One mine’s trash:
Capturing carbon in mine waste

$3.2 million in new funding accelerates research on capturing CO2 in waste from Canadian mines.

By Katie Willis on July 23, 2019

A new project focused on trapping excess carbon dioxide into mineral waste will be piloted by three Canadian mining companies over the next two years.

A collaboration between four Canadian universities and three leading mining companies, the project is funded by a $2 million Clean Growth Program grant through Natural Resources Canada (NRCan), as well as $1.2 million from industry partners, including De Beers Group, FPX Nickel Corp, and Giga Metals Corporation, and with support from government agencies such as Geoscience BC.

Sasha Wilson, associate professor in the Department of Earth and Atmospheric Sciences, is leading the University of Alberta’s arm of the project. Wilson’s research will focus on using fast-reacting clay minerals from diamond mines to capture carbon dioxide.

"Clay minerals are the most common and abundant minerals in the waste from many of Canada’s base and precious metal mines and diamond mines," said Wilson, expert in economic geology, and Canada Research Chair in Biogeochemistry of Sustainable Mineral Resources. "Our work will help to unlock the potential of these minerals as an effective resource for managing greenhouse gas emissions, which will contribute to making Canada’s resource sector more environmentally and economically sustainable."

In a natural process called carbon mineralization, carbon dioxide reacts with minerals in mine tailings, trapping the greenhouse gas into a mineral, where it can remain in a benign state for thousands of years or more. "This is an accelerated version of the reactions that naturally control carbon dioxide in the atmosphere to regulate Earth’s climate system on geological timescales," added Wilson.

Wilson will be working with project lead Greg Dipple from the University of British Columbia, and fellow principal investigators Louis Pasquier from the Institut National de la Recherche Scientifique (INRS) and Ian Power from Trent University.

With a national carbon tax set to reach $50 per tonne in 2022, this research project could spell significant savings for Canada’s mining industry.

“It may be possible to use this technology to offset the greenhouse gas emissions from mines—sometimes completely—by reacting the finely crushed mineral waste produced by mines with carbon dioxide,” explained Wilson. “The technologies we are developing will help support Canada’s resources sector in remaining at the forefront internationally during the global energy transition as we work toward decarbonizing the economy.”

Source: Faculty of Science