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Pilot CO₂ injection into an onshore aquifer in Nagaoka, Japan

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Abstract: A pilot-scale CO₂ sequestration test into an onshore saline aquifer has been conducted in Nagaoka-City, 200km north of Tokyo under cooperation of Research Institute of Innovative Technology for the Earth (RITE) and Engineering Advancement Association of Japan (ENAA).

The aquifer, 1,100 meters in depth and 12 meters in thickness, is in shallower zone of Minami-Nagaoka gas field which is being operated by Teikoku Oil Co., Ltd. (TOC). An injection well and three observation ones were drilled in the site. CO₂ of supercritical phase had been injected into a permeable zone in the aquifer with the rate of 20 to 40 tonnes per day. The injection started on July 7, 2003 and ended on January 11, 2005 with total amount of 10,405 tonnes. A series of monitoring method including time-lapse well logging, time-lapse cross-well seismic tomography, bottom-hole pressure/temperature measurement, fluid sampling and microseismicity monitoring have been successfully carried out to grasp the movement of injected CO₂ during and after the injection. History-matching simulation had been performed to interpret the monitoring results. Long-term CO₂ movement was predicted using the last model of history matching, implying the location and size of the CO₂ to remain almost unchanged from those at the end of injection in the test area over a period as long as 1,000 years. The monitoring at the test site will be continued until 2007.

Key words: [CO₂](#), [saline aquifer](#), [monitoring](#), [time-lapse](#), [simulation](#)

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