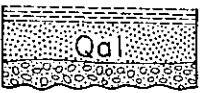





GEOLOGIC COLUMN AND UNIT DESCRIPTIONS

AGE	ROCK UNIT	LITHOLOGY; THICKNESS WHERE KNOWN	UNIT DESCRIPTION	ECONOMIC VALUE	REFERENCES
QUATERNARY	Alluvium 	Clay, sand and gravel; thickness less than 10 meters	Alluvium, consisting of clay, sand and gravel, is distributed in the drainage basins of the Han-no Ho (罕諾河), the Erh-ken Ho (二根河), the Nan-weng Ho (南翁河), the Wo-la-ken Ho (倭拉根河), the T'a-ha Ho (塔哈河), the Ta-pu-k'u-erh Ho (多布庫爾河) and their tributaries. The deposit contains promising placer gold derived from the pre-Jurassic granite (g ₂).	Gold Placer gold is found in the Recent deposits along the Ch'o-na Ho (綽納河), the Kala Ho (喀拉河), the Nei-wo-la-ken Ho (內倭拉根河), the Nan-weng Ho, the Ta-ssu-tao Kou (大四道溝), the Wu-tao Kou (五道溝), the San-tao Kou (三道溝), the Liu-tao Kou (六道溝) and the Han-no Ho. It was formerly worked prosperously. Some of the gold mines are as follows: (1) Hsing-lung-kou (興隆溝) Gold Mine, along the Ch'o-na Ho, was formerly called the Hu-ma Ho Gold Mine. A gold-bearing sand and gravel bed, lying 0.6 - 1 m below the surface, is 0.6 m to 1.8 m thick. The bed is widely distributed and contains 13 - 27 gr gold per ton on an average, and locally exceeded 150 gr per ton. A total of 750 kg of pure gold was produced in 1913. According to W. J. TOIMATSCHIEFF (1930), the Kuang Hsin (廣信) Co. managed eleven gold mines in the vicinity of Hsing-lung-kou, with 10,000 to 20,000 gold diggers, and produced 1,700 kg of pure gold in 1915 and 1916. (2) Hsi-pei-li (西北里) Gold Mine (not shown on map) is 1.7 km west of Hsing-lung-kou. A gold-bearing sand and gravel bed, 0.3 to 1.2 m thick, contains 10 to 27 gr of gold per ton on an average.	Geological Institute, South Manchuria Railway Co., 1933, Report on the mineral resources in Manchuria, no. 1. _____ 1938, Map of North Manchurian mineral resources, scale 1:500,000. (Unpub.) Research Section, South Manchuria Railway Co., 1938, Outline of Manchurian economy. SAITŌ, Rinji, compiler, 1940, Geological map of Manchuria and adjacent area, scale 1:3,000,000: Manchoukuo Geol. Inst. TOIMATSCHIEFF, W. J., 1930, Mineral resources and mining industry in the Far East: Manchuria Mining Assoc. Rept.
TERTIARY	Neogene formation 	Sandstone, shale, lignite, bentonite and gravel; thickness unknown	The Neogene formation near Ka-lu-ho (喀魯河), resting on the pre-Jurassic granite, consists of reddish yellow to gray soft rough sandstone, dark brown to black clayey shale, lignite, bentonite and gravel. It is generally flat lying and is correlated with the Pliocene continental deposit along the Amur River.		
MESOZOIC	Cretaceous granite 	Porphyritic granite, felsitic granite, graphic granite, aplite, quartz porphyry, syenite and diorite	Cretaceous granite is generally rough, friable, massive, coarse- to medium-grained, and more or less porphyritic, consisting mainly of pinkish idiomorphic microcline, idiomorphic to hypidiomorphic quartz and a small amount of biotite or hornblende. The granite is locally accompanied by felsitic granite, graphic granite, aplite, quartz porphyry, syenite and diorite. The Recent deposits in the Cretaceous granite region are destitute of placer gold.		
	Pre-Jurassic granite 	Gneissose granite, aplite, granodiorite and quartz diorite	Pre-Jurassic granite is light gray, pinkish gray or pinkish green, fine- to coarse-grained, subequigranular and more or less gneissose, consisting of orthoclase, plagioclase, small amounts of quartz, biotite, hornblende, muscovite, and accessory minerals such as apatite, magnetite, titanite and zircon. Muscovite phenocrysts occur only in gneissose granite. Titanite phenocrysts 1.5 mm in diameter are locally found. The granite is locally accompanied by aplite, granodiorite and quartz diorite. It is intruded by the Cretaceous gold-bearing quartz veins which are considered to be the source of the placer gold in the nearby Recent deposits. The geologic boundary between this granite and the Cretaceous granite is unknown.		
	(Column not drawn to scale)				