LA-ICP-MS U-Pb data files, detrital zircon geochronology, and geochemistry of the Stuhini and Hazelton groups, Scottie gold mine area, northwestern British Columbia

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Front cover: Looking southeast from the southern ridge of Summit Mountain. In foreground, interbedded latite breccias and argillites, upper volcanic unit, Stuhini Group. In near background, ridge underlain by steeply east-dipping Stuhini Group, which is overlain by Unuk River andesite unit, lower Hazelton Group (contact in saddle in centre of photo) and upper siltstone unit at base of ridge, adjacent to Salmon Glacier. **Photo by Ben Stanley.**

Back cover: Outcrop of well-bedded upper siltstone unit, lower Hazelton Group, site where detrital zircon sample 20-S-2 was collected (Blueberry area). **Photo by Jon Rigg.** Inset: ammonite mold (5 cm wide), tentatively identified as Pliensbachian, from this unit. **Photos by Ben Stanley.**

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Abstract
This release provides whole rock geochemical and LA-ICP-MS zircon geochronologic data from Stuhini Group and Hazelton Group rocks in the Scottie gold mine area of northwestern British Columbia to support conclusions presented in Stanley and Nelson (2022).

Keywords: Scottie gold mine, Stewart mining camp, Stuhini Group, Hazelton Group, detrital zircon geochronology, lithogeochemistry, shoshonite

1. Introduction

The past-producing Scottie gold mine lies within the Stewart mining camp, in the southern part of a prolific mineral district in northwestern British Columbia popularly known as the 'Golden Triangle' (Fig. 1). The Scottie property is underlain by strata of the Stuhini and Hazelton groups, intruded by Early Jurassic plutons of the Texas Creek suite. Elsewhere, we used detailed geological mapping, supported by geochemistry and LA-ICP-MS zircon geochronology of volcanic and sedimentary units, to establish a stratigraphic section through the upper Stuhini and lower Hazelton groups (Stanley and Nelson, 2022). Herein we present the supporting geochronological and geochemical data and sample site photographs (BCGS_GF2022-08.zip).

Sample sites are shown on Figure 2. Appendix 1 presents outcrop and sodium cobaltinitrite-stained slab photographs for the sample sites. Appendix 2 contains whole rock major and trace element data for the geochemical sample suite. Appendix 3 provides details of U-Pb analytical methods, and Appendix 4 is an Excel file of results and supporting data from LA-ICP-MS analysis at Pacific Centre for Isotopic and Geochemical Research (PGIR) at the University of British Columbia. Appendix 5 is a montage of cathodoluminescent images of the analyzed zircon grains.

2. Stratigraphic units in the Scottie gold mine area

The Stuhini Group in the study area comprises two informal units, a lower fine-grained sedimentary unit that is gradationally overlain by an upper volcanic unit (Fig. 2). The lower sedimentary unit consists of dark grey, carbonaceous argillite with lesser light-toned, plagioclase-rich fine-grained sandstone, very fine-grained felsic tuff interbeds, and discontinuous grey limestone lozenges up to 10s of m long. Within the alkalic upper volcanic unit, light-toned augite-phyric trachyandesite -(latite) breccias, flows and flow-breccias, felsic flows, and lapilli tuffs interfinger with laminated felsic (trachyte) crystal lithic tuffs and, at some localities, argillite (Stanley and Nelson, 2022). Most of the sampled volcanic rocks have high contents of potassium feldspar, as indicated by sodium cobaltinitrite staining (Appendix 1).

Hazelton Group units occur in two separate outcrop areas (Fig. 2). A nunatak in the west-central part of the map area forms an isolated exposure of basal Hazelton Group siltstone, sandstone, and mudstone, surrounded by Stuhini Group strata. In the eastern half of the map area, the upper volcanic unit of the Stuhini Group is overlain by a thick, east-younging section of the Betty Creek Formation of the lower Hazelton Group. The section there comprises two units of feldspar-hornblende-

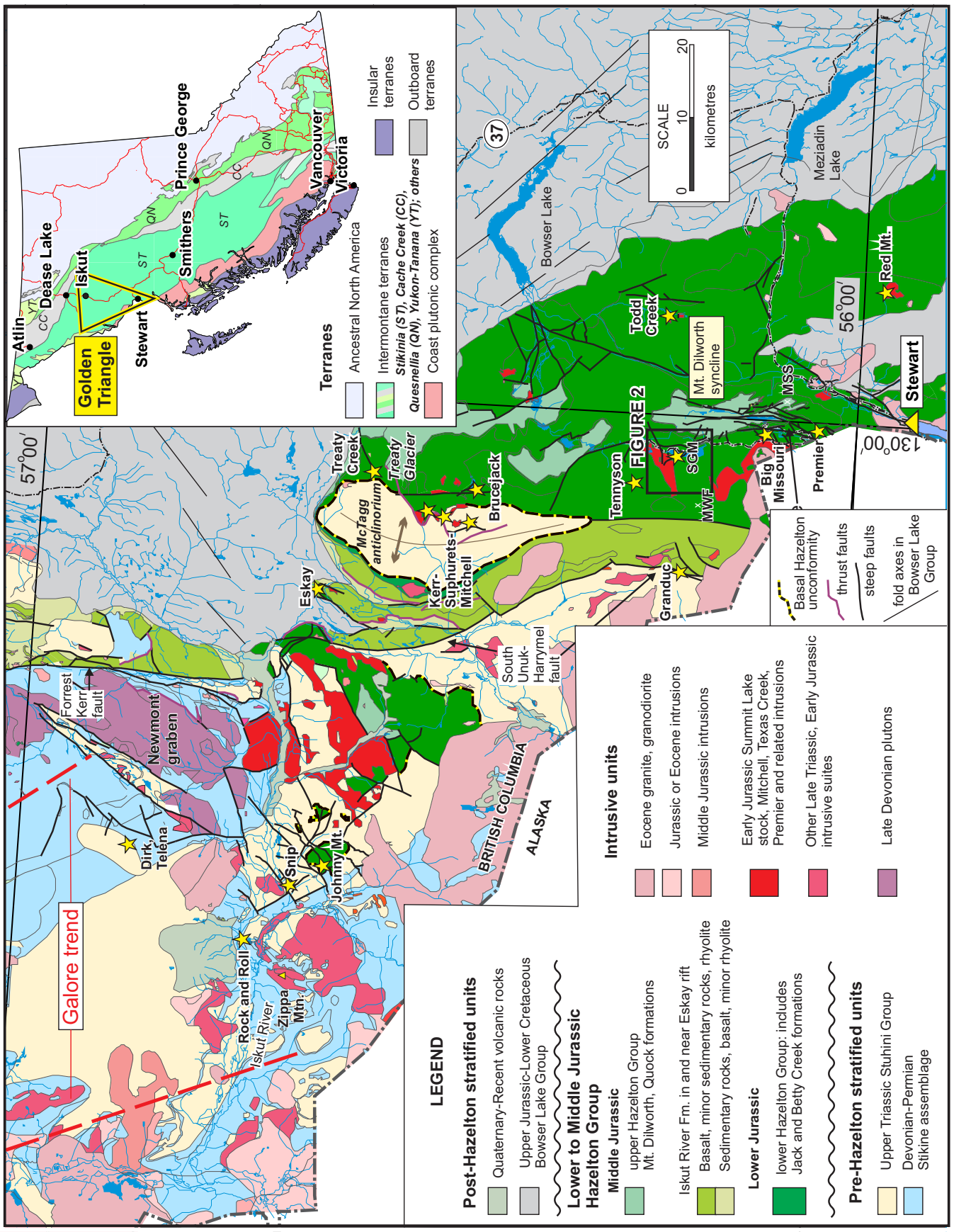

Fig. 1. Regional setting of the Scottie gold mine area in the southern Iskut River region of northwestern British Columbia. Inset, generalized terrane map and position at southern tip of the Golden Triangle. SGM = Scottie Gold Mine; MWF = Mt. White-Fraser; MSS = Mt. Shorty-Stevenson.

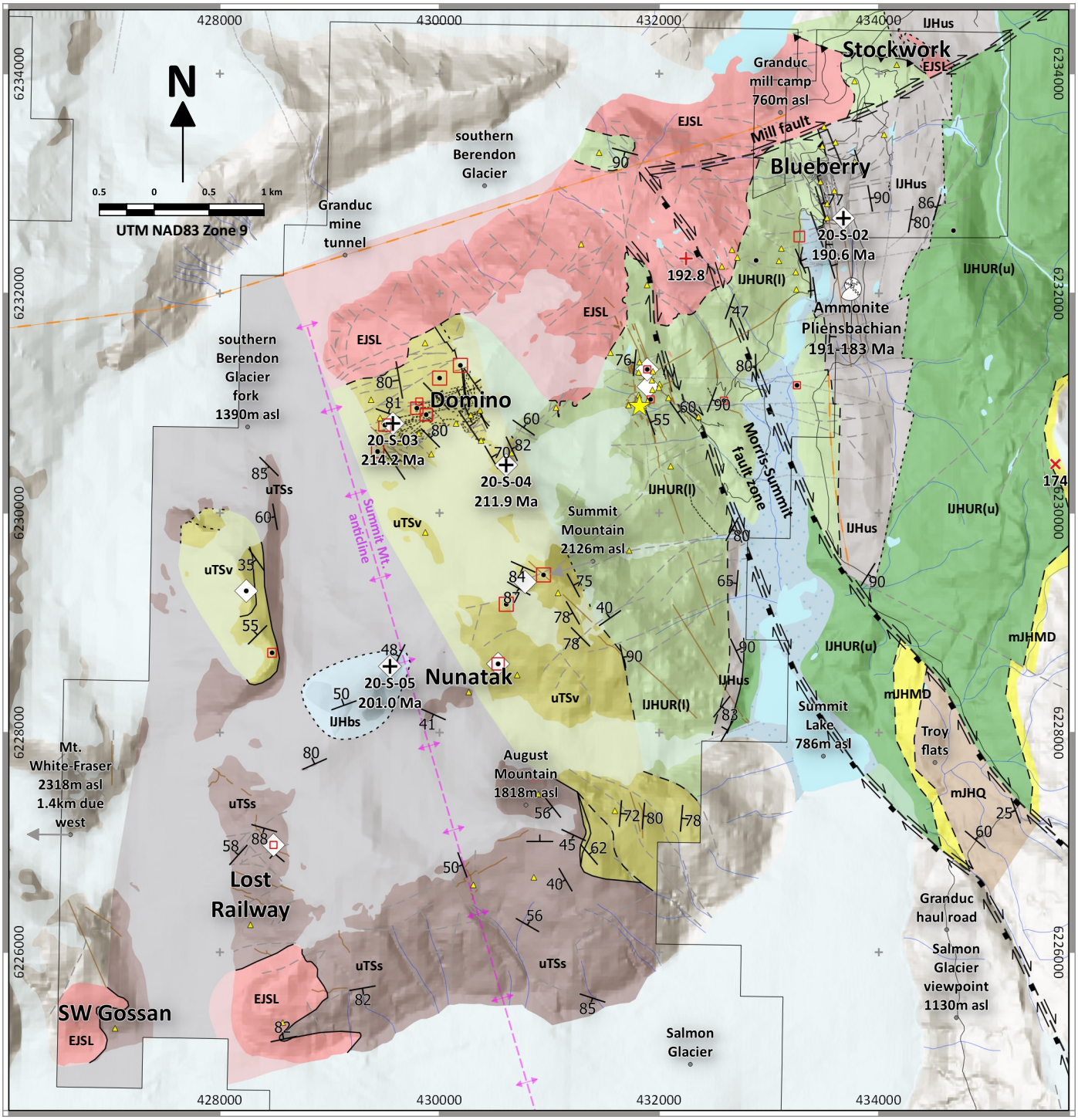

Fig. 2. Geology of the Scottie gold mine area.

phyric andesitic flows, tuffs, breccias, and conglomerates assigned to the Unuk River andesite unit of the Betty Creek Formation, following the lithologically based usage of Nelson et al. (2018), and an intervening siltstone interval, termed the 'upper siltstone unit'. A Pliensbachian(?) ammonite mold has been recovered from the siltstone (Stanley and Nelson, 2022).

3. Whole rock lithogeochemistry of Stuhini and Hazelton volcanic rocks

Eighteen representative samples from volcanic-volcaniclastic units were collected across the study area for whole-rock geochemical analysis (Appendix 2). Twelve samples are from the upper Stuhini volcanic unit, five samples are from the lower

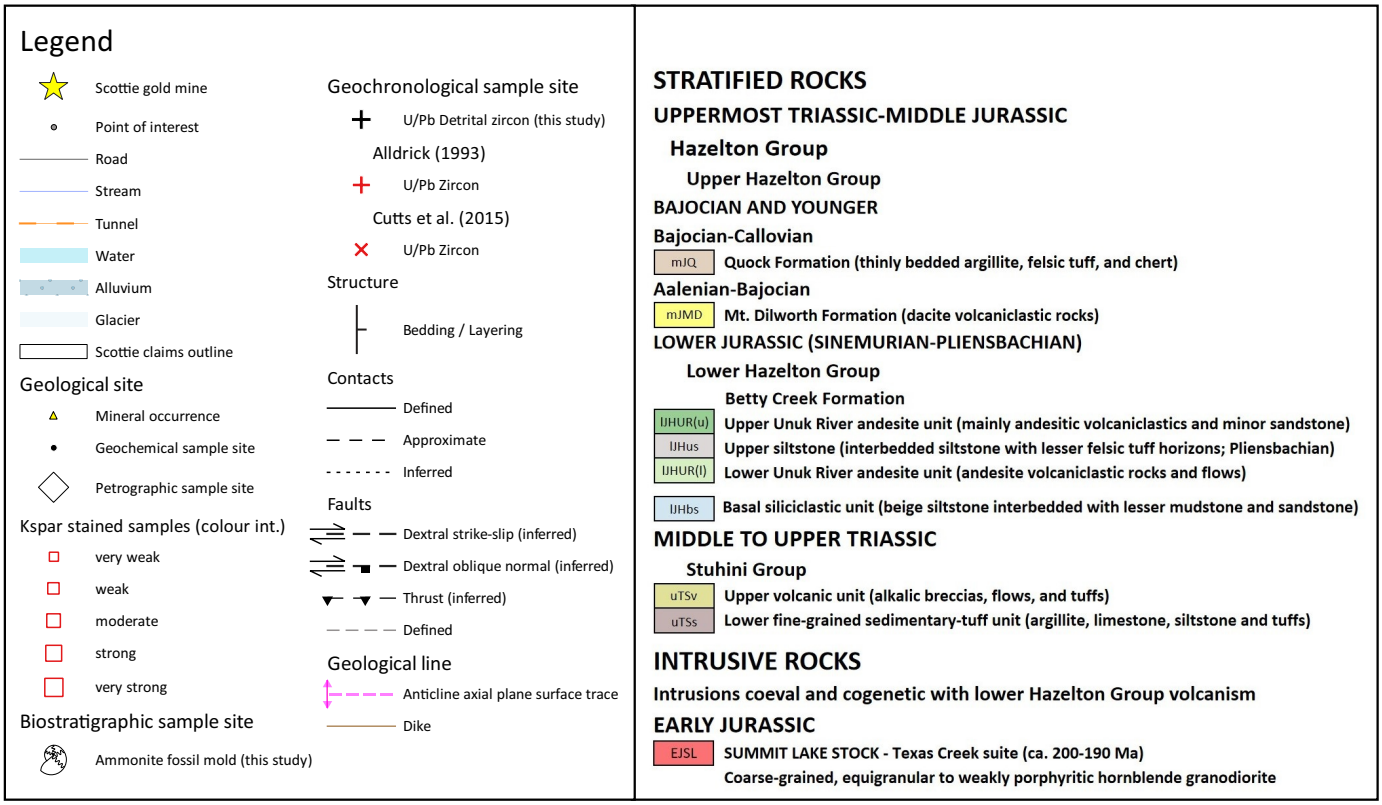

Fig. 2. Continued, legend.

Unuk River andesite unit and one sample is from the upper Unuk River andesite unit. During sample collection every effort was taken to avoid altered rock. A diamond saw was used to trim and remove veins and weathered material. Major and trace elements for most samples were analyzed at Australian Laboratory Services (ALS Terrace, BC) using ICP-Atomic emission spectrometric methods; two samples were analyzed at Société Générale de Surveillance (SGS; Burnaby, BC) using ICP-optical emission spectrometric methods. At both laboratories, analysis followed lithium metaborate fusion and nitric acid digestion.

Samples were classified according to K_2O, Na_2O and SiO_2 contents (Stanley and Nelson, 2022). All 12 of the samples from the upper volcanic unit of the Stuhini Group plot in the alkaline field on TAS (total alkalis-silica) diagrams, ranging from basaltic trachy-andesite, trachy-andesite, phono-tephrite, tephri-phonolite, to phonolite compositions, and all samples, except D707510 and D707513, plot within the shoshonite series, ranging from absarokite, shoshonite, to banakite compositions on the potassium versus silica discrimination diagram (Stanley and Nelson, 2022). The abundance of augite phenocrysts in most of these rocks may skew the analytical compositions to lower silica contents and lead to clustering in the basaltic trachy-andesite field as opposed to their field identification as predominantly latites.

Samples of Unuk River andesites form an array that spans calc-alkaline, high-K calc-alkaline and mildly shoshonitic compositions (Stanley and Nelson, 2022), similar to the reported range for Betty Creek volcanic rocks and associated Texas Creek suite intrusions in the region (Alldrick, 1993; Febbo et al., 2019).

4. LA-ICP-MS zircon geochronological data

LA-ICP-MS analysis was conducted on two igneous samples from the upper volcanic unit of the Stuhini Group (20-S-3, 20-S-4) and two siliciclastic samples from the Hazelton Group, 20-S-5 from the basal clastic unit and 20-S-2 from the upper siltstone unit. The analyses were carried out at the Pacific Centre for Isotopic and Geochemical Research (PCIGR), University of British Columbia using a Resonetics RESOlution M-50-LR. Analytical procedures are presented in Appendix 3, and results and calculations in Appendix 4. Cathodoluminescent images of the analyzed zircon grains are shown in Appendix 5.

The age of volcanism in the upper part of the Stuhini Group is ca. 214 Ma, based upon the youngest statistical population (YSP) for sample 20-S-3. The maximum depositional age (MDA) of the basal Hazelton Group is ca. 201 Ma, based on the YSP for sample 20-S-5. The MDA for sample 20-S-2 from the upper siltstone unit is ca. 190.6 Ma. For full discussion of the results, see Stanley and Nelson (2022).

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