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MEETING
PAPER



THREAT OF A SINKHOLE: A REEVALUATION OF
CAVERN 4, BAYOU CHOCTAW SALT DOME, LOUISIANA

by

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ABSTRACT

Cavern Lake at Bayou Choctaw salt dome resulted from the failure of Cavern 7 in 1954. Uncontrolled solutioning of this cavern through the thin caprock had set the stage for overburden to collapse into the cavern below. A similar situation developed with nearby Cavern 4, but with less dissolution of the caprock. Because pressure loss was already a problem and because another 800 ft diameter lake would have endangered surface operations, solutioning of Cavern 4 was stopped and the cavern abandoned in 1957 in order to protect the already-small site. In 1978 the Strategic Petroleum Reserve (SPR) acquired a number of caverns at Bayou Choctaw, including Cavern 4, and the possible repeat of the Cavern 7 failure and formation of another lake thus became an issue. The cavern dimensions were re-sonared in 1980 for comparison with 1963 and 1977 surveys. Annual surface leveling between 1982-92 showed less subsidence occurring than the site average, and a cavern monitoring system, installed in 1984, has revealed no anomalous motion. Repeat sonar surveys in 1992 showed very little, if any, change occurred since 1980 although a small amount of uncertainty exists as a result of changing sonar techniques. We conclude that significant additional solutioning or erosion of the caprock has not occurred and that there is no increased threat to SPR operations.

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