

COLORADO GEOLOGICAL SURVEY

Open-file Report OF-24-11
Reconnaissance Investigation of Critical Minerals in Historic Mine-Related
Effluent, Colorado

HOW TO USE THIS ZIP FILE

To open the compressed (.zip) file that you downloaded, double-click on the file. Inside the folder labeled **OF-24-11**, there are a number of files and folders. The report is stored in Adobe Portable Document (.pdf) format. Spreadsheet files are also included as Microsoft Excel files (.xlsx). These spreadsheets include the laboratory data associated with the report. For more about these files, see the enclosed report: *Jones-Fredrickson, E., Goodman, A., O'Keeffe, M.K., and Ranville, J., 2025, Reconnaissance investigation of critical minerals in historic mine-related effluent, Colorado: Colorado Geological Survey Open-File Report OF-24-11.*

Colorado contains an abundance of historic mine-related waste materials, some of which may contain elevated concentrations of critical minerals and other metals. Many of these sites are currently being remediated by several entities. Metal-laden water flows continuously from some of these acid mine drainage (AMD) sites where it is collected, treated, and discharged to local streams and rivers depending on its impact to human health and the environment. Many of these historic mining sites are associated with mineral deposits that may contain critical minerals, or historically produced a few of these minerals, and therefore, the water effluent from these sites may contain these materials as well. The main goal of this investigation is to support the evaluation of potential critical mineral endowment of mine waste in Colorado currently being conducted by the USGS with the assistance of state agencies. This investigation was conducted in conjunction with the early stages of this program under the USGS Earth Mapping Resources Initiative (EarthMRI) who provided funding, laboratory analysis, and the preliminary sampling protocol for this project. It is reconnaissance in nature - Colorado was one of three states first chosen for this program and the USGS is revising sampling protocols based on their field visits and input from the first few projects to improve this process. The tasks associated with this project included the sampling and analysis of effluent from select AMD sites, and obtaining effluent discharge rates, to measure the concentration, variability, and to provide estimated loads of critical minerals at these sites. Other geochemical information was collected including the concentrations of other elements, precious metals, and anions to provide a complete data set of these waters for future evaluation by the USGS and others. The data collected during this investigation may also be used in the future to provide a preliminary evaluation of the characteristics of these mine wastes to assist with determining potential reprocessing, management, and reclamation strategies by others. This investigation is reconnaissance in nature and the data associated with this project are not intended to fully characterize potential economic resources or provide a complete assessment of other conditions at these sites.

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HOW TO IDENTIFY AND READ FILES REPORT DOCUMENTS

- **OF-24-11_ReadMe.pdf**
This file.
- **OF-24-11_CritMinsMineWater.pdf**
The main report document.
- **OF-24-11_AppendixC_ElectronicResults.zip**
Summary spreadsheets (MS Excel), laboratory data (MS Excel), and field data sheets (pdf).

To view .pdf files

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