

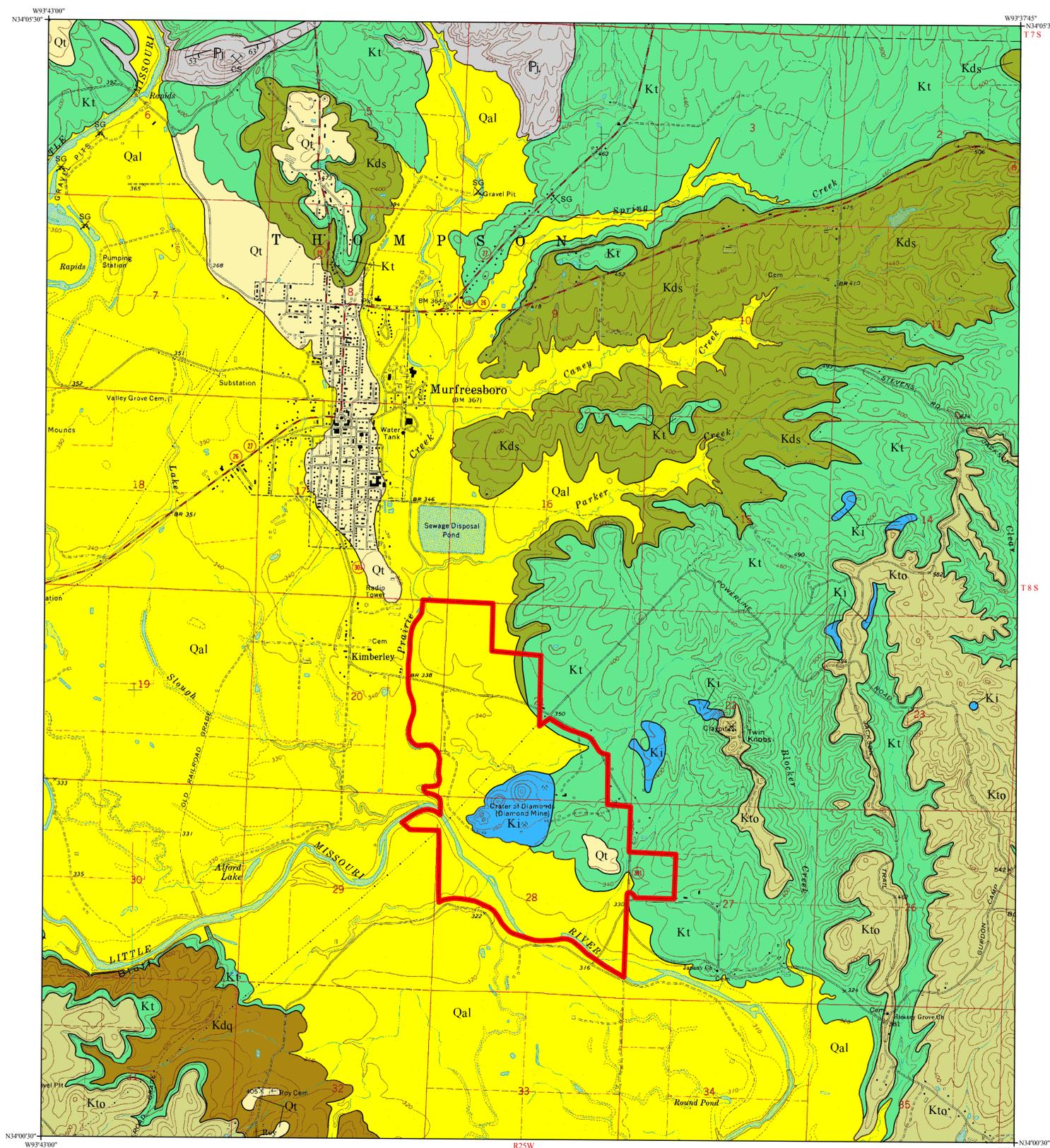
# GEOLOGY OF THE CRATER OF DIAMONDS STATE PARK AND VICINITY, PIKE COUNTY, ARKANSAS

Geology by William D. Hanson, J. Michael Howard, and Benjamin F. Clardy

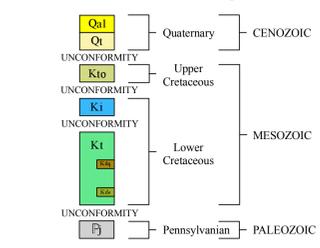
2007

Arkansas Geological Survey, Bekki White, State Geologist

Digital compilation by Nathan H. Taylor



### Correlation of Map Units



### Description of Map Units

- Qal** Alluvium (Quaternary) – unconsolidated gravel, sand, silt, and clay. Varies from 0 – 25 feet in thickness.
- Qt** Terrace deposits (Quaternary) – unconsolidated coarsening upwards deposits of gravel, sand, silt, and clay. Varies from 0 – 30 feet in thickness.
- Kto** Tokio Formation (Upper Cretaceous) – sand, gravel, clay, and altered volcanic ash. Iron-oxide cemented gravel may be present. Kaolin clay was once mined on Twin Knobs in section 22, T. 8 S., R. 25 W. Thickness ranges from 0 – 120 feet in mapped area. The formation dips south approximately 80 feet to the mile (less than 1 degree).
- Kt** Igneous rocks (Cretaceous) – magmatic and explosive phases of lamproite-related rocks, along with a mixed assemblage unit termed maar epiplastics. Chemically unstable at surface conditions, these rocks weather to green and yellow clays. Explosive phase rocks are known to be diamond-bearing. Both magmatic and explosive phase rocks originated from the earth's mantle. Phlogopite isotopic dating gives  $106 \pm 3$  Ma for intrusion of the Prairie Creek diatreme.
- Ks** Trinity Group (Lower Cretaceous) – sand, clay, gravel, limestone, gypsum, and zones bearing celestine and barite. The Dierks Limestone Lenticle and the DeQueen Limestone Member are included in this Group. The oyster, *Ostrea franklini*, is commonly collected from the Dierks, and the gastropod, *Cassiope brameri*, is frequently collected from the DeQueen. The formation dips south approximately 100 feet per mile. Thickness of the Group is approximately 900 feet, but varies due to thickness variations of the individual members.
- P** Jackfork Formation (Pennsylvanian) – alternating layers of black shale, light gray sandstone and siltstone. Minor debris flows are present. Steep dips are encountered locally. This formation is the only Paleozoic unit of the Ouachita Mountains within the mapped area. It is separated from the younger overlying units by a major angular unconformity.

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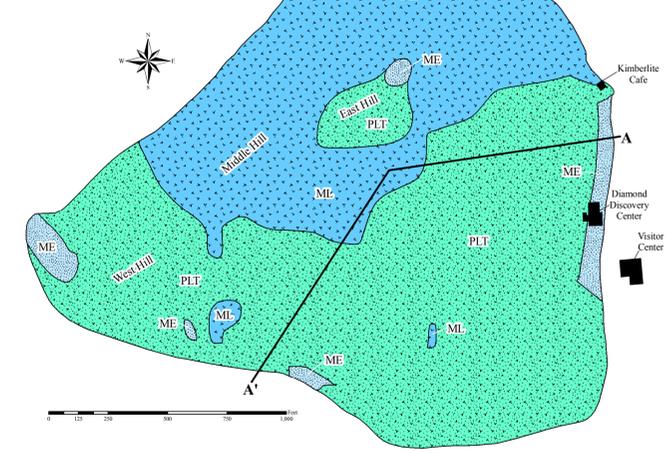
### Symbols

- State Park Boundary
- Contacts
- Strike and Dips
- Pit
- Abandoned Pit
- Mine/Quarry
- Sand/Gravel
- Sand/Gravel
- Crushed Stone

### DIGITAL IMAGERY OF SEARCH AREA

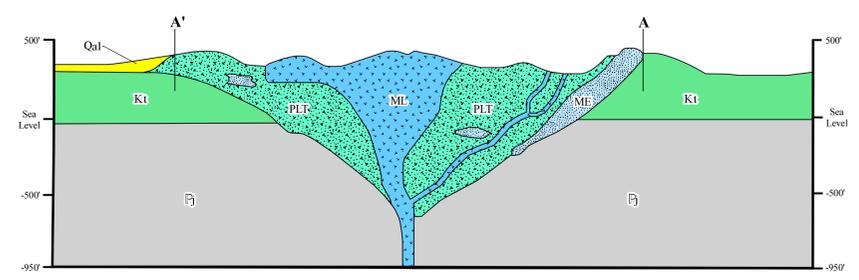


### PRAIRIE CREEK DIATREME BEDROCK GEOLOGY



- PLT Breccias & Pyroclastic Crater Facies
- ML Magmatic Lamproite
- ME Maar Epiplastics

### SCHEMATIC CROSS SECTION OF PRAIRIE CREEK DIATREME



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Topography by photogrammetric methods from aerial photographs taken 1968. Field checked 1970. Lambert conic projection. 1983 North American Datum.

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked.



CONTOUR INTERVAL 20 FEET  
DOTTED LINES REPRESENT 50-FOOT CONTOURS  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

