Enhanced Online Public Access to the Minnesota DNR Drill Core Library

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• Library overview
• Library significance
• Webpage
• Web map

http://www.dnr.state.mn.us/lands_minerals/dc_library.html
OVERVIEW

- 3 buildings located in Hibbing, MN
- 4+ million feet of capacity
- Currently, 3 million feet of core
- From 9,000+ drill holes

http://www.dnr.state.mn.us/lands_minerals/dc_library.html
SME MN 2015

Stretching 3 Million Feet Along Interstate Highways

568 miles is roughly the distance between St. Paul and Indianapolis along Interstate Highways.

3 Million Feet in Perspective

http://www.dnr.state.mn.us/lands_minerals/dc_library.html
OVERVIEW

- Open to the public
- Log and sample public drill core
- Accept delivered drill core
- Delivered drill core fulfills statutory requirements (since 1980)

Inside examination room in building #3
OVERVIEW

• Clients include
  • Exploration geologists,
  • Researchers,
  • Geological surveys,
  • Professors and college students.

Drill Core Building #1 built in 1972. 400,000 lineal feet
Significance of Library

- Explorers are searching for mineral deposits in the bedrock.
- Deposits can be difficult to assess because most of the bedrock in Minnesota is buried under glacial sediments.
- Drill core samples, combined with indirect methods (geophysics and geochemistry) provide the only glimpse of the bedrock for many tens of square miles in Minnesota.

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Significance of Library

- Explorers reuse existing core samples to develop new ideas about Minnesota's mineral resources and geology.
- The materials at the library have contributed to the discovery of two valuable nonferrous mineral deposits: the Birch Lake deposit & Maturi deposit in the Duluth Complex
- Additionally contributed to the Tamarack Ni-Cu-PGM discovery
Significance of Library

- Drill core samples are often reused several times in exploration programs and academic research
- Limiting the need for additional drilling disturbances
Significance of Library Mapping and research
- Drill core logging
Significance of Library
Mapping and research
-Geologic mapping
-Mineral potential studies
-Hydrogeologic studies

http://www.dnr.state.mn.us/lands_minerals/dc_library.html
• Scheduling a visit
• View drill core
• Sample drill core
• Deliver drill core
• Policies & purpose

http://www.dnr.state.mn.us/lands_minerals/dc_library.html
Scheduling your visit

Location
The Drill Core Library is located in the DNR’s Hibbing office at:
1525 Third Avenue East Hibbing, MN 55746

Hours
While the library is open to the public during normal business hours you must contact the DNR before visiting the facility. The DNR prefers to be notified two weeks in advance of each visit.

Before Your Visit
In order to better assist those visiting the Drill Core Library the DNR has prepared a pre-visit document listing information we would like to know when you contact us.

Pre-visit information document »

DNR Contact
- Barry Frey
  Email: Barry.Frey@state.mn.us
  Telephone: 218-231-8450
Stacks of core boxes in Building 3. ~3,200,000 lineal feet of capacity
Webpage Features

Minneapolis’s Drill Core Library
Bedrock drill core and data from drilling throughout Minnesota

Overview

Library Details
Learn more about the library

- Scheduling your visit
- Selecting drill core
- Viewing drill core
- Sampling drill core
- Delivering drill core
- Policies and Purpose

Map
View an interactive map displaying the geographic distribution of core and other samples stored at the drill core library. The web map also includes 150 layers of all state minerals leases (active and past mineral leasing) and real estate surface mineral leases (active and past mineral leasing) as well as any related mine land reclamation cases.

Selecting drill core

Provided below are drill core sample datasets and digital documents related to drill holes in Minnesota. The datasets are updated quarterly throughout the year. Note that some of the drill core samples found in these data sets are not publicly available for viewing as a result of being a part of an active mineral exploration program.

GIS drill core data »
Microsoft Excel drill core data »
Interactive web map »
Minarchive: mineral exploration documents »

http://www.dnr.state.mn.us/lands_minerals/dc_library.html
**Webpage Features**

**Minnesota’s Drill Core Library**

Bedrock drill core and data from drilling throughout Minnesota

**Overview**

The Minnesota Department of Natural Resources, Lands and Minerals Division, maintains a Drill Core Library in Hibbing, Minnesota. It serves as the State of Minnesota’s repository for archiving bedrock and earth material core samples collected during minerals exploration, engineering, and geoscience research programs across the state. The library attracts a worldwide audience of researchers, mineral explorers, and engineers who reuse existing core samples to develop new ideas about Minnesota’s mineral resources and geology.

The three buildings that comprise the drill core library house more than 2 million linear feet of drilled core samples archived from approximately:

- 7,000 mineral exploration cores,
- 1,500 roadway and bridge foundation cores, and
- 300 ore samples.

**Library Details**

Learn more about the library

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**Map**

View an interactive map displaying the geographic distribution of core and other samples stored at the drill core library.

The web map also includes other layers of all state minerals leases (active and past mineral leases) and high-resolution surface geology for a better understanding of the drill core samples.

**Viewing drill core**

**Examination rooms:**

The drill core library has two heated rooms in which to view your selected drill core samples. The DNR will retrieve your selected core samples in preparation for your visit. Please see the ‘Schedule Your Visit’ tab above for more information.
Drill log from drill hole B1-1. Drilled by Bear Creek Mining in 1958 and intercepted mineralization at Babbitt Grid #1 for the first time. Today commonly known as the Mesaba Cu-Ni Deposit.
Webpage Features

Minnesota’s Drill Core Library
Bedrock drill core and data from drilling throughout Minnesota

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The three buildings that comprise the drill core library house more than 3 million linear feet of drilled core samples, archived from approximately:
- 7,000 mineral exploration cores,
- 1.5 million roadway and bridge foundation cores, and
- 500 cores related to other activities.

Sampling drill core

The DNR encourages sampling of publicly available drill core for chemical analysis, thin sectioning, etc. The following documents are designed to preserve and enhance the value of these unique cores. Please preview or download these documents if you plan to sample drill core. Your cooperation will be greatly appreciated. If you have any questions please contact a staff member.

- Sampling guidelines »
- Policy and Instructions for Sample Request Form »
- Sampling Request Form »

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- 7,000 mineral exploration cores,
- 1,500 roadway and bridge foundation cores, and
- 300 cores collected by state scientists.

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Map
View an interactive map displaying the geographic distribution of core and other samples stored at the drill core library.
The map also includes 100 layers of all state minerals leases (active and past minerals leasing), and high resolution surface and bedrock geology data.

Delivering drill core
In order to better assist those delivering drill core to the Drill Core Library the DNR prefers a minimum 2 week notice in advance of core deliveries and pickups to best ensure meeting the customer's needs. The DNR has prepared a pre-deliver document listing information we would like to know before you deliver drill core.

Delivering core information document

DNR Contact
- Nicholas Niemi
  Email: Nicholas.Niemi@state.mn.us
  Telephone: 218-231-8461

http://www.dnr.state.mn.us/lands_minerals/dc_library.html
Drill core boxes from drill hole BM-3. This core was drilled in 1953 by the US Bureau of Mines (USBM).
Policies and Purpose

View a PDF of this information »

Policies
The majority of drill samples in the library are public data and available for viewing. Most exploratory boring samples are delivered to the library in fulfillment of statutory requirements which have been in effect since 1980.

- If a state mineral lease terminates, then the drill cores associated with that lease become state property and public data. The drill samples remain public data even if a new lease becomes active on the same mining unit.
- Exploratory Boring Procedures - Minnesota Statutes 103L.601
- Submission of Data from Exploratory Borings - Minnesota Statutes 103L.605

Those same statutes also identify that some core samples and related data are not public data meaning they are not viewable by the public. This is due to the core sample and data being on an active state minerals lease. The DNR must follow this law. If you wish to view confidential core, then you need to be an employee of the state mineral lessee or have written permission from the state mineral lessee.

Purpose

The primary purpose of the Drill Core Library is to receive, preserve, and make available drill samples to serve the state policy for mineral development (M.S. 93.001). This means that environmental impacts are reduced when existing drill samples can be re-used multiple times such that the total number of drill holes is reduced. The drill samples have also proven to be extremely valuable for academic researchers, such as university professors and graduate students. Many graduate student theses have been possible largely based upon the free access to drill core samples in this library. Further, the drill samples are available for environmental research, such as to understand the natural background trace element composition of the bedrock materials.
Access Web Map

Minnesota's Drill Core Library

Bedrock drill core and data from drilling throughout Minnesota

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The three buildings that comprise the drill core library house more than 3 million linear feet of drilled core samples archived from approximately:
- 7,080 mineral exploration cores,
- 1,300 roadway and bridge foundation cores, and
- 200 miscellaneous samples.

Library Details

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Map

View an interactive map displaying the geographic distribution of core and other samples stored at the drill core library. The web map also includes GIS layers of all state minerals topics (active and past).
Select Map Layers
Toggle on/off GIS layers to view in map

Drill Holes (DNR)
State Mineral Leases (DNR)
Surficial Geology (MGS)

Bedrock Geology (MGS)
Bedrock Outcrops & Depth to Bedrock Model (MGS)
Aeromagnetic Map (MGS)

http://www.dnr.state.mn.us/lands_minerals/dc_library.html
Select Map Layers
Set a layers transparency

0% Opaque

75% Opaque: See items below easier
Change Basemap – Select from 10 different basemaps
Search for a geographic location

Use the search bar to zoom to a city or county
Display and ID drill holes, geology, and state mineral leases

Also view MGS Statewide Surficial & Bedrock Geology, Outcrops, Depth to Bedrock, and Aeromagnetic Layers
ID most map features by clicking on the map.
1. Select the ‘up arrow symbol’ to bring out the tabular records of any visible map layer. Shown here are:
   - Drill holes
   - Active state leases
   - Terminated state leases

2. Select ‘Options’ then check on ‘Filter by Map Extent’ (not shown) to limit your records to what’s on your map screen.
   - This graphic is showing 14 drill hole records in this area.
   - There is also tabular information that you can turn on for active and terminated state leases.
Learn more by clicking on the ‘i’ icon

• Instructions
• Metadata
• Links to data

http://www.dnr.state.mn.us/lands_minerals/dc_library.html
Query Tool:
- Zoom to certain selected data
  - Public Land Survey Location
  - Drill hole name
  - Drill holes by company or agency
  - Active state minerals leases by company
How it works?

- Drill holes by company or agency query
  - Select from Drop-Down List (FMC)
  - Click Apply
    - Application zooms to drill hole locations
Thank you!

Questions?