DIGITAL MAPPING TECHNIQUES 2024

The following was presented at DMT‘24
May 13 - 16, 2024

The contents of this document are provisional

See Presentations and Proceedings
from the DMT Meetings (1997-2024)
http://ngmdb.usgs.gov/info/dmt/
An Update on Near-Surface Hazards in the Butte Mining District

By Anthony Roth (Montana Bureau of Mines and Geology)

This oral presentation will update the attending members of the 2024 Digital Mapping Techniques Seminar on the focus of Montana Bureau of Mines and Geology’s (MBMG) Data Preservation department since the last oral presentation in 2021, what the MBMG is currently doing with this collection, and what future plans are possibly in store for the Stope Books.

The Stope Books were the responsibility of the Anaconda Mining Company (founded in 1881) and are a hand-drawn representation of the tens of thousands of miles of underground workings that make up what is known worldwide as the “Richest Hill on Earth.” Each book shows all of the working levels and sills of the mines in 6.64’ increments, from the shaft collar to the deepest workings, represented in each book’s 40.04-acre “footprint.” In addition to illustrating the stopes of the mines, the books also contain detailed records of survey points, shaft/raise/winze/drift/crosscut locations, bulkheads, fire doors, and timber sets as well as many other features associated with underground mining at a scale of 1:50.

Through the generosity of New Butte Mining, the Butte–Silver Bow Public Archives, and two grants from the U.S. Geological Survey’s National Geological and Geophysical Data Preservation Program, 182 Stope Books have been digitally preserved. The remaining 171 books are owned by another entity. Due to exemplary working relationships, the MBMG has been granted access to scan the final portion of the collection (as time permits) to make the collection whole again in a digital format.

Every year, the MBMG receives correspondence from county workers or private parties inquiring if there are mine workings in areas that they are working in or underneath privately-owned properties. The phone calls and emails are due in part to the threat of subsidence, when historic mine workings collapse underneath the areas in question. The MBMG’s Data Preservation Department primarily uses the Stope Books, along with other sources of information, to create a visual representation of the workings underneath the surfaces of Butte to a depth of 200 to 300 feet using Google Earth.

Currently, the metadata and images of the Stope Books that have been completed are available to view on the MBMG’s website: https://www.mbmg.mtech.edu/Information/Collections/Butte-Stope-Books/

Eventually, all of the hazard information compiled on Google Earth from the Stope Books will be migrated into ArcPro for other users to study and add information. There has also been discussion about creating a working 3-D model of the entire Butte Hill using the information from the books.
An Update on Near Surface Hazards
In the Butte Mining District
Outline

A brief description of what the Stope Books are

What the MBMG has accomplished to date

Current and Future work
The Butte Stope Books

- Sponsored by the NGGDPP

- Priority 2 Grant – New Butte Mining
  Delivered June 30, 2021

- Priority 1 Grant – Butte Silver-Bow Public Archives
  Delivered June 30, 2023
Stope Book Ownership

Level 1 Grant
139 Stope Books – Butte Silver-Bow Public Archives

Level 2 Grant
47 Stope Books – New Butte Mining

Montana Resources
169 Stope books – Montana Resources
Level 1 Grant

139 Stope Books – Butte Silver-Bow Public Archives

Level 2 Grant

47 Stope Books – New Butte Mining

Work completed as time permits

72 Stope books – Montana Resources scanned

97 Stope Books - Montana Resources left to scan
Current Totals

49,876 total pages scanned to date

42 Terabytes of server space used
Butte Stope Books
Maps of the Underground Workings of the ‘Richest Hill on Earth’

Browse Locations
Use this word cloud visualization to browse books. Word size is determined by frequency and all words link to a corresponding collection search.
Images dated 5/22/2012 are from an Esri presentation completed by Paul Thale and Chris Smith. Date unknown
Emma Mine – 400 Sill
UNDERGROUND STOPES AND DEVELOPMENT
Questions?

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