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**Development of Caverns in the Permian Bedded Salt Formations of West Texas for  
the Storage of Natural Gas**

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**Abstract**

As of September 2002, two gas storage caverns have been completed at Unocal's Keystone Gas Storage Facility with 2 Bcf of working gas storage capacity, and the capability to withdraw 200 MMcf/d and inject 100 MMcf/d of natural gas. Due to strong customer demand, Unocal has initiated the development of the next 2 Bcf of storage working capacity and expects to have the facility built out to its targeted capacity of 5 Bcf by the third quarter of 2005. The Keystone facility currently connects by pipeline with the natural gas systems of El Paso Natural Gas Company and Northern Natural Gas Company. The regional drivers for the development of gas caverns for the storage of natural gas in the Permian Basin Supply Area are operational necessity, security of supply, and price volatility management. The access to adequate gas storage volume, withdrawal and injection capability is a substantial benefit for gas processors and producers, power generators, and pipelines for load balancing. In the construction of this type of bedded cavern gas storage facility, many factors impact the development. These include cavern design, salt quality, insoluble layer removal, regulatory requirements, environmental compliance, fresh water supply and brine disposal capability. The presentation will discuss the development of these caverns and the experiences learned from the construction process.

Keywords: Caverns for Gas Storage, Cavern Development, Cavern Design, Texas