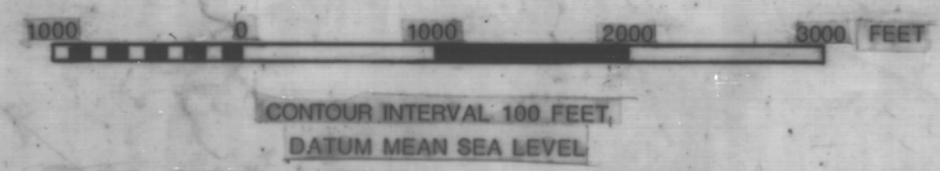
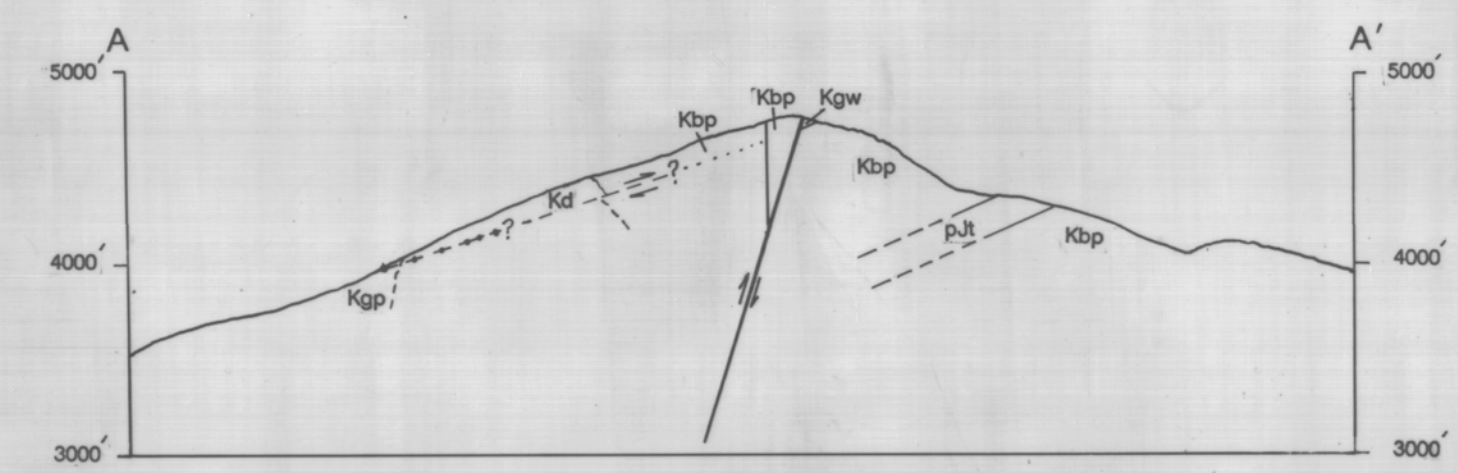


THIS REPORT HAS NOT BEEN REVIEWED FOR TECHNICAL CONTENT (EXCEPT AS NOTED IN TEXT) OR FOR CONFORMITY TO THE EDITORIAL STANDARDS OF DGGS



Bedrock geology by M.A. Wiltse, 1988 and T.E. Smith, 1981. Surficial geology by R.D. Reger, 1988.



- CORRELATION OF MAP UNITS**
- | | | | |
|----------------------------|---|---------------------------|------------------------------------|
| SURFICIAL DEPOSITS | | | |
| FLUVIAL DEPOSITS | GLACIAL DEPOSITS | COLLUVIAL DEPOSITS | MAN-MADE DEPOSITS |
| Qal
Qaf
Qac | Qdc
Qd | Qc
Qcd
Qcl
Qct | Qchf |
| | | | Holocene
Holocene & Pleistocene |
| QUATERNARY | | | |
| METAMORPHIC ROCKS | | | |
| Kbp
Kgw
Kgp | Late Cretaceous Age Of Metamorphism | | |
| CRETACEOUS | | | |
| pJh
pJba
pJga | Pre-Late Jurassic | | |
| JURASSIC TO LATE PALEOZOIC | | | |
| MAN-MADE DEPOSITS | | | |
| Qchf | PLACER-MINE TAILINGS- Ridges, piles, aprons, fans, and blankets of well washed gravel with numerous cobbles and boulders left by placer mining activities. Bedding is medium to thick. Estimated thickness up to 6 meters. | | |
| FLUVIAL DEPOSITS | | | |
| Qal | STREAM ALLUVIUM- Elongate deposits of pebble-cobble gravel and sand with occasional to numerous boulders beneath modern floodplains. Generally well sorted and medium to thick bedded; locally cross-bedded. Estimated thickness is up to 6 meters. Surface is smooth, except for low scarps. | | |
| Qaf | ALLUVIAL-FAN DEPOSITS- Poorly to moderately sorted gravel, sand, and silt deposited primarily by streams at valley mouths. Proximal parts of fans are frequently composed of unsorted debris-flow deposits. Contain numerous large boulders in discrete zones representing major flood episodes, especially in proximal areas of fans and along former channels. Estimated thickness is up to 25 meters. Surface is smooth to slightly irregular and covered by abandoned braided stream channels. | | |
| Qac | ABANDONED MELT-WATER-CHANNEL DEPOSITS- Elongate channel fillings of well-sorted pebble-cobble gravel and gravelly to coarse sand laid down in channels cut into the surfaces of till sheets by former glacial-meltwater streams. May consist entirely of concentrations of boulders left as lag by the winnowing of the fine-fraction from till. Medium to thick bedded. Estimate to range in thickness from less than 1 meter to more than 3 meters. Surface is generally smooth except for low scarps. | | |
| GLACIAL DEPOSITS | | | |
| Qdc | MODIFIED TILL- Heterogeneous mixtures of gravel, sand, and silt with occasional to numerous cobbles and boulders deposited initially from glacial ice and subsequently reworked by meltwater, debris flows, gelifluction, solifluction, and frost creep. Generally massive bedded. Estimated to range in thickness up to 25 meters; thickest on lower slopes. | | |
| Qd | TILL- Heterogeneous mixtures of gravel, sand, and silt with occasional to numerous cobbles and boulders deposited directly from glacial ice. May be locally reworked by meltwater, gelifluction, frost creep, and debris flows. Generally massively bedded, except thin to thick bedded where reworked by stream action. Estimated to range in thickness from 3 to more than 20 meters. | | |
| COLLUVIAL DEPOSITS | | | |
| Qc | UNDIFFERENTIATED COLLUVIUM- Heterogeneous mixtures of angular rock fragments, gravel, sand, and silt left on slopes or at the bases of slopes by complex mass-movement processes, including free fall, bouncing, rolling, sliding, snow avalanches, gelifluction, and frost creep. Locally washed by meltwater slope runoff. Bedding is medium to thick. Estimated thickness is up to 6 meters. Surface is generally smooth and follows configuration of underlying bedrock surface. | | |
| Qcd | DEBRIS-FLOW DEPOSITS- Tongues, fans, and cones deposited by the slow to rapid flowage of water-saturated masses of unsorted gravel, sand, and silt with occasional to numerous cobbles and boulders. On slopes may contain numerous angular fragments of local bedrock. Locally washed by meltwater and slope runoff. Bedding is medium to thick. Estimated thickness is up to 5 meters. Surface is slightly irregular, ridged, and furrowed. | | |
| Qcl | FLUVIAL-COLLUVIAL FAN DEPOSITS- Heterogeneous mixtures of angular rock fragments, gravel, sand, and silt deposited at the mouths of steep bedrock canyons and sideslopes primarily by debris flows and during stream floods caused by heavy summer rainfall. Estimated thickness is up to 15 meters. Surface is generally smooth, except for shallow, steep-sided channels, and covered by scattered boulders. | | |
| Qct | TALUS- Very unsorted mixtures of angular rock fragments, gravel, sand, and silt deposited at the mouths of bedrock couloirs as individual particles by snow avalanches, free fall, tumbling, rolling, and sliding. Estimated thickness is up to 15 meters. Surface is typically smooth and cone or apron shaped, and covered by numerous angular boulders. | | |

- GEOLOGIC MAP SYMBOLS**
- Contact - dashed where approximate, dotted where concealed.
 - Thrust fault - dashed where approximately located or inferred, dotted where concealed.
 - High-angle fault - dashed where approximately located or inferred, dotted where concealed. Bar and ball indicate dip.
 - Lineament - visible on air-photos or ground surface.
 - Syncline - troughline, dashed where approximately located, dotted where concealed.
 - Strike and dip of bedding.
 - Strike and dip of phyllitic foliation. Inclined arrow indicates lineation.
 - Strike and dip of fracture cleavage.
 - Strike and dip of shear zone.
 - Iron oxide-cemented tectonic breccia.
 - Mineral-prospect adit.
 - Small mineral-prospect pit.
 - Active mine.
 - Quartz-carbonate-chlorite-vein material.
 - Mineralized vein, dashed where approximately located.
 - Prospect shaft.
- IGNEOUS ROCKS**
- Kd Late Cretaceous } CRETACEOUS
- METAMORPHIC ROCKS**
- Kbp **BLACK PHYLLITE-** Black to dark gray phyllite and siltstone. Forms steep jagged cliffs mantled by slabby, irregular, shingled talus and underlies extensive soil covered slopes and saddles. Randomly oriented porphyroblasts of brown biotite (1 to 2 mm in diameter) are present in varying amounts. The biotite porphyroblasts are more abundant on Gold Hill and in the black phyllite exposed in Lucky Gulch. Foliation is subparallel to compositional layering at most outcrops. Numerous low-angle, north-dipping shear zones are apparent in cliff faces.
 - Kgw **META-GRAYWACKE-** Dark gray-brown to dark gray, well foliated, fine-grained, slightly calcareous, lithic meta-graywacke and quartz-pebble meta-conglomerate. Forms prominent cliffs within the Black Argillite and Black Phyllite units. Lithic fragments consist of flat, black slate clasts up to 0.5 cm in longest dimension, and polycrystalline quartz pebbles to 1 cm. Degree of quartz pebble deformation varies from moderate flattening in quartz-rich units, to extreme stretching in units having a phyllitic matrix.
 - Kgp **GREEN PHYLLITE-** Green, greenish-gray, and mottled green and tan quartz muscovite phyllite. Forms subdued outcrops mantled by slabby irregular talus ranging up to 1 meter in greatest dimension. Pervasive ferroan-carbonate microveinlets and thin lensoid compositional layers. Weathering of the ferroan-carbonate imparts a salmon-orange-to-tan color in the phyllite. Foliation surfaces have a distinct sheen and are sometimes weakly crenulated. Small (1 mm) randomly oriented, brown biotite porphyroblasts are commonly present on foliation surfaces. Brown biotite also is present as part of micaceous compositional banding in the phyllite. Abundance of biotite porphyroblasts is greatest on Gold Hill. Sparse black tourmaline needles about 1 to 3 mm long occur in the green phyllite adjacent to the Yellow Horn prospect.
 - pJh pJba pJga **TUFFACEOUS PHYLLITE-** Black, mottled gray, and yellowish-green, thinly-laminated, fissile phyllite commonly having paper-thin parting parallel to foliation. Siliceous units support low cliff faces. Outcrops characterized by mantle of small (2.5 to 15 cm diameter) irregular flakes-to-slabs of phyllite. Randomly oriented dark brown biotite porphyroblasts present in variable amounts are more common on Gold Hill. Yellowish-green phyllite hosts tectonically dismembered and foliated meta-igneous porphyry boudins (pJh) and occasional conformable quartz-carbonate-chlorite lenses up to 0.6 meter thick and 3 meters in long dimension.
 - pJba **BLACK META-ARGILLITE-** Black, dark gray, and dark greenish-gray argillite, graywacke, siltstone, and rhytmite. Outcrops vary from smooth rounded slopes to blocky angular outcrops. Rounded slopes covered with rubble of thin fissile argillite plates 15 to 25 cm in largest dimension. Blocky to slabby angular talus armor base of graywacke and rhytmite cliffs. Original bedding occasionally apparent. Cleavage fractures are the most obvious structural elements. Stipples = graywacke.
 - pJga **GREEN PYRITIC META-ARGILLITE-** Green, grayish-green, reddish brown, limonite stained weathered surfaces, green to grayish green on fresh surfaces. Predominantly massive argillite and minor siltstone. Extensively brittily fractured to small angular fragments up to 15 cm in largest dimension. Forms smoothly rounded, resistant, rubble-covered knolls west and south of the Wagner Lode mine. Sporadically distributed small (1 to 2.5 cm) porous gray patches occasionally present throughout the unit are probably the result of surficial weathering of sulfide minerals. The green color, limonite staining, and evidence of sulfide minerals may be the result of alteration associated with localized mineralization.
- IGNEOUS ROCKS**
- Kd d **MONZODIORITES AND QUARTZ-DIORITES-** Medium to dark gray or gray-brown weathering, medium to dark gray on fresh surfaces. Forms subangular blocky talus which mantles the stocks. Texture varies from fine-grained equigranular to fine-grained porphyritic. Modal and normative composition varies from monzodiorite to diorite, quartz-diorite, and quartz-monzodiorite. Intrusions have been regionally metamorphosed and perhaps altered by local mineralization. Weak to moderate foliation is common. Brown biotite, green to pale-green chlorite, clinzoisite, sericite, incipient albite porphyroblasts and occasional tremolite are common metamorphic minerals that partially obscure primary igneous textures. Anhydrous to euhedral sphene and ilmenite are common trace minerals. Late, dark, blue-gray tourmaline and colorless apatite are common secondary trace minerals. Carbonate patches and microveinlets are always present. Dikes (d) and sills (s) of andesite- and very fine-grained diorite porphyry are compositionally similar to the stocks.