

BHP Jansen Potash Project

Integrated mine-to-market modelling supporting major capital, capacity and project-value decisions.

During Jansen's prefeasibility studies, mining, hoisting, processing and outbound logistics were evaluated as one integrated production system. Decisions about equipment capacity, infrastructure sizing and redundancy could have significant consequences elsewhere in the value chain. The modelling allowed competing designs and operating strategies to be evaluated against production capacity and project value before major capital commitments were made.



Integrated production and logistics analysis

Project objective	Quantify mine-to-market production capacity and compare engineering and operating alternatives by their contribution to delivered production and project NPV.
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PUBLISHED PREFEASIBILITY DECISION IMPACT

<p>~\$300M</p> <p>Capital expenditure deferred</p> <p>Second-shaft equipment / headframe</p>	<p>15-20%</p> <p>Increase in estimated Stage 1 capacity</p> <p>Two-thirds attributed to modelling</p>	<p>~\$500M</p> <p>Estimated Stage 1 NPV improvement</p> <p>From projected production gains</p>
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Decisions supported	Supported deferral of ~\$300M in second-shaft equipment; showed that a proposed \$10M stockpile saving would reduce NPV by \$33M; and informed hoist and mill sizing, equipment redundancy, bypass provisions and maintenance strategies.
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Integrated model scope

MINE → HOIST → PROCESSING → RAIL → PORT → MARKET

<p>Mining & hoisting</p> <p>Mining rates, equipment availability, buffers and hoist constraints.</p>	<p>Rail & port logistics</p> <p>Train movements, inventories, unloading and shiploading.</p>
<p>Processing & reliability</p> <p>Plant configuration, downtime, maintenance and redundancy.</p>	<p>Market & inventory</p> <p>Demand timing, customer orders and outbound product inventories.</p>

Understanding system-wide performance

Assessing design and operational trade-offs

The analysis captured equipment availability, maintenance, storage constraints, production variability and the interactions between mining, processing and logistics. It identified bottlenecks, compared alternative capital configurations and quantified how operating changes would affect performance across the full production system.

Transferable insight	The lowest-cost design for an individual asset is not necessarily the best investment for the project. Evaluate capital and operating decisions by their impact on saleable production and project value, accounting for interactions, constraints and variability across the full value chain.
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KEY-PERSONNEL EXPERIENCE	PROJECT TEAM AT THE TIME	PROJECT OWNER
Bryan Monk, P.Eng. model lead, original modelling team	BHP + Amec Foster Wheeler	BHP