SBIR·STTR America's Seed Fund

U.S. DEPARTMENT OF ENERGY | SBIR/STTR Programs Office

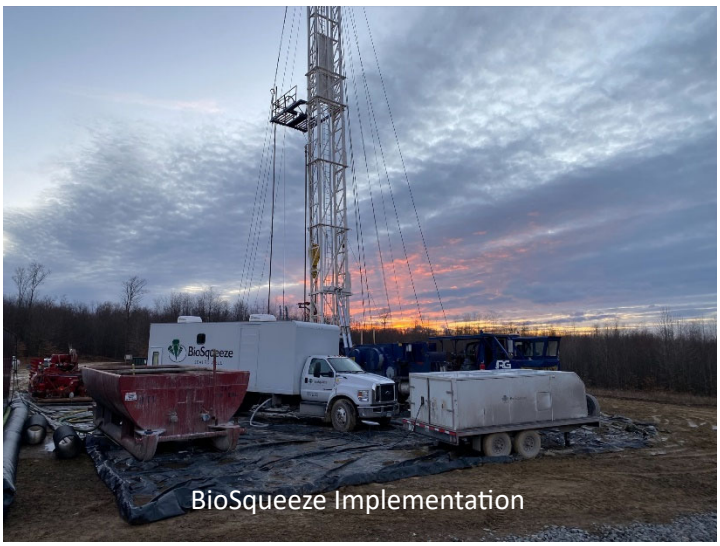
BioSqueeze SEALED WELL

Montana Emergent Technologies, Inc (MET) was established in 2010 by then president, Randy Hiebert and three other co-founders. Hiebert quips, "there were only four of us, so we either got to be President or Vice President." MET was a team of experienced engineers working on biomineralization research and development in the form of microbially induced calcium carbonate precipitation (MICP). The process works like a natural biological cement, using soil bacteria to form a mineral similar to limestone. Early on, MET partnered with the scientists at the Montana State University (MSU) Center for Biofilm Engineering to form an alignment of scientific research and field deployment talent.

> Definition: *Biomineralization* is the process by which living organisms produce minerals, often to harden or stiffen existing tissues and in MET's case, to deposit minerals and fix cement leaks in underground oil & gas wells.

MET won its first grant from DOE as a Phase I STTR partnering with MSU, which was working on biomineralization technologies and had the expertise to support the grant work. Dr. Robin Gerlach from MSU was the PI on the grant titled *Using Biomineralization Sealing for Leakage Mitigation in Shale During CO2 Sequestration* under an Office of Fossil Energy topic: *Carbon Storage Technologies, Advanced Geologic Storage Technologies.* Brian Dressel of the Office of Fossil Energy and Carbon Management and the program manager at the time described it as, "A very unique technology that excited me on its potential use for carbon capture and storage (CCS) wellbore and reservoir leakage remediation applications."

MET's Phase I grant work was completed successfully and in 2014 the company applied for and was awarded a $1mm Phase II grant under the same topic and title; continuing to work with Montana State University and Dr. Gerlach. Following the initial Phase II award, the company pivoted its use case for the biomineralization technology and in 2017 was awarded a follow-on Phase IIB grant: *Developing Biomineralization Technology for Ensuring Wellbore Integrity*. The Phase IIB grant ended in 2019 with the company's first commercial deployment and yielded the technology / use case combination that the company provides commercially today. To get the technology to that point, MET received 4 SBIR grants, all from DOE, totaling $2.3mm. As Hiebert puts it, "We had no more need of SBIR funding on this technology. We were self-supporting and off to the races."



BioSqueeze Implementation

To capitalize on the opportunities before them, MET's founders knew that certain

changes were needed. Hiebert recalls, “We needed help selling our product and raising venture capital. The team had some weaknesses and we recognized them.” So, the first two items the team tackled were: 1) to bring in somebody to be their CEO and drive the business elements of the company, and 2) to bring in more capital by way of follow on funding from early-stage investors to quickly grow the team and take on more field work.

Bringing in your own boss in the form of a new CEO is not an easy task. Per Hiebert, “The first individual we brought in did not work out. We quickly cut ties, but it was still a bit of a painful experience.” Undeterred, the MET team continued its search for a new CEO. In 2021, they were introduced to the former Dean of the MSU College of Business and Entrepreneurship, Mark Ranalli. It clicked. Ranalli, an entrepreneur that had successfully taken several companies from startups to large scale businesses, became the full time CEO.

In addition to leadership and funding, the company realized that it needed a rebranding. The Montana Emergent Technologies brand was regional and limiting for a company with global aspirations. In 2021 the team formed BioSqueeze, Inc. to use MET’s technology to provide the most successful solution to annular gas leaks in oil and gas wells. Hiebert relates, “In the oil industry, they call it a squeeze job when they pump cement at very low volume and high pressure into small fractures to seal things up. So that's why BioSqueeze; it's a squeeze job using bio cement.” Wells typically will be shut down for several days to perform a traditional squeeze job and are often shut down much longer due to repeat attempts to alleviate the issue stemming from the low success rate of traditional sealants. Using BioSqueeze®, that number comes down to two or three days. Hiebert sums up the value proposition this way, “In the oil industry, time is money, just like everywhere else, and they're paying a lot of money to keep rigs on site.”

With Ranalli as CEO at BioSqueeze, the team has been able to raise its first two rounds of capital. Per data available on Pitchbook, the company has raised rounds of $4.1mm and $7.4mm to date. The most recent round, closing in February of 2023, valued the company at $32mm. The current round of funding is primarily being used to grow the team and build new field systems. From the four original founders of MET, the company has grown to 23 employees as of the writing of this article (spring 2023). The company plans to have between 30 and 40 employees by the end of 2023 with a large team of engineers and technicians focused on field deployments. BioSqueeze is currently working in nine states in the US and two Canadian provinces. Per Hiebert, “We're trying to hire people as fast as we can to keep up with the demand.”

BioSqueeze is growing from a revenue perspective as well. Cumulative revenue to date is estimated at approximately $5mm. With the company in full implementation mode, BioSqueeze has aggressive plans to grow annual revenues 10x over the next three years.

PHASE III SUCCESS

Quick Facts

- Employees 29 people
- Generated $5mm+ revenue
- Raised $11.4mm follow on funding

Impact

Remediates leaks from carbon capture storage facilities and other carbon intensive applications

DOE Program

Office of Fossil Energy and Carbon Management

https://biosqueeze.com/

Looking to the future, BioSqueeze is researching additional use cases for its MICP technology. MICP may have additional energy-related uses delivering enhanced oil recovery in existing wells. In the defense sector, MICP has the potential to be used as a rapid repair system for runways damaged in conflict zones. In 2022, more concretely, the company was awarded a direct-to-Phase 2 SBIR from DARPA for a project titled *Engineered Biological Cement for Surface Hardening in Semi-Aquatic Environments*. The project would see BioSqueeze applying its MICP technology to harden beach locations for amphibious vehicle landings without tearing up the beaches. This latest SBIR award may well start another virtuous path of technology derisking, market adoption, follow-on funding, and rapid revenue and job growth.