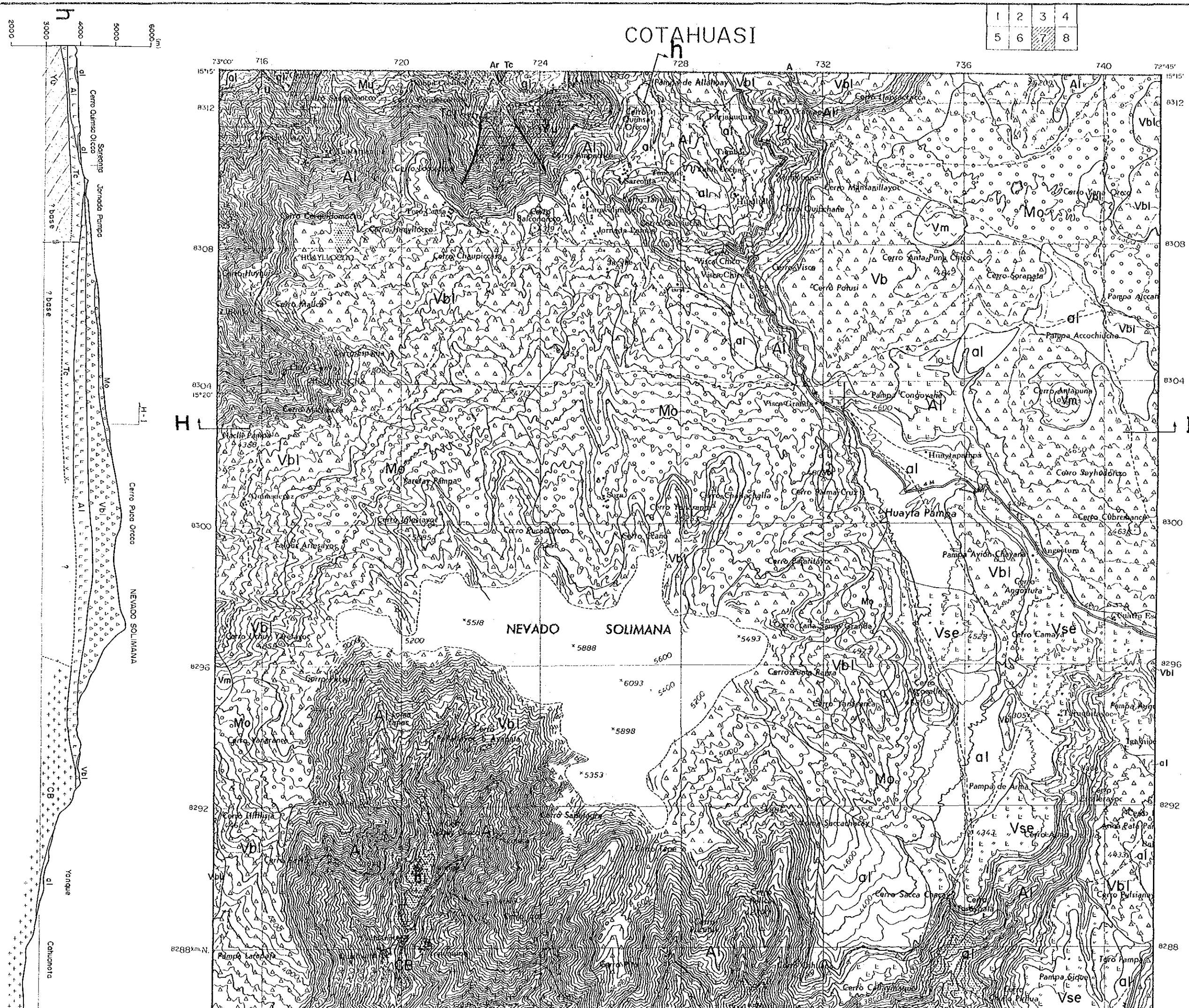
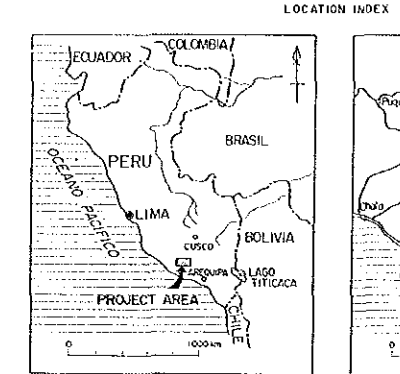


# COTAHUASI

1	2	3	4
5	6	7	8



## GEOLOGICAL MAP OF THE REGIONAL SURROUNDINGS (7)



JAPAN INTERNATIONAL COOPERATION METAL MINING AGENCY OF INSTITUTE GEOLOGICO MINERO Y PETROLOGICO  
February 1986

Scale 1:50,000

### LEGEND

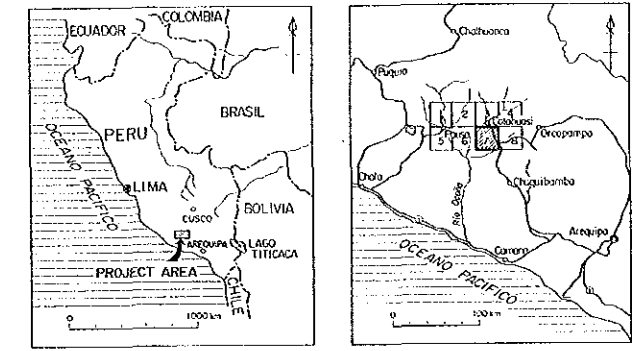
Cenozoic	Quaternary	Alluvium	al	Sand, mud and silt	
		Mollebamba Volcanic Rocks	Vm	Andesite lavas	
		Volcanic Sediment of Pousa	Vsp	Volcanic ash	
		Lampa Volcanic Rocks	Vla	Andesitic (basaltic) lavas	
	Pleistocene	Moraine Sediment	Mo	Gravel, sand and silt	
		Barroso Group	Upper	Vbu	Acidic tuff
	Lower		Vbl	Andesite lavas	
	Tertiary	Pliocene	Sencca Volcanic Rocks	Vse	Hornblende-tuff welded tuff
			Huayllillas Formation	Hy	Dacitic tuff
		Miocene	Alpabamba Formation	Al	Dacitic tuff, and welded tuff (porphyry with dacite)
Tacaza Formation			Vtc	Andesitic tuff and dacitic tuff	
Pogocene	Huanca Formation	Vhc	Andesitic volcanic tuffaceous rocks		
	Arcurquina Formation	Ar	Limestone and chert nodules		
Mesozoic	Cretaceous	Murco Formation	Mu	Red shale and bearing conglomerate	
		Yura Group	Yu	Quartzite, siltstone and alternations	
	Jurassic	Socosani Formation	So	Black shale, siltstone	
		Chocolate volcanic rocks	Cho	Andesitic tuff tuffaceous rocks	
Precambrian		Gn	Gneiss, gneiss		
	Intrusive Rocks				
Tertiary	Stock and Dyke	VAn	Hornblende andesite		

MINERAL EXPLORATION  
IN  
COTAHUASI AREA  
(PHASE I)

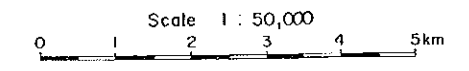
# GEOLOGICAL MAP OF THE REGIONAL SURVEY AREA (7)

国際協力事業  
1514  
図書資料室

LOCATION INDEX

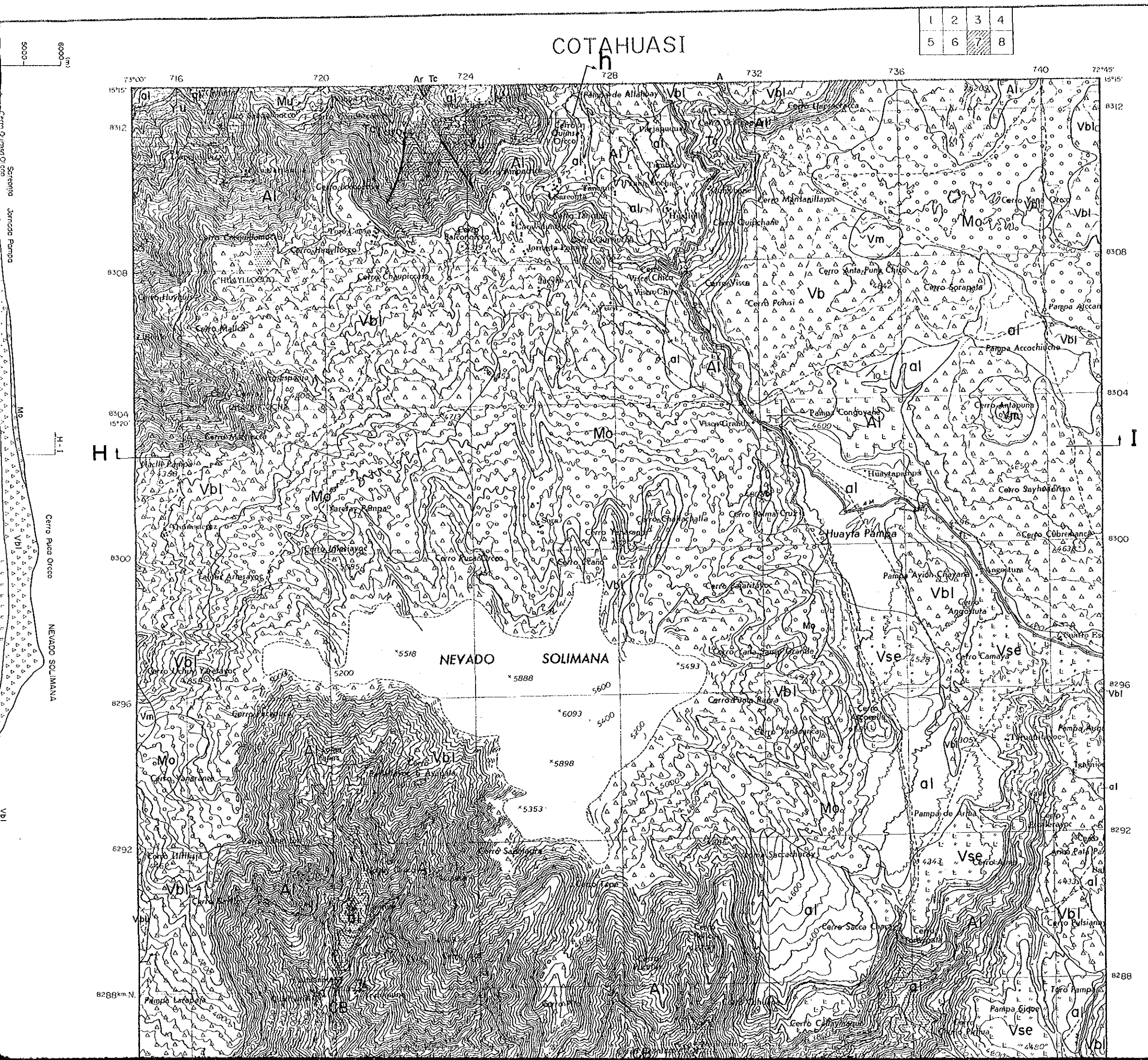


JAPAN INTERNATIONAL COOPERATION AGENCY  
METAL MINING AGENCY OF JAPAN  
INSTITUTO GEOLOGICO MINERO Y METALURGICO  
February 1986



## LEGEND

Cenozoic	Quaternary	Alluvium	al	Sand, mud and gravel	
		Mollebamba Volcanic Rocks	Vm	Andesite lava and volcanic ash	
		Volcanic Sediment of Pousa	Vsp	Volcanic ash, sand and gravel	
	Tertiary	Pliocene	Lampa Volcanic Rocks	Vla	Andesite (basaltic), volcanic breccia
			Moraine Sediment	Mo	Gravel, sand and mud
		Pleistocene	Boroso Group (Upper)	Vbu	Acidic tuff
			Boroso Group (Lower)	Vbl	Andesite lava and pyroclastic rocks
	Mesozoic	Cretaceous	Sencca Volcanic Rocks	Vse	Hornblende-biotite dacite lava, welded tuff and tuff
			Huayllillas Formation	Hy	Dacitic tuff (partly pumice bearing)
			Alpabamba Formation	Ala	Dacitic tuff, lapilli tuff, tuff breccia and welded tuff (partly with dacite lava or andesite lava)
Jurassic		Tacoza Formation	Vtc	Andesitic tuff breccia, Andesite, tuff and dacitic tuff breccia (greenish grey)	
		Huanca Formation	Vhc	Andesitic volcanic conglomerate, tuff breccia and tuffaceous sandstone (greenish grey)	
		Arcurquina Formation	Arq	Limestone and marl with sandstone and chert nodule	
		Murco Formation	Mu	Red shale and sandstone with gypsum bearing conglomerate	
Precambrian	Yura Group	Yu	Quartzite, siliceous sandstone, black shale and alternation of quartzite and shale		
	Socosani Formation	So	Black shale, limestone with sandstone and tuff		
	Chocolate volcanic rocks	Cho	Andesitic tuff breccia, tuff, andesite and tuffaceous sandstone		
Tertiary	Intrusive Rocks	Stock and Dyke	An	Hornblende andesite, andesite	
		Accha Stock	Ac	Diorite and quartz diorite	



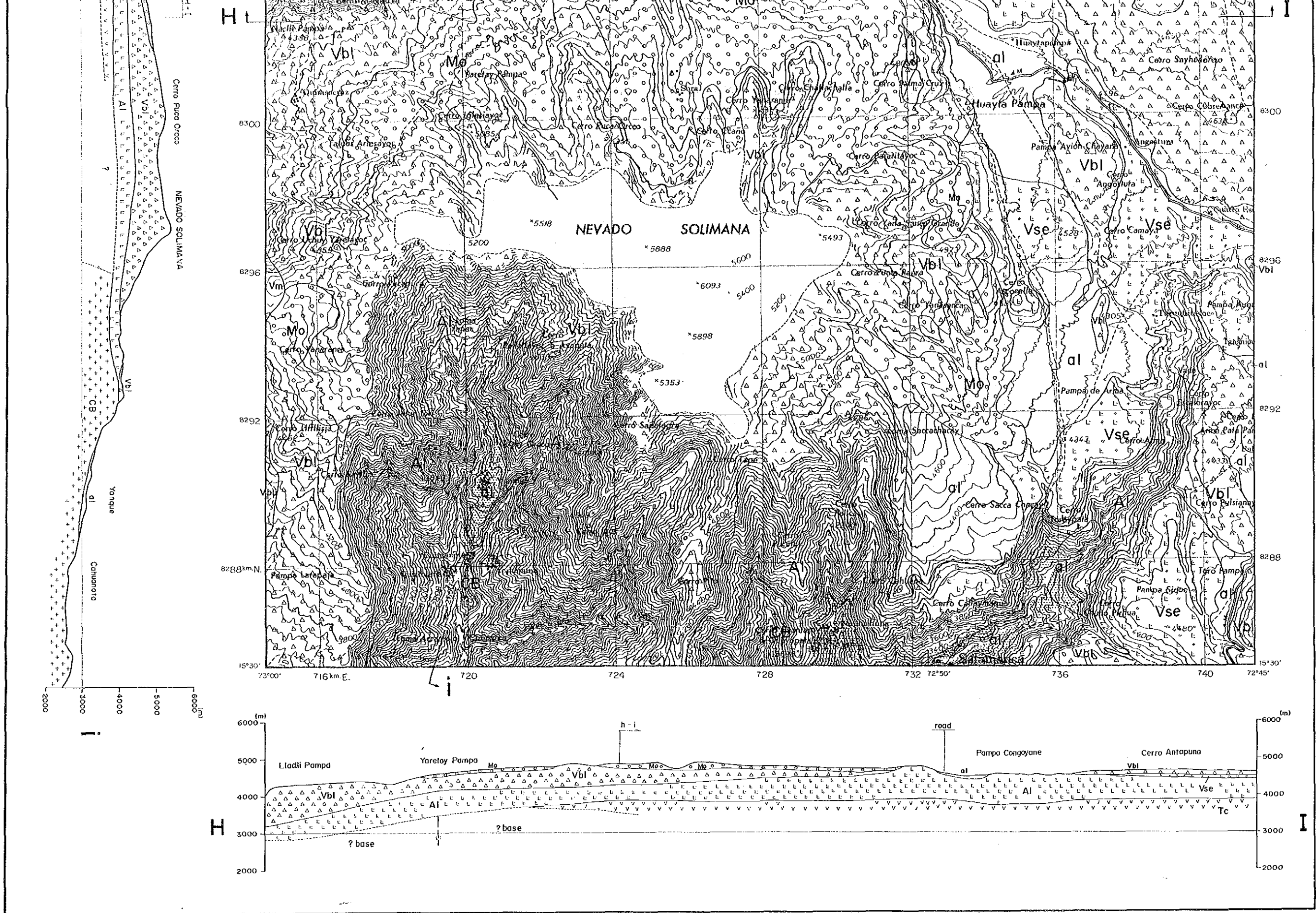
1	2	3	4
5	6	7	8

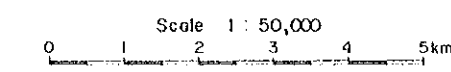


LEGEND

Cenozoic	Quaternary	Alluvium	al	Sand, mud
		Mollebamba Volcanic Rocks	Vm	Andesite (I)
		Volcanic Sediment of Paosa	Vsp	Volcanic (I)
		Lampa Volcanic Rocks	Vla	Andesite (I)
	Pleistocene	Moraine Sediment	Mo	Gravel, sand
		Barroso Group	Upper	Vbu
	Lower		vbl	Andesite (I)
	Pliocene	Sencca Volcanic Rocks	Vsc	Hornblende welded tuff
		Huayllillas Formation	Hly	Dacitic tuff
	Tertiary	Miocene	Alpabomba Formation	Al
Tacaza Formation			Tc	Andesitic tuff and dacitic
Pliocene	Huancá Formation	Vhc	Andesitic tuff and tuffaceous	
	Arcurquina Formation	Ar	Limestone and chert	
Mesozoic	Cretaceous	Murco Formation	Mu	Red shale bearing corals
		Yura Group	Yu	Quartzite, sandstone and altered
		Socosani Formation	So	Black shale
Precambrian	Jurassic	Chocolate volcanic rocks	Cho	Andesitic tuffaceous
		Gneiss, quartzite	Gn	Gneiss, quartzite
Tertiary	Intrusive Rocks	Stock and Dyke	Vy An	Hornblende
		Accha Stock	X B1	Diorite and gabbro
Cretaceous	Intrusive Rocks	La Costa Batholith	CB	Quartz diorite

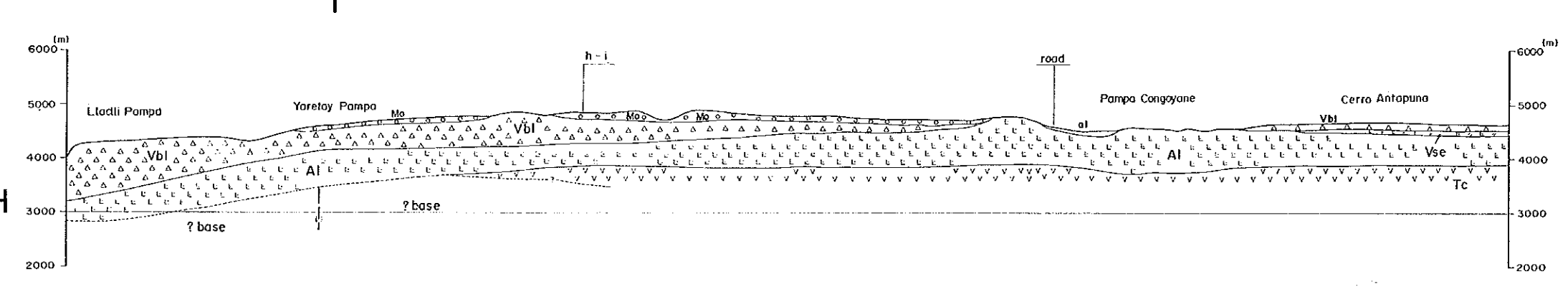
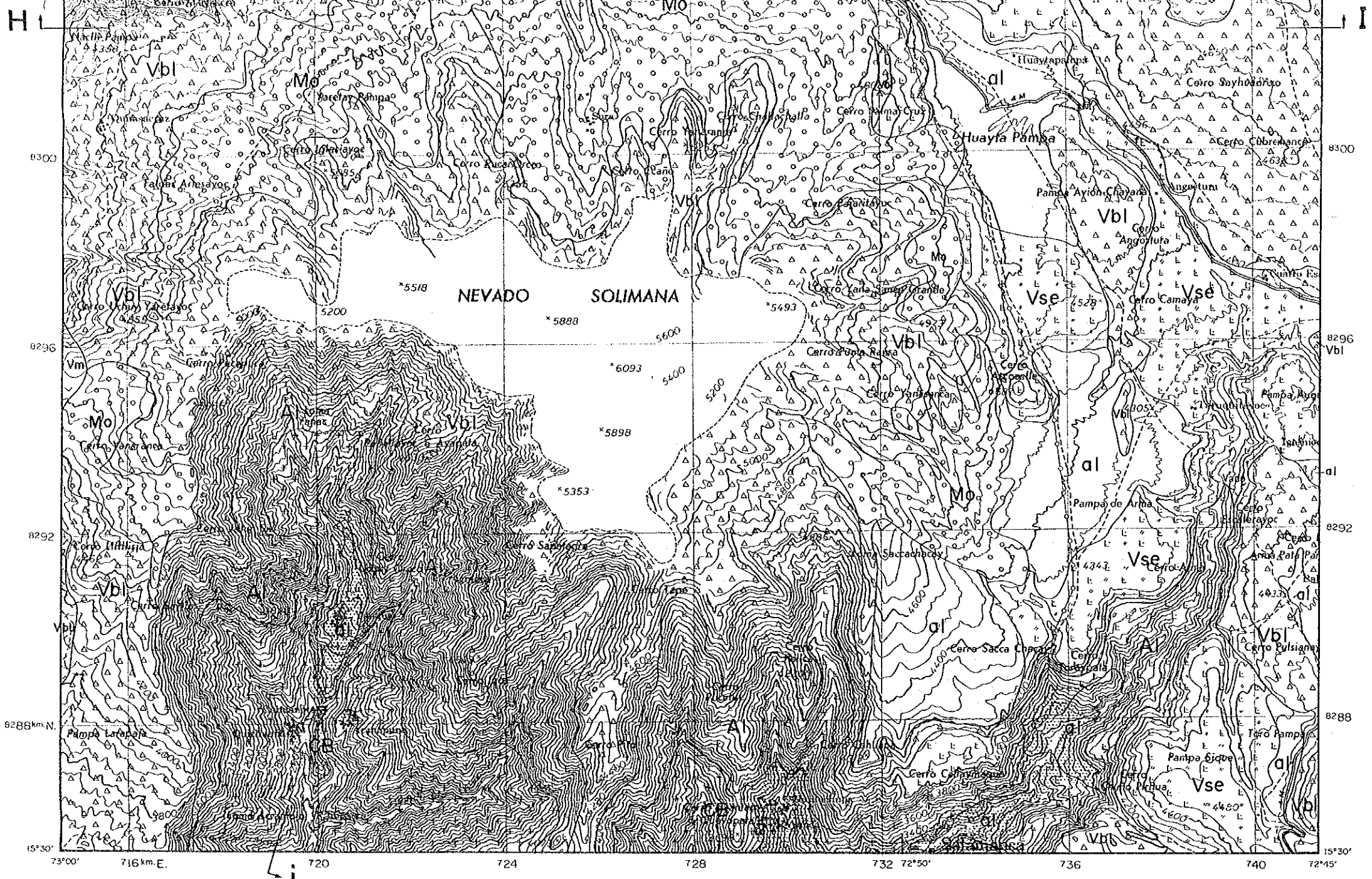
- Fault
- - - Inferred fault
- ∩ Anticline
- ∪ Syncline
- Geological
- Geological
- ↗ Strike and dip
- ↘ Strike and dip
- Strike and dip
- X Mine work
- ⊕ Hot spring





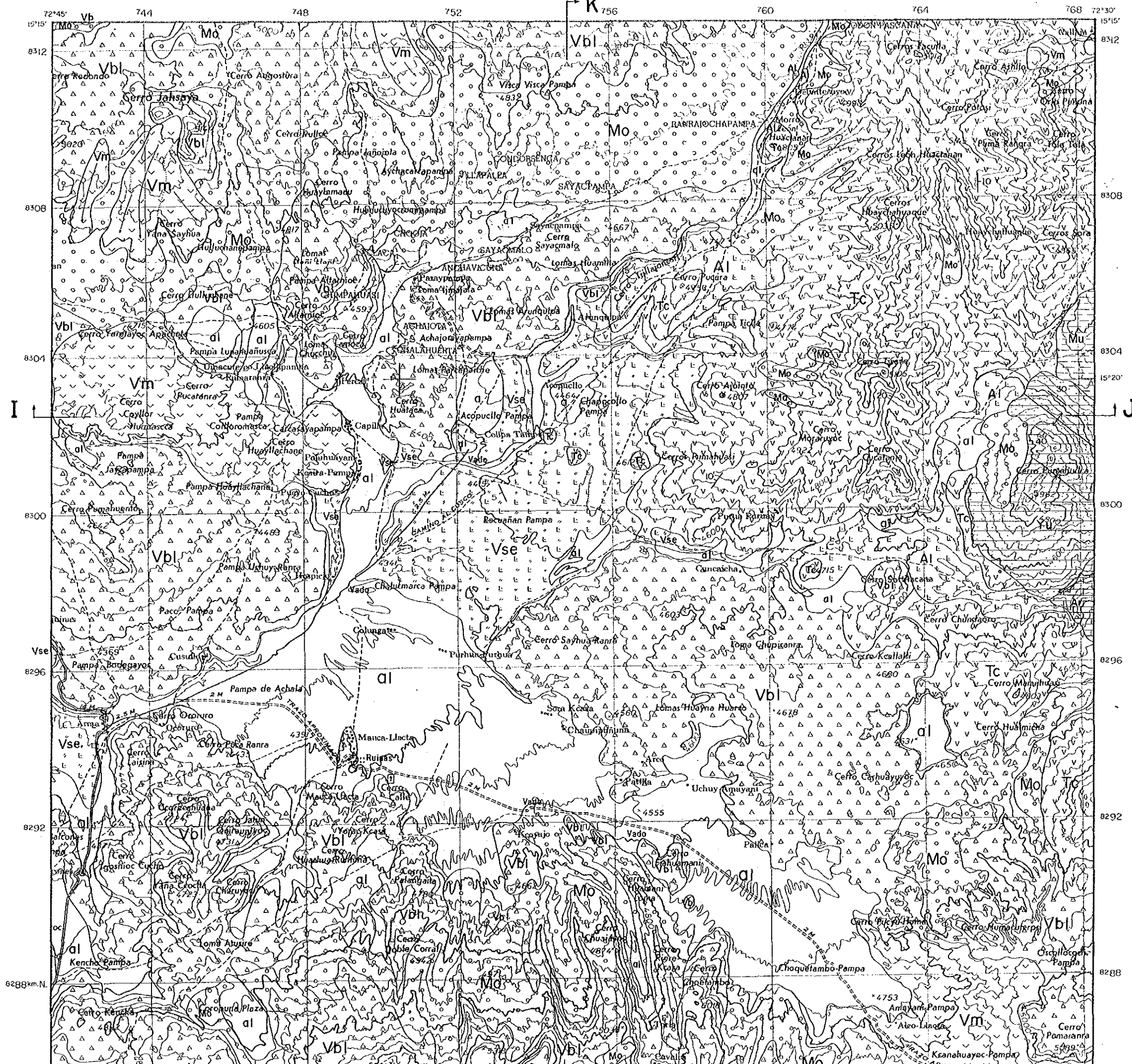
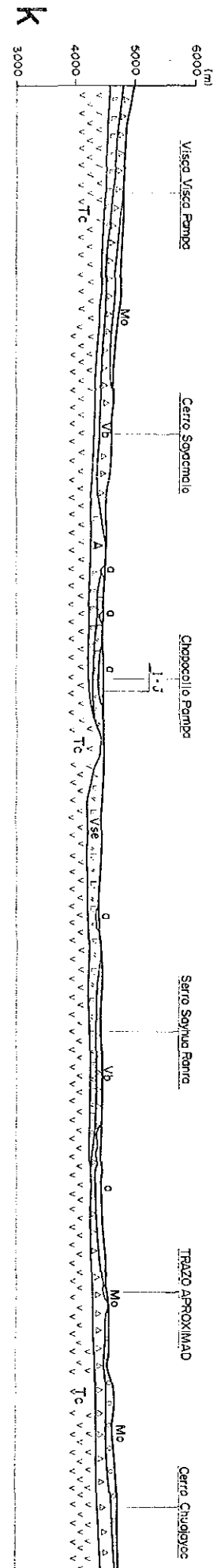
LEGEND

Cenozoic	Quaternary	Alluvium	al	Sand, mud and gravel	
		Mollebamba Volcanic Rocks	Vm	Andesite lava and volcanic ash	
		Volcanic Sediment of Pausa	Vsp	Volcanic ash, sand and gravel	
	Pleistocene	Lampa Volcanic Rocks	Vla	Andesite (basaltic), volcanic breccia	
		Moraine Sediment	Mo	Gravel, sand and mud	
	Pliocene	Borroso Group	Vb	Acidic tuff	
			Vbl	Andesite lava and pyroclastic rocks	
	Tertiary	Pliocene	Sencca Volcanic Rocks	Vse	Hornblende-biotite dacite lava, welded tuff and tuff
			Huayllitas Formation	Hy	Dacitic tuff (partly pumice bearing)
		Miocene	Alpabamba Formation	Al	Dacitic tuff, lapilli tuff, tuff breccia and welded tuff (partly with dacite lava or andesite lava)
Tacaza Formation			Tc	Andesitic tuff breccia, Andesite, tuff and dacitic tuff breccia (greenish grey)	
Pliocene		Huanca Formation	Hc	Andesitic volcanic conglomerate, tuff breccia and tuffaceous sandstone (greenish grey)	
Mesozoic	Cretaceous	Arcurquina Formation	Ar	Limestone and marl with sandstone and chert nodule	
		Murco Formation	Mu	Red shale and sandstone with gypsum bearing conglomerate	
		Yura Group	Vu	Quartzite, siliceous sandstone, black shale and alternation of quartzite and shale	
	Jurassic	Socosani Formation	So	Black shale, limestone with sandstone and tuff	
		Chocolate volcanic rocks	Chc	Andesitic tuff breccia, tuff, andesite and tuffaceous sandstone	
Precambrian		Gn	Gneiss, gneissose granite and diorite		
Tertiary	Intrusive Rocks	Stock and Dyke	An	Hornblende andesite, andesite	
		Accha Stock	Di	Diorite and quartz diorite	
	Cretaceous	La Costa Batholith	Cb	Quartz diorite and granodiorite	
		—		Fault	
		- - -		Inferred fault	
		∧		Anticline	
		∩		Syncline	
		○		Geological boundary	
		—		Geological profile line	
		30°		Strike and dip of bedding	
		50°		Strike and dip of foliation	
		↘		Strike and dip of flow structure	
		X		Mine (working or closed)	
		⊙		Hot spring	



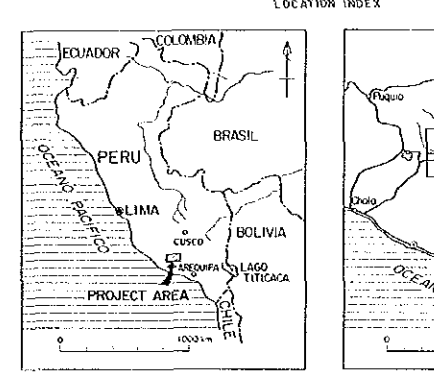
# COTAHUASI

1	2	3	4
5	6	7	8

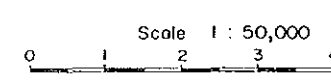


MINERAL EXPLORATION  
IN  
COTAHUASI AREA  
(PHASE I)

## GEOLOGICAL MAP OF THE REGIONAL SURVEY (8)



JAPAN INTERNATIONAL COOPERATION  
METAL MINING AGENCY OF JAPAN  
INSTITUTO GEOLOGICO MINERO Y METALURGICO  
February 1986

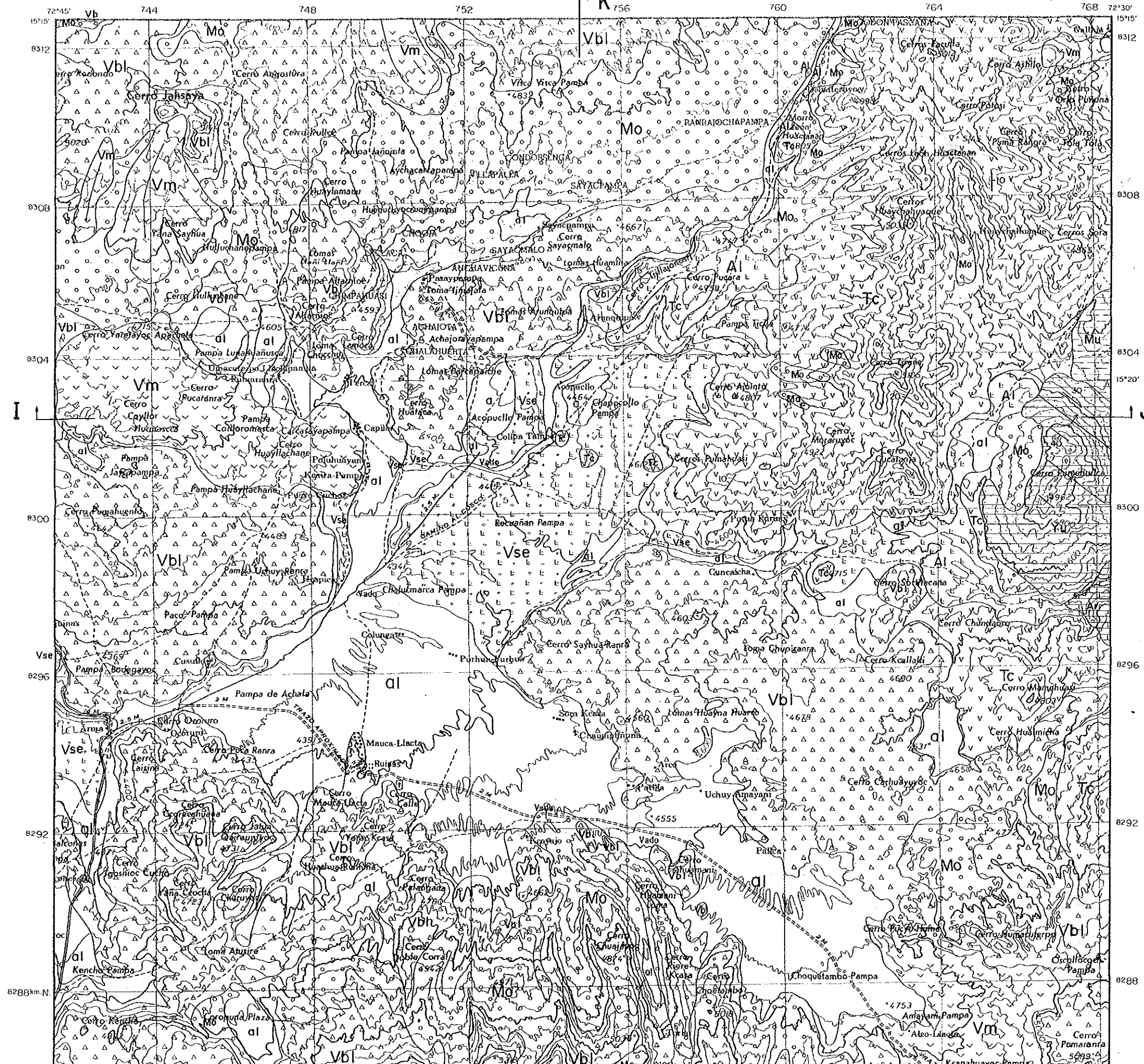


### LEGEND

Geological Period	Formation/Unit	Symbol	Description
Cenozoic	Quaternary	al	Alluvium Sand, mud and gravel
		Vm	Mollebamba Volcanic Rocks Andesite lava and tuff
		Vsp	Volcanic Sediment of Pausa Volcanic ash, sand and tuff
		Vb	Lampa Volcanic Rocks Andesite (basaltic)
	Pleistocene	Mo	Moraine Sediment Gravel, sand and silt
		Vb	Barroso Group (Upper) Acidic tuff
		Vb	Barroso Group (Lower) Andesite lava and tuff
	Tertiary	Vse	Seneco Volcanic Rocks Hornblende-biotite welded tuff and andesite
		Vh	Huayllillas Formation Dacitic tuff (partly with welded tuff)
		Vc	Alpabamba Formation Dacitic tuff, lapilli and welded tuff (partly with dacite)
Vt		Tacaza Formation Andesitic tuff breccia and dacitic tuff breccia	
Mesozoic	Vh	Huanco Formation Andesitic volcanic and tuffaceous sandstone	
	Vd	Arcuquina Formation Limestone and marl and chert nodules	
	Vm	Murco Formation Red shale and sandstone bearing conglomerate	
	Vu	Yura Group Quartzite, siliceous and alternation of sandstone and shale	
	Vs	Socsoni Formation Black shale, limestone	
Precambrian	Cho	Chocolate volcanic rocks Andesitic tuff breccia and tuffaceous sandstone	
	Gn	Gneiss, gneissose	
Tertiary	VAn	Intrusive Rocks (Stock and Dyke) Hornblende andesite	
	VDi	Accha Stock Diorite and quartzite	

# COTAHUASI

1	2	3	4
5	6	7	8



PL. 3-(8)

MINERAL EXPLORATION  
IN  
COTAHUASI AREA  
(PHASE I)

## GEOLOGICAL MAP OF THE REGIONAL SURVEY AREA (8)

1514  
圖書資料室

LOCATION INDEX

JAPAN INTERNATIONAL COOPERATION AGENCY  
METAL MINING AGENCY OF JAPAN /  
INSTITUTO GEOLOGICO MINERO Y METALURGICO  
February 1986

Scale 1 : 50,000  
0 1 2 3 4 5 km

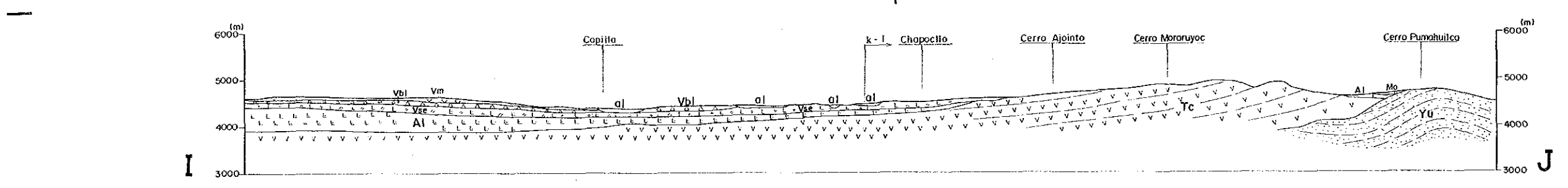
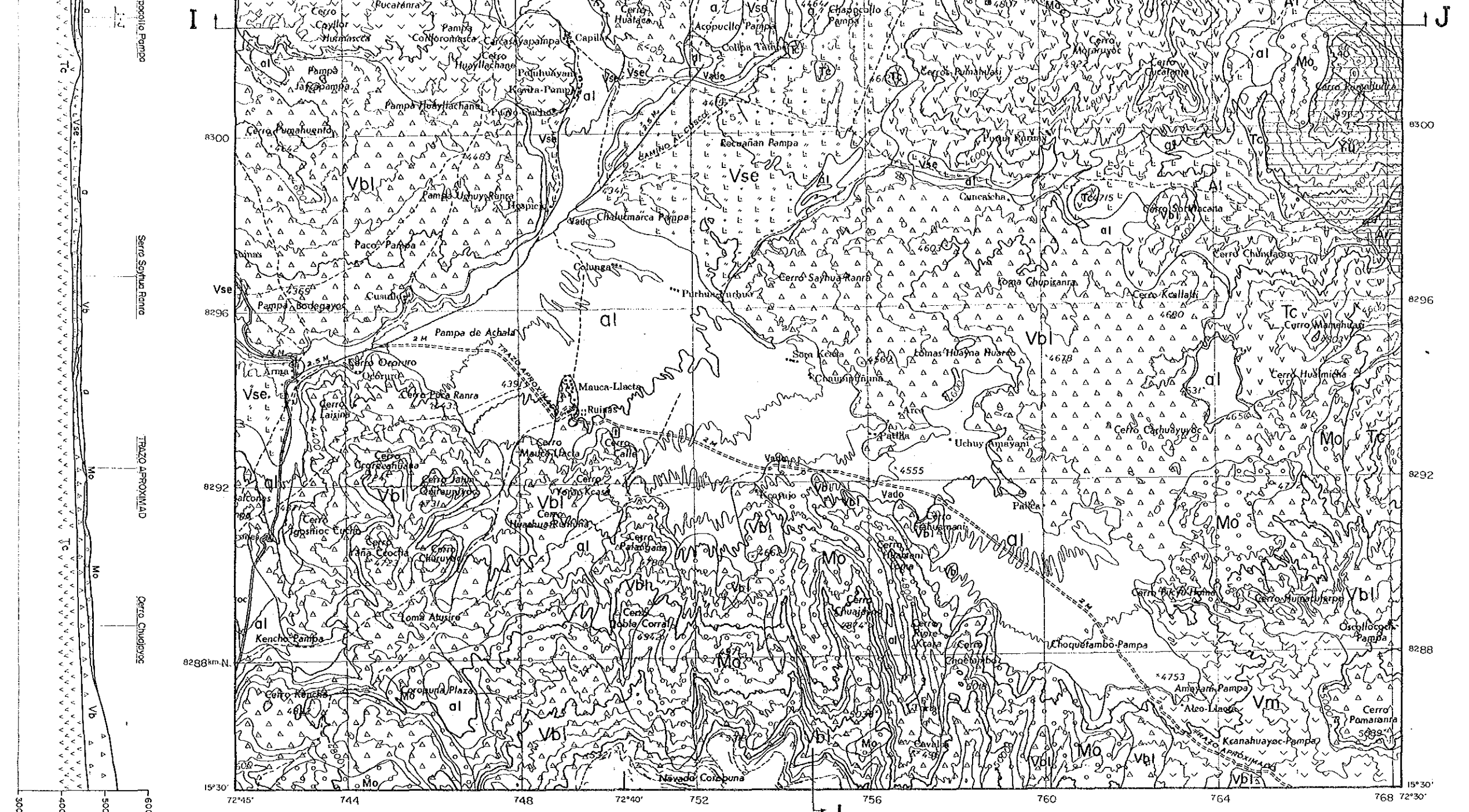
### LEGEND

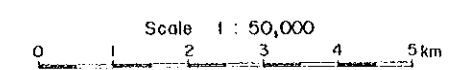
Cenozoic	Quaternary	Alluvium	al	Sand, mud and gravel	
		Holocene	Mollebamba Volcanic Rocks	Vm	Andesite lava and volcanic ash
			Volcanic Sediment of Pausa	Vsp	Volcanic ash, sand and gravel
		Lampa Volcanic Rocks	Vlo	Andesite (basaltic), volcanic breccia	
	Pleistocene	Moraine Sediment	Mo	Gravel, sand and mud	
			Barroso Group	Upper: Vbu, Lower: Vbl	Acidic tuff
		Pliocene	Sencca Volcanic Rocks	Vsc	Andesite lava and pyroclastic rocks
			Huayllillas Formation	Vhy	Hornblende-biotite dacite lava, welded tuff and tuff
	Tertiary	Miocene	Alpabamba Formation	VAl	Dacitic tuff (partly pumice bearing) and welded tuff (partly with dacite lava or andesite lava)
			Tacaza Formation	VvTc	Andesitic tuff breccia, Andesite, tuff and dacitic tuff breccia (greenish grey)
Palaeocene		Huanca Formation	VvHc	Andesitic volcanic conglomerate, tuff breccia and tuffaceous sandstone (greenish grey)	
		Arcurquina Formation	VAr	Limestone and marl with sandstone and chert nodule	
Mesozoic	Cretaceous	Murco Formation	Mu	Red shale and sandstone with gypsum bearing conglomerate	
		Yura Group	Vu	Quartzite, siliceous sandstone, black shale and alternation of quartzite and shale	
	Jurassic	Sacosani Formation	VSe	Black shale, limestone with sandstone and tuff	
		Choclate volcanic rocks	Vcho	Andesitic tuff breccia, tuff, andesite and tuffaceous sandstone	
Precambrian		Gn	Gneiss, gneissose granite and diorite		
	Intrusive Rocks	Stock and Dyke	VvAn	Hornblende andesite, andesite	
		VvD	Diorite and quartz diorite		

Scale 1 : 50,000  
0 1 2 3

### LEGEND

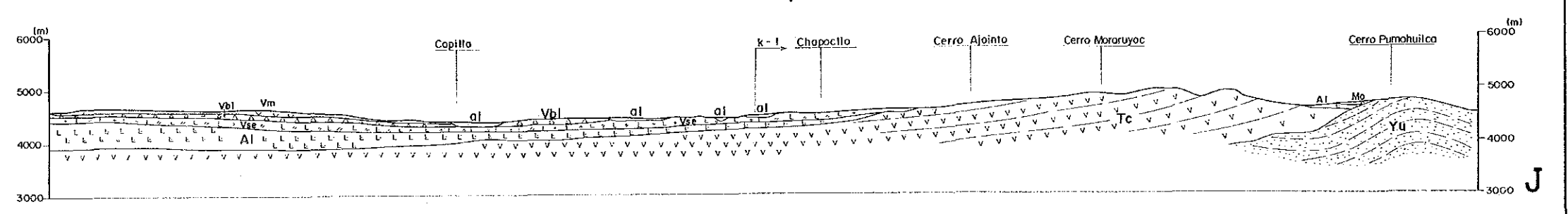
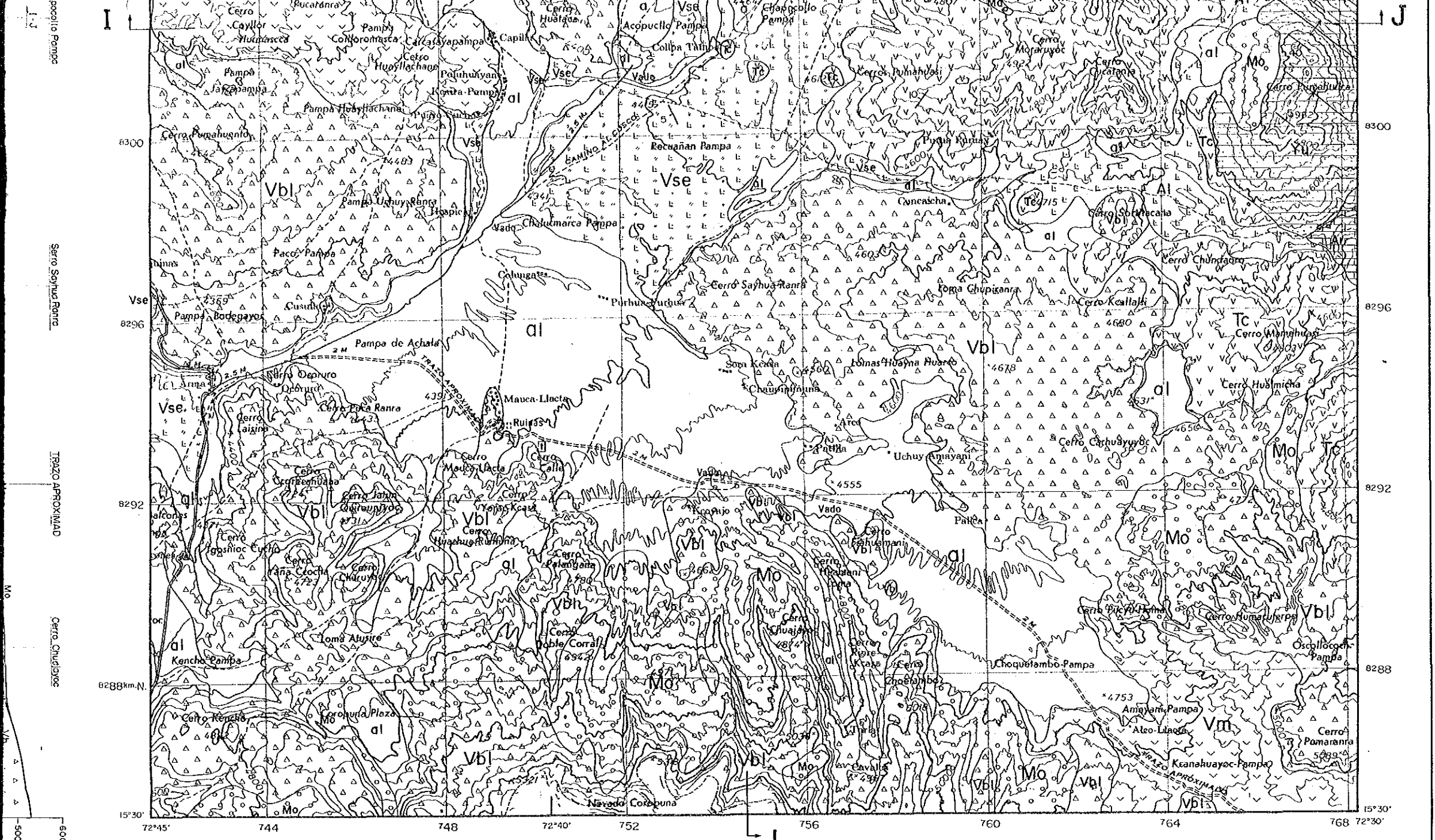
Cenozoic	Quaternary	Alluvium	al	Sand, mud or	
		Mollebamba Volcanic Rocks	vvm	Andesite lava	
		Volcanic Sediment of Pausa	oioVsp	Volcanic ash,	
		Lampa Volcanic Rocks	AAVq	Andesite (basal)	
	Pliocene	Moraine Sediment	oMo	Gravel, sand	
		Barroso Group	Upper	vbu	Acidic tuff
	Lower		vbl	Andesite lava	
	Tertiary	Pliocene	Sencca Volcanic Rocks	LVse	Hornblende-bi welded tuff
			Huayllillas Formation	Hy	Dacitic tuff (
		Miocene	Alpabamba Formation	LA	Dacitic tuff, l and welded tu (partly with d
Tacaza Formation			VVTC	Andesitic tuff and dacitic tu	
Palaeoogene-Oligocene		Huanco Formation	VVHC	Andesitic volc and tuffaceous	
		Cretaceous	Arcurquina Formation	AR	Limestone an and chert n
Murco Formation	Mu		Red shale an bearing congl		
Yuro Group	Yu		Quartzite, silic and alteration		
Socosani Formation	So		Black shale, l		
Jurassic	Chocolate volcanic rocks	Cho	Andesitic tuff tuffaceous sar		
	Precambrian	Gn	Gneiss, gneiss		
Intrusive Rocks	Tertiary	Stock and Dyke	VvAn	Hornblende a	
		Accha Stock	XDI	Diorite and qu	
	Cretaceous	La Costa Batholith	CB	Quartz diorite a	
<ul style="list-style-type: none"> <li>— Fault</li> <li>- - - Inferred fault</li> <li>∧ Anticline</li> <li>∨ Syncline</li> <li>○ Geological bou</li> <li>AL 30 Geological pro</li> <li>30 Strike and dip</li> <li>50 Strike and dip</li> <li>Strike and dip</li> <li>X Mine (working)</li> <li>Hot spring</li> </ul>					



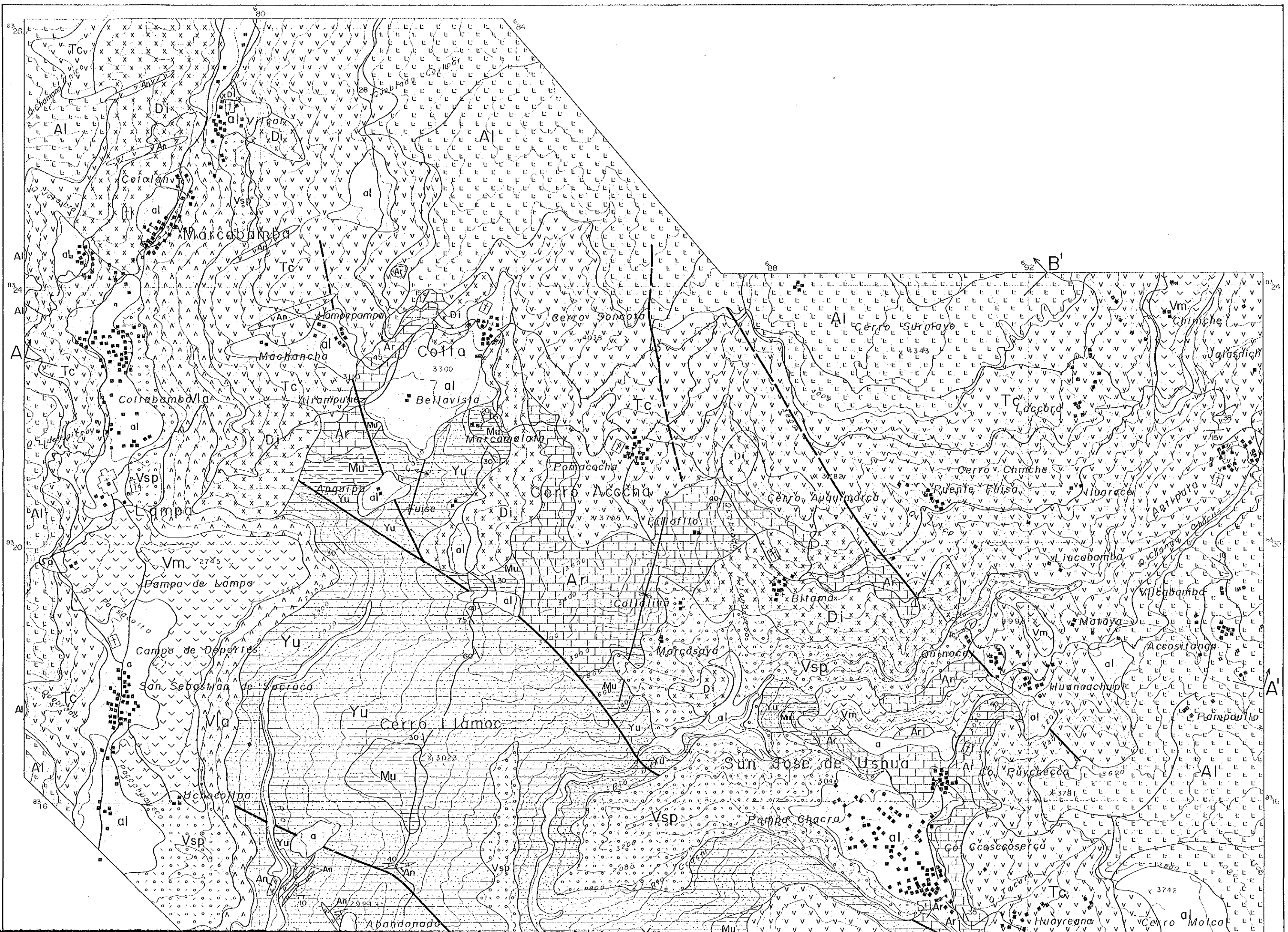


### LEGEND

Cenozoic	Quaternary	Alluvium	al	Sand, mud and gravel	
		Mollebamba Volcanic Rocks	Vm	Andesite lava and volcanic ash	
		Volcanic Sediment of Pausa	Vsp	Volcanic ash, sand and gravel	
		Lampa Volcanic Rocks	Vlo	Andesite (basaltic), volcanic breccia	
	Pleistocene	Moraine Sediment	Mo	Gravel, sand and mud	
		Barroso Group	Upper	Vbu	Acidic tuff
	Lower		Vbl	Andesite lava and pyroclastic rocks	
	Tertiary	Pliocene	Sencca Volcanic Rocks	Vse	Hornblende-biotite dacite lava, welded tuff and tuff
			Huayllitas Formation	Hy	Dacitic tuff (partly pumice bearing)
		Miocene	Alpabamba Formation	Al	Dacitic tuff, lapilli tuff, tuff breccia and welded tuff (partly with dacite lava or andesite lava)
Tacaza Formation			Tc	Andesitic tuff breccia, Andesite, tuff and dacitic tuff breccia (greenish grey)	
Oligocene		Huanca Formation	Hc	Andesitic volcanic conglomerate, tuff breccia and tuffaceous sandstone (greenish grey)	
		Arcuquino Formation	Ar	Limestone and marl with sandstone and chert nodule	
Murco Formation			Mu	Red shale and sandstone with gypsum bearing conglomerate	
		Yura Group	Yura	Quartzite, siliceous sandstone, black shale and alternation of quartzite and shale	
Jurassic			Socosani Formation	So	Black shale, limestone with sandstone and tuff
		Chocolate volcanic rocks	Cho	Andesitic tuff breccia, tuff, andesite and tuffaceous sandstone	
Precambrian	Gneiss, gneissose granite and diorite	Gn			
Intrusive Rocks	Tertiary	Stock and Dyke	An	Hornblende andesite, andesite	
		Accha Stock	Di	Diorite and quartz diorite	
	Cretaceous	La Costa Batholith	CB	Quartz diorite and granodiorite	
<ul style="list-style-type: none"> <li> Fault</li> <li> Inferred fault</li> <li> Anticline</li> <li> Syncline</li> <li> Geological boundary</li> <li> Geological profile line</li> <li> Strike and dip of bedding</li> <li> Strike and dip of foliation</li> <li> Strike and dip of flow structure</li> <li> Mine (working or closed)</li> <li> Hot spring</li> </ul>					

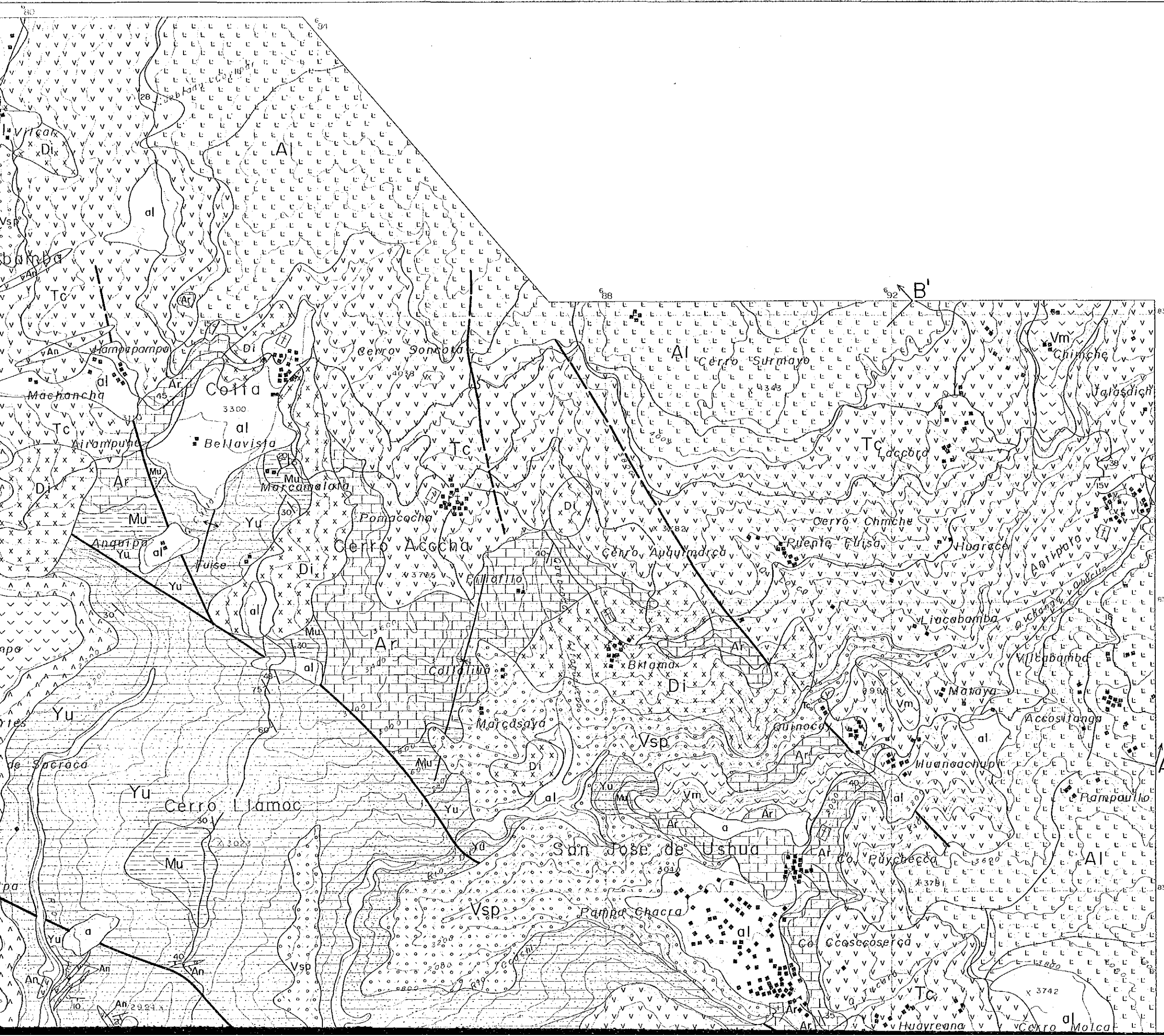






Mesozoic	Jurassic	Choc. volca.	
		Saco. F.	
	Cretaceous	Yura	
		Murca. F.	
	Tertiary	Pliocene	Huanc. F.
			Alpat. F.
		Miocene	Taca. F.
			Fo. F.
	Quaternary	Holocene	Lamp. Volca.
			Volca. of P.
Morai.			
Cenozoic	Pleistocene	Barros. Gr.	
		Senco. Volca.	
	Pliocene	Huanc. F.	
		Alpat. F.	
	Miocene	Taca. F.	
		Fo. F.	
	Quaternary	Holocene	Lamp. Volca.
			Volca. of P.
	Tertiary	Pliocene	Huanc. F.
			Alpat. F.
Cretaceous	Jurassic	Choc. volca.	
		Saco. F.	
Mesozoic	Jurassic	Yura	
		Murca. F.	
Cretaceous	Tertiary	Huanc. F.	
		Fo. F.	
Quaternary	Holocene	Lamp. Volca.	
		Volca. of P.	
Cenozoic	Pleistocene	Barros. Gr.	
		Senco. Volca.	
Pliocene	Miocene	Huanc. F.	
		Alpat. F.	
Quaternary	Holocene	Lamp. Volca.	
		Volca. of P.	

THE





PL. 4

MINERAL EXPLORATION  
IN  
COTAHUASI AREA  
(PHASE I)

### GEOLOGICAL MAP OF THE DETAILED SURVEY AREA (A)


国際協力事業団  
15147  
図書資料室蔵書

LOCATION INDEX

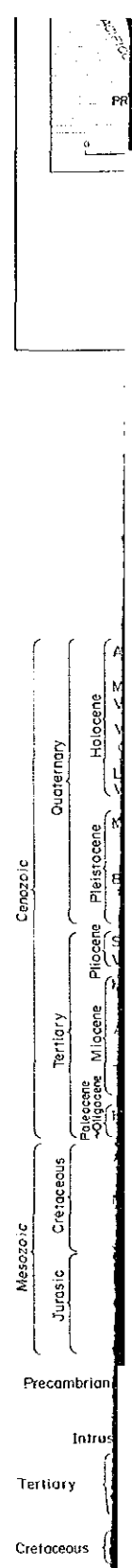
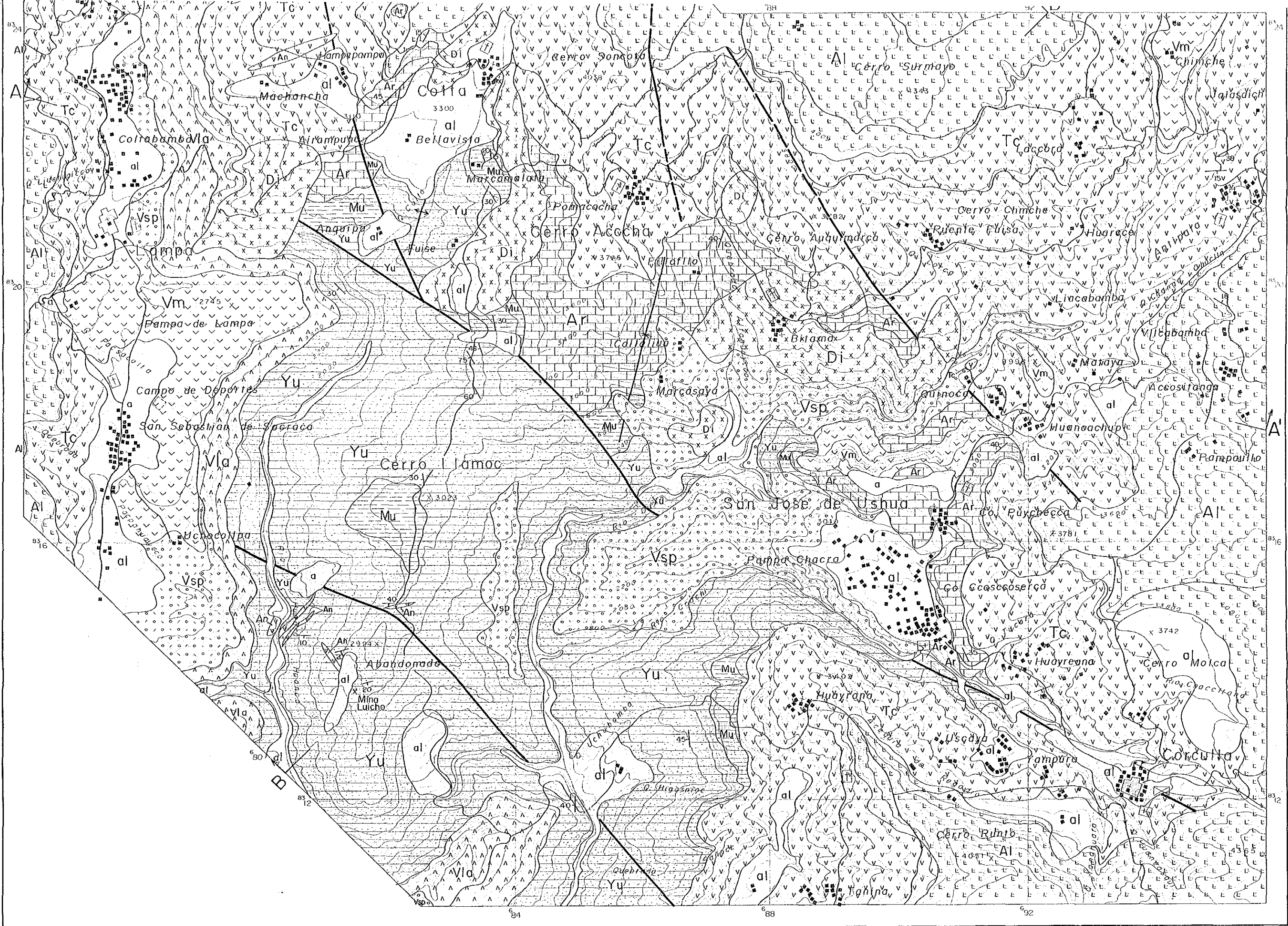
JAPAN INTERNATIONAL COOPERATION AGENCY  
METAL MINING AGENCY OF JAPAN  
INSTITUTO GEOLOGICO MINERO Y METALURGICO  
February 1986

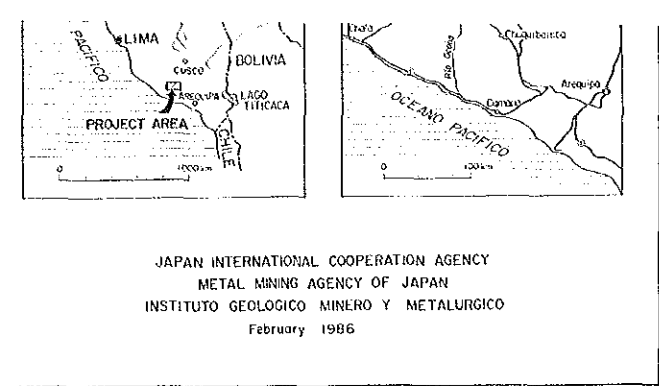
Scale 1 : 25,000



### LEGEND

Quaternary	Alluvium	al	Sand, mud and gravel
	Mollebamba Volcanic Rocks	Vm	Andesite lava and volcanic ash
Holocene	Volcanic Sediment of Pausa	Vsp	Volcanic ash, sand and gravel
	Larepa Volcanic Rocks	A1A2A3A4A5A6A7A8A9A10A11A12A13A14A15A16A17A18A19A20A21A22A23A24A25A26A27A28A29A30A31A32A33A34A35A36A37A38A39A40A41A42A43A44A45A46A47A48A49A50	Andesite (basaltic), volcanic breccia
Pleistocene	Moraine Sediment	Mo	Gravel, sand and mud
	Barroso Group	B1B2B3B4B5B6B7B8B9B10B11B12B13B14B15B16B17B18B19B20B21B22B23B24B25B26B27B28B29B30B31B32B33B34B35B36B37B38B39B40B41B42B43B44B45B46B47B48B49B50	Acidic tuff
Pliocene	Sencca Volcanic Rocks	S1S2S3S4S5S6S7S8S9S10S11S12S13S14S15S16S17S18S19S20S21S22S23S24S25S26S27S28S29S30S31S32S33S34S35S36S37S38S39S40S41S42S43S44S45S46S47S48S49S50	Hornblende-biotite dacite lava, welded tuff and tuff
	Huayllillas Formation	Hy	Dacitic tuff (partly pumice bearing)
Miocene	Alpabamba Formation	Al	Dacitic tuff, lapilli tuff, tuff breccia and welded tuff (partly with dacite lava or andesite lava)
	Tacaza Formation	Ta	Andesitic tuff breccia, Andesite, tuff and dacitic tuff breccia (greenish grey)
Pliocene	Huancza Formation	Hu	Andesitic volcanic conglomerate, tuff breccia and tuffaceous sandstone (greenish grey)
	Arcarquina Formation	Ar	Limestone and marl with sandstone and chert nodule
Cretaceous	Murco Formation	Mu	Red shale and sandstone with gypsum bearing conglomerate
	Yura Group	Yu	Quartzite, siliceous sandstone, black shale and alternation of quartzite and shale
Jurassic	Sacosani Formation	So	Black shale, limestone with sandstone and tuff
	Chocolate volcanic rocks	Ch	Andesitic tuff breccia, tuff, andesite and tuffaceous sandstone
Precambrian	Gneiss	Gn	Gneiss, gneissose granite and diorite
	Intrusive Rocks	Stock and Dyke	Hornblende andesite, andesite

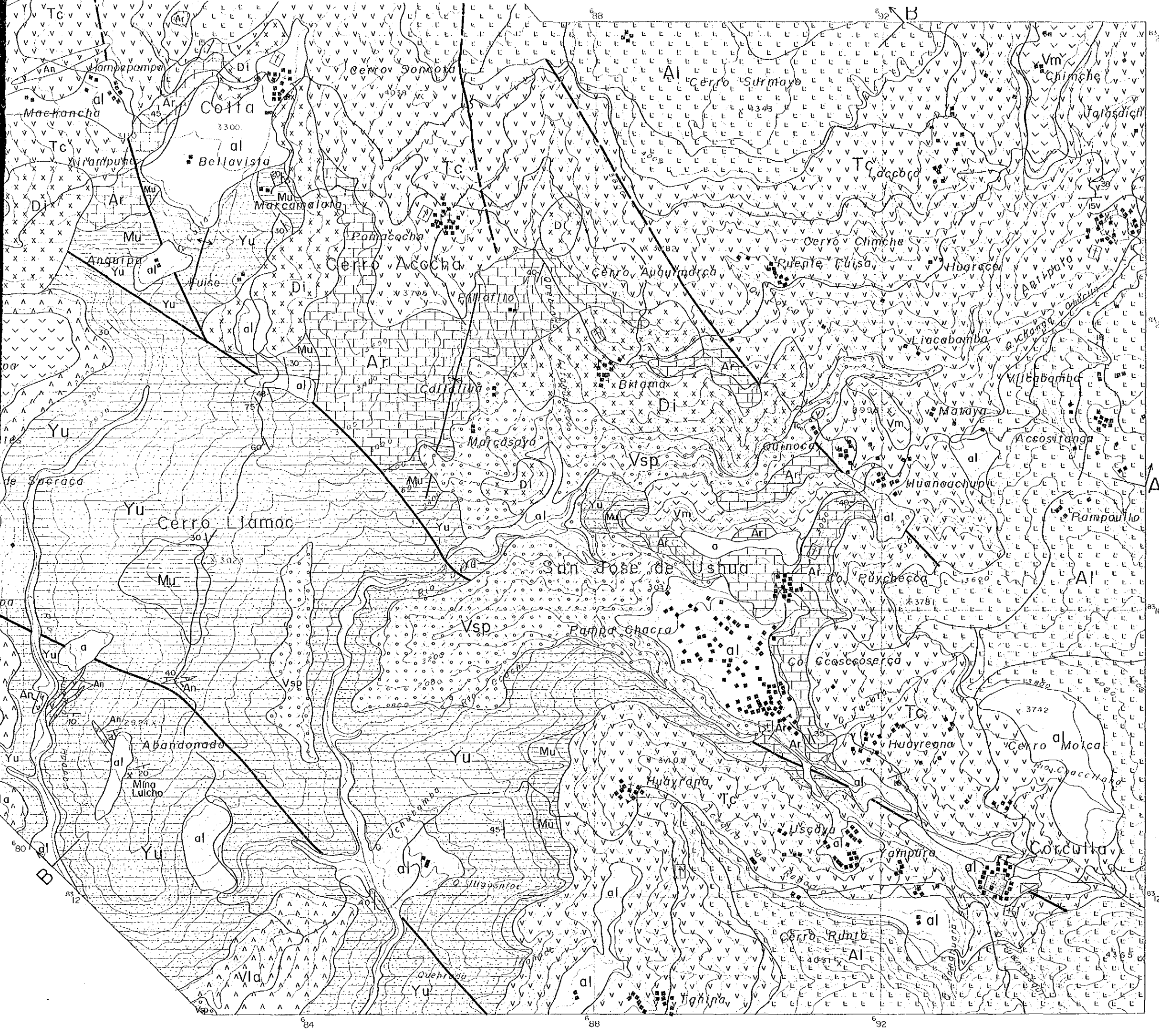




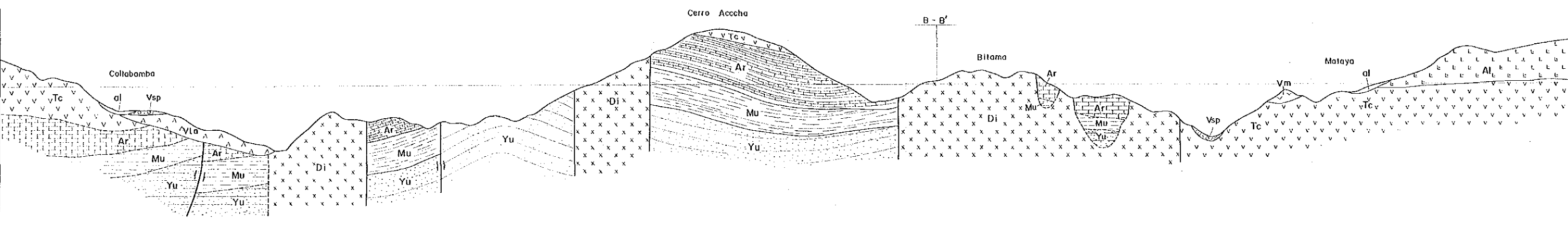
Scale 1 : 25,000  
0 2 km

**LEGEND**

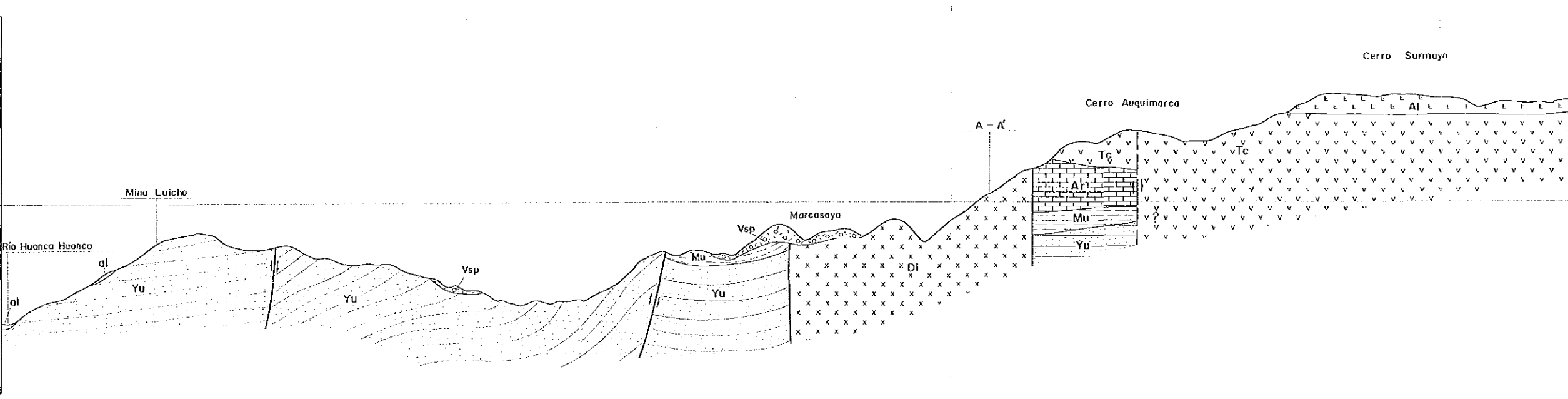
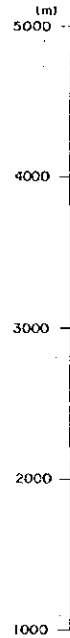
Quaternary	Holocene	Alluvium	al	Sand, mud and gravel	
		Mollebamba Volcanic Rocks	Vm	Andesite lava and volcanic ash	
	Lampa Volcanic Rocks	Volcanic Sediment of Pausa	Vsp	Volcanic ash, sand and gravel	
		Andesite (basaltic), volcanic breccia	Al		
	Pleistocene	Moraine Sediment	Mo	Gravel, sand and mud	
		Barroso Group	Upper	Vbu	Acidic tuff
	Lower		Vbl	Andesite lava and pyroclastic rocks	
	Tertiary	Pliocene	Sencca Volcanic Rocks	Vse	Hornblende-biotite dacite lava, welded tuff and tuff
			Huayllillas Formation	Hy	Dacitic tuff (partly pumice bearing)
		Miocene	Alpabamba Formation	Al	Dacitic tuff, lapilli tuff, tuff breccia (partly with dacite lava or andesite lava)
Tacaza Formation			Tc	Andesitic tuff breccia, Andesite, tuff and dacitic tuff breccia (greenish grey)	
Pliocene-Oligocene		Huanca Formation	Hc	Andesitic volcanic conglomerate, tuff breccia and tuffaceous sandstone (greenish grey)	
		Arcuquina Formation	Arc	Limestone and marl with sandstone and chert nodule	
Mesozoic	Cretaceous	Murco Formation	Mu	Red shale and sandstone with gypsum bearing conglomerate	
		Yuro Group	Yu	Quartzite, siliceous sandstone, black shale and alternation of quartzite and shale	
	Jurassic	Socosani Formation	So	Black shale, limestone with sandstone and tuff	
		Chocolate volcanic rocks	Cho	Andesitic tuff breccia, tuff, andesite and tuffaceous sandstone	
Precambrian	Gneiss, gneissose granite and diorite	Gn			
Intrusive Rocks	Tertiary	Stock and Dyke	St	Hornblende andesite, andesite	
		Accha Stock	Ac	Diorite and quartz diorite	
	Cretaceous	La Costa Batholith	Lc	Quartz diorite and granodiorite	
		Fault		—	
		Inferred fault		- - -	
		Anticline		∩	
		Syncline		∪	
		Geological boundary		○	
		Geological profile line		A-L	
		Strike and dip		30°	
		Mine (working or closed)		X	



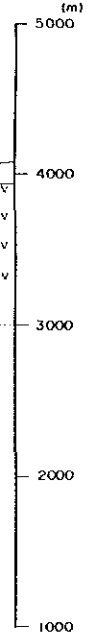
A



B



B'

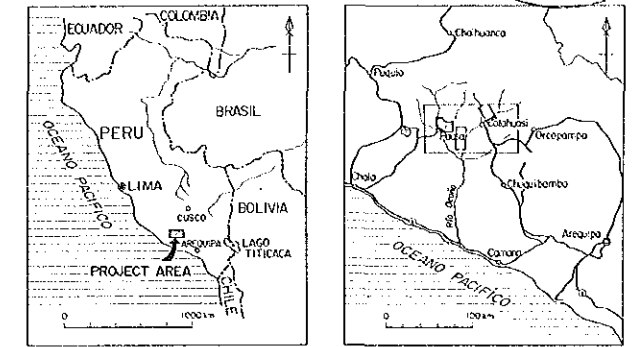


MINERAL EXPLORATION  
IN  
COTAHUASI AREA  
(PHASE I)

GEOLOGICAL PROFILES OF THE  
DETAILED SURVEY AREA  
(A)

国際協力事業団  
15147  
図書資料室蔵

LOCATION INDEX

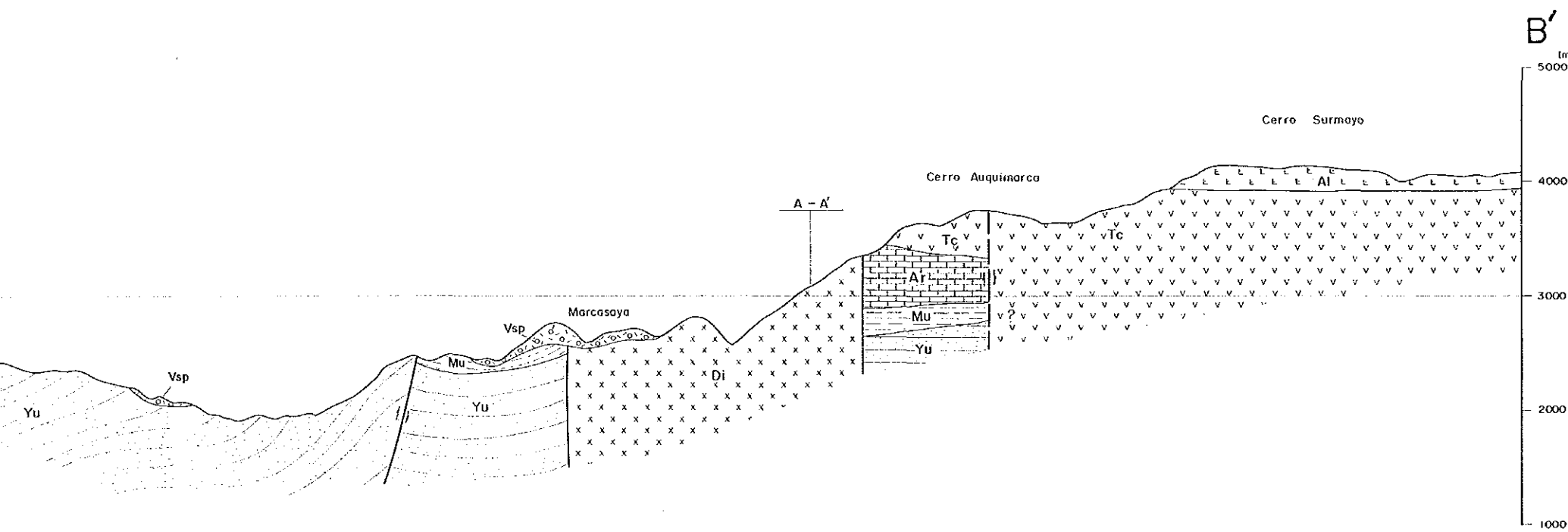
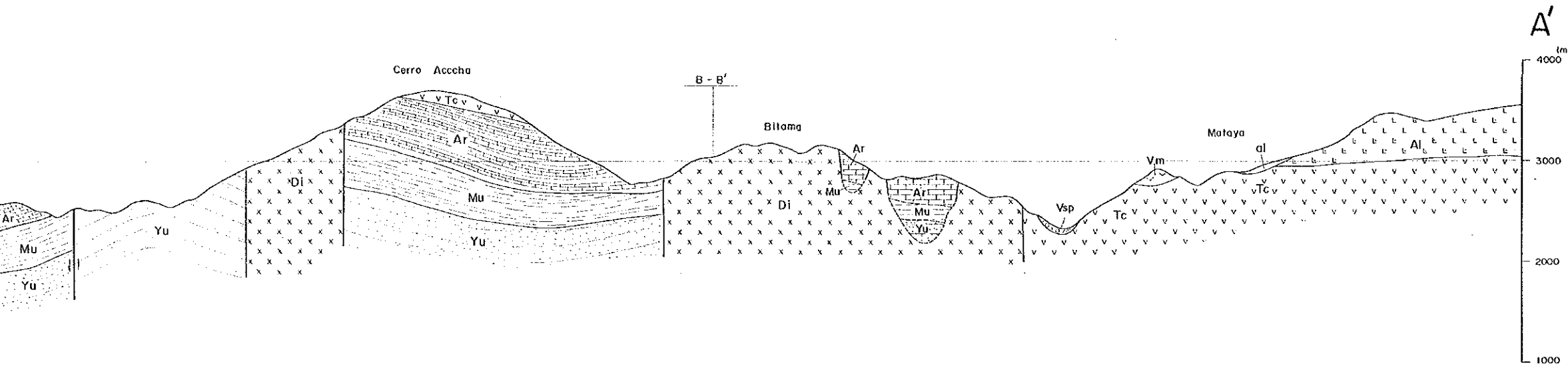


JAPAN INTERNATIONAL COOPERATION AGENCY  
METAL MINING AGENCY OF JAPAN  
INSTITUTO GEOLOGICO MINERO Y METALURGICO  
February 1986

Scale 1: 25,000  
0 1 2 km

LEGEND

Quaternary	Alluvium	al	Sand, mud and gravel	
Cenozoic	Matlebonba Volcanic Rocks	vm	Andesite tuff and volcanic ash	
	Volcanic Sediment of Puno	vs	Volcanic ash, sand and gravel	
	Luzo Volcanic Rocks	vl	Andesite/basaltic, volcanic breccia	
Tertiary	Micene Sediment	ms	Gravel, sand and mud	
	Barrosi Group	Upper	vb	Acidic tuff
		Lower	vl	Andesite lava and pyroclastic rocks
	Senca Volcanic Rocks	sv	Basaltic-basaltic diorite lava, welded tuff and tuff	
	Mugallas Formation	mu	Dacitic tuff (partly pumice bearing) and welded tuff	
	Arcabamba Formation	ar	Basaltic tuff, andesite tuff, andesite lava and andesite tuff breccia	
	Tacaza Formation	ta	Andesite tuff, andesite tuff and dacitic tuff breccia (granitic grey)	
	Husca Formation	hu	Andesite volcanic conglomerate, tuff breccia and sulfurous sandstone/pumice grey	
	Atacama Formation	at	Limestone and marl with sandstone and chert nodules	
	Mesozoic	Muro Formation	mu	Red shale and sandstone with gypsum bearing conglomerate
Yura Group		yu	Quartzite, siliceous sandstone, black shale and alternation of quartzite and shale	
Scorpa Formation		sc	Black shale, limestone with sandstone and tuff	
Choclate volcanic rocks		cv	Andesite tuff breccia, tuff, andesite and sulfurous sandstone	
Precambrian	gn	Gneiss, gneissic granite and quartz		
Intrusive Rocks	Stock and Dyke	sd	Monzonitic andesite, andesite	
	Accha Stock	as	Diorite and quartz diorite	
	Ta Costa Batholith	tc	Quartz diorite and gneiss/diorite	
Fault		—	Fault	
Inferred fault		---	Inferred fault	
Anticline		~	Anticline	
Syncline		~	Syncline	
Geological boundary		—	Geological boundary	
Strike and dip of bedding		—	Strike and dip of bedding	
Strike and dip of foliation		—	Strike and dip of foliation	
Strike and dip of flow structure		—	Strike and dip of flow structure	
Mine (acking or closed)		X	Mine (acking or closed)	
Hot spring		○	Hot spring	

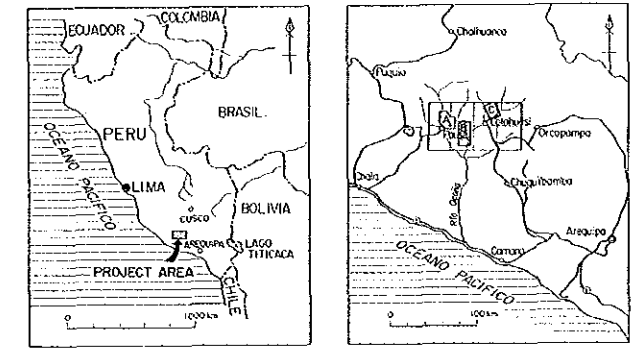


MINERAL EXPLORATION IN COTAHUASI AREA (PHASE I)

GEOLOGICAL MAP OF THE DETAILED SURVEY AREA (B)

国際協力事業団 15147 図書資料室蔵書

LOCATION INDEX

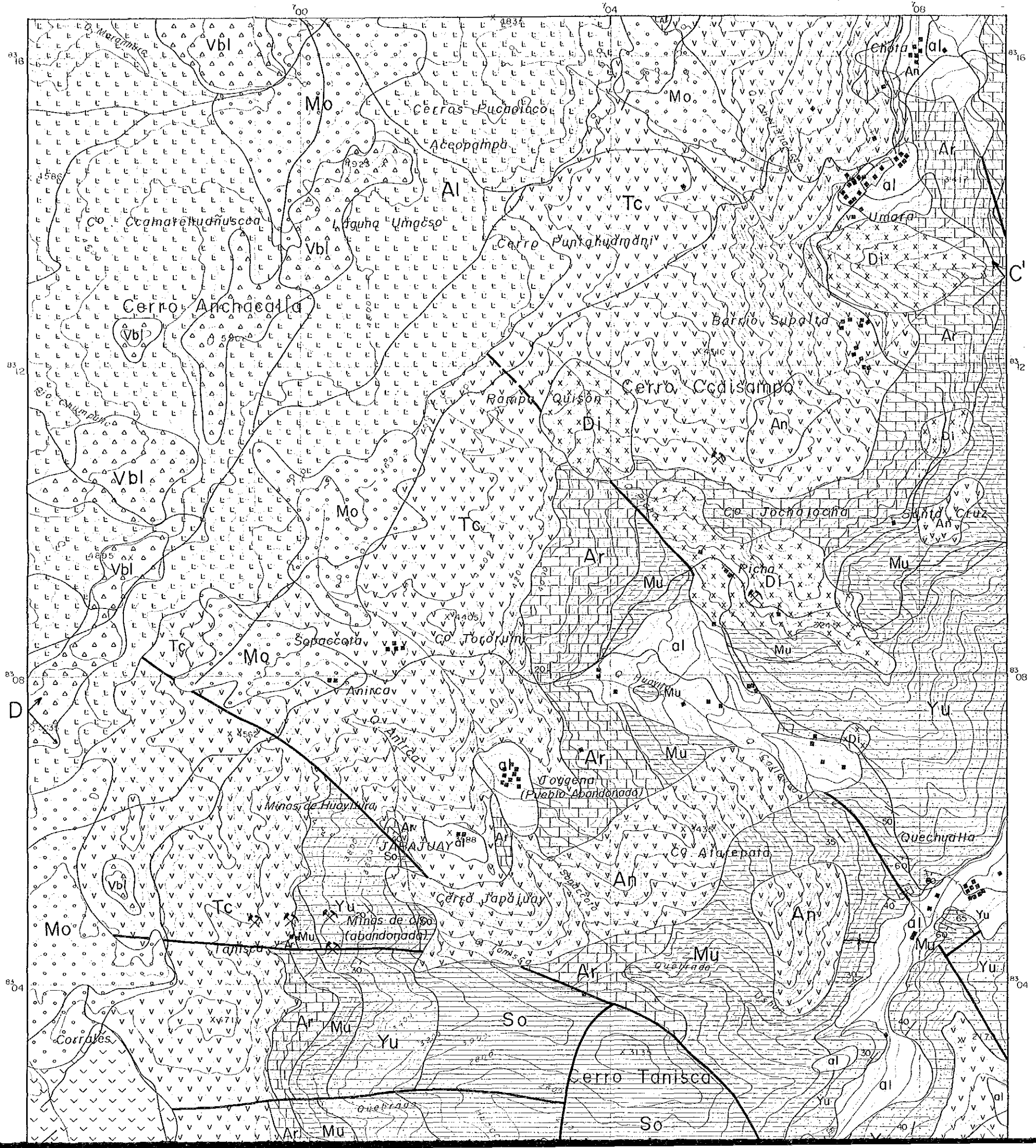


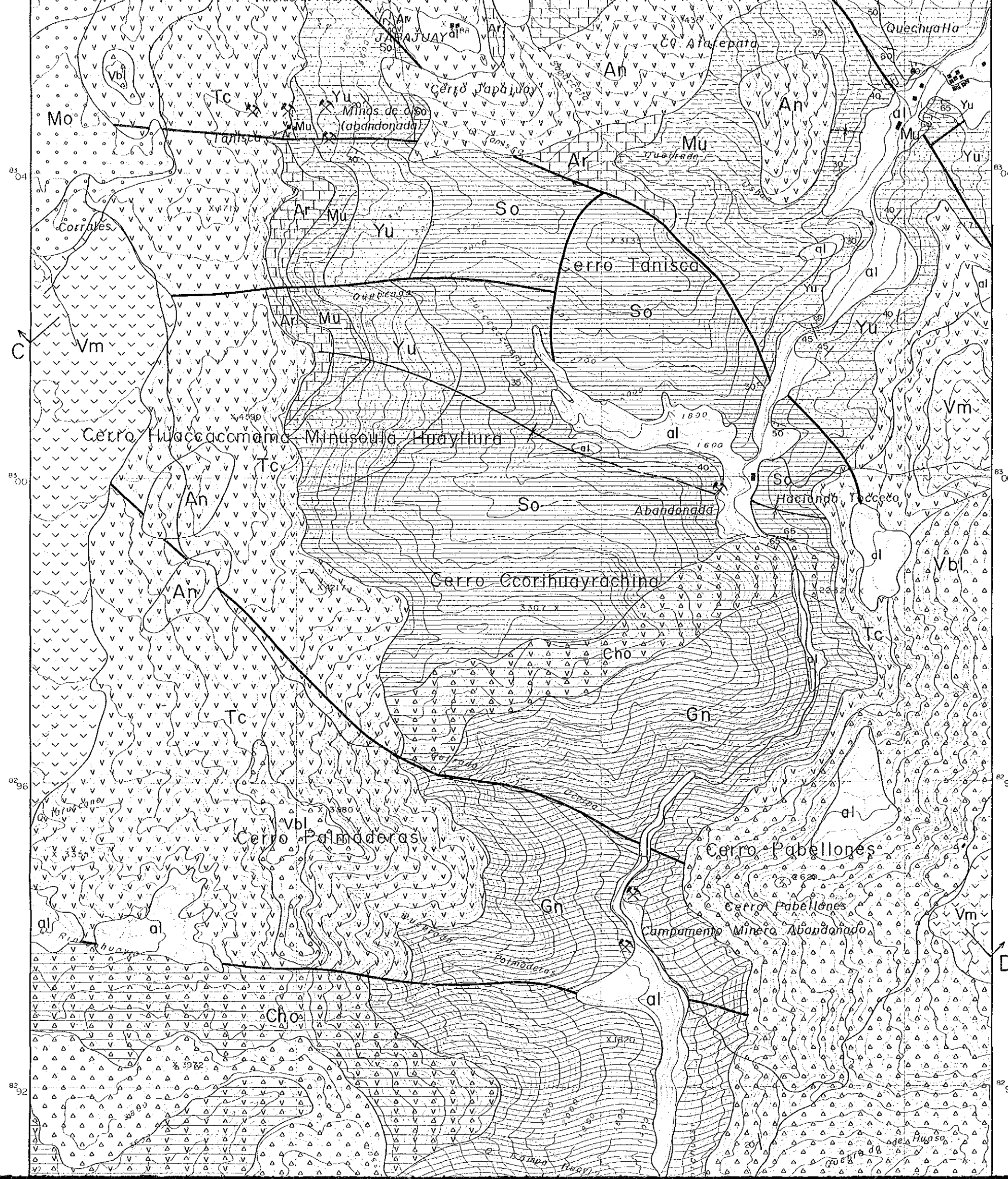
JAPAN INTERNATIONAL COOPERATION AGENCY METAL MINING AGENCY OF JAPAN INSTITUTO GEOLOGICO MINERO Y METALURGICO February 1986

Scale 1:25,000 0 1 2 km

LEGEND

Geological legend table with columns for geological units (Alluvium, Mollebamba Volcanic Rocks, etc.), symbols, and descriptions.

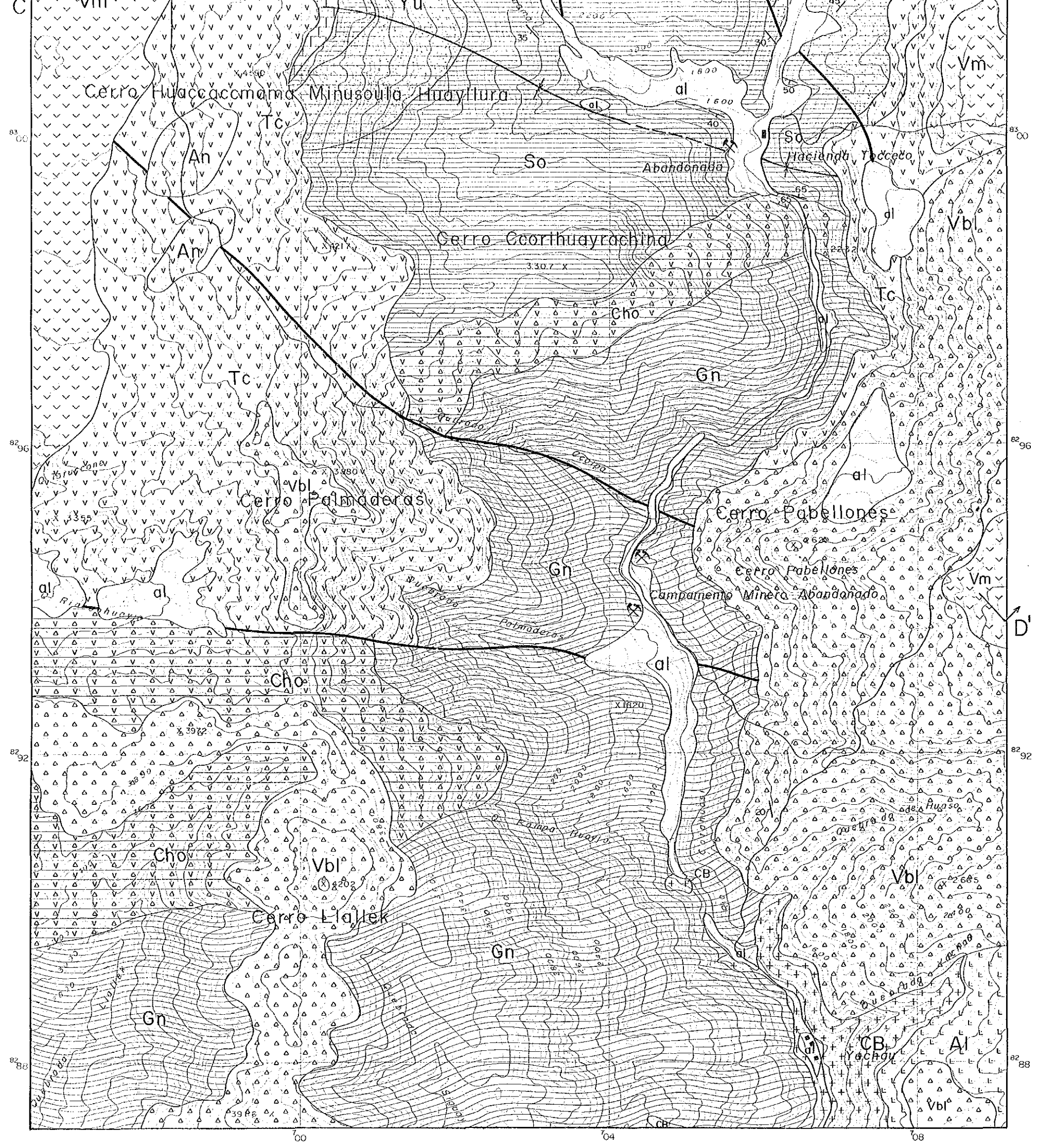




Mesozoic	Tertiary	Pliocene - Oligocene - Miocene	Sercca Volcanic Rocks		Hornblende-biotite dacite lava, welded tuff and tuff
			Huayllillas Formation		Dacitic tuff (partly pumice bearing)
			Alpabamba Formation		Dacitic tuff, lapilli tuff, tuff breccia and welded tuff (partly with dacite lava or andesite lava)
			Tacaza Formation		Andesitic tuff breccia, Andesite, tuff and dacitic tuff breccia (greenish grey)
			Huanca Formation		Andesitic volcanic conglomerate, tuff breccia and tuffaceous sandstone (greenish grey)
			Arcurquina Formation		Limestone and marl with sandstone and chert nodule
			Murco Formation		Red shale and sandstone with gypsum bearing conglomerate
			Yura Group		Quartzite, siliceous sandstone, black shale and alternation of quartzite and shale
			Socosaní Formation		Black shale, limestone with sandstone and tuff
			Chocolate volcanic rocks		Andesitic tuff breccia, tuff, andesite and tuffaceous sandstone
Precambrian				Gneiss, gneissose granite and diorite	

Tertiary	Intrusive Rocks	Stock and Dyke		Hornblende andesite, andesite
		Accha Stock		Diorite and quartz diorite
		La Costa Batholith		Quartz diorite and granodiorite
Cretaceous				Fault
				Inferred fault
				Anticline
				Syncline
				Geological boundary
				Geological profile line
			Strike and dip	
			Mine (working or closed)	





- Fault
- Inferred fault
- Anticline
- Syncline
- Geological boundary
- Geological profile line
- Strike and dip
- Mine (working or closed)