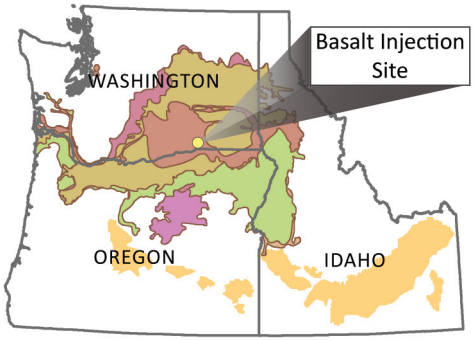
Basalt Pilot Factsheet

Project Overview

Battelle, in partnership with Boise Inc. and others, is testing the feasibility of permanently storing carbon dioxide (CO_2) in deep basalt formations. CO_2 is a gas contributing to climate change and research is ongoing worldwide to look for options to reduce these emissions.



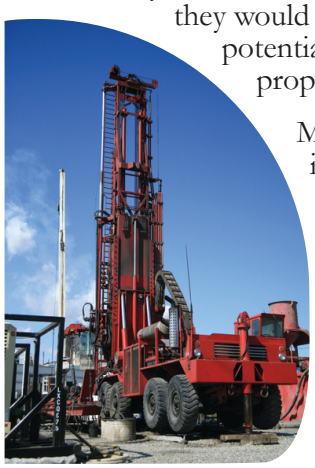
This project will take promising laboratory results for capturing and permanently storing CO_2 to the next step – a field test in southeastern Washington State. The efforts consist of collecting and analyzing large amounts of environmental and subsurface data, drilling a well, injecting 1000 tons of CO_2 deep underground and monitoring the CO_2 underground to ensure that it will be trapped safely and permanently. The project has been permitted by the Washington Department of Ecology and funded by the U.S. Department of Energy and other private companies.

Project Goals

The primary goal is to demonstrate that CO_2 can safely be stored in basalt, resulting in no leakage and eventual mineralization of the CO_2. The team is committed to involving stakeholders in the community to make them aware of the project and to solicit their feedback. State regulators have also been engaged to ensure that regulatory procedures are followed through the permitting process.

Why are basalt rocks a good target to store CO_2?

For several years scientists at Battelle and elsewhere have been researching basalt formations to determine if they would be a good geology for CO_2 storage. They have discovered that basalts have great potential to store CO_2 because of the way they were formed and their unique chemical properties.



Millions of years ago, basalts were formed as volcanic lava flows cooled and solidified into layers. The cooling process created stacks of many individual flows tens to hundreds of layers thick similar to a stack of pancakes. Variations during the solidification of the lava caused the fast-cooling tops of flows to be full of cracks and holes, while the slower-cooled interior of flows formed dense, impermeable barriers. The porous tops of the flows are well suited to store CO_2, while the dense interiors function to trap the CO_2. Additionally, laboratory experiments have shown basalt rocks can rapidly convert injected CO_2 to solid carbonate minerals, thereby permanently trapping and securing the CO_2.

What is the significance of the research?

Continental flood basalts represent one of the largest geologic features on the planet and exist in the U.S. and around the globe. Worldwide people are continuing to be reliant on fossil fuels for power generation in many areas where there are limited options to reduce CO_2 emissions. Some parts of Asia also have extensive flood basalts and could rely on this technology once proven to store their CO_2 emissions.

Quick Facts

Location: near Wallula, Wash on Boise property

Amount of CO_2: 1,000 tons

Injection Depth: ~2,700 feet

Project Cost: $10.9 million