

A STORY OF PARTNERING & INNOVATION

By Bob Johnson

Many years ago, I left the University of NSW to start a small business offering whiz-bang mathematical data processing to help mining companies with their exploration for coal and minerals. I had received an undergraduate scholarship from the Joint Coal Board and wanted to contribute something back to the industry.

Utah Development Company was then developing the large open cut coal mines in the Bowen Basin. To their credit, senior mine planners gave me some geophysical data to play with. I processed it, producing results that were interesting but of little consequence. However, I did receive my first income in four months.

A few weeks later Utah gave me another chance. Their coal exploration in the Lake Phillipson area of South Australia had amassed about 200 hand written field logs and some coal assays. There was nothing I could do immediately, they said, until the plans were drawn up. The drafting would take about six months. I could then get the data from the plans and 'process' it.

I couldn't wait that long for my next job. I had an old plot buried in my briefcase - a stratigraphic column drawn on a Calcomp pen plotter. I flattened it out on the desk and they jumped on it.

'You can do that on a computer?' they exclaimed. Intrigued that what I had almost forgotten was valuable to my customers, I left with a few of the hand written logs. I said it would be 'easy' - it would only take a few days!

I had learned that I must talk to customers to find out their true needs.

I would be able to feed my family and Utah would get a faster and better outcome than conventional drafting methods - a win-win situation.

I dusted off ideas from my doctorate and created the first borehole database system and borehole cross-section plotting program. Stratigraphic sections were automatically generated at any desired scale, showing different lithologies and formation codes. I even added their logo, title block and all the finishing elements a drafting office would provide.

I returned to the Utah mine planners as promised and rolled out the section. I left with a commission to set up the database and generate sections and contour plans for the entire deposit. They estimated saving on a year of effort. We moved on to do extensive work for Queensland's Bowen Basin mines. The rest is history.

Computer based modelling had proved profitable, but as a service company we were limited by the number of hours in a day. When computer technology caught up anyone could own a PC.

Maptek was started up in 1981 to write software that would allow customers to do the modelling themselves.

Utah's input kickstarted innovations that would have come about eventually. However, this way was far more effective, leading to mutual satisfaction and long-term partnerships.


Maptek still provides software and services to those Bowen Basin mines, which BMA acquired in 1990.

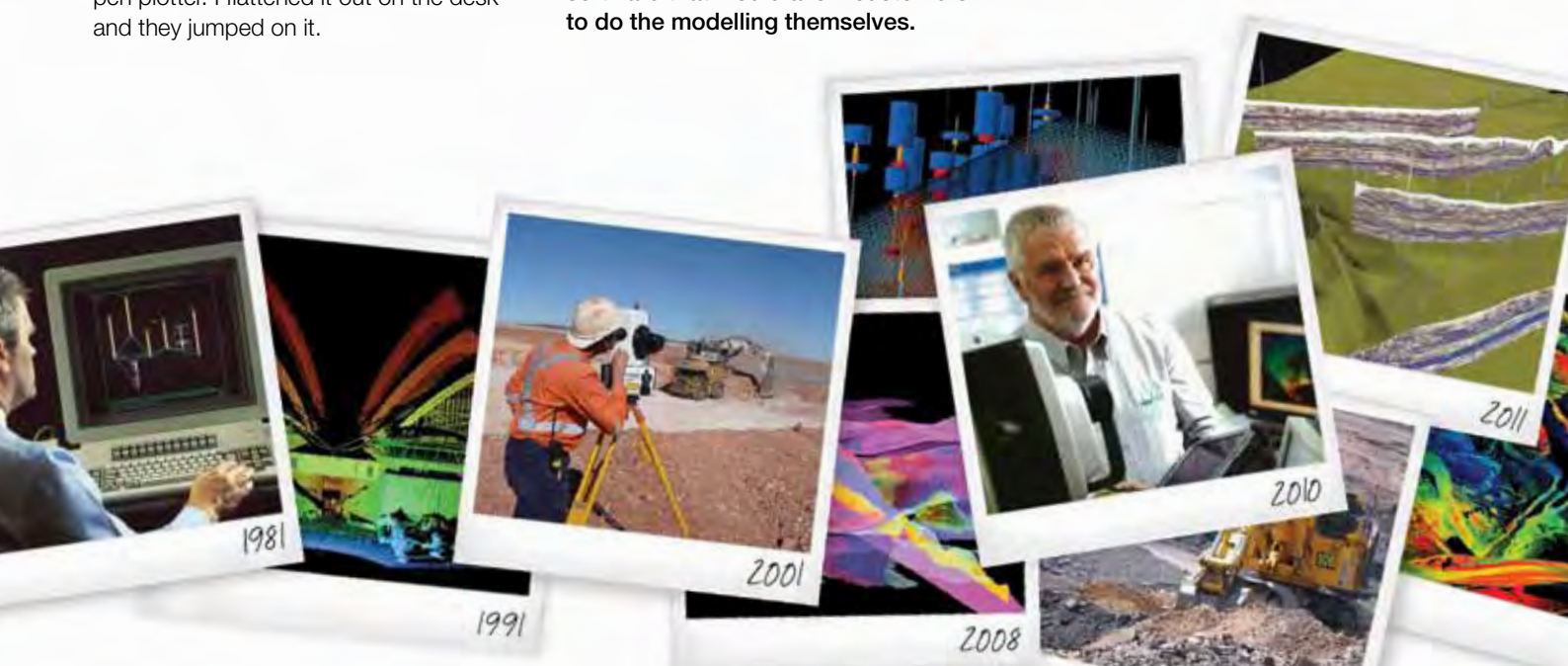
The memory of those early days drives me to keep listening to customers to identify how we can help. Mines want lower operating costs and people want job satisfaction. Maptek's Vulcan software has evolved through close interaction with users to ensure practical outcomes.

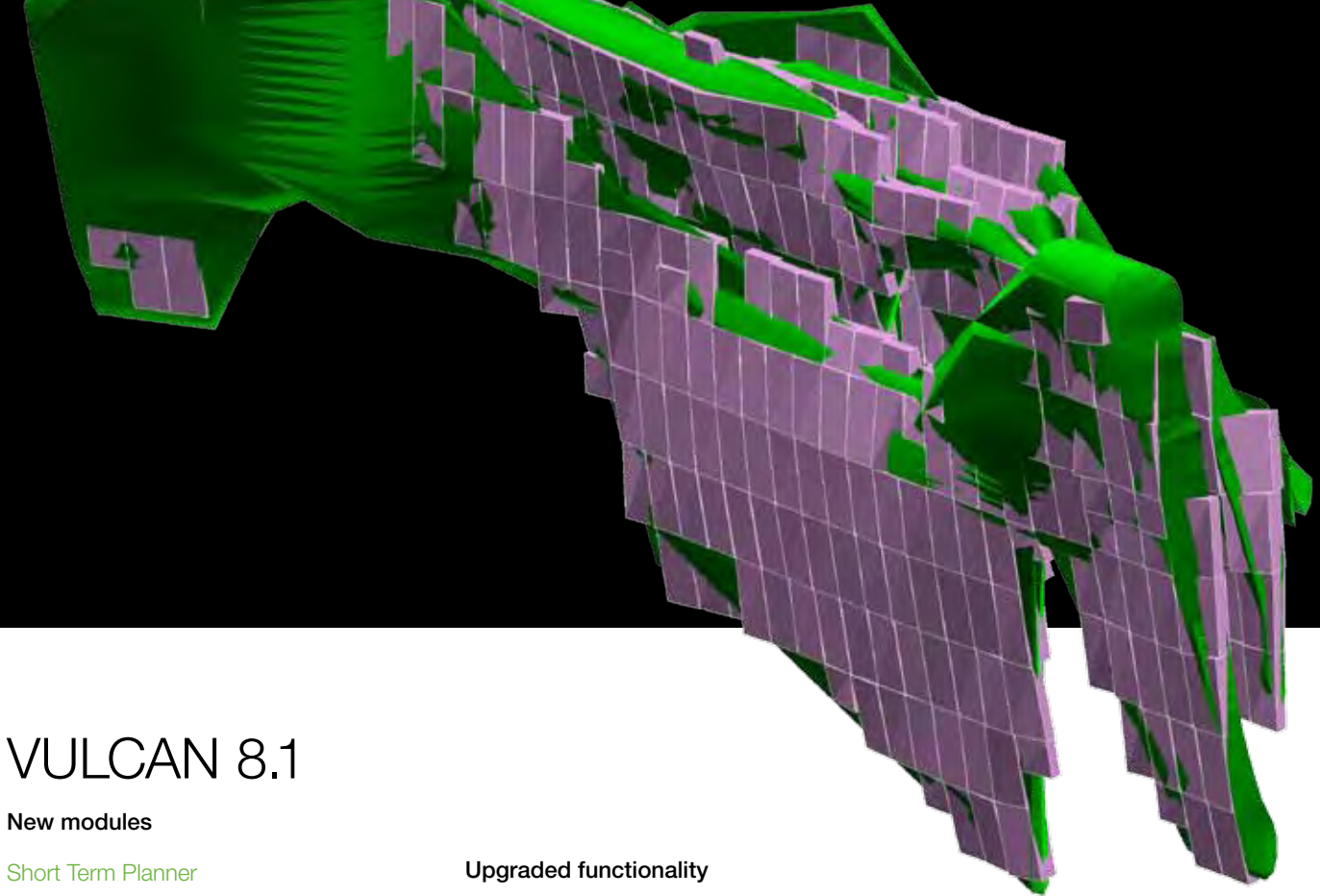
Likewise, a job with the Defence Science Technology Organisation in Adelaide led to our I-Site system. We recognised the potential of laser scanning technology and then collaborated with our customers.

The result was a highly efficient system for rapid, safe and accurate surveying. Mine surveyors around the world have pooled their experience to help create the industry standard for 3D laser mapping.

Of course, when I left academia in 1976, such concepts were beyond our realisation. From those first ideas, quantum leaps have followed.

Maptek remains committed to innovation. Seeing customers successfully using our products in their daily tasks encourages us to continue to push the boundaries. Together we can achieve better outcomes for the mining industry. 





VULCAN 8.1

New modules

Short Term Planner

- > Analyse open pit scheduling scenarios
- > Create 3D period regions automatically
- > Extract required information directly from block models
- > All variables in block models can be used for cutoffs
- > Reporting and statistics integrated with other Vulcan tools

Stope Optimiser

- > Assess multiple scenarios to target mineable zones
- > Apply to very steep orebodies or horizontal benches
- > Use for open pit or horizontal underground designs
- > Analyse and compare stopes
- > Generate triangulations for design, reserves and scheduling

Upgraded functionality

- > Underground ramp unfolding for easier grade analysis and plotting
- > Determine fuel consumption when evaluating different haulage routes
- > Store and manipulate more information in design data
- > Draw legends in multiple planes
- > Click on 3D data to link to external applications
- > Easier digitising with hot key tracking
- > Improved survey station management

Improved performance

- > Multi-threading reduces time required to run optimisations by up to 99%
- > Optimised run length compositing results in better resource determination
- > Access acQuire managed databases faster

Streamlined display

- > Redesigned interface for generating bench & batter projections
- > Geotechnical utilities include tadpole and stickplot display options
- > New grade control display toolbar for faster, easier viewing

Integration with third party programs

- > Share 3D data in documents and web using VRML and Ngrain formats
- > Better support for AutoCAD files with large amounts of design data

For more information on new functionality and improvements in Vulcan 8.1, visit www.maptek.com/vulcan8.1

VULCAN IN INDONESIA

Maptek has engaged a local representative to promote Vulcan in Indonesia.

PT Globecon Indonesia will sell Vulcan to the local mining market, as well as offer technical support, training and consulting for Vulcan users from its offices in Jakarta and Balikpapan.

PT Globecon technical staff, who are trained in Vulcan and experienced in delivering quality services, will work with Maptek staff to ensure the highest quality outcomes for Indonesian customers.

PT Globecon was established in 1995 and its team of expatriate and Indonesian professionals provides expertise of international excellence.

'Indonesian mining has matured into a professional and skilled industry, where technical adaptation is readily accepted, especially in embracing the latest and

best in mining software,' says Roy Vogler, President of PT Globecon Indonesia.

'Maptek is excited about the opportunities that this agreement will open up, and recognises the benefit in being able to deliver better services to existing Indonesian Vulcan users, as well as providing Indonesian miners with world class technical solutions,' said Peter Johnson, General Manager, Australia.

To arrange a demonstration of Vulcan contact support@globecon.co.id or visit the website at www.globecon.co.id

SCANNING THE PILBARA

Atlas Iron has realised the benefits of using the Mapttek I-Site™ 8800 laser scanner to acquire detailed topographic data for new mining projects in the Pilbara.

Atlas Iron is committed to the exploration and development of iron ore projects throughout Western Australia. As a producer of iron ore, Atlas Iron has an extensive portfolio of projects which cover an area of over 15,000 km² in the northeast Pilbara, Newman area and midwest of Western Australia.

The company has recently extended its footprint around Newman and will target large scale orebodies in the southeast Pilbara as it looks to grow its resource and reserve base. Two key operations in this expansion are Mount Dove and Wodgina.

The I-Site 8800 laser scanner was commissioned by Atlas to provide up-to-date, detailed surface topography data of these two emerging mining operations. Existing aerial survey data from the 1960s was neither detailed nor reliable enough for Atlas Iron to use in mining preparations.

I-Site Sales and Technical Consultant, Luke Holdcroft and Atlas Iron Senior Surveyor, Gary Johnson were able to capture all the data needed from both sites in two days. All of the data and 3D models were available to Atlas immediately, something that is simply not possible with conventional methods such as aerial or GPS surveying.

'MAPTEK PROVIDED US WITH AN EFFICIENT SOLUTION TO ACQUIRE AND PROCESS SPATIAL DATA. IT WAS SAFE, COST EFFECTIVE AND UNPARALLELED IN ACCURACY.'

Gary Johnson, Atlas Iron

Surveying at Mount Dove involved scanning almost 600,000 m² of undulating terrain. The portability of the I-Site 8800 laser scanner was greatly appreciated, especially when climbing the summit of Mount Dove.


At the Wodgina operation, 13 scans of the area and surrounding hills were captured.

'With mining already underway at Wodgina, we wanted accurate topographic data of the operation to assist with future mine development and planning,' Gary explained.

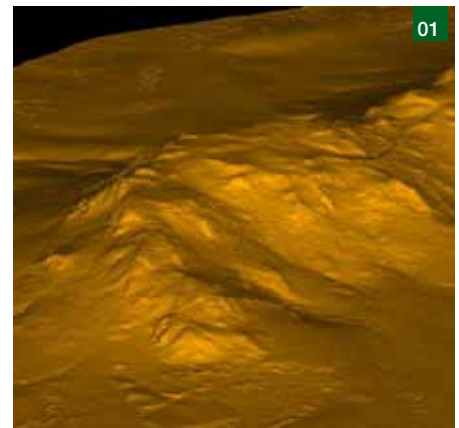
'Maptek provided us with an effective solution to acquire and process spatial data. It was safe, cost effective and unparalleled in accuracy.'

'In less than 4 hours at Mount Dove we observed 21 million points. Capturing this number of points would take 210,000 hours with conventional equipment which generally rates at 100 points/hour.'

Triangulations, contour files and gridded point files at 1 metre and 5 metre spacings were modelled from the scan data of the two areas. This data can now be exported to Mapttek Vulcan™ software for further geotechnical analysis and mine planning.

The spatial data acquired using the I-Site 8800 laser scanner has provided Atlas Iron with a sound foundation for mine development. Atlas Iron now has topographic data of the area with points every 1 metre. When you consider that the only data the company had before undertaking this work was points every 20 metres, the benefit is clear. 

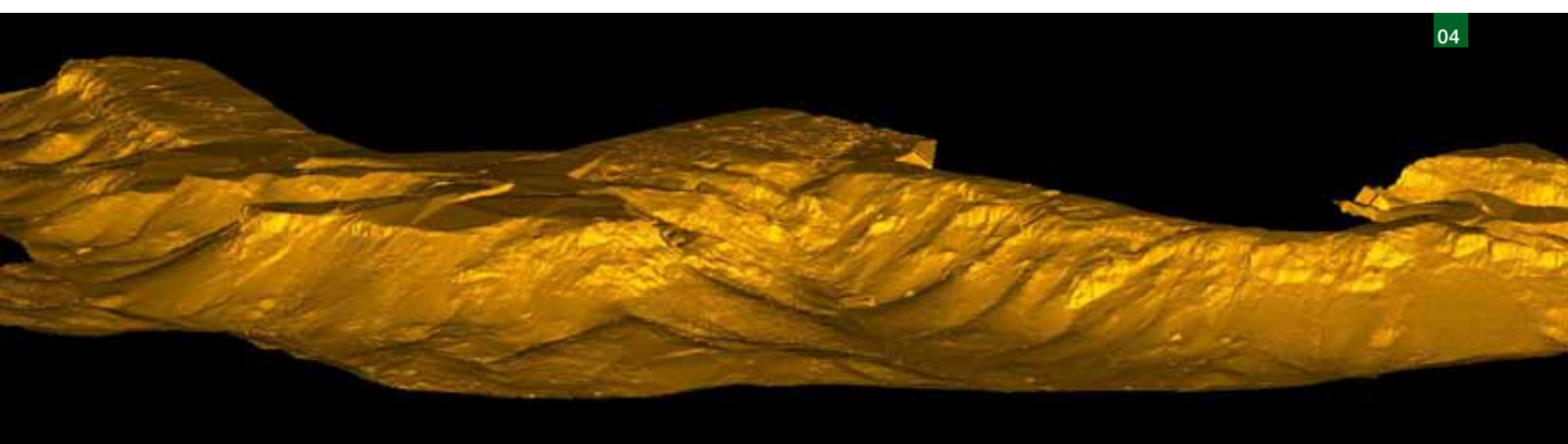
Thanks to Gary Johnson, Senior Surveyor Atlas Iron



- 01 Modelled topographic data for Mount Dove
- 02 Atlas Iron and Maptek personnel with the I-Site 8800 laser scanner at Wodgina
- 03 Scanning at Wodgina
- 04 Model of Wodgina mining area

LASER SCANNING ADVANTAGES

- > Higher resolution data
- > Up-to-date data when you need it
- > Massive saving in field time
- > More cost effective than aerial survey
- > More accurate pit designs





FROM JUNIOR EXPLORER TO COPPER PRODUCER

Phoenix Copper Limited has entered an exciting new stage, transforming from explorer to mining and exploration company through acquisition of a copper mine near Leigh Creek. Vulcan is now being used for planning and production as well as geological evaluation.

Phoenix Copper floated on the Australian Stock Exchange in March 2008, intent on copper and gold exploration in the midnorth of South Australia. The company then had seven staff, five exploration licences and two exploration licence applications around Burra, Spalding and the Yorke Peninsula.

Over the last three years this tenement package has grown to 18 exploration licences and three granted mining leases, and the company has moved from junior explorer to copper producer with 22 staff.

Phoenix Copper has set out to employ state of the art exploration tools including MapInfo-Discover, Maptek Vulcan™ and field portable X-ray fluorescence (XRF) analysers to quickly evaluate its holdings.

Using the portable XRF has allowed Phoenix Copper to identify the most prospective geochemical targets within each tenement.

Linking the Nomad GPS and Palm size data recorder running MapInfo-Discover to the XRFs has allowed real time data collection and viewing for the exploration geologist. Geophysical surveys and drilling follow the initial evaluation phase.

Maptek's Vulcan Explorer software has been used to map, manipulate and display the data, graphically showing the potential of the mineralised systems from both historic and recent drilling.

Phoenix Copper's projects are centred on three of the most significant mining areas in South Australia:

- The historic and relatively unexplored mining district around Burra - in the 1950s the Monster Mine produced 2.7 Mt of copper ore and was as important to South Australia as Olympic Dam is today.
- The Leigh Creek mineral fields, which are rich in coal, copper, uranium and zinc.
- The Yorke Peninsula, host to copper and gold deposits in the southern extension of the Olympic Domain.

In all of these areas Phoenix Copper has been able to build a comprehensive geological, geophysical and geochemical database at a regional level.

The Leigh Creek Copper Mining acquisition consisted of three mining leases hosting four copper deposits containing about 20,000 tonnes of copper in an indicated resource.

'BEING ABLE TO VALIDATE HISTORIC GEOLOGICAL DATA WITH I-SITE SURVEY AND CURRENT DRILLING HAS GIVEN US A STRONGER SENSE OF WHAT WE HAVE UNDER THE GROUND.'

Mark Manly, Phoenix Copper





Copper ore



Leigh Creek Copper leach pad and processing facilities

Vulcan was rapidly redeployed from exploration projects to a primary role in mine planning and daily production.

Copper ore is won using a leaching process, and copper cement comprising 75% copper is delivered to the Adchem plant in Burra.

Vulcan Explorer was used to validate historic drill data from different eras with recent data and Maptek I-Site™ survey data. The Vulcan GeoModeller with Pit Optimiser has been added to handle mine planning requirements.

With these tools Phoenix Copper can efficiently and effectively complete in-house resource estimations, optimisations and pit designs for each of the copper deposits.

Phoenix Copper uses Vulcan on site and in the Adelaide head office on a daily basis for everything from site layouts, grade control, drainage planning, drill planning, interpreting, section plotting, to block modelling and pit optimisation/design.

‘We’re a company with four JORC-compliant resources and up to four other pods with significant mineralisation. Vulcan gives us the flexibility to be running these eight projects at once’, said Mark Manly, Chief Geologist.

‘We can easily swap from the pit optimisation for one project to the drilling plans for another’, he added.

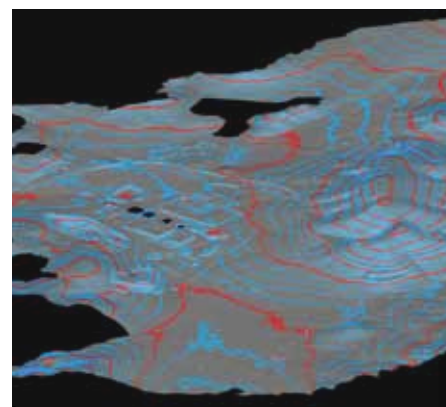
In July 2010 Phoenix Copper engaged Maptek to survey the Leigh Creek mining leases with the I-Site 3D laser scanner.

This provided up-to-date data for the heap leach pads and a detailed topography of the existing and future mining areas.

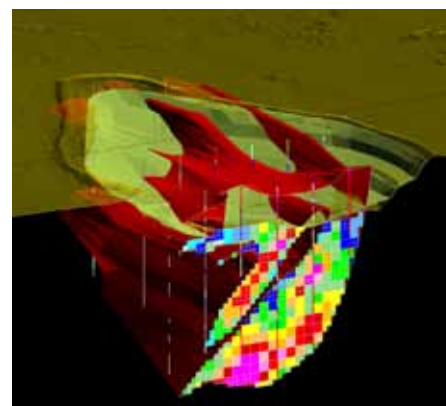
Triangulations were imported into Vulcan to ensure an accurate surface is used as the basis for future mine designs. Stockpile volumes were calculated, providing an accurate record of the company’s holdings.

Using Vulcan has allowed Phoenix Copper to move to a position where mineralisation can be defined with confidence. *✍*

*Thanks to
Mark Manly, Chief Geologist
Phoenix Copper*



Topography contours on I-Site survey of Leigh Creek mining leases



Pit, orebody and block model slice of the Rosmann East pit which is in full production

‘ONCE WE SEE ALL THE DATA IN THE ONE BLOCK MODEL WE HAVE A CLEAR 3D PICTURE OF OUR OVERALL POSITION. THIS ALLOWS US TO PLAN OUR NEXT MOVE.’

Mark Manly, Phoenix Copper



INVESTING IN TRAINING

Newmont geologists from Ghana are spending eight weeks in Maptek's Edinburgh office for comprehensive Vulcan training.

Newmont is investing heavily in Ghana's gold resources, and has the Ahafo mine currently operating.

Vulcan has been chosen by Newmont as the geological modelling and mine planning solution for several projects in Ghana. Maptek provides training and support to Newmont mines.

Senior geologist Emmanuel Trebi and geologists Samuel Obeng and Johnny Sam Donkor will undertake two weeks of intensive training in Vulcan 3D geological and block modelling. This will be followed by six weeks focusing on the creation of detailed geological models.

The geologists will take their new skills back to their colleagues on site. The investment will continue to pay dividends as knowledge is passed on to other Newmont staff.

'The key to a successful mine plan lies in an accurate geological model – if you don't get it right now, you are bound to make a lot of corrections later. A good model can only come from good training,' commented Shadrach Abeku Ainoo, District Exploration Manager, Newmont Ghana Gold Ltd.

Newmont's Johnny Sam Donkor, Samuel Obeng and Emmanuel Trebi are using the intensive training to improve their Vulcan skills

E-LEARNING INITIATIVE

A commitment to training and education sees Maptek develop E-learning courses for Vulcan.

A pilot course is being developed in partnership with the South Australian Chamber of Mines and Energy. The initiative will bring together different learning methods in an accessible format.

Lisa Jeffery, Manager of the Geoscientist Assistance Program, said, 'The Maptek training provides young geoscience graduates with an invaluable insight into the exciting and endless possibilities of 3D visualisation and modelling tools.'



Graduate students undertake Vulcan training in Adelaide under the trial E-learning program



SCANNER TRAINING

Maptek I-Site experts from Australia recently trained Leica Geosystems staff from around the world in the new system.

The I-Site 8800 long range laser scanner has proved its value to open pit operations since Maptek launched it last year.

The Leica HDS8800 is produced under an OEM agreement with Maptek to bolster Leica's long range survey products.

Leica staff received three days of intensive training in preparation for sales. They learnt to operate the hardware, use the I-Site Studio software and apply the new techniques in real situations.

Jason Richards, Laser Scanning Sales & Technical Services Manager commented that 'the long range scanner virtually sells itself - Leica will be instrumental in promoting its value in their market'.



[L-R] Sergey Kotelnikov, HDS Product Manager, Russia, Qisan Duan, HDS Sales Engineer, China and Julian Norton, HDS Business Manager, Heerbrugg, with the HDS8800 in Switzerland

VISIT MAPTEK AT THESE TRADESHOWS IN 2011

March 29-30

OZMINE
Jakarta, Indonesia

April 11-15

AustMine Mission to Russia
Moscow, Russia

May 17-18

AustMine
Brisbane, Queensland - Technical paper

May 22-25

CIM
Montreal, Quebec - Booth 1904

June 9-10

Elko Mining Expo
Elko, Nevada - Booth 110

June 13-17

Exponor
Antofagasta, Chile

August 17-19

Australian Institute of Mine Surveyors
Melbourne, Victoria

August 22-24

VIII International Mining Geology Conference
Queenstown, New Zealand

August 26-30

APCOM 2011
Wollongong, New South Wales

September 12-16

Extemin
Arequipa, Perú - Booth 446

USERS CONFERENCES 2011

AUSTRALIA

4-6 April, Western Australia

Places are filling fast for the Australian users conference. Interesting keynote addresses will introduce the theme of Partnering for Innovation and Success.

Case studies and customer presentations will highlight the applications and benefits of technology to various operations.

Topics and product launches will populate the 3-day program, including:

- > Productive Grade Control for Iron Ore
- > Vulcan 8.1 and Beyond
- > Pre- and Post-Blast Survey using I-Site
- > Underground Stope Optimiser
- > Mine Control for Sustainable Success
- > Advances in Stratigraphic Modelling
- > Assessing Potash Grade
- > Coal Resource Classification

Networking will take place in a relaxed resort environment. Attendees will enjoy welcome cocktails, a gourmet poolside barbecue and a conference dinner.

It's not too late to register! Visit www.maptek.com/australia_2011 or email register@maptek.com.au

EUROPE-AFRICA

4-7 September, Scotland

The Europe and Africa Users Conference is shaping up to be as successful as last year's counterpart in the Big 5 game park in South Africa.

The conference will be held in Atholl Palace in Perthshire, against the backdrop of the Scottish Highlands.

Scotland gave rise to some great innovations which have impacted on the success of the mining industry - James Hutton (modern geology), James Watt (steam engine) and John Boyd Dunlop (pneumatic tyre) to name a few.

Innovators must overcome obstacles in the quest to perfect and commercialise inventions. Building on their foundation sees everyone share in the success.

The conference theme of Innovation will allow us to review what Maptek has contributed to the mining industry over the last 30 years.

As we look to the future we will explore new and innovative solutions to the challenges facing the industry today.

Visit www.maptek.com/europe_2011

LOOKING TO THE FUTURE

Maptek is sponsoring a new mining engineering scholarship at the University of Adelaide in South Australia.

The scholarship will fund a full year's study for a final year student with a keen interest in the application of computers in mining.

Mining engineering students already use Maptek Vulcan software for their final year project, with a Maptek award for the best mine design.

'We pioneered 3D modelling software for mining applications and put it in the hands of the geologists and engineers who needed it,' said Maptek Chairman and Founder Bob Johnson.

'We want to ensure that future generations of mining professionals benefit from using the best technology.'

Maptek has strong ties with research and education sectors through our operations in the US, UK and South America.

The Centre of Mining at the Pontifical Catholic University of Chile, one of Chile's oldest universities, is incorporating Vulcan in mine design and mine planning courses. Students gain deeper understanding of the mining process by using real data for design work.

The University of Adelaide scholarship is just one of several initiatives that will help celebrate Maptek's 30 years in business.

Follow our website for regular updates about activities and projects to mark this milestone www.maptek.com/30_years

PAST USERS CONFERENCES



North America - 1992



South America - 2000



Mexico - 2005



South Africa - 2010

MAPTEK'S FIRST DECADE

Milestones 1981-1990

- 1981** Maptek founded in Sydney
- 1984** Pioneers in 3D graphics
- 1985** First global sale to Utah International
- 1986** Denver office established
- 1988** Maptek #1 Silicon Graphics reseller
- 1989** Offices open in Perth and Nottingham
- 1990** Head office consolidated in Adelaide

VULCAN

AMPHOS21, which has offices in Chile and Spain, has acquired Vulcan for consulting.

ANCAP Portland cement division in Uruguay will use Vulcan and the Pit Optimiser for geological and mine design applications.

BANNERMAN RESOURCES is using Vulcan for mine modelling and mine design in its office in Perth, Western Australia.

BRENNAND CIMENTOS, a cement producer based in Brazil, will use Vulcan for geological modelling and mine design.

CARABELLA RESOURCES in Queensland, Australia will apply Vulcan to coal exploration and development projects in the Bowen, Mulgildie, Clarence-Morton and Eromanga Basins.

CEMENTOS LIMA, the largest and most important cement manufacturer in Perú, will use Vulcan for geological modelling and mine design.

ENERGIA SANTANDER ANDINA, a coal company based in Bogota, Colombia, will use Vulcan for geological modelling.

ESSAR STEEL will use Vulcan for geological modelling of the open pit iron ore operation located in Hibbing, Minnesota, USA.

MINERA LUMINA COPPER will use Vulcan for geological and geotechnical applications at the Caserones copper and molybdenum project in Chile.

MINERA SANTA RITA owns and operates the El Chanate open pit gold mine in Sonora, Mexico, and will use Vulcan for modelling, resource estimation and Chronos scheduling.

MINMAP GEOLOGICAL SERVICES

will use Vulcan for 3D capture of open pit geology mapping and drillhole data, and for creating 3D structural geological models for geotechnical studies and pit slope designs.

NEW ERA PETROLEUM, which applies special extraction technology to recover stranded oil from its operation in Sheridan, Wyoming, USA, has purchased Vulcan for geological modelling.

NEW PACIFIC METALS, based in Vancouver, BC, Canada, will use Vulcan for geological modelling of its underground gold mine and pit optimisation on other projects.

RIO ALTO S.A.C. has acquired Vulcan for geology and mine design, and Chronos scheduling for the La Arena gold-copper project in central north Perú.

SALVA RESOURCES will use Vulcan for geological modelling and mine design for exploration, mining and investment companies from its headquarters in Brisbane, Queensland.

SANDFIRE RESOURCES is using Vulcan for geological modelling of the world-class DeGrussa copper-gold project, 900 km northeast of Perth, Western Australia.

TWIN METALS MINNESOTA LLC, one of the world's largest copper-nickel-platinum resources, has purchased Vulcan for its underground operations.

VALE VGB, which operates Vale's iron ore projects, has purchased Vulcan for geological applications, specifically ore modelling and geostatistics.

I-SITE

ANGLO CAPCOAL Lake Lindsay mine has purchased an I-Site 8800 laser scanning system and mobile vehicle mount for end-of-month surveys and geological mapping. Lake Lindsay is 250 km inland from the port of Mackay, Queensland, Australia.

BEMAX MINERAL RESOURCES

has purchased an I-Site 8800 laser scanning system for the Gingko mineral sands mine in the Murray Basin, 220 km from Broken Hill in New South Wales. The scanner and vehicle mount system will help streamline site survey.

BHP BILLITON Cerro Colorado Mine, perched in the Atacama Desert of Chile at an altitude of 2,600 metres, has purchased an I-Site 8800 scanner for stockpile volume control as well as geotechnical analysis.

CARDNO SPECTRUM SURVEY is now a preferred provider for I-Site 8800 laser scanning services in Western Australia. Cardno specialises in surveying and mapping for infrastructure, mining, exploration and land development.

DOWNER EDI CONTRACTORS has purchased an I-Site 8800 laser scanning system and vehicle mount for the Goonyella Riverside mine, 190 km west of Mackay. The main applications will be end-of-month surveys, stockpiles and highwall mapping.

KUMBA RESOURCES has purchased an I-Site 8800 laser scanner for end-of-month survey, as well as for detection of movement in the open pit Thabazimbi iron ore mine in Limpopo, northern South Africa.

VALE MOZAMBIQUE has purchased an I-Site 3D laser scanning system to conduct end-of-month survey, as well as for mapping coal geology using digital imaging at the Moatize site in Mozambique.

MINESUITE

TATA IRON & STEEL COMPANY has selected MineSuite as the truck dispatch system for their open cut operation, Quarry SEB, at Ranchi, India.



Alberto Ramirez, Maptek, front left, with personnel from El Chanate mine undertaking Vulcan training



Elton du Plessis, Maptek, left, with Hannes Henkel, African Barrick Gold, at the Indaba show

Maptek Forge newsletter is published quarterly. You can receive it by mail, emailed pdf or emailed link to the Maptek website. Email forge@maptek.com to subscribe or advise changes to contact details.

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