

# Molecular Gate<sup>®</sup> Adsorption Technology

## Molecular Gate System Upgrades Coal Mine Methane in Southern Illinois



*Molecular Gate<sup>®</sup> unit in Southern Illinois*

Nitrogen rejection using the Molecular Gate<sup>®</sup> adsorbent-based technology is enabling a Southern Illinois natural gas producer to treat and sell gas from abandoned coal mines and contaminated natural gas that would otherwise remain unrecovered in shut-in wells.

By implementing the Molecular Gate<sup>™</sup> system, Grayson Hill Energy, LLC is removing water, nitrogen (N<sub>2</sub>) and carbon dioxide (CO<sub>2</sub>) from gas produced from its coal mines and natural gas wells. The company now produces natural gas to pipeline specifications (4% inerts), enabling it to serve major gas markets in the Northeastern United States.

"We are pleased that this system enabled us to bring the gas to pipeline purity and allow the delivery to an interstate pipeline," said Steven Sisselman, President of Grayson Hill Energy LLC. "The Molecular Gate system helped give us a valuable new revenue stream."

The system is a prefabricated, modular plant based on patented Molecular Gate<sup>®</sup> adsorbent materials and separation process. It is generating significant interest and applications among gas producers

due to its economical processing cost, easy start-up and operation, and environmental friendliness.

"Molecular Gate is a truly novel technology as it removes nitrogen and carbon dioxide in a single unattended step and provides high on-stream factors," said Michael Mitariten, Business Manager for Molecular Gate. With two-dozen projects underway, it is gaining widespread market acceptance.

The Molecular Gate technology enables Grayson Hill Energy to treat up to two and a half million standard cubic feet per day (2.5 MM SCFD) of natural gas. The Grayson Hill Energy system is located at the wellhead and is powered by an on-site gas-driven generator that uses tail gas from the Molecular Gate process as fuel.

The Molecular Gate system at Grayson's facility includes an integrated dehydration unit to remove water and simultaneously removes about 7% carbon dioxide and 12% nitrogen while delivering product with less than 4% nitrogen – as required by the interstate pipeline.

The process operates by adsorbing contaminants at 100 psig while delivering the product sales gas with minimal loss of pressure. This ability to deliver methane at near feed pressure minimizes compression requirements. The technology is offered as a modular packaged plant by Guild Associates.

Flow rates handled to date range from 0.5 MMSCFD or smaller to 10 MMSCFD, with nitrogen concentrations as high as 40% reduced to pipeline specifications. A major feature of the process is the

ability to meet pipeline specifications regardless of the feed composition, a benefit as future wells of varying composition are brought online.

System turndown is to zero flow and units are commonly designed for expansion of the treating capacity for future production – often to double the initial capacity.

**About Grayson Hills Energy LLC**  
Grayson Hill Energy LLC is a subsidiary of Itera International Energy Corporation – a Florida corporation affiliated with the Moscow-based Itera Group of Companies, one of the largest natural gas traders and producers in the Commonwealth of Independent States (CIS).

### **About Guild Associates**

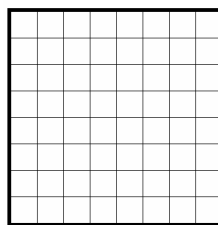
Guild Associates is the exclusive USA licensee of the Molecular Gate technology originally developed by Engelhard Corporation (now a part of the BASF Group), and provides adsorption and catalyst systems to a variety of markets as well as shop fabricated engineered systems including Molecular Gate systems.

### **Contact**

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You can also visit us on the Internet at [www.moleculargate.com](http://www.moleculargate.com)

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