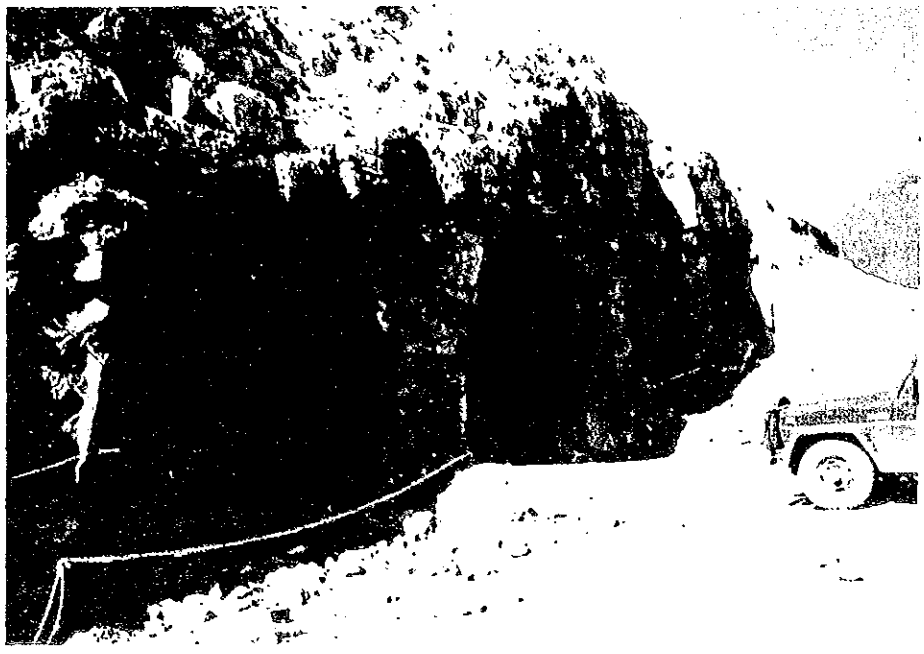
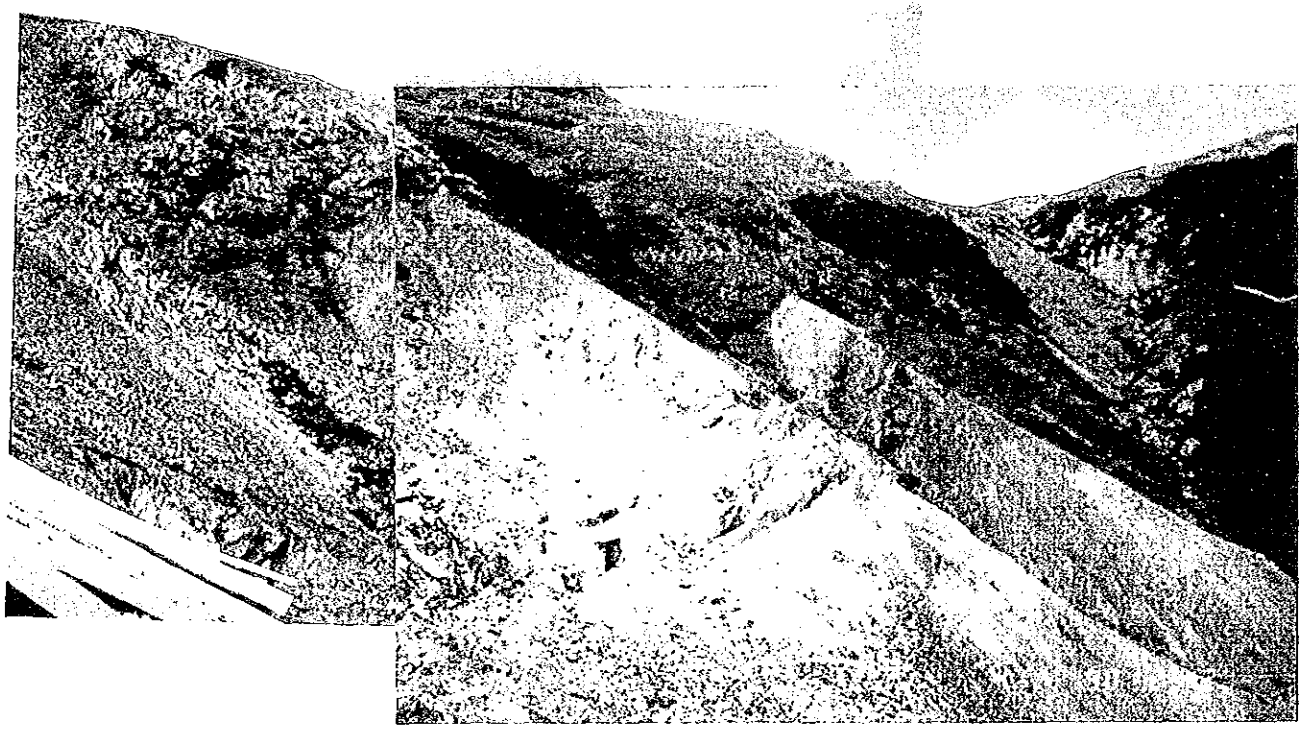
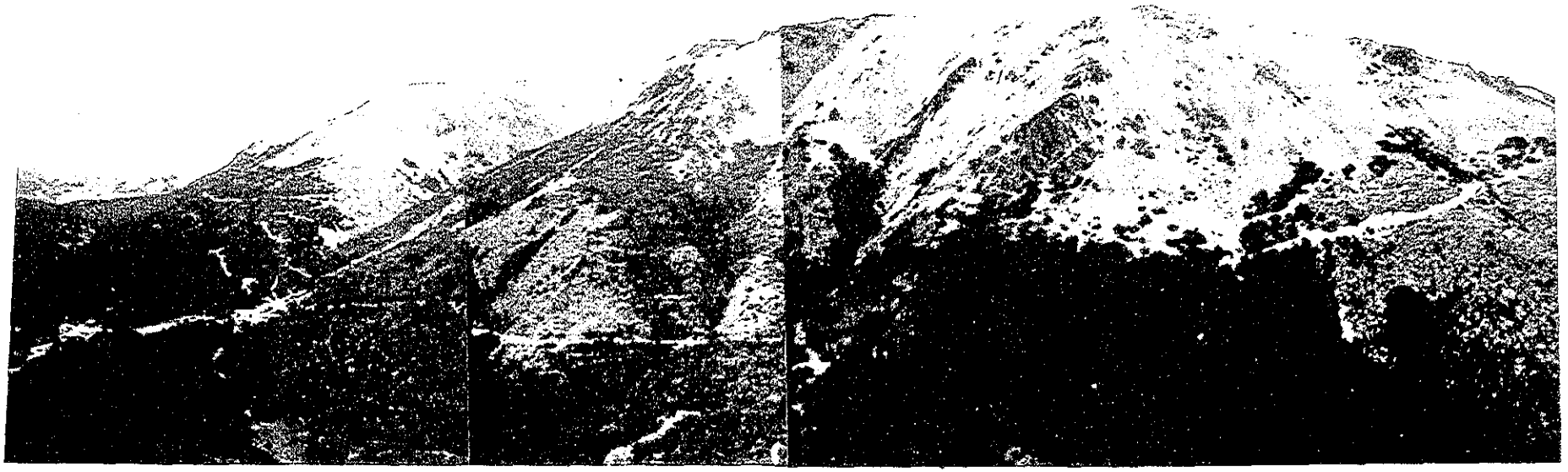
PHOTOGRAPHS



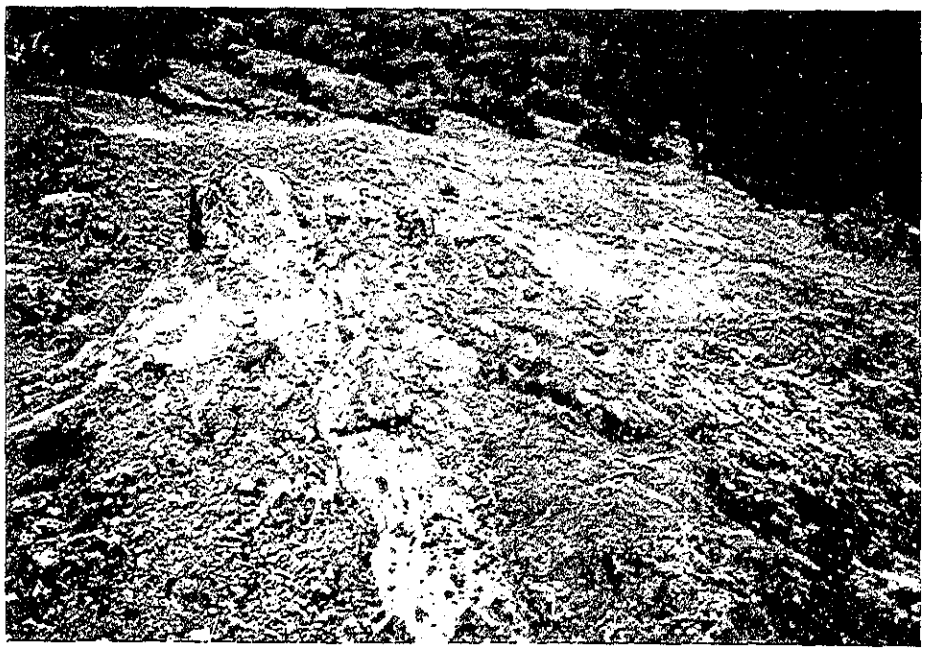
Main entrance to stope of the El Toqui mine



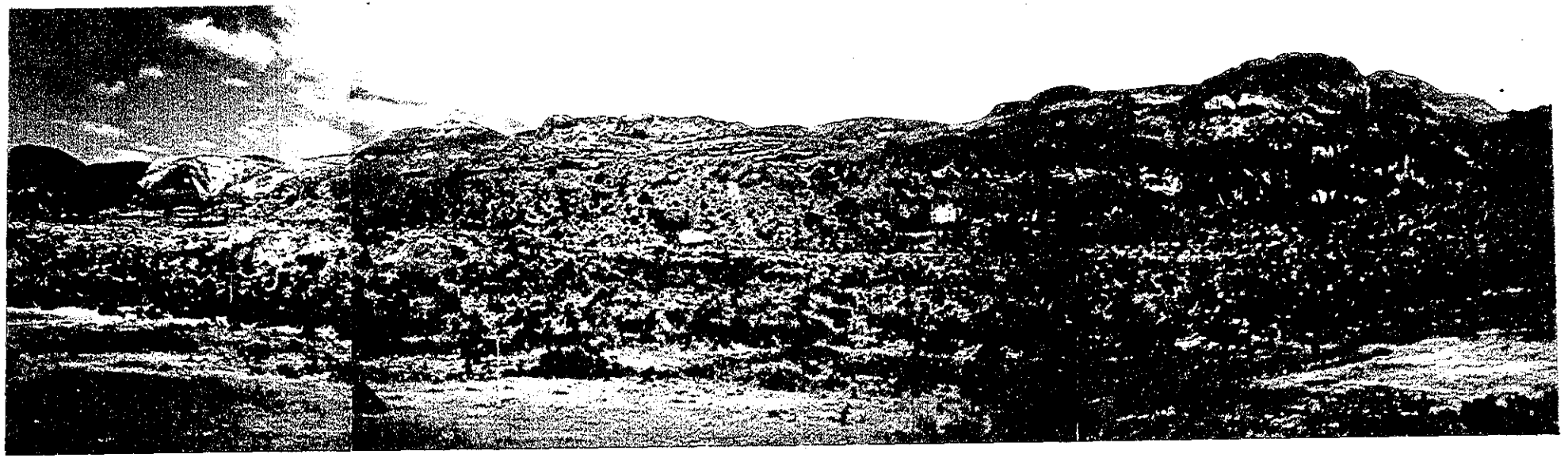
Out crop of ore in Santa Teresa deposit



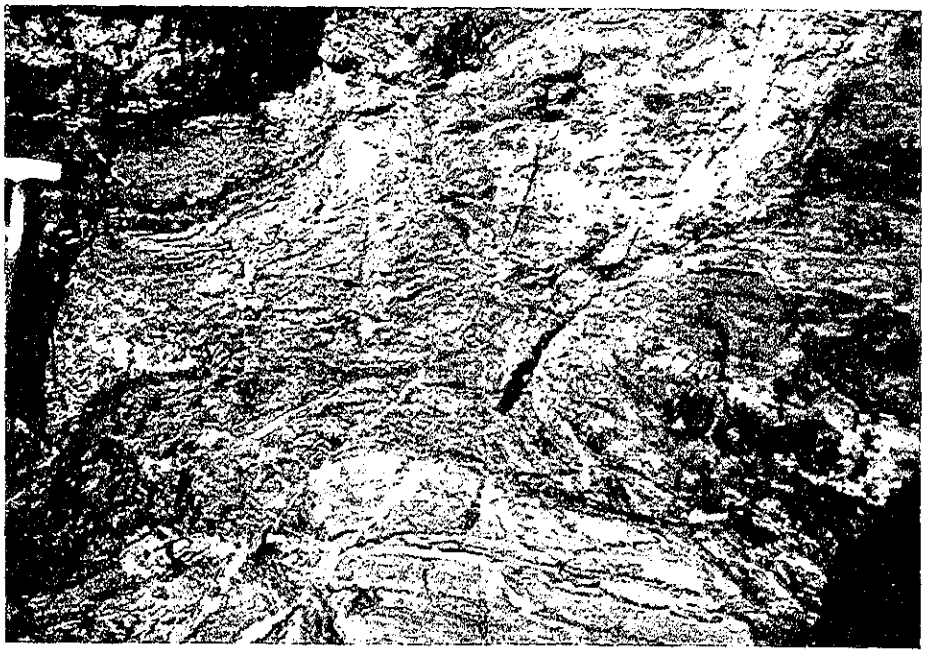
The whole view of alteration zone of the Katterfeld deposit



Silicified zone of the Katterfeld deposit

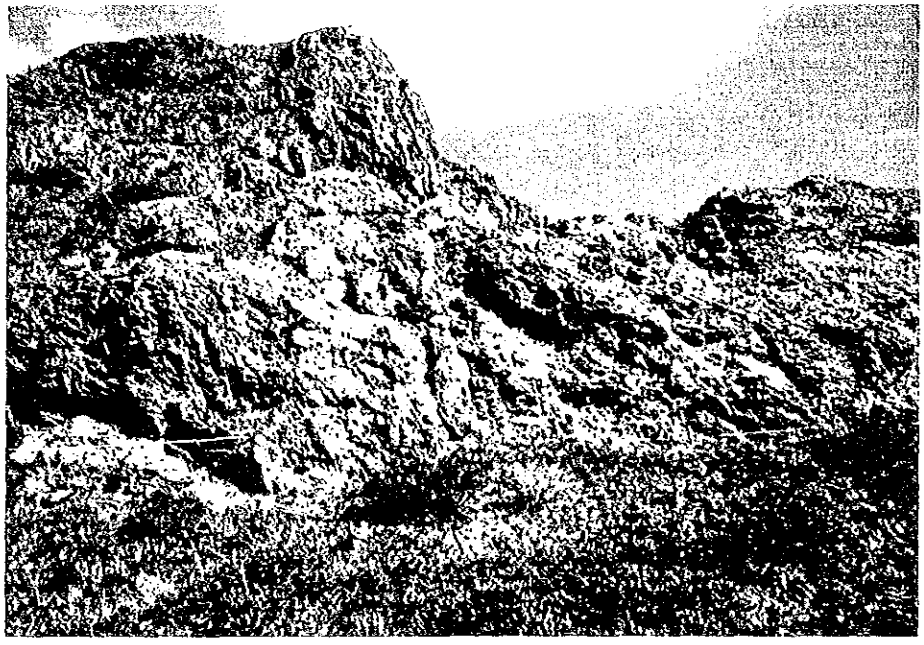


Whole view of the La Poza



A mode of occurance of ore in La Poza deposit

Silicified alteration zone in Laguna Verde diposit

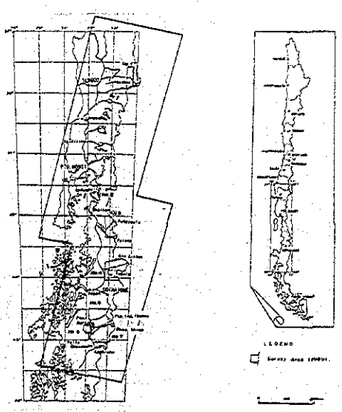


feature of views of Laguna Verde diposit

PL. 1

THE INVESTIGATION OF MINERAL POTENTIAL IN THE LOQUIMAY AREA AND REGIONS LOS LAGOS AND AYSEN PHASE I

PHOTOGEOLOGICAL INTERPRETATION MAP FOR LANDSAT MSS IMAGES

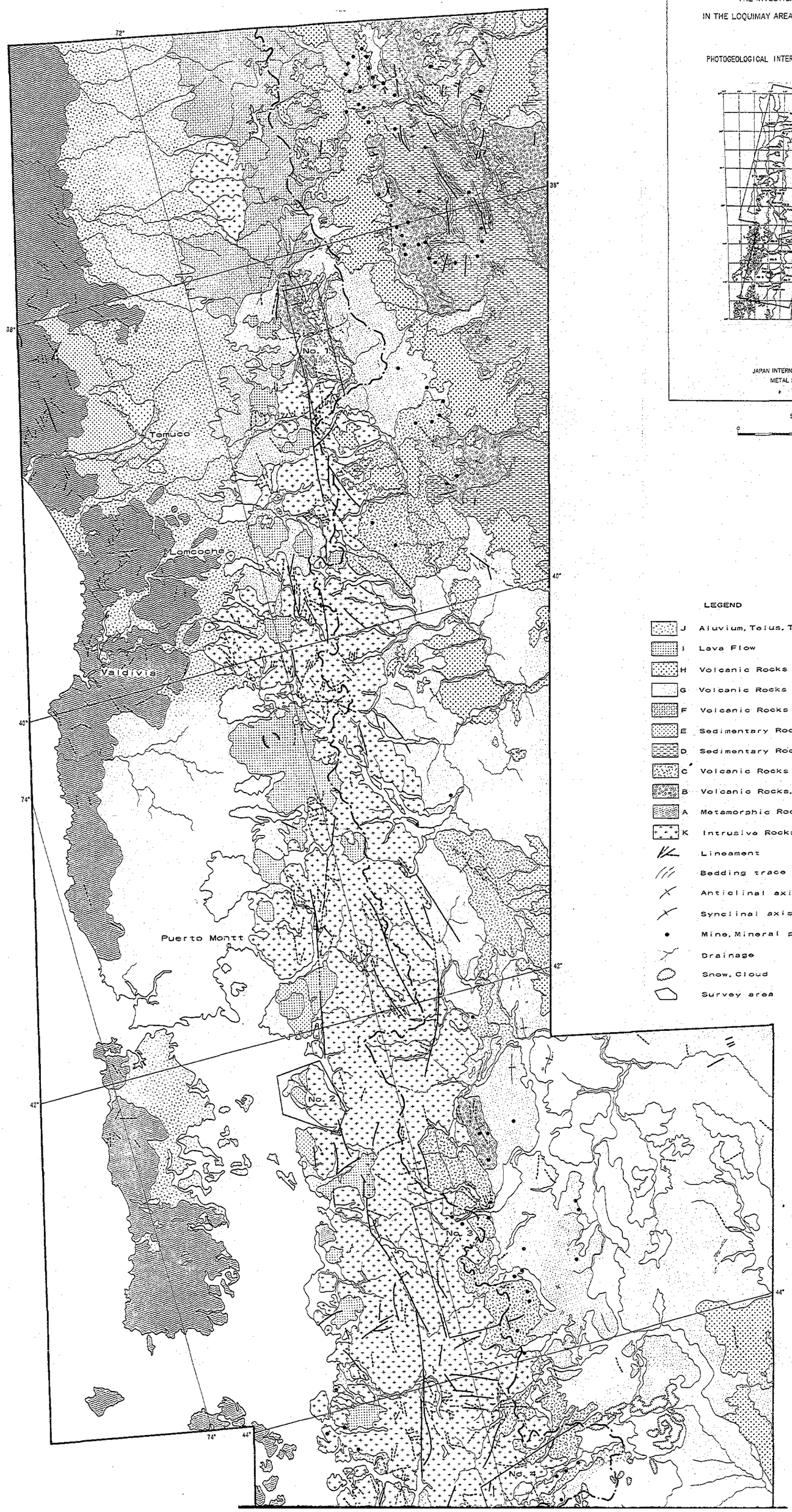


JUNE 1990

JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

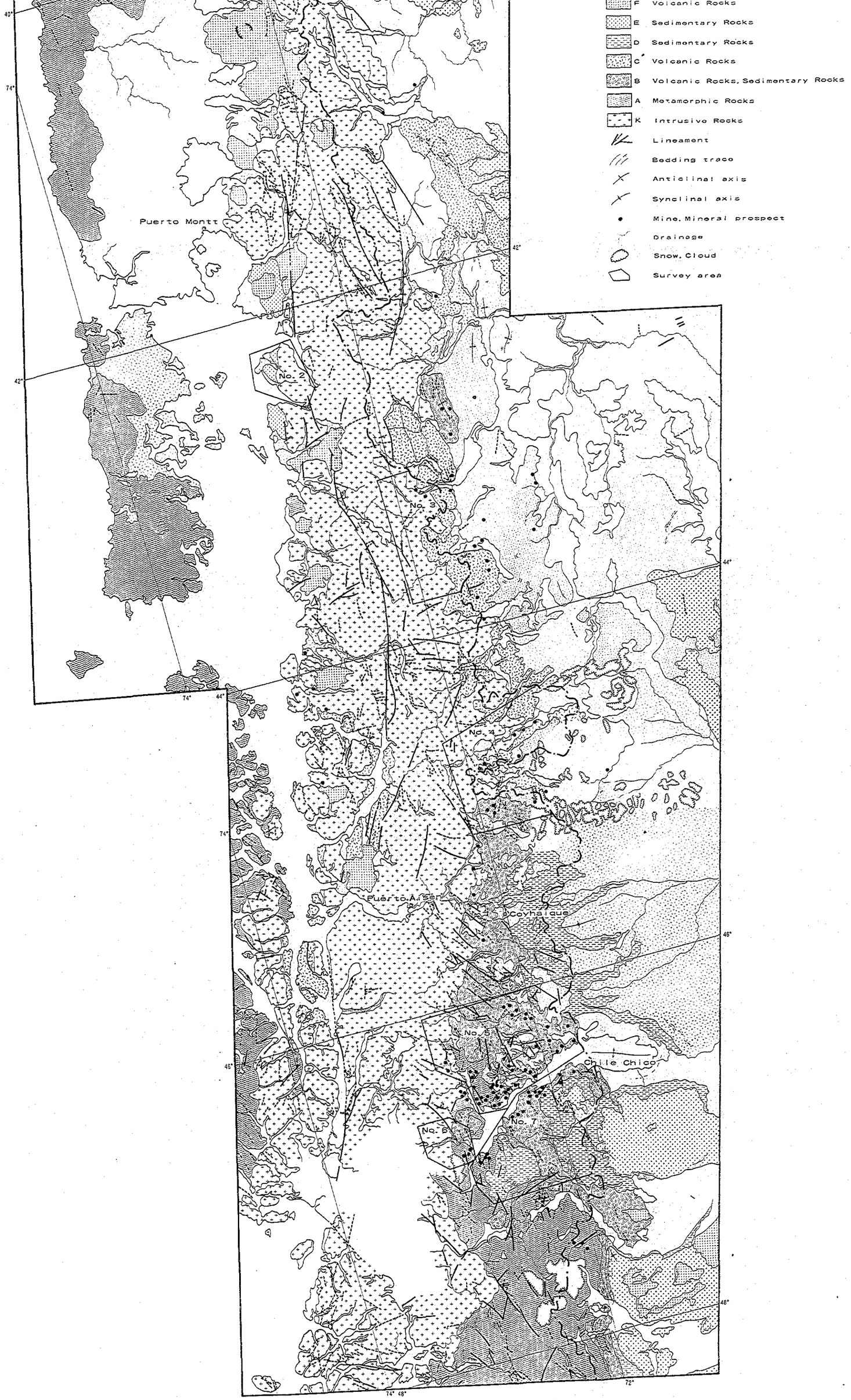
Scale 1:1,000,000

0 50 100km



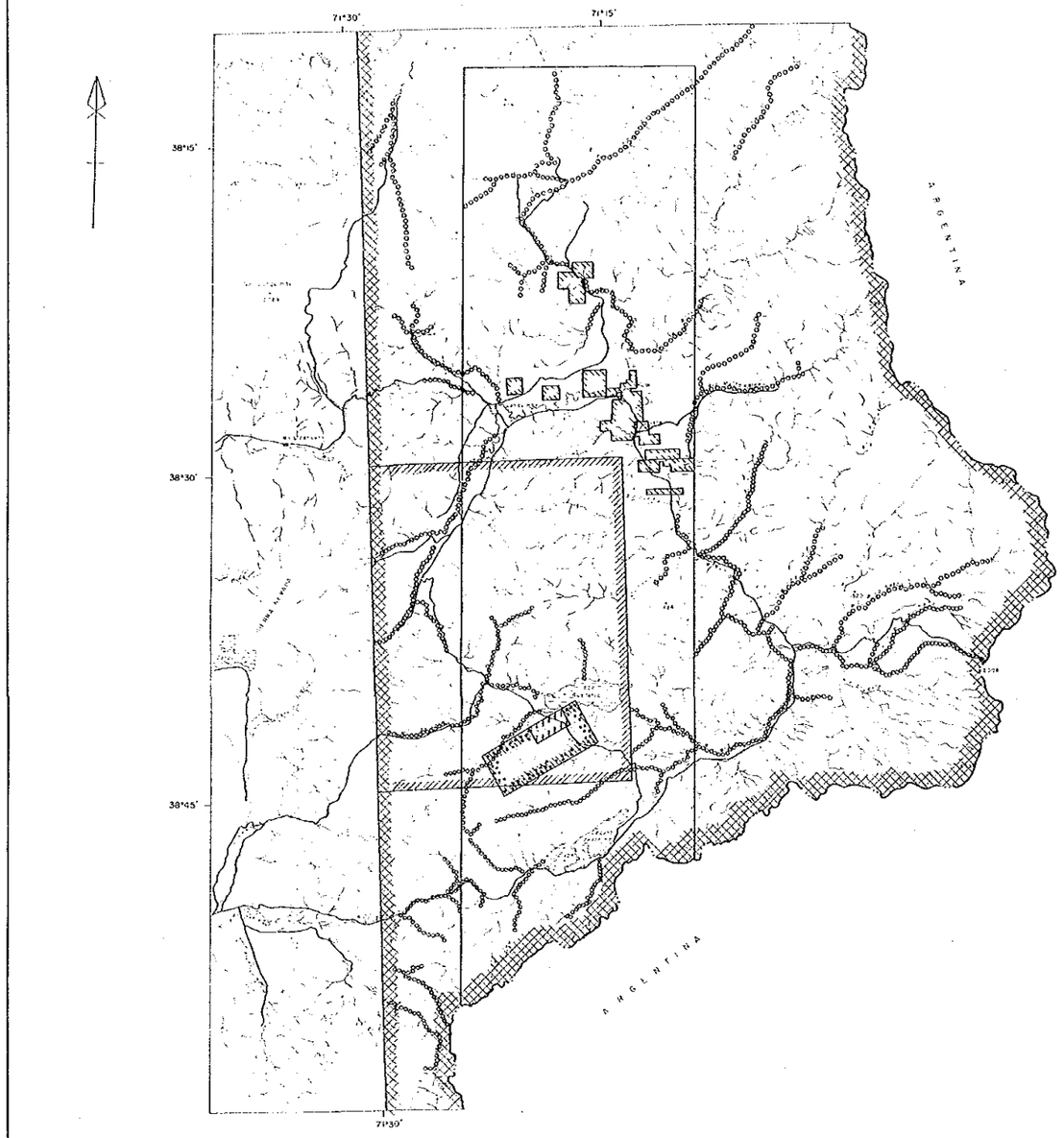
LEGEND

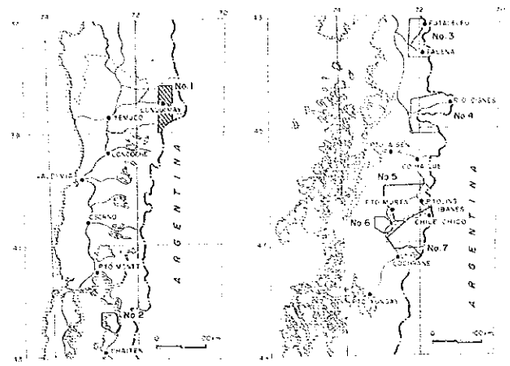
- J Aluvium, Talus, Terrace, Gracier Deposit
- I Lava Flow
- H Volcanic Rocks
- G Volcanic Rocks
- F Volcanic Rocks
- E Sedimentary Rocks
- D Sedimentary Rocks
- C Volcanic Rocks
- B Volcanic Rocks, Sedimentary Rocks
- A Metamorphic Rocks
- K Intrusive Rocks
- Lineament
- Bedding trace
- Anticlinal axis
- Synclinal axis
- Mine, Mineral prospect
- Drainage
- Snow, Cloud
- Survey area


F Volcanic Rocks
E Sedimentary Rocks
D Sedimentary Rocks
C Volcanic Rocks
B Volcanic Rocks, Sedimentary Rocks
A Metamorphic Rocks
K Intrusive Rocks
Lineament
Bedding trace
Anticlinal axis
Synclinal axis
Mine, Mineral prospect
Drainage
Snow, Cloud
Survey area
Puerto Montt
No. 2
No. 3
No. 4
Puerto Aisen
Coyhaique
No. 5
Chile Chico
No. 6
No. 7
40°
42°
44°
46°
48°
74°
72°

THE INVESTIGATION OF MINERAL POTENTIAL IN THE LOQUIMAY AREA AND REGIONS LOS LAGOS AND AYSEN PHASE I

PAST EXPLORATION WORKS IN AREA NO. 1 (LONQUIMAY AREA)





JUNE 1993

JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

Scale 1:250,000

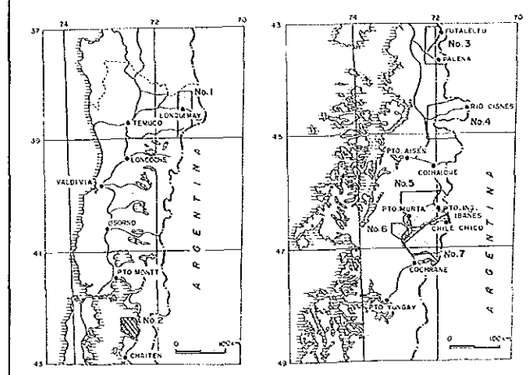
0 10 20km

LEGEND

- Geological and Geochemical Survey (1:50,000)(JICA-MMAJ, 1978)
- Detailed Geological and Geochemical Survey (1:10,000)(JICA-MMAJ, 1978)
- Geophysical Survey and Drilling Exploration (JICA-MMAJ, 1978)
- Geochemical Survey (SERNAGEOMIN, in Preparation)
- Geological Survey (1:250,000)(SERNAGEOMIN, in Preparation)
- Mining title
- Survey Area

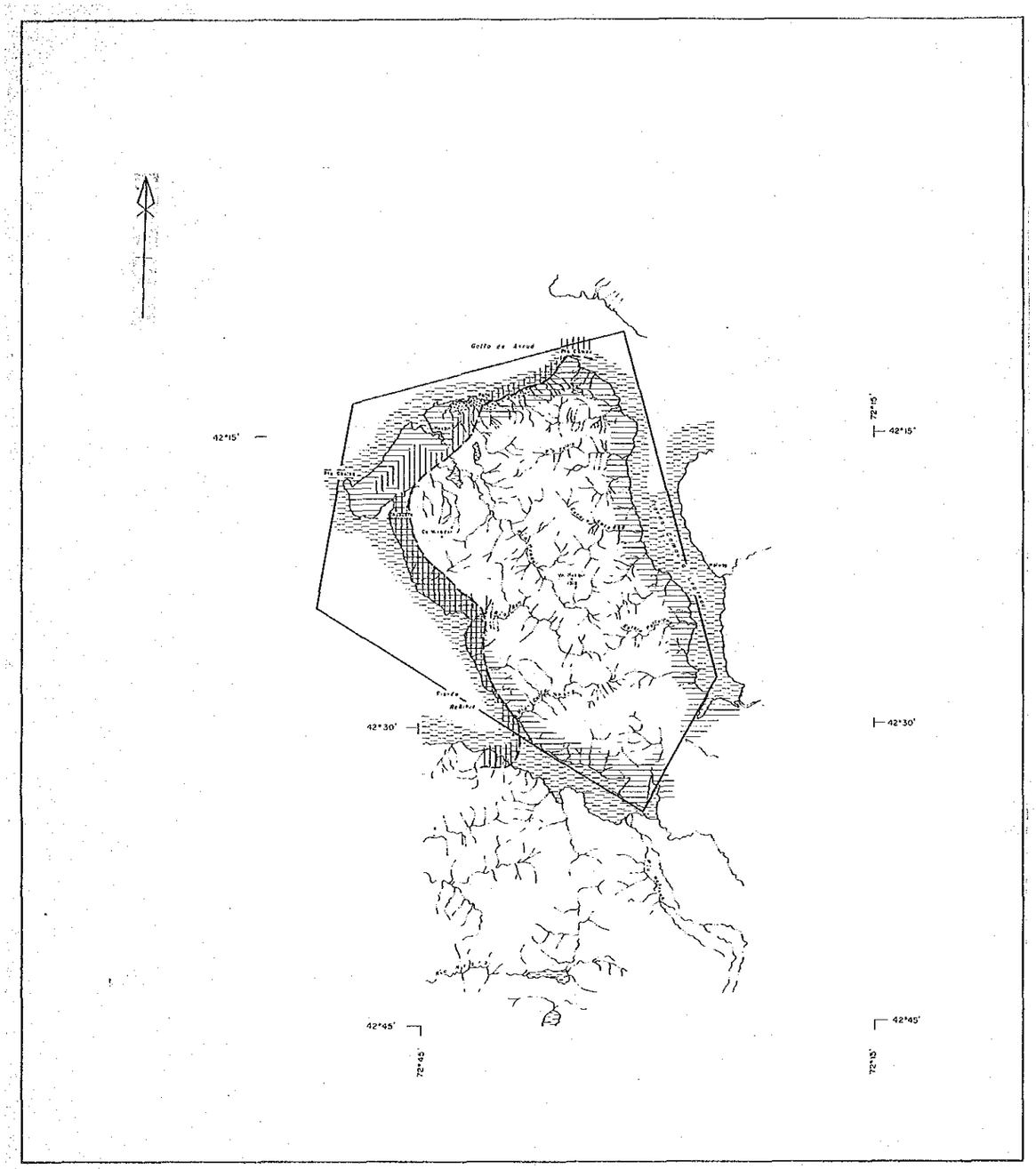
THE INVESTIGATION OF MINERAL POTENTIAL IN THE LOQUIMAY AREA AND REGIONS LOS LAGOS AND AYSEN PHASE I

PAST EXPLORATION WORKS IN AREA NO. 2(HUEQUI PENINSULA AREA)



JUNE 1990

JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN



Scale 1:250,000

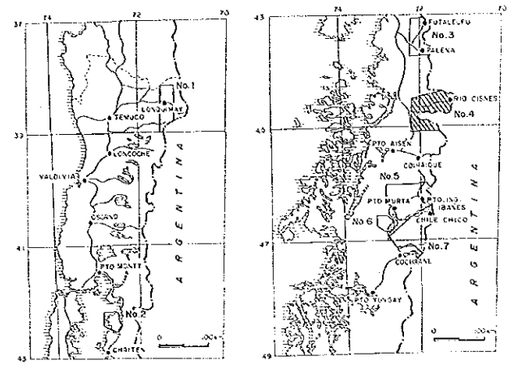
0 10 20km

LEGEND

- Geochemical Survey (1:500,000)(116, 1966)
- Geochemical Survey
- Air-Borne Magnetic Survey (ENAP, 1962)
- Survey Area

THE INVESTIGATION OF MINERAL POTENTIAL IN THE LOQUIMAY AREA AND REGIONS LOS LAGOS AND AYSEN PHASE I

PAST EXPLORATION WORKS IN AREA NO 4(ALTO CISNES-EL TOQUI AREA)

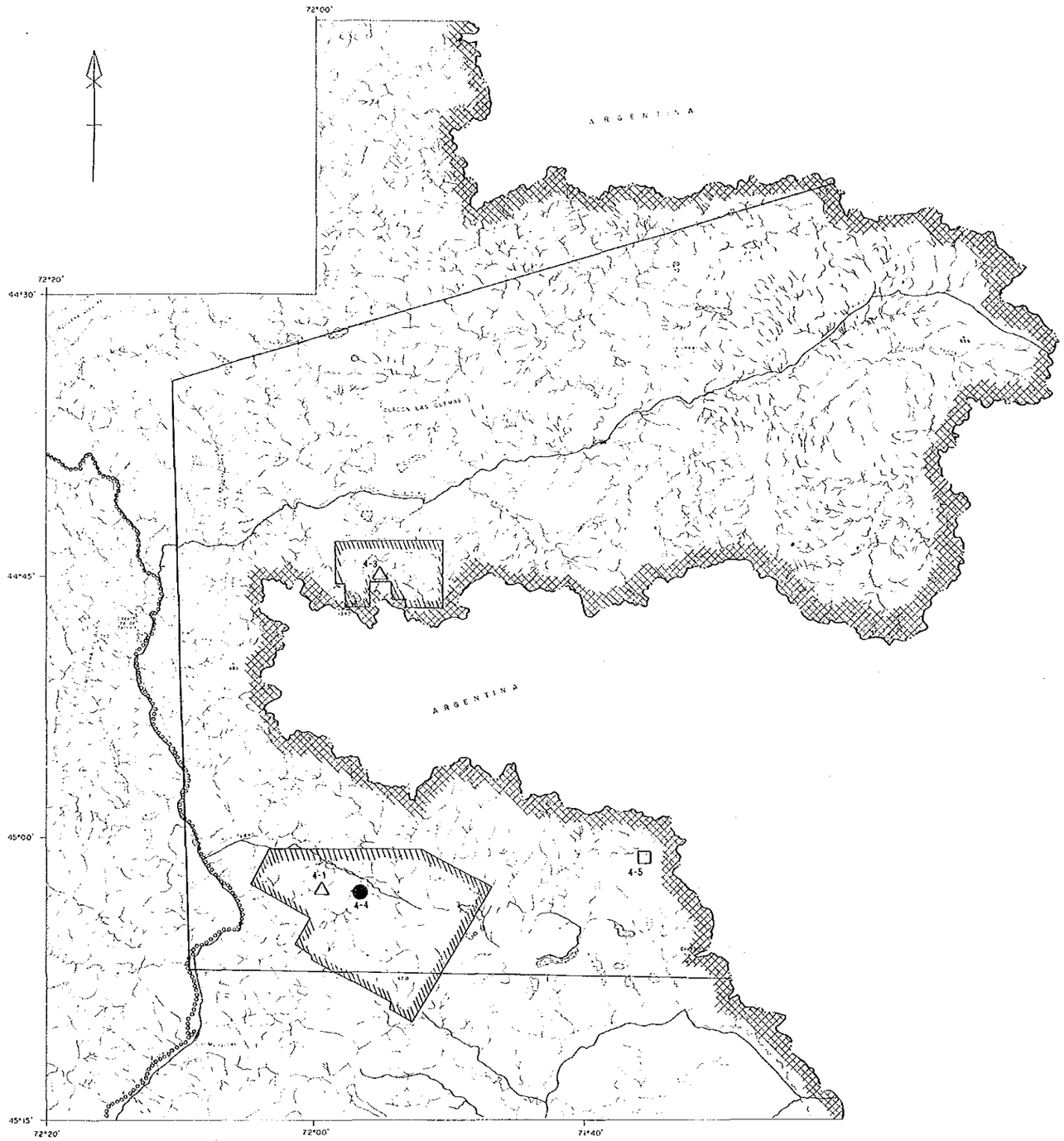


JUNE 1990

JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

Scale 1:250,000

0 10 20km



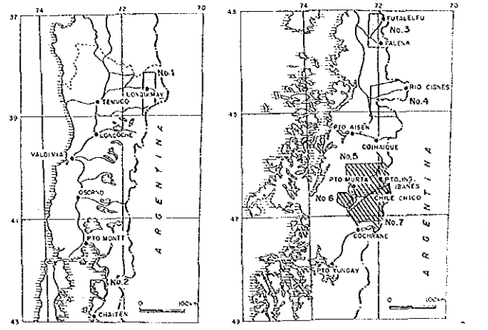
LEGEND

- Geological Survey (1:250,000)(SERNAGEOMIN, 1983)
- Geochemical Survey (SERNAGEOMIN. ?)
- Mining title
- Operating Mines
- Suspended Mines
- Mines under Exploration
- Survey Area

4-1 Co. Estatuas
4-3 Santa Teresa
4-4 El Tozur
4-5 Katterfeld

THE INVESTIGATION OF MINERAL POTENTIAL IN THE LOQUIMAY AREA AND REGIONS LOS LAGOS AND AYSEN PHASE I

PAST EXPLORATION WORKS IN AREAS NO. 5(IBAÑEZ-MURTA AREA), NO. 6(LOS LEONES AREA) AND NO. 7(CHILE CHICO-CHACABUCO AREA)

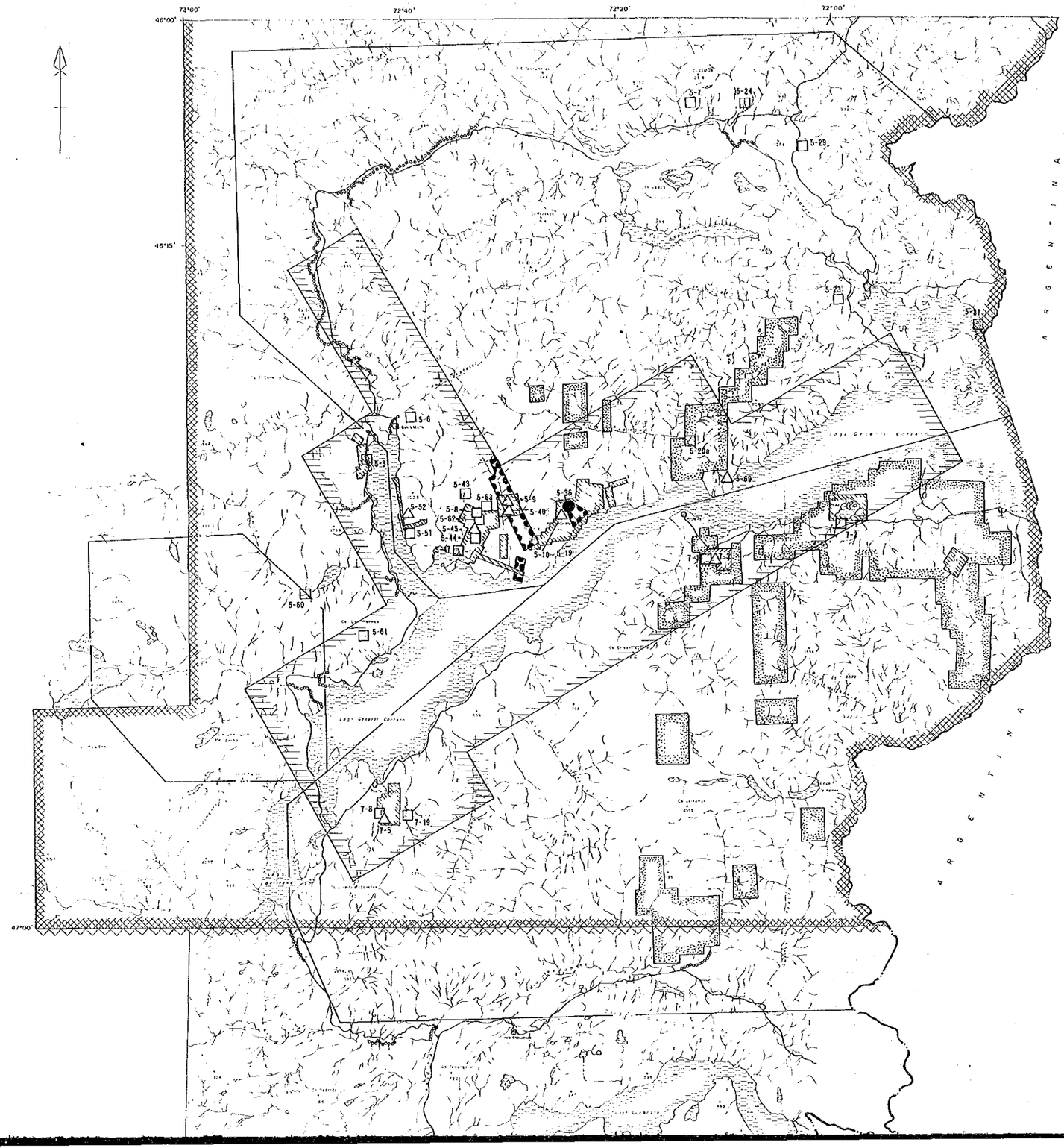


JUNE 1990

JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

Scale 1:250,000

0 10 20km

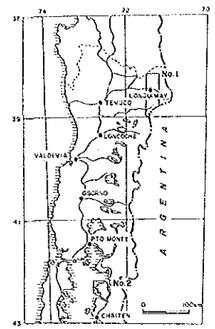


LEGEND

- Geological Survey (1:250,000)(SERNAGEOMIN, 1982)
- Geological Survey (1:250,000)(SERNAGEOMIN, 1984)
- Geological Survey (1:100,000)(MMAJ, 1978)
- Detailed Geological and Geophysical Survey (1:10,000)(MMAJ, 1979)
- Geochecal Survey (SERNAGEOMIN, ?)
- Mining Title
- Prospecting Title
- Operating Mines
- Suspended Mines
- Prospects
- Survey Area

5-3	Veta Perez	5-51	Veta el Plomo
5-6	Felix Barria	5-52	Mina Lago Negro
5-7	Mina Cerro Castillo	5-60	Lago Tranzvillo
5-8	Mina Las Pelado	5-61	El Encanto
5-9	Mina El Pelado	5-62	Veta De La Mona
5-10		5-63	Veta Hualo I and II
5-19	Mina Silva	5-69	Veta San Jose
5-20a	Veta Anita	7-1	Paulina
5-23	Mina Long	7-2	Laguna Verde
5-24	Prospecto Co. Castillo	7-3	Mina La Poza
5-29	Patagonia Is las	7-5	Mina Escondida
5-31	Co. Grando	7-8	Mina San Sebastian
5-36	Mina Rosillo	7-19	Veta Victor

PAST EXPLORATION WORKS IN AREAS NO.5(IBAÑEZ-MURTA AREA), NO.6(LOS LEONES AREA) AND NO.7(CHILE CHICO-CHACABUCO AREA)



JUNE 1990

JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

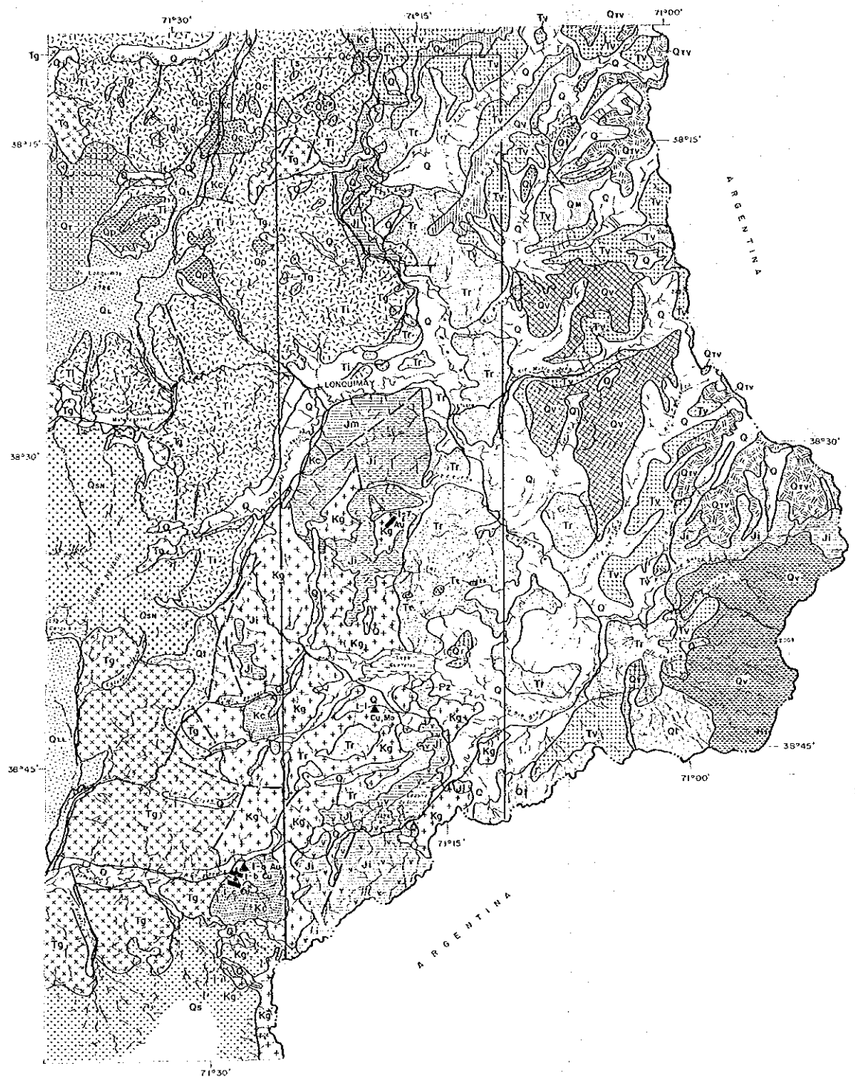
Scale 1:250,000

0 10 20Km

LEGEND

- Geological Survey (1:250,000)(SERNAGEOMIN, 1982)
- Geological Survey (1:250,000)(SERNAGEOMIN, 1984)
- Geological Survey (1:100,000)(MMAJ, 1978)
- Detailed Geological and Geophysical Survey (1:10,000)(MMAJ, 1979)
- Geochecal Survey (SERNAGEOMIN, ?)
- Mining Title
- Prospecting Title
- Operating Mines
- Suspended Mines
- Prospects
- Survey Area

5-3 Veta Perez
5-6 Felix Barria
5-7 Mina Cerro Castillo
5-8 Mina Las Pelado
5-9 Mina El Pelado
5-10 ~ 5-19 Mina Silva
5-20a Veta Anita
5-23 Mina Long
5-24 Prospecto Co.Castillo
5-29 Patagonia Is las
5-31 Co. Ovando
5-36 Mina Rosilio
5-40 Mina Del Bajio
5-43 Farellon Sanchez
5-44 Veta el Llano
5-45 Las Mulas
5-47 El Flores
5-51 Veta el Plomo
5-52 Mina Lago Negro
5-60 Lago Tranzvilio
5-61 El Encanto
5-62 Veta De La Mona
5-63 Veta Hualo I and II
5-69 Veta San Jose
7-1 Paulina
7-2 Laguna Verde
7-3 Mina Lo Poza
7-5 Mina Escondida
7-8 Mina San Sebastian
7-19 Veta Victor



L E G E N D

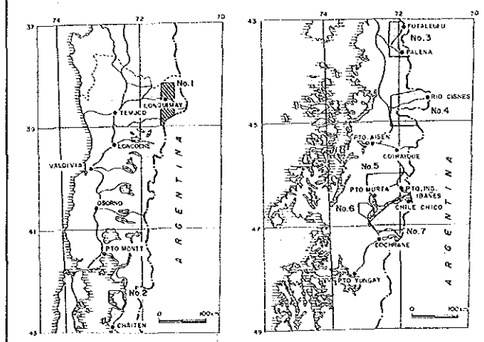
- **Quaternary**
  - Q — Inconsolidated sediments (alluvial, fluvial, colluvial and glacial)
  - Qt — Shallow tephra
- **Holocene~ Late Pleistocene**
  - Ql — Lonquimay volcano
  - Qll — Llaima volcano
- **Late Pleistocene**
  - Qs — Sollipulli volcano
  - Qc — Caltaqui volcano
  - Qt — Tolguaca volcano
  - Qsn — Sierra Nevada volcano
  - Qi — Ignimbrite and lava
  - Qv — Laguno Marinanqui volcano
- **Early Pleistocene**
  - Qb — Penon volcano, El Marcial Volcano and Co. Conasto Volcanic rocks
  - Tv — Pino Solo-Trallihue pampas Volcanite
  - Qtv — Rahue volcanic rocks
  - Qv — Mitrauquen-Pacunto pampas Volcanite
  - Qv — Pino Hachado Caldera
  - Qv — Cordillera de Huisa Volcanite
- **Early Pleistocene ~Late Miocene**
  - Qz — Cerro del Medio Gabbro
  - Tv — Los Rios (Lanquen-Ranquil and Cerro Batecamahuida
  - Tv — El Rio Pehuenco Volcanite
  - Tt — Huichahue stratum
- **Miocene**
  - Tr — Rio Pedregoso Formation
- **Guapitrio Volcanic complex**
  - Ti — Indifferenciated
  - Ts — Sedimentary intercalation
  - Tz — Hypabyssal rock
  - Tε — Rio Renaico granitoid
  - Kg — Guallotue granitoid
- **Cretaceous**
  - Kc — Cerro Loncotiugua Formation
- **Late Dogger**
  - Jm — Cordillera Lonquimay Formation
- **Early Dogger~Lias**
  - Ji — Cordillera de Litrancura Formation
  - Ji — Carilauquen complex
- **Pre-Jurassic**
  - P2 — Guallotue Stratum

- Fault
- Vein type deposits, confirmed
- Dissemination and/or stockworks deposits, confirmed
- I-C — Number of deposits
- Cu — Principal metal
- Survey area

PL. 6

THE INVESTIGATION OF MINERAL POTENTIAL IN THE LOQUIMAY AREA AND REGIONS LOS LAGOS AND AYSEN PHASE I

GEOLOGICAL MAP OF AREA NO.1(LONQUIMAY AREA)



JUNE 1990

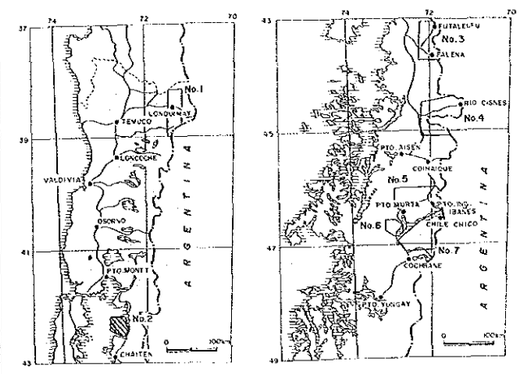
JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

Scale 1:250,000

0 10 20km

THE INVESTIGATION OF MINERAL POTENTIAL IN THE LOQUIMAY AREA AND REGIONS LOS LAGOS AND AYSEN PHASE I

GEOLOGICAL MAP OF AREA No. 2(HUEQUI PENINSULA AREA)

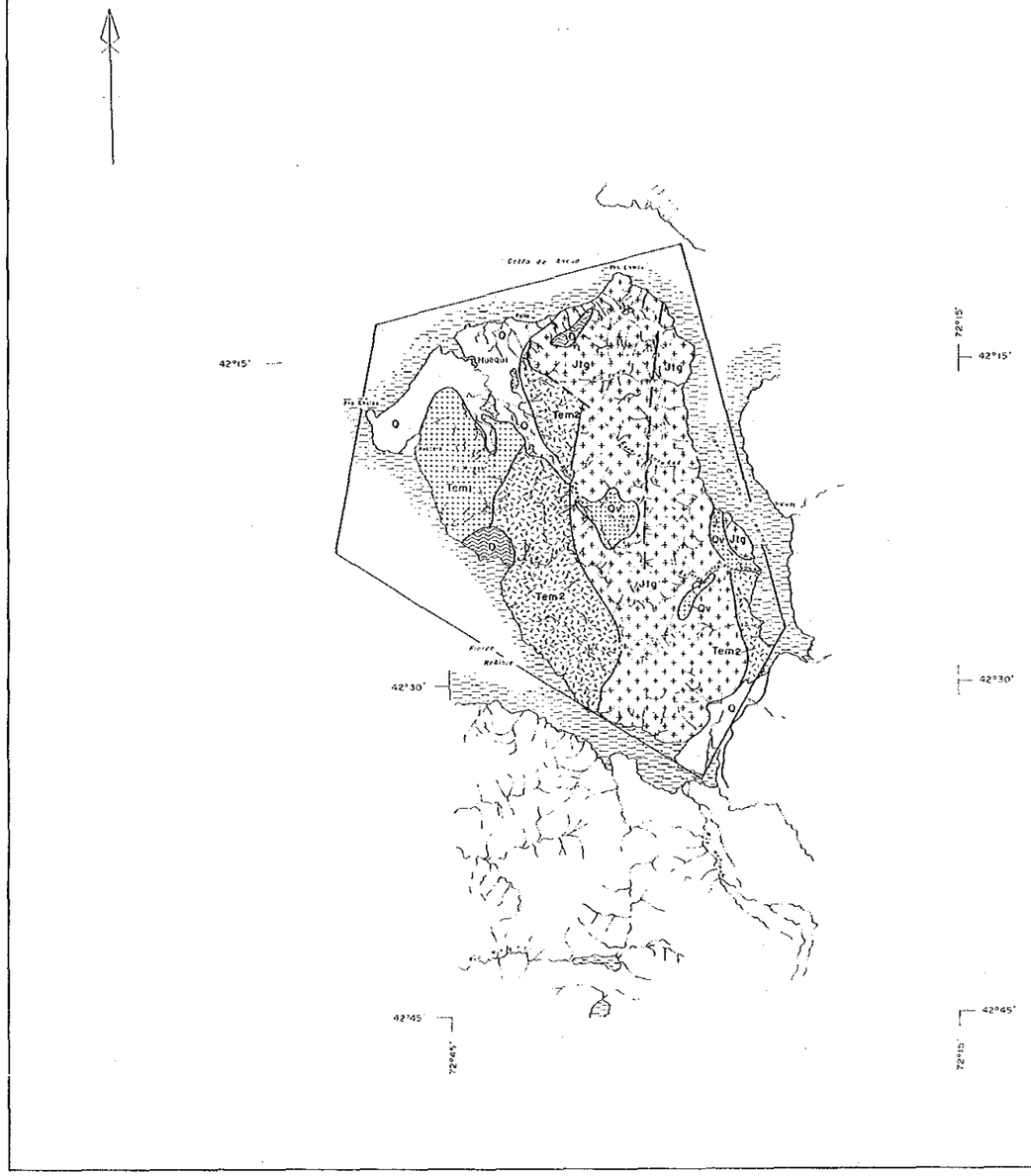


JUNE 1990

JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

Scale 1:250,000

0 10 20km



LEGEND

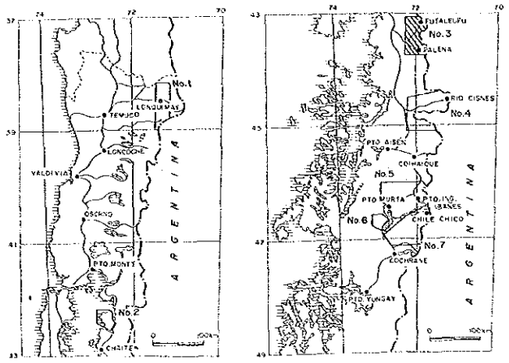
Quaternary		O	Continental and marine sediments
		Ov	Volcanic rocks
Tertiary	Miocene~Eocene	Tem1	Marine sedimentary rocks
		Tem2	Continental sedimentary rocks
Devoniam		D	Marine and transitional and sedimentary rocks
Intrusive rock		Jtg	Tonalite, migmatite, amphibolite, gneiss and pegmatite

Fault

Survey area

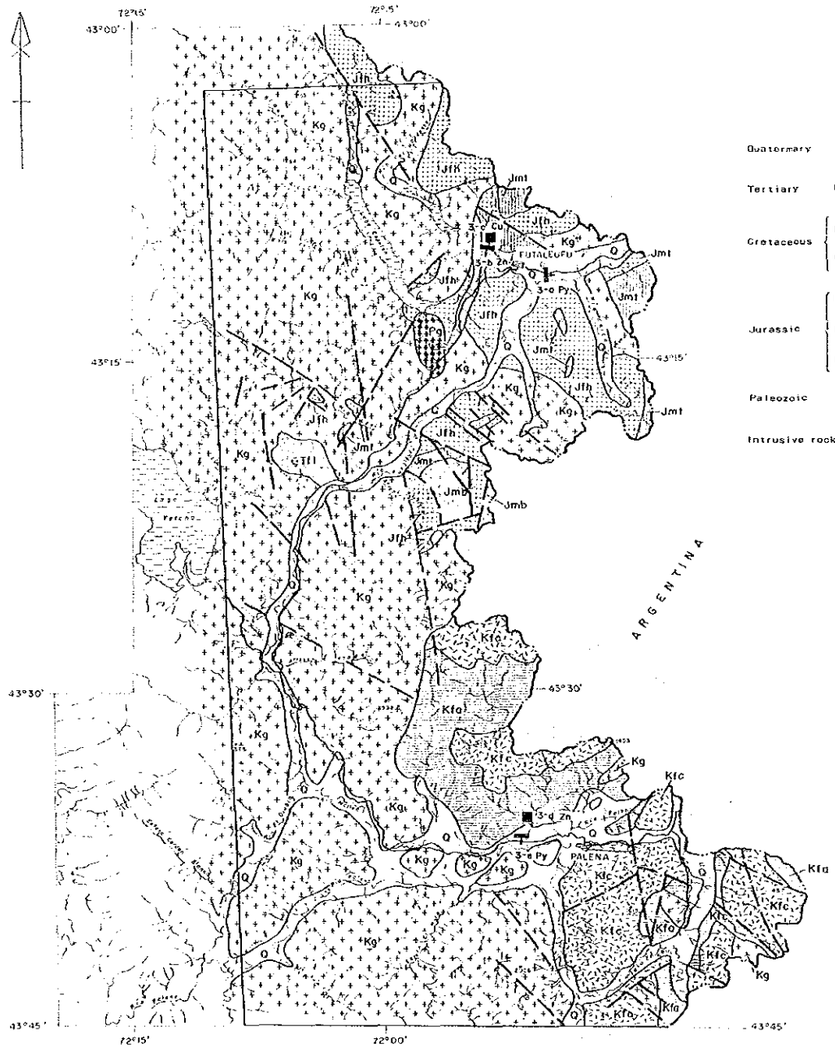
THE INVESTIGATION OF MINERAL POTENTIAL IN THE LOQUIMAY AREA AND REGIONS LOS LAGOS AND AYSEN PHASE I

GEOLOGICAL MAP OF AREA NO 3(FUTALEUFU-ALTO PALENA AREA)



JUNE 1990

JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN



L E G E N D

Quaternary		Q	Fluvio-Glacial and Fluvial deposits
Tertiary	Eocene	Ttl	La Cascada Formation : Marine sediments
Cretaceous	Late Cretaceous	Kfc	Cordon de Las Tobas : Continental volcano-sedimentary rocks
	Early Cretaceous	Kfa	Alto Palena Formation : Marine and continental sedimentary rocks
Jurassic	Late Cretaceous	Jmb	Tamango Formation : Ventisquero Member(volcanic rocks)
	Middle Jurassic	Jmt	Tamango Formation : Tres Monjas member(marine sedimentaryand volcanic rock)
	Early Jurassic	Jfh	Huemul Formation : Continental volcanic rocks
Paleozoic		Pg	Longonao Stock
Intrusive rocks			
	Late Cretaceous	Kg	Futaleufu-Palena batholith

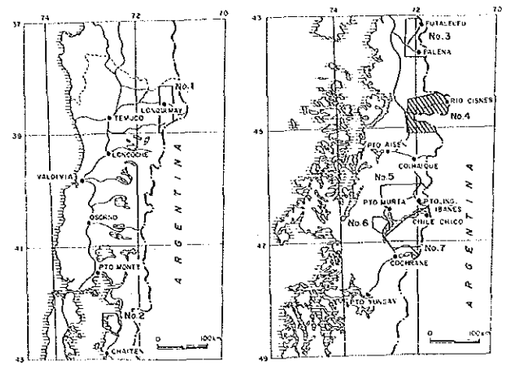
- Fault
- Vein type deposits, confirmed
- Strata-bound, manto and lenticular type deposits, confirmed
- 3-a Number of deposits
- Cu Principal metal

Scale 1:250,000

0 10 20km

THE INVESTIGATION OF MINERAL POTENTIAL IN THE LOQUIMAY AREA AND REGIONS LOS LAGOS AND AYSEN PHASE I

GEOLOGICAL MAP OF AREA NO. 4(ALTO CISNES-EL TOQUI AREA)

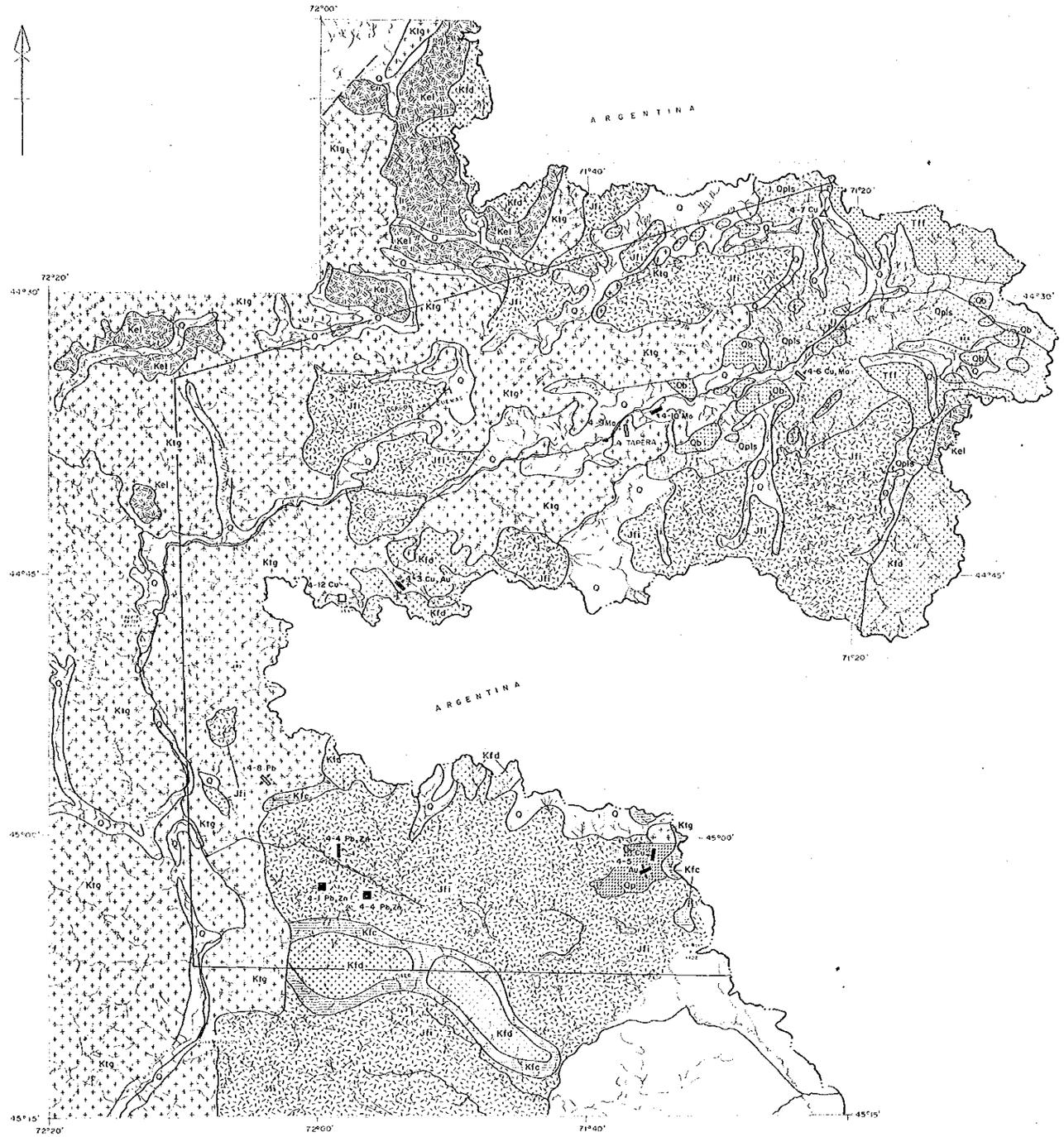


JUNE 1990

JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

Scale 1:250,000

0 10 20km

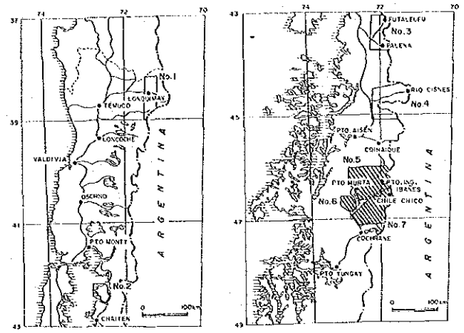


LEGEND

Quaternary	Holoceno		Q	Fluvial, alluvial and glacial deposits
	Pleistocene		Opls	Old fluvio-glacial deposits: Glaciols and sands (semi-consolidated)
			Ob	Las Nacientes del Rio Cisnes stratus : Basalts andesites
Tertiary	Neogene		Tff	Frias Formation : Gravels semi-consolidated, tuffs and tuffites
Cretaceous	Late Cretaceois		Kfd	Divisadero Formation : Dacites, andesites and tuffs
Cretaceous to Jurassic	Neocomian to Late Jurassic		Kel	Lago Vide stratus : Green andesites, tuffs and lapilli tuffus
	Neocomian		Kfc	Coyhaique Formation : Shales and sandstones
Jurassic	Late Jurassic		Jfi	Ibanez Formation : Rhyolites, dacite, andesites, tuffs, breccias and sandstones
Intrusive rocks			Ktg	Granitic rocks : Granites to gabbros
			Op	Quartz porphyry
				Fault
				Vein type deposits, confirmed
				Vein type deposits reported
				Strata-bound, manto and lenticular type deposits, confirmed
				Strata-bound, manto and lenticular type deposits, reported
			4-4	Number of deposits
			Pb	Principal metal
				Survey area

THE INVESTIGATION OF MINERAL POTENTIAL IN THE LOQUIMAY AREA AND REGIONS LOS LAGOS AND AYSEN PHASE I

GEOLOGICAL MAP OF AREA NO.5(IBAÑEZ-MURTA AREA), NO.6(LOS LEONES AREA) AND NO.7(CHILE CHICO-CHACABUCO AREA)



JUNE 1990

JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

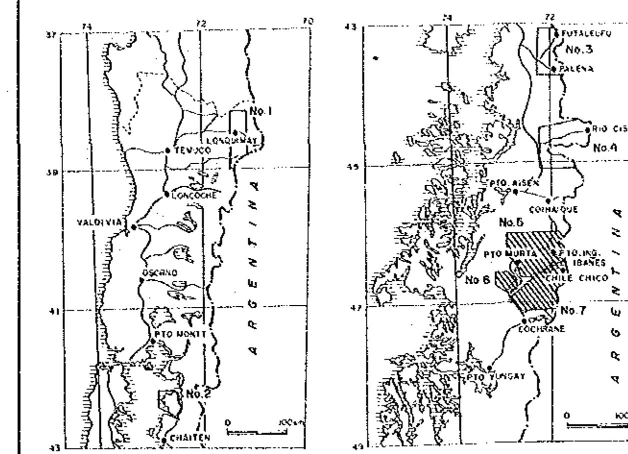
Scale 1:250,000

0 10 20km

LEGEND

Quarternary		Q	Alluvial, fluvial, colluvial talus, terrace and glacial deposits
Tertiary	Pliocene	TTeba	Meseta Buenos Aires Formation : Alcalic basaltic lavas with pyroxene, olivine, plagioclase
	Lower Pliocene ~ Miocene	TTfg	Galera Formation: Conglomerates sandstones, shales continental tuffites with cross-bedding and imbricate structure to east
	Early Oligocene to Late Eocene	TTfgd	Guadal Formation: Mainly marine sandstones
Cretaceous	Aptian-Cenomanian	Kfd	Divisadero Formation: Tuffs, tuff breccias, tuffaceous sandstones, andesitic micro-breccias, andesites
	Neocomian	Kfc	Coyhaique Formation: Fossiliferous black shales fine grained arkose sandstones, partialy calcareous and conglomerates
Jurassic	Late to Middle Jurassic	Jfl	Ibañez Formation: Dacites, andesitic and rhyolitic breccias, rhyolites, andesitic tuff breccias, andesites
Paleozoic	Late Paleozoic	Pzbm	Metamorphic basement: Amphibolites, schists, phyllites and quartzites
		Pzc	Metamorphic basement: Marls and calcareous schists
Intrusive rocks		Tfib	Basalts
		KTir	Lagima Pollatia rhyolite: Rhyolitic dome
		Ktg	Granitic rocks: Granites, tonalites and diorites
			Hydrothermal alteration
			Fault
			Unclassified deposits
			Vein type deposits, confirmed
			Vein type deposits reported
			Strata-bound, manto and lenticular type deposits, confirmed
			Strata-bound, manto and lenticular type deposits, reported
			Dissemination and/or stockworks deposits, confirmed
			Dissemination and/or stockworks deposits, reported
		5-43	Nucber of deposits

NO.6(LOS LEONES AREA) AND NO.7(CHILE CHICO-CHACABUCO AREA)



JUNE 1990

JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

Scale 1:250,000

0 10 20km

LEGEND

Era	Period	Symbol	Description
Qurternary		Q	Alluvial, fluvial, colluvial talus, terrace and glacial deposits
Tertiary	Pliocene	TTmba	Mesota Buenos Aires Formation : Alcalic basaltic laves with pyroxene, olivine, plagioclose
	Lower Pliocene ~ Miocene	TTfg	Galera Formation: Conglomerates sandstones, shales continental tuffites with cross-bedding and imbricate structure to east
	Early Oligocene to Late Eocene	TTfgd	Guadal Formation: Mainly marine sandstones
Cretaceous	Aptian-Cenomanian	Kfd	Divisadero Formation: Tuffs, tuff breccias, tuffaceous sandstones, andesitic micro-breccias, andesites
	Neocomian	Kfc	Coyhaique Formation: Fossiliferous black shales fine grained arkose sandstones, partialy calcareous and conglomerates
Jurassic	Late to Middle Jurassic	Jfi	Ibañez Formation: Dacites, andesitic and rhyolitic breccias, rhyolites, andesitic tuff breccias, andesites
Paleozoic	Late Paleozoic	Pzbm	Metamorphic basement: Amphibolites, schists, phyllites and quartzites
		Pzc	Metamorphic basement: Marls and calcareous schists
Intrusive rocks		TTib	Basalts
		KTir	Laguna Pollolla rhyolite: Rhyolitic dome
		Ktg	Granitic rocks: Granitos, tonalites and diorites

- Hydrothermal alteration
- Fault
- Unclassified deposits
- Vein type deposits, confirmed
- Vein type deposits reported
- Strata-bound, manto and lenticular type deposits, confirmed
- Strata-bound, manto and lenticular type deposits, reported
- Dissemination and/or stockworks deposits, confirmed
- Dissemination and/or stockworks deposits, reported
- 5-43 Number of deposits
- Cu Principal metal
- Survey area