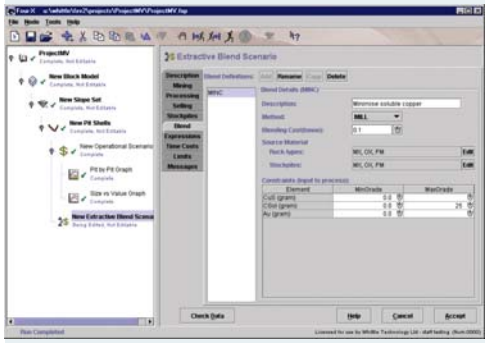
GEMCOM
Mine Production Management Solutions

WHITTLE: BLENDING MODULE

BLEND YOUR WAY TO A HIGHER NPV

OVERVIEW: Whittle is a suite of strategic mine planning tools designed for professional mine planners. There is a growing range of modules which can be added to Analyser, further increasing its performance and utility.



Typical extractive blend screen

BLENDING MODULE

The new Blending module helps to make Whittle accessible to a whole range of strategic planners who up until now, have had to manage with less than satisfactory tools. Coal, iron ore and industrial minerals miners often have to blend ore to meet product specifications. Metals miners need to blend ore before feeding it into the extraction process. Whittle's new blending module not only allows such blending to take place, it actually optimises the blend, and the stockpile usage and when combined with Whittle's Milawa Algorithm®, also optimizes the scheduling of the mine. All this is driven by the overall objective of maximising the Net Present Value (NPV) of the whole operation.

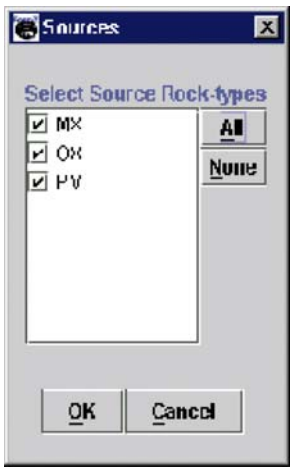
This module allows a blending optimisation to be performed on a mining sequence produced in Whittle, or imported into the system. This is no "black box" solution. The process is under the total guidance of the engineer, who has tremendous control over the assumptions, models and constraints which control the optimisation process.

WHAT IT CAN DO

The blending module plugs into Whittle's well established simulation and analysis system and utilises all the power and flexibility that has made Whittle world famous.

- **Bulk blend options:** You can specify multiple products, each5 with different specifications (constraints), prices, blending costs and blending limits.
- **Extractive blend options:** a blend criteria is specified for each method which includes blending costs and constraints. The standard process recovery, prices and selling costs and limits are applied to the extractive process.

When used in conjunction with Whittle's Multielement module, the system allows multiple grade constraint criteria to be used. For example, a coal specification can be given as a minimum BTU, maximum ash and sulphur.



Typical Rock Source Allocation

Multiple stockpiles can be specified, each with minimum cut-offs, time dependent recoveries, and (if applicable) initial size and grades.

The Blending module is totally integrated into the Whittle scheduling system and multiple pushbacks can be scheduled using one of Whittle's three standard scheduling methods. If the Milawa Algorithm is used at the same time of scheduling the pushbacks, then the blending and stockpile usage is also optimised. The user has control over minimum and maximum leads and bench separations for each push back and like many other variables in Whittle, these can be changed over time.

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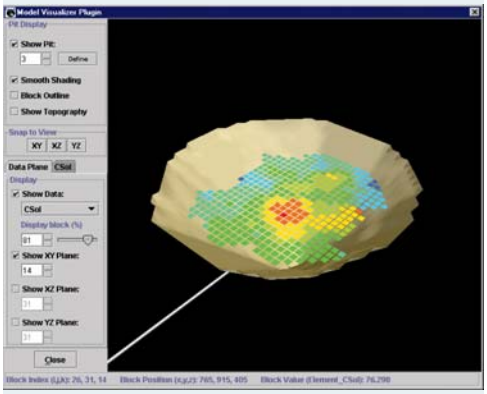
To find out more about how your operation can benefit from Whittle's Blending Module, contact us at info@gemcomsoftware.com, or visit our web site at www.gemcomsoftware.com.



Element and Blend Characteristics

The Blending module is totally integrated into the Whittle scheduling system and multiple pushbacks can be scheduled using one of Whittle's three standard scheduling methods. If the Milawa Algorithm is used at the same time of scheduling the pushbacks, then the blending and stockpile usage is also optimised. The user has control over minimum and maximum leads and bench separations for each push back and like many other variables in Whittle, these can be changed over time.

HOW IT WORKS

Gemcom has integrated the industry-standard Lindo™ Linear Programming (LP) engine into Whittle, where it is used to optimize the blend and the stockpile utilisation. Whittle reduces the problem to an LP formulation and passes it to the Lindo optimization engine. Lindo then calculates the solution and feeds the results back to Element and Blend Characteristics Whittle, which completes the calculations and formats the results for the user. When used in conjunction with the Milawa Algorithm, blend optimizations occur within each Milawa iterative loop, so blend considerations influence the schedule optimization. Combining both the algorithms of Milawa and Lindo leads to an unprecedented ability to handle tremendous complexity. The result is a schedule that meets all your technical requirements, and maximizes project NPV.

MODULAR AND SCALABLE

The Blending Module is just one of a growing range of advanced modules that can be added to the Foundation architecture of Whittle. This scalable approach allows the Whittle strategic mine planning suite to adapt and evolve with individual user requirements. A whole new range of mine planning analysis possibilities is now available to mine planning professionals.