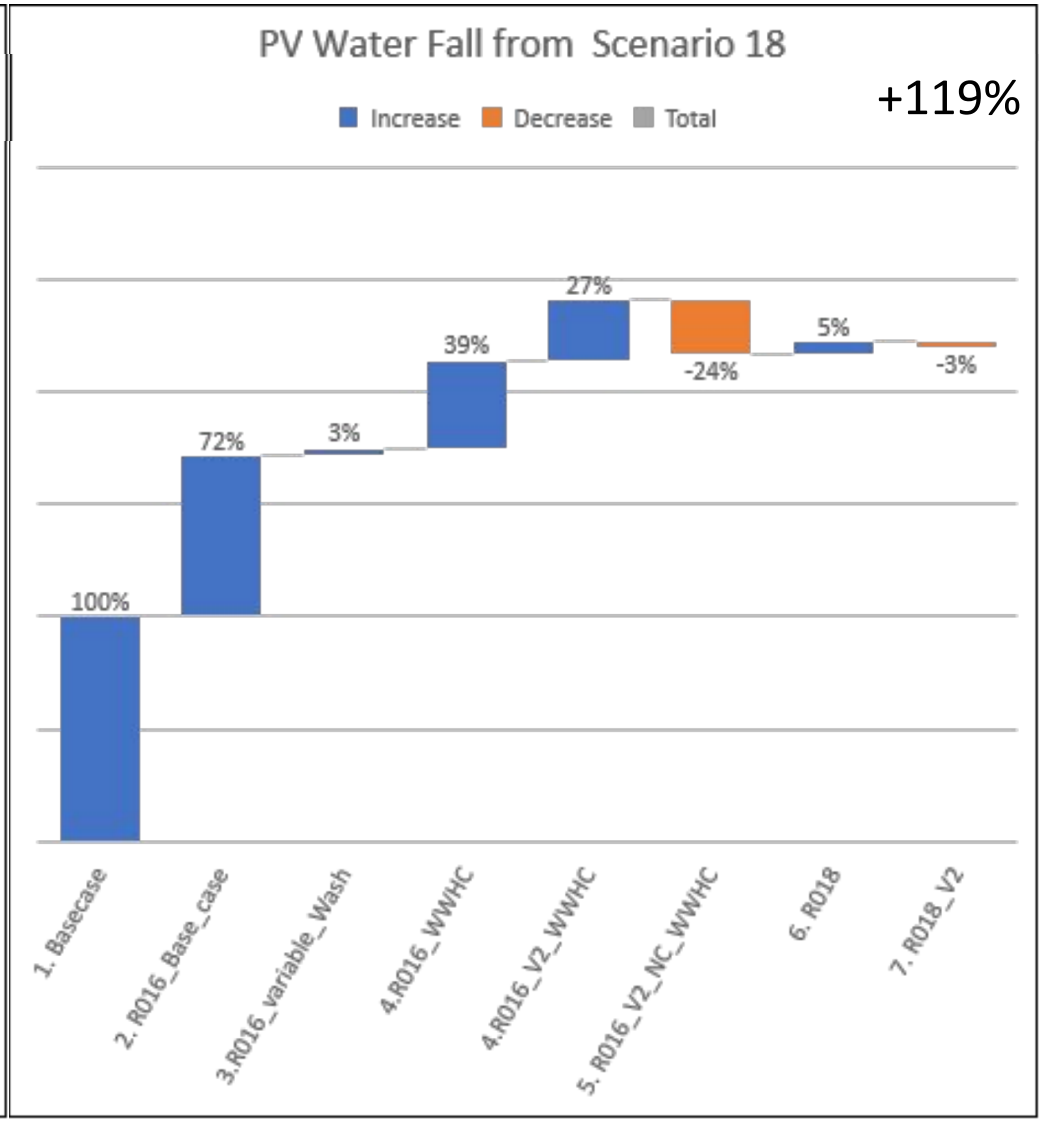
- Terry Moynihan
- Mark Lionnet
- Rob Boyd
- Tony Jury
- Eden Sinclair
- Huw Parker
- Lori Lukasewich

Paradyn

- James Whitacre
- Michelle Delebet
- Paradyn Support Team

Just for fun





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