

# Engineers with a green streak stand out

## Two British Columbians earn awards for their environmentally sound innovations

BY SCOTT SIMPS ON, VANCOUVER SUN    SEPTEMBER 8, 2010



UBC professor of civil engineering Don Mavinic holds fertilizer recovered from the sludge of a waste water treatment plant.

**Photograph by:** Gerry Kahrmann, Vancouver Sun, Vancouver Sun

Civil engineer Don Mavinic started looking for a way to rid waste treatment plants of a concrete-like compound that was jamming up equipment - and ended up with a techno-fix that could help feed the world.

Mechanical engineer Ray Roussy stubbornly persisted with a belief that he could build a better drill rig - and ended up with a machine that's ideal for installation in the booming field of geothermal energy systems.

Both men, residents of British Columbia, will be announced today as winners of 2010 Manning Innovation Awards.

The awards -- named for former Alberta premier Ernest Manning -- are distributed nationally each year to a total of four applicants across Canada in recognition of "innovative talent in developing and successfully marketing a new concept, process or procedure."

In B.C.'s case, Manning Foundation executive director Bruce Fenwick said Tuesday in a telephone interview, both winners had a noticeable green streak.

Mavinic, a civil engineering professor at the University of B.C., will receive the \$25,000 David E. Mitchell Award of Distinction for a bio-digester system that transforms nutrients at waste water treatment plants into a commercial fertilizer product.

That product is rich in phosphorus, an essential nutrient for high-yield crop production despite its relative scarcity as a recoverable mining product -- and predictions that the world's deposits will be exhausted before the end of the century.

The system, which is being commercialized by Vancouverbased Ostara Nutrient Recovery Technologies, facilitates recovery of phosphorus and other compounds that otherwise transform during biodigestion of sewage into a substance called struvite, which accumulates inside bio-reactor tanks and pipe systems -- and clogs them up like plaque in arteries.

Some waste water treatment facilities have developed methods of screening out struvite components -- but discharge them as waste instead of harvesting them.

Japan has struvite recovery technology similar to Ostara's -- but isn't sharing it with the world, according to Mavinic.

"It's a problem for the waste water treatment industry, big time," Mavinic said in a phone interview. "We've known about this for 40 or 50 years but no one's ever done anything about it.

"As a civil engineer I intended to find a solution to this, once and for all. We finally did, and we solved two problems.

"All we do is add a little bit of magnesium ... and it forms these beautiful pellets" -- which Ostara is now marketing as 'Crystal Green' fertilizer. So far, golf courses and nurseries are enthusiastic buyers, Mavinic said.

Ostara purchased the technology from UBC in 2005 and has taken it to commercial scale -- the cities of Edmonton and Portland are using the technology full-time and Mavinic said Ostara has a "backlog" of waste water treatment utilities around the world that are awaiting delivery of pilot-test sized digesters.

"We congratulate Don," said Ostara president and CEO Phillip Abrary in an e-mail. "This promising technology has developed into a viable business helping waste water treatment plants remove otherwise polluting nutrients and turning them into a valuable fertilizer product."

Roussy, a mechanical engineer from Surrey, is receiving a \$10,000 Innovation Award for a 27-year effort to develop a cost-effective and 'green' sonic drilling technology that can effectively bore holes to a depth of as much as 300 metres with limited use of water and less energy consumption than conventional augur and hammer drill rigs.

Sonic Drilling's technology has proven particularly effective at drilling holes for underground alternative-energy systems -- the underground pipe loops that sustain geothermal energy systems -- because the drills run at high speeds with smaller operational energy requirements than rival systems.

Geothermal systems are an increasingly common feature in downtown Vancouver office buildings as well as schools and government institutions -- and even single family homes.

Sonic is in the process of drilling hundreds of holes for a new building at UBC.

"Geothermal is really catching on in the Vancouver area. It will eventually become mainstream," Roussy said.

ssimpson@vancouver.sun.com

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