

Exploration for Metallic Mineral Resources in Minnesota

Gold

The
ARCHEAN SUPERIOR PROVINCE GREENSTONE BELTS
Hosting Significant Gold Resource Potential in Northern Minnesota

State Exploration Leases

- Active state nonferrous metallic mineral leases
- Company labeled codes below for map labels

Company labeled codes

- AG - AngloGold Ashanti Minnesota has 33 state leases
- V - Vermilion Gold has 24 state leases
- A - Agate Lake Resources has 1 state lease

Terminated state nonferrous metallic mineral leases (1967-August 2016)

General Bedrock Geology Map Units
Archean Superior Province Related Map Units

- Mafic metavolcanic and metasedimentary or mafic intrusive rocks (MGS S-21 map units - Auv, Avs, Amv, Amm, Ami, Alkv, Alks, Alx, Agv, Acv, Ags)
- Iron formation: Aif
- Massive granodiorite to granite or intermediate to felsic intrusive rocks (MGS S-21 map units - Agd, Agm, Agn, Agr, Agt, Ags, Aqg, Aqj, Aqm, Aqj, Aqk, Asd)
- Metasedimentary rocks and derived gneisses: (MGS S-21 map units - Aqs, Aqs, Ams)
- Metaconglomerate, sandstone: Asc

Penokean Related Map Units

- Penokean Virginia Formation, Thomson Formation, or Pokegama Quartzite

Iron Ore Mining Features

- Biwabik Iron Formation
- Taconite or Natural Iron Ore Pit
- Tailings Basin

Map Scale 1:175,000

Bedrock Geology data from the Minnesota Geological Survey's 2011 S-21 statewide map at 1:500,000 scale. State active and terminated nonferrous metallic mineral leases (as of 2/1/2017) and iron ore mining features (as of 1/1/2015) from DNR's Division of Lands and Minerals.

Inset Map Displaying Gold Mines, Past Producers, and Geologic Subprovinces in Minnesota and Ontario

Subprovince Types

- Plutonic
- Metasedimentary
- Volcanoplutonic

Gold

- Producing Mine
- Past Producer
- Exploration Areas in Minnesota
- Advanced Gold Projects in Canada:

Printed Map Scale: 1:12,000,000
Base Maps: 1:500,000 (MGS)/1:1,000,000 (OGS)
After Jirsa and Southwick (2003), OGS (2017)

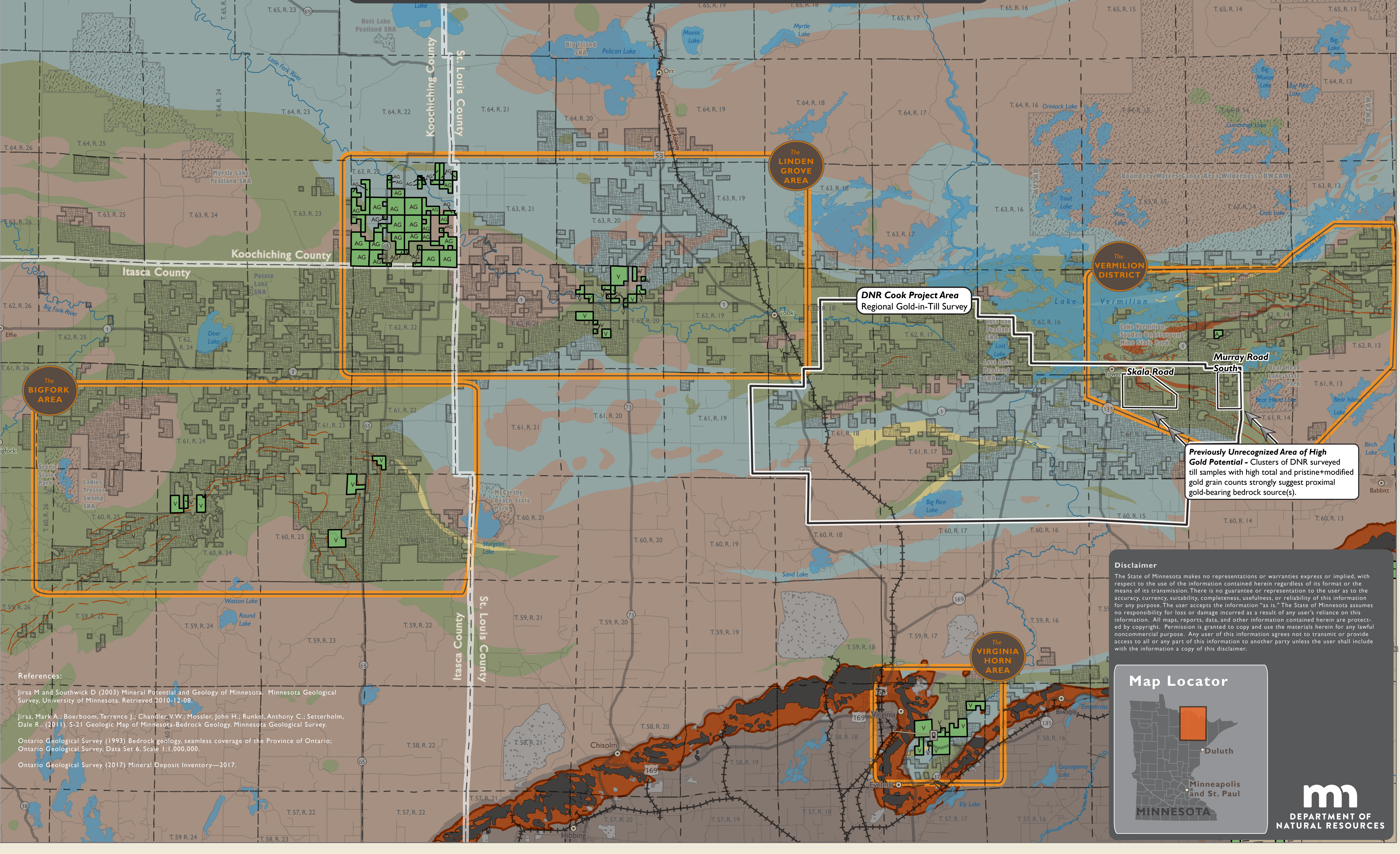
Rainy River - 8M oz
Hammond Reef - 7M oz
Moss Lake - 3M oz
Cameron Lake - 1.5M oz

BACKGROUND

The Archean Superior Province greenstone belts that host many of Canada's richest gold camps continue along strike across the U.S. border and into the northern portion of Minnesota. The potential for gold in Minnesota's portions of the Wawa and Wabigoon Subprovinces is excellent, and the exploration models used for nearby gold deposits in Northwestern Ontario (e.g. New Gold, Hammond Reef, Moss Lake/Shebandowan), should be considered. Overburden thickness and composition in Minnesota range from thin layers of glacial drift in the northeast, to saprolite buried under thicker layers of glacial deposits in the northcentral part of the State. The possibility of supergene enrichment within saprolitic zones adds to the list of viable ore deposit models, and expands the area of viable greenstone belt gold exploration.

HIGHLIGHT

Previously Unrecognized Area of High Gold Potential - In 2015 the DNR identified two areas with high bedrock gold potential within a portion of the Wawa Subprovince granite greenstone terrane (see T.61, R.14-15 on the map). Clusters of till samples with high total and pristine+modified gold grain counts strongly suggest proximal gold-bearing bedrock source(s).



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Map Locator

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DEPARTMENT OF NATURAL RESOURCES

References:

- Jirsa M and Southwick D (2003) Mineral Potential and Geology of Minnesota. Minnesota Geological Survey, University of Minnesota. Retrieved 2010-12-08.
- Jirsa, Mark A.; Boerboom, Terrence J.; Chandler, V.W.; Mosler, John H.; Runkel, Anthony C.; Setterholm, Dale R., (2011). S-21 Geologic Map of Minnesota-Bedrock Geology. Minnesota Geological Survey.
- Ontario Geological Survey (1993) Bedrock geology, seamless coverage of the Province of Ontario; Ontario Geological Survey, Data Set 6, Scale 1:1,000,000.
- Ontario Geological Survey (2017) Mineral Deposit Inventory—2017.