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**Meeting Paper
and
Poster Presentation**



**McCAULEY SINKS:
a Composite Breccia Pipe in Evaporite Karst,
Holbrook Basin, Arizona**

by

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McCAULEY SINKS: a Composite Breccia Pipe in Evaporite Karst, Holbrook Basin, Arizona

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Introduction

The McCauley Sinks are a conspicuous feature of the northern Arizona landscape, having a unique appearance from the air and surface. This group of some 50 sinkholes in the western part of the Holbrook Basin astride Chevelon Canyon occur in a saucer-shaped depression that is unlike any other known sinkhole cluster. The three-kilometer diameter of the depression places McCauley Sinks on a scale similar to Meteor Crater and its associated ejecta field, located just 45 km northwest, but there is no genetic similarity between the two features. The McCauley Sinks result from dissolution in the underlying salt; Meteor Crater has been shown to be an impact feature — beyond reasonable doubt.

The ubiquitous Kaibab Fm. limestone occurs practically everywhere at the surface around the sinks, prompting some early observers to believe the features were in limestone karst. But individual sinks transect the entire 12-15 m Kaibab thickness and the collapse continues through the underlying Coconino sandstone. Well records show that the Corduroy Member evaporites of the Schnebly Hill Formation beneath the Coconino have thinned markedly, so that evaporite dissolution and collapse is responsible for the karst. The area adjacent to the McCauley Sinks contains five other subsidence depressions, three of which have associated sinkholes. Richards Lake, the largest of the five depressions, is smaller than McCauley

Sinks, and contains only a single central sinkhole. The saucer-like attributes of Richards Lake and the McCauley Sinks are similar to other breccia pipe structures on the Colorado Plateau that are ascribed to dissolution occurring in the Redwall Limestone.

The evidence for a similar origin with other Colorado Plateau breccia pipes, by dissolution in quite different lithology, is examined here, along with hydrogeologic implications in this environment. The Holbrook Basin is currently used for LPG storage at one location and has potential for additional storage caverns. Geologic site characterization that is required for future permitting will need to consider the varieties of karst expression.

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