

[Folding and circular structures]

No folding and circular structures are observed in this area.

7) The Plaza Huincul area

[Geological unit]

Rocks and sediments distributed in this area were classified into 22 geological units in total (Fig. II-2-21 and Table II-2-8). Eight of them were comparable to sedimentary rocks of the Triassic to Tertiary, and six units to the volcanic rocks of the Triassic to Quaternary. Four units correspond to the unconsolidated or semi-consolidated sediments of the Quaternary. One geological unit can be compared mainly to the schist generated in the Paleozoic, and another can be compared to the intrusive rocks generated in the Paleozoic. One unit was judged to be a dike and another to be an alteration zone.

[Alteration zone]

In total, nine alteration zones were extracted in this area (Fig. II-2-21 and Table II-2-21). All of these alteration zones are collectively found in the Triassic volcanic rocks distributed in the southwestern end.

The largest size of the alteration zones is 2 km x 0.5 km (PH005), and other zones are less than 1 km<sup>2</sup>. In general Morphology is an irregular ellipsoid. Near these zones, several lineaments running in parallel to the NW-SE orientation are observed.

[Lineament]

Lineaments interpreted and extracted in this area are roughly classified into four zones. Each zone has the following characteristics in general (Fig. II-2-21).

(1) West zone

Lineaments in the N-S direction with good continuity whose lengths are less than 18 km are dominant in this area. In addition to these, a bunch of NW-SE lineaments as long as 5 km develops in the western area.

(2) Central zone

In this zone, E-W and NW-SE lineaments are observed. The longest extension of the E-W lineaments is about 10 km and that of the NW-SE lineaments is about 8 km. These are distributed in the Jurassic to Cretaceous sedimentary rocks, and no alteration zones are observed on the periphery.

(3) Southwest zone

In this zone, five lineaments running in parallel to the NW-SE direction are observed,

Table II -2-8 Characteristics of photogeologic units of the Plaza Huincul area

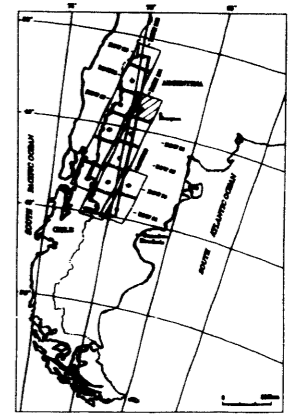
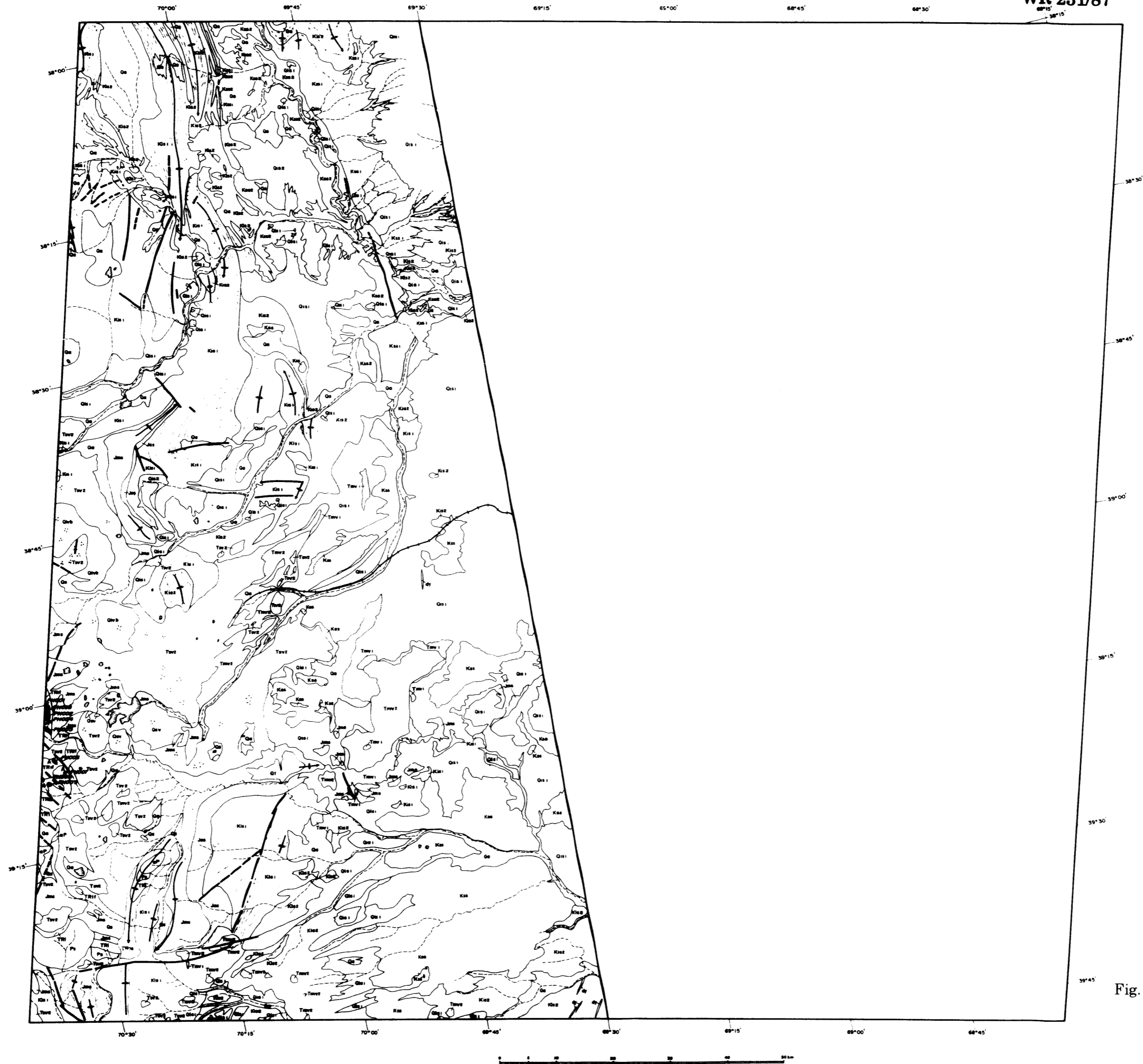
Unit	Photo-Characteristics		Mophologic Expression					Superficial Cover		Probable Lithology (Correlation with available Geologic Map)
	Tone	Texture	Drainage		Rock Resistance	Section	Bedding	Vegetation	Cultivation	
			Pattern	Density						
Qa	gray, purplish red, green	very fine	meandering	very low	very low	very low	none	partly dense	partly intense	Unconsolidated sediments composed of gravel, sand, silt and clay (Holocene : Recent alluvial deposits)
Qt	gray	fine	meandering	very low	very low	very low	none	none	partly	Unconsolidated sediments composed of gravel, sand, silt and clay (Holocene : Recent talus deposits)
Qsv	purplish gray	rough	radial	low	medium-high	medium-high	none	none	none	Basic volcanic rocks (Holocene : Basalt, andesite, trachyte)
Qis2	light gray	medium	sub-parallel	low	low	low	none	none	none	Glacial deposits (Pleistocene : Gracial deposits)
Qis1	purplish	fine	sub-parallel	low	low	low	very gentle	rare	none	Unconsolidated sediments composed of gravel, sand, silt and clay (Pleistocene : Fluvial, talus deposits)
Qivb	reddish brown	rough	radial	medium	low	low	none	none	none	Basic volcanic rocks (Pleistocene : Basalt, pyroclastic rocks)
Tsv2	brown	fine	radial, sub-parallel	low	high	high	massive	partly	partly	Volcanic rocks (Pliocene : Andesite, basaltic andesite, basalt and pyroclastic rocks)
Tmv2	brown	coarse	sub-dendritic	medium	medium-high	medium-high	massive	partly	none	Mainly pyroclastic rocks (Miocene : Pyroclastic rocks, basalt, andesite)
Tmv1	gray	coarse	sub-dendritic	low	low	low	massive	none	none	Mainly pyroclastic rocks (Miocene : Tuff, ignimbrite, basalt)
Kss	gray	fine-medium	pinnate	medium	low-medium	low-medium	bedded	none	none	Fine to medium grained sedimentary rocks (Upper Cretaceous : Sandstone, mudstone,
Kss2	pinkish gray	fine-medium	pinnate	medium	low	low	bedded	none	none	Fine to medium-grained sedimentary rocks (Upper Cretaceous : Sandstone, mudstone, conglomerate)
Kss1	purplish gray	fine-medium	sub-dendritic	medium	medium-high	medium-high	bedded	none	none	Fine to medium-grained sedimentary rocks (Upper Cretaceous : Sandstone, mudstone, conglomerate)
Kis2	brown	fine-medium	sup-parallel	medium-high	medium-high	medium-high	well bedded	none	none	Fine to medium grained sedimentary rocks (Lower Cretaceous : Sandstone, mudstone, gypsum, limestone etc.)
Kis1	brown	medium	sub-parallel	medium-high	medium-high	medium-high	well bedded	none	none	Medium grained sedimentary rocks (Lower Cretaceous : Lutite, limestone, fanglomerate,
Jss	brown	fine-medium	sub-parallel	medium-high	medium-high	medium-high	well bedded	none	none	Medium grained sedimentary rocks (Upper Jurassic : Conglomerate, sandstone, shale, limestone, gypsum etc.)
Jms	brown	medium	sub-parallel	medium-high	medium-high	medium-high	well bedded	partly	none	Medium grained sedimentary rocks (Middle Jurassic : Conglomerate, sandstone, limestone, shale, tuff etc.)
TRif	gray	medium	sub-parallel	medium	medium	medium	bedded	none	none	Sedimentary rocks (Lower Triassic : Tuffs composition andesitic to dacitic)

Table II -2-8 Characteristics of photogeologic units of the Plaza Huincul area

Unit	Photo-Characteristics		Morphologic Expression						Superficial Cover		Probable Lithology	
			Drainage		Rock Resistance	Section	Bedding	Vegetation				Cultivation
			Pattern	Density								
TRi	Tone	Texture	sub-dendritic	high	high			rare	partly	none	Volcanic rocks (Lower Triassic : Breccia, ignimbrite, andesite, dacite and rhyolite) Schistose rocks (Paleozoic : phyllite, schist, gneiss and migmatite) Dyke rocks Igneous rocks (Paleozoic : Plutonic rocks and hypabyssal rocks) Alteration Zone (Hydrothermal alteration zone)	
Ps	dark gray	rough	sub-dendritic	high	high			schistose	none	none		
dy	dark gray	rough	-	-	medium			-	-	-		
αP	gray	coarse	sub-dendritic, rectangular	medium	medium-high			massive	partly	none		
A	light gray	fine	none	low	low			none	none	none		

# Plaza Huincul

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Code	Unit Name	Age	Stratigraphic Position	Thickness (m)	Color	Texture	Structure	Remarks
Qs1	Quaternary (Holocene)	Recent	Top	0-10	Light brown	Loose, silty	None	Recent alluvium
Qs2	Quaternary (Holocene)	Recent	Top	0-10	Light brown	Loose, silty	None	Recent alluvium
Ks1	Quaternary (Holocene)	Recent	Top	0-10	Light brown	Loose, silty	None	Recent alluvium
Ks2	Quaternary (Holocene)	Recent	Top	0-10	Light brown	Loose, silty	None	Recent alluvium
Tsv1	Tertiary (Miocene)	Recent	Top	0-10	Light brown	Loose, silty	None	Recent alluvium
Tsv2	Tertiary (Miocene)	Recent	Top	0-10	Light brown	Loose, silty	None	Recent alluvium
Jm	Jurassic	Recent	Top	0-10	Light brown	Loose, silty	None	Recent alluvium

- LEGEND**
- Geology/Structure**
    - Boundary of photogeologic unit
    - Alteration zone
    - Lineament(certain)
    - Lineament(uncertain)
    - Angular structure
    - Building trace
    - Artificial side and its plunging direction
    - Synclinal side and its plunging direction
    - Crater and its slope
  - Geography/Infrastructure**
    - Drainage system
    - Lake or dam
    - Road
    - Railway
    - City and city area
    - International boundary

Fig. II -2-21 The Plaza Huincul area:  
Photogeologic interpretation map

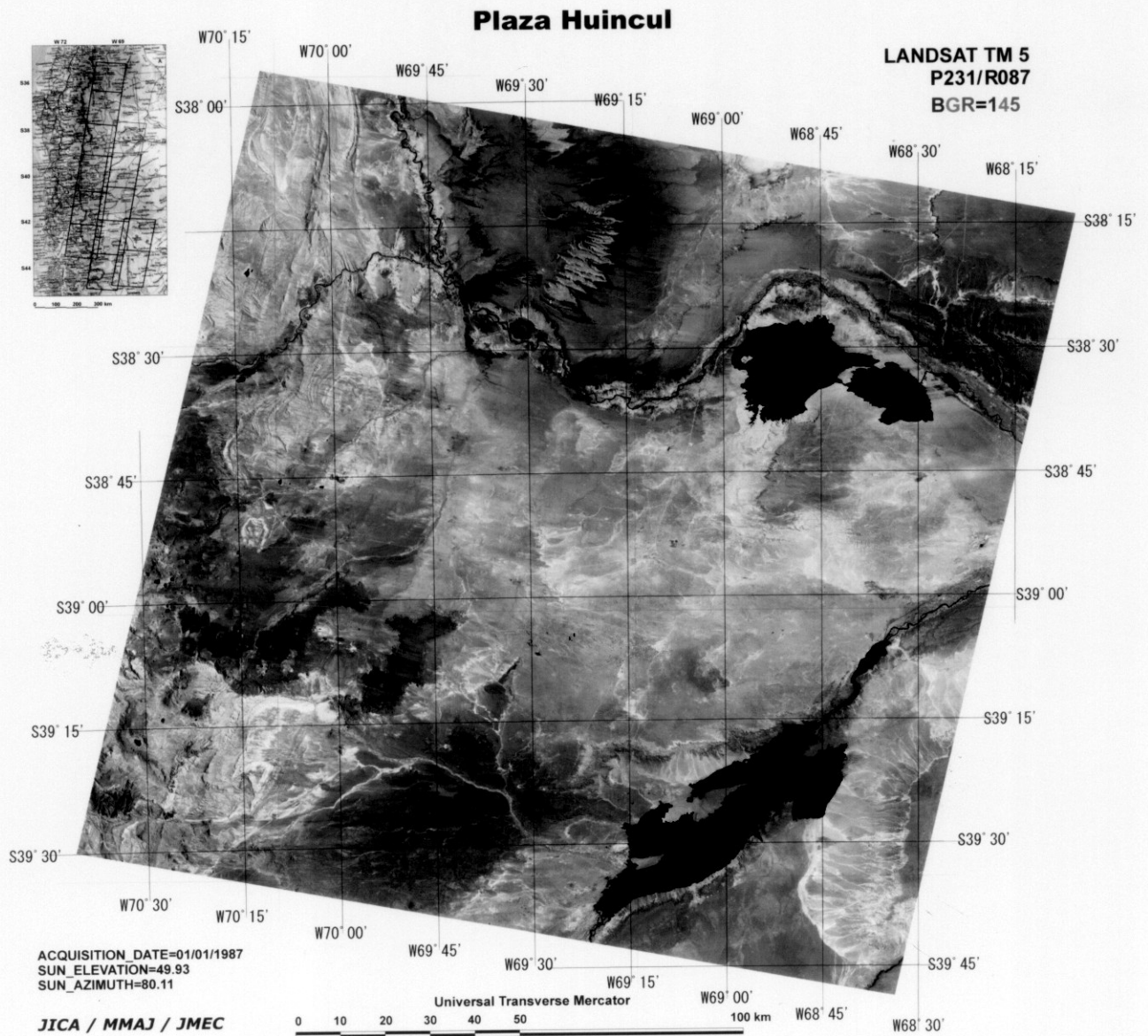


Fig. II -2-22 The Plaza Huincul area: Landsat TM false color image

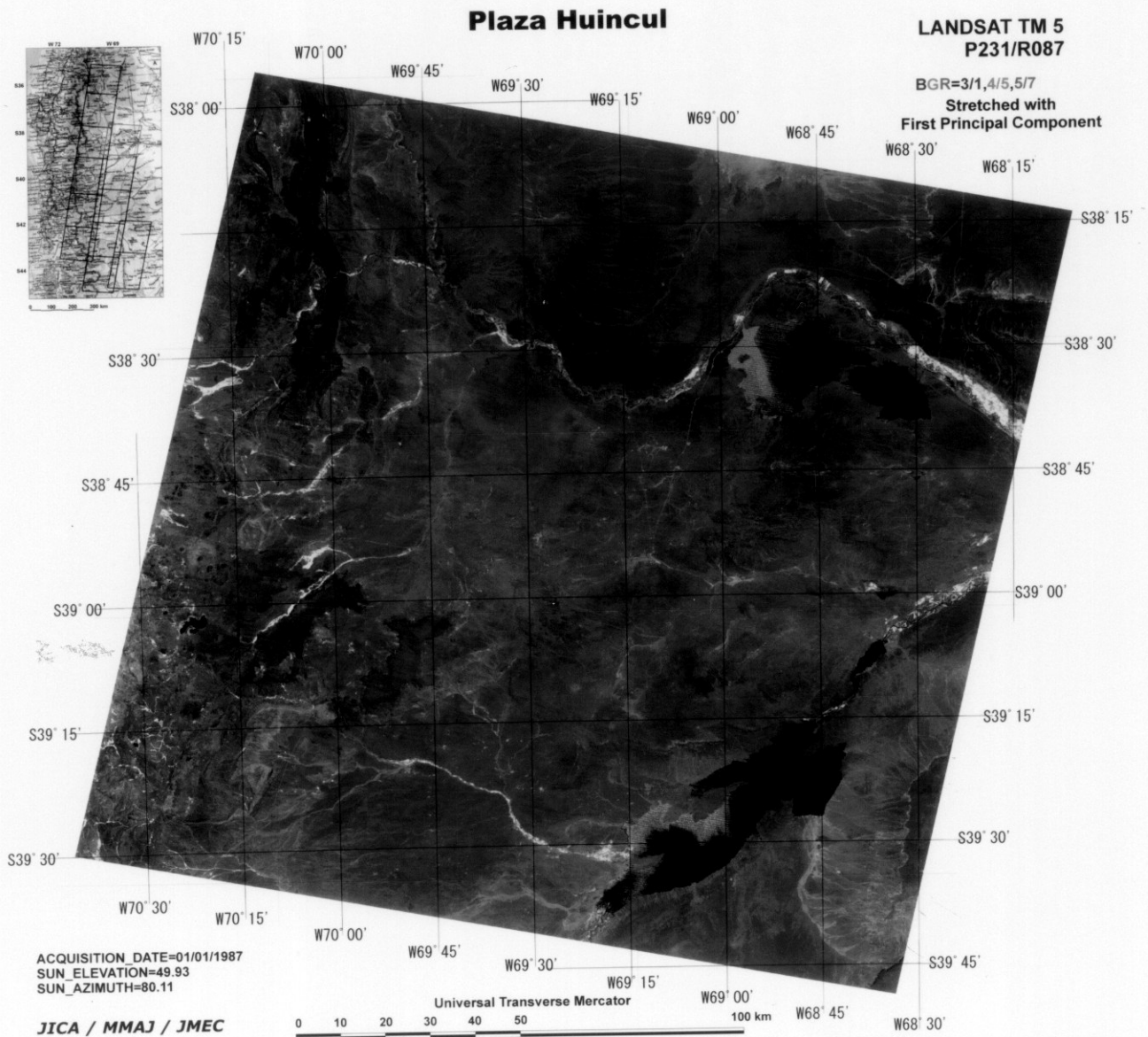


Fig. II -2-23 The Plaza Huincul area: Landsat TM ratio image

and one lineament trending toward the NNE-SSW is found on the north and south of the area where the NW-SE lineaments are located. On the periphery of and near the NW-SE lineaments, there are nine alteration zones extracted in this area.

(4) Southwest end zone

In this zone a lineament with good continuity that runs in the NNE-SSW direction (extension: about 25 km), a NE-SW lineament crossing it obliquely (extension: about 15 km) and an ENE-WSW lineament (extension: about 30 km; the eastern end is separated by a lineament in almost the same direction) have been recognized. Two other NNW-SSE lineaments are observed in the southern end. All of them are distributed in the Jurassic to Cretaceous sedimentary rocks and Tertiary volcanic rocks. No alteration zones are found on the periphery. A lineament in the NNW-SSE direction (extension: about 15 km) is observed in the northeast.

[Folding and circular structures]

(1) Folding structure

Many beddings develop in the Jurassic to Cretaceous sedimentary rocks (geological units: Kis1, Kis2 and Jms) distributed widely in the west of this area. Pursuit of these beddings has resulted in understanding of the clear repetition of anticlinal and synclinal structures. The direction of all the fold axes is N-S. The longest one is an anticlinal axis seen in the northwest. It has an extension of 40 km or longer and extends from this area to the north of the area.

(2) Circular structure

No circular structures are observed in this area.

8) The Laguna Blanca area

[Geological unit]

Rocks and sediments distributed in this area were classified into 27 geological units in total (Fig. II-2-24 and Table II-2-9). Ten of them were comparable to the sedimentary rocks of the Carboniferous to Tertiary, and another ten were equivalent to the Triassic to Quaternary volcanic rocks. Two geological units correspond to the unconsolidated or semi-consolidated sediments of the Quaternary. In addition, one geological unit is comparable mainly to the Paleozoic schist while three units are compared to the intrusive rocks generated from the Paleozoic to the Tertiary. One unit is comparable to a dike.

[Alteration zone]

No alteration zones were extracted in this area (Fig. II-2-24 and Table II-2-22).

#### [Lineament]

Regarding the distribution of lineaments interpreted and extracted from this area, while only a few lineaments are observed in the northwestern end, many are distributed in the area from the central to the south. Within this distribution area, there is a slight difference between the eastern and western zones. These zones have the following characteristics, respectively (Fig. II-2-24):

##### (1) East zone

This zone is mainly composed of the Paleozoic metamorphic rocks and Tertiary volcanic rocks. In the area where the Tertiary volcanic rocks are distributed, few lineaments are interpreted. Concerning lineaments interpreted in the Paleozoic strata, four systems tending toward the NW-SE, NNW-SSE, NNE-SSW and E-W are dominant. Lineaments in the NW-SE direction have relatively good continuity with the longest extension of 25 km.

##### (2) West zone

In addition to the Paleozoic metamorphic rocks as a dominant component, this zone is mainly composed of the Jurassic sedimentary rocks and Tertiary volcanic rocks. Two systems in the N-S and NW-SE directions are dominant. Lineaments in the NW-SE direction have good continuity, and those with extension as long as 20 km were extracted. Length of lineaments in the N-S direction generally range from 5 to 7 km. Areas where lineaments densely occur are unevenly distributed in the Paleozoic strata and the Jurassic volcanic rocks of the central area.

#### [Folding and circular structures]

##### (1) Folding structure

In the Cretaceous sedimentary rocks (geological unit: Kis1) distributed in the northwestern region, anticlinal and synclinal structures in the N-S direction are repeatedly observed in the south of this region. In the northward area, anticlinal and synclinal structures in the NW-SE direction, anticlinal structures in the NE-SW direction, anticlinal and synclinal structures in the NNE-SSW direction and synclinal structures in the ENE-WSW direction are recognized. In addition, NNE-SSW anticlinal structures are found in the Triassic rocks at the northwest corner (Fig. II-2-24).

##### (2) Circular structure

No circular structures are observed in this area.



Table II -2-9 Characteristics of photogeologic units of the Laguna Blanca area

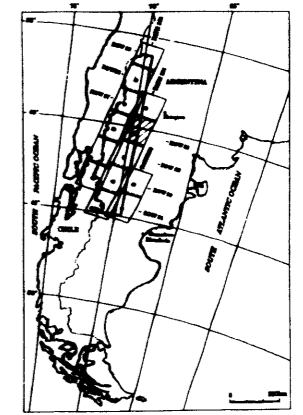
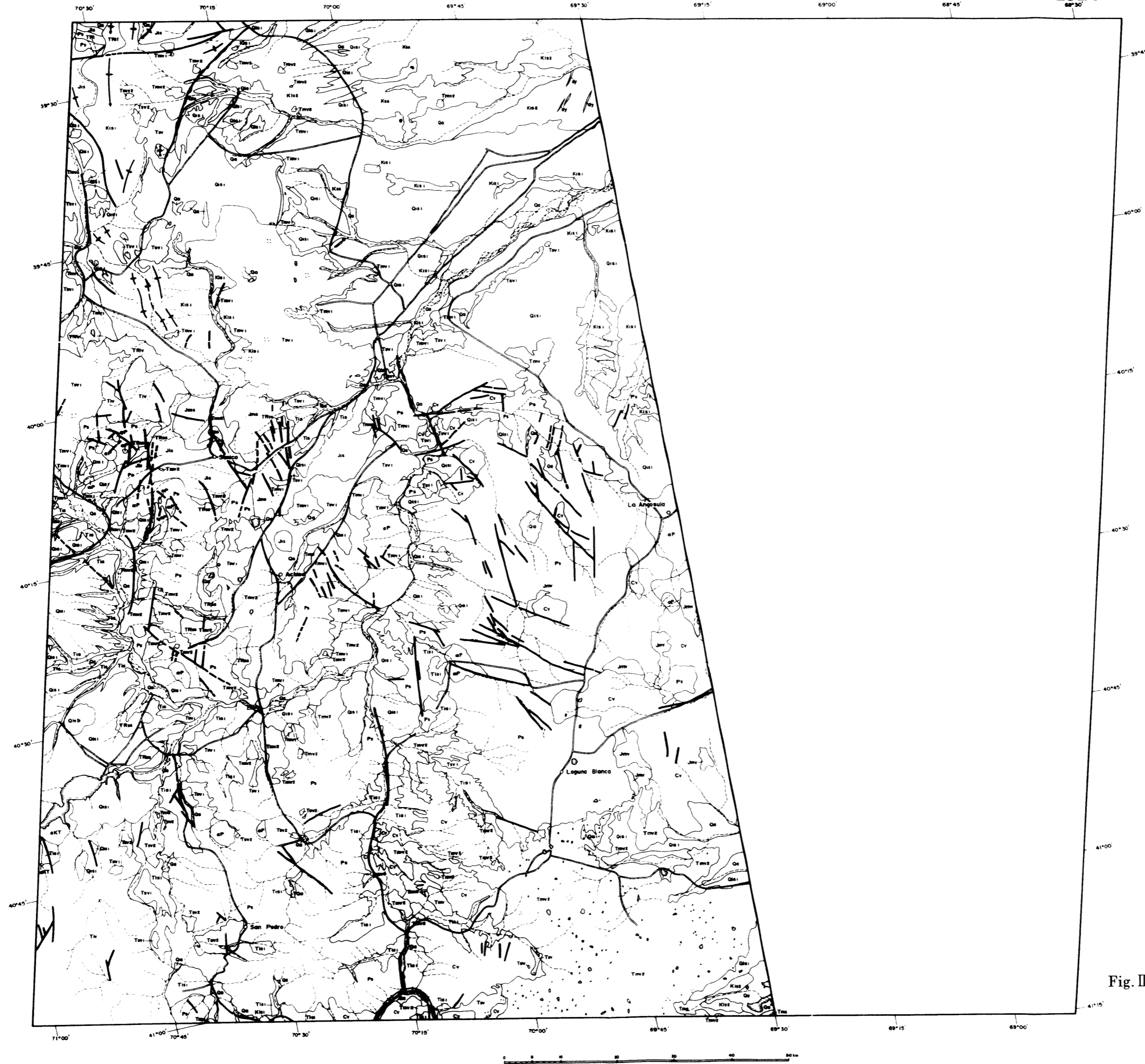
Unit	Photo-Characteristics		Morphologic Expression					Superficial Cover		Probable Lithology (Correlation with available Geologic Map)
	Tone	Texture	Drainage		Section	Bedding	Vegetation	Cultivation		
			Pattern	Density					Rock Resistance	
Qa	gray, purplish red, green	very fine	meandering	very low	very low	none	partly dense	partly intense	Unconsolidated sediments composed of gravel, sand, silt and clay (Holocene : Recent alluvial deposits)	
Qis1	purplish	fine	sub-parallel	low	low	very gentle	rare	none	Unconsolidated sediments composed of gravel, sand, silt and clay (Pleistocene : Fluvial, talus deposits)	
Qivb	reddish brown	rough	radial	medium	low	none	none	none	Basic volcanic rocks (Pleistocene : Basalt, pyroclastic rocks)	
Tsv2	brown, gray	fine	sub-parallel	low	high	massive	partly	rare	Volcanic rocks (Pliocene : Andesite, basaltic andesite, basalt and pyroclastic rocks)	
Tsv1	reddish brown	medium	radial	low	high	massive	none	none	Basic volcanic rocks (Pliocene : Basalt, pyroclastic rocks)	
Tsv	brown	rough	sub-parallel	low	medium	none	none	none	Volcanic rocks (Pliocene: Basalt and pyroclastic rocks)	
Tmv2	brown	coarse	sub-dendritic	medium	medium	massive	partly	partly	Mainly pyroclastic rocks (Miocene :Pyroclastic rocks, basalt, andesite)	
Tmv1	brown	rough	sub-dendritic	medium	high	massive	none	none	Volcanic rocks (Miocene : Ignimbrite, basalt, tuff)	
Tiv	dark brown	coarse	sub-dendritic	medium	medium-high	massive	dense	partly	Andesitic volcanic rocks (Eocene-Oligocene : Andesite, basalt and pyroclastic rocks)	
Tis1	brown, dark purple	coarse	sub-dendritic	medium	low	partly	none	none	Sedimentary rocks (Eocene-Oligocene : Continental sedimentary rocks, Sarmiento Formation etc.)	
Tis	brown	coarse	sub-dendritic	high	medium	partly	medium	partly	Coarse grained sedimentary rocks (Paleocene : Sandstone conglomerate, mudstone, limestone and gypsum)	
Kas	gray	fine-medium	pinnate	medium	low-medium	bedded	none	none	Fine to medium grained sedimentary rocks (Upper Cretaceous : Sandstone, mudstone, conglomerate)	
Kis2	brown	fine-medium	sub-parallel	medium-high	medium-high	well bedded	none	none	Fine to medium grained sedimentary rocks (Lower Cretaceous : Sandstone, mudstone, gypsum, limestone etc.)	
Kis1	brown	medium	sub-parallel	medium-high	medium-high	well bedded	none	none	Medium grained sedimentary rocks (Lower Cretaceous : Lutite, limestone, fanglomerate, mudstone, sandstone)	
Jmv	brown	medium	sub-parallel	medium-high	medium-high	massive	partly dense	none	Volcanic rocks (Middle-Upper Jurassic : Intermediate volcanic rocks, Lago La Plata, Lonco Trapia Formations etc.)	
Jms	brown	medium	sub-parallel	medium-high	medium-high	well bedded	partly	none	Medium grained sedimentary rocks (Middle Jurassic : Conglomerate, sandstone, limestone, shale, tuff etc.)	

Table II -2-9 Characteristics of photogeologic units of the Laguna Blanca area

Unit	Photo-Characteristics		Morphologic Expression					Superficial Cover		Probable Lithology (Correlation with available Geologic Map)
	Tone	Texture	Drainage		Section	Bedding	Vegetation	Cultivation		
			Pattern	Density					Rock Resistance	
Jis	brown	medium	sub-parallel	low-medium			partly	partly	none	Sedimentary rocks (Lower Jurassic : Marine and continental sedimentary rocks , Piltriquitron Formation etc.)
TRss	brown	rough	sub-dendritic	medium			partly	partly	none	Sedimentary rocks(Upper Triassic: Marine and continental sedimentary rocks, Paso Flores Formation etc.)
TRif	gray	medium	sub-parallel	medium			bedded	none	none	Sedimentary rocks (Lower Triassic : Tuffs composition andesitic to dacitic)
TRi	brown	coarse	sub-dendritic	high			rare	partly	none	Volcanic rocks (Lower Triassic : Breccia, ignimbrite, andesite, dacite and rhyolite)
TRiv	dark brown	coarse	sub-dendritic	high			massive	partly	none	Volcanic rocks (Lower Triassic : Breccia, ignimbrite, andesite, dacite and rhyolite)
Cv	brown	coarse	sub-dendritic	high			massive	none	none	Mainly pyroclastic rocks (Carboniferous-Devonian: Andestic tuff, sandstone, shale)
Ps	dark gray	rough	sub-dendritic	high			schistose	none	none	Schistose rocks (Paleozoic : Phyllite, schist, gneiss and migmatite)
dy	dark gray	rough	-	-			-	-	-	Dyke rocks
αKT	brown	coarse	sub-dendritic, rectangular	medium			massive	partly	none	Igneous rocks (Cretaceous-Tertiary : Plutonic rocks and hypabyssal rocks)
αJm	brown	coarse	sub-dendritic, rectangular	medium			massive	none	none	Igneous rocks (Middle Jurassic : Granodiorite, diorite, granite, tonalite and dacite)
αP	gray	coarse	sub-dendritic, rectangular	medium			massive	partly	none	Igneous rocks (Paleozoic : Plutonic rocks and hypabyssal rocks)
A	light gray	fine	none	low			none	none	none	Alteration Zone (Hydrothermal alteration zone)

# Laguna Blanca

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Unit	Symbol	Stratigraphic Position	Thickness	Composition	Structure	Remarks
Qs1	...	...	...	...	...	...
Qs2	...	...	...	...	...	...
Qs3	...	...	...	...	...	...
Qs4	...	...	...	...	...	...
Qs5	...	...	...	...	...	...
Qs6	...	...	...	...	...	...
Qs7	...	...	...	...	...	...
Qs8	...	...	...	...	...	...
Qs9	...	...	...	...	...	...
Qs10	...	...	...	...	...	...
Qs11	...	...	...	...	...	...
Qs12	...	...	...	...	...	...
Qs13	...	...	...	...	...	...
Qs14	...	...	...	...	...	...
Qs15	...	...	...	...	...	...
Qs16	...	...	...	...	...	...
Qs17	...	...	...	...	...	...
Qs18	...	...	...	...	...	...
Qs19	...	...	...	...	...	...
Qs20	...	...	...	...	...	...
Qs21	...	...	...	...	...	...
Qs22	...	...	...	...	...	...
Qs23	...	...	...	...	...	...
Qs24	...	...	...	...	...	...
Qs25	...	...	...	...	...	...
Qs26	...	...	...	...	...	...
Qs27	...	...	...	...	...	...
Qs28	...	...	...	...	...	...
Qs29	...	...	...	...	...	...
Qs30	...	...	...	...	...	...
Qs31	...	...	...	...	...	...
Qs32	...	...	...	...	...	...
Qs33	...	...	...	...	...	...
Qs34	...	...	...	...	...	...
Qs35	...	...	...	...	...	...
Qs36	...	...	...	...	...	...
Qs37	...	...	...	...	...	...
Qs38	...	...	...	...	...	...
Qs39	...	...	...	...	...	...
Qs40	...	...	...	...	...	...
Qs41	...	...	...	...	...	...
Qs42	...	...	...	...	...	...
Qs43	...	...	...	...	...	...
Qs44	...	...	...	...	...	...
Qs45	...	...	...	...	...	...
Qs46	...	...	...	...	...	...
Qs47	...	...	...	...	...	...
Qs48	...	...	...	...	...	...
Qs49	...	...	...	...	...	...
Qs50	...	...	...	...	...	...
Qs51	...	...	...	...	...	...
Qs52	...	...	...	...	...	...
Qs53	...	...	...	...	...	...
Qs54	...	...	...	...	...	...
Qs55	...	...	...	...	...	...
Qs56	...	...	...	...	...	...
Qs57	...	...	...	...	...	...
Qs58	...	...	...	...	...	...
Qs59	...	...	...	...	...	...
Qs60	...	...	...	...	...	...
Qs61	...	...	...	...	...	...
Qs62	...	...	...	...	...	...
Qs63	...	...	...	...	...	...
Qs64	...	...	...	...	...	...
Qs65	...	...	...	...	...	...
Qs66	...	...	...	...	...	...
Qs67	...	...	...	...	...	...
Qs68	...	...	...	...	...	...
Qs69	...	...	...	...	...	...
Qs70	...	...	...	...	...	...
Qs71	...	...	...	...	...	...
Qs72	...	...	...	...	...	...
Qs73	...	...	...	...	...	...
Qs74	...	...	...	...	...	...
Qs75	...	...	...	...	...	...
Qs76	...	...	...	...	...	...
Qs77	...	...	...	...	...	...
Qs78	...	...	...	...	...	...
Qs79	...	...	...	...	...	...
Qs80	...	...	...	...	...	...
Qs81	...	...	...	...	...	...
Qs82	...	...	...	...	...	...
Qs83	...	...	...	...	...	...
Qs84	...	...	...	...	...	...
Qs85	...	...	...	...	...	...
Qs86	...	...	...	...	...	...
Qs87	...	...	...	...	...	...
Qs88	...	...	...	...	...	...
Qs89	...	...	...	...	...	...
Qs90	...	...	...	...	...	...
Qs91	...	...	...	...	...	...
Qs92	...	...	...	...	...	...
Qs93	...	...	...	...	...	...
Qs94	...	...	...	...	...	...
Qs95	...	...	...	...	...	...
Qs96	...	...	...	...	...	...
Qs97	...	...	...	...	...	...
Qs98	...	...	...	...	...	...
Qs99	...	...	...	...	...	...
Qs100	...	...	...	...	...	...

### LEGEND

- Geology/Structure**
- Boundary of photogeologic unit
- ⊙ Alteration zone
- Lineament(certain)
- - - Lineament(uncertain)
- ⌒ Annular structure
- Bedding trace
- ✕ Anticlinal axis and its plunging direction
- ✕ Synclinal axis and its plunging direction
- ∇ Crater and its slope
- Geography/Topography**
- Drainage system
- Lake or dam
- Road
- Railway
- City and city area
- International boundary

Fig. II -2-24 The Laguna Blanca area:  
Photogeologic interpretation map

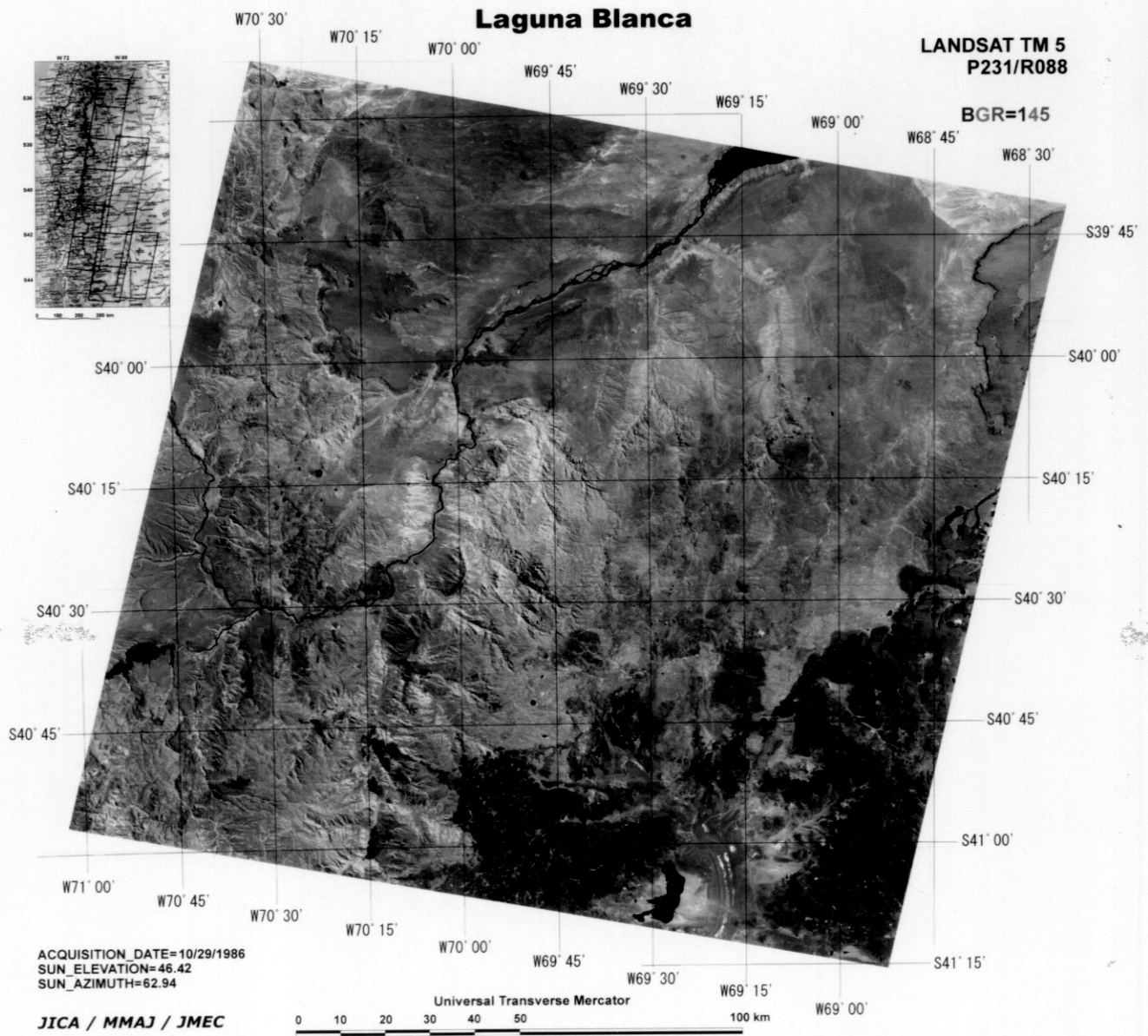


Fig. II -2-25 The Laguna Blanca area: Landsat TM false color image

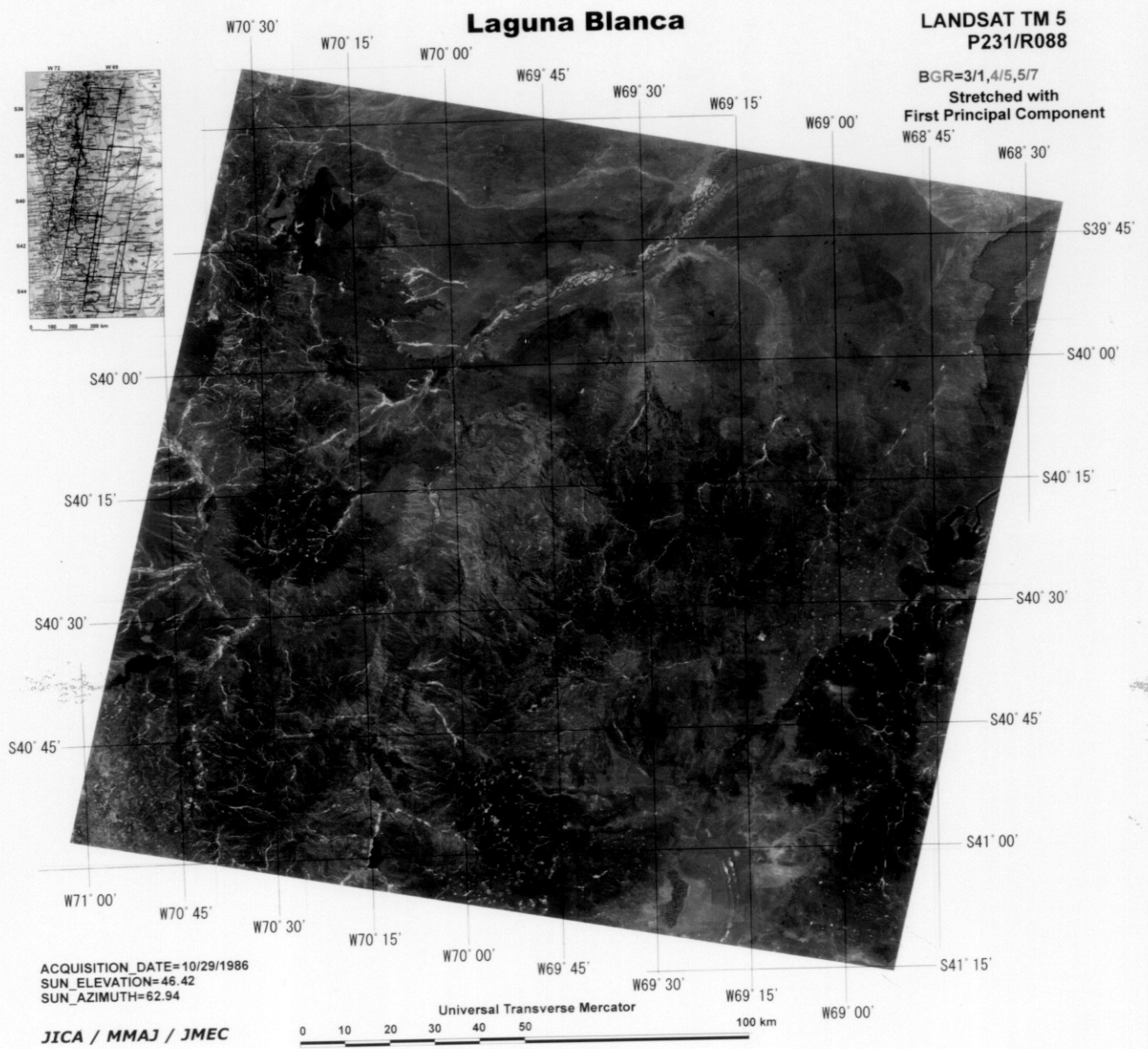


Fig. II -2-26 The Laguna Blanca area: Landsat TM ratio image