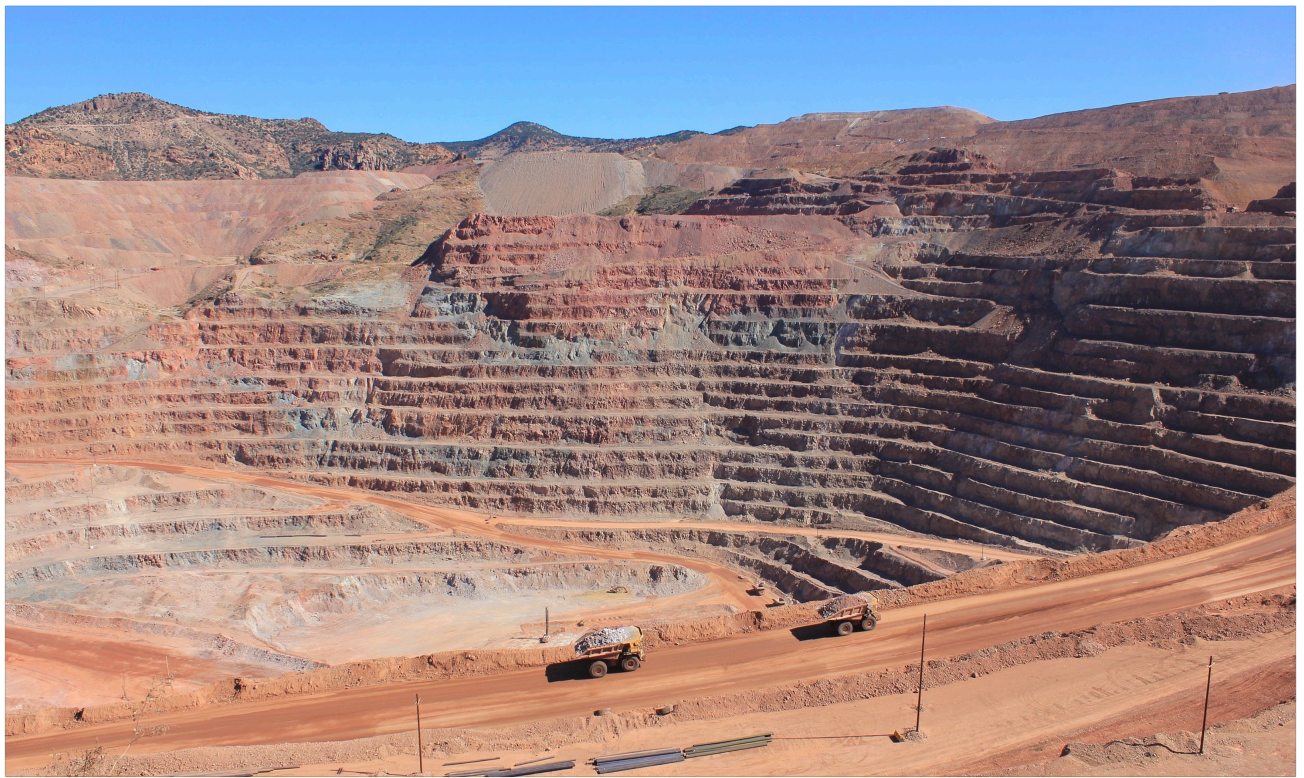


THRUPUT

Supply chain reconsidered



MINING

RECONSIDERING PROCESS AND MATERIAL HANDLING

VERTICAL LIFTS, INSTALLATION, SITE SUPPORT, TESTING & MORE

Mining is 24/7 tough. Remote sites, long production times and a reliance on heavy duty equipment makes it complicated and demanding. Knowledge of the work varies throughout supply chain consulting. There's expertise, but it's sporadic, siloed and firms don't think mining is sexy. Again, this work is hard.

But we know mining, from big picture to granular levels of operation. From storeroom and equipment management. We see a complicated but manageable puzzle. We understand parts availability, security/control, issue responsiveness, and indoor/outdoor space management for MRO/material supply chains.

In mining, shutdowns result in thousands to millions of lost production; "efficient supply chain" means safe and efficient operations versus scrambling to meet quotas

Section II - Let's Rethink This:

Reconsider management of MRO Parts/Equipment by establishing basic practices in core operations:

Implement Inventory Management Best Practices: This includes tracking inventory levels, setting reorder points, and utilizing barcoding and scanning technologies to improve accuracy and efficiency. Your VMI suppliers already do this.

Centralized Maintenance and Support: Have the right parts, critical spares, long-lead items, and consumables positioned in central operations and distributed to point of use by supply chain, not retrieved by technicians.

Minimize Point of Use Parts Hoarding: Shops with stockpiles of parts indicate gaps and materials not on the books. If its hidden, real operating costs are not measurable.

Warehouse Management Systems: This is complex. Design this to accommodate frequent movement of warehouses and support the management of multiple types of inventories. Multiple warehousing (MRO, bulk refined ores, supplier VMI warehouses, explosives, fuel, and supplies) types and frequent relocation of warehouses allow gaps in critical material information. Track it and know where it resides.

Automation and technology: Most stockrooms and warehouses are rack, shelving and floor storage with some leveraging aging carousels. Automation technology especially for small parts is denser, more secure, and safer today than it has been. And space and labor savings make it justified in most primary parts warehouses.

A Case in Point: Recent Mining Project

We just completed a full warehouse renovation at one of the highest output copper mines in the US opening over 14,900 SF or a 90% reduction of enclosed storeroom. This consolidated of several operations. Additionally, it allowed at risk motors to be moved under-roof. Total project cost was slightly above the value of 2 large motors that were weather exposed previously.

We delivered: Better material management and prolonged equipment performance.

We worked with on-site leadership to understand current and future planned site equipment mix across all process and pit operations (both new and planned phase-out). Parts models were developed to create required small part, sensitive part, large part, indoor/outdoor, and high-volume consumables. This became foundational to a new layout and consideration of automation and alternative equipment. Small parts and motors were identified and critical gaps in the stockroom and the creation of space was the focus of the improvements.

We delivered: Long-term thinking yielded structural changes in planning.

Review of multiple storage options and automation; six Vertical Lift Modules (VLMs) were selected to replace high-bay shelving and stacked drawers scattered around the warehouse. Centralization of small parts into a single storage and pick area near the issue counter provided greater control. It also created more rack storage for large items. Smaller warehouses were consolidated improving inventory security and reduced staffing needs.

We delivered: Buildings better re-purposed as material storage and specialty shop space.

Systems integration was a challenge. Here, the VLM software was integrated into an existing SAP installation configured for basic warehouse operation (receive, stock, pick, issue). The VLM configuration required a secondary SAP application and security protocols to allow for external maintenance and software updates. This created challenges to identify the correct IT resources to both configure SAP and approve

network/SAP remote access before design, configuration, and testing of the automation could begin. Once the chaos of firewalls and options passed, our team developed a clear configuration, testing, and operational procedure delivering a robust deployment and smooth start-up of the VLM.

We delivered: Correct testing and didn't avoid the weeds of integration.

Parts identification and slotting balanced pick volumes, weight, and product heights across the VLM (including trays) identified parts and created a multi-week VLM loading strategy. It avoided impacting operations by having all parts available during the transition. On the facility side, the addition of back-up power to the VLMs even during power outages was completed. Lighting and fire suppression changes made to the impacted areas and prioritization of vulnerable high value yard storage parts was developed to bring into the main warehouse.

We delivered: Comprehensive thinking and prevented downtime as well as smarter facilities

There are fundamentals to doing this correctly. ThruPut exists because we know a better way to go about this work. Each sector we serve have models purpose built for them and then reused across the industry. We've seen breakdowns in those models. In short, every sector we served needs reconsideration.

Our world has shifted. The patterns that we once saw as predictable undergone radical rethinking. Supply Chain Reconsidered is our approach to addressing these shifts.

Mining, equipment management and storeroom operations need reconsideration.

Let us know if we can be of service to you.