

AquaTracker Groundwater Monitoring



VALIDATING AQUIFER INTEGRITY



Aquifer Monitoring Challenges

Groundwater is an essential resource for agricultural, municipal, industrial, stock and domestic users. Careful management of groundwater resources is essential to optimizing social, environmental and economic quality of life.

Most groundwater is stored in porous strata, referred to as aquifers. Development and production of unconventional hydrocarbon resources can potentially interfere with those aquifers and threaten local quality of life.

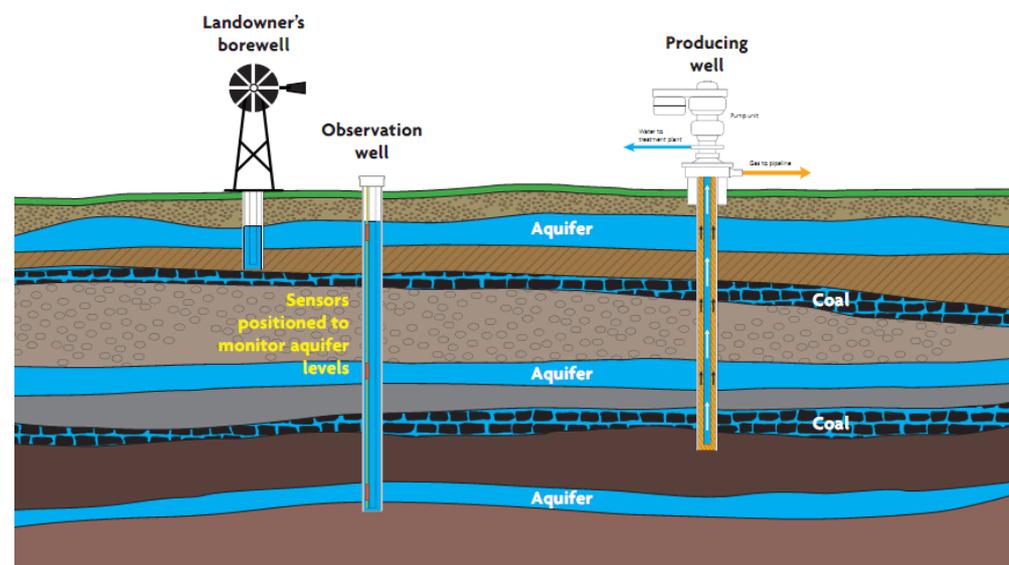
As a consequence, legislation exists in many countries that establish responsibilities for operators to monitor and manage impacts caused by extraction of these hydrocarbons, including a responsibility to make good impairment of private bore water supplies.

Complying with these responsibilities requires the development of a water management strategy, which is designed to achieve a number of very specific objectives:

- Establish background spatial and temporal trends in advance of hydrocarbon reservoir development.
- Identify changes in aquifer conditions within and near areas of such developments.
- Identify changes in aquifer conditions near critical groundwater use.
- Identify changes in aquifer conditions near springs.
- Improve future groundwater flow modeling.

FEATURES & BENEFITS

- > Fit-for-purpose, reliable and cost effective
- > Sensitive, high resolution pressure sensors with exceptional long term stability
- > Modular, freely configurable downhole gauge architectures
Metal-to-metal seals throughout to optimise robustness and long term reliability
- > Permanent or retrievable architectures
- > Flexible surface data acquisition systems



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FEATURES & BENEFITS

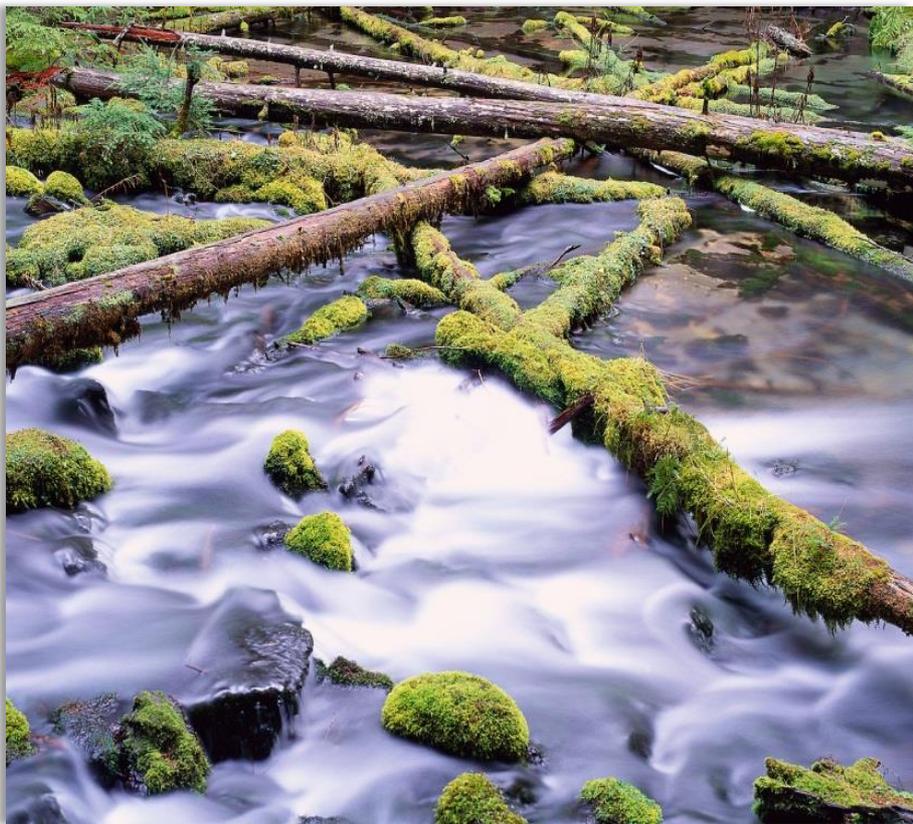
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- > Suitable for both shallow aquifer and deeper underlying hydrocarbon reservoirs penetrated by the same well
- > Identify degree of hydraulic connectivity between aquifers and hydrocarbon reservoirs and between aquifers using variety of tests, such as slug tests, pulse interference tests and vertical interference tests
- > Improve understanding of connectivity between aquifers

Constraints

Several factors influence the degree to which aquifer integrity is disturbed by depletion of nearby hydrocarbon bearing reservoirs. Aquifer size, degree of hydraulic constraint and extent of hydraulic communication with the reservoirs are the primary factors. These can combine to result in a very gradual rate of change in aquifer pressure, and thus water level.

As a consequence, very sensitive, high resolution pressure sensors will be required for early detection of communication between aquifers and hydrocarbon reservoirs. Furthermore, the pressure sensors need to exhibit good, long term stability in order to accurately track these changes over time. Long term reliability is also essential in order to provide data on a continuous basis, spanning field life.



Solution

Aquifer Monitoring using AquaTracker™

WellDog's AquaTracker™ technology continuously monitors and records pressure and temperature of discrete aquifers within a single well. A variety of cost-effective sensor types are available for this purpose, with selection based on matching performance characteristics with anticipated pressure trends. These are incorporated into freely-configurable, modular, multi-zone and/or retrievable system architectures, featuring metal-to-metal seals throughout, and designed to accommodate a wide range of well designs and complex hydrogeologic settings. The systems can be further customized to facilitate deployment on production tubing, coiled tubing or permanently installed on multiple casing strings.

Data from each AquaTracker™ sensor is transmitted to a Surface Data Acquisition (SDA) system, which provides power to the sensors and archives data from each. This data can be transmitted via a wired connection, or wireless RTU link, to a 3rd party SCADA system. Alternatively, data can be relayed via dedicated GSM or satellite modem link to either a 3rd party or dedicated Data Historian and Visualization System (DHVS).

This completely flexible and scalable system enables cost effective, rugged, tailored solutions to be assembled, offering unrivalled functionality and reliability in comparison to traditional monitoring methods.

Contact WellDog to discuss your aquifer monitoring challenges.