

WWJ

WATER WELL JOURNAL

Well Forensics

Difficult wells require a more detailed approach, page 23

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A video camera operator from Madera Pumps Inc. in Madera, California, prepares the downhole video camera for an inspection of an industrial well in the Central Valley of California.

Maximizing Your ROI

Downhole cameras can be a great tool for any company. But make sure you know these five factors before lowering one in a well.

By William Wagner

The technology involving downhole cameras has evolved dramatically over the past several decades.

Just consider:

“We built the world’s first downhole camera over 70 years ago,” says Eric Hadden, vice president of sales and marketing at Laval Underground Surveys in Fresno, California. “It was a still camera that was put into the casing of a World War II-era bomb. It weighed over 200 pounds and was about 9 feet long. So miniaturization certainly has come a long way.”

That’s putting it mildly. Some models now measure about 1.5 inches in diameter and 16 inches in length.

The prices of downhole cameras also have come down considerably, especially over the past 10 years. Hadden says Laval Underground Surveys manufactures a model that costs about \$14,000, which is small potatoes compared with what you would have forked over in the past.

“Ten years ago, you were looking at a system (that was operated) from a vehicle or a trailer,” Hadden says. “And the camera itself was in excess of \$25,000. The winch was another \$10,000, and the cable was maybe \$5000 or \$7000. All told, you were looking at a system that could easily cost \$100,000.”

Although downhole cameras are cheaper than they used to be, more simple to use, and portable enough for a driller or pump installer to own and operate himself, Christopher S. Johnson, PG, Chg, of Aegis Groundwater Consulting LLC in Fresno, California, isn’t averse to farming out the work.

Says Johnson, “I recommend that you find local contractors who specialize in downhole video cameras.”

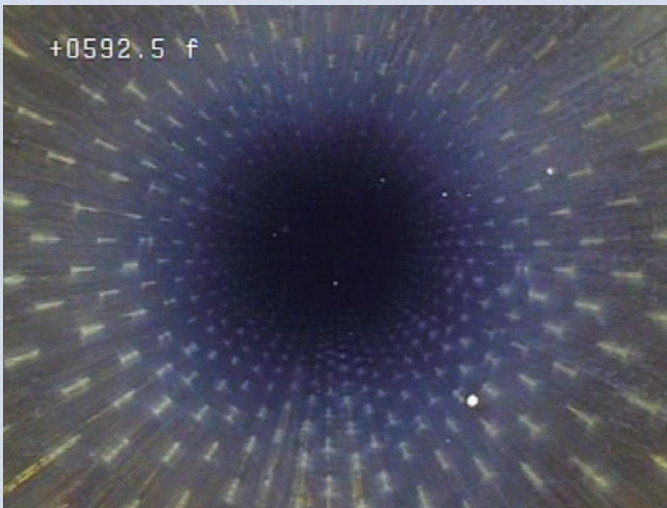
Whether you do it yourself or hire someone, you’ll want to make the most of that camera’s long journey down a well and back. Here are five key factors to consider when using a downhole camera, and why this high-tech tool can be such an important part of your work:

1. The camera doesn’t lie.

There’s no substitute for the intel you’ll gather from a camera, whether you’re drilling a well or doing maintenance on one.

“Don’t pass up an opportunity to run a camera down the well,” Johnson urges. “It provides an objective process for establishing a wide variety of things. Wells are 12 to 20 inches

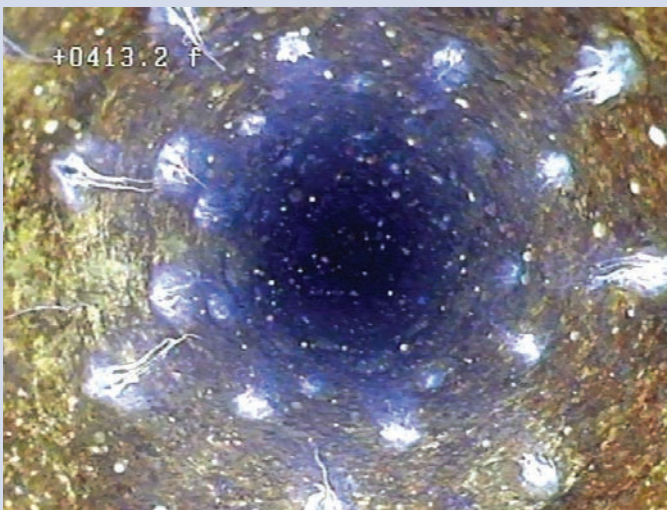
MAXIMIZE ROI WITH CAMERAS continues on page 30



Downhole video camera view of a vertically slotted well showing the vertical slot pattern in sharp relief as a result of residual drilling fluid.



Downhole video camera view of loose wire in a well. Photo courtesy Eric Hadden, Laval Underground Surveys in Fresno, California.



Downhole video camera view of a cable tool, Miles knife-perforated well with clearly visible bacterial growth within the perforations of the well. Top photo and photo above courtesy Christopher S. Johnson, PG, Chg, Aegis Groundwater Consulting LLC in Fresno, California.

MAXIMIZE ROI WITH CAMERAS from page 29 in diameter and can be 2000 feet deep. We want to try to avoid the voodoo factor, and cameras provide us with an objective technology.”

Sometimes, however, it’s difficult to convey that notion to contractors who have spent a lifetime in the business.

“I always like to emphasize that unless you have a downhole camera and you can verify with a visual, everything else is purely speculative,” Hadden says.

“That ruffles some feathers because there’s a tendency in this industry to believe that experience is enough. If you’ve been in the industry for 25 or 40 years, you believe you’ve seen everything under the sun. You think that you’ll be able to look at a little anecdotal piece of evidence and be able to make a determination of what is happening. My point is that a camera is the only way to get a bona fide, hard look at what’s going on.”

2. View the images as if you’re a doctor.

It’s not enough simply to be in possession of the images delivered by a downhole camera. The trick is to read them correctly.

“The real challenge is interpreting what you see,” Johnson says. “You’ll often see medical programs where a radiology technologist sees something on an X-ray and raises an eyebrow. There’s a certain amount of the same science that goes into understanding what you’re looking at (in video footage of wells).”

3. Don’t hesitate to ask for a second opinion.

Building on the doctor analogy, it’s always smart to seek feedback from another expert on your video footage.

“Second opinions are worth the money,” says Johnson. “The vast majority of video work is done because something is amiss. Somebody has said, ‘Hey, the well’s pumping sand’ or ‘The water tastes funny’ or ‘The production is off.’

“A second opinion almost always is done as a forensic exercise in an attempt to evaluate what the issue is. You might not necessarily have the experience to see something. It’s worth the effort to call someone who has more experience than you do to look at the video.”

4. Have a plan.

Would you start working on a water well system without a plan? Or begin a maintenance procedure without a plan? Heck, no. The same goes with downhole cameras. In other words, avoid placing your camera into the hole until you’ve figured out exactly what you want to do with it.

“Don’t just lower a camera to the bottom of the well and bring it back out,” Johnson says. “Always have a game plan.

“We use the term *indexing*. By that I mean we go down to a number of specific points in the well and let the camera stop, or hover. It sits there, and we can watch water flow past the camera. Then we index that location. Say three years down the road, we can check that location and look at the differ-

DACUM Codes

To help meet your professional needs, this article covers skills and competencies found in DACUM charts for drillers, pump installers, and geothermal contractors. DO refers to the drilling chart and PI represents the pumps chart. The letter and number immediately following is the skill on the chart covered by the article. This article covers:

DOF-4, DOH-2, DOI-1, DOL-11, PIC-3

More information on DACUM and the charts are available at www.NGWA.org/Certification and click on "Exam information."

ences between then and today."

And by formulating a plan for your camera positions, you'll be better able to approach the work on the well itself in a more structured manner.

"Here in California, we've been going through a multiyear drought, so well rehabilitation has become very popular," says Hadden. "The reason for this is that drilling a new well is becoming incredibly cost prohibitive. It's easier to rehab a well.

"We're finding that a lot of operators are buying down-hole cameras specifically for well rehabilitation. You put the camera down a hole that probably hasn't been used in five to ten to thirty years, and you use that tool to get a view of what exactly the condition is of the well.

"That data really helps you structure your plan of action. Then you can go ahead and conduct your work.

"What we as camera manufacturers are always advocating for is taking that camera and dropping it back into the well after

you're done in order to confirm that you have performed the work to expectations. It gives (the customer) a physical deliverable. They can view that footage and understand exactly what you did and how it will contribute to the well's performance."

5. Remember that you get what you pay for.

This is as true with drilling and maintaining water wells as it is with anything else in life.

"Our industry is very price sensitive," Hadden says. "I speak to a lot of customers who say, 'I can't possibly afford a camera because I need to make sure I'm the lowest-cost provider.'

"My response is, 'If that's true—if this really is an economic race to the bottom and based on who can charge the least amount of money to do the work—then we all need to go find something else to do. That's a completely disadvantageous position to be in.

"The reality is, we're really advocating for differentiation based on services provided, and a camera is a great way to differentiate yourself. If you're able to show the customer exactly what you did, then when it comes time to pay the invoice, they are able to justify the cost. You've given them peace of mind." [WWJ](#)

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