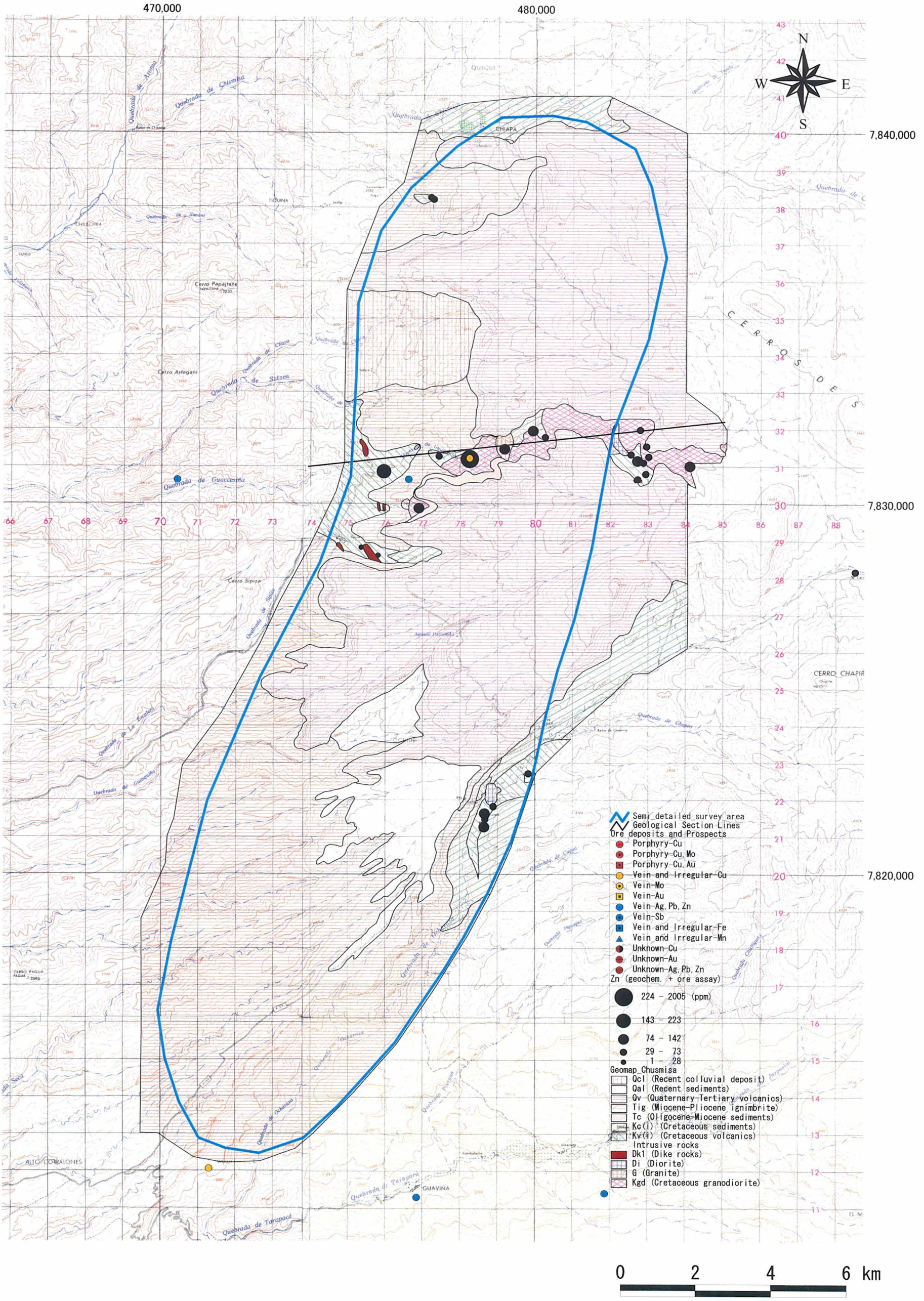


Fig. 2-2-54 (5) Geochemical Anomaly Map in the Chusmisa Area (Zn)

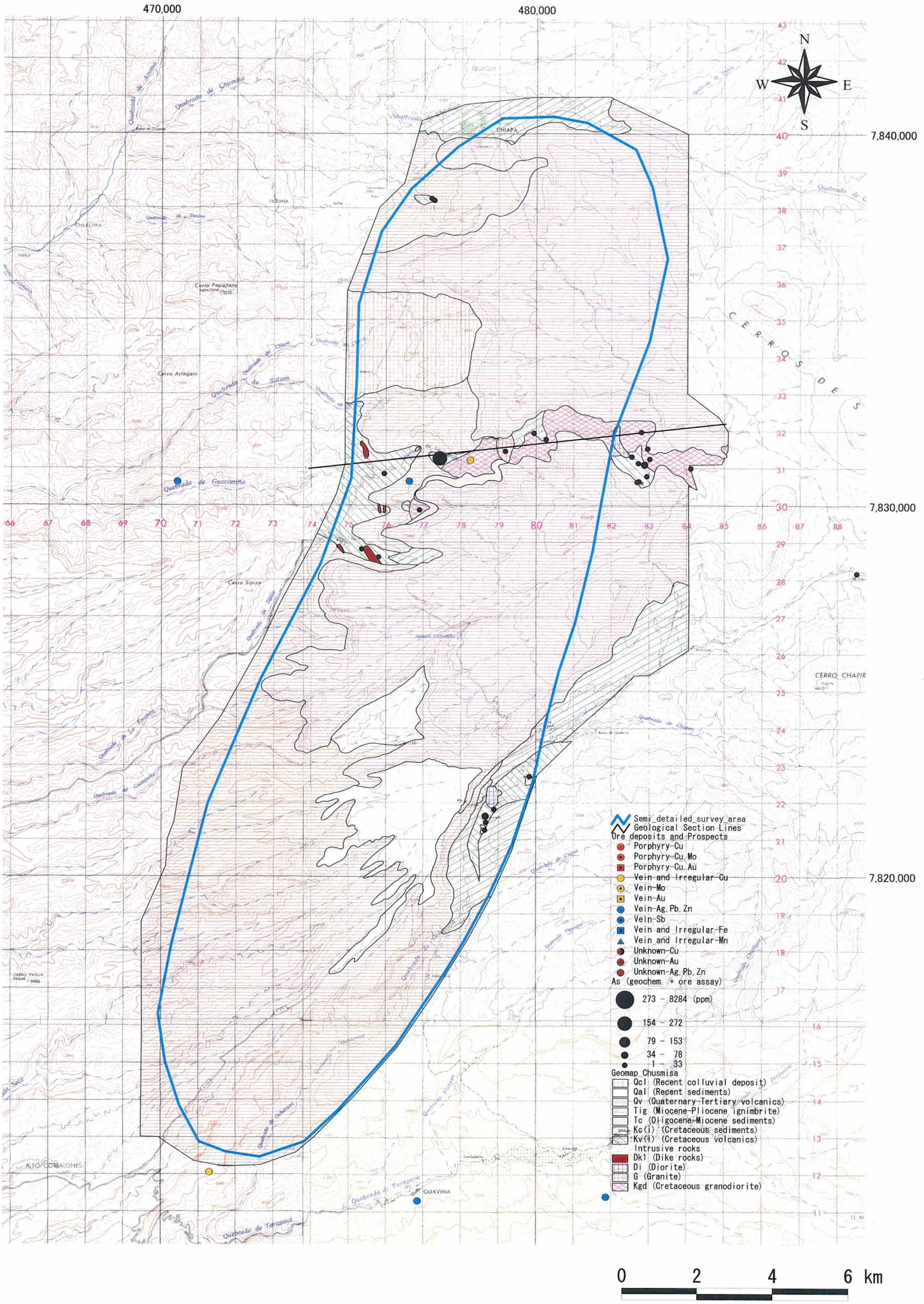


Fig. 2-2-54 (6) Geochemical Anomaly Map in the Chusmisa Area (As)

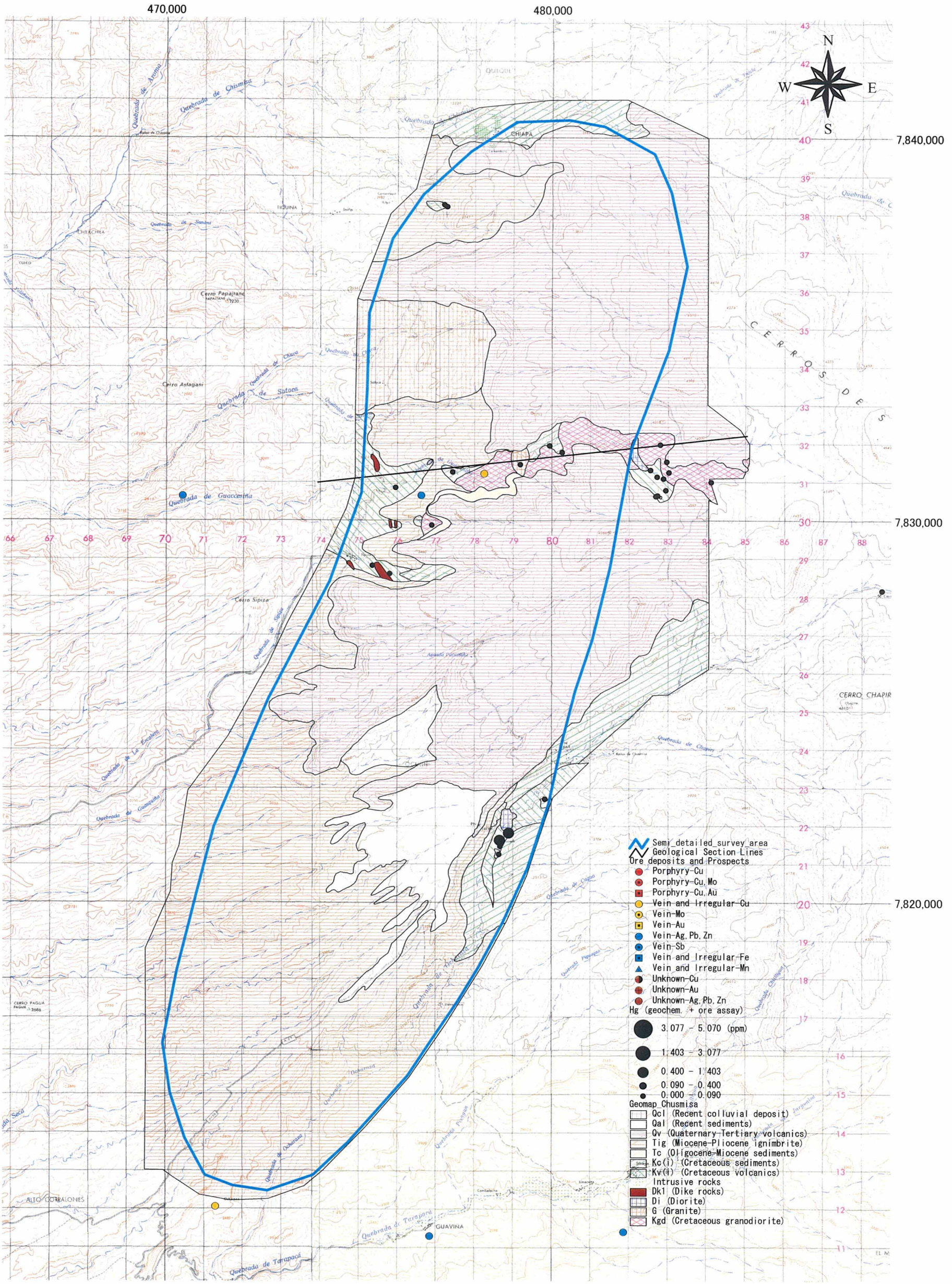


Fig. 2-2-54 (7) Geochemical Anomaly Map in the Chusmisa Area (Hg)

rocks surrounding the above sericitized zone. Contact metamorphic facies containing biotite is found in the silicified zone. Quartz veinlets containing pyrite are observed in the diorite in the eastern part, and pyrite veinlets and pyrite dissemination occur in the silicified zone in the granodiorite and Cretaceous System. Quartz-tourmaline veins containing copper oxide minerals occur in granodiorite of the western part of the area, and they have been mined for about 10m in both horizontally and vertically. Silicification, similar to that in the eastern part, is developed in the Cretaceous sedimentary rocks and pyroclastic rocks to the west of this vein.

The southern alteration zones are developed in diorite, granite porphyry, and their vicinity. Sericitic-tourmalinized zone occur in granite porphyry and its vicinity, and propylitized zone occurs surrounding the sericite-tourmaline zone. Ore minerals are not observed.

Regarding rock geochemical anomalies, (Au)-Ag-Pb-Zn-As anomalies were detected in the central alteration zone and Hg anomalies in the southern alteration zone.

The central alteration zone which is developed mainly in granitic rocks, is located in the airborne intermediate magnetic intensity zone and its vicinity. The eastern side of this alteration zone overlaps the periphery of short wavelength low airborne magnetic anomaly and also the western side overlaps the periphery of the medium wavelength high airborne magnetic anomaly zone. Also the southern alteration zone developed in the vicinity of granitic rocks is located in the overlapping part of the periphery of short wavelength high magnetic anomaly zone, adjacent to the medium wavelength low anomaly zone, and intermediate magnetic intensity zone.

2 - 11 District to the northeast of Chusmisa

A geological map of this area is shown in Figure 2-2-55, schematic geologic columns in Figure 2-2-56, mineral showings in Figure 2-2-57, distribution of altered minerals in Figure 2-2-58, and rock geochemical anomaly distribution in Figure 2-2-59.

The geology of this area consists of Middle~Upper Tertiary System and Upper Tertiary-Quaternary System.

The Middle~Upper Tertiary System consists of Neogene Miocene~Pliocene ignimbrite (rhyolitic welded tuff · pumiceous tuff), and is unconformably overlain by Upper

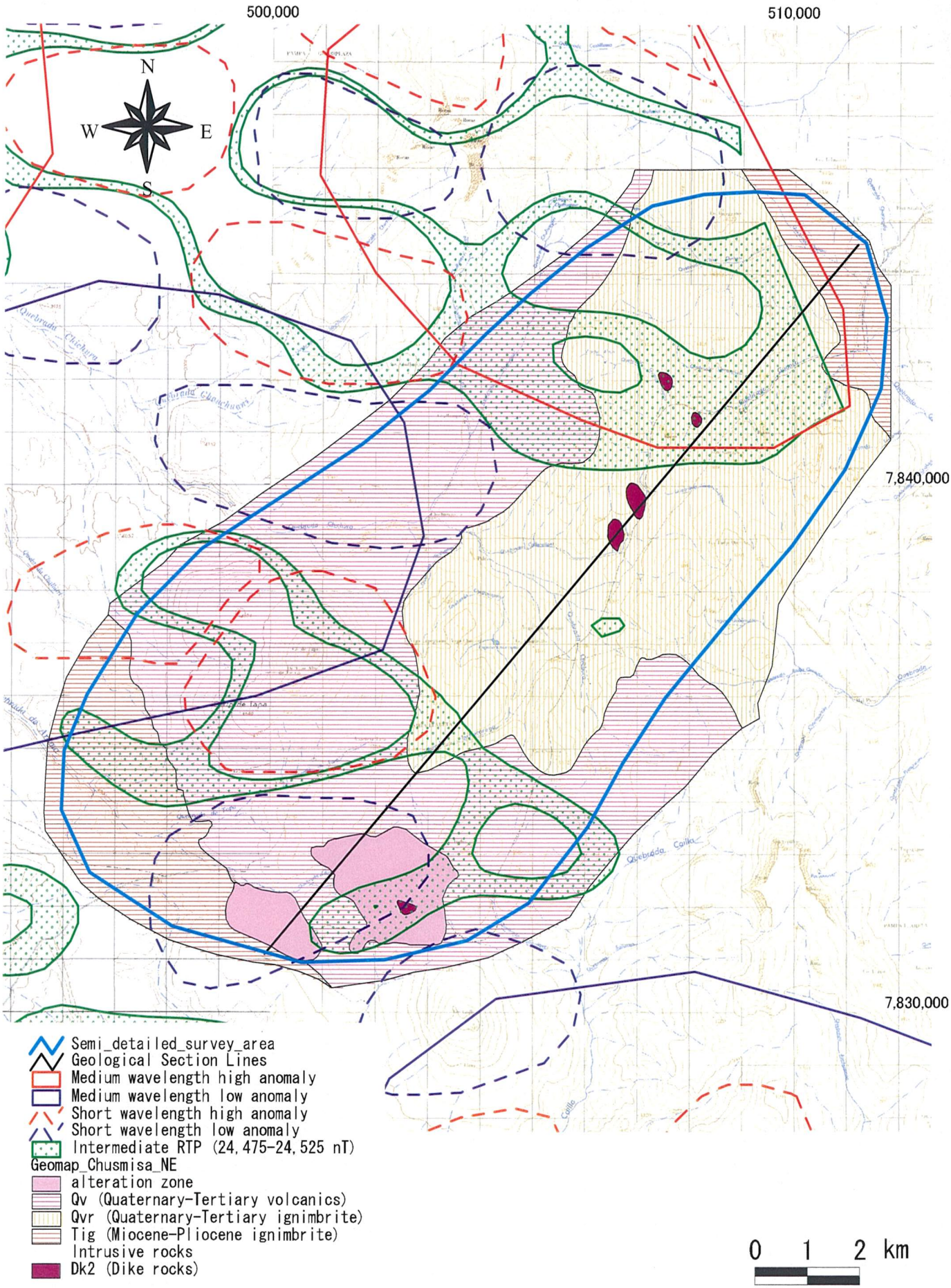
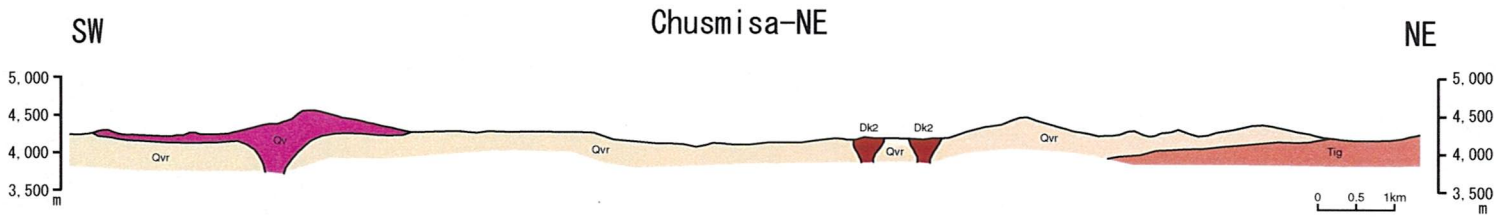


Fig. 2-2-55 Geological Map of the Area to the Northeast of Chusmisa



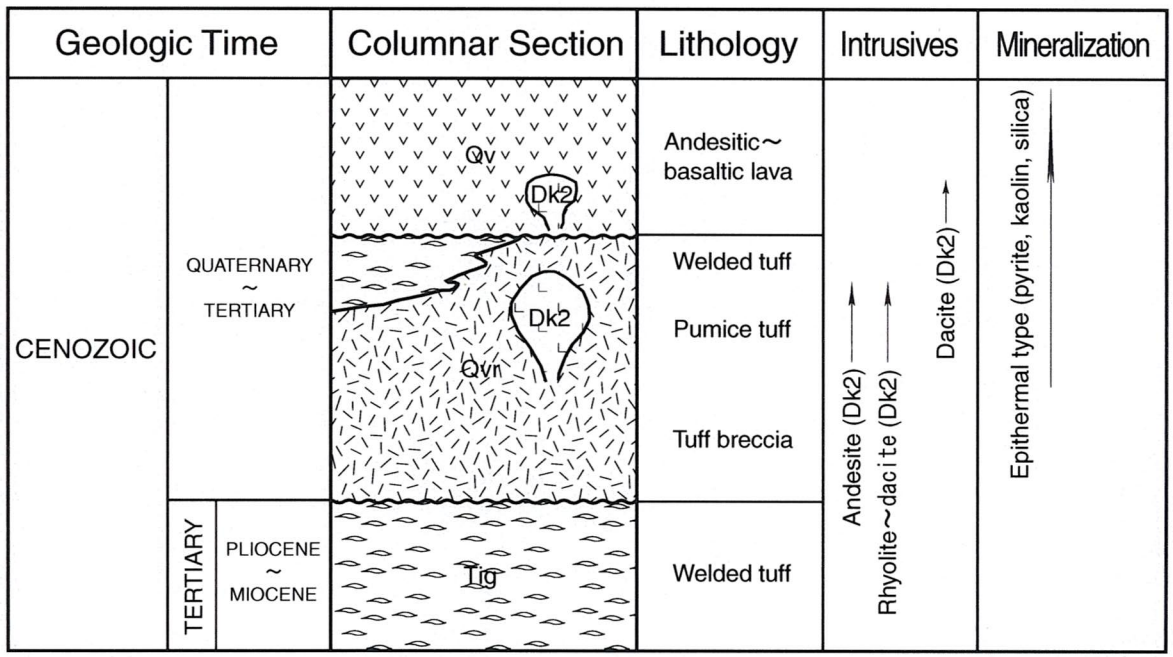


Fig.2-2-56 Schematic Stratigraphic Columns and Profiles of the Area to the Northeast of Chusmisa

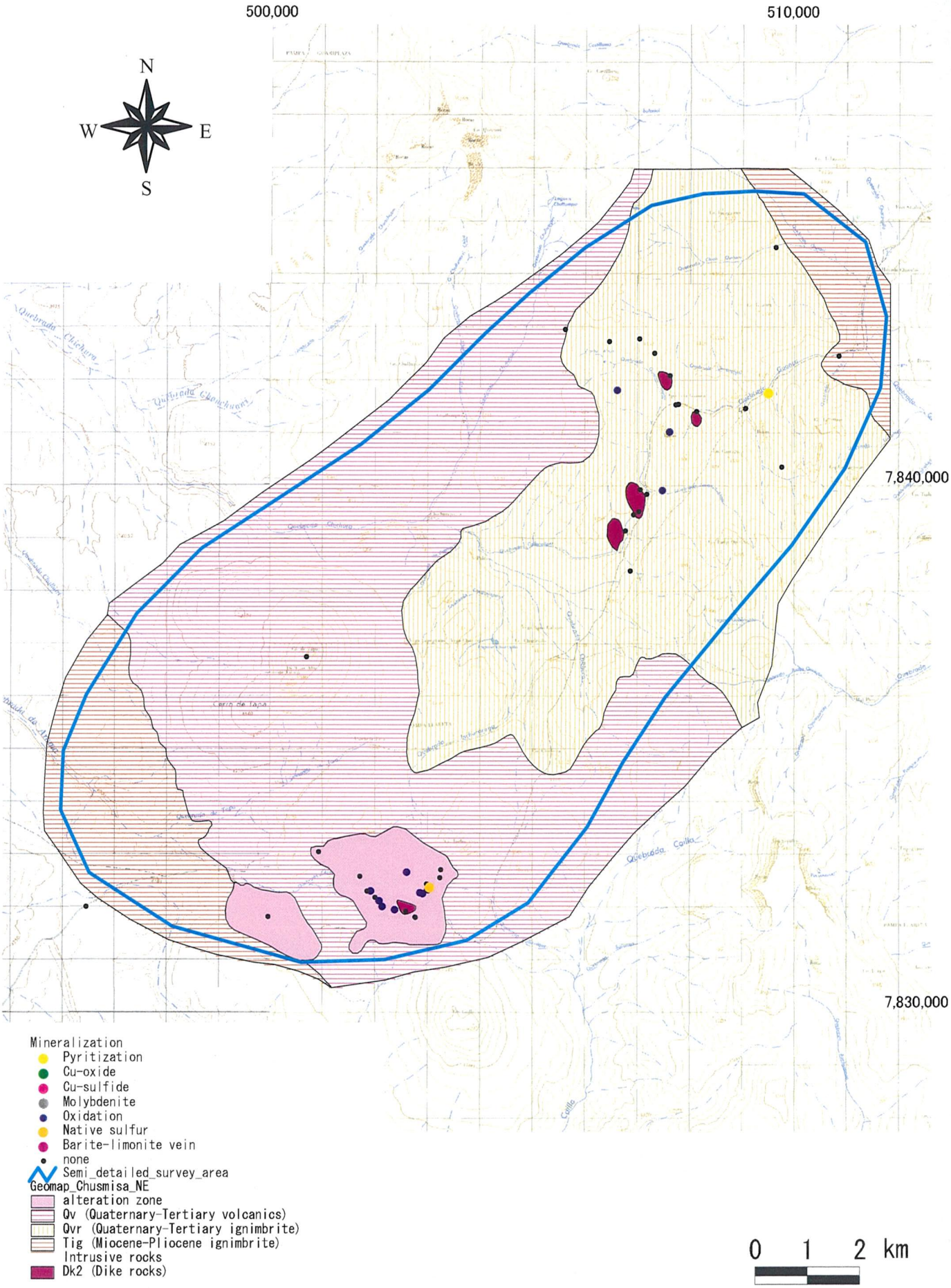


Fig. 2-2-57 Mineralization Map of the Area to the Northeast of Chusmisa

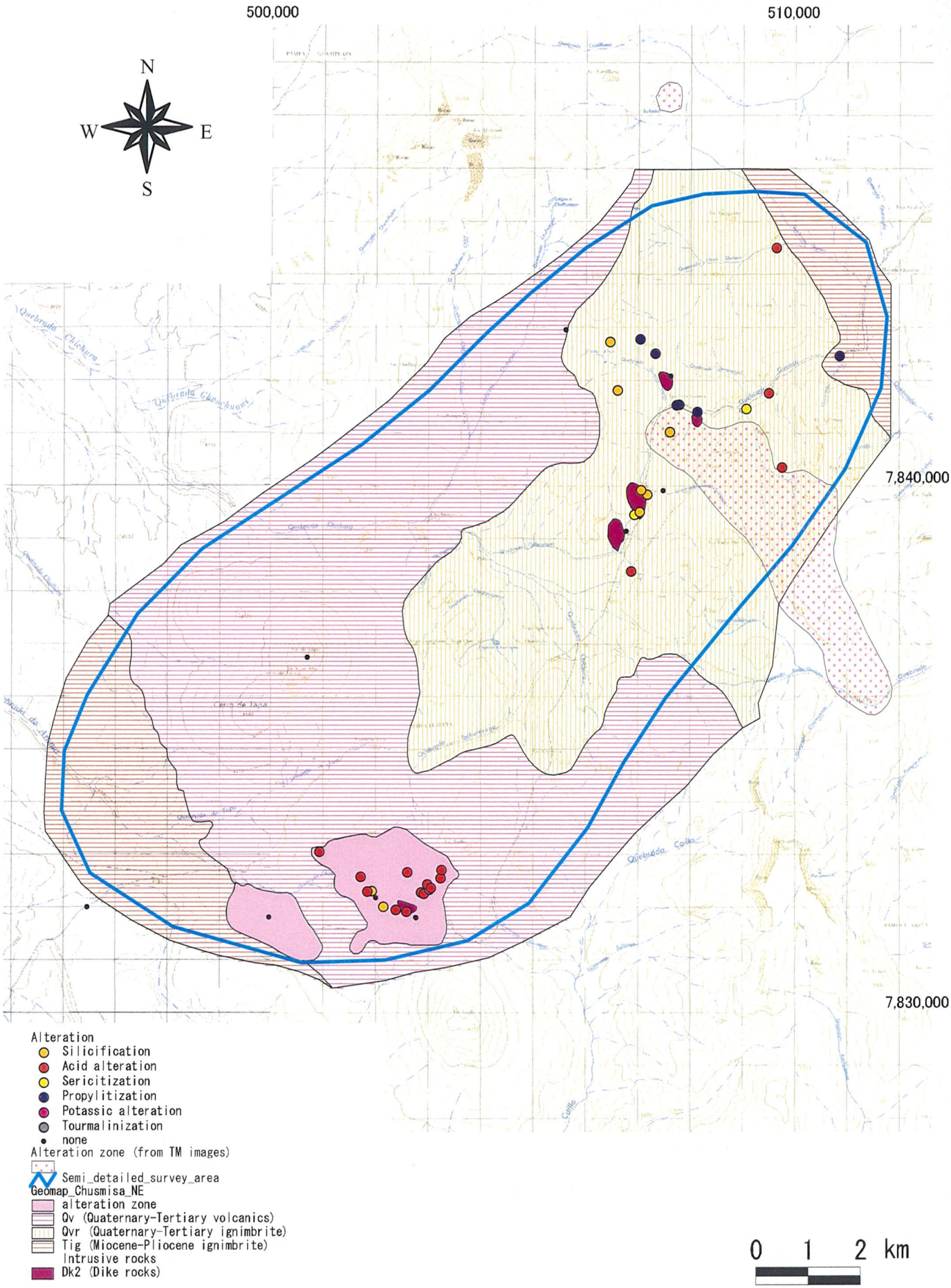


Fig. 2-2-58 Distribution Map of Alteration Minerals at the Area to the Northeast of Chusmisa

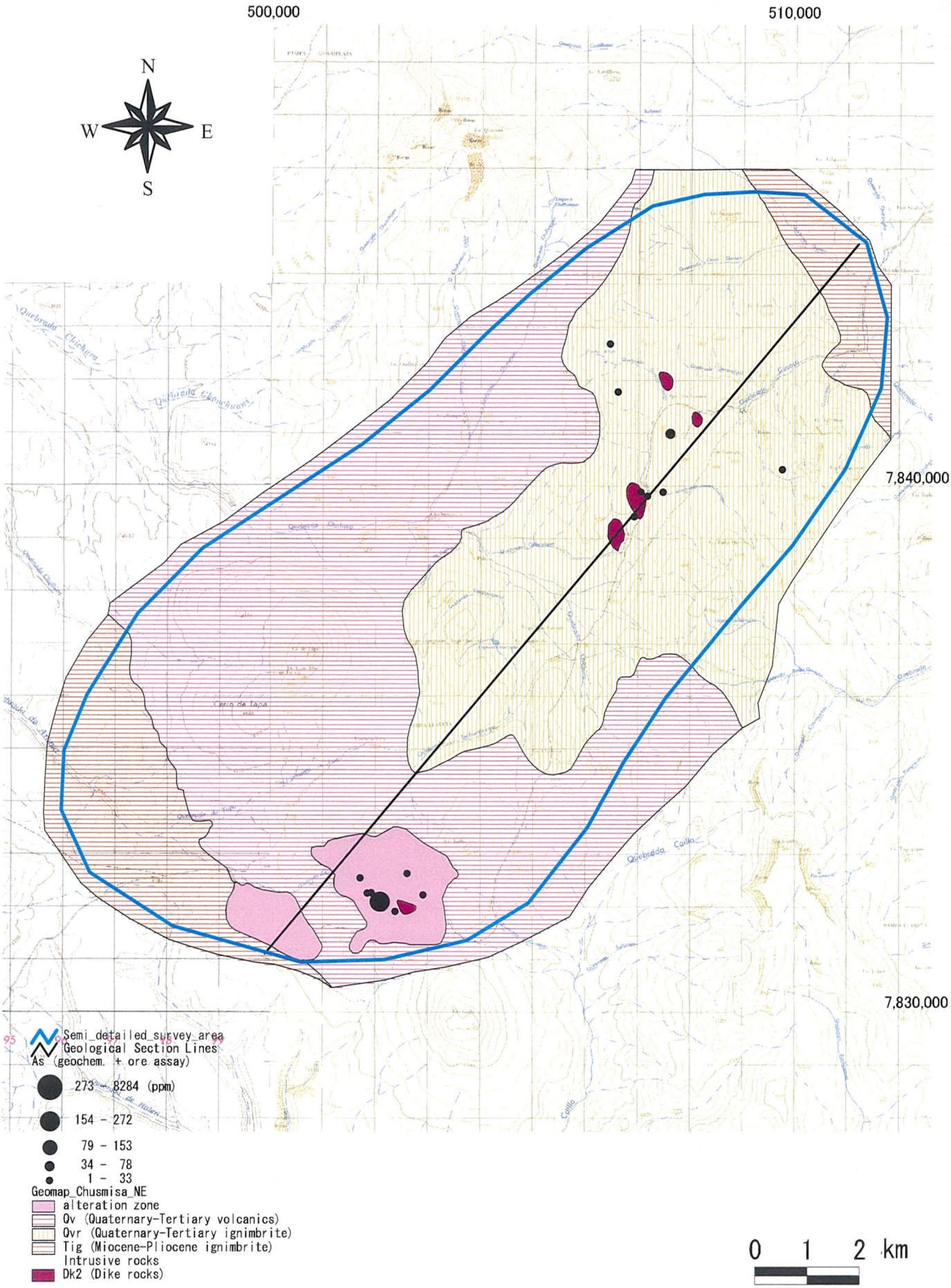


Fig. 2-2-59 (1) Geochemical Anomaly Map in the Area to the Northeast of Chusmisa (As)

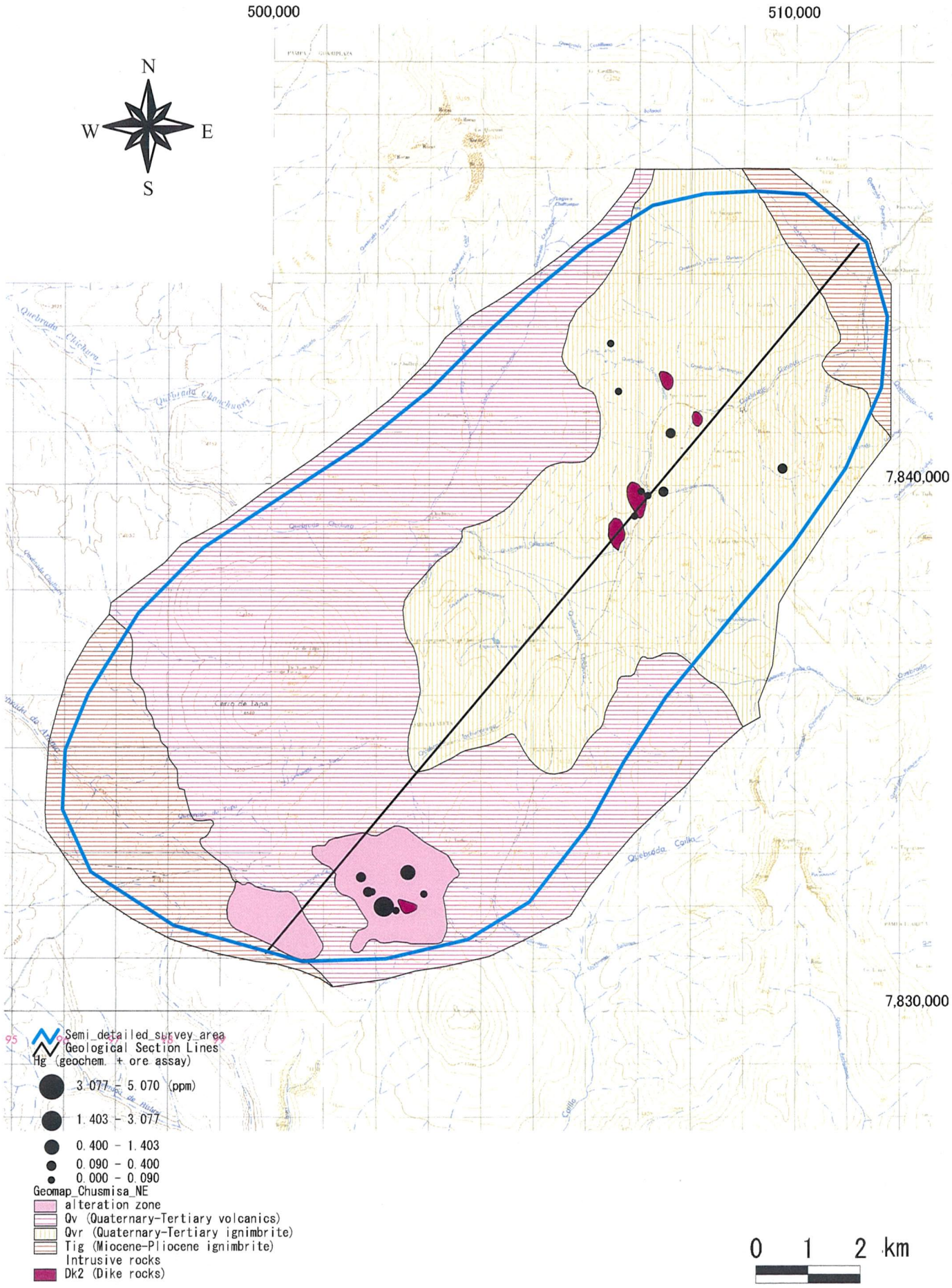


Fig. 2-2-59 (2) Geochemical Anomaly Map in the Area to the Northeast of Chusmisa (Hg)

Tertiary-Quaternary System.

The Upper Tertiary-Quaternary System is composed of ignimbrite (rhyolitic welded tuff・pumiceous tuff) and unconformably overlying andesitic~basaltic lava. Andesite or rhyolitic~dacitic plug intrudes the ignimbrite and dacite plug intrudes the lava.

White alteration zones are distributed widely in the southern and northeastern parts of this area. These are mainly silicified and kaolinized zones and they are accompanied by limonite or native sulfur dissemination in the south, and by pyrite dissemination in silica sinter in the northeast.

Notable rock geochemical anomalies in this area are high As-Hg anomalies.

The above alteration zones occur in the intermediate airborne magnetic intensity zone. The northeastern alteration zone occurs at the periphery of medium wavelength high magnetic anomaly zone, and the southern alteration at the periphery of short wavelength low magnetic anomaly.

2 - 12 Pailca district

A geological map of this area is shown in figure 2-2-60, and schematic geological columns in Figure 2-2-61.

The geology of this area consists of Upper Tertiary System, Upper Tertiary-Quaternary System and Quaternary System.

The Upper Tertiary System is composed of Miocene-Pliocene ignimbrite (rhyolitic tuff・pumiceous tuff with conglomerate intercalation) and is overlain unconformably by Upper Tertiary-Quaternary System.

The Upper Tertiary-Quaternary System consists of conglomerate and is unconformably overlain by Quaternary System.

The Quaternary System consists of alluvium, landslide deposits, and talus deposits.

Alteration zones and mineralized zones do not occur in this area.

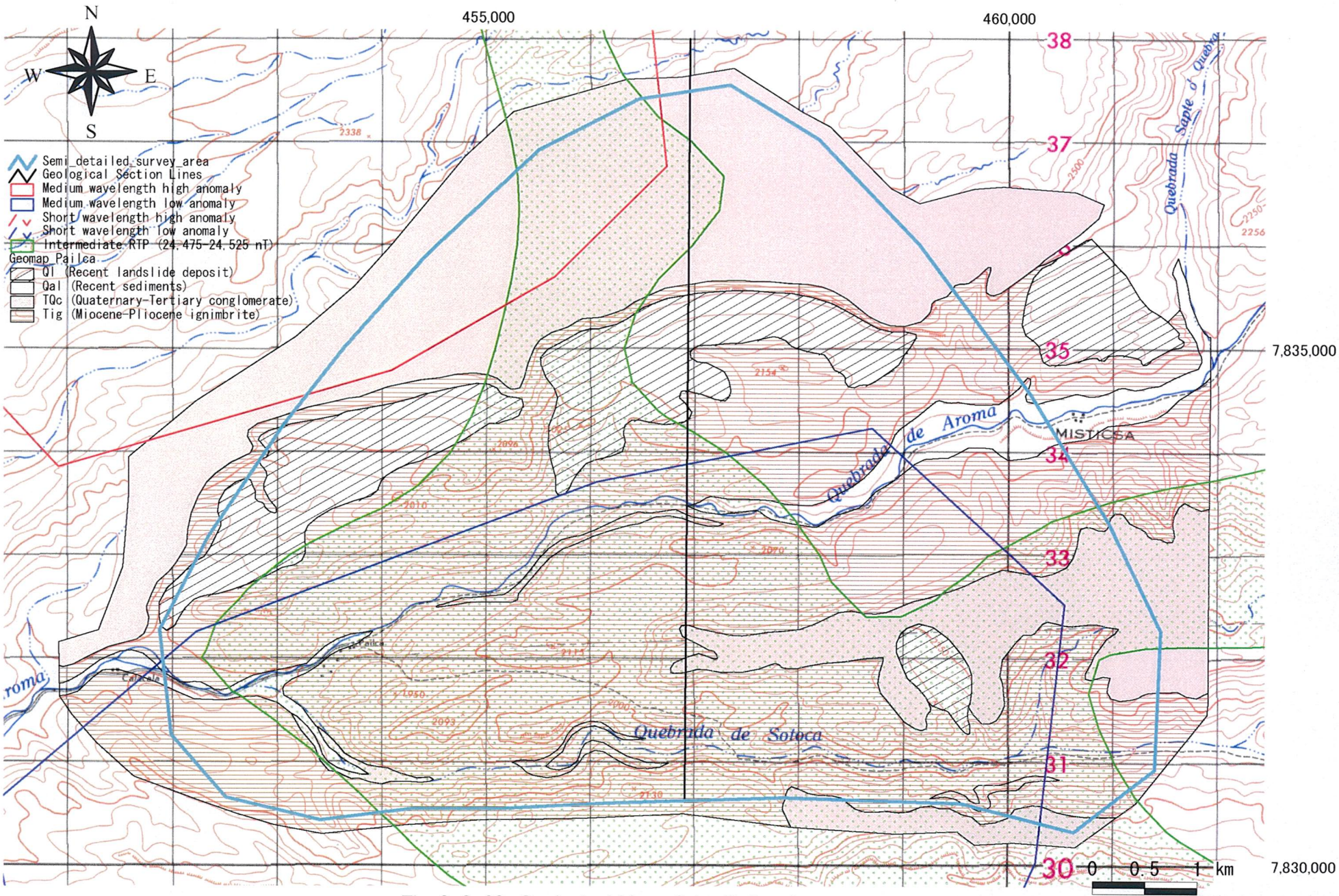
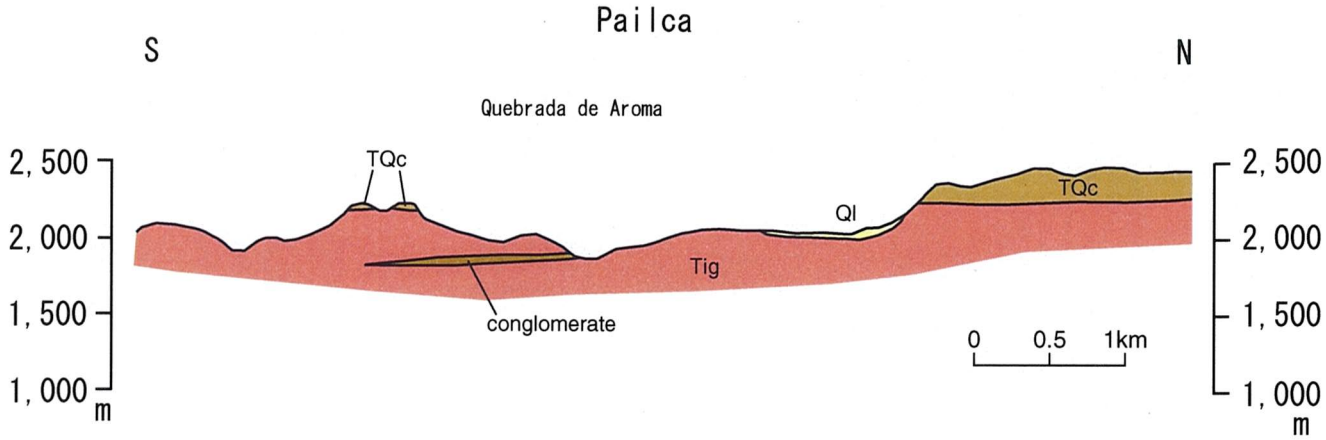


Fig. 2-2-60 Geological Map of the Pailca Area



Geologic Time			Columnar Section	Lithology	Intrusives	Mineralization
CENOZOIC	QUATER-NARY	HOLOCENE	Ql, Qal	Landslide deposit Alluvium		
	QUATERNARY ~ TERTIARY		TQc	Conglomerate		
	TERTIARY	PLIOCENE ~ MIOCENE	Tig	Pumice tuff Welded tuff Conglomerate		

Fig.2-2-61 Schematic Stratigraphic Columns and Profiles of the Pailca Area

From airborne magnetic survey, medium wavelength high anomaly, medium wavelength low anomaly, intermediate intensity zones have been extracted from this area. And the medium wavelength high anomaly is correlated to Upper Tertiary-Quaternary conglomerate areas, while the medium wavelength low anomaly to Miocene-Pliocene ignimbrite areas. The geologic phenomena, which can be correlated to the intermediate magnetic intensity are not known.

2 - 13 Camiña district

A geological map of this area is shown in Figure 2-2-62, schematic geologic columns in Figure 2-2-63, mineral showings in Figure 2-2-64, distribution of altered minerals in Figure 2-2-65, and rock geochemical anomaly distribution in Figure 2-2-66.

The geology of this area consists of Upper Jurassic System, Lower Cretaceous System, Tertiary-Quaternary System, and Quaternary System.

The Upper Jurassic System mainly comprises shale, sandstone, and conglomerate.

The Lower Cretaceous System consists of andesitic~basaltic lava・pyroclastic rocks with intercalation of sandstone・shale.

The Cretaceous System is intruded by Cretaceous to Tertiary intrusive bodies. These intrusive bodies consist of granodiorite, diorite, diorite porphyry, and quartz porphyry. The age of intrusion has been considered to be Cretaceous in the existing geologic maps, but K-Ar age determination of whole rocks indicated; 58.8±2.0 Ma for diorite, 56.8±1.9 Ma and 58.1±1.9 Ma for diorite porphyry, 56.9±2 Ma and 63±2 Ma for quartz porphyry. Thus some of the intrusive activities were clarified to have occurred in Paleocene. The Upper Jurassic System, Cretaceous System, and the above intrusive bodies are overlain unconformably by Tertiary-Quaternary System.

The Tertiary-Quaternary System is composed of lower layer comprising ignimbrite (rhyolitic welded tuff・pumiceous tuff) and conglomerate・sandstone, unconformably overlain by basaltic lava.

The Quaternary System are alluvium and landslide deposits.