Expomin 2016, Santiago, Chile

MundoGeo Connect 2016, São Paulo, Brazil

CIM, Vancouver, Canada
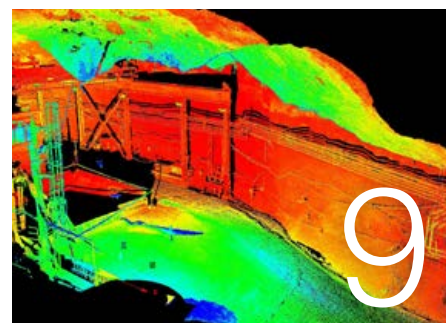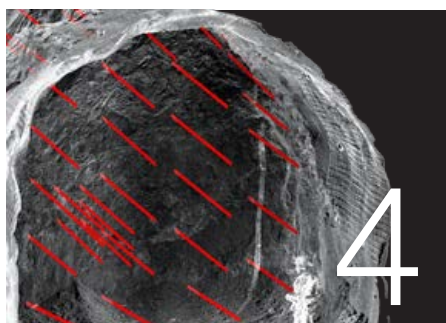
Global activities

Maptek tradeshows and field days were held around the globe in recent months.
See our 2016 calendar for details of events where you can find out more about our technology.

International Mining, Chihuahua, Mexico

Chaffey Riverland Field Day, South Australia

Forge

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In this issue

Smart Maptek systems offer immediate and universal access to data, simplifying workflows and accelerating routine tasks. Wrestling with multiple static sources of data is a thing of the past.

The pressure to consolidate, summarise, analyse and report results in line with the fast moving mining environment is answered by connected solutions and integration between processes.

End to end solutions push timely information to decision makers where it can usefully impact the planning cycle.

Advanced algorithms and dynamic models support a range of processes and tasks at the scale and flexibility required by modern projects.

University partnerships ensure that the students of today become the best mining professionals of the future.

We hope you enjoy this issue, and we welcome feedback at forge@maptek.com

Contents

On the cover

Safety, speed and accuracy of data acquisition are critical survey requirements at the Rix's Creek open cut coal mine.

End to end solutions in Vulcan 10

Maptek™ Vulcan™ 10 includes enhanced Gantt scheduling tools, new stratigraphic fault modelling and enhancements driven by user feedback.

Vulcan Gantt Scheduler

Vulcan Gantt Scheduler (VGS) is a resource and activity based scheduling module. Users can create and sequence activities, allocate resources, animate schedule scenarios, and report mining activities efficiently and transparently, all within Vulcan.

Gantt charts illustrate the start and finish dates of mining activities and allow users to clearly communicate the schedule variables by any period definition.

VGS was released with Vulcan 9.1 in early 2015. Customer feedback contributed to further development which is available in Vulcan 10. Upgrades include more levelling capabilities, additional colouring options in both design and Gantt bars, automatic filter generation, improvements in updating the schedule with project actuals, and precedence visualisation.

Ongoing development focuses on streamlining the Gantt scheduling process through better performance and capacity to increase user efficiency. Attention has been paid to enhancements that improve stability and add extra functionality required by users.

The flexibility of VGS has been demonstrated in various commodities, mining methods and planning cycles. Customer sites include underground metals and potash operations, and open pit coal and metalliferous mines.
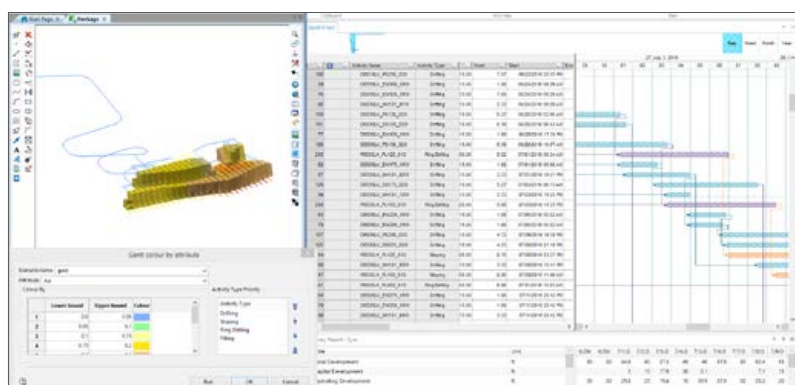
Direct connection between modelling, design and scheduling allows operations to easily respond to changing scenarios.

> Using Vulcan provides mining operations with an end to end solution.

Mining is a dynamic process, and many factors add to the complexity of mine planning. Accurate, repeatable processes are critical to the key desired outcome of predicting profitability. Accurate planning provides a firm base for costing, which ultimately impacts NPV and cash flow, from project startup through to mine reclamation.

Consider the interplay between four staged tasks of mine planning – resource modelling, mine design, scheduling and costing. If different software packages are used data transfer can create a management problem. Data can change at any time during any stage. Users must have confidence that updates are accurately reflected throughout.

If geotechnical constraints change, stopes must be redesigned and the schedule will need adjusting. As new survey information is collected, the schedule can be updated to reflect how much of a task has been completed. New activities can be added to the schedule while a plan is already in progress. If a block model changes, values already in the schedule can be easily updated.

Scheduled activities can be easily updated with new designs. Design colouring capabilities and animation help communicate the progress of mining much better than a Gantt chart alone.

Vulcan links the schedule visually to the design, making it easier to sequence, identify bottlenecks, level production and report metrics per period. This integration eliminates issues caused by transferring data between different packages and ensures all departments are working off the current mine plan.

Instead of separate packages for the separate tasks, just two are necessary. VGS streamlines the process from model creation to scheduling, and provides the appropriate data for input to costing packages.
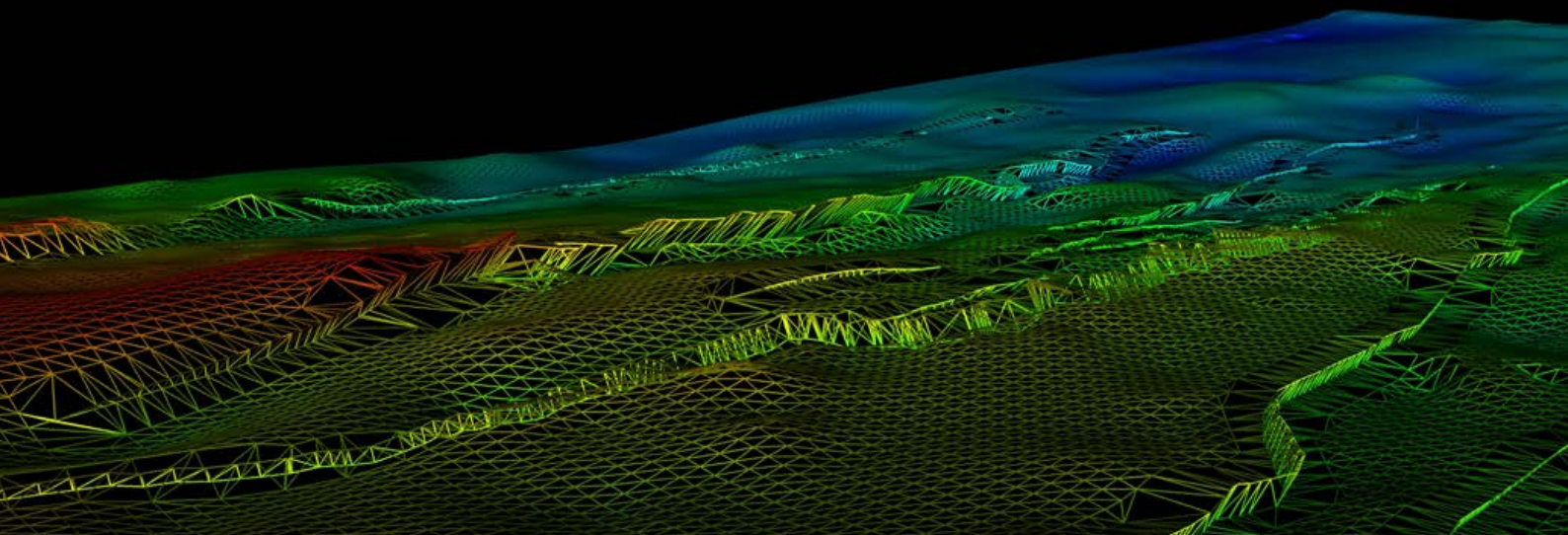
Stratigraphic Fault Modelling

A new Stratigraphic Fault Modelling method complements the existing 'blocks' method in Vulcan 10. Users can create reverse and normal faulted stratigraphic models using defined dip and throw, without requiring solid triangulation fault domains. The new modelling approach works with strings or fault surfaces as input.

Output from all stratigraphic options has been improved. Data points can be directly incorporated from drillholes or CAD inputs into gridded output via triangulated hybrid surfaces.

Australian CoalLog Standard

Vulcan 10 is fully compliant with the new Australian Coal Logging statutory reporting standard CoalLog, which makes collecting and sharing coal exploration data easier.

Vulcan includes data entry sheets and standard code lookup tables for header, drilling, lithology and geotechnical data as well as a format for the transfer of this data.

Interest in the Australian CoalLog Standard has spread internationally since the first version was released in early 2012, with some companies in other countries also voluntarily adopting the system.

Vein Modelling

Vulcan 10 contains new options based on grid modelling methods for steeply dipping vein deposits. Rather than calculate separate surfaces for each hanging wall and footwall, a single plane is used to pick the vein which has the most data and fit a surface through it.

Level Designer

Vulcan Level Designer includes support for transverse and longitudinal stoping, upgrades to fine tune outputs and the ability to apply a primitive in the attributes display. Specifying a length extends the crosscut beyond the stope.

3D Geological Sculpting

Solid objects can now be modified in freehand mode, including pinching, smoothing and cutting of solids, to better represent the geological interpretation.

Categorical Smoothing

This new geostatistical option improves output when using simulations and probabilistic modelling in block models.

Property Editor

The Properties Window has been re-released as the Property Editor in Vulcan 10. Users can conduct a wide range of queries on length and area of polygons, and change polylines from open to closed. Triangulations are validated quickly, and surface areas and volumes can be easily generated.
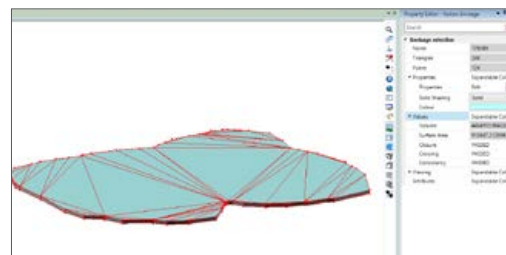
Users can change between solid shade and wireframe triangulations, and access properties with one click. The intersection of any CAD object with the current section can be displayed; section widths can be used to apply a defined front width and back width to the object while in section view.

More information on Vulcan 10 can be found at www.maptek.com/vulcan10
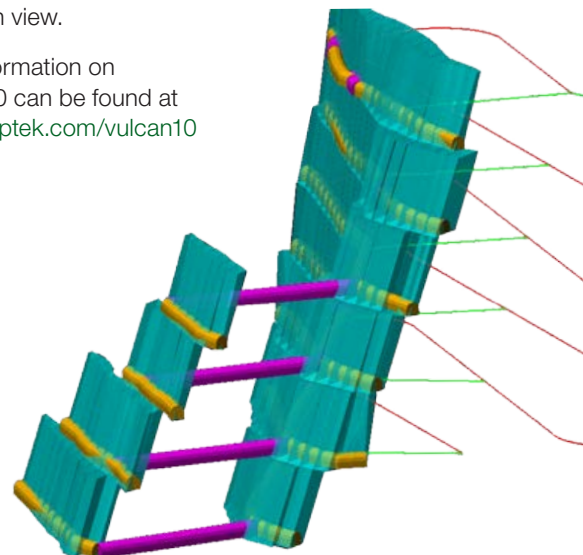
Accurate models aid ground support

Maptek™ I-Site™ Studio generates high resolution models for geological mapping and ground support quality control at a large mine in Utah.

Maptek™ I-Site™ Studio software is used at the mine to generate high resolution models for as-builts, ground support quality control, geological mapping and blast designs.

The project consists of drainage galleries which are present underneath the operating open pit. Six rigs drilling out of 41 bays will produce 700 holes; tunnels advance at around 250 feet per week across the rapidly developing project.

The main geotechnical objective is to obtain high resolution models of drifts before implementing ground support measures. Fast turnaround from data to models is important as delays can affect production.

A laser scanner collects 40 million points, with 3 repeats on each point, in 4 minutes from each setup. Data is captured down drift as well as from the advancing face. The survey process is conducted very quickly so there is no impact on the mining cycle.

Ground quality is variable, with rock mass rating (RMR) values ranging from low teens to 80, so the drift surface is shotcreted after every blast round. Scanning with the short range laser scanner requires survey control of targets in the drift every few setups. The control points are surveyed with a total station and then acquired with the laser scanner as 3D targets.

The I-Site Studio three-point registration tool registers the point cloud into mine grid coordinates. The workflow employed for efficient scanning means that for every 15 setups a surveyed scan is acquired. Each scan in between is registered to the surveyed scans using I-Site global registration. This improves accuracy and repeatability for each traverse.

Laser scan data is modelled in I-Site Studio to assess the spatial juxtaposition of drillholes with drifts.

Underbreak and overbreak is measured after the advancement of each face heading, and a new as-built is created every round.

Scanning before and after shotcreting removes the need to measure shotcrete thickness by drilling. The colour distance by surfaces tool in I-Site Studio allows users to quickly visualise and compare the distance between the original surface and the newly created surface after shotcreting.

Accurate models are quickly produced from the laser scan data. Rib lines are generated, allowing any deviation from plan to be easily identified. Drillhole locations are reported in a 3D PDF.

Using laser scanning for geotechnical quality control underground brings significant safety benefits, including reduced time in the drift, recording shotcrete thickness without coring and avoiding working at heights. More accurate data is acquired and quickly validated.

Analysing the 3D models away from active mining allows users to carefully review the information for mapping and design.

Thanks to
Thomas Moorcroft, Geologist
Maurice Ayisi, Geotechnical Engineer
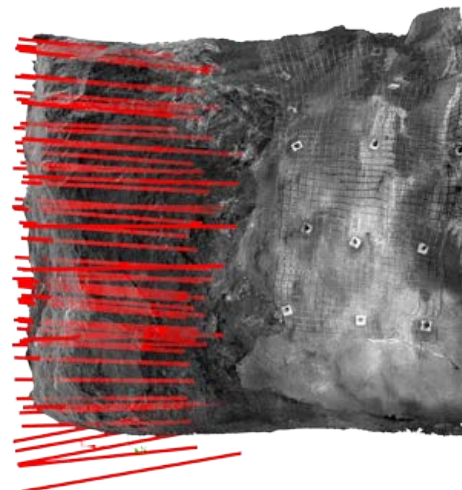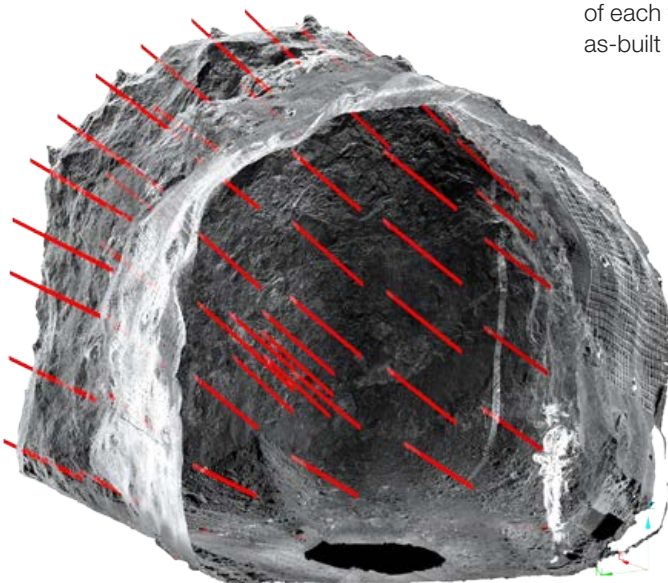
Digital mapping at Round Mountain

Maptek™ Vulcan™ software helps improve field mapping at the Round Mountain gold mine in Nevada.

The Kinross Gold Corporation mine at Round Mountain has produced more than 12 million ounces of gold since 1906, through 60 years of underground mining and then as an open pit.

Kinross wanted to implement digital mapping to speed up the field mapping process, and to improve efficiency in order to provide real time response to mining issues.

Site staff had a lot of experience with Maptek™ Vulcan™ as well as Trimble and AutoCad. However, they had limited GIS software access, with little to no in-house experience and a limited budget.

> Kinross wanted timely implementation of an easy to use solution that required minimum survey support.

Requirements included high accuracy and precision, simple coordinate conversion to the irregular mine grid, the ability to map remote structures, and straightforward import into Vulcan.

A proof of concept system for rapid digital mapping was built, integrating the Trimble Geo7X handheld data collector with Vulcan software.

Trimble field data was exported to Vulcan, where it was viewed and manipulated using tools in the Vulcan geotechnical module.

A Trimble user interface was constructed in two days. Building a data dictionary and setting up the coordinate conversion process ensured that the relevant information could be collected for export to Vulcan.

Existing data was validated and converted. Designing the Vulcan geotechnical database and loading it with legacy data took an additional day. Once the codes and structures were set up, the process was streamlined.

Geologists field testing the system found it intuitive and easy to use. Comprehensive forms for entering field data led to collection of more structured observations, and less information was lost.

Being able to view all the existing data and using an iterative process to add new data allowed a better map to be built. The time taken to input data in the field is balanced by less data entry in the office.

> 'The new system gives us the potential to save $15,000 on labour per year.'

Projected benefits from converting to digital mapping are appreciable, primarily due to the more efficient workflow. Labour costs are decreased, and further intangible savings and increased safety are realised from having on-time information.

Thanks to
Kristine Alvarez, Senior Geologist
Kinross Gold Corporation - Round Mountain

I-Site meets survey requirements

Rix's Creek coal operation has embraced the versatility of the Maptek™ I-Site™ laser scanning survey solution.
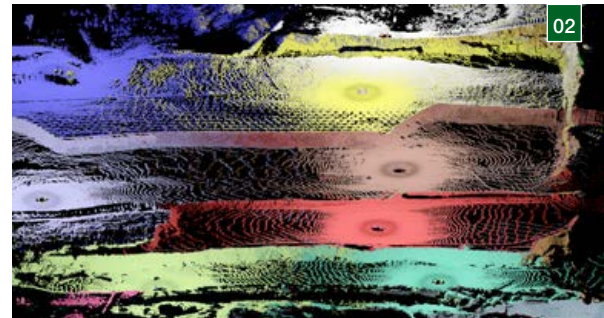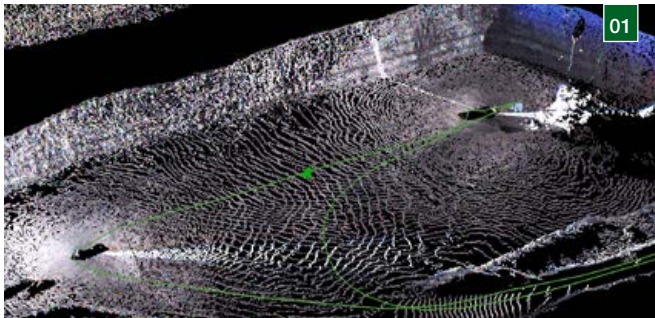
Rix's Creek is an open cut mining operation northwest of Singleton in New South Wales. The Bloomfield Group mine produces both thermal coal and high quality, semi-soft coking coal for overseas and domestic customers. A multi-seam bench mining technique mines up to 9 seams and splits.

Survey pressure

With the recent acquisition of the Integra Camberwell coal mine and expansion into Rix's Creek North, the company had more survey work to handle. A crucial issue with existing methods of recording survey information was avoiding proximity to hazardous areas. Ensuring safe capture of accurate data is a top priority for the mine.

Rix's Creek analysed several solutions for speeding up survey data acquisition. UAVs would allow capture of large areas from overhead, but incur issues around accuracy. Moreover the UAV data is time-intensive to process.

The company wanted to try Maptek™ I-Site™ laser scanning. I-Site was used by surrounding mines and carried a reputation of being robust and easy to use.

Maptek consultant Jordan Herrmann performed end of month survey with a vehicle mounted I-Site laser scanner, using the stop-go method. Surveyors were impressed and the operation implemented I-Site without delay.

Benefits

The I-Site 8820 laser scanner with vehicle mount kit is now used to its full potential. Significant improvements have been noticed across daily survey:

> Up-to-date accurate as-built and void models
> Fast and accurate end of month surveys
> Highwall scans for geological markup
> Drill & blast hole clearance and optimisation
> Deformation monitoring

I-Site field operation directly ties into the onsite RTK GPS rovers. It is easy to see what has been scanned and to identify areas where more information is needed. This live feedback removes the need for surveyors to return to the field to capture more data.

'Ease of use and speed were stand out features. A key differentiator was the distance we could scan from, eliminating safety risks involved with traditional survey methods.'
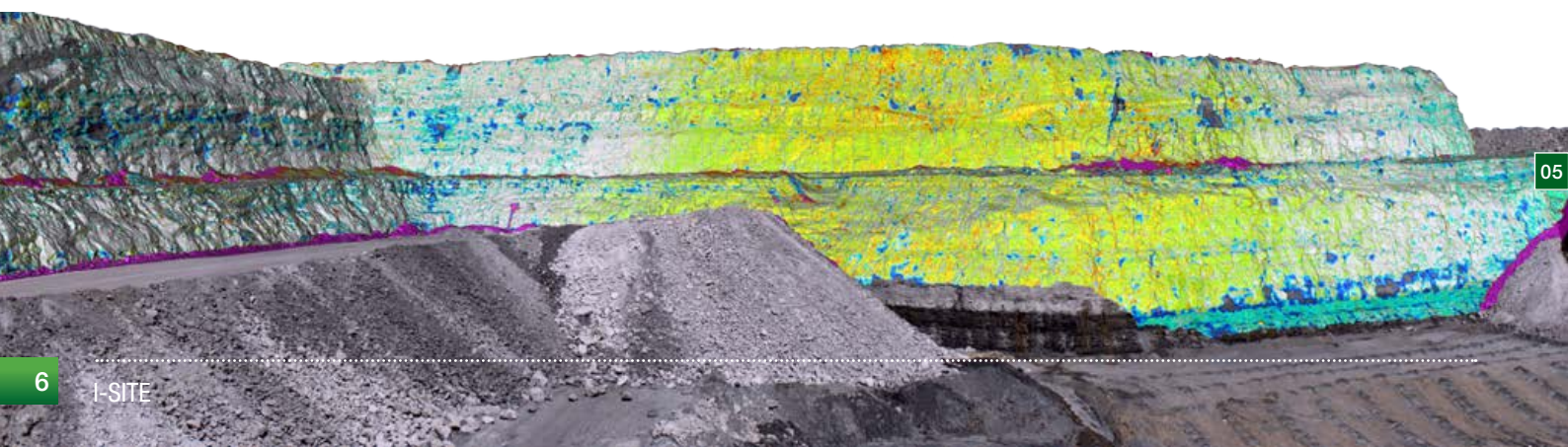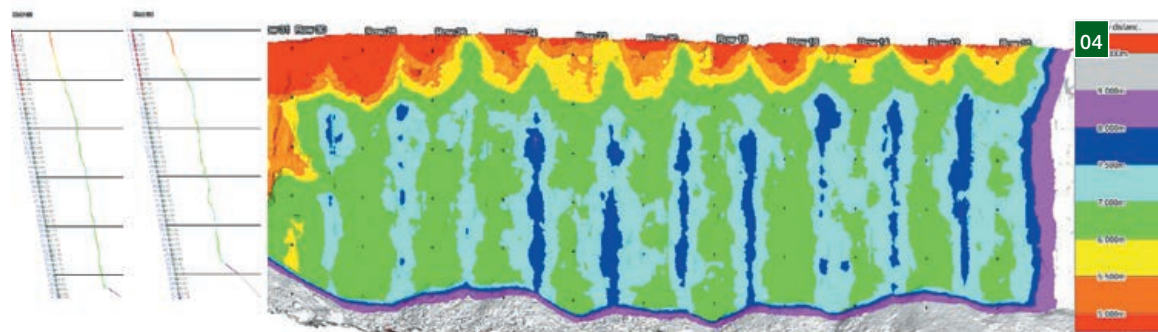
Versatility

Rix's Creek personnel also use the I-Site system for calculating offsets between drillhole design and highwall scanning. Their innovative approach prevents overcharging the material close to the highwall face which would lead to flyrock.

Section tools in I-Site Studio 6 make this task easier, allowing certain items in the view to be sectioned and others to remain unsectioned.

Using the system with tripod setup as well as vehicle mounted allows greater versatility on scanning viewpoints. The static setup provides the high levels of accuracy required for collecting data for monitoring. Surveyors have been using the I-Site laser scanner on a weekly basis to monitor areas of movement.

The integrated camera in the I-Site 8820CT laser scanner has proved very useful for geological mapping, and also assists in visualisation and sharing of data.

> Overlaying design surfaces or monitoring information on the images is a powerful communication tool for data handover.

Rix's Creek has found the I-Site laser scanning solution easy to use, and processing in I-Site Studio software very intuitive. Feedback from the operation is positive, and surveyors look forward to further automation of workflows.

Thanks to
Chris Moy, Technical Services Superintendent
Tim Gentle, Surveyor
Rix's Creek

01 *Scans are previewed in real time on the tablet*
02 *Live feedback of scan coverage for efficient survey*
03 *Design surfaces overlaid on laser scanner images*
04 *I-Site Studio section tools allow items to be selectively sectioned in the same view, showing offsets between drillhole design and highwall scanning*
05 *Deformation scan with photograph overlay showing movement and rockfall history*

Coordinate System tools

I-Site Studio 6.1 will include new Coordinate System tools allowing users to transform data between different coordinate systems.

Setting a coordinate system allows the user to import data directly into I-Site Studio using the specific mine grid coordinates.

I-Site Studio 6.1 is due for release in July.

More information on I-Site Studio can be found at www.maptek.com/studio

Fast, agile blast design and management

Through instant data connection and visualisation, Maptek™ BlastLogic™ re-focuses engineering time on design, tracking adherence to plan and improving process.

Maptek™ BlastLogic™ is an advanced drill & blast design and management system that is relied on in the most demanding production environments.

Users gain immediate access to operational data through interfaces with drill navigation systems and the BlastLogic Field Tablet.

Very few sites have accurate up-to-date data available throughout their drill & blast process. Those that do are not always able to harness it, which effectively constrains improvement.

Traditional static systems create a large overhead for engineers to collate, review and manipulate data for effective design. Errors easily creep in, and grow in size and complexity when left unchecked.

The consequences are usually expensive. Difficulties in objectively understanding the root cause can lead to division between functional departments.

Fundamental requirements of any drill & blast process are quick identification of problem holes, fast and flexible management of exceptions, and the ability to update plans on the fly without interrupting or frustrating the blast crew.

Only BlastLogic links design to geology, and allows side by side comparison of multiple design scenarios with fragmentation, vibration and overpressure. This informs decision making at critical stages that impact cost, productivity and safety.

What happens if there is no time for engineers to review drilling performance, or QA/QC? Or hole charging has commenced at the same time as the review?

With BlastLogic, initial charge plans are automatically updated on the field tablets once drilling data is validated or as QA/QC data is collated. This means the blast crew can commence charging of holes, while engineers can push through updated designs at any time without interruption to workflow.

'Reducing the turnaround of holes ready for QA/QC and charging means more bomb in the ground, thus increasing production.'

With BlastLogic, all data associated with the blast is stored centrally, and is accessible by multiple mines and users. Handover of technical tasks or sharing of information between geology, geotechnical, mine planning, survey and operations is transparent and seamless.

Deployed on the Cloud or on-premise, BlastLogic provides options to implement at scale, and only requires 3G connectivity.

Bringing together distributed data streamlines reporting. Importantly, data integrity can be trusted. Blast summary reports, drilling statistics, charge placement, field measurement and videos close the loop on design and performance.

BlastLogic provides a mechanism to catalogue blasts and detect subtle patterns over time. Through blast analytics in 3D and tabular data each mine can customise the factors used to measure and monitor blast performance.

Engineers can quickly relate performance such as dig rates, measured vibration, overpressure, blast movement, fragmentation or crusher throughput back to the blast design and how accurately it is executed.

This insight enables engineers to consider which instruments to fine tune to advance improvements in design and process. With BlastLogic, the tension between various blast objectives can be expertly balanced.

Operations must be agile to adapt to changing business landscapes. Collecting and maintaining accurate up-to-the minute data during drill & blast requires connected solutions and integration between processes.

More information can be found at www.maptek.com/blastlogic

Safe, reliable underground monitoring

Maptek™ Sentry brings the safety of remote sensing and the reliability of laser scanning technology to underground monitoring.

Displacements underground are traditionally monitored by point measurement devices such as extensometers. However, only one dimension is measured and behaviour is monitored in only a small area. Manual measurement is also impractical and unsafe, with potential to interrupt mining operations.

Remote sensing with Maptek™ Sentry is a practical, cost-effective and safe method for monitoring movement of rock masses and support structures in underground mines.

Sentry combines data from Maptek™ I-Site™ 8820 and 8200 series laser scanners with sophisticated software to track and analyse movement over time. Intensity-based grayscale images allow the system to operate in low light environments such as underground and at night.

Sentry helps improve safety underground by early detection of movement.

Movement in entire mine sections can be visualised and reviewed through high detail time-lapse videos.

Sentry laser-based scanning is the most effective method for monitoring roof movement. This can be done regularly without relying on lengthy stoppages of the face.

Remote sensing is fast, cost-effective and practical to implement. Manual measuring devices are subject to changing behaviour underground and are difficult to use in the dark, dusty, humid environment.

Regular monitoring is critical for balancing continuous production against the risk of major delays. Problems can be identified early to allow remedial action before a minor issue escalates into a major failure.

Underground operations can apply I-Site spatial imaging solutions to all development survey, stope scanning and conformance reporting tasks. Survey applications include face end location and face alignment, drive clearance and adherence to design, scaling and spalling on ribs.

> Track and alarm underground surface movement and stability
> Monitor high personnel traffic areas
> Identify movement across multiple areas and set email notification thresholds
> View data in real time for predicting potential failures
> Analyse trends and conduct geotechnical analysis for safety measures
> Use laser scan data for survey applications and geotechnical mapping

If a monitoring task is interrupted, or the I-Site laser scanner is taken away to be used for other survey tasks, Sentry can be resumed without losing the monitoring history.

Sentry data provides slope stability and geotechnical engineers with enhanced awareness of rock mass behaviour. Sentry can track movement leading to rockfalls and provide quantitative information on rockfall volumes.
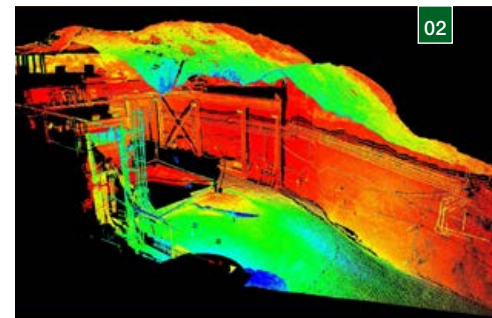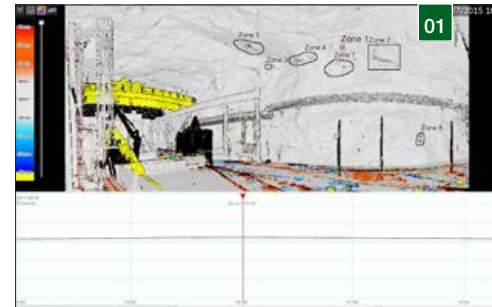
01 Underground scene showing zones of specific interest in Sentry
02 Underground scan data brought into I-Site Studio

Analysis tools in Sentry allow for historical comparison of point readings. Results can be displayed on a velocity graph or a distance map. Volumes of materials moved as a result of failures can be quantified.

Accuracy, ease of use and low power consumption make Sentry an attractive alternative to all other underground monitoring systems.

More information on Sentry can be found at www.maptek.com/sentry

Evolutionary scheduling

Maptek™ Evolution is ahead of the curve when it comes to creating optimised schedules for complex real world operations.

Maptek™ Evolution uses an evolutionary scheduling approach to unlock the value in a resource model. Much effort goes into amassing and analysing data to prepare models, so it makes sense to take advantage of the hard-won data for optimisation.

Evolution enables waste and haulage to be integrated in a fully auditable schedule that optimises project NPV. The intuitive, flexible environment allows schedules to be re-run in response to changing commodity or market conditions.

Evolution 4.5

The latest Maptek 3D visualisation technology delivers a significant asset for customers. Evolution 4.5 brings improved usability in Evolution Origin, new tools in Evolution Strategy and enhanced connection with Maptek™ Vulcan™.

A new high performance graphics engine improves display and manipulation of very large block models, including large numbers of attributed solids.

Mine planners are presented with an holistic 3D view of a mine site by simultaneous display of models with multiple pits, waste dumps, haul networks and topography.

Evolution Strategy applies smart constraint techniques to scheduling complex mines with multiple models and processes. Strategy presents the big picture and also handles details of variable pricing, costings and recovery factors.

With Evolution 4.5 users can target specific blend constraints for contaminants while maximising value and undertaking cut-off grade optimisation. Interactive charting and reporting presents the exported schedules across multiple elements and processes.

> Track and report multiple elements and contaminants per process and/or destination.

> Design and model stockpiles with tonnes and grade.

> Specify global minimum cut-off grade to prevent interpolation into inconsistent parts (grade bins) of the block model.

> Minimum (soft) and maximum (hard) accumulation constraints per process.

> Users define fixed cut-off grade policy (whole or part) and the optimisation process then determines the best extraction sequence for the policy.

Evolution Origin handles open pit scheduling for haulage, waste landform and blending optimisation to minimise haulage costs early on. It is ideal for sites requiring detailed life of mine scheduling down to 18-month medium term planning.

In Evolution 4.5 a maximum constraint per stage, group and/or period manipulates how temporal sequences are created through the model. Specifying multiple truck fleets in the same area allows for mining different material types with different equipment. Users can drag and drop a haul network created in Vulcan to automatically configure the schedule network. Calendars now support scheduling with multiple digger fleets.

Custom preferences for projects include imperial or metric units. Haulage units accurately reflect speed and fuel consumption. Specification of decimal places and currency units persists through schedules, charts and reports. Enhanced colour selection includes auto reverse mapping, non-linear and combined colour ranges.

For more information on Evolution see www.maptek.com/evolution

Two new modules are planned for release in 2016.

Evolution Epoch will apply haulage and blending optimisation technology for short term scheduling of stratigraphic and metalliferous mines.

Evolution Phase will automate the manipulation of optimal shells developed in pit optimisation. Users can adjust, split and combine shells and write new stage codes back to the model. These new stages can then be tested to improve NPV while achieving practical mining shapes.

Grade control tools underground

Eagle Mine has developed an efficient and accurate method for estimating stope grades by innovative application of Maptek™ Vulcan™ grade control tools.

Lundin Mining is a diversified base metals mining company with operations and projects in Chile, Portugal, Sweden, Spain, Finland, DRC and the USA, producing copper, zinc, lead and nickel.

One of their mines, located in Michigan's Upper Peninsula, Eagle Mine is an underground, high grade nickel and copper mine employing long-hole stoping techniques to recover the ore.
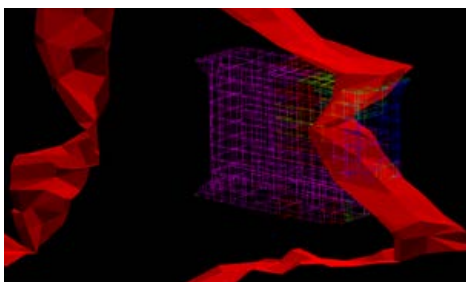
Eagle Mine is the first mine to be permitted under Michigan's *Part 632 Non Ferrous Mineral Mining Law*. Maptek™ Vulcan™ has been used at Eagle Mine since the start of operation in 2014. Vulcan is being used by all technical services departments including engineering and geology.

The greatest challenge for the technical services team was to accurately estimate stope grades using the life of mine model for short range planning. A short range model was not available to help predict grades that included production sample data.

The mine needed to produce an on the fly block model outlining higher grade zones as well as lithology changes within a single stope. Engineers also wanted to determine mineable stope shapes based on current metal prices.

Instead of trying to build a short range model, Eagle Mine decided to adapt Vulcan grade control tools. This approach allowed use of the most current production and exploration data to build a model.

Advanced preferences allow the mine to combine lithological domains with block estimation files to provide more options when estimating blocks. The use of Lava scripting is also very beneficial within grade control, allowing the process to be more automated when generating the block models.

As mining and infill drilling progress, the massive and semi-massive sulphide zones of a stope may change. Importing all of the new data as it is collected allows results to be calculated immediately.

Once a model is generated for a stope, several reports can be created for storing grade block data in output databases.

> Dilution summaries report the main material type and separate the waste with a grade-tonnage report.

The material report tool is most useful. Reports can be produced immediately after grade block creation and customised for managers, metallurgists, engineers and geologists. The classification report summarises tonnes and grade for each stope.

Dilution reports help Eagle Mine plan for metallurgical and lithological changes within a stope, which in turn helps the mill prepare for different product.

Stope blasts and corresponding models can be saved to a database which stores all grade block statistics. This database is then exported to Microsoft® Excel and incorporated into end of month reporting or added to stope reports.

Point locations for each grade block are also stored in the output database so that the grade block can be viewed at any time. This helps resolve questions that may arise about individual stopes.

Vulcan grade control tools provide Eagle Mine with a practical and reliable method for identifying ore and waste, and managing production effectively.

*Thanks to
Lars Olaussen
Mine Geologist
Eagle Mine*
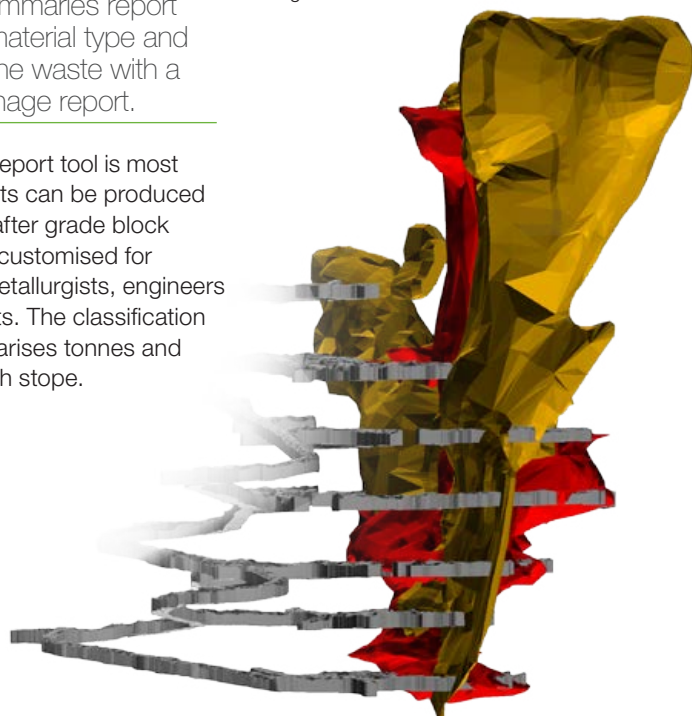
University partnerships

Maptek invests in the next generation of engineers and geologists by providing software and training tailored to the needs of universities and industry.

University of San Luis Potosí

The University of San Luis Potosí in Mexico is incorporating Vulcan into the academic curriculum. The Faculty of Engineering has contributed to research, industry, agriculture, construction and mining over many years. The professional achievements of graduates demonstrate the quality of their education.

Feedback from graduates confirms that employers demand knowledge of computer technology, so that they can capture, organise, analyse and present data obtained in the field. Vulcan was identified as one of the most popular software products.

The Geological Engineering course is also seeking European accreditation so the academic program is under continuous adjustment. Vulcan was implemented when the software taught in applied computing subjects was updated. Compared with other software, Vulcan proved more user friendly with better graphics manipulation tools.

The introduction of Vulcan allows students to gain an overview of the tools available in the industry. They enhance their professional development and gain an advantage when looking for job opportunities.

'We are excited about this integration in our program and access to educational licences. We believe it will be a beneficial partnership with Maptek.'
Professor Jorge Aceves

Pedro de Valdivia University

In May, Maptek conducted training in underground mining for 23 senior and junior Civil Mining Engineering students from Pedro de Valdivia University in Chile.

'Our university has a commitment to training future professionals in all areas.'
Professor Héctor Araya

The training focused on mine planning, mine development and evaluation of resources and reserves, preparing students for future careers. Recruitment data suggests that engineers trained in Vulcan are preferred by companies.

The university wants to teach the latest advances in engineering and technological innovation.

The introduction to new software, methods and equipment is foundational for providing students with the right knowledge and experience. Graduates with an understanding of Vulcan are in a good position to take advantage of vacancies and promotions.

Andrés Bello University

In May, Maptek South America conducted a masterclass for 35 final year Geology students from Andrés Bello University in Chile. The focus was on Sentry, Vulcan 10, geotechnical modelling with Vulcan and I-Site Studio, implicit modelling, and 3D geological sculpting.

'This demonstration enlightened students about the tools available for geological data capture and modelling lithologies, structures and water flows.'
Professor Regina Toloza
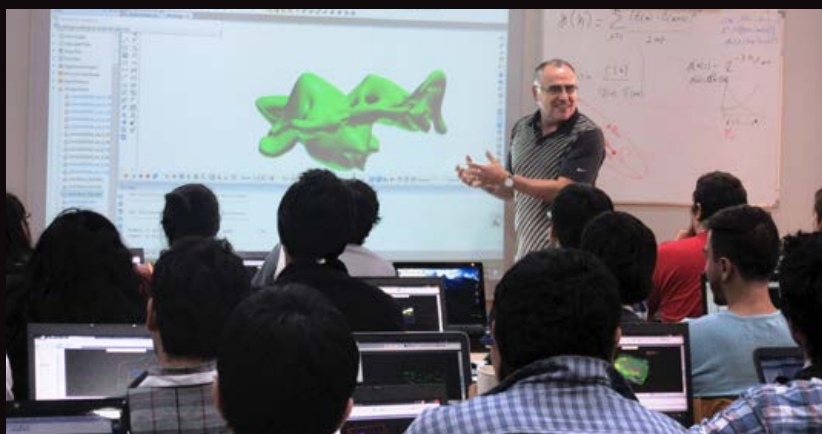
3D geological sculpting demonstration received enthusiastic applause from the audience

University of Concepción

In April, Maptek held a masterclass at its Viña del Mar office for 53 fifth- and sixth-year Geology students and graduates from the University of Concepción, Chile.

The primary objective was to expose students to Vulcan geology tools. A brief tutorial on geostatistics explained the theory behind the software.

Different practical exercises demonstrated the scope of Vulcan for geology and allowed students to apply some of their learning.

It is an advantage for the students to finish their course with a basic knowledge of Vulcan. Teachers and students always welcome new opportunities for practical learning.

Topics included geological modelling, implicit modelling and a sample of new Vulcan 10 tools such as 3D geological sculpting.

During the sessions led by Marcelo Arancibia, General Manager Maptek South America, students also gained practical experience with I-Site survey technology.

'Knowing Vulcan is an advantage for graduates in future careers.'
Professor Fernanda Alvarez

Maptek Calendar

2016

June 8-11
Reunión Internacional de Minería Zacatecas
Zacatecas, México - Booth 6

June 9-10
Elko Mining Expo
Elko, Nevada - Booth 110

June 16-18
Euromine Expo 2016
Skelleftea, Sweden

August 17-20
México Minergy 2016
Cancun, México - Booth 240

August 24-27
5th Congress - Tendencias de Actividad
Minera en México
Durango, México - Booth 14

August 30 - September 1
Switch on Innovation
Maptek Africa Technology Conference
Johannesburg, South Africa

September 6-8
Asia Pacific Slope Stability in Mining Conference
Brisbane, Queensland

September 14-16
ExpoMina Peru 2016
Lima, Peru

September 14-16
International Mine Surveyors Conference
Brisbane, Queensland

September 26-28
MINExpo 2016
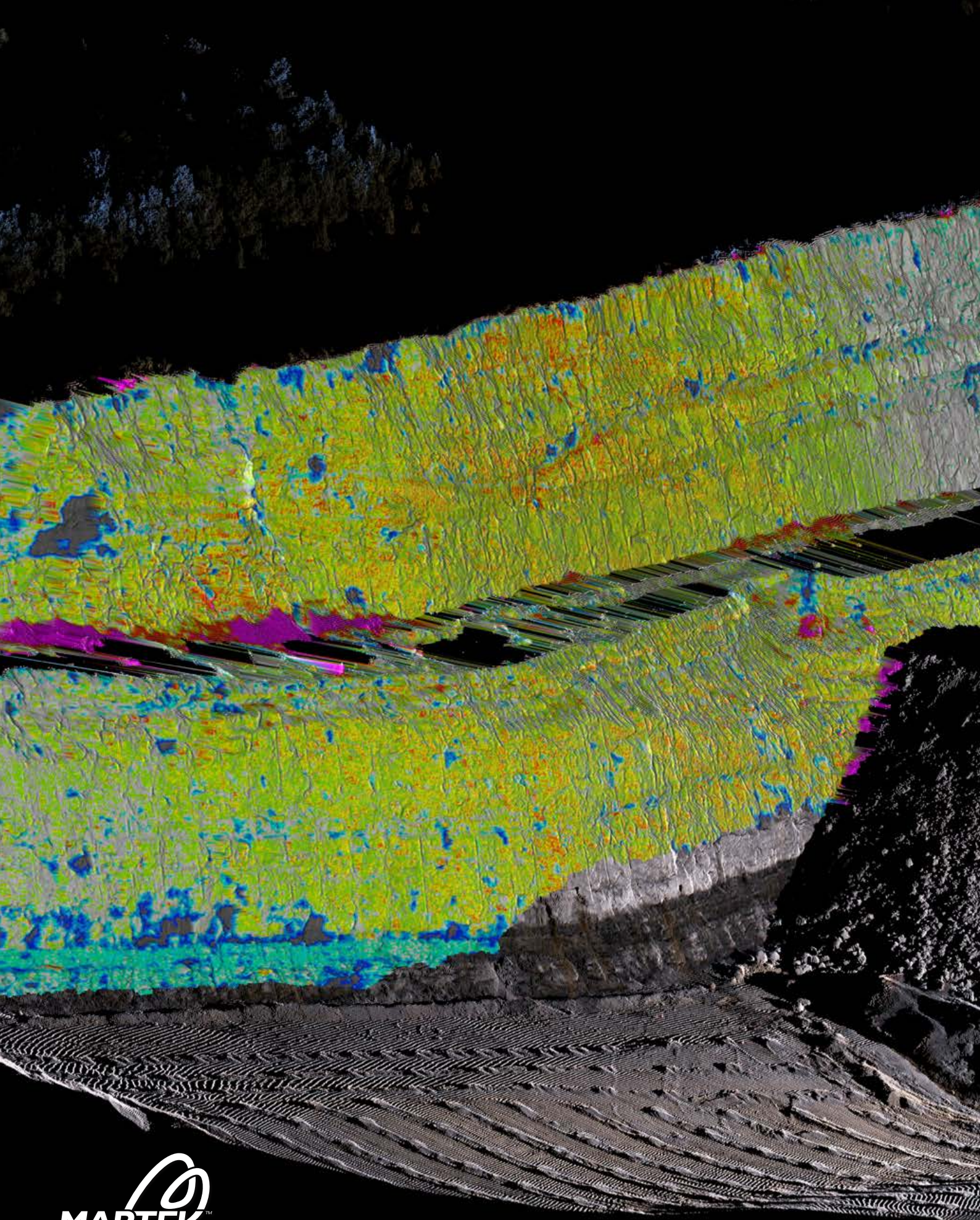Las Vegas, Nevada

October 16-19
XVIII Geology Congress
Lima, Peru

October 25-28
XII Seminario Internacional de Minería Sonora
Hermosillo, Sonora, México - Booth 285

Switch on Innovation
at the 2016 Maptek Technology Conference

August 30 - September 1
Johannesburg
www.maptek.com/africa2016

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