# Maptek South America celebrates 20 years

2014 marks 20 years since Maptek became operational in Chile.

'Since 1994 we have faced different challenges, both professionally and technologically,' said Vice-President Maptek South America Marcelo Arancibia.

'What has remained the same is our purpose. We provide our customers with products and services of excellence and global quality.'

'From simple beginnings in 1994 in Santiago, Chile the South American contingent has grown to a taskforce of nearly 100. Besides the main office in Viña del Mar, Chile, dedicated sales teams are located in Lima, Peru and Belo Horizonte, Brazil.'

'This expansion has been driven by our customers. More than 7,000 mining professionals have received product training, and 150 specialists have completed the graduate Geostatistics course.'

The renowned course has been conducted continuously for 13 years in partnership with the University of Alberta, Canada, through the Geostatistics Center led by Dr Clayton Deutsch.

Vulcan software maintains a strong position in South America with more than 1,300 licences in use. These are supported by a local team of developers and technical experts who provide support 24/7.

The founder of Maptek, Dr Bob Johnson congratulated the team in South America, acknowledging their dedication and commitment to our users and the mining industry.

'Maptek has always enjoyed the support and commitment of our customers. A mark of this respect is participation in the regular South American Users Conferences,' added Arancibia.

'We now offer a range of technical solutions covering mine planning, blast management and 3D laser scan survey, all of which are focused on helping our customers.'

'In South America, we know that if we did not have the support and trust of our customers, none of this would have been possible. We take this opportunity to thank you again for letting us share with you our 20 years in South America!'

'South America leads in pushing the technology envelope to allow our customers to gain continuous benefits from using the Maptek products.'

# Forge

## In this issue

The technical mining systems landscape changes almost as quickly as an advancing mine face. More connected, efficient and integrated systems use volumes of data an order of magnitude above what we see now.

Shorter planning cycles will drive the need for real time data to monitor performance against design. All technical systems, plant and equipment will be able to access that data to better meet production targets.

Maptek measurement and modelling systems quickly record, analyse and communicate this data. Feeding it back into the mine production cycle is a key enabler to success and continuous improvement.

Businesses must be agile and flexible if they are to meet their performance targets. Maptek technology systems help them by providing accurate data and powerful analysis tools to guide decision making.

## Contents

## MAPTEK / LEARN
Learn new software skills and how to apply the latest tools

## Introducing Maptek Learn

Maptek Learn is your hub for gaining new skills. Learn more about Haulage Profile with this tutorial and case study. Watch the videos by Stratigraphic Development Manager, Peter Odins, where he outlines a few of his favourite things in Vulcan 9.1. And see what other Vulcan technical services staff rate highly in this release.

**www.maptek.com/learn**

# Monitoring wear rates in crushers

Maptek™ technology proves to be a cost-effective and safe solution for monitoring wear rates of ore crushers.

Wear and tear in ore crushers can impact fragmentation size, cause damage to machinery and increase power costs. Maptek™ recently conducted a proof of concept for monitoring components of crushers, using I-Site™ laser scan technology and Vulcan™ modelling software.

The safe, efficient and accurate solution provides mining companies with data to predict crusher down time and metrics for optimising downstream processes. Applying best practice in the crushing and processing phase can significantly reduce costs in the mining life cycle.

Fragmentation size is controlled by two main crusher components - the lining and the mantle. The interior lining of a rotary primary crusher is designed to absorb the continuous impact of material dumped into the crusher. Over a 10 week period, the lining can wear by as much as 350mm, depending on the material being crushed.

The inside mantle is the main control over fragmentation size. During the 10 week cycle, the mantle position is adjusted vertically to maintain a consistent spacing for generating constant fragment size.

The mantle is designed in 4 different sizes depending on the wear profile of the outside lining. The higher the wear rate of the lining, the larger the mantle that is installed.

Being able to accurately predict when to make adjustments is essential for optimising downstream material handling in secondary and tertiary crushing systems.

## Safety and time

Safety and time are the main concerns around manual measurements in the crusher compartment.

An infra-red device traditionally would be used to measure wear patterns. Taking measurements from an estimated centre point in the crusher compartment at 50mm vertical spacing in octants could take up to 3 hours for a vertical extent of 2.75m.

Physically entering the crusher cavity exposes team members to dust and noise as well as risks of falling from the side walls. Working at heights requires wearing safety harnesses.

Production must stop when the crusher is shut down, with loss of revenue estimated at US$200,000 per hour. Typically 3 hours is needed to collect manual measurements; if this happens every 10 weeks, it means $3m per annum.

Even though measurements are taken during part of a wider shutdown program, time savings are significant with the Maptek solution.

## The solution

Using the I-Site 8200 laser scanner, Maptek demonstrated that the lining of the primary crusher, as well as other downstream crushers, could be scanned in a fraction of the time. It could also be conducted safely and with accurate results.

Moreover, the detailed 3D laser scan data can be applied to analysis outside the original scope of the study.

Wide scanning field of view, coarse levelling and 8mm minimum accuracy make the I-Site 8200 system ideal for crusher survey.
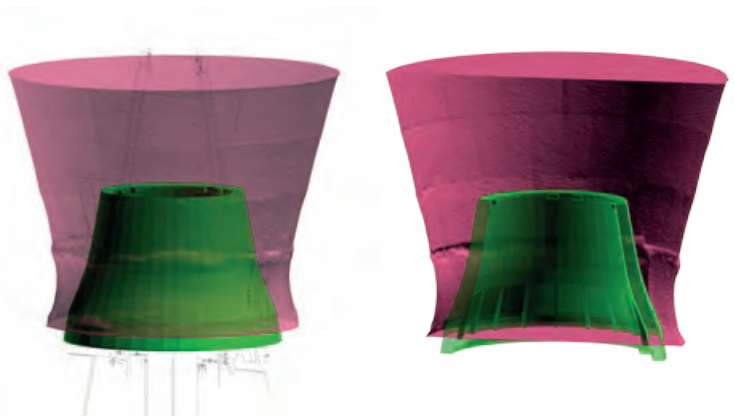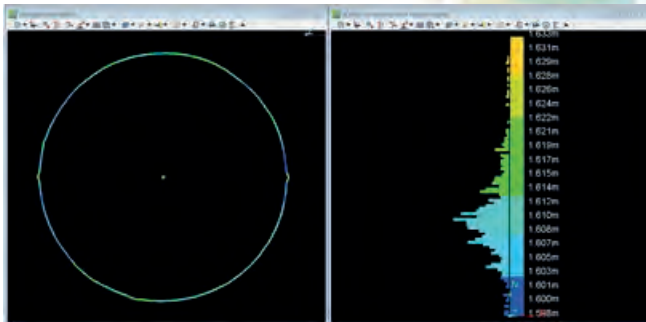
*Wear to the crusher lining can be easily seen by comparing the distance from the centre point of the crusher to the lining before and after operation*

Laser scanning was conducted with the scanner mounted on the dust collar alongside the crusher compartment. Scanning was completed in less than 30 minutes. Staff did not need to enter the crusher.

A 3D triangulation model of the crusher lining before operation was built from design parameters to establish a benchmark for calculating wear patterns. The model was divided into horizontal and vertical segments so that results could be easily related to what was happening in the crusher. Loading positions and various vertical design components of the lining were also referenced.

Scan data was compared to the modelled design data to create a wear profile. Tools in I-Site Studio and Vulcan allowed various metrics to be extracted, with the main focus on wear patterns for each quadrant.

As expected, the highest wear occurred at the bottom of the crusher lining, where the actual crushing takes place. Further evaluation was needed to determine if crushing occurred consistently throughout the lining and to assess its impact on wear rates.

Using Vulcan 3D solid tools the entire model was shelled into vertical and horizontal segments. This allowed comparison of both thickness and distance from centre points. The Survey Radiations function showed the distance from the centre point of the crusher of both the design and the actual scanned area.

## Further analysis

The study revealed uneven wear on the crusher lining. Quadrants where material was tipped into the crusher showed higher wear. Data for one quadrant indicated that trucks were not stopping parallel to the crusher dump box, exacerbating wear at this point.

Wear in the lower section of the crusher was greater at the join in the lining. Allowing material with increased fragment size to pass through this area has potential for impact on downstream processing performance.

A dramatic reduction in time spent measuring the crusher lining, combined with a significant increase in accuracy of data captured by I-Site laser scan technology, allows advanced analysis of data and more effective decision making.

## Ideal scenarios

Reducing down time of crushers allows mining operations to effectively increase revenue. Accurate digital data promotes more informed decisions relating to the position of the mantle that ultimately controls the gap between it and the lining.

**Sending consistent size material to the processing plant provides an opportunity to improve productivity.**

Crusher design companies can evaluate the wear patterns and adjust the position of the mantle based on this accurate data. Industry R&D investment could also lead to further improvements in the overall crushing process.

Predicting crusher shutdown to replace parts and achieve optimum crusher life will deliver ongoing productivity gains.

The ideal scenario would be to continuously scan crusher components to measure wear and tear. If safety and access limitations make this impractical, scanning more regularly would still be a worthwhile investment.
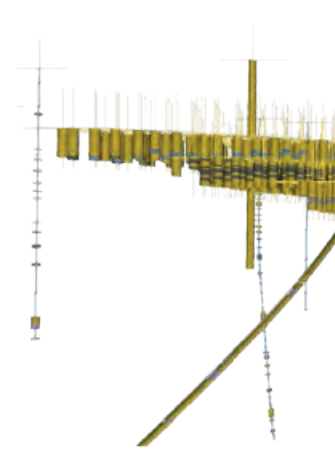
# Vulcan 9.1 models ALL of your data

New stratigraphic modelling tools in Maptek™ Vulcan™ 9.1 ensure geologists and engineers make the most of their valuable data.

Stratigraphic modelling has come a long way since the days when each site had a 'handcrafted' macro – virtually held under lock and key, only to be released once a year to rerun the resource model.

The revolution in stratigraphic modelling began with the release of Vulcan™ 6. The Integrated Stratigraphic Modelling (ISM) workflow brought the tools for making accurate and timely geological models onto the desktops of all users.

However, just because the ISM workflow made it simpler to incorporate all the available geological and exploration data into the final model, it didn't mean all sites immediately embraced it.

Protocol must be clearly followed, especially at larger operations, before such a comprehensive change in approach can be adopted. Acceptance timeframes are not uncommonly measured in years.

Adoption of the ISM tools reached a peak during the Vulcan 9.1 development period.

Guided by client feedback and requests, we have responded to many additional requests within this version. Vulcan 9.1 ensures that nothing is lost.

Users want to squeeze the most value out of all their data, especially in tougher economic conditions when it becomes a clear case of 'use it or lose it'.

## Use all your data

If you happen to have a 'spare' 40,000 correlated blastholes, which in the past could not be used effectively in FixDHD due to containing only one horizon, then try the new **short hole** capability.

This allows you to really tie down your structural models with high resolution drillhole data – without introducing any artefacts in the remainder of the stratigraphic sequence due to over-enthusiastic interpolation.

As an added bonus it will probably run 20 times faster!

Perhaps when your drillholes start or end in the coal seam, you are tired of telling Vulcan that this really is the roof or floor of the coal!

If so, try the new **trust list** option in FixDHD. Instead of ignoring these holes or fudging additional intervals in your database, simply specify which holes you trust for the roof or floor and let FixDHD do the rest. Your valuable data will be honoured – without compromising the original drilling data.

## Model stratigraphy

Are you frustrated at having to discard lots of valuable in-pit, crop line, scanned or seismic interpretations because you prefer to use a stacking base method in Model Stratigraphy?

In Vulcan 9.1 there is no need to throw away data – simply select the new **hybrid** base method and include everything in the additional design data section for any or all horizons. ISM will let you have your (layer) cake and eat it too!
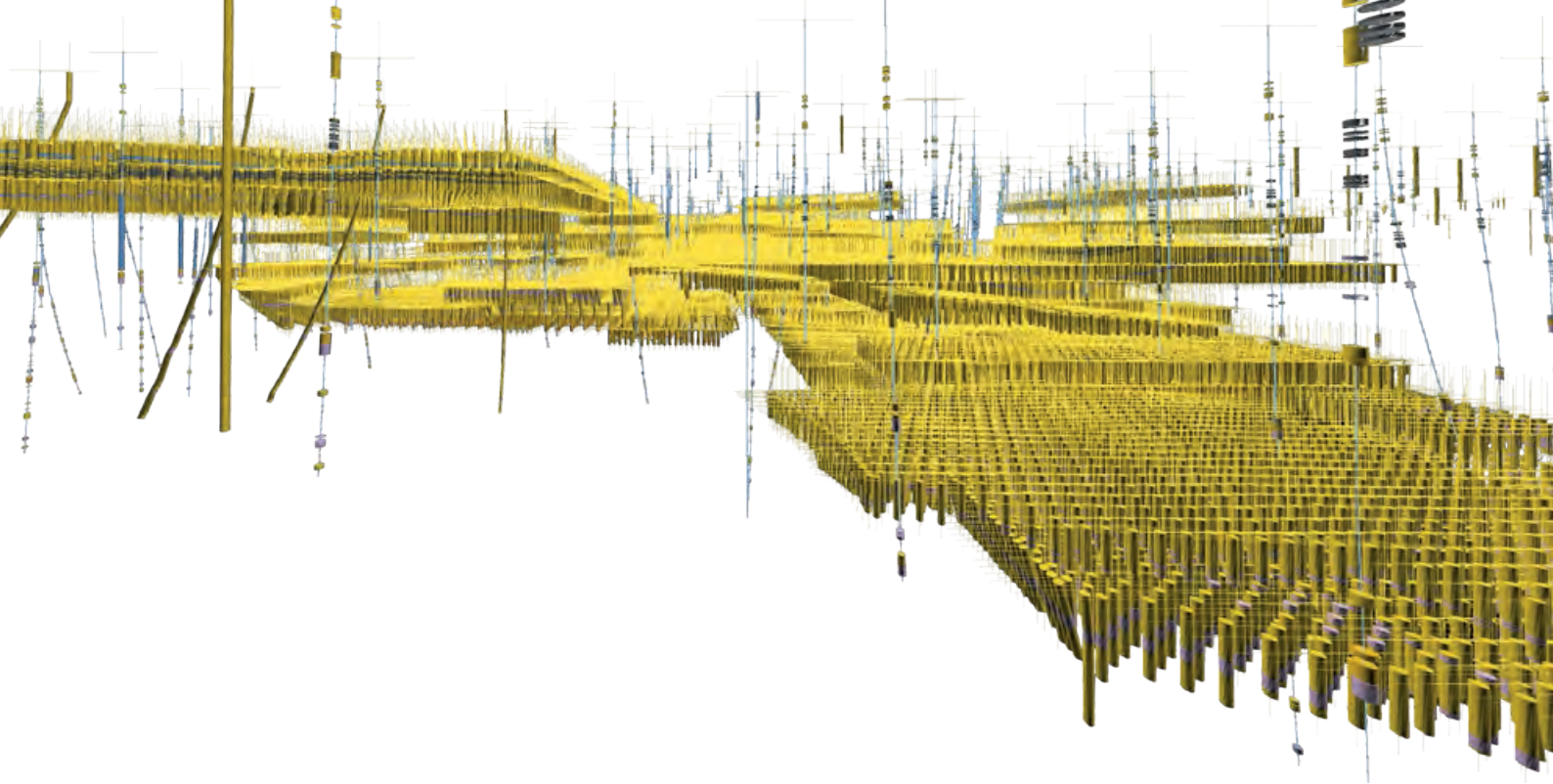
If you prefer the **structural surfaces** approach, the new **preserve thickness** option will help prevent unrealistic pinch-outs or thickening of seams. This uses thickness information from the structural surface with the most information to control the surface with the least.

These two apparently small changes will have a profound influence on modelling stratigraphic deposits. Even more power is placed in the hands of geologists or engineers, ensuring that no relevant data is left unused.

## HARP models

HARP modellers are not ignored. Enhancements to HARP creation mean that you can include modelled or constant values directly in the waste blocks between horizons as well as within horizons, with the option to break them down into vertical sub-blocks.

If you already have a perfected HARP model and want to upgrade

it with additional information from grids or constants, then try the new **update HARP model qualities** option. You will save time and effort by not having to recreate your model from first principles.

## Model sharing

Once you have created a terrific HARP model and are satisfied that you have squeezed the most value out of your hard won data, you will be keen to share it. The new **export HARP model to surfaces** option has that covered too.

As the name suggests this option allows you to easily extract any structural or quality data from the model directly to triangulations or grids ready for downstream use. There is no need to copy thousands of grid and triangulation files in order to share your model.

You spend a lot of time and money collecting data. Maptek ensures that you get the most value out of it. Vulcan 9.1 goes a long way to helping you work in the most efficient way to meet your goals.





LEARN
MORE
ONLINE

**www.maptek.com/vulcan9.1/stratigraphic.html**
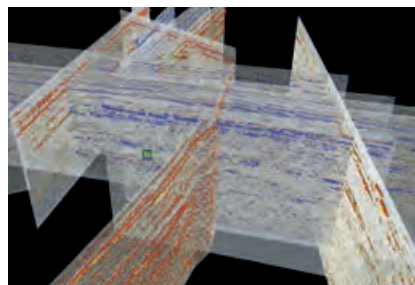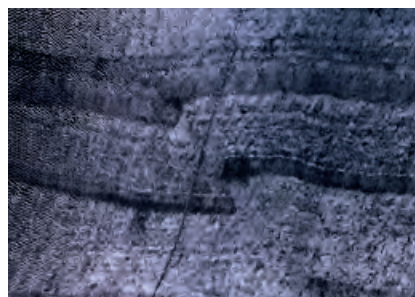
# Integrated haulage strategy cuts costs

Maptek™ recently added the Evorelution capability to Vulcan™, providing advanced strategic mine scheduling optimisation tools.

Now known as Vulcan™ Open Pit Scheduler, Evorelution proved its worth in a scheduling study at the Tropicana gold mine in Western Australia in 2012.

One large block model covered the Tropicana project, which extended more than 5km along strike and to a depth of 400m. Ten waste destinations were involved.

Practical medium and long-term mine plans were developed from the resource model.

The mine plans met mill feed requirements while minimising haulage costs, maximising recovered metal production and minimising stockpile rehandle.

The efficient scheduling process reduced the time to generate optimal fleet haulage routes for the 10 waste landforms.

Haulage costs were lowered by developing a practical operating plan which met all of the complex objectives associated with operational readiness.

Plans had to incorporate infrastructure such as tailings dam lifts, ROM pads and haul roads, and allow for growth medium (topsoil) as well as encapsulation of potentially acid generating material.

Other requirements were to build in truck ramp-up strategy, and to allow for variable period length and variable crusher throughput, which is dependent on lithology, to process 5.8 to 6.6 mtpa.

## Productivity benefits

As well as maximising value by meeting required metal production, haulage costs were reduced by 10%. Additional productivity benefits were realised by deferral of capital outlay on fleet purchases and early identification of where, when and how much land needs to be cleared.

Analysis revealed that purchasing three extra trucks could be delayed for 18 months, saving more than 1,000 haulage hours per month for this period.

Closure planning was included as part of the mine plan. The benefit of this lies in identifying areas where final landform development can commence early in the mine schedule. Management is then able to make decisions based on known clearance costs.

Running production scheduling, route allocation, haulage cycle time analysis and waste landform optimisation within the same package meant a 30% reduction in mining software costs.

Technical staff also reported improved efficiency through working across planning horizons, with reduced training costs and enhanced workflows.

Vulcan Open Pit Scheduler powered by Evorelution is now available.

*Contact your local Maptek office to find out more about the benefits for strategic mine planning at your operation.*
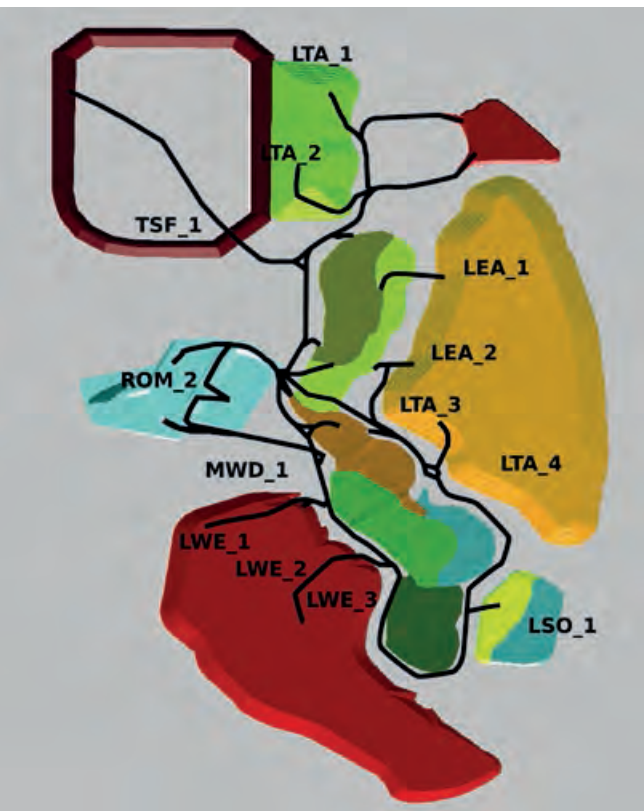
# Coal tracking enhances site efficiency

Maptek™ is implementing a coal quality tracking system at a Queensland operation to meet needs for site wide efficiency gains.

The work started in late 2012 when Maptek was approached to develop software modelling functionality for a coal tracking system.

The mine delivered its first coal in 2014 and will produce up to 5.5 mtpa of premium quality metallurgical coal.

Energy efficiency was a key focus during the mine development phase, with measures built into the design and management systems. This included installing highly efficient equipment and optimisation of truck, shovel and dragline movements.

The coal tracking system is an integral part of the overall IT environment which will help deliver efficiencies across the operation. Maptek IT implemented a specific design for the modelling functionality to ensure it matched the on-site facilities for coal tracking. New machinery and mine site operations were simulated to mirror real world conditions.

The system allows the operation to monitor the quality of coal through its various mine sites and facilities.

It is already in use at some sites within the operation, where it reports on quality levels and trending qualities in pseudo real-time. This ensures that customer contracts and products realistically match specifications.

**The modelling functionality will be seamlessly integrated with the mine fleet management system to track payloads and coal origin information through the production machinery and stockpiles.**

The coal tracking system successfully passed all factory acceptance tests in August 2014. Current work involves implementing the system for calibration and modelling at both the raw coal and product site facilities. It is expected to be operational by August 2015.

Maptek involvement continues past development and implementation. Expert application support services include incident management and resolution, upgrade changeover, monitoring, administration and system maintenance.

## Maptek IT support framework

> Manage incidents
> Troubleshoot problems
> Manage releases/upgrades
> Capacity management
> Monitoring systems
> Administration services
> Change management
> System maintenance

Support transition has been successful. Knowledge and expertise were transferred from in-house systems to Maptek IT with no interruption to production. To date all service level agreements have been met.

*Contact info@maptek.com.au to find out how Maptek IT can help optimise your operation.*
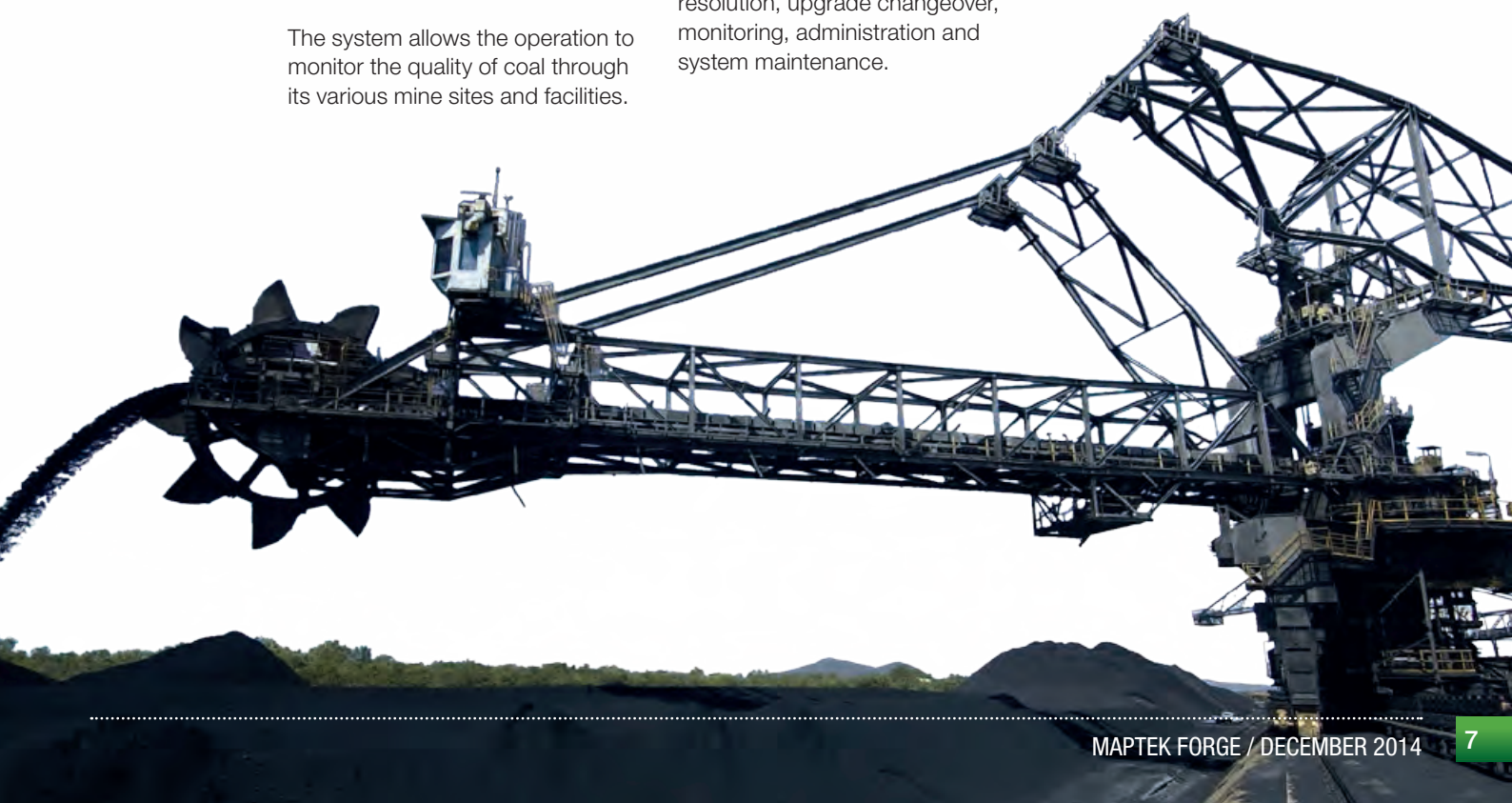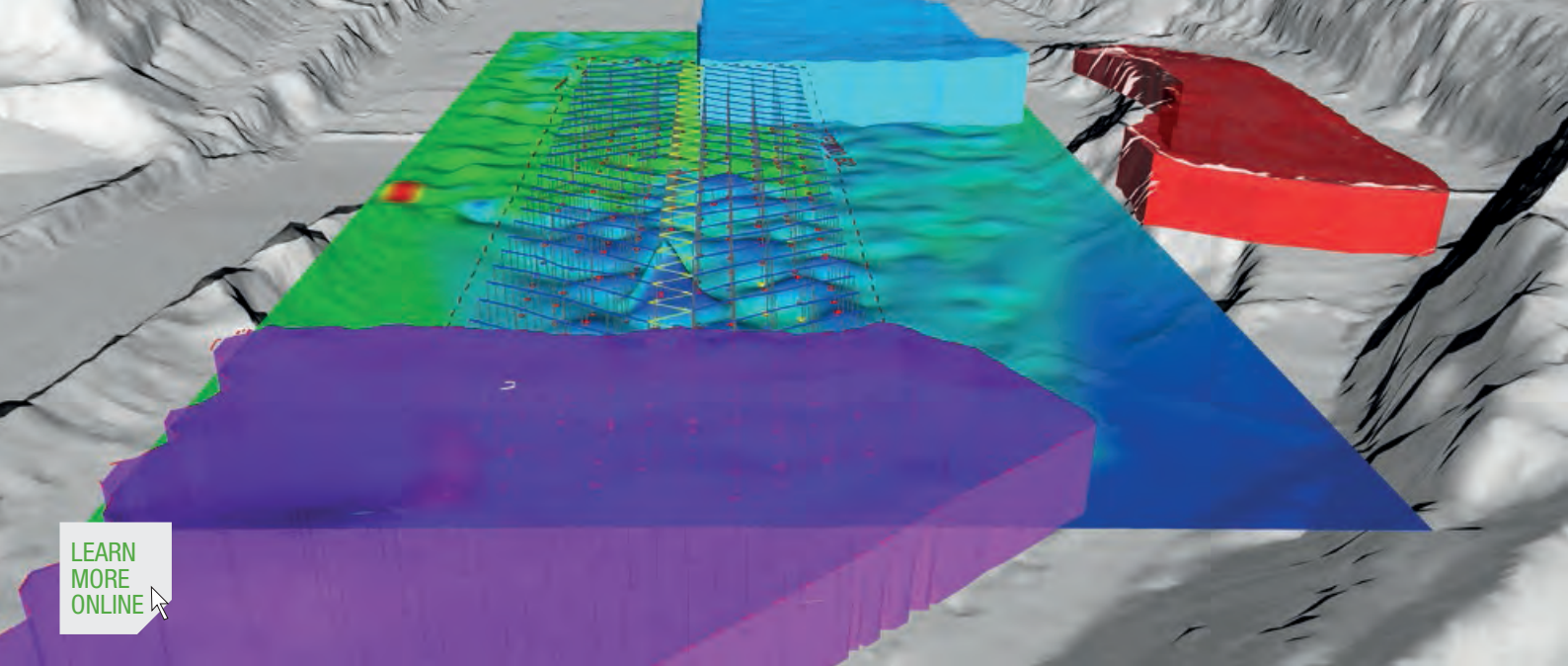
# Blast by blast advances

Maptek™ BlastLogic™ blast analytics help operations identify trends to guide production improvements and reduce risk.

An Australian coal mine wanted to quantify the impact of various blast plans on the operation. Existing methods relied on manual processes and inefficient software for analysing blasting results. There was no way of comparing and contrasting multiple blasts.

**Leveraging blast analytics at an operation can preempt risk, reduce production bottlenecks and eliminate potential cost issues.**

## Strategy

To leverage blast analytics, the first step was to find a way to instantly connect and visualise data. Reliable information was needed for quick recognition of factors impacting drill and blast at critical stages, so that timely action could be taken.

Maptek™ BlastLogic™ software provided a site wide solution for all stakeholders. BlastLogic enabled instant access to drill and blast data. Visualisation in a 3D environment provided a platform for logical planning and implementation of blasting activities.

## Execution

BlastLogic compared the design with implementation and outcome, providing important production insight across multiple mining areas. No additional workload was placed on engineers and blast crews, allowing more time for engineers to focus on design improvement and operational collaboration.

Blast crews used the BlastLogic tablet in the field to capture critical data. All information was instantly synchronised back to the server. Charge plans were dynamically updated based on real time dipping data from field crews. Direct interface with support drill navigation systems ensured consistent data, which was reconciled back in the office.

Overloading of explosives was avoided using visual warnings displayed on the BlastLogic tablet and desktop software. Planning and operations teams could work in sync to fine tune cost and performance differentials.

## Outcome

The greatest benefit came from the production insights gained through cataloguing blasts by conditions, performance and region. Multiple field and office users accessed the same data and worked together to identify areas for improvement.

**As a result, this operation achieved more cost effective blasting, with a 10% reduction in powder factor and faster timing.**

Site users found the flexible BlastLogic workflow particularly helpful when applying changes and performing simple analysis. All updates were communicated on the fly, reducing down time and minimising chances of miscommunication.

Operational knowledge was linked effectively with blast by blast insights and production details. This meant that the operation could use blast analytics to uncover connections and trends that emerge in their drill and blast processes.

*Email blastlogic@maptek.com.au*

# Trend analysis for surface movement

The new Maptek™ Sentry system provides intuitive visualisation and trend analysis tools, enabling better understanding of surface movements within mines.

Hillgrove Resources Limited Kanmantoo Copper Mine is a 10-year open cut mine producing 20,000 tpa of copper metal with associated gold and silver. The mine, in the Adelaide Hills of South Australia, has been trialling Maptek™ Sentry since late 2013.

## Sentry setup

Sentry is a reliable laser-based system for accurately detecting change in real time. The latest I-Site™ 8820 laser scanner was positioned on a permanent bollard in a newly opened pit, approximately 200m from a wall of concern. Weekly scans were taken to build up baseline data.

Results were compared to the output from regularly monitored prisms. Sentry data correlated well, and supplied extra information on the surrounding areas. This correlation instilled trust in Sentry, and the additional data assisted with decisions such as remedial stabilisation berm positioning. Based on prism data alone, the stabilisation berm would have been considerably shorter.

When slow creep movement was detected in the highwall, the I-Site laser scanner was repositioned to be more perpendicular to that portion of the wall. A radar was deployed at the same time to specifically cover the area. Although the radar collected more frequent data (5 minutes versus 42 minutes) the I-Site scan showed similar total movement (3-7mm) and movement rates (<1mm/day).

More recently the rate of highwall movements has increased. Although the laser scanner resolution has been reduced to

greatly increase the monitoring frequency to 4 minutes, the scanner and radar data continue to follow similar trends.

During the recent laser scanning period, additional movements were detected below the main ramp into the pit. The combined data from the radar and I-Site scanner were used to manage mine production and establish a second stabilisation berm under the ramp.

## Trial results

Maptek returned regularly to Kanmantoo Mine to compare results as changes were detected.

**Sentry results provided excellent correlation with radar systems. Movement trends in ductile rock were tracked with millimetre accuracy.**

Sentry showed the points of origin and landing, as well as the volume (down to 0.5-1.5m³) of small rock falls. This data has been invaluable for improving Hillgrove's rock fall database, which management uses to reduce small-scale rock fall risk in the vicinity of highwall toes.

With regard to larger wall movements, being able to view data in 2D and 3D with images and heat maps overlaid improves analysis of movements over time. Sentry's graphical and statistical reporting tools promoted better understanding of the failure mechanisms of several wall movements – the slowly progressing highwall toppling, a weathered slump failure and the slumping under a haul ramp.

The failure timelines from these areas also allowed information to be fed back into the system for creating radar alarms.

## Value adding

Laser scan data can also be used for other spatial, geotechnical and volumetric tasks. Design conformance reporting can be conducted in PerfectDig. Sentry can be halted temporarily so that the laser scanner can be used elsewhere in the operation for survey or geotechnical work.
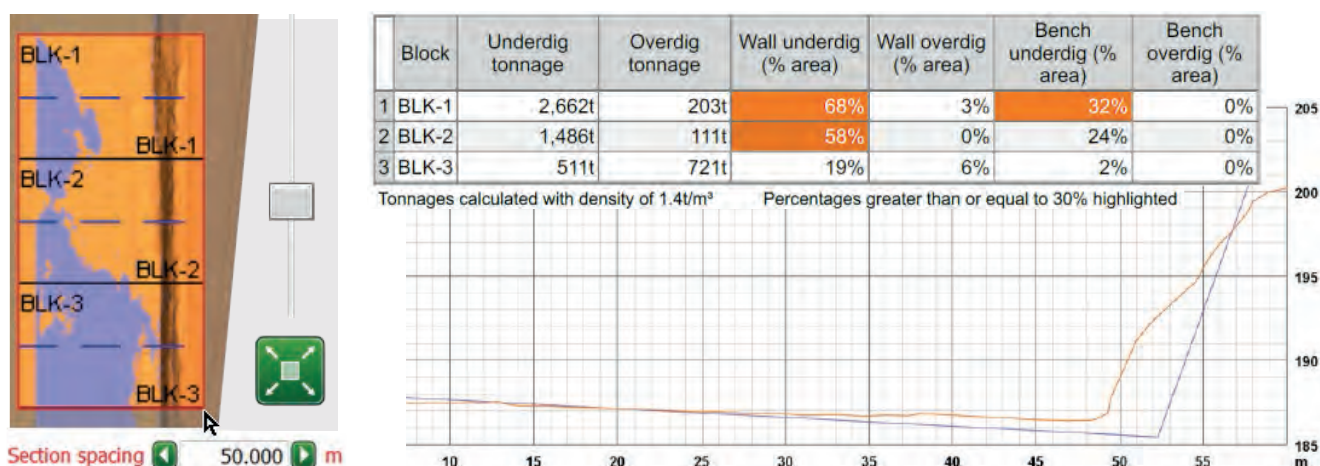
Hillgrove found that Sentry data improved awareness of movement in the pit and helped plan remedial action. The Hillgrove trial demonstrated Sentry's value for visualising and analysing movement trends and meeting safety objectives.

*Thanks to Hillgrove Resources Limited*

# Valuable design conformance reporting

Maptek™ PerfectDig is a fast, easy and accurate solution for reporting mining activity to help operations avoid cost overruns arising from non-conformance.



| Block | Underdig tonnage | Overdig tonnage | Wall underdig (% area) | Wall overdig (% area) | Bench underdig (% area) | Bench overdig (% area) |
|---|---|---|---|---|---|---|
| 1 BLK-1 | 2,662t | 203t | 68% | 3% | 32% | 0% |
| 2 BLK-2 | 1,486t | 111t | 58% | 0% | 24% | 0% |
| 3 BLK-3 | 511t | 721t | 19% | 6% | 2% | 0% |

Tonnages calculated with density of 1.4t/m³     Percentages greater than or equal to 30% highlighted

Successful mining organisations rely on some form of reconciliation procedure or system to guide them in implementing their mine designs.

The question is no longer whether mine reconciliation systems benefit operations, but whether they can be improved to deliver additional productivity gains. With new, disruptive technology becoming available, the answer is invariably that improvements can be made.

Maptek™ solutions look to add value to even the most solid business foundations. We are continually investigating new ways to collect and exploit spatial data in its various forms.

One example is the PerfectDig **conformance report generator** which targets the reconciliation feedback loop. Customer input to enhancements which are now available in PerfectDig 1.2.

## Data input & output

The concept is simple. Input data can be laser scans, existing surfaces, airborne LiDAR point clouds or UAV data.

Outputs are intuitive, useful and rapidly generated with minimal user effort. The user selects a design, blocklines if applicable, and as-built data.

Once a region and the section spacing are selected, PerfectDig processes the data and produces a conformance report. Data can be reported in various unit formats, including tonnages if material density is known.

Users can annotate the reports, save as pdf and print or publish directly to PerfectDig Online. A link can be emailed to all stakeholders.

## Value proposition

Manual workflow for reporting often creates months of backlog. The process is then perceived as merely a corporate requirement with no tangible benefit to sites.

Fast, simple output of PerfectDig reports creates an effective conduit for feedback into the operational loop. This makes real time decisions possible, leading to measurable business outcomes.

**Using the report generator means a task that would take hours can become a simple function taking minutes.**

One customer estimated that the conformance reporting tool alone could pay off the purchase price in 1 year by saving the wages of a single person. This is apart from any consideration of operational savings arising from using the PerfectDig results efficiently.

## Conformance reporting

Taking a step back we can explore why (not how) PerfectDig adds value to the design conformance process.

**Resource modelling**, the first step in mining, dictates the economic feasibility of the project and in turn the mining limits. During mining, information is continually fed back to refine the model. Most of the resource reconciliation compares as-built information against the resource model.

**Mine designs** are then created for extracting ore from the ground. Long and mid-term designs are based on the broader model and generally do not involve daily mining input.

Short term design requires constant refining and is very much a day to day proposition, with ground conditions, equipment and previous mining activity taken into account.

Great effort goes into generating designs. Successful mining dictates that they be followed accurately. Deviation from design affects both timing and costs.

**Design execution** is where most of the savings can be made. Tools that aid conformance to design should be relied upon in this phase. Cost overruns due to under and overdig can tip the balance between profit and loss.

Real time comparison between design and as-built highlights issues before they get out of hand.

**Monitoring** is another big impact area. It is the main real time data gathering stage, with data flowing into all downstream processes.

Ideal monitoring provides daily or hourly comparisons to design. The closer to real time the monitoring is, the better results it yields and the more efficient the operation.

The monitoring method must be simple and fast. The data needs to be easily accessible and transparent to all parties, from accountants to machine operators.

Understanding and quantifying conformance data is paramount for making good decisions which ultimately drive organisational improvement.

**Optimisation** depends on information gathered during execution and monitoring. This is where the loop that started with resource modelling is closed.

All of the acquired information is applied to improve the design. True optimisation demands consistency in execution. This requires comprehensive monitoring with near real time feedback.
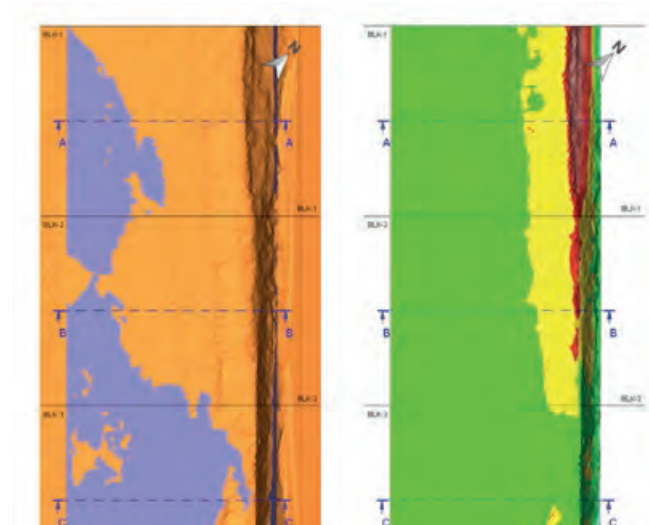


## Conclusion

Planning assumptions are improved by monitoring and optimising the modelling, design and execution of a mine plan. Deficiencies can be identified and dealt with in a reasonable time frame.

It is no longer necessary to delay milestone reporting. The technology is now available to make it a constant, achievable mechanism for day to day operational improvement.

*To see all of the latest features for design conformance reporting, visit www.maptek.com/products/perfectdig/*
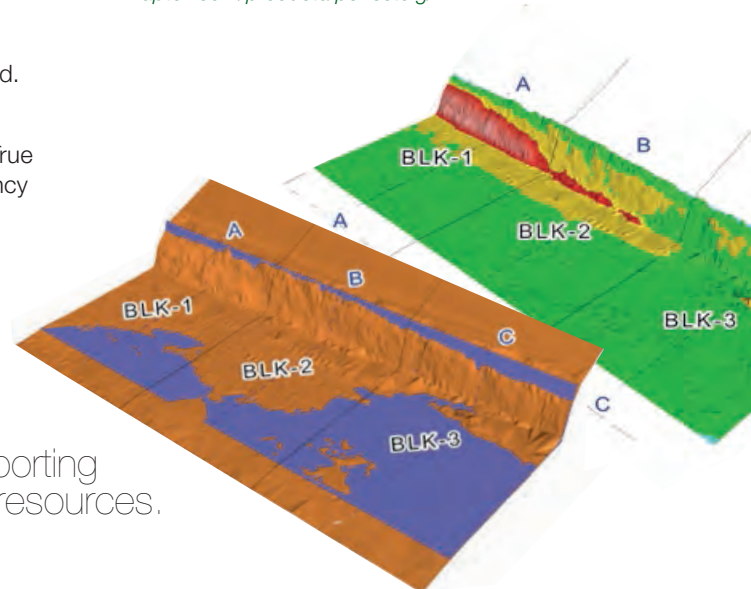


The cost of the conformance reporting tool alone can save significant resources.

# Geology helps define road expansion

Maptek™ I-Site™ technology defined the geology and stability of cliff faces, helping a road construction company to plan a safe expansion project.

Khasab, a city in the exclave of Oman, was isolated for a long time. Mountains rising from the plains of Ras al Khaimah made it virtually impossible to reach the city by land.

The development of a coastal road from the United Arab Emirates opened Khasab to the world.

## Access challenges

The highway is built up against a sheer coastal cliff. Large overhanging rocks are susceptible to falling, particularly following rainfall. A planned upgrade prompted officials to commission a study to ensure the new design would prevent rock falls and improve road safety.

Due to the challenging geology of the region, the road construction company, STFA, required details of the geology and rock stability to gain a better understanding of the cliff faces.
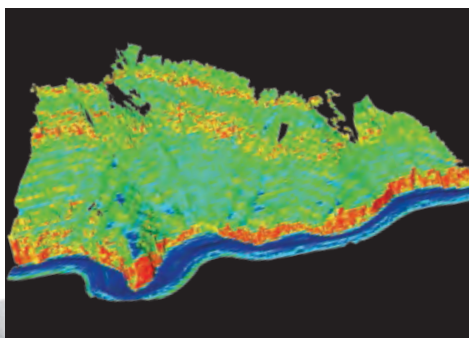
## Accurate solution

A Maptek™ I-Site™ 8810 laser scanner was used for geological mapping and geotechnical data acquisition. Surveying was fast and safe: 3 kilometres of road could be scanned each day. Cliff walls were up to 100 metres high.

Traditionally, a team of rock climbers would scale the cliffs and use a handheld compass to map the rock faces. This was neither fast nor safe.

**Mounting the laser scanner on a vehicle allowed the survey crew to scan the walls from a safe distance, away from large overhangs.**

Access was difficult with the road running right against the sea wall. The I-Site laser scanner was mounted on a crane to capture data on high faces where the offset was even tighter.

## Detailed results

The original scope of the project required I-Site Studio software to generate rose diagrams for each of the thousands of rock faces along the cliff. This data was to be the basis for developing a regional geological report.

Topographic surfaces of the road and cliff face were generated to create a slope map for identifying steep areas.

After data collection finished, STFA asked for cross-sections of the walls and road, along with the volumes of particular rocks at high risk of coming loose. Traditionally, time consuming new surveys would have been required.

These deliverables were outside the initial scope. However, the comprehensive I-Site 8810 data was easily modelled and exported as cross-sections. This information helped determine where mesh or shotcrete would be required to stabilise surfaces.

*Thanks to Destecs International*
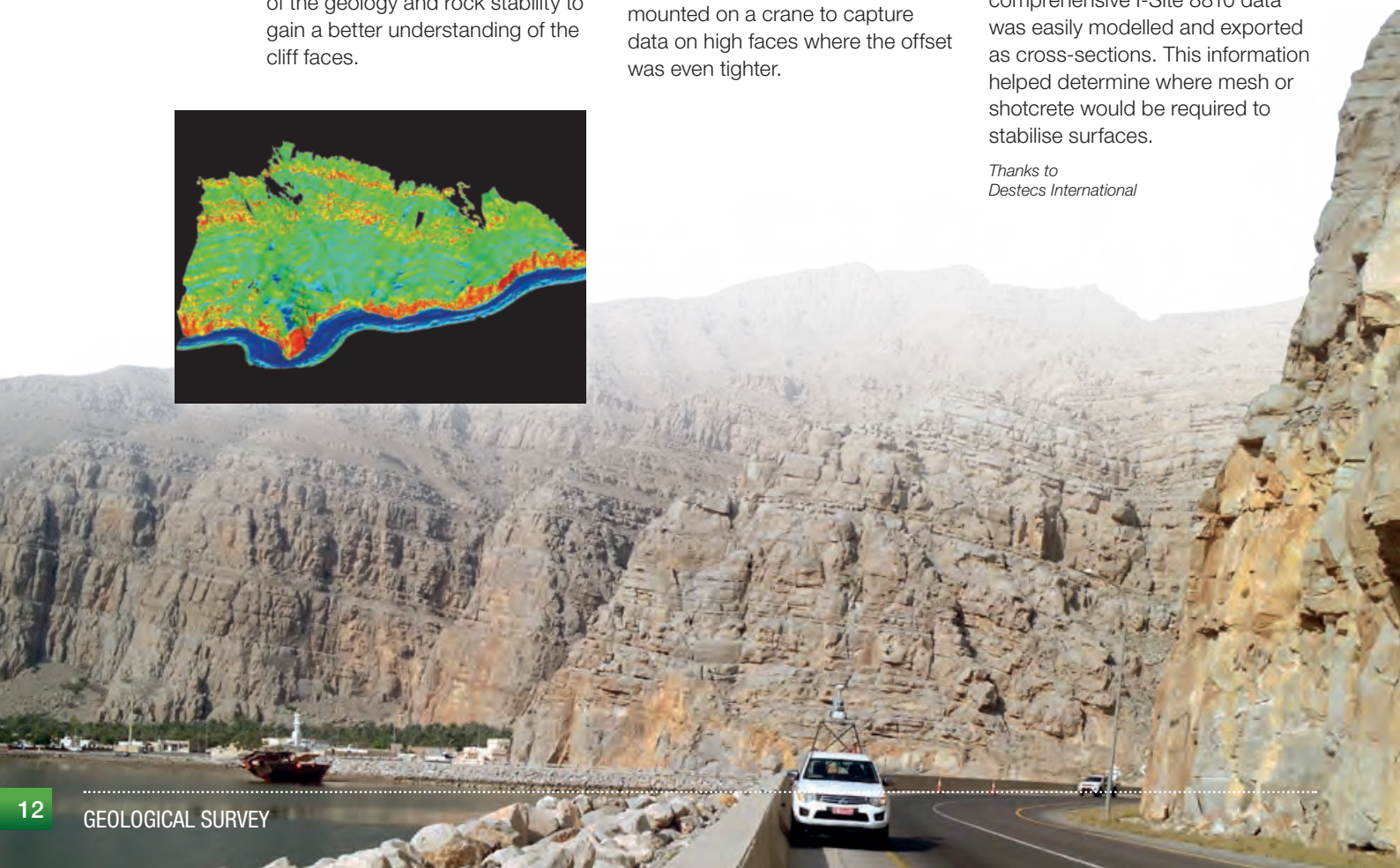
# University partnerships

## Students experience the ideal survey workflow

Final year surveying students at the University of Southern Queensland (USQ) recently took part in a one-day masterclass run by Maptek™.

Maptek technical services consultant James Mckenzie conducted the session for external spatial science students attending their residential week in Toowoomba, west of Brisbane.

The workflow based class saw students importing, editing and manipulating scans in Maptek I-Site™ Studio software. Models and triangulations were exported to Vulcan for calculating volumes and reporting.

Almost all of the 30 strong class were final year surveying students. The activities followed the daily rounds of a surveyor in the typical mining environment.

Several had experienced Maptek products before but even those students found the workflow approach particularly beneficial. The tips, tricks and shortcuts that were demonstrated will stand them in good stead.

Feedback from the university was very positive. Firm plans have been made for further sessions, along with a request for more I-Site studio licences to allow USQ to expand the class.

'The Maptek session highlighted the need for more 3D modelling exercises in USQ courses. The university is keen to provide an environment where as many students as possible gain exposure to the latest technology, to set them up for their future careers,' said Chris Power, Survey & Spatial Science Lecturer, Faculty of Health, Engineering and Sciences.

Maptek will now develop a short course incorporating I-Site Studio, Vulcan™ and PerfectDig for students in coming years. This will provide an end-to-end mine site workflow from survey pickup to reporting.
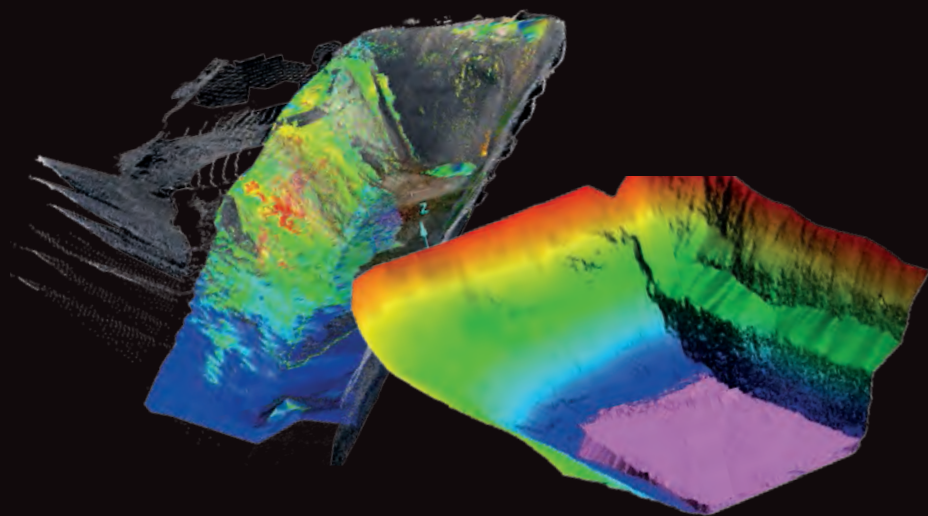


# Maptek Calendar

## 2015

**January 26-29**
Association for Mineral Exploration BC
Vancouver, BC, Canada - Booth 600

**February 1-4**
International Society of Explosives Engineers
New Orleans, Louisiana, USA - Booth 510

**February 15-18**
SME
Denver, Colorado, USA - Booth 1303

**February 23-25**
International LiDAR Mapping Forum 2015
Portland, Maine, USA

**March 1-4**
Prospectors & Developers Association of Canada
Toronto, BC, Canada - Booth 1039

**May 9-13**
Canadian Institute of Mining, Metallurgy and Petroleum
Montreal, BC, Canada - Booth 2009

**May 23-27**
APCOM
Fairbanks, Alaska, USA

**June 4-5**
Elko Mining Expo
Elko, Nevada, USA

**June 11-12**
Africa Australia Technical Mining Conference
Adelaide, South Australia - Booth 1

**July 13-15**
Iron Ore 2015
Perth, Western Australia - Booth 20

**August 24-26**
Fragblast 11
Sydney, NSW, Australia - Booth 16

**September 21-25**
Perumin Extemin
Arequipa, Peru - Booths 1591 & 1592

**October 7-9**
7th Bowen Basin Geology Group Symposium
Brisbane, QLD, Australia - Booth 37

**October 7-10**
XXXI International Mining Convention
Acapulco, México

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