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Meeting Paper



Gas Releases from Salt

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ABSTRACT

The occurrence of gas in salt mines and caverns has presented some serious problems to facility operators. Salt mines have long experienced sudden, usually unexpected expulsions of gas and salt from a production face, commonly known as outbursts. Outbursts can release over one million cubic feet of methane and fractured salt, and are responsible for the lives of numerous miners and explosions. Equipment, production time, and even entire mines have been lost due to outbursts. An outburst creates a cornucopian shaped hole that can reach heights of several hundred feet. The potential occurrence of outbursts must be factored into mine design and mining methods. In caverns, the occurrence of outbursts and steady infiltration of gas into stored product can effect the quality of the product, particularly over the long-term, and in some cases renders the product unusable as is or difficult to transport. Gas has also been known to collect in the roof traps of caverns resulting in safety and operational concerns.

The intent of this paper is to summarize the existing knowledge on gas releases from salt. The compiled information can provide a better understanding of the phenomena and gain insight into the causative mechanisms that, once established, can help mitigate the variety of problems associated with gas releases from salt. Outbursts, as documented in mines, are discussed first. This is followed by a discussion of the relatively slow gas infiltration into stored crude oil, as observed and modeled in the caverns of the U.S. Strategic Petroleum Reserve. A model that predicts outburst pressure kicks in caverns is also included.

* Retired from Sandia, currently an independent consultant

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