



The Buzz

- >> [Our Website](#)
- >> [Drill Rig Purchases](#)
- >> [Press Releases](#)
- >> [Brochures](#)
- >> [Contact Us](#)

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IN THIS ISSUE

Mine Tailings Reveal Rich Past

Sonic Drills Often Called to the Rescue

Pounding Pile Drivers Replaced by Quiet Sonic Hum

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Mine Tailings Reveal Rich Past



In an era defined by its vast array of disposable goods, it may seem surprising that anyone would want to excavate old mine tailing waste sites. Long considered an eyesore and an environmental problem, mine tailings – the waste rock produced in the mining process – may actually be a valuable commodity, after all.

With the price of metals soaring, small amounts of leftover gold, silver and copper, buried in heaps of mine tailings, could be profitable if an accurate assessment of the tailings were possible. Unfortunately, with most tailing piles composed of fine, sandy, mixed materials, getting an accurate core sample can be difficult. And, without a number of revealing core samples, it would be nearly impossible to determine the amount of leftover metal. Recently, however, a sonic drill rig was used to extract a large number of undisturbed, continuous samples from a mine tailing heap in the Princeton, British Columbia area of Canada. The sonic drill rig was hired to provide core samples accurate enough to allow geologists and engineers to decide if there was enough precious metal left in the Princeton tailings to make mining them a viable project.

In less than three days, one sonic rig drilled and cored 11 holes, each to a depth of 100 ft. for a total of 1100 ft. of continuous core samples – a drilling result that delighted the client, considering that the contract had asked for only three holes to be drilled.

“We just kept drilling for the time period we were hired for and that gave the client nine more holes than they required,” says Bill Fitzgerald, general manager for Sonic Drilling Ltd.

Sonic Drills Often Called to the Rescue



Sonic drills are often used as “rescue” drills. In one example, a sonic drill was called in replace a trio of rigs working on a geothermal project for the Langara community college in Vancouver. In the Langara case history, three standard rigs had been working the site for nearly two months and, in that time period, they had managed to drill only 18 holes in total.

As the crews discovered, under the Langara site, the soil was a diverse mixture of sand, till and gravel and littered with large boulders – daunting terrain no matter what kind of rig worked it. Despite these soil conditions, a single sonic rig was able to drill, case, loop and grout 23 geothermal holes in two weeks flat. It was a stunning result given that it had taken three traditional rigs nearly two months to accomplish much less.

In another example, the call that came into Sonic Drilling Ltd.’s office was no surprise. On the other end of the line was a rival drilling company asking for help in completing a geothermal project on time.

“In this case, it was a greenhouse nursery where the competitor’s rig had only been able to drill about 50 feet in two weeks,” says Bill Fitzgerald, general manager for Sonic Drilling Ltd.

“They had hit lots of mixed sand, clay and gravel,” explained Fitzgerald. “It’s hard sometimes for people to understand that we can just buzz right through all that.”

Indeed, the skeptics often shake their heads disbelievingly when confronted with the evidence of a sonic rig in action.

Pounding Pile Drivers Replaced by Quiet Sonic Hum

Working or living near a construction site can generate more than a few headaches but none worse than listening to piles being driven into the ground.

The repetitive percussions and thumping ground vibrations are enough to make most people reach for the nearest bottle of painkillers. But, despite the headache factor, piles are integral to the foundation of any building.

Normally, concrete piles are formed by drilling a hole with a large, heavy, high-torque auger but, in recent years, a quieter and more economical option has become available.

Some foundation contractors, including Roger Bullivant of the UK, have begun experimenting with a sonic drill rig for use in pile drilling.

By using Sonic’s patented technology, pile holes can be drilled with high frequency low amplitude vibrations along with high-pressure water to clear the cuttings.



The sonic vibrations are much higher than the natural frequency of the surrounding soil and are not transmitted beyond the immediacy of the hole – unlike a pile driver hammer which can cause severe vibrations to be transmitted a considerable distance. With a sonic rig, as the outer casing is vibrated out of the hole, concrete is forced to flow into the void created by the casing.

With concrete and soil particles now intermingled, an extremely strong bond can be created, once the concrete has cured. Another promising use for the sonic drill is the installation of micropiles, either by vibrating the piles directly into the ground or by first drilling and casing through any difficult material followed by a micropile inserted inside the casing.

In any case, for workers and residents alike, there’s one final benefit – no rush for painkillers. Instead of the incessant pounding of a pile driver, there is only the quiet hum of a sonic rig in action.