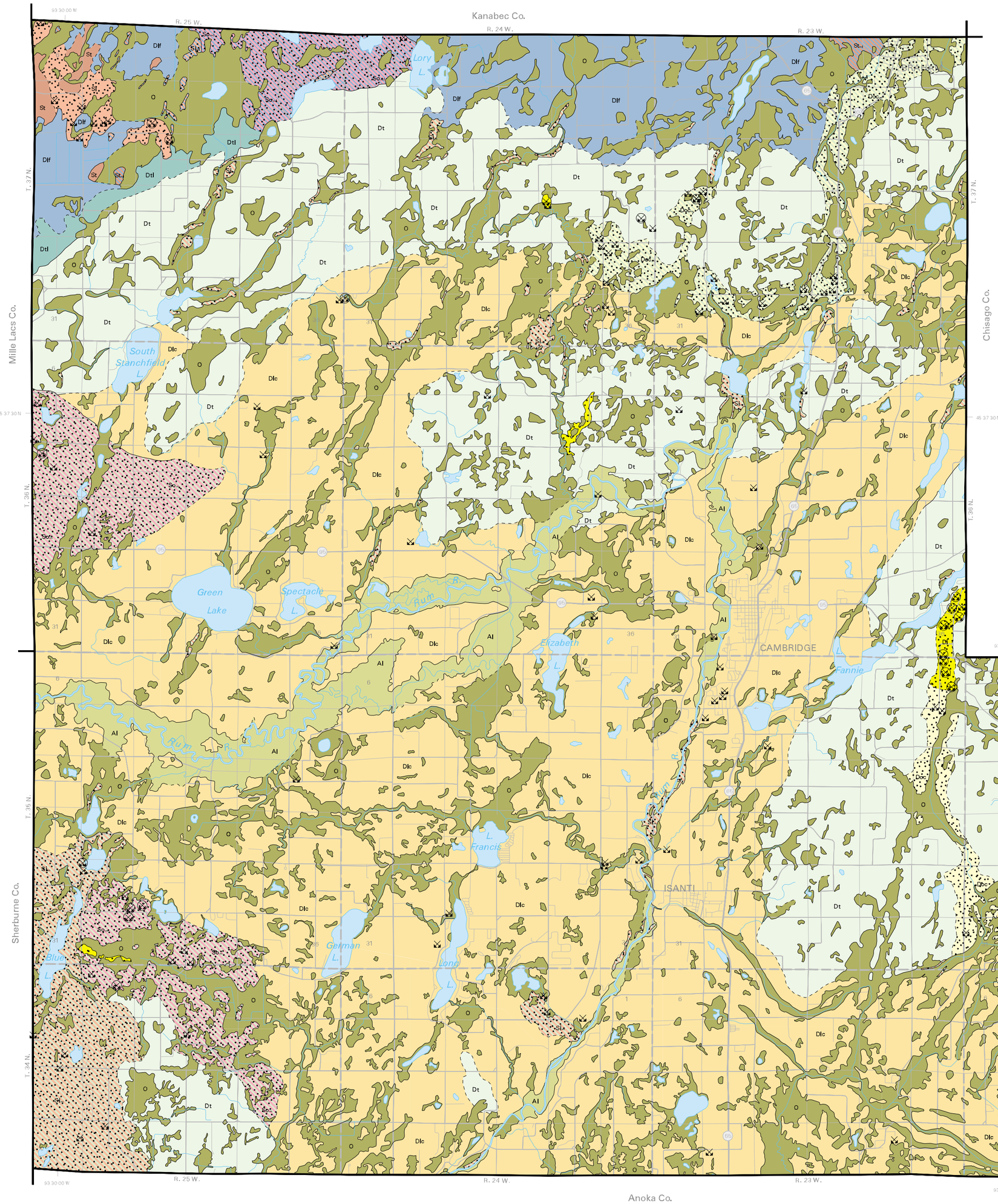
Department of Natural Resources
Division of Minerals
William C. Brice, Director

Plate I, Report 304

AGGREGATE RESOURCES AND QUATERNARY GEOLOGY
ISANTI COUNTY, MINNESOTA

J.D. LEHR

1992*



AGGREGATE RESOURCES

IDENTIFIED AGGREGATE RESOURCES:
Gravel pit/Sand pit - Locations gathered from a variety of sources. May be active, inactive, depleted, or reclaimed. In places, single symbols indicate multiple gravel pits.

MnDOT-identified aggregate sources - Test hole logs, sieve and quality test data available. Typically include gravel pits.

POTENTIAL AGGREGATE RESOURCES: Those geologic units that are inferred to contain potentially significant aggregate deposits.

LIMITED POTENTIAL FOR AGGREGATE RESOURCES: Those geologic units that generally have little or no potential for aggregate resources. In places, includes aggregate deposits either too small or extremely difficult to map.

QUATERNARY GEOLOGY

HOLOCENE

O — ORGANIC DEPOSITS: Peat and organic-rich silt and clay. Includes alluvium along smaller streams. In places includes small bodies of water.

Al — ALLUVIUM: Stratified sand and organic-rich silt and clay. Mapped only along the Rum River.

PLEISTOCENE - LATE WISCONSINAN
Grantsburg sublobe deposits

Dlc — LACUSTRINE DEPOSITS - COARSE: Fine sand and silt; in places underlain by Grantsburg sublobe sand and gravel. The upper part of this unit has been locally reworked by wind.

Dlf — LACUSTRINE DEPOSITS - FINE: Silt and clay deposited in Lake Grantsburg. This unit is thicker in low-lying areas and is commonly thin in upland areas where it mantles Superior lobe deposits.

Doc$_D$ — MANTLED COLLAPSED OUTWASH: Interbedded sand and pebbly sand with collapsed bedding, mantled by a variable thickness of undifferentiated Grantsburg sublobe deposits.

Doc — COLLAPSED OUTWASH: Interbedded sand and pebbly sand, with collapsed bedding.

Dl — ICE-CONTACT STRATIFIED DEPOSITS: Interbedded sand, pebbly sand, silty sand, and till (Dt unit).

Dtd — LAKE-MODIFIED TILL: Loam to clay loam diamicton, yellowish brown (10 YR) to olive brown (2.5 Y), calcareous. Locally mixed with underlying reddish-colored Superior lobe depostits. The surface of this unit has been modified by Lake Grantsburg and, in places, is mantled by silt and clay (Dlf unit).

Dt — TILL: Loam to clay loam diamicton, yellowish brown (10 YR) to olive brown (2.5 Y), calcareous. Locally mixed with underlying reddish-colored Superior lobe deposits. In places is mantled by fine sand and silt (Dlc unit).

Superior lobe deposits

So$_D$ — MANTLED OUTWASH: Interbedded sand, pebbly sand, sandy pebble gravel, and silt; locally cobbly. Mantled by undifferentiated Grantsburg sublobe deposits, which are locally quite thick.

So$_m$ — MANTLED OUTWASH: Interbedded sand, pebbly sand, sandy pebble gravel, and silt; locally cobbly. Mantled by silt and clay (Dlf unit).

Sl$_m$ — MANTLED ICE-CONTACT STRATIFIED DEPOSITS: Interbedded sand; pebbly sand; sandy pebble gravel, locally cobbly; and till (St unit). Mantled by a variable thickness of undifferentiated Grantsburg sublobe deposits.

Sl$_m$ — MANTLED ICE-CONTACT STRATIFIED DEPOSITS: Interbedded sand; pebbly sand; sandy pebble gravel, locally cobbly; and till (St unit). Mantled by silt and clay (Dlf unit).

Sl — ICE-CONTACT STRATIFIED DEPOSITS: Interbedded sand; pebbly sand; and sandy pebble gravel, locally cobbly; and till (St unit).

St$_m$ — MANTLED TILL: Sandy loam to silt loam diamicton, reddish brown (5 YR) to dark brown (7.5 YR). Mantled by silt and clay (Dlf unit).

St — TILL: Sandy loam to silt loam diamicton, reddish brown (5 YR) to dark brown (7.5 YR). Stone content is quite variable.

Geologic contact

Geologic contact - inferred, gradational, or approximately located

Water boundary

1:100,000

0 1 2 3 4 Miles
0 1 2 3 4 5 6 Kilometers

Geology: Air photo interpretation and field mapping by J.D. Lehr, 1990-1992

Base map: Roads and hydrography from U.S. Bureau of the Census, 1:100,000 TIGER/Line Files for the 1990 Census
Public Land Survey digitized from 1:24,000 USGS quadrangles (1961-1983)

GIS database design and cartography by R.L. Johnson, with assistance from Y.M. Hsu

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*Note: second edition, 1997, to make it available in digital format