Tracers for Carbon Capture, Usage and Storage

CO_2 tracers to prove storage integrity or reveal source of leak

Objective

Carbon Capture and Storage is today primarily focused on storage in existing oil and gas fields. It is estimated that the global storage capacity for CO_2 in such fields are 300 Gt, which will be a significant contributor to reducing human induced emissions. CO_2 can be injected for storage only, but also used for pressure support and CO_2 flooding. Either way, when injecting CO_2 into a producing field, it is important to monitor that the CO_2 stays in the underground and does not leak to the environment, and this control can best be achieved using tracer technology.

Solution

RESMAN tracers and methodologies are compatible with CO_2 – and at the same time unique and distinguishable from the CO_2 itself or other molecules present in the sub-surface. Using RESMAN methodology, an extreme detectability for tracer is possible. Therefore, a small tracer amount is sufficient to monitor large scale subsurface flow patterns. For this reason, RESMAN tracer methodology is well-suited to monitor the state and possible movements of CO_2 in CCS projects. RESMAN tracers can therefore be an aid in CCS projects by acting as an assurance that CO_2 is contained in the desired location sub-surface.

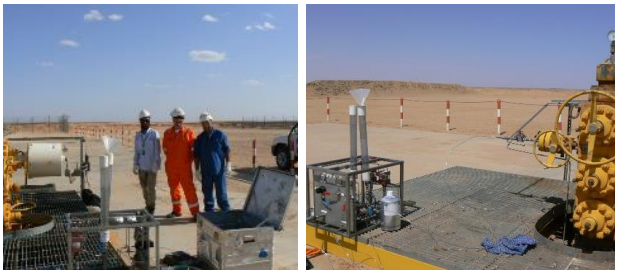

Fig. 1 – On site In Salah: RESMAN's current Norway OPS manager injected CCS tracers to monitor CO2 movement from CCS injectors.

RESMAN tracer technology is founded on unique non-radioactive tracers, safe enough that they are approved for medical usage and satisfying environmental protocols in Norway, Europe and several jurisdictions world-wide. RESMAN tracer technology enables reduction of tracers to a minimum and amounts as small as parts-per-trillion suffice to get decisive detection. A full storage project surveillance can thus be achieved by usage of kilograms of tracer, rather than tonnes.

Applications

In the past, our technology has been used to monitor and study movements in CCS projects in Algeria (Mathieson et al., 2011), in the Netherlands (Vandeweijer et al., 2011) as well as in Norway (Snøhvit).

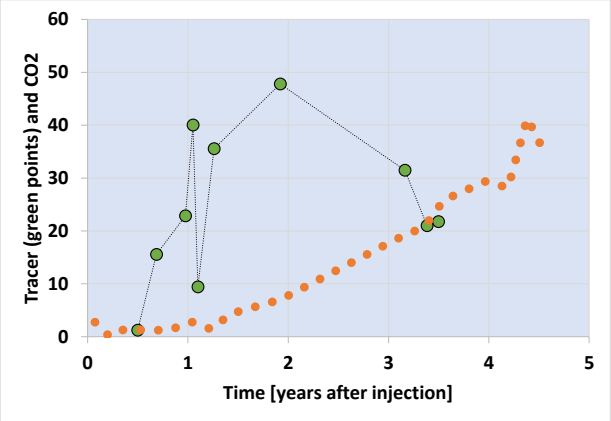

Fig. 1 – Tracer data (points) and CO2 as functions of time in observation wells in the K12-B project, where RESMAN's CO_2 tracers were first piloted. (Data reproduced from Vanderweijer et al., 2011 - Energy Procedia 4:5471-5478).

References

Mathieson et al. "In Salah CO_2 Storage JIP: CO_2 sequestration monitoring and verification technologies applied at Krechba, Algeria", Energy Procedia 4, (2011) pp3596-3603

Vandeweijer et al. "Monitoring the CO_2 injection site: K12B", Energy Procedia 4, (2011) pp5471–5478

HQ +47 925 64 070 • Norway/EU +47 976 35 227 • UK/Africa +44 78 99 763 463 • Russia/CIS +7 977 956 48 43
M. East +971 4 572 6318 • Far East Asia +60 122 412 056 • Americas +1-504-239-7705
info@resman.no • www.resman.no

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