

**DISTRIBUTION OF UPPER CENOZOIC CARBONATE-CEMENTED SANDSTONES,
KUCHE DEPRESSION, NORTHWEST CHINA: INSIGHTS FROM HIGH-
RESOLUTION BOREHOLE MICRO-RESISTIVITY IMAGING**

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ABSTRACT: High-resolution micro-resistivity images are used to study the distribution of neoformed carbonate concretions in Upper Cenozoic shallowly buried fluvial sandstones in the Kuche Depression, northwest China. The carbonate concretions are high-resistivity white facies on borehole images. Most of them occur as patches 1--40 cm thick and in shapes ranging from equant, oblate, to elongate. These concretions contrast markedly with the poorly cemented or uncemented host sandstones, which appear as dark to immediate grayscale facies on the images. Three patterns of occurrence of carbonate concretions are identified: isolated concretions, discontinuously cemented layers, and continuously cemented layers. Most concretions occur in fine-grained, low-permeability laminae, suggesting that their growth was controlled more probably by diffusion transport rather than advective transport. Grain size, lamination, and distribution of intergranular clay all potentially influenced the selective distribution of carbonate cement in the sandstones. Shale interbeds and terrigenous carbonate rock fragments in the sandstones are potential sources of carbonate cement.