Albemarle Kemerton

Lithium hydroxide plant: process and traffic simulation supporting design decisions.

The proposed lithium hydroxide plant required reliable process capacity and practical truck movements across a constrained industrial site. Equipment configuration, surge storage and downtime needed to be evaluated alongside loading times, truck queues and parking requirements. Two dynamic models provided a quantitative basis for refining process design and site arrangements before operation.



Process reliability and site logistics design analysis

Project objective	Validate process capacity and reliability, confirm equipment and storage requirements, and test traffic flow, loading, queuing and parking arrangements during plant design.

DESIGN QUESTIONS EVALUATED

PROCESS

Capacity and reliability

Equipment, storage and downtime

TRAFFIC

Truck movements and queues

Gates, scales, loading and parking

DESIGN

Configuration and layout

Operating modes and site footprint

Decisions supported	Validated surge volumes and equipment sizing, tested process bottlenecks and reliability sensitivities, and used truck-cycle results to refine traffic flows, loading areas, queuing, parking and site footprint.

Model scope

ORE → PROCESSING → PRODUCT | GATE → LOAD / UNLOAD → EXIT

Process equipment

Mass flows from spodumene receipt through to product and tailings.

Equipment reliability

Downtime, buffers, storage, flow rates and process bottlenecks.

Material movements

Four inbound materials and three outbound products by truck.

Site traffic

Gates, weigh scales, loading, unloading, queues and parking.

From simulation to design decisions

Testing configurations and operational variability

Process simulations explored equipment, storage, flow-rate and downtime alternatives. The traffic model tracked complete truck cycles to identify congestion and define queuing needs. Results informed traffic circulation and loading-area arrangements. A configurable process model was delivered for subsequent analysis.

Transferable insight	Equipment capacity alone does not establish a workable plant design. Testing reliability and storage limits alongside truck arrivals, queuing and circulation reveals constraints that steady-state calculations and layout drawings can overlook.

KEY-PERSONNEL EXPERIENCE	MISIM CORPORATE ENGAGEMENT	CLIENT
Yes | Bryan Monk, P.Eng., modelling lead	No | prior-employer project	Albemarle Lithium

Historical key-personnel project experience developed during employment at Wood.