

New technologies can help make mining greener

But building a cleaner mine is no magic bullet for the industry's public perception problems, especially when operating abroad

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An Energold drilling project in San Luis, Argentina.

With its mobile ready-to-assemble drilling kits, Energold Drilling Corp. is used to going into untrammelled corners of the Earth — sometimes with unexpected results.

In particular, Energold CEO and president Fred Davidson recalls the Shuar tribe of Ecuador. “We had guys who, literally one generation earlier, had been headhunters,” Davidson said. “And they’d be standing there in a helmet, gloves, hearing-protection, goggles, boots and nothing else but a loincloth.”

Of the Vancouver company’s 245 drilling rigs, nearly 100 of them are what Energold calls low-impact. These are module-based rigs whose individual pieces can be carried on foot or by pack-mule down already-established trails (the heaviest piece, Davidson said, is just under 200 kilograms). This means that no access roads need to be cut to transport the rig to a remote site.

Once the pieces are at the site, workers — often including locals, like the Shuar — assemble the pieces into a drilling apparatus that takes up a significantly smaller amount of space than a conventional rig (four by four metres rather than 20 by 20).

At their best, new mining technologies like Energold’s portable rigs are greener, cheaper, safer and

more versatile than standard equipment.

But they don't really answer more fundamental questions, says MiningWatch Canada program coordinator Ramsey Hart.

"The use of smaller, lighter drilling equipment is a benefit, certainly," Hart said. "But we also need to recognize that there are some places where any intrusion of industrial development may not be appreciated by local communities, and the presence of people and that scale of activity can still have an impact. It isn't going to be a panacea for resolving conflicts around mineral exploration by any means."

Advances in extraction and drilling methods can at least reduce waste.

Extraction of manganese, for example, uses a lot of energy and can leave toxic tailings (the material left after the valuable mineral has been extracted from the rock ore). Manganese is an important component in steel and rechargeable batteries.

American Manganese Inc. of White Rock, and Kemetco Research of Richmond, have developed a hydro-metallurgical process that the company says can produce electrolytic manganese dioxide at a lower cost and more cleanly than the traditional method. Electrolytic manganese dioxide is used in some types of rechargeable batteries.

The traditional method of extracting the metal from ore is to crush, grind, roast and then leach the metal from the rock using sulphuric acid.

"All those things make your hair stand on end, right?" Larry Reaugh, company CEO and president, said.

American Manganese's method breaks down the material in a weak acidic solution, a process that leaves the manganese suspended in the liquid. The process is designed so that dissolving the manganese consumes the acid, leaving a neutral solution and tailing that are far more benign.

The process also allows the water that was used to be recycled.

"We leave a very small footprint. Environmentally, it's a very friendly process. And we get high extraction."

The process isn't universally applicable, however — it's best suited to lower-grade mines, like an Arizona property where American Manganese owns the mineral rights.

Sonic drilling, however, has more widespread applications. The technology has been used to mine everything from alluvial diamonds to uranium to gold to lithium. Chilliwack-based Sonic Drill Corporation is leading the way in the technology, which is more efficient and cleaner than traditional methods like the hollow-stem auger system.

"The main advantage is we are able to generate highly representative core samples for mineral

exploration, completely dry, using no drilling fluids at all,” Sonic Drill Sales and Operations Manager Kevin Reimer said. “This has a very low environmental impact.”

It also generates far less development waste, the cuttings that come back up to the surface when drilling, than other methods of extraction, Reimer says.

The sonic drill uses a mechanical oscillation in the drill head. This generates high-frequency vibrations to the cutting bit, which allows the machine to advance up to three times faster than a conventional drill, Reimer says. The sonic drills also run on far smaller engines than traditional rotary drills.

MiningWatch Canada’s Hart can see the benefit of sonic drilling.

“They don’t need to use drilling muds or fluids, the materials that are put down with the core drill to provide lubrication to get the rock material out of the hole,” he said. “Managing those drilling muds is always an environmental challenge, so avoiding the use of them is an improvement over standard practices. Again, it isn’t going to necessarily address the more fundamental questions around where companies are exploring and who do they seek consent from in terms of getting out on the land. But, if widely applied, it would certainly be an improvement and reduce the risks of exploration activities.”

But Marcello Veiga, professor in UBC’s mining engineering department, says that cleaner tech and locally based hiring isn’t going to solve the fundamental problem with many mining activities.

Community consultation is much more important, Veiga said.

“You can have the cleanest technology in the world and we’re always going to have some problems — how the companies deal with communities, what kind of benefits they bring. They have to involve the communities and create some participation in the decision process. The companies go in and the communities have these expectations, that everybody’s going to have a job.

“But mining’s not sustainable. The communities have to see what they can do with the money generated by taxes from mining to create a different business model. (Mining) companies try to give a lot of benefits to the community, but they don’t create a link to be sustainable.”

When it comes to mining technology, Hart said he doesn’t see a lot of concentrated effort in the industry to improve practices. Nor is Canada leading the way in greener mining initiatives.

“I don’t have any evidence to suggest we are,” he said.

“I do have a lot of evidence to suggest Canada is creating a large number of environmental and social conflicts around the world with our mining practices.”

Canadian mining companies have been involved in a number of high-profile conflicts with local communities around the world.

Energold’s Davidson sees Canadian mining differently, however.

“I think Canadians do stand out” in being conscious of the local environment, he said. “You find that with the mining companies, with the energy companies we work with. They have a high standard very oriented to the local community. They don’t always get it right, but they try.”

sconner@vancouversun.com

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