GEOCHEMICAL DATA FROM SAMPLES COLLECTED IN 2021 FOR THE TAYLOR MOUNTAIN PROJECT, TANACROSS AND EAGLE QUADRANGLES, ALASKA

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GEOCHEMICAL DATA FROM SAMPLES COLLECTED IN 2021 FOR THE TAYLOR MOUNTAIN PROJECT, TANACROSS AND EAGLE QUADRANGLES, ALASKA

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INTRODUCTION

During the 2021 field season, geologists from the Alaska Division of Geological & Geophysical Surveys (DGGS) conducted 1:100,000-scale bedrock geologic mapping of ~2,600 mi^2 (~6,900 km^2) within the Tanacross and Eagle quadrangles. The field area for the Taylor Mountain project is within a 50-mile radius of Chicken, Alaska. The project area is of current and historic interest for potential mineral resource development, including quartz vein gold (Au) mineralization, placer Au deposits, granite-hosted tin (Sn) mineralization, and intrusion-related copper (Cu)-Au deposits. Prospects in the area include Tweeden, Lilliwig Creek lode, and others. Much of the field area was mapped at 1:250,000 scale by the U.S. Geological Survey (USGS) in the 1960s (Foster, 1970, 1976). This project aims to produce more detailed and modern geologic maps and supporting datasets that will promote mineral resource exploration in eastern interior Alaska.

Highlights of this DGGS eastern Taylor Mountain geochemical report include locating and sampling of the Tweeden, Lilliwig Creek lode, Moose Creek, and Fish prospects. Four samples collected at Tweeden returned gold (Au) values over 1 ppm: 21ET247–2.66 ppm Au; 21ET248–1.75 ppm Au; 21ET249–1.34 ppm Au; and 21ET250–1.3 ppm Au. A greenstone sample collected at Kechumstuk Mountain (21MLB195) returned a Cu concentration of 2,960 ppm.

The DGGS map area includes a section of pre-Mississippian to Permian metasedimentary and metaigneous rocks as well as Triassic to Paleogene intrusive and volcanic rocks. Major- and trace-element geochemistry was analyzed for metamorphic rocks to distinguish between igneous and sedimentary protoliths, and for igneous rocks to characterize and differentiate Mesozoic and Cenozoic magmatic events in the area.

The analytical data tables associated with this report are available in digital format as comma-separated value (CSV) files. Additional details about the organization of information are noted in the accompanying metadata file. All files can be downloaded from the DGGS website: https://doi.org/10.14509/30843.

All the samples collected during this project, as well as laboratory sample rejects and pulps, will be stored at DGGS for the duration of the project and will be available for public viewing upon request. Once the project concludes, the samples and the pulps will be turned over to the Geological Materials Center in Anchorage.

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DOCUMENTATION OF METHODS

Sample Collection

Rock samples were collected for two different purposes. First, samples of visibly mineralized or altered rock were preferentially collected and analyzed for trace-element geochemistry. Second, igneous and metaigneous rocks showing little alteration or weathering were collected for whole-rock major-oxide, minor-oxide, and trace-element analyses to aid in classification and study of petrogenesis and tectonic setting. Most samples are 'grab' samples, which were collected for their overall representation of the outcrop. However, a few samples are 'select' samples, which were more deliberately collected from a specific feature, as noted in the sample field description.

Location data were collected using GPS-enabled tablets and smartphones running the ESRI Collector App. Data were merged into an ArcGIS geodatabase. The devices have a reported error of about 10 m. Latitude and longitude are reported in the WGS84 datum.

Sample Preparation

Rock samples were processed by ALS Geochemistry using their PREP-31 package. The samples were crushed to greater than 70 percent passing 2 mm, and a 250 g split was pulverized to greater than 85 percent passing 75 microns. Prior to crushing, samples for whole-rock analysis were trimmed by DGGS staff to remove weathering.

ANALYTICAL METHODS

Samples were analyzed for a variety of suites of major and trace elements depending on the sample type. In addition to ALS Geochemistry's accredited (ISO/IEC 17025–2005) internal quality-control program, DGGS monitored analysis quality with one standard reference material per batch of 20 analyses.

- Whole-rock geochemistry samples and major- and minor-oxides were analyzed by lithium borate fusion digestion and ICP-AES (ALS Geochemistry method ME-ICP06). Trace elements, including rare-earth elements, were determined using lithium metaborate fusion digestion and ICP-MS (ALS Geochemistry method ME-MS81). Ag, Cd, Co, Cu, Li, Mo, Ni, Pb, Sc, and Zn were determined by four-acid digestion and ICP-AES (ALS Geochemistry method ME-4ACD81); and As, Bi, Hg, In, Re, Sb, Se, Te, and Tl were determined by aqua regia digestion followed by ICP-MS (ALS Geochemistry method ME-MS42). Total C and S were analyzed by Leco furnace (ALS Geochemistry methods C-IR07 and S-IR08, respectively). Pt, Pd and Au were determined by fire assay with ICP-MS finish (ALS Precious Metals method PGM-MS23).
- Major- and trace-element values for rock samples were determined by ALS Geochemistry method ME-MS61: Four-acid digestion followed by inductively-coupled plasma–atomic emission spectrometry (ICP-AES) and inductively-coupled plasma–mass spectroscopy (ICP-MS); Au values were analyzed using flux digestion and fire assay and ICP-AES (ALS Geochemistry method Au-ICP21).

- Samples that exceeded detection limits for elements of interest were reanalyzed using specific elemental tests. Over-limit values for S were analyzed using four-acid digestion followed by inductively-coupled plasma–atomic emission spectrometry (ALS Geochemistry method ME-OG62).

For each sample, data tables contain either assay values or coded-value placeholders (null = not analyzed; -1 = the element's assay result is less than the lower detection limit for the method; -2 = the element's assay result is greater than the upper detection limit for the method). Detection limits for each of the reported elemental values obtained by the various methods are documented in the metadata file.

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