

SUDBURY

MINING SOLUTIONS JOURNAL

Consulting sector buzzing

■ Northern Ontario engineering practices serve global market

BY NORM TOLLINSKY

Euro zone debt, American stagnation and a slowdown in China paint a picture of economic doom and gloom, but Northern Ontario's mining engineering consulting firms have never been busier.

Sudbury and North Bay staff with Hatch, Stantec, Wardrop, AMEC and Knight-Piésold are busy working on projects across Canada and around the world, and are bullish about the next few years.

The engineering consulting sector in north-eastern Ontario constitutes an important subsection of the region's mining cluster, employing upwards of 600 engineers, scientists, technicians and administrative staff.

This wasn't always the case. Wardrop, now part of Pasadena, California-based Tetra Tech, started out with a three-man operation in 2001 and today has 50 employees at its Sudbury office. Stantec, formerly McIntosh Engineering, had one or two people in Sudbury in 2008 and now has 92, with approximately 100 more in North Bay.

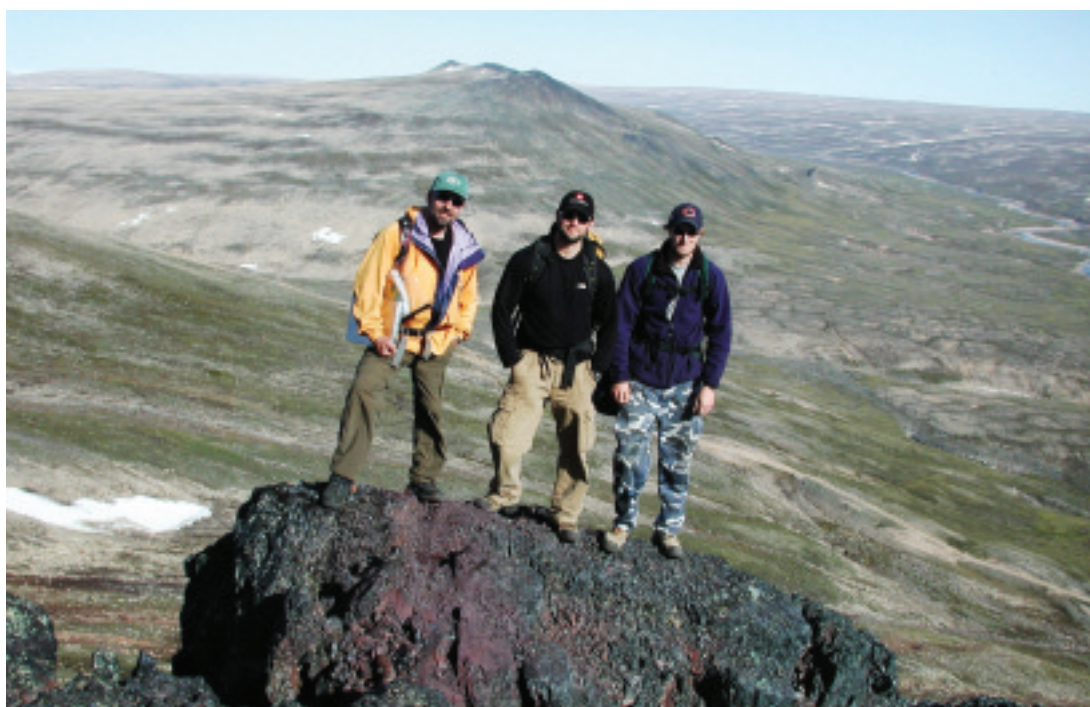
Hatch has the largest presence in the north-east with more than 230 employees in Sudbury, Golder Associates has 110, AMEC has grown from an office of two in 1999 to 40 today and Knight-Piésold in North Bay has 40. Most consulting firms also report that they could hire more staff, but are having trouble recruiting them.

Hatch

The Hatch office in Sudbury serves as a centre of mining excellence for all of North America, but also plays a lead role on projects in Europe, Russia and South America, said Jim Gallagher, director of mining for North America.

According to Gallagher, the number of employees at Hatch's Sudbury office has doubled in just over a year.

"We have a very strong team in Sudbury and we treat it as a centre of mining excellence. We have full capabilities here. We can do all aspects of a study, from ventilation to computer simula-



Dr. Robert Mercer (left) and Knight-Piésold geological engineering crew at Mary River iron ore project on Baffin Island in Canada's Nunavut territory.

tion for mining productivity and performance. We do shafts and hoists, all the infrastructure underground, geological block modeling...we can do all of that, including full detail engineering and project execution."

Hatch's Sudbury office has satellite groups in Saskatoon, Scottsdale and Mississauga, and provides support to the firm's St. Petersburg office in Russia.

"Originally, our office in Sudbury was here to serve Falconbridge and Inco. We still do that, but now we're also working on projects globally and bringing that work back to Sudbury," said Gallagher.

Work underway includes Xstrata Zinc's Pallas Green project in Ireland, Kinross Gold's Fruta del Norte project in Ecuador, Kennecott's Eagle Minerals nickel project in Michigan and Vale's Clarabelle Mill upgrade in Sudbury. The office

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Bestech acquires RopeInspector technology

Computer visioning system identifies wire rope defects with hoist travelling at full speed

BY NORM TOLLINSKY

Bestech, an engineering, automation and software development company, has acquired the rights to a ground-breaking wire rope inspection system developed by SEER Technology and the St. John's, Newfoundland-based Centre for Cold Ocean Resource Engineering.

RopeInspector technology eliminates the need to slow hoists down to a crawl for 20 to 30 minutes a day to allow for manual inspection of the rope. Three systems are currently installed: one at Xstrata Copper's Kidd Mine in Timmins and two in Australia at Newcrest Mining's Telfer Mine and BHP Billiton's Leinster operation.

The acquisition of RopeInspector by Sudbury-based Bestech brings the technology back to where it was conceived by Inco personnel and its development funded through the CAMIRO-managed Deep Mining Research Consortium.

SEER Technology didn't have the resources to effectively market the solution, said Bestech sales and marketing manager Pat Dubreuil. "They figured that word of mouth would suffice, but in the mining industry, you still have to knock

on the door and make your pitch. Mines don't adopt technology on a whim."

The automated, computer visioning system performs a 360 degree daily visual inspection of a rope with the hoist travelling at up to 20 metres a second. It automatically identifies rope defects, including fraying, necking and birdcaging, and transfers images of the suspected defects to rope monitoring and reporting systems, where they can be viewed and assessed by the mine's rope inspector in the comfort of his office.

Normally, explained Dubreuil, ropes have to be slowed to two or three metres a second for inspection with the human eye, detracting from the hoist's productivity.

"We just finished doing a business case for a potash mine in Saskatchewan," he said. "Their skipping capacity is worth about \$1,700 per minute and they're down 20 minutes a day."

That's 140 minutes a week times \$1,700, or \$238,000 worth of potential increased production every week.

The three mines using RopeInspector "love it," said Dubreuil. "It pays for itself in under a month. The return on investment is incredible, so we want to make

sure that the rest of the world knows about it."

The RopeInspector technology still relies on mine personnel to review the suspected defects and decide whether they merit a manual inspection.

The system tells the operator the location of the defects, so "He can call the hoistman and say 'bring the rope back up to this point. I need to take a look at it,'" said Dubreuil.

In addition to viewing images of suspected defects identified by the system, the operator can also do a full rope visual inspection offline.

"Everything is tracked and logged, so when the Ministry of Labour comes in, all the records are there."

Bestech will be upgrading the system installed at Xstrata Copper's Kidd Mine, making some software modifications and equipping it with new light panels and cameras for improved performance.

Additional enhancements to the technology are also planned to reduce the number of false positives and allow for lay length calculations.

Labour ministry officials in both Canada and Australia have taken note of the technology and have indicated that they have "no issues" with its use.

The system is considered to be safer given the fact that manual inspection at two or three metres per second is a monotonous task easily compromised if



The automated, computer visioning system performs a 360 degree daily visual inspection of a rope with the hoist travelling at up to 20 metres a second.

the inspector blinks or is distracted for any reason.

Bestech has assumed responsibility for sales, service and further development of the technology and plans to aggressively market it to its existing customer base. ■

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Paul Lalonde, Bestech automation specialist, reviews air quality instrumentation control point that collects data from the environmental monitoring sensors at Coleman Mine.

Coleman Mine VOD system hailed as success

Bestech's NRG1-ECO system generates energy savings

BY NORM TOLLINSKY

The successful deployment of a ventilation-on-demand system at Vale's Coleman Mine in Sudbury is generating energy savings of up to 40 per cent and turning heads in the mining industry.

The NRG1-ECO system developed by Bestech, an engineering, automation and software development company in Sudbury, is installed on five levels of the mine's 153 Orebody and running on automatic, modulating fans and air volumes as RFID-equipped personnel

and equipment enter and exit zones in the mine.

"The next installation will be done at Goldcorp's Hoyle Pond Mine in Timmins," said Bestech sales and marketing manager Pat Dubreuil. "We'll be working on 28 levels."

A go-slow approach was adopted for the pilot at Coleman, but now that the technology is proven, Vale plans to extend the system to other working areas of the mine.

A competing system from Quebec-based Simsmart Technologies has been selected for Vale's new Totten Mine east of Sudbury, but management has declined to comment on how the two technologies compare or if they plan to standardize on one or the other.

Xstrata Nickel has also split its VOD

business between the two companies, with Simsmart technology installed at its Nickel Rim Mine and Bestech's NRG1-ECO system slated for Fraser Mine.

"There's a lot of interest in it. A lot of companies are looking to Coleman as an example and are interested in the outcomes."

- Cheryl Allen, principal engineer, ventilation, Vale Canada

The two ventilation-on-demand technologies are fundamentally different,

according to Dubreuil.

The NRG1-ECO system relies on a network of sensors throughout the mine to measure airflow, temperature and gas levels to confirm air volume and quality.

"NRG1-ECO sends down a set point and says you need to have this fan producing so much air in this area because there are two people and three scoops in there," said Dubreuil. "The system controls the amount of electricity going to that fan, providing the right amount of hertz to get it to spin and provide the desired airflow."

At the same time, however, the system is also getting feedback from the sensors, so if the environmental conditions change, a signal is sent down to adjust the airflow.

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updating diesel exhaust exposure limits and air volume requirements set to take effect in Ontario January 1, 2012, "you need to have a system that is structured like the NRG1-ECO system," he added.

Scheduling

Collecting ambient air quality data can also be used to fine tune scheduled ventilation settings for vacating blast gas. The predictive modeling software may dictate settings that should clear the air in 15 minutes, but once the event has taken place, data from the underground sensors might indicate that it took 20 minutes, said Dubreuil. "That allows you to tweak the system, so next time you'll start your fan five minutes earlier or ramp up the RPMs a little more. From a theoretical perspective, you couldn't do that."

Ambient air quality measuring can be installed to emulate Bestech's NRG1-ECO system, but "the difference is that our system was developed from the ground up with all these components. They're not added on after the fact."

NRG1-ECO operates in three different modes. "One would be if you want to operate it manually," explained Cheryl Allen, Vale Canada's principal engineer for ventilation. "Another is if you want to schedule your ventilation for an event. If you are going to blast at a certain time, for example, you can schedule how you

want your fans to turn on or off.

"We also have the option to run it full. That's where we use the RFID tagging on the equipment and personnel. The system recognizes us and knows that we need so much air, so the fan will stay on until we're out of the area.

It also knows that this is a Toyota with a certain size engine that needs a certain amount of air.

"The other thing we can do is while we're not using the air on one level, we can use more of it on another level, so it gives us flexibility. We don't always use it to save energy. Sometimes, we use it because we need to redistribute the air more efficiently."

NRG1-ECO was also designed to operate in a fail-safe mode using default settings programmed by mine personnel.

"If we lose communication for some reason, say the fiber is cut, or something happens, the miners won't be worried about getting the air they want," said Dubreuil.

With electricity prices rising and mines going deeper, ventilation-on-demand is sure to take off, predicts Allen.

"There's a lot of interest in it. A lot of companies are looking to Coleman as an example and are interested in the outcomes." ■

www.bestech.com
www.simsmart.com



Cheryl Allen,
principal engineer,
ventilation, Vale
Canada



Pat Dubreuil, sales
and marketing
manager, Bestech



Environmental monitoring sensors integrated into the NRG1-ECO control system monitor temperature, relative humidity, carbon monoxide, carbon dioxide and nitrogen monoxide, providing real-time data to support ventilation-on-demand.



Return air louvers and an NRG1-ECO independent zone control and air quality instrumentation cluster, which control underground airflow and air quality, are instrumental in clearing blast gas and diesel particulate through real-time adjustments to underground airflow. Also shown is an ION meter which measures energy consumed by main fans, boosters and auxiliaries in the area.

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