

# Water 'Witch' Engineer Uses Old Sonar Device To Wring Moisture From California Desert

In California, a retired electrical engineer has revived an out-of-production sonar device that uses very low frequency, or VLF, radio waves to locate underground water, and, as recently as Feb. 15, he has been successful. Using improved software, he found water where others had failed.

Richard Varian, owner of Survey4Water, Willits, Calif., uses the WADI VLF-sonar device—developed over 25 years ago by ABEM, Sundbyberg, Sweden—to find water trapped in rock fractures and cavities.

"The fractures in the rock are where the water accumulates," says Varian.

WADI reads 10-kHz to 30-kHz radio waves from VLF transmitters operating to support communication systems across the globe, says Mats Thörnölöf, an ABEM representative.

"It is the band that the [armed forces] use for communication with submerged submarines," says Thörnölöf. ABEM discovered that these frequencies could be used for geophysical applications as well, he says.

WADI's original DOS-based software exported data to a computer, but it was difficult to read, says Varian. When ABEM released a newer version, the readout improved, although Varian says interpretation still is difficult and takes practice.

Soon after the new software was released, the WADI



**OLD INNOVATION** A retired engineer uses an out-of-production device to read very-low-frequency radio waves to find water trapped in underground rock.

went out of production "due to lack of critical components," says Thörnölöf. "We are still looking to see if they can be found," he adds, declining to provide specifics.

Any conductive structure affects the direction and strength of the VLF radio signal. When surveying, Varian looks for a spike in his readings, displayed when the WADI reacts to high electrical conductivity of fracture zones in underground rock.

## Fine-Tuned Device

Thörnölöf says the machine's strength is also a weakness because it reacts to anything with high electrical conductivity, including power lines or buried metal pipes.

In February, Jim Rockstad, an avocado farmer in San Luis Obispo, Calif., says he drilled several dry holes as deep as 600 ft looking for water for his crops. So he called in Varian.

After doing a survey, Varian

told Rockstad where to drill and said he would find water between 115 ft and 180 ft underground. However, Varian added, "If you go over 180 feet, you're throwing your money away."

"We hit water between 115 and 180 feet three times," says Rockstad. The water pressure was four to five gallons a minute, and Rockstad wanted to try for more. "I decided I [wouldn't] listen to Richard and went down to 215 feet," Rockstad says. "We did not hit any water." He adds that, if it's collected aboveground, four to five gallons a minute is more than enough for his avocados. "I don't believe in witching, but he made a believer out of me," says Rockstad.

David Moench, owner of David & Sons' Drilling Co., Oroville, Calif., says he has drilled wells for years. "Out in Butte County, we drilled on this piece of land and didn't hit water," says Moench. The cli-

ent brought in Varian, who advised Moench where to drill, and Moench hit a 50-gallon-per-minute well.

"That was a strong well, so I have to give him credit for it," admits Moench, but he didn't even get Varian's business card after the job. "One well don't tell me nothing."

"There was a witcher who had a device made back in England. This old man was in his 80s, he had whalebone on the end of it with a bunch of minerals," says Moench. "I put him in areas that were really tough for water, and we hit 33 [wells] straight." Moench wanted to go into partnership and guarantee water on the first drill, but then the witcher came up with eight dry holes in a row. Since then, the witcher has regressed to the mean, says Moench. This has soured Moench on dowsers in general.

Varian isn't using whalebone or a forked stick like traditional water witches. He's using science and an old device to back his guarantee. "If there's water there, we'll find it," he says.

Varian has hit more than 50 wells so far and has never missed, he says. His next project is "a 50,000-tree apple orchard in Stanislaus County." ■


By Luke Abaffy

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