

# THE INNOVATION INVESTMENT CLUB

Four large independents have invested in a private equity fund to explore new oilfield technologies.

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Once labeled as laggards in adopting innovative technology, E&Ps are increasingly looking for new methods to make everything they do—from leasing to productivity improvement and cost control—more efficient. And rather than rely on oilfield service providers, in certain cases, they’re not only fostering in-house initiatives, but also providing seed capital to external efforts.

One forum for accelerating the adoption of new technology is under the auspices of Denver-based Altira Group LLC. The venture capital provider specializes in backing new technology that can be used primarily by oil and gas producers. Its latest fund, Altira Technology Fund VI LP, has a mix of investors made up roughly

50:50 by institutional investors and large-cap independent producers.

Altira hosts regular “tech showcases” that are designed to provide potential solutions to what it calls industry “pain points.” The meetings provide a forum where companies developing new, potentially disruptive technologies can present to “innovation teams,” established by the same E&Ps, to provide feedback to the fund’s investment managers.

Altira’s strategy is “actively collaborating with oil and gas companies as investment partners.” Participating E&Ps are well-known names: Apache Corp., Devon Energy Corp., EQT Corp. and Pioneer Natural Resources Co.

In the event these producers successfully test and incorporate any of the new technologies, there is the potential for a built-in customer base for the Altira-backed provider. The advantage could shorten the start-up phase of a new-technology company by years, according to Altira managing partner Dirk McDermott.

“For our investees, it’s a really compelling argument,” McDermott said. “Altira’s industry partners will validate products and services and serve as prospective customers for the fund’s portfolio companies. We’ve done lots of deals, so we know how to put deals together and how to help run companies. We know how to be good mentors and be positive partners.

“As importantly, many companies are struggling to get their products to market. It’s a time-consuming process to go out and talk to five or 10 potential customers and, then, wait while they go through their internal processes as to whether they can buy the product.

“But, if you come to someone like us, you can access a ready group of investors with capital to help you along that process if they like what you’re doing. They’re willing to offer their wells to test your product.

“That can cut years off the product life cycle by introducing your product to market more quickly. And, in turn, that can help you build your company and get a competitive return on your time and investment.”

Pioneer Natural Resources echoed this in terms of the value of vetting new products. “We’ve done a number of pilot programs and some have gone on to extended tests if we really like a technology,” said Chris

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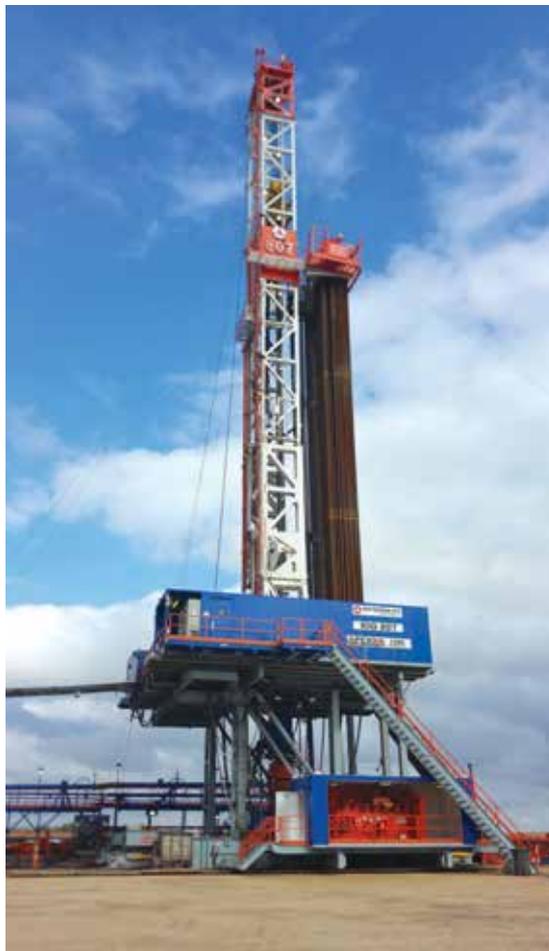


PHOTO COURTESY ALTIRA GROUP LLC

**Eighteen of Pioneer Natural Resources’ rigs in the Permian Basin use Infrastructure Networks for its communications.**

Cheatwood, Pioneer executive vice president and CTO. “We get to vet the technology for Altira, and we give them a ‘thumbs up’ or ‘thumbs down’ as to whether we like it or not. We’re not bashful; we tell them if we don’t. It’s similar to the ‘Shark Tank.’”

The pilot programs give Altira additional guidance as to what types of services are likely to prove most valuable to its industry partners. Still, Altira and Pioneer may not always share a singular view, according to Cheatwood.

“There’s been great cooperation between the strategic investor companies and the Altira team,” he said, “but there are a lot of variables in the process. Sometimes we see something we think is an interesting technology—something that is out of the box, a true start-up—but it’s too early for Altira. It may not fit the investment profile, or the management team may not be as strong as they want.”

### **Innovating within**

Many independents have formed their own in-house innovation teams in this era of unconventional-resource development. “Our model would not have been possible 10 years ago,” McDermott said. “The game has changed. Oil and gas companies working in the unconventional sector today know where most of their resources are. So how do you differentiate yourself from your peer group? One of the key choices is technology.”

McDermott also pointed to the downsizing of large R&D departments within major oil producers, whose work transitioned to large oilfield service providers. In turn, projects were brought in-house by large independents on grounds that the oilfield service sector didn’t meet their needs or it charged too much.

Meanwhile, given the large fairways of unconventional resources, independent producers have been increasingly focused on recovery and cost control rather than discovery, Cheatwood said.

“We’ve proven the hydrocarbon molecules are there. And we’ve proven that we can produce them and make money at \$40 to \$50 per barrel,” he said. “Now we’re working on ‘How can I recover more, and how can I spend less?’ The two areas of focus are gains in recovery and gains in efficiency.”

The interests of the oilfield service sector are “not necessarily aligned” with those of the producers, he said, adding that the sector’s products have suffered “unacceptable failure rates.” For example, Pioneer has worked with people outside the sector to build a specific oilfield tool, which it will probably later sell in exchange for royalties, preferred pricing or other compensation.

“But, at the end of the day, the value to us is being able to use the tool,” Cheatwood said. He and McDermott

anticipate increasing adoption of new technologies—often already in use in manufacturing—by the oil and gas sector.

An example of a nontraditional oil and gas-oriented oilfield technology is Altira’s backing of Infrastructure Networks Inc. (INet). This was the only Fund VI investment it made before the oil-price collapse that began in November 2014. Despite pressure to put more money to work quickly, Altira kept most of the fund’s powder dry.

INet provides next-generation, wireless, broadband communications via 4G LTE technology to customers in oil and gas and other critical-infrastructure industries such as utilities. In oil and gas, it has an expanding network that covers more than 150,000 square miles in key areas: the Bakken, Niobrara, Eagle Ford and Permian Basin as well as the Texas Panhandle and Kern County, Calif.

Not surprisingly, there has been significant growth in the Permian, which is now INet’s biggest customer base. Historically, the region has had poor quality or little communications service. Today, 18 of Pioneer’s rigs, which it owns and operates, use INet for its communications.

How did Pioneer come to rely on INet for its communications in the Permian? Cheatwood recalled seeing multiple trailers arriving on site, with each party—Pioneer’s company man, the driller, the directional driller, the mud company and so on—having its own system. Apart from issues of connectivity, unreliability and slow service, Pioneer was being charged by each for communications service, which didn’t make sense at all, he said.

A decision was made to go to a standard package that met the requirements of both Pioneer and its vendors, which were mandated to



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## **INNOVATION EFFORTS PURSUED BY PIONEER**

The following are examples of new technologies:

- Machine learning and artificial intelligence
- Predictive analytics
- Automation
- 4-D fracture propagation modeling
- Development and use of advanced materials (e.g., fluid end metallurgy)
- Dynamic drill string modeling
- Real-time drilling prediction software
- State-of-the-art downhole tools
- Advanced subsurface measurement (e.g., fiber optics)
- Large-scale produced water recycling

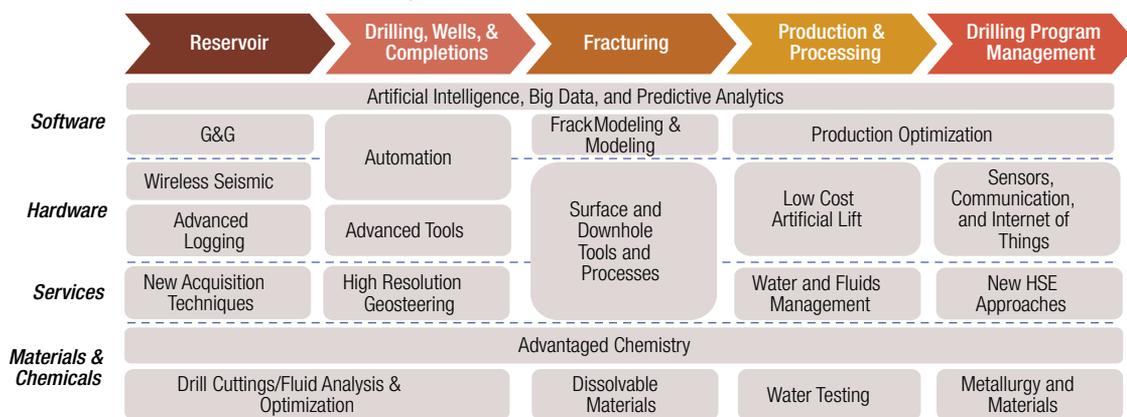


**Pilot programs test new technologies and give Altira additional guidance as to which are likely to prove most valuable to its industry partners, according to Chris Cheatwood, executive vice president and CTO, Pioneer Natural Resources Co.**



**“Adopting the technology rather than waiting years for it to become mainstream creates shareholder value,” said David Ross, senior manager, external innovation, EQT Corp.**

## Altira Unconventional Technology Fairway Example Technologies of Interest



Source: Altira Group LLC

use it—and could no longer charge Pioneer for that service.

“Communication is core to our business, and it will become even more so in the future as we utilize automation, remote operations and other advancements,” he said. “Now we have a standard package, and, ultimately, our field operations will have a backbone of fiber-optic cable running a little over 100 miles from north to south. And the last mile is going to be LTE.”

Cheatwood credits advances in oil and gas technology as “changing the landscape” with its use of horizontal drilling and hydraulic fracturing, albeit within the bounds of industry practices.

“We’re drilling a hole, just like we always have; we’re just doing it sideways now,” he said. “We’ve been fracking wells since the 1950s. Now, we’re doing it with more and bigger stages, but to a large extent we’re doing the same things we’ve been doing for decades.”

These advancements were at a time of higher oil and gas prices, he added. Lower commodity prices prevailing today will necessitate E&Ps moving “outside their comfort zone” and embracing new technologies to stay competitive.

### Strategic criteria

Altira is similarly biased toward technologies that are “capital light,” often providing a potential investment in a software solution, according to McDermott.

“We lean toward services and software vs. big iron, in part because services and software tend to have the higher margins,” he said. “And, importantly, we’re trying to foster next-generation companies. If you think about where a lot of the innovation is happening in the industry today, it’s pushing on the software side and some of these new services rather than big iron.”

In addition to its communications investment, Altira considers areas ripe for a technology solution to include cost control; production uplift; logistics and supply-chain efficiency, including health and safety; predictive maintenance; sensor technology and water disposal.

Potential portfolio companies are “building the next generation of breakthrough technologies.” Altira looks at the management team, the proprietary nature of the technology, and the size and nature of the market.

Its typical investment size is between \$5- and \$30 million. While a target is in the venture growth stage, it should have revenue and offer “a clear sight to profitability.” In particular, Altira has focused on companies that have been able to grow through the downturn.

“We’re not looking for science projects,” McDermott said. “If a company is generating revenue, this provides a measure of how fast its technology is being adopted. With an injection of capital from us, our goal is to get an investee quickly to the point of being self-sustaining, meaning that its sales growth is large enough for it to reach breakeven or generate positive EBITDA.”

Among the primary criteria used by Altira for evaluating a portfolio company is a “solid management team” that has a track record of starting and growing emerging companies.

This quality is illustrated by FlexGen Power Systems, in which Altira has also invested. FlexGen provides innovative hybrid power products for a range of oil and gas applications, including power for drilling rigs and production. The company’s core technology allows traditional combustible power to be replaced by a product called the Solid State Generator, which combines software, high-efficiency power conversion and advanced energy storage.

“FlexGen deployed a version of this technology in Afghanistan,” McDermott said. “The military needed more mobile, hybrid power solutions. That told us this was a team that understood how to build these types of units and how to deploy them. As FlexGen moved into oil and gas, there was never any question that the technology worked.”

One of Altira’s E&P investors, Devon Energy, has tested it. Devon’s innovation efforts have been funded with a formal budget since 2012. One of its teams focuses on strategic innovation; the other, data and analytics.

Work includes improving recovery factors and understanding contributing-rock volumes over time. In addition, the focus is on big data, machine learning, predictive analytics, automation, subsurface applications, and “smart oilfield” practices involving remote sensors and automation.

Kris Goforth, Devon vice president of

reservoir technology and optimization, said the two teams work on capturing short-term opportunities, while pursuing what are hoped to be long-term breakthroughs.

“If we can get some quick wins in cost-cutting and efficiencies, we’re definitely looking at that,” she said. “But we also have some areas aimed at breakthrough technologies that are more of a strategic focus. We’re balanced in how we approach those two.”

### Prospective technology

“One area is, ‘How do you identify and maximize the contributing rock volume in 4-D?’” she added. “It’s not just understanding what you stimulate with your fracks, but also, ‘When does that reservoir contribute hydrocarbons over time?’ Is it contributing at the beginning, and is it contributing five years later? And how do you bring as much of that forward as you can?”

Where’s the sweet spot in terms of development for a prospective technology to be of interest? “Early R&D work is really not our focus,” Goforth said. “Technologies that are close or ready for testing fit well with what we’re trying to accomplish. We’re looking for scalability. And we’re thinking ‘E&P-wide.’ We want to be able to take that across Devon’s area of operations as much as possible.”

Several factors favored Devon’s use of FlexGen’s technology, but the main one was cost, she said.

“FlexGen’s solid-state generator gave us power reliability. But its advantage was chiefly in the cost savings that it achieved through reduced fuel use, and there was also an environmental benefit. This was a technology that could bring power on demand to meet the surges, and, that way, we didn’t have to have as many motors running on the rig all the time.”

For EQT—whose maxim is “where energy meets innovation”—a conscious effort began roughly three years ago. “How can we get everyone internally thinking innovatively rather than just a small group of people?” recalled David Ross, EQT senior manager, external innovation. “And out of that effort came a decision to find ways of looking externally to bring in new technology.”

A new technology may be backed by venture capital and ultimately sold to a major oilfield service company, Ross said. EQT’s objective was to jump ahead.

“Our goal is to get early access to new technology before it becomes mainstream,” he said. “Adopting the technology, rather than waiting years for it to become mainstream, creates shareholder value. While a new technology may save only \$10,000 on a single well, that can translate into \$100 million in future capital cost savings if you have 10,000 locations to drill. That’s why we want to be at the front end of the process.”

EQT looks at approximately 200 new technologies a year. Basic criteria are threefold: Does it reduce costs? Does it increase how much a well may produce? And does it

improve health and safety or have a positive environmental impact?

Importantly, sponsors of a new technology should be able to clearly articulate the value proposition. EQT has seen some technologies take between one and three years to be ready for testing.

“We’re the market, and we’re also the laboratory,” Ross said. “Until you get a new technology in a well or out in the field and really test it, you really can’t tell whether it’s going to work or what you may need to change to make it work to make it valuable.”

One new technology under review is artificial intelligence/machine learning that better organizes land departments’ unstructured lease data and interprets complex legal language, including Pugh clauses that pertain to depth rights.

For E&Ps trying to consolidate acreage to accommodate longer-lateral wells, it could help identify and deal with exceptions to mineral rights. Even with small purchases, the scale of paperwork can be daunting.

“This helps comb through documents more quickly and accurately in terms of doing the due diligence needed to know what you will own and operate,” Ross said.

In its latest fund, Altira raised approximately \$125 million. In total, its six funds have invested more than \$1 billion with partners in more than 50 portfolio companies.

How do the producers, as investors, evaluate the benefits of the partnership? Lucian Wray, Apache vice president of engineering technical services, said, “Our participation stems from a deep commitment to innovation and continuous improvement. During a slowdown, there is a risk that investment in unproven technologies can fall off as companies reduce their overall budgets.

“Apache believes that is when the investment and the willingness to support new ideas are most crucial. This partnership has helped us identify opportunities to deploy technologies that ultimately reduce costs and make us more efficient.

“The benefit of the Altira model is that it introduces us to new technologies and ways of thinking about common industry challenges that otherwise may not make it into the mainstream. Sometimes the ideas may not be a good fit for the partnership, but they get great exposure with some of the largest and most active E&Ps in the business.”

Devon’s Goforth also pointed to less easily quantifiable benefits beyond the investment itself. “Away from the investment piece of it, the beauty of the Altira partnership is that it gives us a lot of access and awareness of other innovation technologies that are out there,” she said. “It gives us an entry into that innovation pipeline.

“There may be technologies that we’re interested in at Devon, but don’t meet Altira’s investment profile. And with the other three operators, you can discuss what ideas they have and what worked for them.” □



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