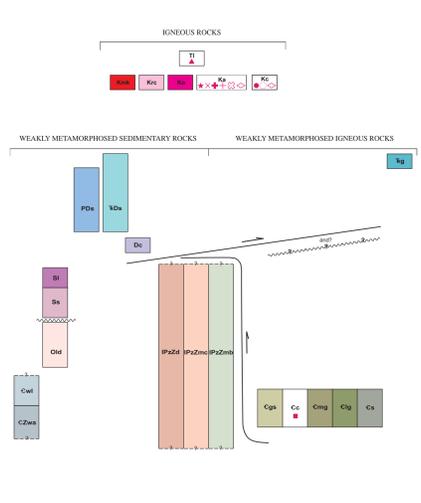


CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

- IGNEOUS ROCKS**
- Tertiary
 - LAMPROPHYRE DIKE (Tertiary)
 - Cretaceous
 - MONEY KNOB PLUTON (Cretaceous)
 - RUTH CREEK PLUTON (Cretaceous)
 - OLIVE CREEK PLUTON (Cretaceous)
 - Cretaceous (See 'Map Symbols' for additional explanation of compositional variation.)
 - MONZONITE TO SYENITE DIKES (Cretaceous)
 - GRANITE AND GRANODIORITE DIKES (Cretaceous)
- METAMORPHOSED SEDIMENTARY AND IGNEOUS ROCKS**
- NORTH OF VICTORIA CREEK FAULT**
- Triassic to Devonian
 - RAMPART GABBRO, QUARTZ GABBRO, AND MINOR CHERT (Triassic)
 - SANDSTONE, SHALE, AND CHERT (Triassic to Devonian)
 - SHALE (Permian to Devonian)
- SOUTH OF VICTORIA CREEK FAULT**
- Middle Devonian
 - Cascade Ridge Unit
 - SANDSTONE, SHALE, AND CONGLOMERATE (Middle Devonian)
 - Late Silurian
 - Lost Creek Units
 - LOST CREEK LIMESTONE (Late Silurian)
 - LOST CREEK SANDSTONE, SILTSTONE, SHALE, AND CONGLOMERATE (Silurian)
 - Oodovician
 - Livengood Dome Unit
 - LIVENGOOD DOME CHERT (Oodovician)
 - Amy Creek Assemblage
 - AMY CREEK DOLOMITE AND LIMESTONE (lower Paleozoic to latest Late Proterozoic)
 - AMY CREEK METABASALT (lower Paleozoic to latest Late Proterozoic)
 - AMY CREEK SILICEOUS MUDSTONE AND CHERT (lower Paleozoic to latest Late Proterozoic)
 - Early Cambrian
 - Ophiolite Assemblage
 - GREENSTONE (Early Cambrian)
 - OLIVINE CLINOPYROXENITE DIKE (Early Cambrian)
 - METAGABBRO (Early Cambrian)
 - LAYERED METAGABBRO (Early Cambrian)
 - SERPENTINITE, METAGABBRO, AND GREENSTONE (Early Cambrian)
 - Wickersham Units
 - WICKERSHAM LIMESTONE (earliest Cambrian?)
 - WICKERSHAM SHALE (earliest Cambrian? to Late Proterozoic)

MAP SYMBOLS

- Contact - Dashed where approximately located or inferred
- Unconformable contact or thrust fault - Dashed where approximately located or inferred, queried since contact type is uncertain; regionally interpreted to be an unconformable contact (Foster, 1966; Weber and others, 1992); in the Money Knob area the contact is a thrust fault (this study)
- Contact or high-angle fault - Dashed where approximately located or inferred, queried since contact type is uncertain. Regionally, the contact between units Pd and Td is interpreted as a high-angle fault; in the map area, the relationship between units Td and adjacent units Kg and Pd is unclear
- Fault - Dashed where approximately located or inferred, queried where location is uncertain. Arrows indicate apparent direction of relative movement; U, upthrown block; D, downthrown block
- Showing relative motion in cross section; A, away from observer; T, toward observer
- Permian thrust fault - Dashed where approximately located or inferred; burbs on upper plate. Timing of Cambrian ophiolite assemblage emplacement over the lower Paleozoic to Late Proterozoic Amy Creek units may be constrained by "Ar" Ar ages reset to 200-250 Ma (map locations AS and AK, and sample D787-16 located 3.3 km south of the map area; Athey and others, 2004a)
- Early Cretaceous thrust fault - Dashed where approximately located or inferred; burbs on upper plate. In the Money Knob area, the Cascade Ridge sedimentary unit (Dc) is thrust over the Cambrian ophiolite and Amy Creek assemblages. Emplacement of the Dc unit may be a later event, accommodating stresses related to compression of the Manley basin (located approximately 6 km south of Livengood)
- Unconformable contact - Shown in 'Correlation of Map Units'; queried where contact type is uncertain
- Fold - Showing trace of axial surface; arrows located on the axial trace indicate direction of plunge
- Antiform
- Overtuned antiform, showing direction of dip of limbs
- Synform
- Overtuned synform, showing direction of dip of limbs
- Trace of bedding - Shown in cross section
- Strike and dip of bedding
- Strike of vertical bedding
- Strike and dip of foliation
- Strike of vertical foliation
- "Ar"/Ar localities - Numbers refer to map and figure 1
- K/Ar localities - Numbers refer to map and figure 1; some localities occur outside the map area
- Sm/Nd locality - Number refers to map and figure 1
- Fossil localities - Numbers refer to map, figure 1, and table 1; some localities occur outside the map area
- Drill hole collar (Minchane and Rogers, 1997)
- Dikes - Shown on geologic map as lines where orientation recorded
 - Lamprophyre; unit T1 (Tertiary)
 - Granite; equivalent to Kc (Cretaceous)
 - Undifferentiated calc-alkaline; equivalent to Kc (Cretaceous)
 - Quartz monzonitic; equivalent to Ka (Cretaceous)
 - Quartz monzonite; equivalent to Ka (Cretaceous)
 - Quartz syenite; equivalent to Ka (Cretaceous)
 - Syenite; equivalent to Ka (Cretaceous)
 - Undifferentiated alkalic; equivalent to Ka (Cretaceous)
 - Undifferentiated felsic; equivalent to Ka or Kc (Cretaceous)
 - Undifferentiated felsic(?); some samples were collected from colluvial units dominated by periglacial mass wasting processes; these samples may not represent bedrock units present directly beneath surficial units (Hite, 1977; Freeman and others, 1997; Minchane and Rogers, 1997; Haneman, 1998; Freeman, 2003)
 - Olivine clinopyroxenite; unit Cc (Early Cambrian)
- Area containing an anomalously high number of undifferentiated felsic(?) samples; some samples were collected from colluvial units dominated by periglacial mass wasting processes; these samples may not represent bedrock units present directly beneath surficial units (Minchane and Rogers, 1997; Haneman, 1998; Freeman, 2003)

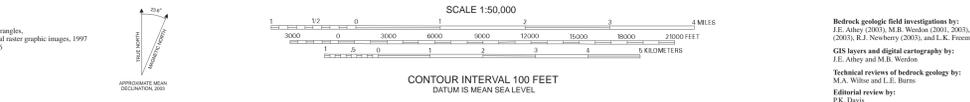
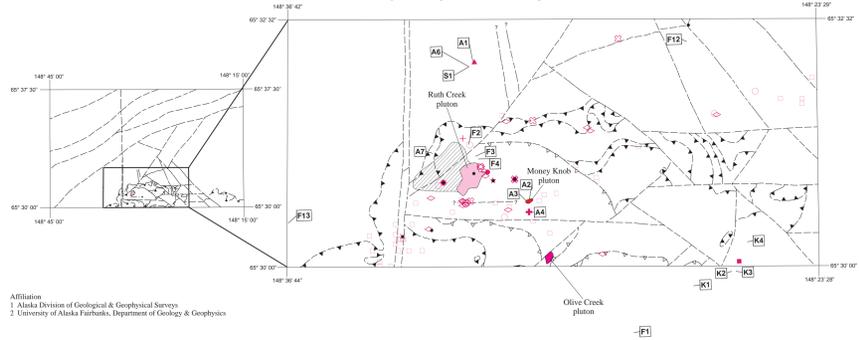
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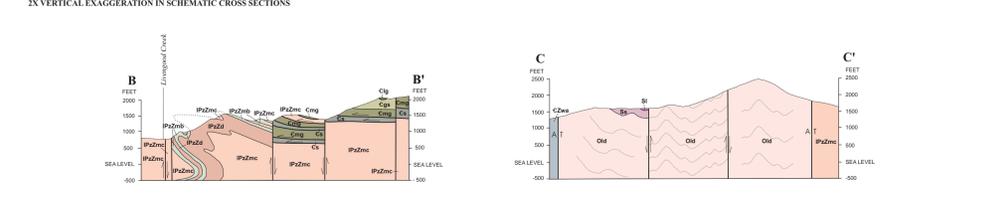
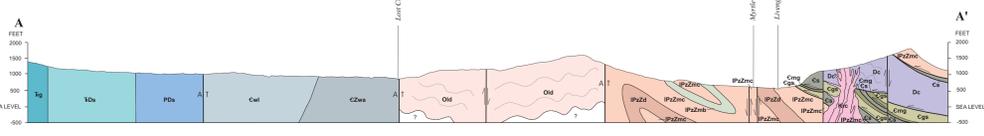
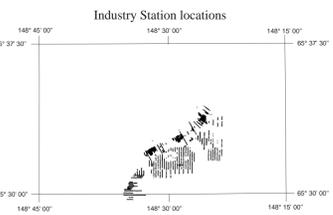
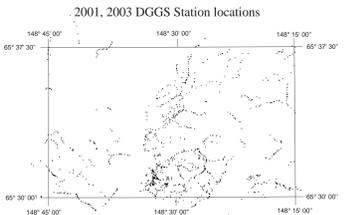
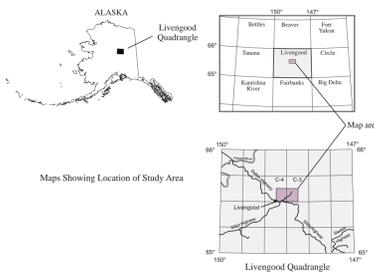
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Figure 1. Inset map of Money Knob-Amy Dome ridge area. Inset map shows dike locations and compositions, igneous rocks, faults, age data, fossil locations, and drill hole collars.



Bedrock geologic field investigations by:
J.E. Athey (2003), M.B. Werdon (2003), D.J. Szumigala (2003), R.J. Newberry (2003), and L.A. Freeman (2003)
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Technical review of bedrock geology by:
M.A. Wilson and L.E. Burns
Editorial review by:
P.K. Davis
Cartographic and GIS advice:
A.G. Steinhilber



BEDROCK GEOLOGIC MAP OF THE LIVENGOOD SW C-3 AND SE C-4 QUADRANGLES, TOLOVANA MINING DISTRICT, ALASKA

by
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