# Common attributes of hydraulically fractured oil and gas production and $CO_2$ geological sequestration

## GCCC Publication Series #2012-09

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**Keywords:** structural

**Cited as:**

Nicot, J.-P., and I.J. Duncan, 2012, Common attributes of hydraulically fractured oil and gas production and $CO_2$ geological sequestration, GCCC Publication Series #2012-09, originally published in *Greenhouse Gases: Science and Technology*

## Abstract

Areal footprints of current and future hydraulically fractured oil and gas reservoirs and potential $CO_2$ geological-sequestration intervals often overlap in sedimentary basins. Significant vertical separations between prospective subsurface volumes, however, will limit their interaction, particularly if the carbon-storage site is deeper than the hydrocarbon resource. Recent intense development of shale resources translates into a reduced need for sequestration capacity. It has also resulted in technological innovations directly transferable to the carbon-storage industry, in particular progress on well completion, such as new approaches to cementing, more mature horizontal drilling methods, and development of field-treatment techniques for saline water. In addition, knowledge collected by operators on stratigraphy and faults – for example, using 3D seismic – and on abandoned wells is directly useful in reducing risk in future carbon-storage projects. Both industries can benefit from development of regional transmission pipelines, pipeline rights-of-way, and a trained workforce. From a regulatory standpoint, hydraulic fracturing of shale and tight formations is not considered injection. Under the US UIC program, because hydraulically fractured wells fall under the production category, they do not follow the same set of rules for protecting water resources as oil and gas industry disposal wells do (UIC Class II). Both subsurface uses share some risk elements, however. Environmental risks result mostly from abandoned wells and faults, poorly characterized for carbon storage, and from defective well completions and surface spills during oil and gas production. Operators of both fields are also concerned about disposal of large fluid volumes possibly generating seismic events.