

# USGasTech Inc

Providing gas-related technologies to the American Gas Industry

---

**PDG**

**Permanent downhole geophone for  
reservoir monitoring**

# USGasTech Inc

Providing gas-related technologies to the American Gas Industry

---

## ➤ Purpose

Improve the performance of underground gas storage fields in porous media by better control of the gas bubble formation.

## ➤ Objectives

- ✓ Better control of gas bubble spread towards spill points in order to optimize storage filling.
- ✓ Identify areas with large accumulations of natural gas in order to optimize location of operating wells.
- ✓ Speed up development of the storage field.

## ➤ Means: PDG

PDG is a fully patented system jointly developed by IFP (Institut Français du Pétrole) and a major European gas company that aims at enhancing oil or gas recovery by combining high-resolution 4D seismic, microseismic surveying and P&T data. PDG system provides, without disturbing the production, valuable reservoir information such as:

- ✓ The evolution of fluid saturation in pay-zone during production and/or injection, at any time a 3D seismic is shot.
- ✓ The characterization of fracture and subsidence activity induced by production using microseismic recording.

# USGasTech Inc

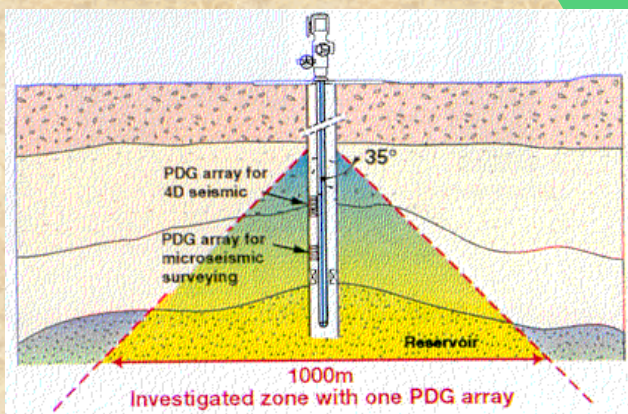
Providing gas-related technologies to the American Gas Industry

PDG makes it possible to efficiently visualize by-passed areas, monitor gas cap and aquifer expansions, anticipate any breakthrough problems, and optimize injection recovery process...

## ➤ What's new?

- ✓ High resolution resulting from a permanent geophone location and coupling, close to the formation
- ✓ Continuous measurements during production
- ✓ An integrated tool for accurate imaging at reservoir scale

## ➤ Deliverables



- ✓ Repetitive 3D seismic raw data on a SEG-D format for data processing and interpretation
- ✓ Recorded microseismic events, reservoir interpretation using  $\mu$ SICS™ software
- ✓ Continuous pressure and temperature data