

## Application of Direct Injection Scavenging to Treatment of Sour Storage Field Withdrawal Gas

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### Abstract

Natural Gas storage in underground formations is an important component of the total supply system. Occasionally, for various reasons the reservoir becomes sour and low levels of  $H_2S$  are found in the withdrawal gas. Since the gas is being sent out to a pipeline, it is necessary to remove the  $H_2S$  to ~4 ppmv (1/4 gr. per 100 SCF) as per typical pipeline tariffs. Use of scavengers such as triazine chemicals has been the preferred approach, but costs are typically as high as \$10 to \$30 per lb of  $H_2S$  removed. In some cases the chemical costs are in excess of several million dollars per season.

GTI and Trimeric have developed patented technology, exclusively licensed by GTI, which addresses the treatment of the  $H_2S$  by direct injection of scavengers into the withdrawal piping network to ensure reliable treating of the gas to specification levels with a minimal consumption of scavenger. GTI has observed application of scavengers at rates far in excess of "best-in-class" systems and often the specification is nonetheless not met and blending with  $H_2S$ -free gas, if available, is necessary to enable the storage withdrawal to proceed.

Four such direct injection designs have been developed by GTI for storage field operators – two are in successful operation and two are in various stages of implementation. The key requirements of the GTI multi-pipe direct injection scheme, results from the working implementations, and process design features common to these applications will be presented.