

CASE STUDY



# Discovers What's Below With Willowstick

INTRODUCTION

CHEVRON DIDN'T BECOME ONE OF THE world's largest and most respected energy companies by following others, they got there by blazing their own trail. With their corporate commitment to being a responsible and environmentally friendly company, Chevron stands apart from their competitors by being open to new ideas.

In 2006 the company brought in Willowstick, a Utah-based company whose AquaTrack™ Technology creates accurate, contoured maps of subsurface water paths. Willowstick was charged with helping Chevron engineers discover what was occurring beneath the ground.

Willowstick was able to provide Chevron a better understanding of the complex underground water systems that were creating difficult problems. In the end



THE AQUATRACK ON SITE.

the company was able to save potentially millions of dollars and countless hours of work, thanks in large part to AquaTrack.

THE PROBLEM

“Chevron needed something that could provide a more concrete reading with accurate data.”

CHEVRON DEVELOPED A NEW TECHNIQUE for revitalizing oil production wells using steam. In order to safely and efficiently utilize the steam, Chevron's Bakersfield, California-area engineers needed a clearer understanding of the subsurface, most specifically the potential routes

through which the steam could travel.

While there were research methods that could give them an educated guess as to subsurface routes, Chevron needed something that could provide a more concrete reading with accurate data.

Pete Dillett, an Earth Scientist at Chevron, needed the method to be inexpensive and justifiable to management. Beyond that, the data pulled needed to be able to be plugged into earth models for the engineers and scientists, but also into presentation formats for executives.

THE SOLUTION

“My boss was basically charged with bringing in technologies that could possibly benefit the company,” Dillett said. Willowstick’s AquaTrack technology had been referred to Dillett’s group by other Chevron engineers who felt that their technology and services could benefit the projects Dillett had been charged to address.

AquaTrack works by measuring magnetic fields generated by an AC current, which is applied using strategically placed electrodes that are in direct contact with groundwater flow. After multiple unobtrusive readings taken by a Willowstick surveyor, the data is applied to mathematical algorithms and used to create maps and three-dimensional models of the subsurface pathways. There is no requisite well drilling involved, no large equipment and no extra personnel to manage.

PROBLEM

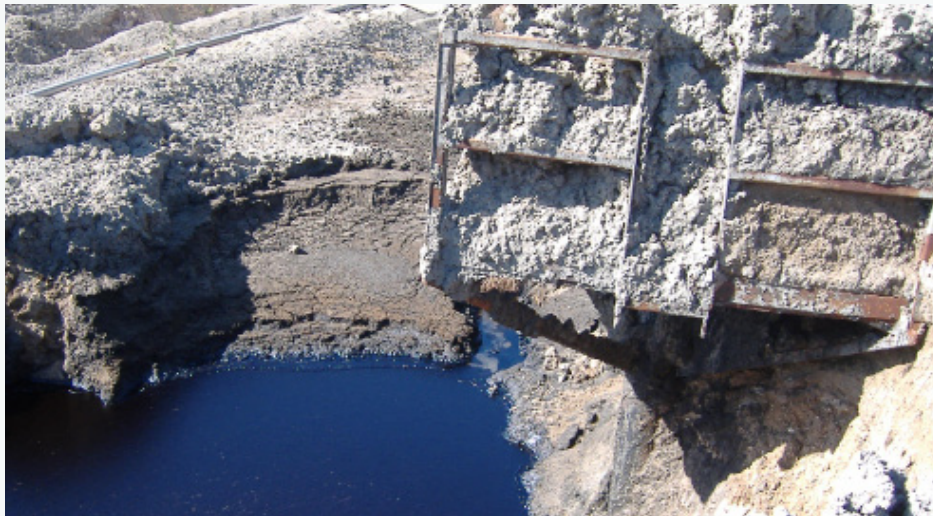
\$6-9 million

SOLUTION

\$140,000

“We felt like Willowstick would be able to give us digital insight that would integrate with data pulled from all our other monitoring sources, to better understand the subsurface”

PETE DILLETTE, EARTH SCIENTIST—CHEVRON



WILLOWSTICK USES ELECTRODES PLACED IN DIRECT CONTACT WITH GROUNDWATER FLOW

“We felt like Willowstick would be able to give us digital insight that would integrate with data pulled from all our other monitoring sources, to better understand the subsurface,” Dillett said. “We wanted it to be supplemental, as opposed to a standalone operation.”

Going from the idea to actual deployment was a cinch. “We worked

with Paul Rollins (Willowstick Vice President of Business Development) and two technicians, beginning with a field tour. We showed them the site and exactly what we wanted to do,” Dillett said. “We gave them a glimpse of our data and in turn they drafted a proposal. I was able to go to my bosses and make a recommendation.”

After the proposal was approved and the final logistics and safety measures were planned, Willowstick deployed a team of

engineers to gather readings of the field. They began with a wider, 100 square-foot pattern, to get a general sense of the area. After examining the data with Chevron’s team, a more detailed reading was taken every 25 square-feet in areas of interest.

From initial talks to completed maps, the entire project took six months. But it only took about a month from the beginning of measurement to finalized maps. Dillett said that, “Willowstick’s turnaround was extremely quick and efficient.”

“The maps are well laid out and easy to understand,” Dillett noted. “We could take the image files and view them in earth models, integrate it with other data we had pulled and get an understanding of what was happening at depth.

“Willowstick did everything we wanted them to do, such as following our safety procedures and checking in on a daily basis,” said Dillett. “They did a great job.

“They were very professional, and we’re really pleased with how they helped us plan and execute the project.”

"We were attacking a \$6-to-\$9 million problem with a \$140,000 solution," Dillett said. "Willowstick wasn't able to give us answers to every issue we've faced, but the data we received has proven to be accurate and reliable. It helped us see things we hadn't seen before."

Dillett took the data Willowstick provided him and was able to plug it into multiple formats, including PowerPoint™, which made it easier to present to management. "Even mid-project, I had information to take to management on the wells we

sought to take action on and why."

Dillett noted that the field has not yet been returned to production but they plan on it in the very near future. Armed with the information Willowstick provided, the process has been simplified greatly, and at a low price.

"Willowstick worked with us on measurements, which helped save on costs," Dillett said. "Instead of doing an intensive 25x25 survey from the outset, we took less readings over a wider area, then focused in on a few spots. We were able to take less time as well.

"The existing survey technology on the market wouldn't be able to give us the same information at all," Dillett said.

"Willowstick really runs a tight business. They have people that manage the project with you, collaborate with you and turn things around quickly.

"All across the board, Willowstick was very professional, very competent and very responsive. They're growing, but we never felt the effects of that; we always received personal attention from them. You don't always get that from vendors in this industry."

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pete dillette, earth scientist—chevron

For more information on Willowstick and AquaTrack™, visit [www.erraus.com.au](http://www.erraus.com.au)

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