

Fig. 2-1-25 Distribution Map of Alteration Minerals at the Camina Area











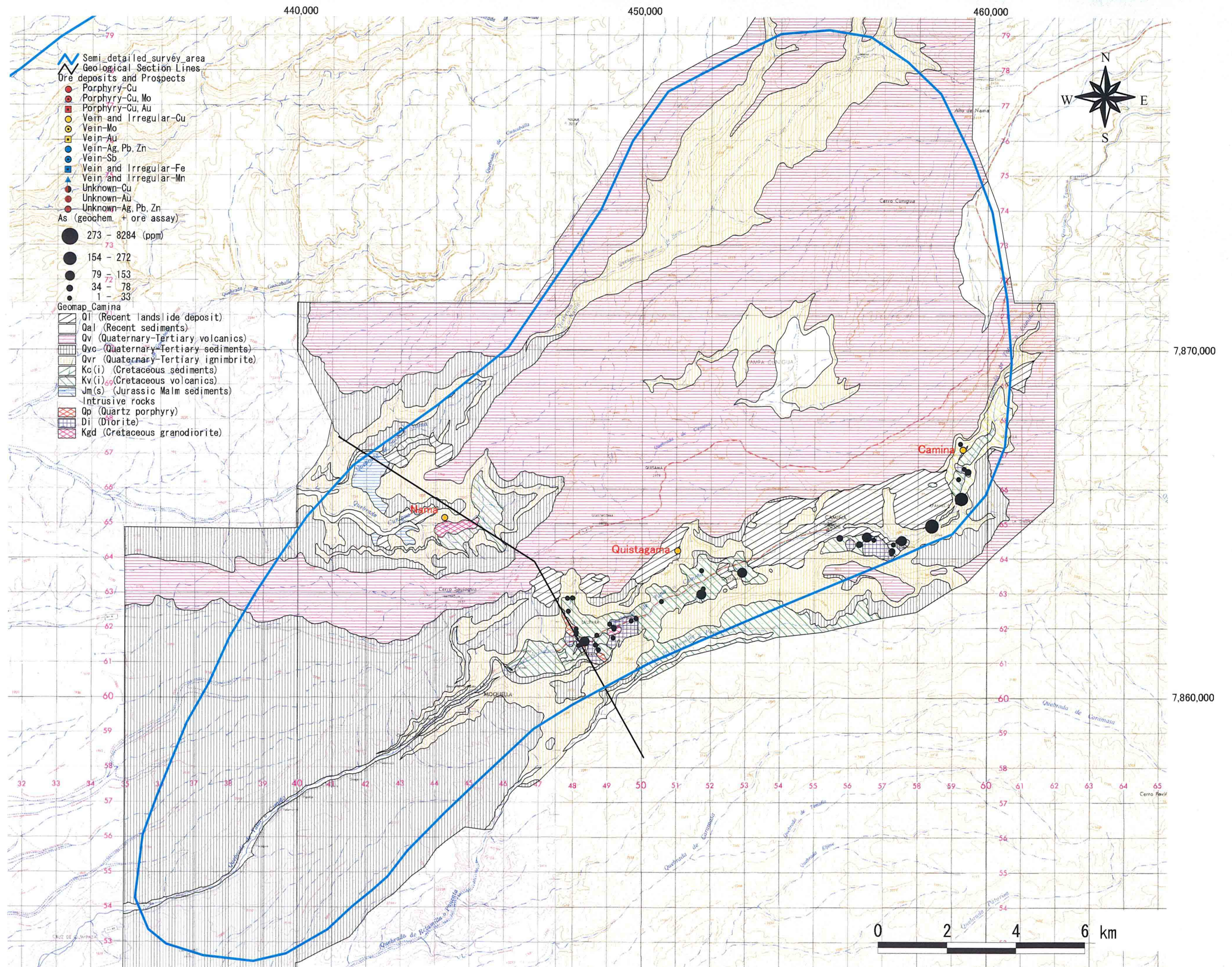


Fig. 2-1-26 (3) Geochemical Anomaly Map in the Camina Area (As)



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;  $58.8 \pm 2.0$  Ma for diorite,  $56.8 \pm 1.9$  Ma and  $58.1 \pm 1.9$  Ma for diorite porphyry,  $56.9 \pm 2$  Ma and  $63 \pm 2$  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.

Alteration zones and mineralized zones occur in the eastern and central parts of this area. Both occur in the granitic intrusive bodies and the vicinity.

The eastern alteration is silicification in the dioritic bodies and in the Cretaceous rocks in the vicinity, and the periphery is propylitized. Several veinlets containing malachite and chrysocolla are developed in the Cretaceous basaltic lava near diorite porphyry body at the eastern end of the area. This mineralized zone corresponds to the known prospect Camiña (Cu).

The alteration zone in the central part consists of strong sericitization-pyrite dissemination developed in quartz porphyry bodies arranged parallel in the N40W direction. The known prospect Quistagama (Cu) should be located nearby, but it was not confirmed. The above quartz porphyry body is directly overlain by Tertiary-Quaternary ignimbrite at both banks of Quebrada de Camiña. Linear milky white coarse-grained crystalline quartz veinlets are observed in Cretaceous andesite immediately below the ignimbrite on the north bank.

Cu prospect, Nama is reported to occur in granodiorite at 4km northwest of the central



alteration zone.

Cu-Zn-As rock geochemical anomalies were detected in the eastern alteration zone.

All of the above alteration zones and mineralized zones are located within or the vicinity of intermediate magnetic intensity zone and medium wavelength and short wavelength anomalies of airborne magnetic survey.

#### **1-2-6 Area to the northeast of Camiña**

The sampling sites of this area are shown in Figure 2-1-27, geological map in Figure 2-1-28, schematic geologic columns in Figure 2-1-29, distribution of altered minerals in Figure 2-1-30, and rock geochemical anomaly distribution in Figure 2-1-31.

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

The Tertiary System is composed of Miocene-Pliocene ignimbrite (rhyolitic welded tuff) · tuffaceous sandstone.

The Upper Neogene-Quaternary System consists of basaltic~andesitic lava. The whole rock K-Ar age of the plug-dome andesite was  $10.4 \pm 0.4$  Ma.

Quaternary unit is alluvium.

In this area, white-colored alteration is widely developed and the alteration zones occur parallel in the NW-SE direction. These alteration zones consist of sericite, kaolin, and silicification, sometimes associated with native sulfur.

Notable rock geochemical anomalies are high As-Hg anomalies.

The above alteration zones are located within the intermediate airborne magnetic intensity zone and in the periphery of medium wavelength high magnetic anomaly and in the vicinity of short wavelength high airborne magnetic anomaly.

#### **1-2-7 Minimiñe area**

A geological map of this area is shown in Figure 2-1-32, and schematic geologic columns in



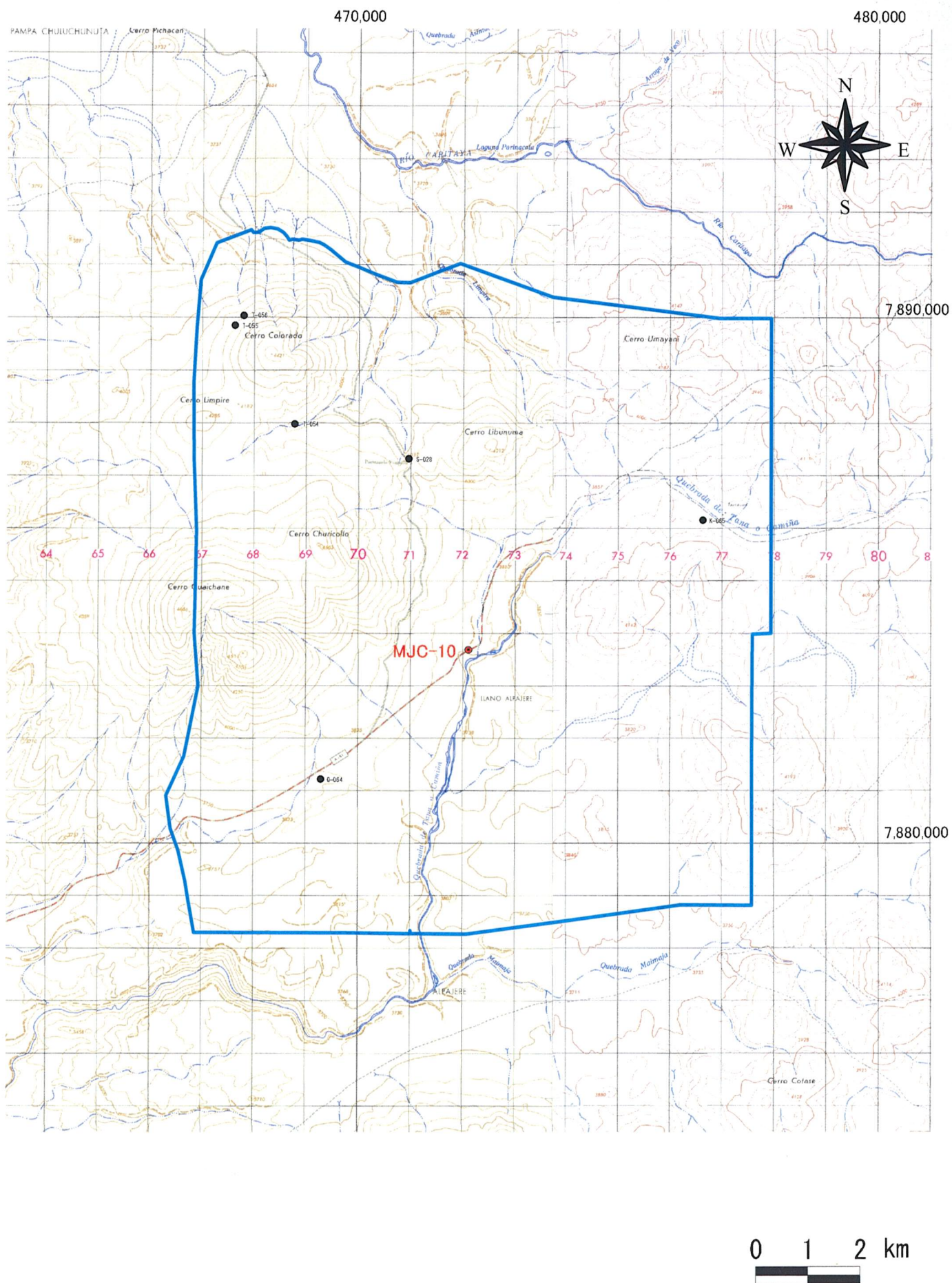
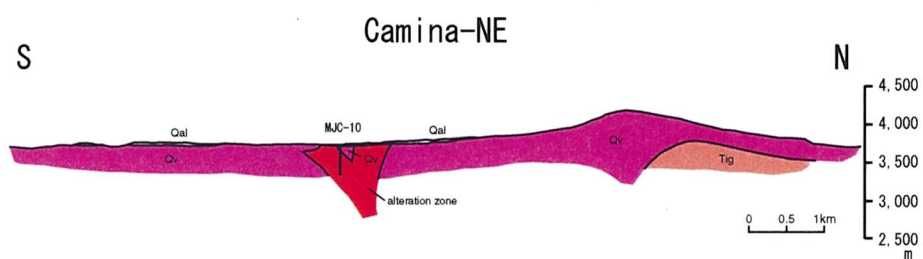


Fig. 2-1-27 Sample Location Map of the Area to the Northeast of Camina









Geologic Time		Columnar Section	Lithology	Intrusives	Mineralization
CENOZOIC	QUATERNARY -NARY	HOLOCENE	Qal Alluvium		Epithermal type ↑ (kaolin, silica, sericite)
	QUATERNARY ~ TERTIARY		Qv Basalt ~ andesite lava		
	TERTIARY	MIOCENE	Tig Tuffaceous ss. Welded tuff		

Fig. 2-1-29 Schematic Stratigraphic Columns and Profiles of the Area to the Northeast of Camiña



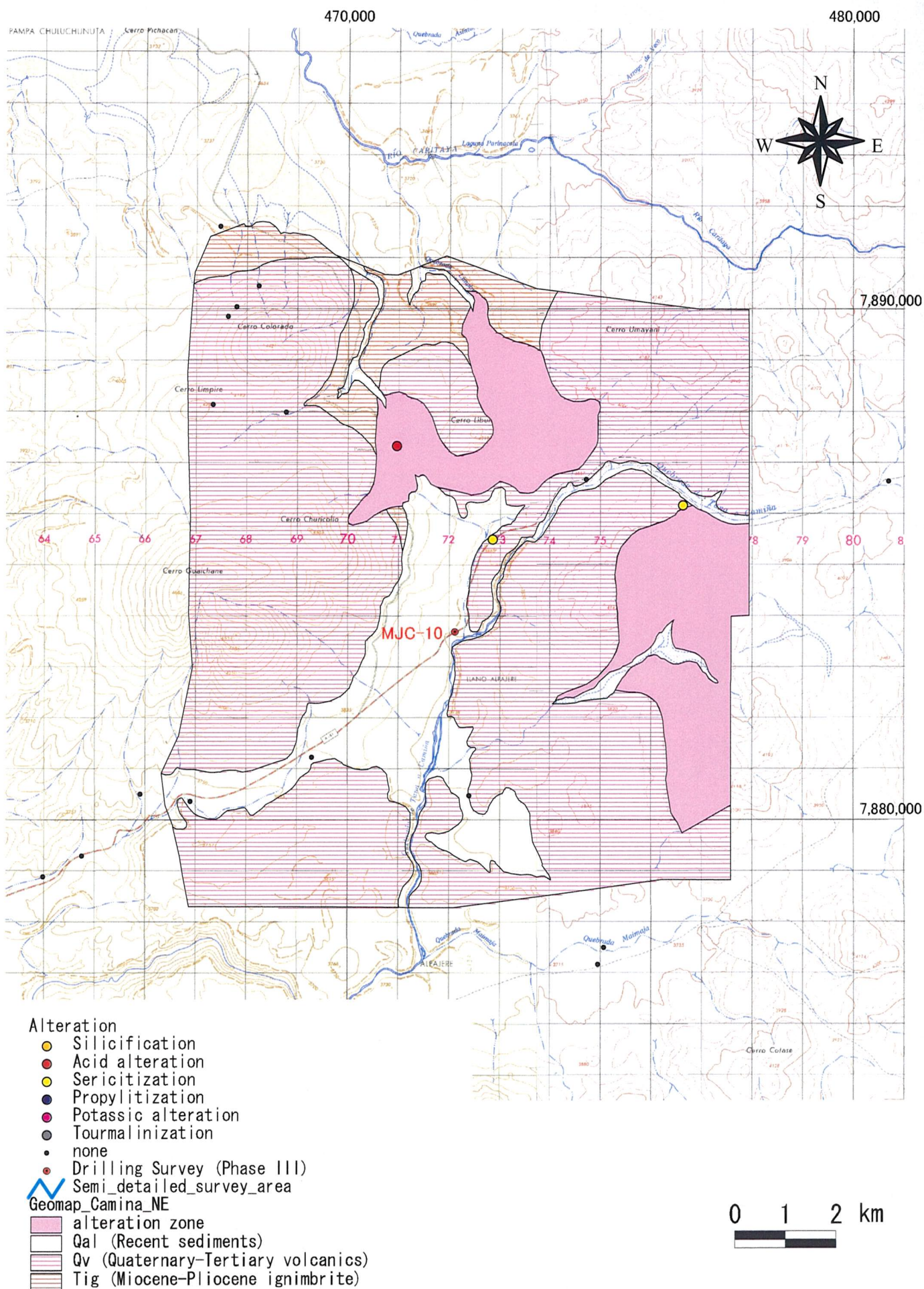


Fig. 2-1-30 Distribution Map of Alteration Minerals at the Area to the Northeast of Camina







