REQUEST A PROPOSAL
FROM K-MINE

End-to-End Solution For Mining Industry

K-MINE
REACH NEW LEVEL

End-to-End Solution For Mining Industry

K-MINE excels in the mining industry by combining expert consulting services with advanced software solutions, catering comprehensively to the mining cycle. Our stand-alone application covers most operational needs in the mining industry.

Leveraging capabilities such as 3D modeling, resource estimation, and equipment management, K-MINE is widely used by companies of different sizes for open pit and underground mining. Over 5,000 surveyors, geologists, mining engineers, designers, and technicians leverage K-MINE modules and their solutions on a daily basis.

EXPLORATION → PRE/FEASIBILITY STUDY → DEVELOPMENT → PRODUCTION

Software For Open Pit Mining

Surveying
Functionality for accurate analysis, monitoring, and optimization of surveying data.

Geology
Geological modeling, resource estimation, mine planning, and operational control in surface mining operations.

Open Pit Design
All tools you need to design pits, dumps, railways, haul roads, and other structures.

Scheduling
All tools you need for Long-, Middle-, and Short-term planning abilities.

Pit Optimizer
Analysis and definition of optimal pit contours with provided deposit economic data.

Drill & Blast Design
All necessary functions you need to design drilling & blasting processes.

Stability Analysis
Stability assessment of open pit walls and bench, and dump lifts in various rock mass.

Infrastructure
Online maps creation and update with 3D elements of industrial sites and maintenance of objects database.

Software For Underground Mining

Surveying
Advanced solution for automating surveying data management processes in underground mining.

Geology
3D ore body modeling and support for complex underground mine layouts.

Underground Design
Solutions for underground projects during the initial mine development and further operations.

Stope Optimization
Tool for determining the most efficient stope boundaries in underground mining.

Ventilation
Simulation of different ventilation modes to determine pollution state and plan accident elimination.

Infrastructure
Online maps creation and update with 3D elements of industrial sites and maintenance of objects database.

K-MINE Highlights

over **30** years on the market

QP for **NI 43-101**

CP for **JORC**

over **300** projects

over **1,500** licenses sold

over **100** team members

Offices in UK, Europe, USA, Canada

Range of Commodities

Chrysotile Asbestos | **Graphite** | **Limestone** | **Granite** | **Kaolin** | **Coal**

26 55.845 **Fe** Iron	79 196.967 **Au** Gold	25 54.938 **Mn** Manganese	29 63.546 **Cu** Copper	47 107.8682 **Ag** Silver	3 6.941 **Li** Lithium	4 9.012 **Be** Beryllium	92 238.02891 **U** Uranium
Polymetals		22 47.867 **Ti** Titanium	27 58.933 **Co** Cobalt	28 58.693 **Ni** Nickel	24 51.996 **Cr** Chromium	13 26.982 **Al** Aluminium	**Clay**

Services

Engineering, Planning and Optimization

- Detailed Mine Design and Engineering
- Mining Method Selection
- Strategic Mine Planning
- Pit Wall Design and Stability Analysis
- Cut-off Grade Optimization
- Optimization Services
- Environmental Impact Assessment
- Mine Closure Planning and Rehabilitation
- Ventilation System Design

Geological Services and Economic Assessment

- 3D Modeling of Deposits
- Geological Mapping
- Resource and Reserve Estimation
- Geostatistical Analysis and Kriging
- Compliance with Reporting Standards (NI 43-101, JORC, etc.)
- Exploration Targeting and Assessment
- Drillhole Planning and Management
- Geotechnical Data Interpretation and Analysis

Financial and Investment Services

- Scoping, Pre-Feasibility, and Feasibility Studies
- Deposit Investment Opportunity Analysis
- Competent Person Reports
- Independent Mine Audit
- Independent Financial Project Audit
- Financial Modeling and Evaluation
- Risk Assessment and Management

Digital and Innovative Solutions

- Digital Twins for Mine Operations
- Advanced Analytics and Machine Learning
- Automated Reporting Systems
- Integration with IoT Devices for Real-Time Monitoring
- Predictive Maintenance Systems
- Cloud-Based Data Management Solutions

METINVEST · ArcelorMittal · FERREXPO · ERG · KAZAKHMYS · CALPORTLAND · BGV GROUP MANAGEMENT · VALE · VOLT RESOURCES · global battery materials · InterGroup MINING · VELTA · UMG · KOSTANAY MINERALS JSC

Surveying

Field Data to Volumes and Reconciliation

Process field measurements to generate as-built surfaces and 3D workings, and deliver volume reconciliation for open pit and underground operations. Data are imported directly from survey instruments, traverses are computed with automatic accuracy checks, and results are seamlessly integrated with mine planning and grade control.

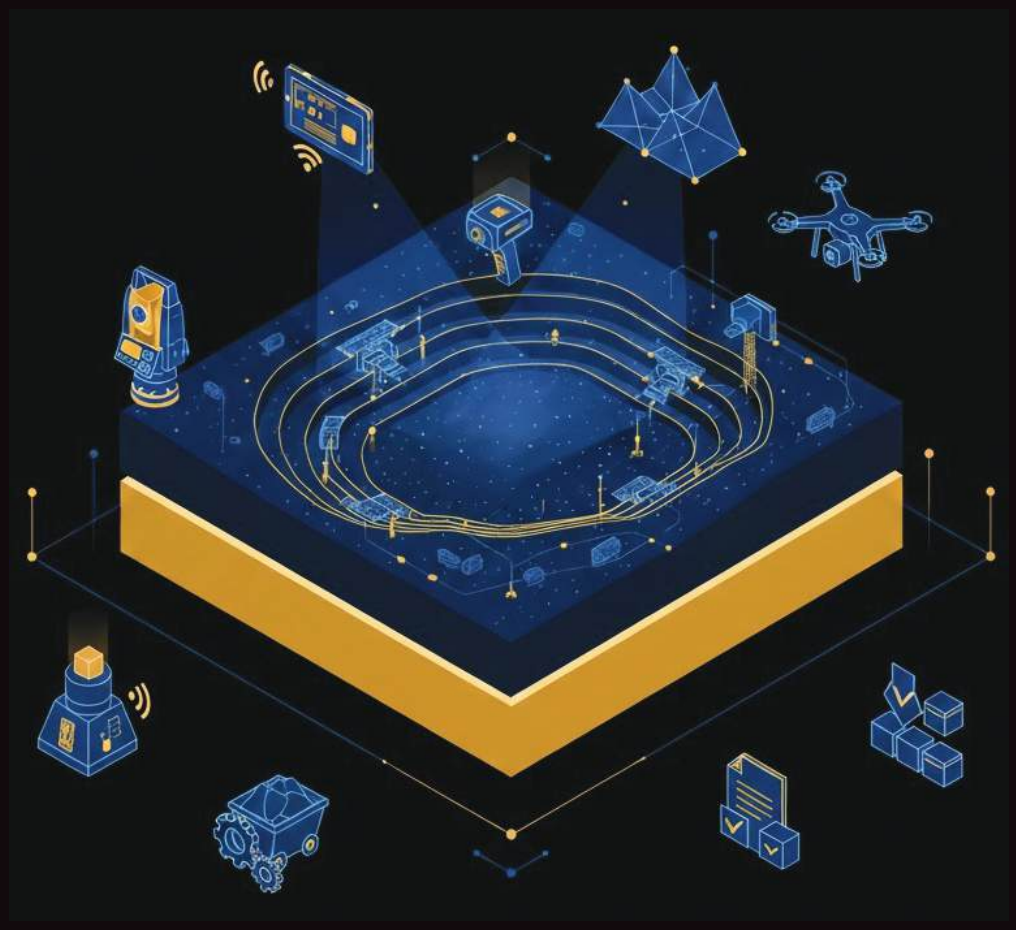
Import & Process Field Data
Direct import from Sokkia, Leica, Topcon, Trimble, and Nikon. Tacheometry, resection, theodolite traverses, and leveling — with automatic discrepancy detection and accuracy assessment. Custom import templates for any other format.

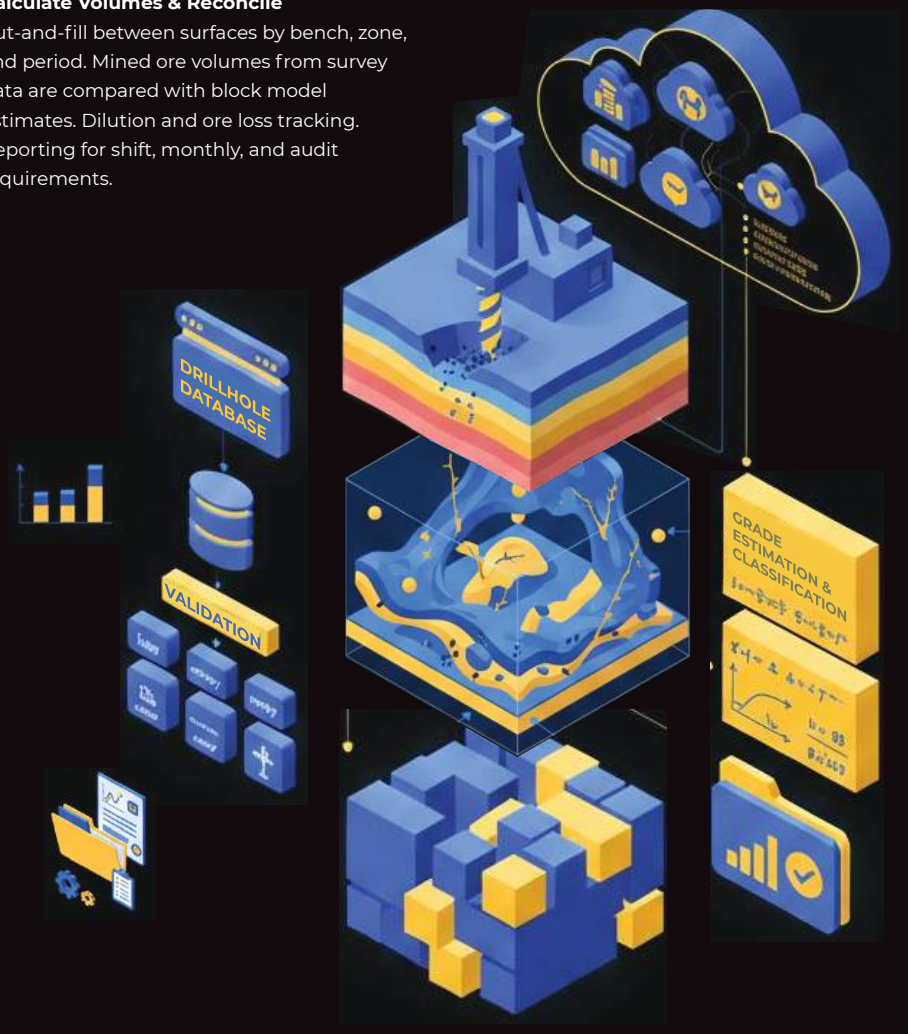
Build Surfaces & Digitize Workings
Triangulated surfaces from survey points with contour generation and slope maps. 3D wireframe models of drifts, crosscuts, raises, and stopes — built from section templates and face surveys. Compare as-built to design at any stage. CSV, XML, and LandXML for CAD, GIS, and stakeout.

Track Progress
Compare surveyed positions against design — bench advance, pit development, and mining progress. Identify deviations early to prevent tonnage and grade impacts.

Report & Export
Surveying journals and technical reports from customizable templates. Export to DXF, CSV, XML, and LandXML for CAD, GIS, and stakeout workflows.

Calculate Volumes & Reconcile
Cut-and-fill between surfaces by bench, zone, and period. Mined ore volumes from survey data are compared with block model estimates. Dilution and ore loss tracking. Reporting for shift, monthly, and audit requirements.





Geology

Drillhole Data to Resource Estimates

Validate drillhole data, build geological domains, estimate grades, and classify resources within a single integrated workflow. The system supports implicit and explicit modeling, a full geostatistical toolkit, and a centralized database that feeds directly into block modeling, mine design, and scheduling.

Drillhole Database & QA/QC
Centralized database with multi-user access and permission controls. Automatic validation across different error types — collar issues, survey deviations, interval overlaps, missing assays. QA/QC tracking for standards, blanks, and duplicates.

Domain Modeling
Implicit surfaces generated from drillhole data, or explicit wireframes where manual control is needed. Categorical domains for lithology and alteration, structural surfaces for faults, numerical modeling, vein models with automatically update when new drilling data is added. Stratigraphic modeling for layered deposits with seam geometry, folds, and pinch-outs.

Grade Estimation & Classification
Ordinary, Simple, and Lognormal Kriging, External Drift Kriging, Cokriging, Nearest Neighbor and IDW interpolation. Variogram analysis, Anisotropy Maps, Unfolding and Kriging Neighbourhood Analysis.

Block Modeling
Regular and irregular block models; percent and variable-Z models; and HARP models. Block model reblocking, splitting, resizing, and merging. Block models carry directly into pit optimization, scheduling, and stope design — no conversion required.

Reporting & Compliance
Resource summaries by category, domain, and elevation. Export estimation parameters and validation outputs for audit.

Pit Optimizer | Stability Analysis

Define Pit Limits. Verify Slope Angles.

Define ultimate pit boundaries using block model economics, validate assumptions through sensitivity analysis, and confirm slope stability before design commitment. Optimization and geotechnical results flow seamlessly into detailed pit design.

Ultimate Pit Limits

PseudoFlow algorithm based on Lerchs-Grossmann. Generate nested pit shells by revenue factor with slope angle constraints by sector. Analyze shell statistics — tonnage, grade, strip ratio, economic value — and select boundaries that fit project strategy.

Pushback Phases

Convert nested shells into mineable pushback sequences. Group shells into practical stages with smooth transitions, adjust for access and operational constraints.

Sensitivity & Scenario Comparison

Test pit economics against price, cost, recovery, and slope angle changes. Compare scenarios side by side — see how assumptions shift geometry, tonnage, and value. Evaluate designed pits against optimal shells to quantify differences before detailed engineering.

Slope Stability Analysis

Calculate factor of safety using Bishop, Janbu, and force-equilibrium methods. Apply FEM-based stress–deformation analysis where limit equilibrium is insufficient.

Include groundwater, tension cracks, and bench loads. Store geotechnical properties in block model fields and automatically feed sector-based slope angle recommendations into mine design.

Slope Monitoring

Track displacement and groundwater indicators over time. Set thresholds to flag changes that require review. Compare observed trends to analysis assumptions.

Open Pit Design

From Pit Shell to Engineered Geometry

Design benches, ramps, haul roads, and waste dumps in 3D. Change parameters — geometry regenerates instantly. Evaluate tonnage and grade directly from the block model at any stage.

Dynamic Pit Design

Automatic parameter propagation — change bench height, slope angle, or ramp position and the entire design updates. Design top-down or bottom-up. Snap to topography with automatic wireframe merging. Combine dynamic and manual tools on the same project.

Benches, Ramps & Haul Roads

Build benches individually or in groups with constant or variable slope angles. Generate ramps dynamically along toe or crest edge — set width, gradient, turning radius. Haul roads with horizontal and inclined sections, conforming to topography with cross-section profiles along centerlines. Switchback automation.

Waste Dumps & Stockpiles

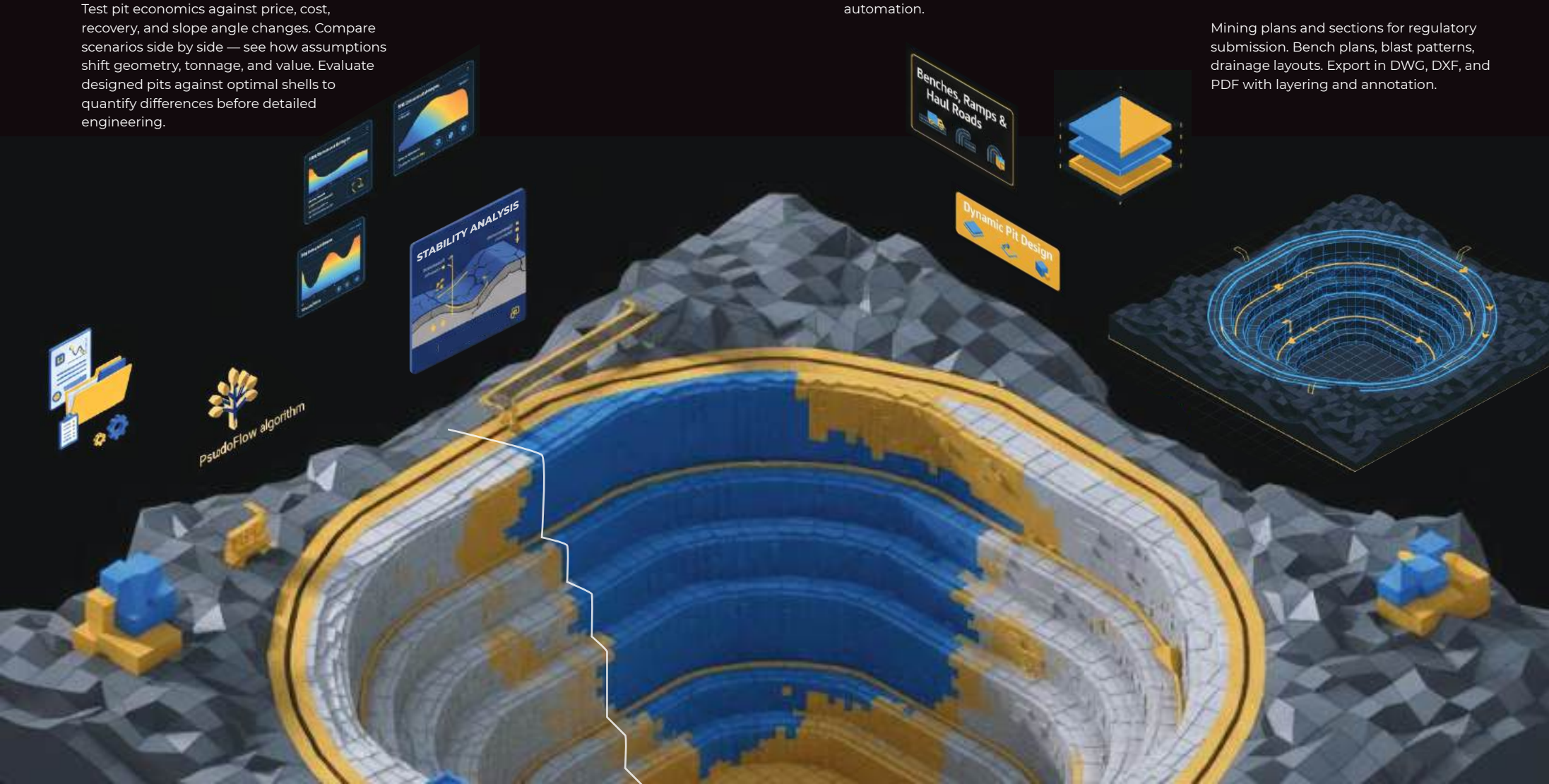
Design dump lifts and stockpiles using the same dynamic workflow — configurable height, width, and slope parameters with automatic geometry updates.

Sections & Volumes

2D cross-sections from preconfigured templates — geological, mining cuts, road profiles. Dynamic 3D section planes through pit designs, block models, and geology. Volume calculations between surfaces, from closed contours, or block model data — by bench and zone.

Documentation & Export

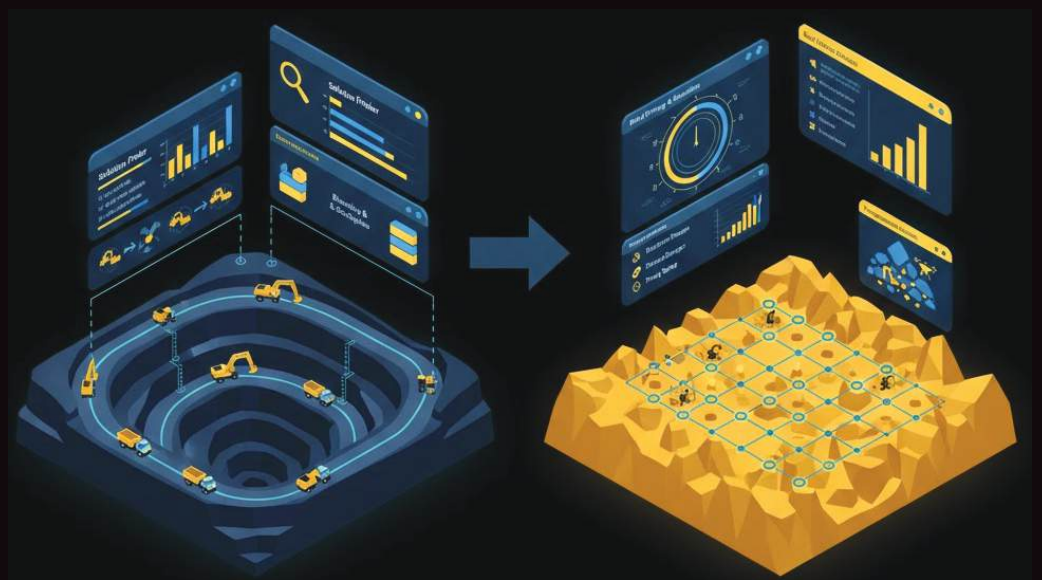
Mining plans and sections for regulatory submission. Bench plans, blast patterns, drainage layouts. Export in DWG, DXF, and PDF with layering and annotation.



Scheduling | Drill and Blast Design

From Production Sequence to Controlled Fragmentation

Plan extraction sequences across all horizons, assign equipment, design drill patterns, calculate charges, and validate blasts prior to execution. Scheduling defines where and when to mine, while drill and blast delivers the broken rock.



Production Scheduling

Long-term, mid-term, and short-term schedules from pushback phases. Solution Finder searches for feasible sequences against production rates, grade targets, and equipment constraints, or take manual control with excavator placement and block selection by period. 3D sequence animation to validate pit development and access before operational handoff.

Equipment & Logistics

Assign excavators and trucks by period with shift rosters, maintenance windows, and availability factors. Define haul routes and material flow paths. Subdivide mining areas to coordinate crews and reduce conflicts between working faces.

Blending & Stockpiles

Blend material from multiple faces to meet plant feed specifications. Define grade constraints, stockpile rules, and rehandling logic. The scheduler selects blocks to keep feed within limits while respecting equipment and access constraints.

Drill Pattern Design

Regular, staggered, 90°, and second-row stagger layouts with automatic burden and spacing from bench geometry and rock properties. Four LLR calculation methods. Twin hole configurations. Twin-hole configurations.

Decked charges with explosive density and stemming defined by row position. Initiation design for non-electric and electronic detonators with full wiring-complexity support. Complete blast design preparation and technical documentation. Send patterns directly to drilling rigs.

Blast Timing & Simulation

Five delay methods: From Center, By Vectors, By Vectors With Averaging, Along Line, In Rows. Millisecond-resolution detonation simulation to verify firing sequence before execution. Dangerous zone calculation for safety planning.

Fragmentation Analysis

Drone-based muckpile imaging with automatic fragment detection and grain size distribution. Compare actual fragmentation to design targets. Feed results back into pattern parameters for continuous improvement.

Underground Mining

Design Workings. Optimize Stopes. Plan Ventilation.

Design excavation networks and declines, optimize stope boundaries for maximum value, and calculate ventilation for safe air distribution — all integrated with geological block models.

Stope Optimization

Perform NPV-based stope optimization using recovery, price, royalty, costs, and discount rate inputs. Apply three clustering methods — Regular Grid, Adaptive Size, and Guide Lines — for massive, vein, and layered deposits.

Optimize stope walls with independent hangingwall and footwall control. Control dilution and ore loss using the Normative method or ELOS. Define cut-off grade by economic parameters or grade thresholds. Compare multiple scenarios side by side.

Underground Design

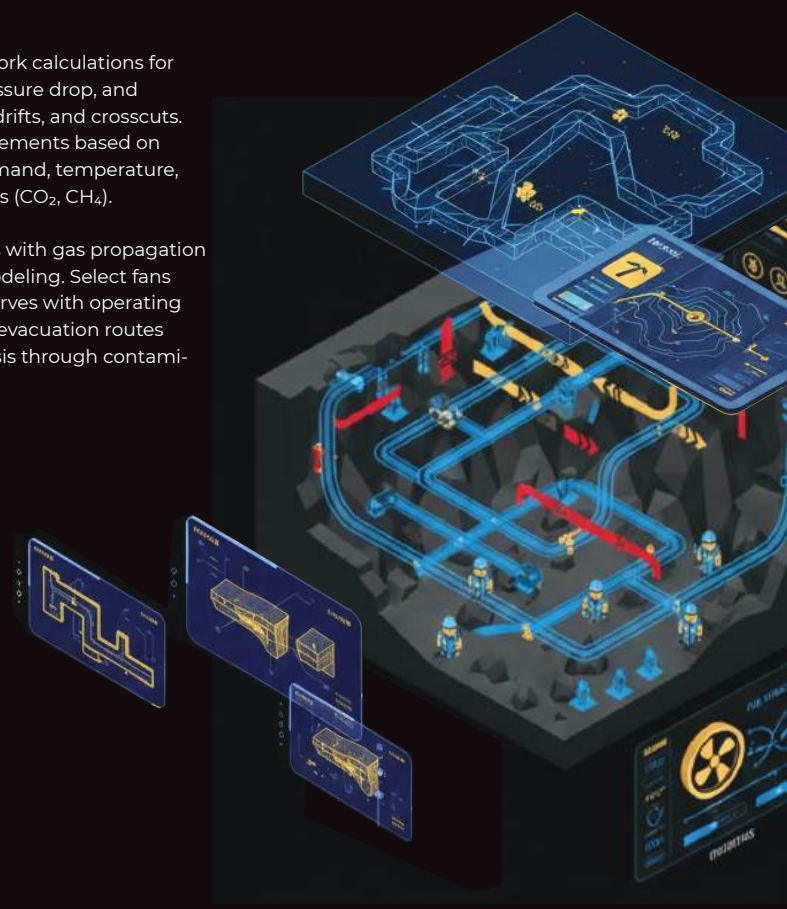
Excavation networks with automatic connectivity control. Declines and ramps defined by gradient, curvature, and alignment parameters — updated dynamically when inputs change.

Drift, roadway, and raise design. Development drilling patterns with fan and beam configurations. Ground support material calculations for bolts, mesh, shotcrete, and steel sets. Tonnage, grade, and dilution calculated from block models for any design volume.

Ventilation

Run node-based network calculations for airflow, resistance, pressure drop, and velocity across shafts, drifts, and crosscuts. Evaluate airflow requirements based on velocity, personnel demand, temperature, and gas concentrations (CO_2, CH_4).

Simulate fire scenarios with gas propagation and thermal decay modeling. Select fans using characteristic curves with operating point evaluation. Plan evacuation routes with travel-time analysis through contaminated zones.



K-MINE replaces fragmented toolchains with a single integrated environment from drillhole data to production schedule, without file conversions, data loss, or departmental silos.

Fragmented Software Stack
Most operations run geology in one tool, design in another, scheduling in a third. Every handoff means file exports, format conversions, and lost data integrity. → K-MINE runs geology, mine design, pit optimization, scheduling, drill & blast, and stability analysis in one application.

Disconnected Departments
When geologists, engineers, and planners work in separate systems, conflicting versions of the block model, pit design, or schedule become the norm. → Single shared database. One block model. One design. Everyone works from the same source of truth.

Slow Design Iterations
Updating a pit shell or schedule shouldn't require re-exporting data across three platforms. But with most toolchains, it does. → Changes propagate instantly — adjust geological inputs and see the impact on design and schedule without leaving the environment.

High Licensing Costs
Paying separate vendors for geology, design, optimization, and scheduling adds up fast — especially for mid-tier and junior miners. → Full-suite access in one license. No need to maintain multiple vendor contracts, integrations, and support agreements.

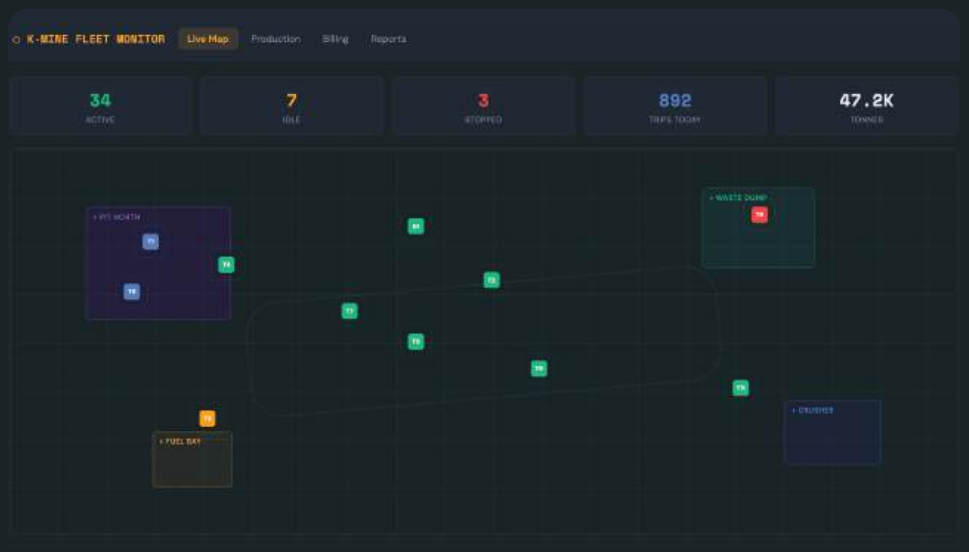
K-MINE Fleet Monitor

Independent Trip Verification. Automated Billing Reconciliation.

Connect existing telematics — GPS, fuel sensors, OEM systems — into one dashboard. Automatic trip detection and verification for own fleet and contractors. No new hardware.

One map for a mixed fleet — Cat, Komatsu, Hitachi, XCMG, and hired equipment. Per-trip and per-tonne billing with rate cards. Contractor self-service portal. Shift reports ready before handover.

5–12% typical contractor overreporting. Every load-haul-dump cycle verified against GPS data. Flag discrepancies, generate reconciliation reports by contractor, shift, or period.



LET'S TALK ABOUT YOUR FLEET

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HOW IT WORKS

01 CONNECT

Plug into your existing telematics: Wialon, KOMTRAX, VisionLink, Omnicomm fuel sensors, AEMP 2.0. No new hardware.

02 DETECT

Automatic trip detection from GPS + fuel + engine data. Geofences map pits, dumps, crushers. Every cycle logged.

03 RECONCILE

Compare verified trips vs contractor claims. Flag discrepancies. Generate billing and fuel reports per shift.