

MGS Metadata Lake Elmo Quadrangle

Map name: Bedrock geology of the Lake Elmo 7.5 minute quadrangle, Washington and Ramsey Counties, Minnesota

Map author(s): Julia Anderson

Publishing organization: (Minnesota Geological Survey)

Date of publication: 2009, as Miscellaneous Map Series, M-185

Date of data: Compiled in 2008 from maps dated from 1974 to 2006.

Map key words: Bedrock geology, Paleozoic, Lake Elmo quadrangle, Washington County, Ramsey County, Minnesota

Horizontal accuracy: Lines on map are based partially on point data with horizontal accuracy of 15 meters. Because of the scarcity of actual data points (drill holes that reached bedrock) the lines of interpreted geologic features are much less accurate. See below for estimated accuracy of different types of lines.

Coordinate system: UTM, NAD83, zone 15N

Map area: Lake Elmo 7.5 minute quadrangle, Minnesota: bounding box based on quadrangle outline shape file (lat., long.):

Lake Elmo

Bounding coordinates

Horizontal

In decimal degrees

West: -93.000322

East: -92.875317

North: 44.970133

South: 44.879146

In projected or local coordinates

Left: 499974.608033

Right: 509832.052136

Top: 4979632.610832

Bottom: 4969532.770562

Bdrktopoln_clip2

Bounding coordinates

Horizontal

In decimal degrees

West: -93.000322

East: -92.875317

North: 44.970133

South: 44.879146

In projected or local coordinates

Left: 499974.608033

Right: 509832.052136

Top: 4979632.610832

Bottom: 4969532.770562

CJDN_folds

Bounding coordinates

Horizontal

In decimal degrees

West: -93.000322

East: -92.875317

North: 44.970133

South: 44.879146

In projected or local coordinates

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CJDNstructure_clip

Bounding coordinates

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Bounding coordinates

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Ocp2

Bounding coordinates

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wwpts

Bounding coordinates

Horizontal

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xxln_clip

Bounding coordinates

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GIS files associated with map from Arc Info or (Arc View 3.x or 9.x): bgpg- bedrock geology polygons and contacts, btln- lines of equal elevation of bedrock surface, ocgp- outcrop polygon locations, wwpts- water well point data, cjln- contour lines of the stratigraphic surface of the Jordan Sandstone, stln- geological fold structures, xsln- line location of cross section

Description of map: Depicts bedrock geology for Paleozoic rocks in Lake Elmo quadrangle. Presentation includes a geologic map of the bedrock surface, as well as a cross section showing subsurface geology.

Map scale: 1:24,000

Map units: meters

List features and accuracy as shown on map, including scales of fieldwork and compilation: Outcrops and boreholes were located on 1:24,000 quadrangles, with a horizontal accuracy of about 15 meters. The accuracy of the line work representing bedrock topographic contours, bedrock geologic unit's contacts, and bedrock structural contours and faults are therefore limited by the accuracy with which those data were located. In addition the density of data determines the relative accuracy of the line work, a greater density of data corresponds to relatively greater accuracy of the line work.

Summary of procedures for compiling data used to make map: The locations of water well borings with driller's logs have been field checked and verified over a period of about 30 years on 1:24,000 scale topographic maps. Well logs for recently drilled wells were field verified as part of this study. Logs for engineering test borings for highway bridges were acquired from the MN Department of Transportation. Locations of newly acquired water well and engineering logs were digitized and entered into the County Well Index with their stratigraphic information. Water well cuttings and down

hole geophysical logs are available for some water well borings. All driller's logs, geophysical logs and well cuttings descriptions were examined for this study and stratigraphic interpretations were revised if necessary.

The map was compiled at a scale of 1:24,000 in ArcMap. Data from boreholes and outcrop descriptions were printed on base maps and mylar overlays were used to contour the elevation of the bedrock surface, contacts between geologic units and the upper surface of the Jordan Sandstone. The placement and orientation of geologic folds were derived from the Jordan Sandstone structure contour map and the bedrock geologic map. The mylar overlays with geologic line work were traced in ink on clean Mylar overlays that then were scanned and processed and vectorized and put into GIS files. Minor editing of the geologic line work was done in ArcMap following final revisions. Outcrop data was digitized by hand in ARCMAP.

To create digital products the borehole locations were plotted directly from County Well Index (MGS and Minnesota Department of Health water well data base) coordinates and line work and outcrop data added from the other digital files.

Explanatory text for the map is based on field observations, examination of water well cuttings and geophysical logs, water well drillers' logs, and previous studies.

Lineage: Earlier mapping of bedrock of this quadrangle includes mapping of the bedrock geology at a scale of 1:100,000 for the Ramsey and Washington County geologic atlases (published in 1990 and 1992) and mapping of bedrock aggregate resources at a scale of 1:100,000 (published in 1999). Recent mapping was also completed in adjacent quadrangles including St. Paul Park and Hudson by John Mossler in 2005 and 2006. Outcrops were located with aid from bedrock outcrop maps compiled in 1974 by John Mossler, and re-examined.

Contact for GIS data: Richard Lively (612-627-4780 ext. 211)

Contact as MGS to obtain map: Map sales, ph 612-627-4782, online order form, <http://www.geo.umn.edu/mgs> or by e-mail at mgs@umn.edu

Other comments: