

BALDER™

Downhole Isolation Barrier Verification Service for well integrity/well abandonment

There are thousands of wells globally that have a requirement to be permanently abandoned, when they are no longer profitable. The costs of plugging these wells are huge. They also represent an environmental risk, and a liability risk for the operators.

There is no reliable way today to verify that these wells are sealed tight in the direction of flow. The lack of an effective verification method makes it difficult for the operators, and regulators, to introduce more cost-effective plugging solutions.

Exedra has developed a game changing method to verify that these permanent barriers are leak tight, enabling new cost-effective plugging solutions, while reducing the environmental risks. Leaking abandoned wells is a major source of methane emissions to the atmosphere, contributing to global warming.

GEOLOG, the world's largest, privately owned, independent surface logging company, has partnered with Exedra to use advanced detection systems to analyse, record and validate any leakage of the sealing method.

The technology platform is generic and can be applied across a wide array of different well designs and plugging types. This includes verification inside and outside of multiple casings. It also has the potential for rig-less / riser-less plugging operations.

The technology is protected through a strong patent position.

The service is deployed via a downhole system, typically integrated with a temporary plug, that acts as the base for the permanent plug material. This downhole tool includes a programmable electronic unit and a highly pressurized gas container. The electronic unit controls the release a tracer gas from the container at a pre-programmed time and differential pressure, after the permanent plug material has cured and is ready for testing. Circulation is then established above the barrier to be tested. In case there is a leak of tracer material across the barrier, this will be detected using GEOLOG's sensitive gas analysis service. If no tracer gas is detected, the barrier is verified to be sealing and leak tight.

The main benefits of this unambiguous way of verifying the integrity of a barrier are:

- *Reduced exposure to costly re-intervention to fix leaking wells*
- *Enables deployment of more cost-effective barrier plugging solutions, including shorter sections, and new plugging materials*
- *Quick response, very sensitive and at a low cost*
- *Testing and verifying the barrier in the right direction of failure – from below towards the surface*
- *The method is generic and can be used in a wide variety of barrier applications*
- *No subjective human interpretation affects the result*



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