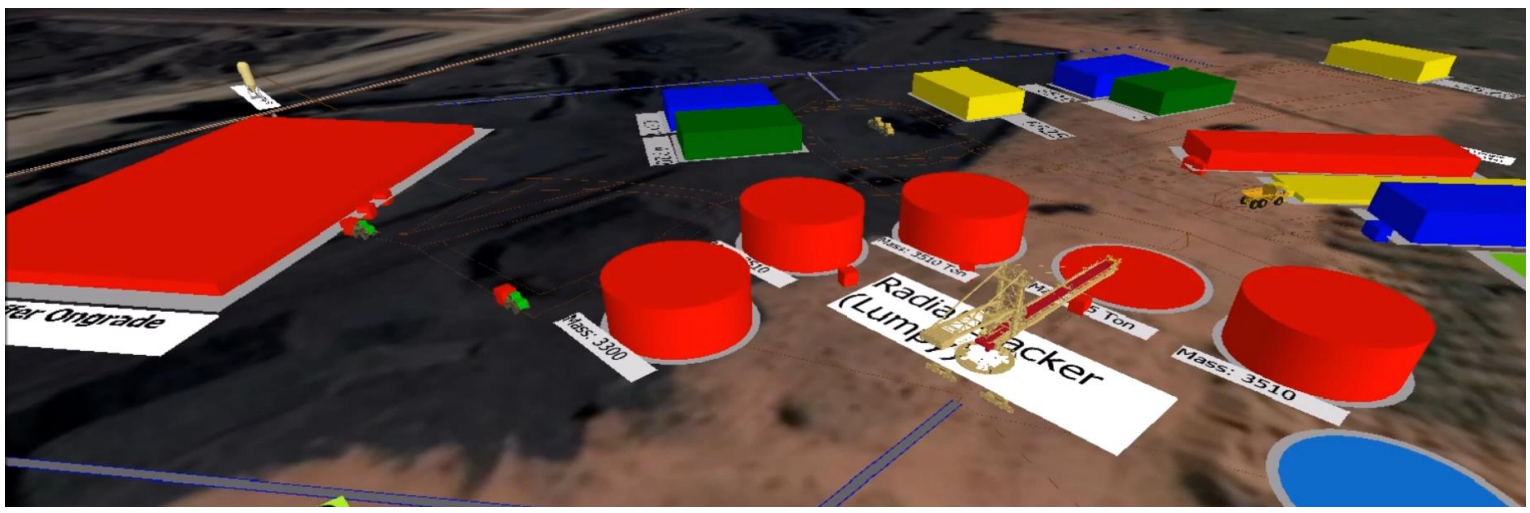
PRODUCT YARD SIMULATION

Simulation and Decision Support

25 Mn

Clients: *Kudumane Manganese Resources (KMR)*
Duration: 3 Months (2018)



Product Yard snapshot from SIMIO video Click HERE or follow the link for a video: bit.ly/2TOqZPY.

Project Team:


Tiaan Ackermann
PROJECT LEAD


Margariet Lumgair
TECHNICAL LEAD


Johan Erasmus
SIMULATION

CLIENT NEED

KMR requested VBKOM to develop a dynamic simulation model in Simio software that simulates the flow of material from ROM crushing to train loadout.

The primary purpose of the simulation was to test several grade and material allocation scenarios, and determine the optimal layout and infrastructure required in the Product Yard.

APPROACH

VBKOM set out by defining the system operating philosophy in a Model Blueprint. Typical **inputs** to the simulation model included:

- Forecasted mine schedule of ROM feed to crushers (grade distribution applied)
- Equipment specifications (crushing, conveying, stacking speeds, breakdowns and failures, capacities, shifts, grade cut-offs, etc)
- Stockpile specifications (allocated grades, capacities, locations)
- Load and haul scenario parameters (cycle time, equipment matching, interfacing rules with stockpiles)
- Forecasted train demand schedule and train loading specifications (wagon capacities, silo feed bin operation, surge capacity)

The dynamic simulation model delivered several key **metrics**:

- System uptime in a dynamic breakdown environment
- Stockpile optimisation and sizing within a constrained product yard area footprint
- Material re-handling indicator as a risk to degradation
- Train loading duration
- Mobile equipment (front-end loaders) fleet optimisation

SCENARIOS

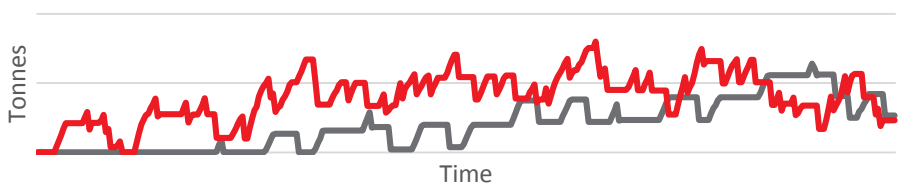
KMR is constructing a new crushing circuit to increase production ROM feed from additional mining reserves. The current product yard configuration and train product feed bin will then become the bottleneck, and therefore the following scenarios were tested in the simulation:

- Second offline feeder system to the train loading silo
- New radial stockpile for rapid loading of high-grade material
- New crushing circuit in conjunction with existing infrastructure
- Optimal number of mobile equipment to move material between stockpiles due to grade priority, mining '**push**' production and train '**pull**' demand
- Sizing and location of stockpiles as per grade allocation

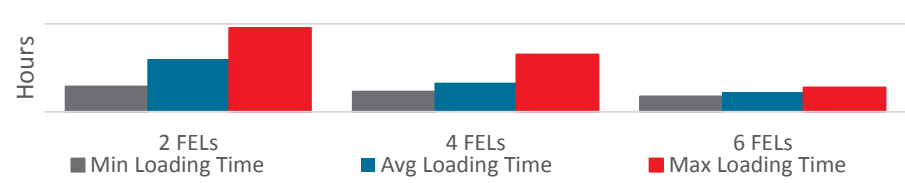
VALUE DELIVERED AND RESULTS

The simulation demonstrated real value with accurate results for various Front-End Loader and Offline Feeder scenarios:

- Annual stockpile level fluctuation



- Train loading duration



info@vbkom.com
vbkom.com
Centurion | Kathu | Rustenburg

VBKOM
Innovation. Expertise. Solutions.