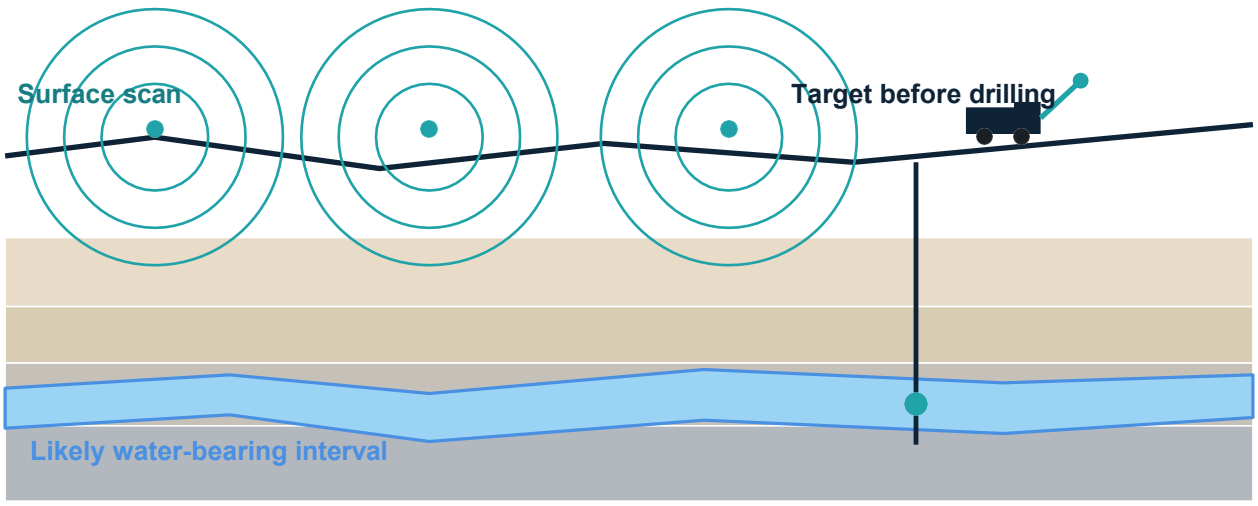
How to Find Groundwater Without Drilling

A practical guide to deep aquifer detection, lower dry-hole risk, and smarter pre-drill targeting for water, mining, and energy teams.

Non-invasive | Early-stage | Decision-ready

Finding new water sources is harder than it used to be. Shallow supplies are under pressure, blind drilling is expensive, and many promising targets sit deeper or in more difficult terrain. This guide explains how a non-invasive survey can narrow the search area before a rig is mobilised.

PLAIN-ENGLISH FIELD GUIDE



Why groundwater projects stall before the first borehole

Shallow sources are increasingly stressed by overuse, pollution, and climate variability, while the next viable target may be deeper, fragmented, or hidden beneath difficult overburden. The traditional answer—drill more holes—adds cost, delay, and risk before you know whether the target is right.

Blind drilling burns budget

Every unsuccessful borehole consumes capital, logistics, permitting, crew time, and stakeholder patience.

Access can be the real obstacle

Remote terrain, sensitive sites, and community constraints often make early drilling harder than the geology itself.

Uncertainty multiplies

Depth, rock type, fluid presence, and salinity all shape whether a target is worth pursuing.

The smarter question is not “Where can we drill?” but “Where is drilling most likely to succeed?”

What a non-invasive survey helps you do first

- Narrow the search area before mobilising rigs or water well contractors.
- Highlight likely water-bearing zones and the depth intervals worth testing first.
- Compare multiple candidate sites using one decision framework.
- Reduce unnecessary land disturbance during early-stage exploration.
- Move more quickly from regional understanding to drill-site selection.

Best audience for this guide

Water developers, government water teams, NGOs, mining operators, geothermal developers, and any project team that needs better subsurface confidence before committing to drilling.

How Adrok's ADR survey works in plain English

Adrok describes Atomic Dielectric Resonance (ADR) as a non-invasive method that sends electromagnetic energy into the subsurface and reads the response from different materials. Because water and rock have very different dielectric properties, the data can be used to identify water-rich intervals, distinguish rock packages, and build depth-calibrated “virtual boreholes” before drilling begins.

1. ADR Scan
Collect non-invasive surface data across candidate sites.

2. Read the response
Measure dielectric and spectral differences between layers.

3. Build virtual holes
Interpret likely water-bearing intervals and depth targets.

4. Drill smarter
Prioritise the best location before mobilising a rig.

What it can help with

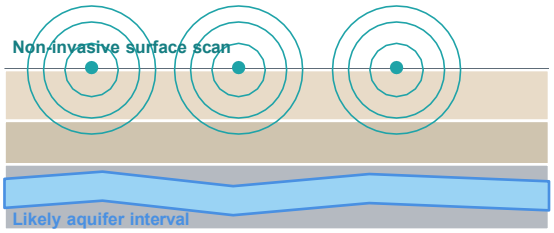
- Highlight likely aquifers and fluid-rich intervals before a borehole is drilled.
- Estimate the depth ranges that deserve priority testing first.
- Support differentiation between rock packages and water-bearing zones.
- In some settings, support the distinction between fresh and saline water.
- Work as a de-risking step between regional interpretation and final drill-site selection.

What it does not replace

- Local hydrogeology, geology, and site-specific interpretation.
- Borehole confirmation and ground-truthing.
- Pump testing, water chemistry, and sustainable abstraction planning.
- Permitting, community engagement, and land access decisions.
- A good exploration programme design.

Think of ADR as a way to spend your drilling budget more intelligently — not as a shortcut around proper hydrogeology.

Where this approach adds the most value



Best-fit scenarios

- Arid or water-stressed regions searching for new water sources.
- Remote or logistically difficult terrain where each borehole is expensive.
- Projects under ESG, land disturbance, or community scrutiny.
- Early-stage programmes with several candidate drill sites to rank.
- Targets where fluid type matters and “water or not?” is too blunt a question.

Good use of a pre-drill ADR survey	Still needs something else alongside it
Site ranking, reducing uncertainty, narrowing search areas, identifying likely aquifers, and deciding where drilling budget should go first.	Yield forecasting on its own, final resource certification, permitting decisions, and long-term sustainability assessments without hydrogeology.

Evidence snapshot from Adrok’s published materials

- Adrok says it is developing precision targeting for aquifers up to and over 1,000 metres depth, depending on overlying geology.
- In a Scottish Water case study, Adrok says known aquifers at 58–68 m and 98–110 m were identified at matching depths across three virtual boreholes.
- Across multiple site pages, Adrok positions ADR as a non-invasive step between regional subsurface understanding and final drill-site selection.
- Adrok also says suitable programmes can reduce unnecessary boreholes and may save up to 90% of exploration costs.

Before you commission drilling

Use these questions to decide whether a pre-drill survey should be part of your groundwater workflow. The stronger your answers, the more valuable early targeting becomes.

1	What depth range matters commercially, socially, or operationally for this project?
2	Are you trying to find any water — or specifically fresh water?
3	What does one dry or poorly placed hole cost at this site once logistics are included?
4	How many candidate locations are being compared, and what makes each different?
5	What geological, hydrogeological, or remote-sensing data already exists?
6	What access, environmental, or community constraints make early drilling harder here?
7	What exact decision must the pre-drill survey unlock: site ranking, depth targeting, or go/no-go?

Finding water is only the first step. Confirmation drilling, hydrogeology, pump testing, chemistry, recharge, and stakeholder approvals still matter. But better pre-drill targeting can help you spend that effort where it has the best chance of paying off.

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