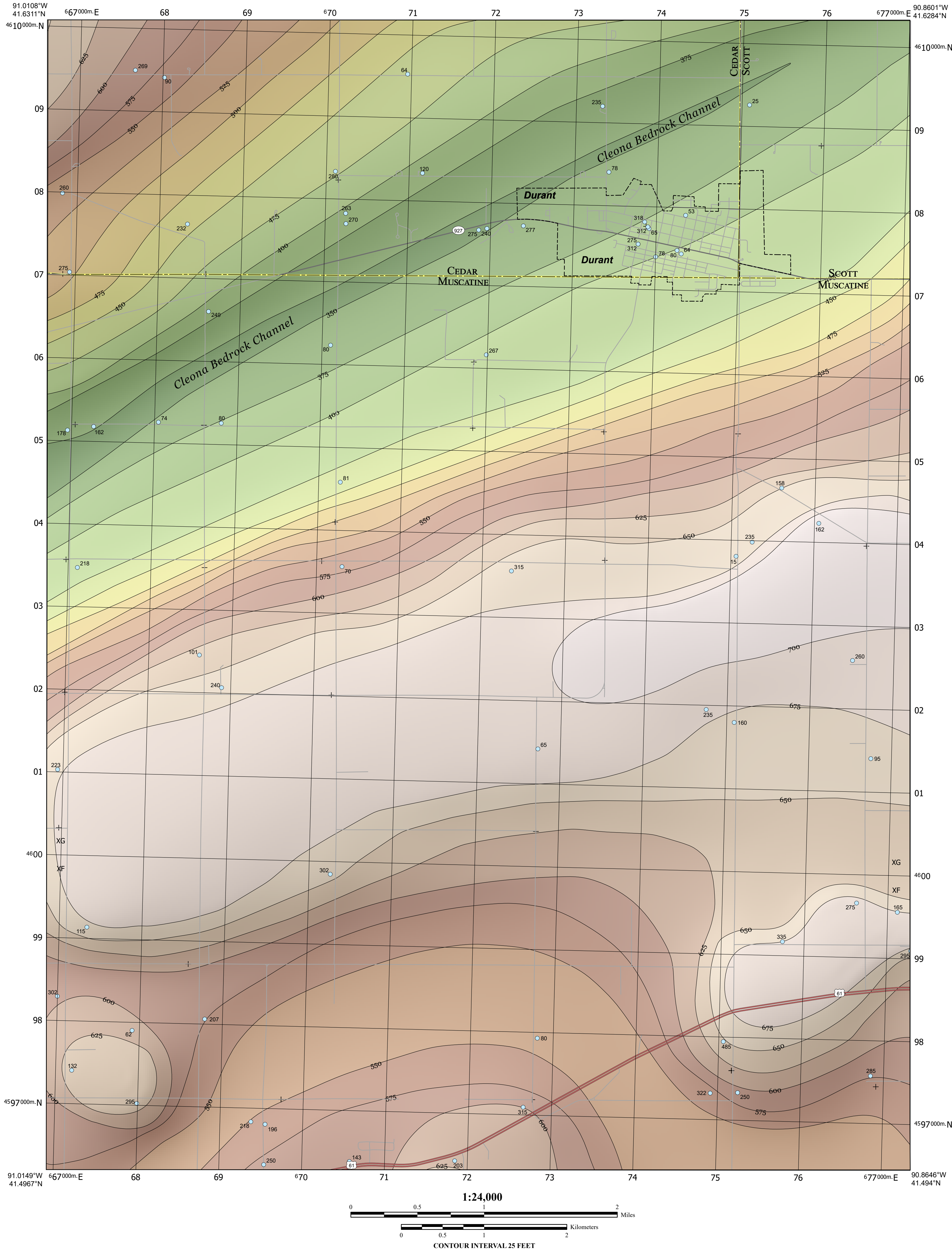


## BEDROCK ELEVATION



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### INTRODUCTION

The Durant 7.5' Quadrangle in Muscatine, Cedar, and Scott counties, Iowa, is located mostly on the Illinoian till plain. There are no bedrock exposures in the map area due to burial by Quaternary materials, and this unconsolidated package is dominated by glacial diamictites. The Quaternary package fills a buried bedrock valley, the Cleona Channel. This feature trends northeast-southwest across the northern portion of the map area and can have a depth up to 350 feet below the modern surface.

Although entirely buried by Quaternary deposits, the bedrock surface of the Durant 7.5' Quadrangle is dominated by Middle Devonian (Givinites) strata of the Little Cedar Formation (Cedar Valley Group) and the Pinicon Ridge and Otis formations (Wapsipicon Group). Silurian strata of the Gowar and Scotch Grove formations make up the bedrock surface of the Cleona Channel. Just to the west of the mapping area these Paleozoic stratigraphic units are exposed in the Moscow Quarry (Wendling Quarries Inc., in the Wilton 7.5' Quadrangle; IGS Open File Maps OFM-24-01 and OFM-24-02). In the southern half of the quadrangle there are two remnants of Lower and Middle Pennsylvanian strata of the Racoon Creek Group (Muscatine [formerly "Caseyville"] and Tradewater formations), which infilled topographic lows and unconformably overlie Middle Devonian strata. The Bedrock Elevation and Quaternary Thickness Maps of the Durant 7.5' Quadrangle were produced concurrently with the Bedrock Geologic Map (IGS Open File Map OFM-25-01). Like much of Iowa, the bedrock surface within the quadrangle is entirely concealed by glacial deposits and further information about the Quaternary geology in the area can be found on the Surficial Geologic Map of the Durant 7.5' Quadrangle of Muscatine, Cedar, and Scott Counties, Iowa (IGS Open File Map OFM-25-02). The boundary between Paleozoic bedrock and unconsolidated Quaternary deposits is likely just as irregular as the land surface itself, as a result, the thickness of the Quaternary varies widely across the quadrangle and ranges from 25 to 400 feet (7.5 to 122 m).

### METHODOLOGY

The Bedrock Elevation and Quaternary Thickness Maps of the Durant 7.5' Quadrangle were constructed using the same datasets as the Bedrock Geologic Map (Open File Map OFM-25-01). Geologic information from Muscatine County and the surrounding area was used, and this includes drilling records housed in the Iowa Geological Survey (IGS) Geologic Sampling Database (GeoSam), existing maps and technical reports, Iowa Department of Transportation (IDOT) data, horizontal-to-vertical spectral ratio (HVSR) passive seismic geophysical data (collected using a Tromino<sup>®</sup>), and reports from engineering projects and quarry operators.

More than 100 boring records from the IGS GeoSam Database, including both lithologic descriptions of well cutting samples (striplugs) and driller's logs, were evaluated for the Durant 7.5' Quadrangle and the area surrounding the quadrangle. Each record was checked for locational accuracy using information from the driller's logs, historic plat books, county assessor information, and direct communication with landowners. The depth to the surficial-bedrock contact was determined for each well and assigned an elevation value by subtracting it from the surficial digital elevation model (DEM). These data points provided the framework for the Bedrock Elevation Map. Additional information was gained from an assessment of the Natural Resources Conservation Service (NRCS) County Soil Survey by identifying soil series that indicate shallow bedrock.

To create the Bedrock Elevation Map, bedrock elevation contours (drawn at a 25-foot contour interval) were digitized manually onscreen using Esri ArcGIS Pro 3.0 software. The bedrock elevation raster was then generated using interpolations of the bedrock surface created with the 'Topo to Raster' geoprocessing tool (ArcGIS Pro 3.0). The Quaternary Thickness Map was created by subtracting the bedrock elevation raster values from the surficial DEM raster. The resulting surface was rounded to the nearest integer and contours were generated from this result and then smoothed.

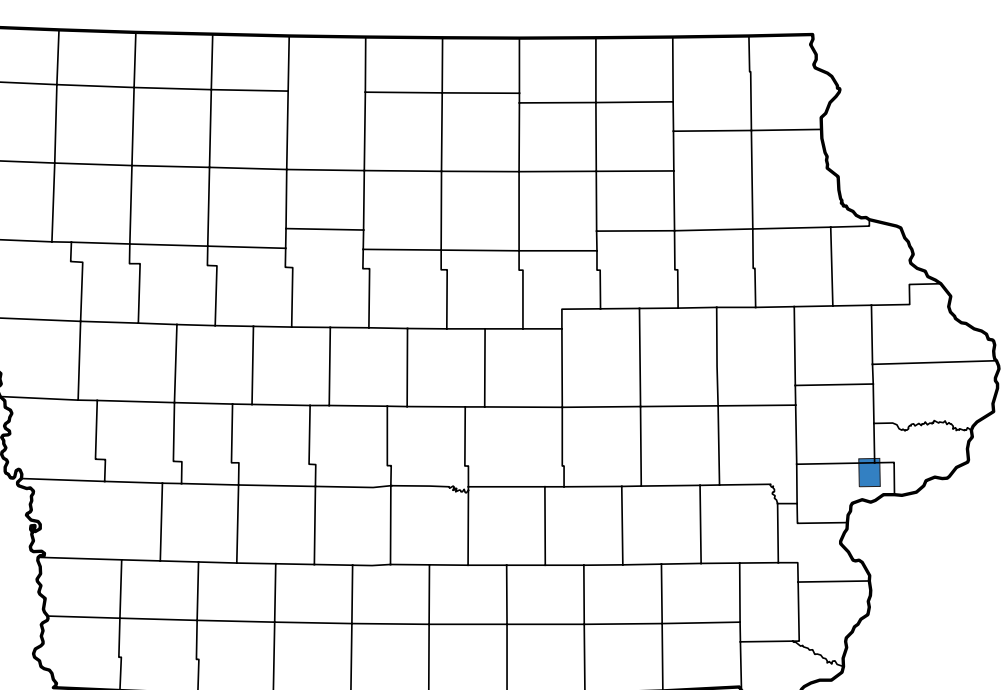
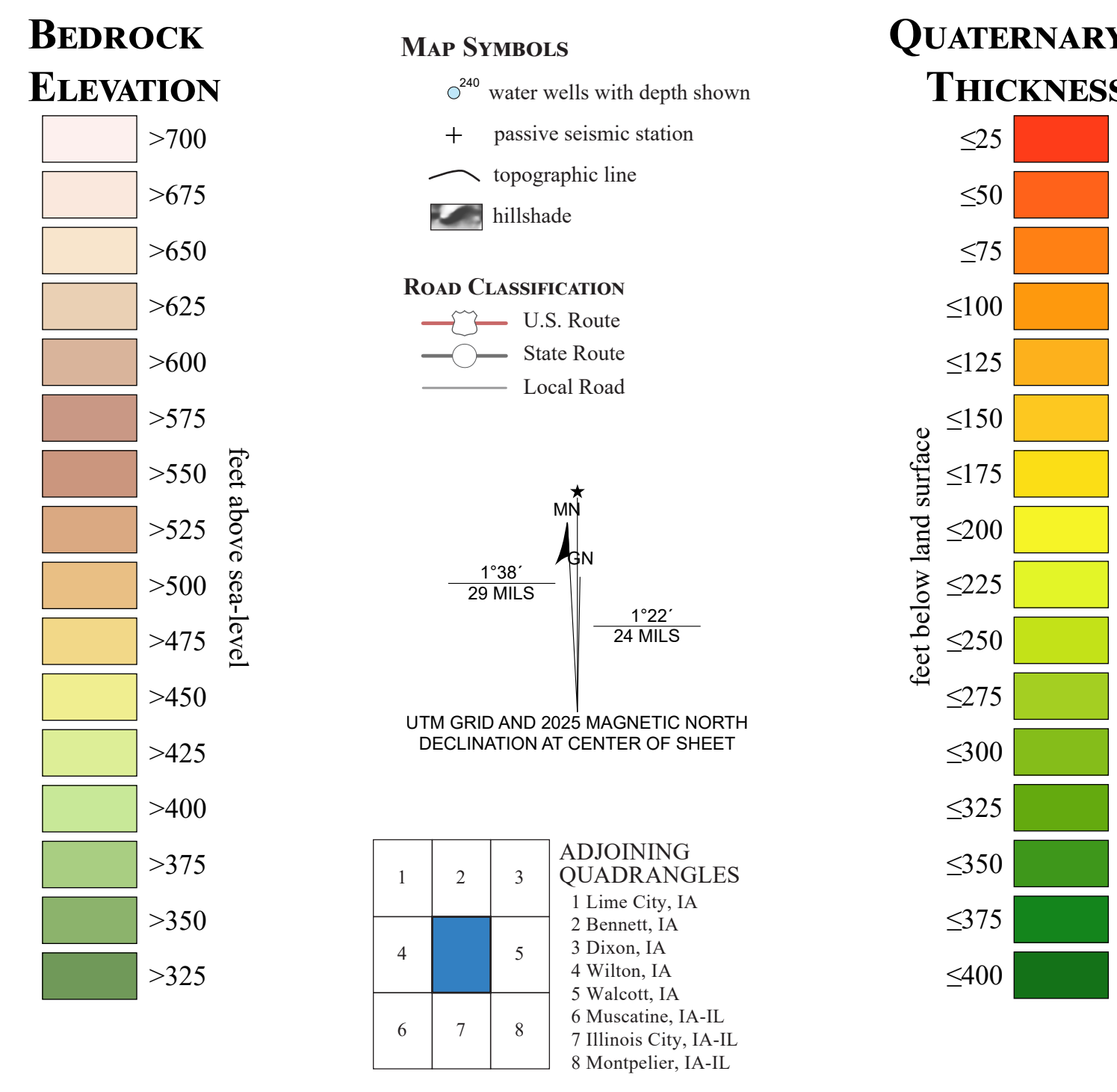


Figure 1. The location of the Durant Quadrangle in Iowa.

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Geology based on work done by A. Bancroft 2022-2023. Digital cartography by P. Kerr. Base map generated using data from the [Iowa Geospatial Data Clearinghouse](#).  
Map projection and coordinate system: Universal Transverse Mercator (UTM) Zone 18N, Datum: NAD83.  
The map and construction are based on interpretations of the best available information at the time of mapping. Map interpretations are not a substitute for detailed site-specific studies. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government.  
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## QUATERNARY THICKNESS

