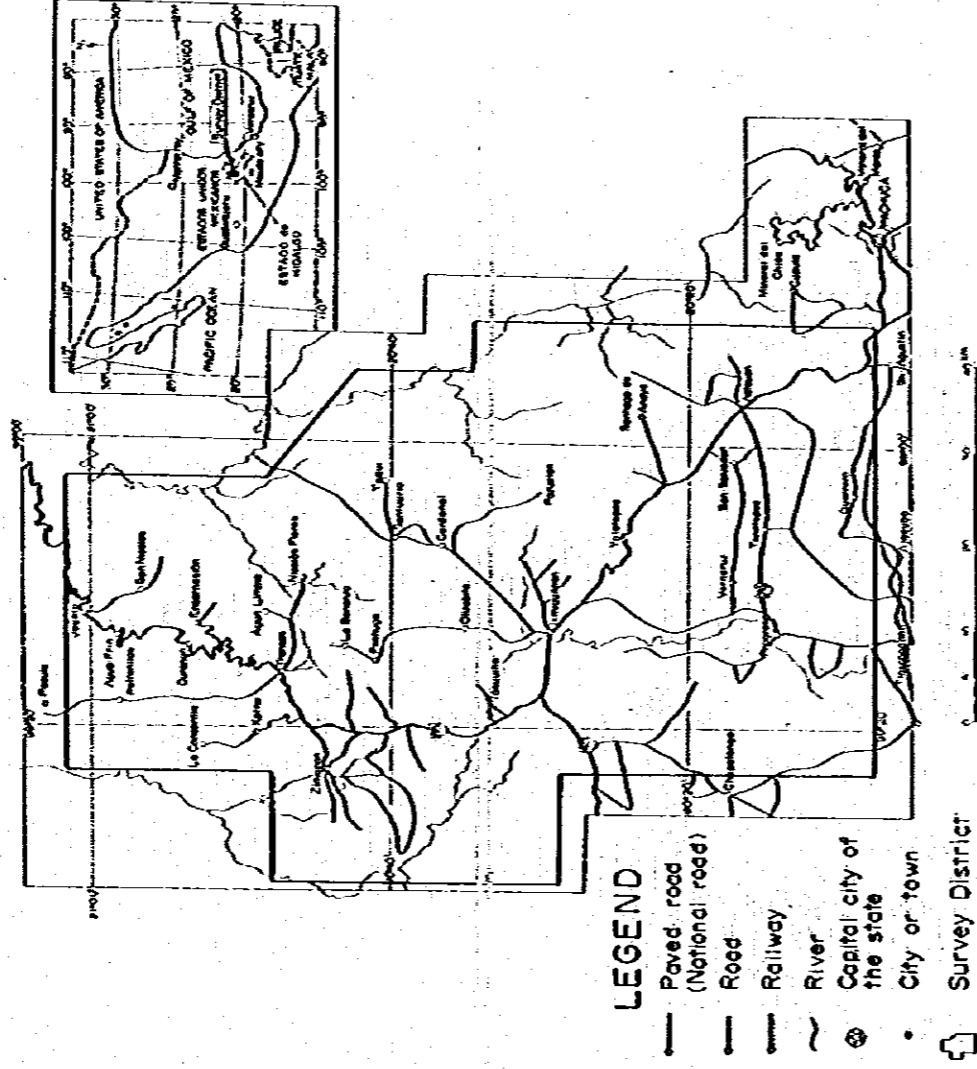


PL. I

GEOLOGICAL SURVEY
OF
THE PACHUCA - ZIMAPAN AREA

GEOLOGICAL MAP

Scale 1 : 100,000



JAPAN INTERNATIONAL COOPERATION AGENCY AND
METAL MINING AGENCY OF JAPAN
IN COLLABORATION WITH
CONSEJO DE RECURSOS MINERALES DE MEXICO
MARCH 1983

LEGEND

| | |
|--|--|
| | Gravel |
| | Basalt lava |
| | Gravel, sand, silt and ash |
| | Q Tgs |
| | Basalt lava |
| | Dacite lava and pyroclastic rocks |
| | Rhyolite lava and pyroclastic rocks |
| | Andesite lava |
| | Acidic tuff, Lapilli tuff, tuff breccia and tuffaceous sandstone |
| | Rhyolite lava and pyroclastic rocks |
| | Basalt lava and pyroclastic rocks |
| | Andesite lava and pyroclastic rocks |
| | Volcanic rocks |
| | INTRUSIVE ROCKS |
| | Rhyolite |
| | Andesite |

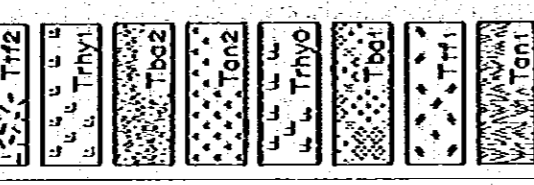
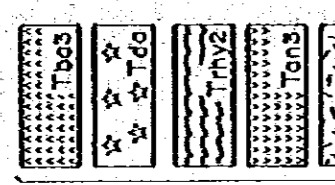
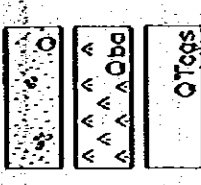
Quaternary

Tertiary

20°45'00"

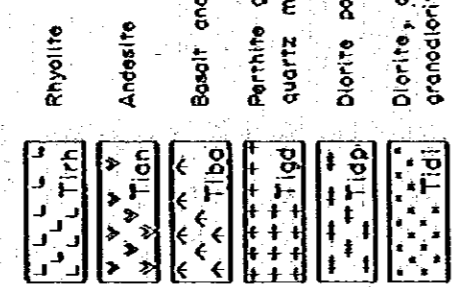
Quaternary ?

Tertiary



Volcanic rocks

INTRUSIVE ROCKS



El Morro Formation



Mendez Formation



El Doctor Formation



Lower ~ Upper Cretaceous



Los Frances Formation



Upper Jurassic ~ Lower Cretaceous



Muddy limestone and limestone with a few black flint bands

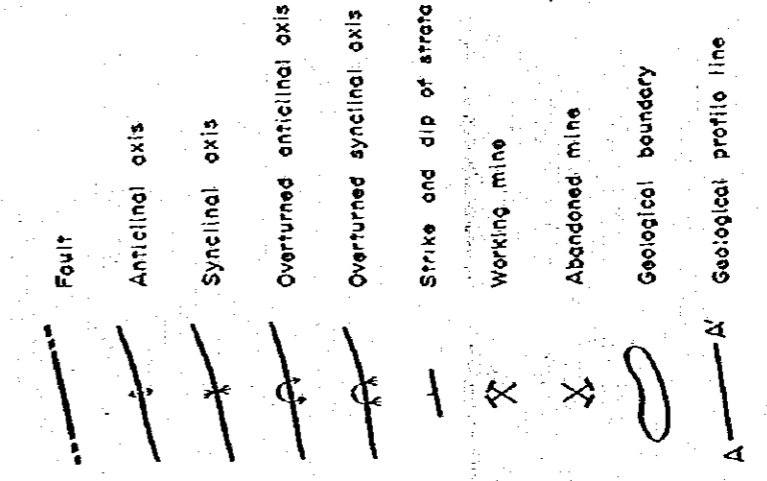
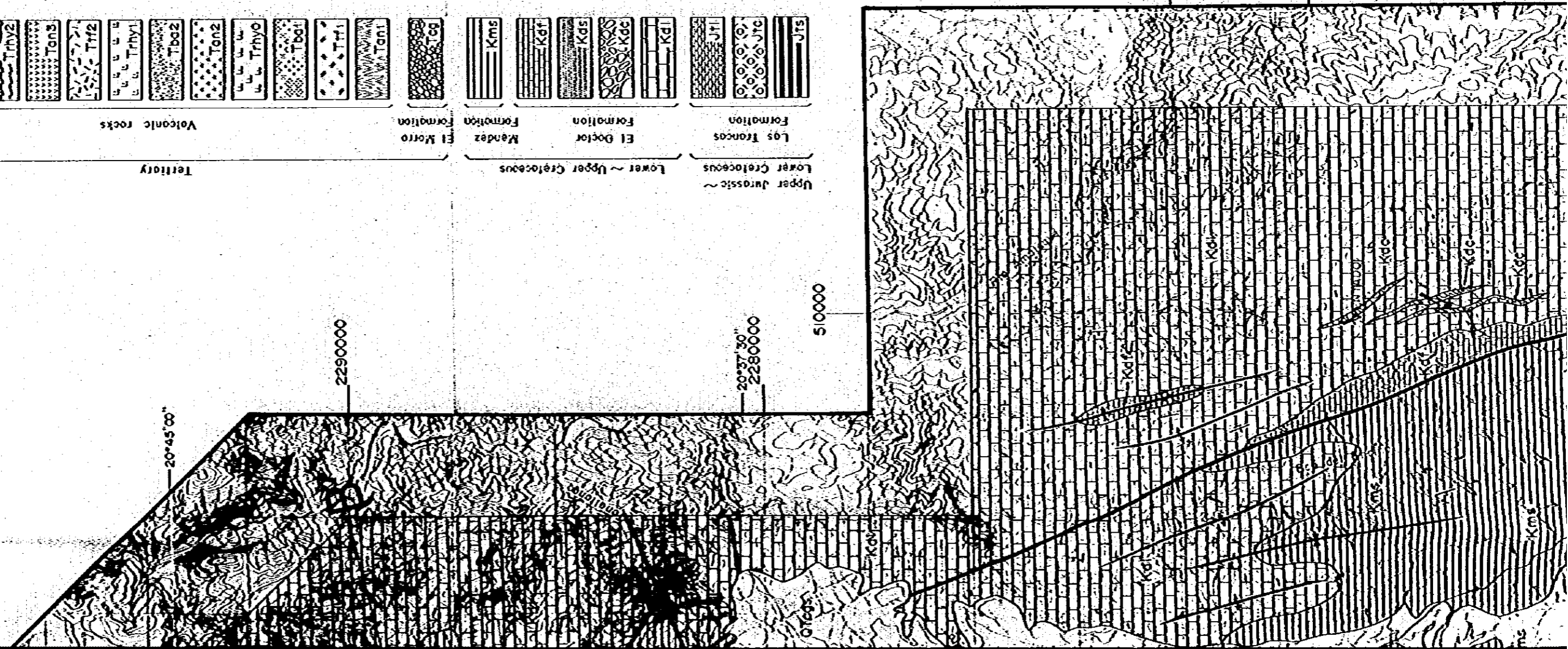


Tuffaceous conglomerate, sandstone and andesitic tuff



Shale intercalated with calcareous shale, sandstone and marl

Shale intercalated with siltstone, sandstone and marl
 Alternation of limestone, marl, calcarenite, shale and black flint
 Alternation of shale and marl
 Clastic limestone, conglomeratic limestone and calcarenite
 Massive limestones
 Muddy limestone and limestone with a few black flint bands
 Tuffaceous conglomerate, sandstone and andesitic tuff
 Shale intercalated with calcareous shale, sandstone and marl



- Overturned anticlinal axis
- Overturned synclinal axis
- Strike and dip of strata
- Working mine
- Abandoned mine
- Geological boundary
- Geological profile line

2270000

20°30'00"

2260000

20°22'30"

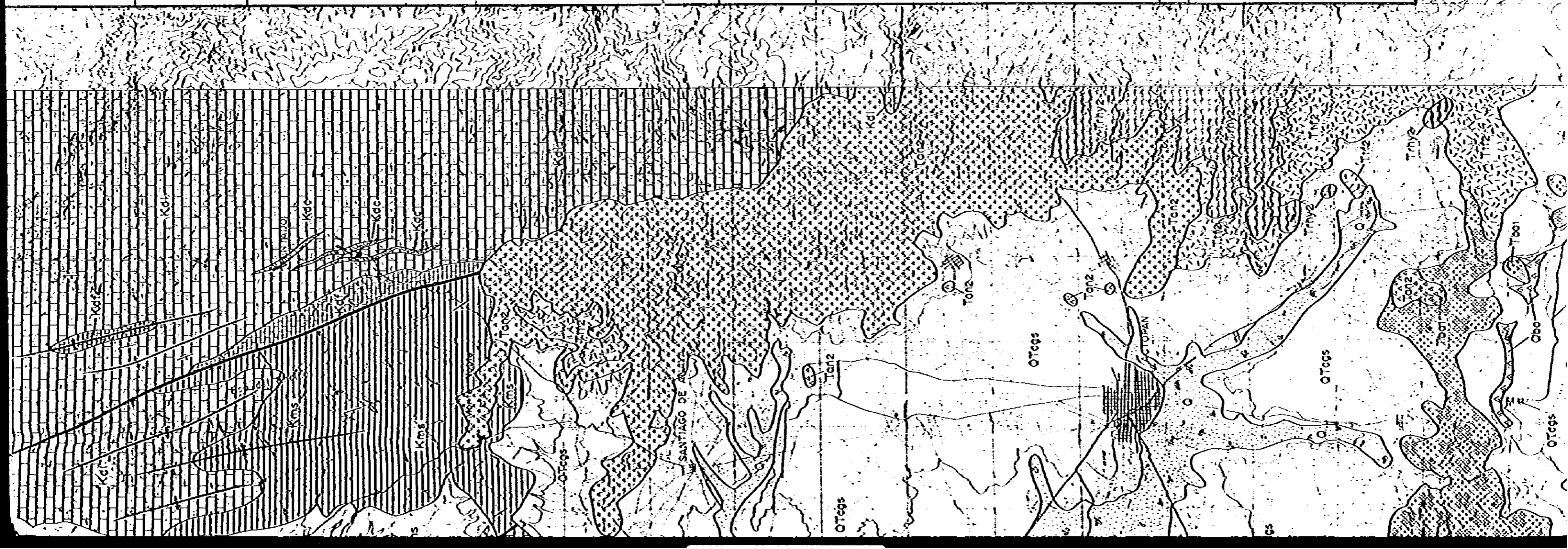
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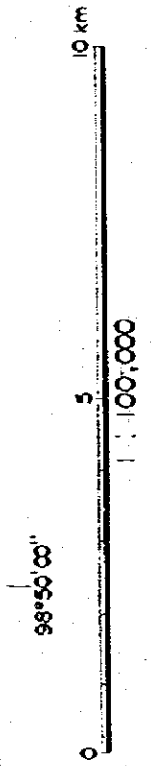
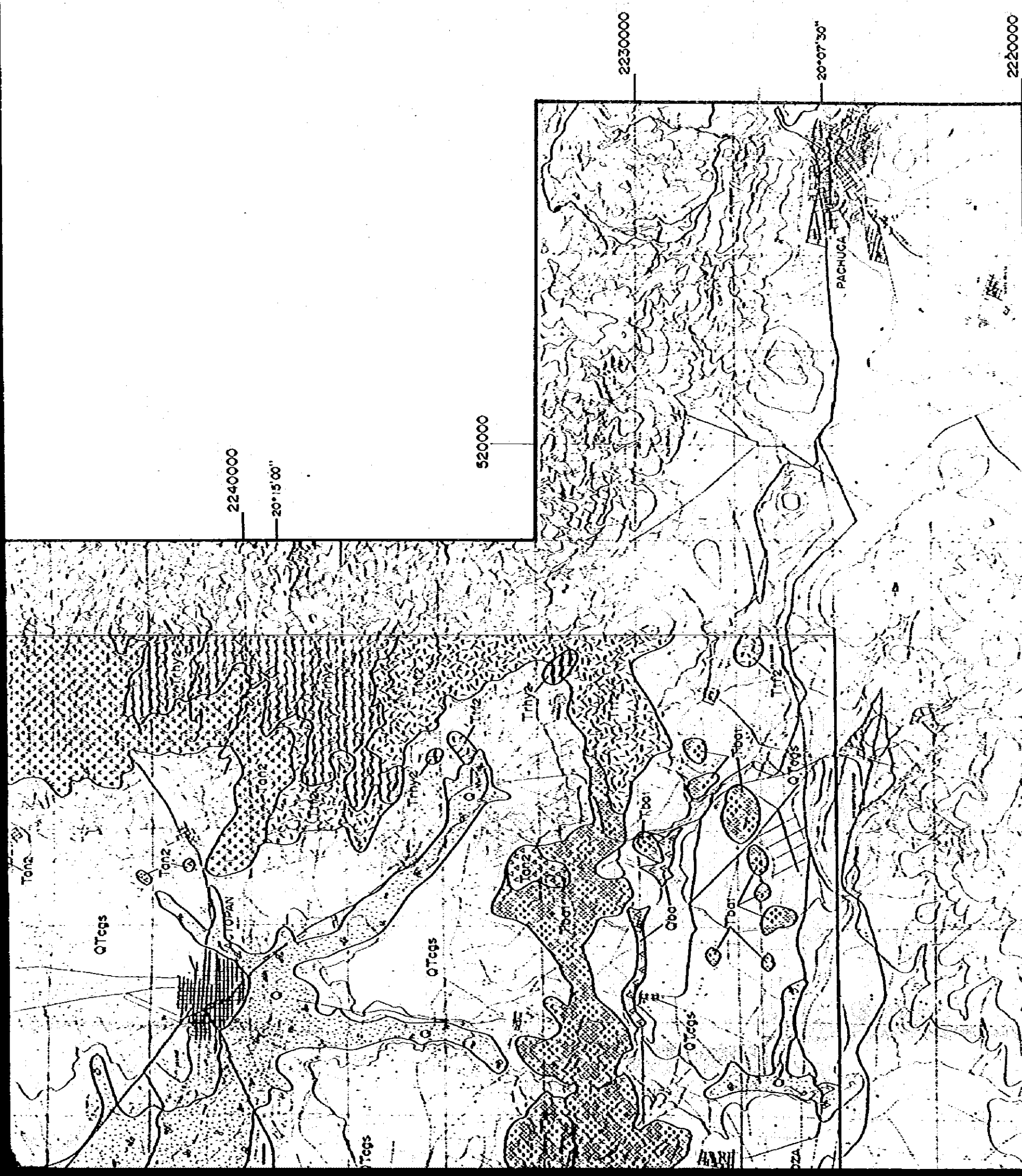
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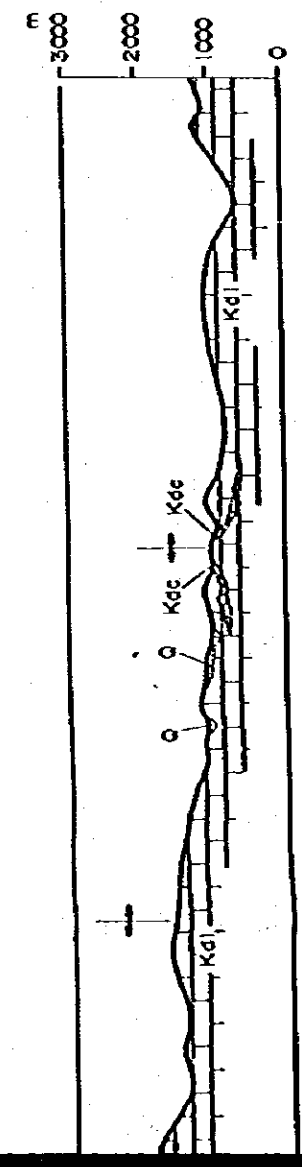
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2230000

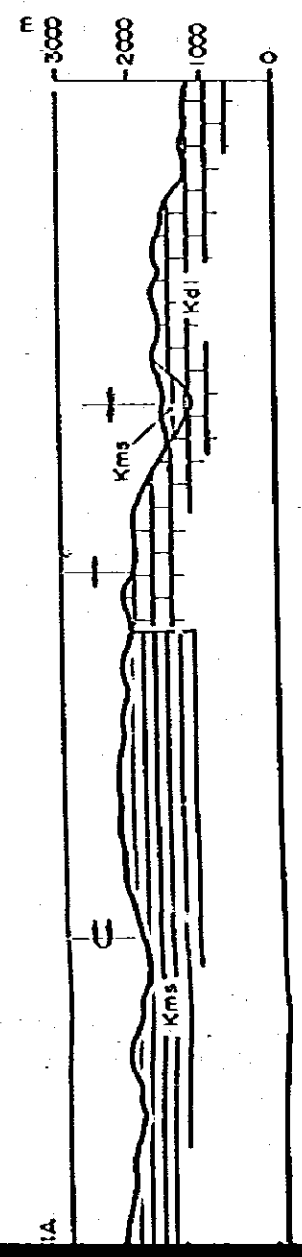




A'



B'



490000

99°10'00"

480000

21°00'00"

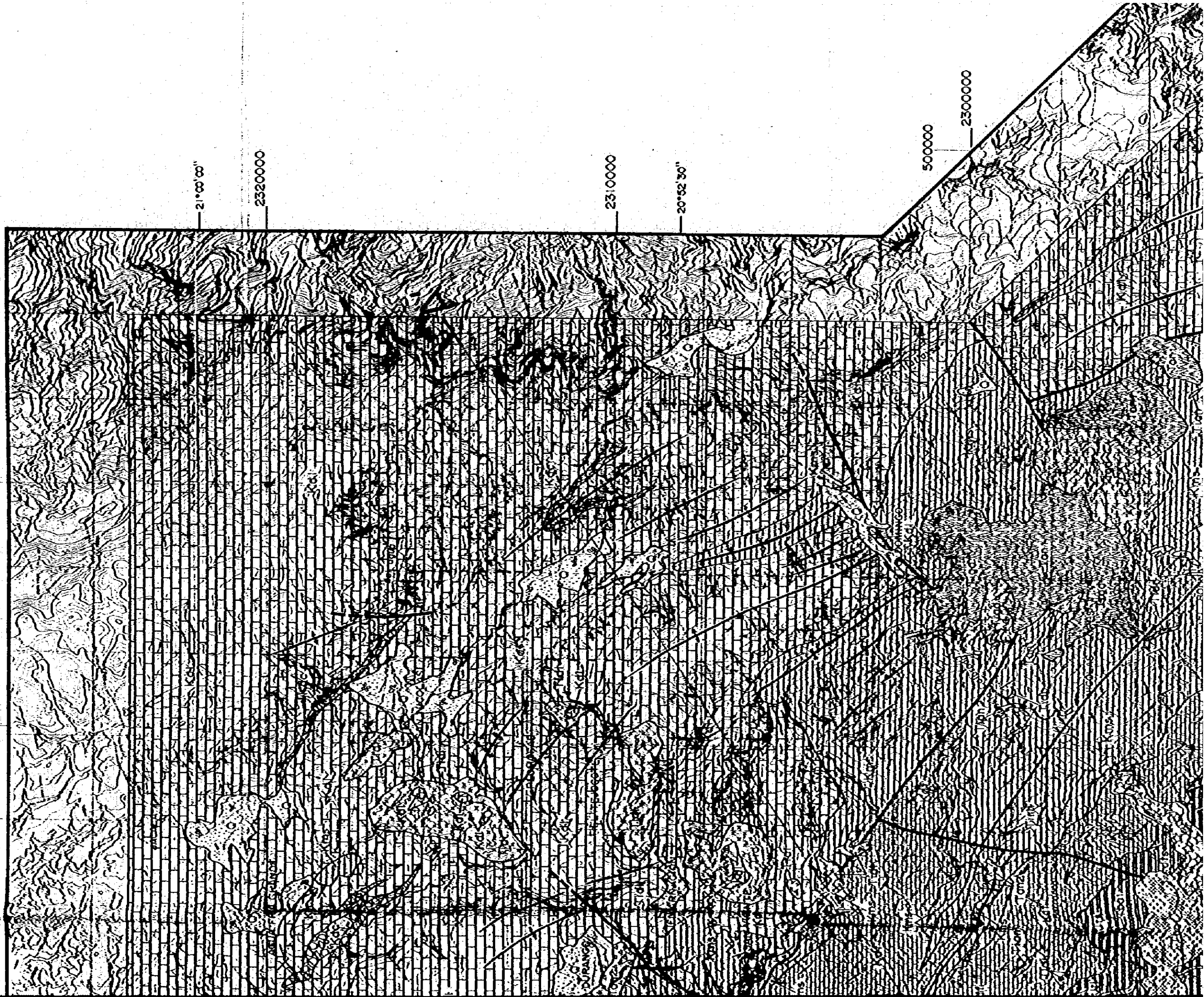
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2310000

20°52'30"

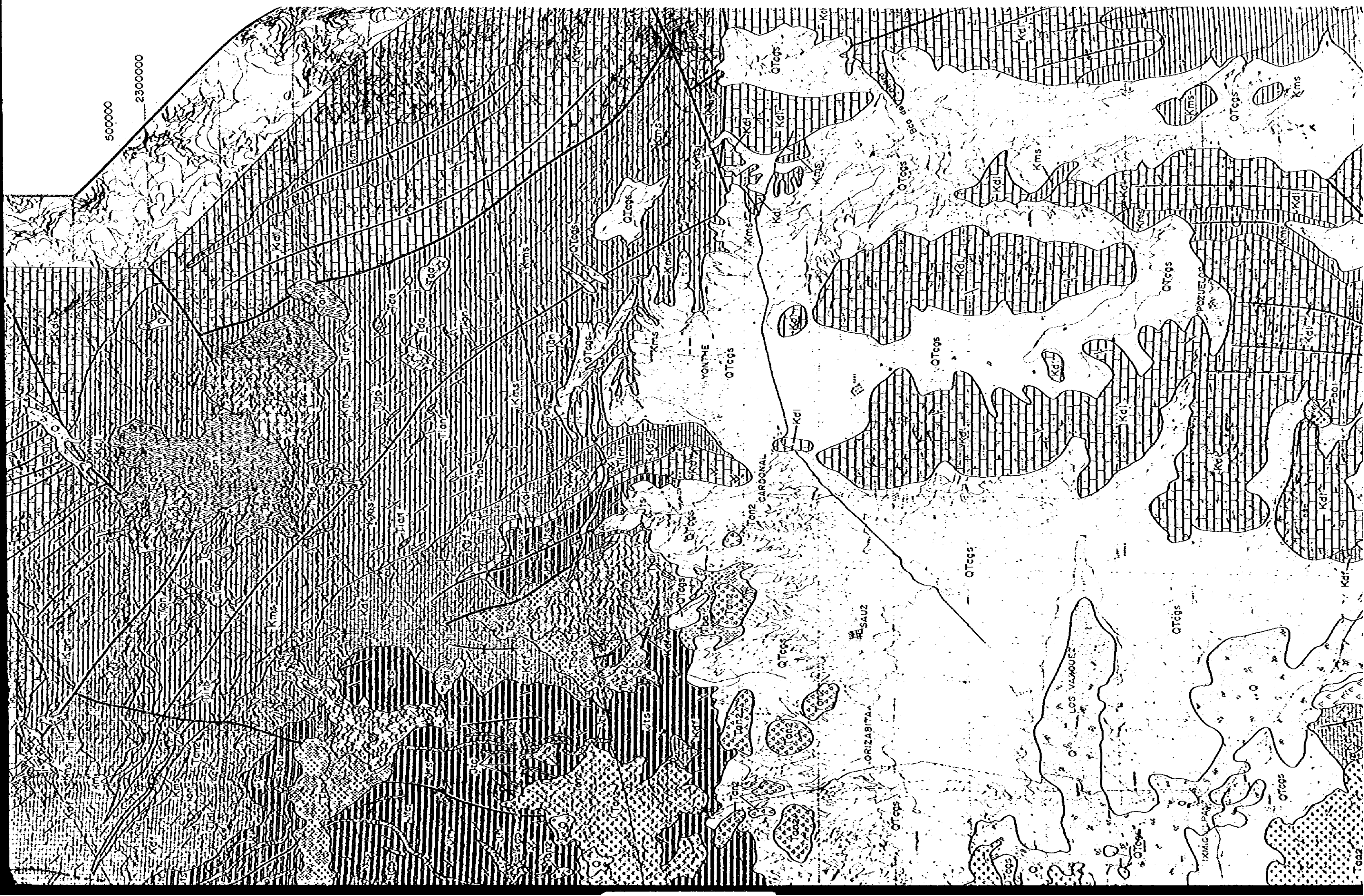
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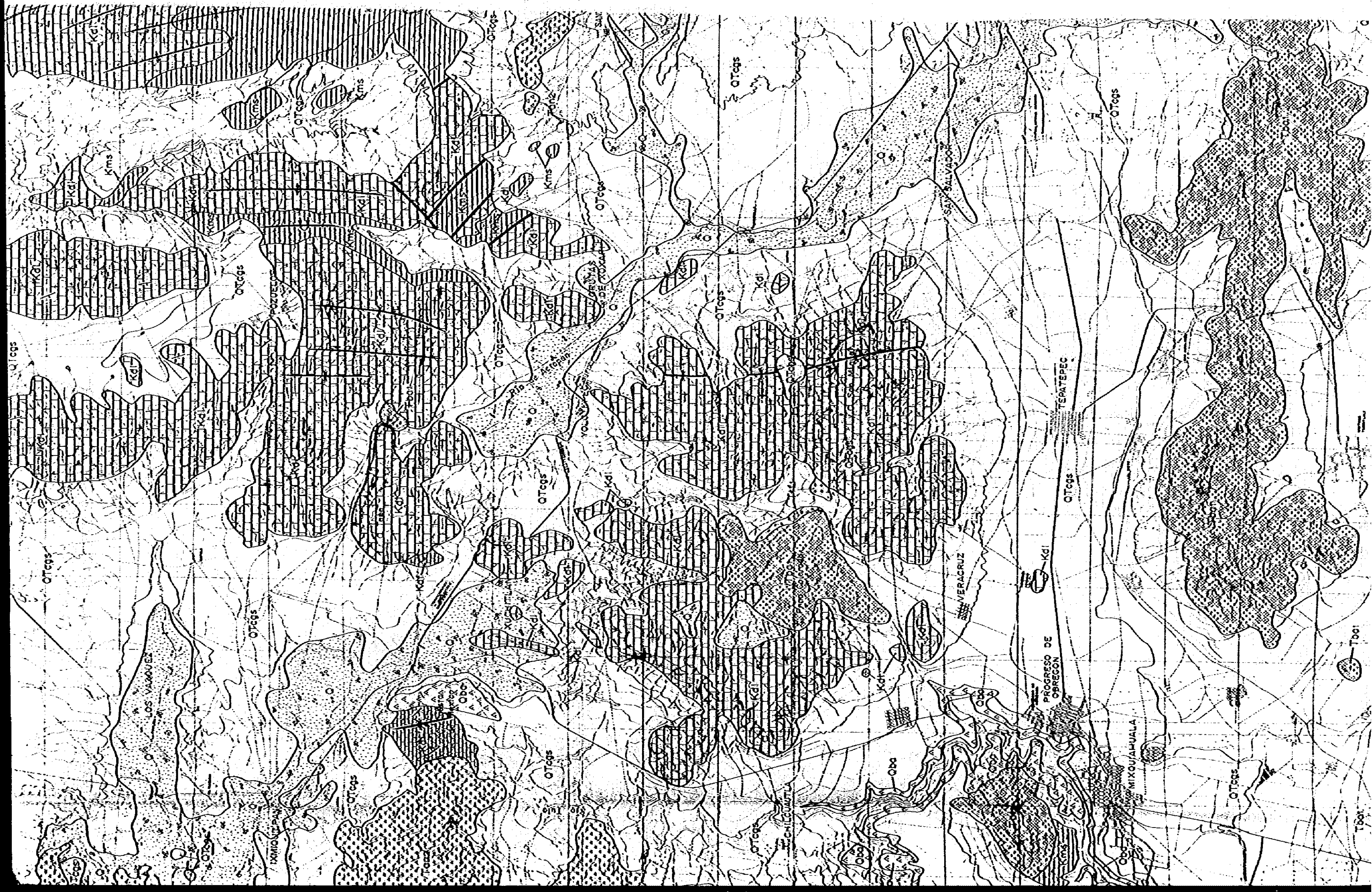
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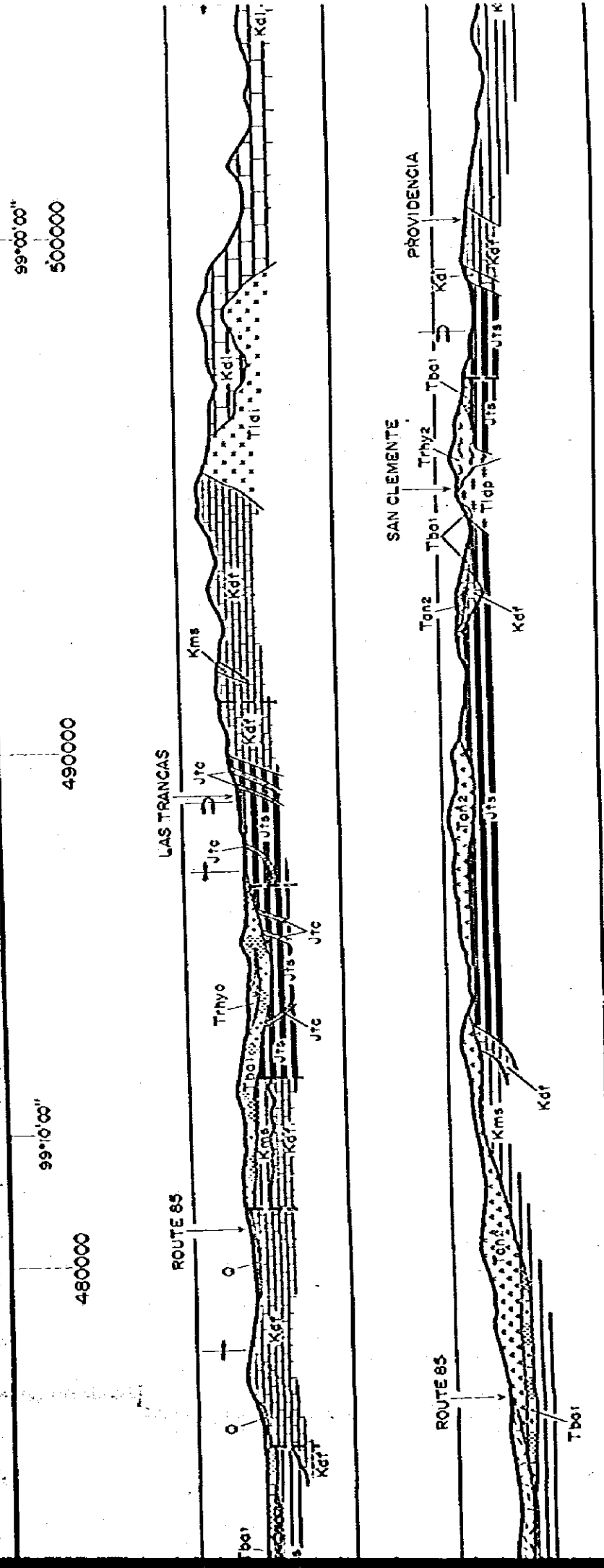


500000

2300000







470000

99°20'00"

460000

21°00'00"

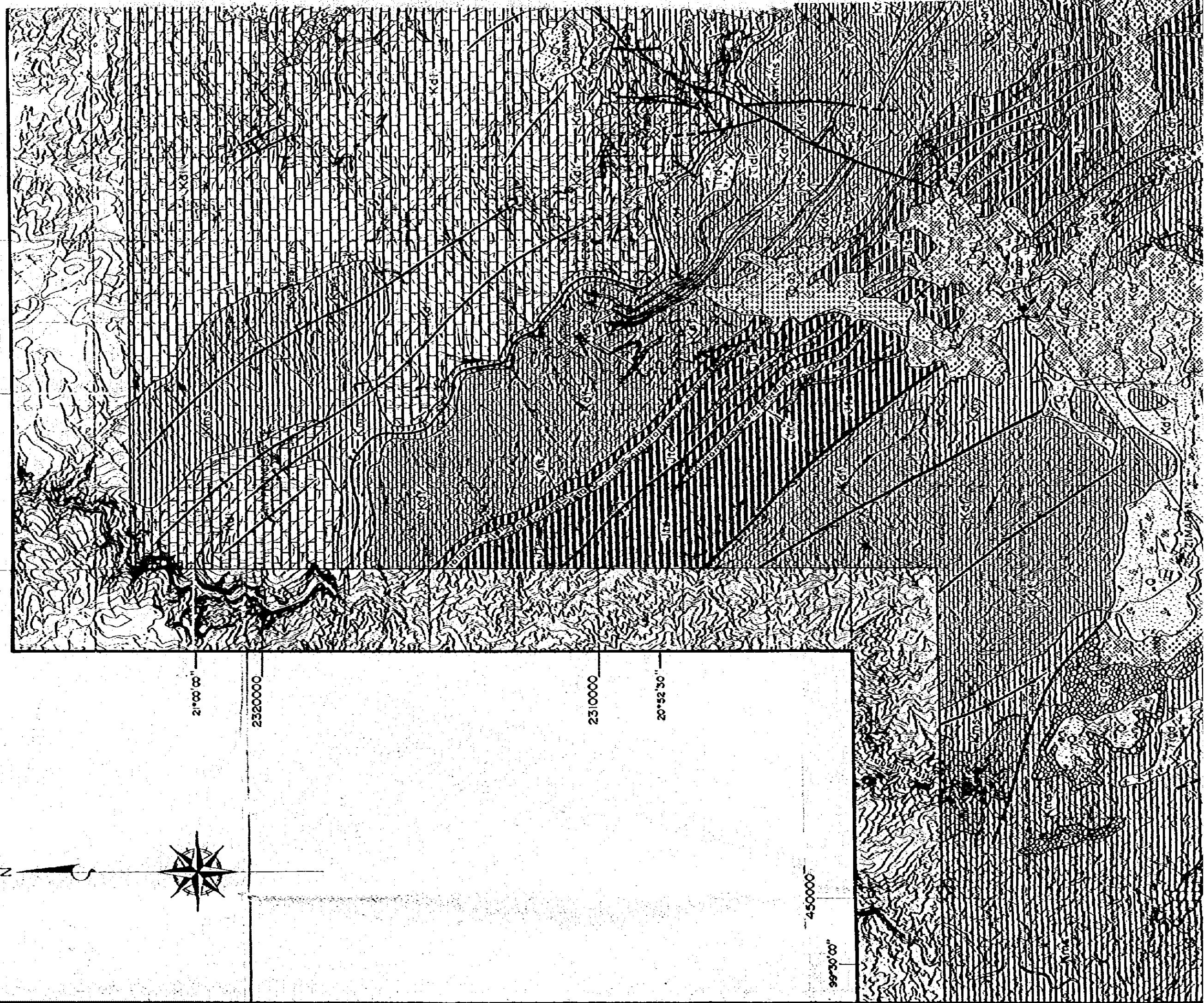
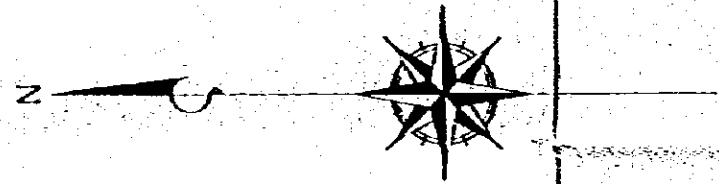
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2310000

20°52'30"

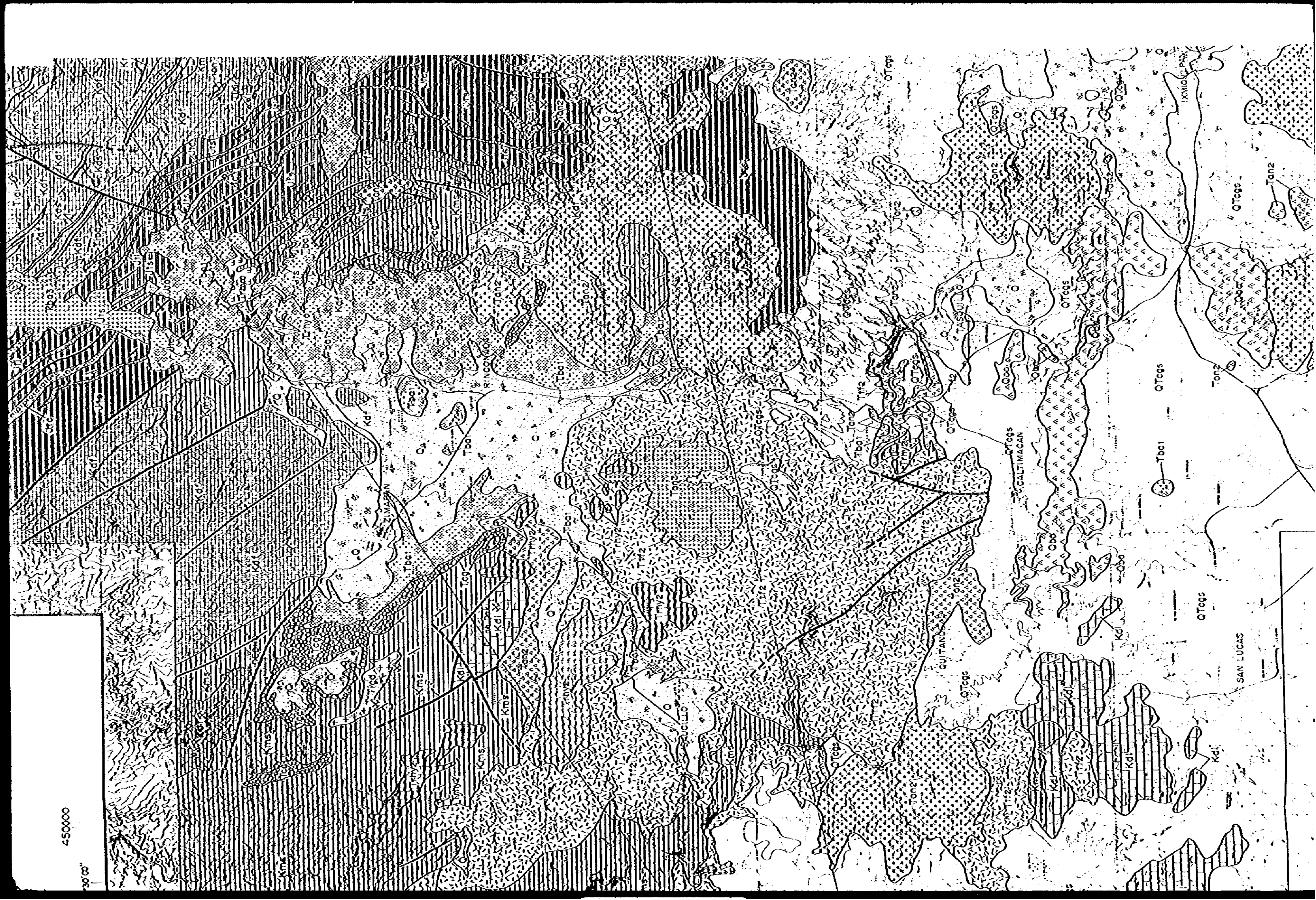
450000

99°30'00"



450000

20 00'



Kms

Kdl

Tbcg

QTcgs

Tingo

QUITANDAS

CALTIMACAN

SAN LUCAS

Tong

QTcgs

Tbcg

QTcgs

Kdl

Kdl

QTcgs

Tanz

QTcgs

Tong

QTcgs

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QTcgs

QTcgs

QTcgs

QTcgs

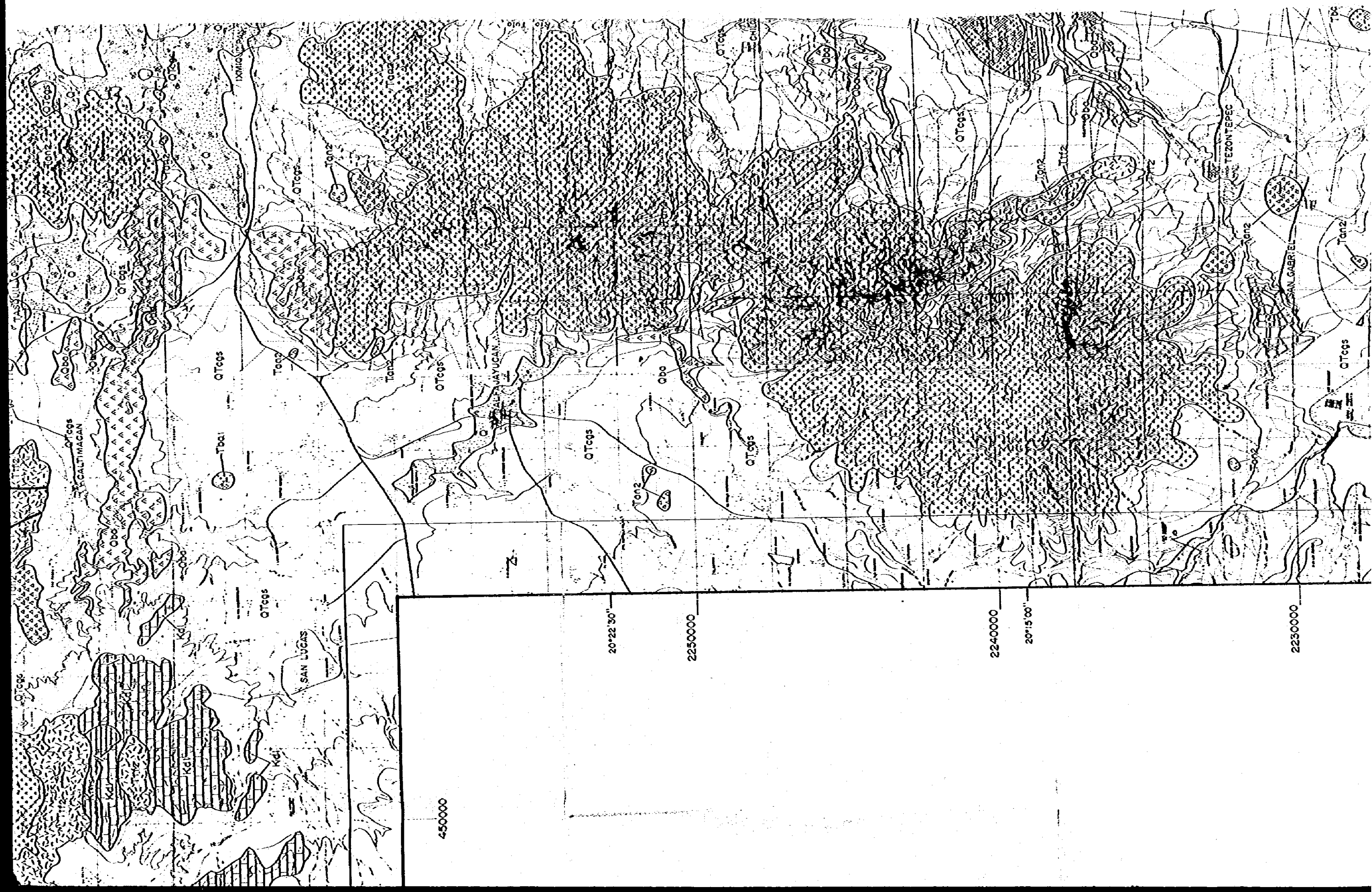
QTcgs

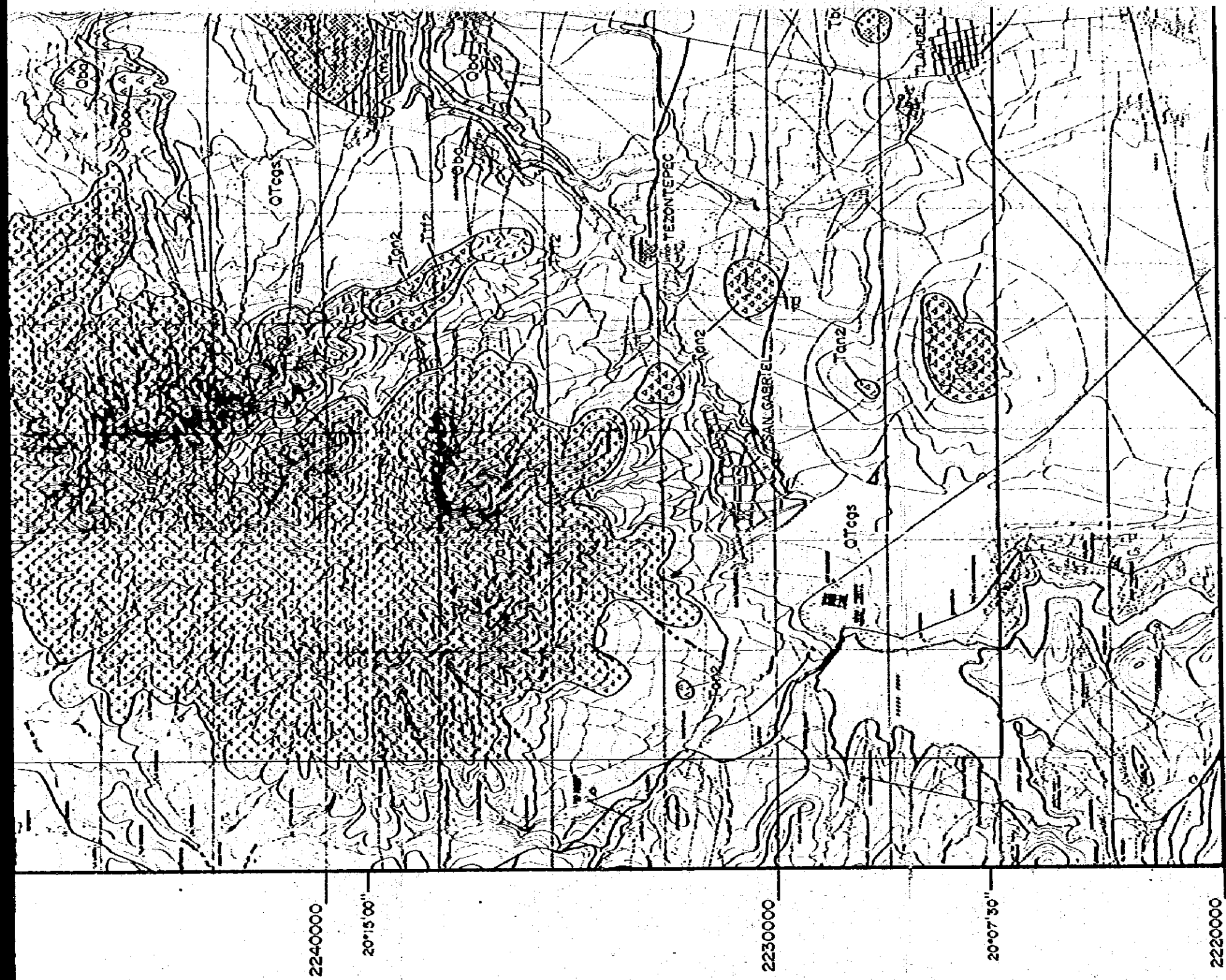
QTcgs

QTcgs

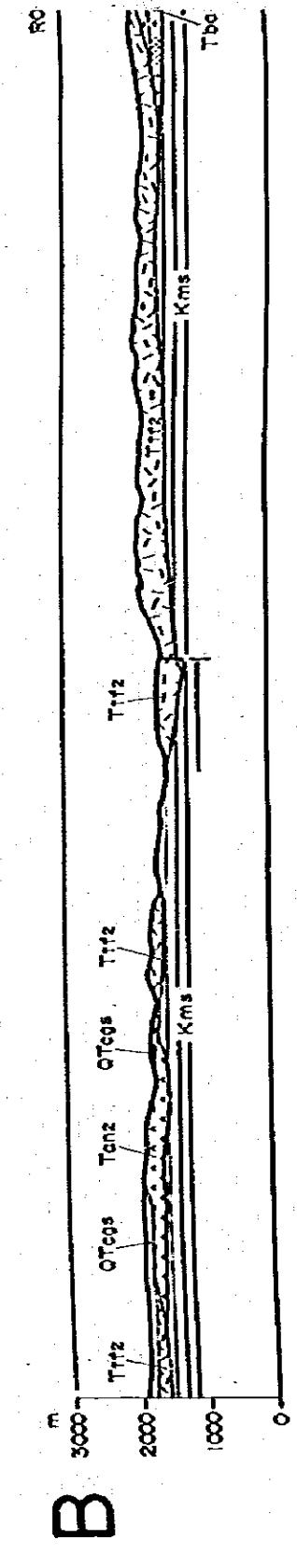
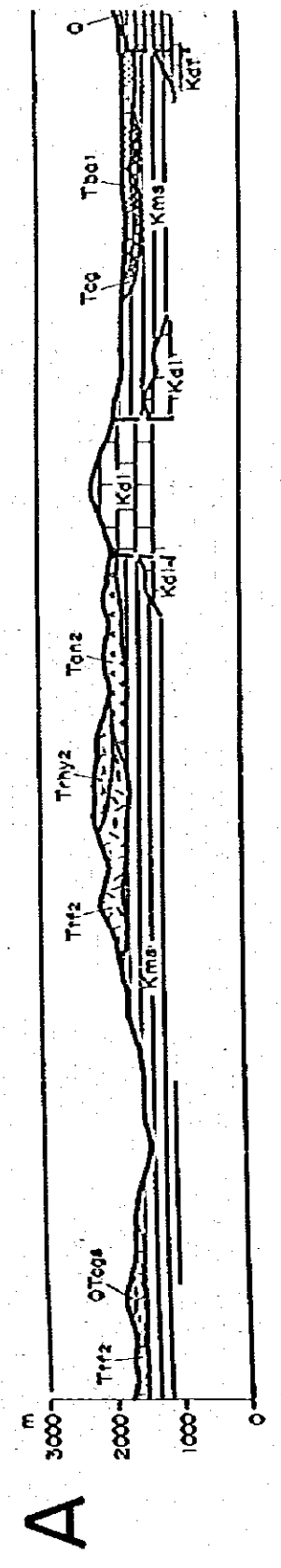
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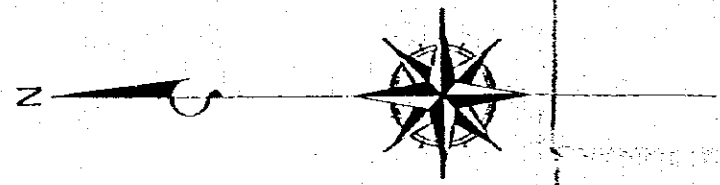
QTcgs





460000 99°20'00" 470000





460000

99°20'00"

21°00'00"

2320000

2310000

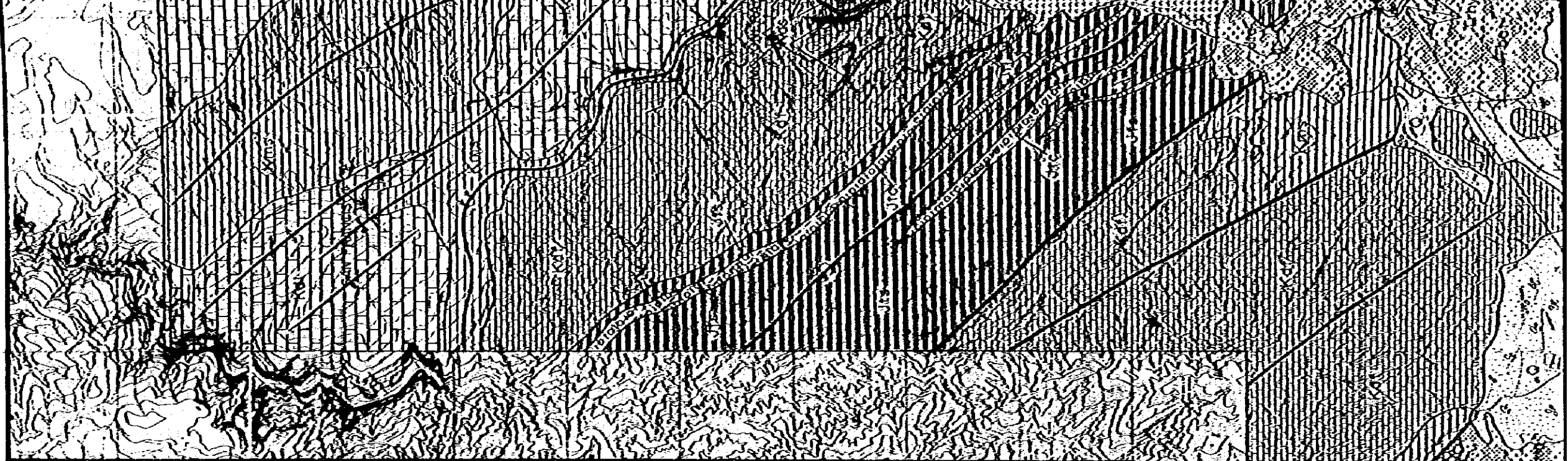
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450000

99°30'00"

2300000

20°45'00"



450000

99°36'00"

2300000

20°45'00"

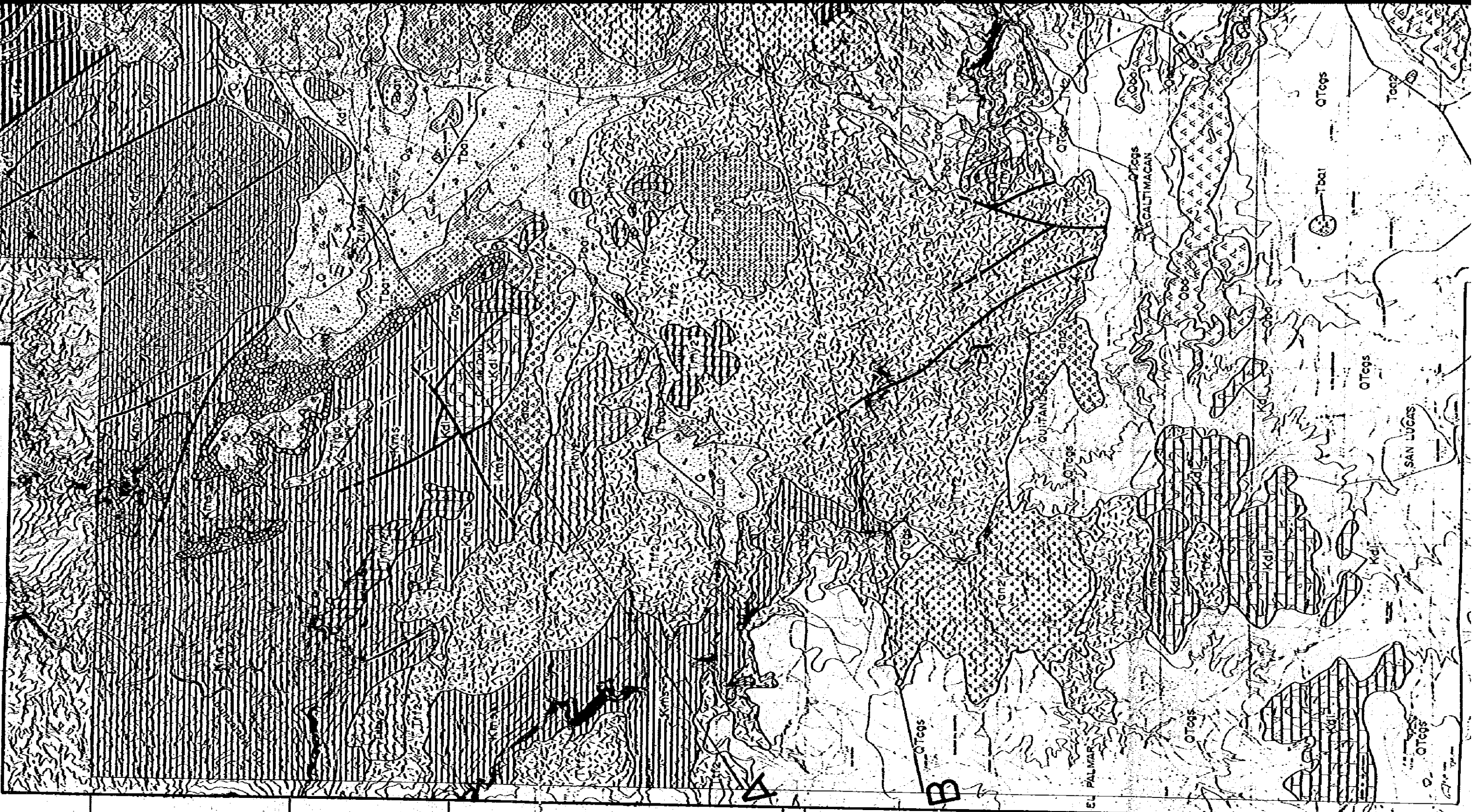
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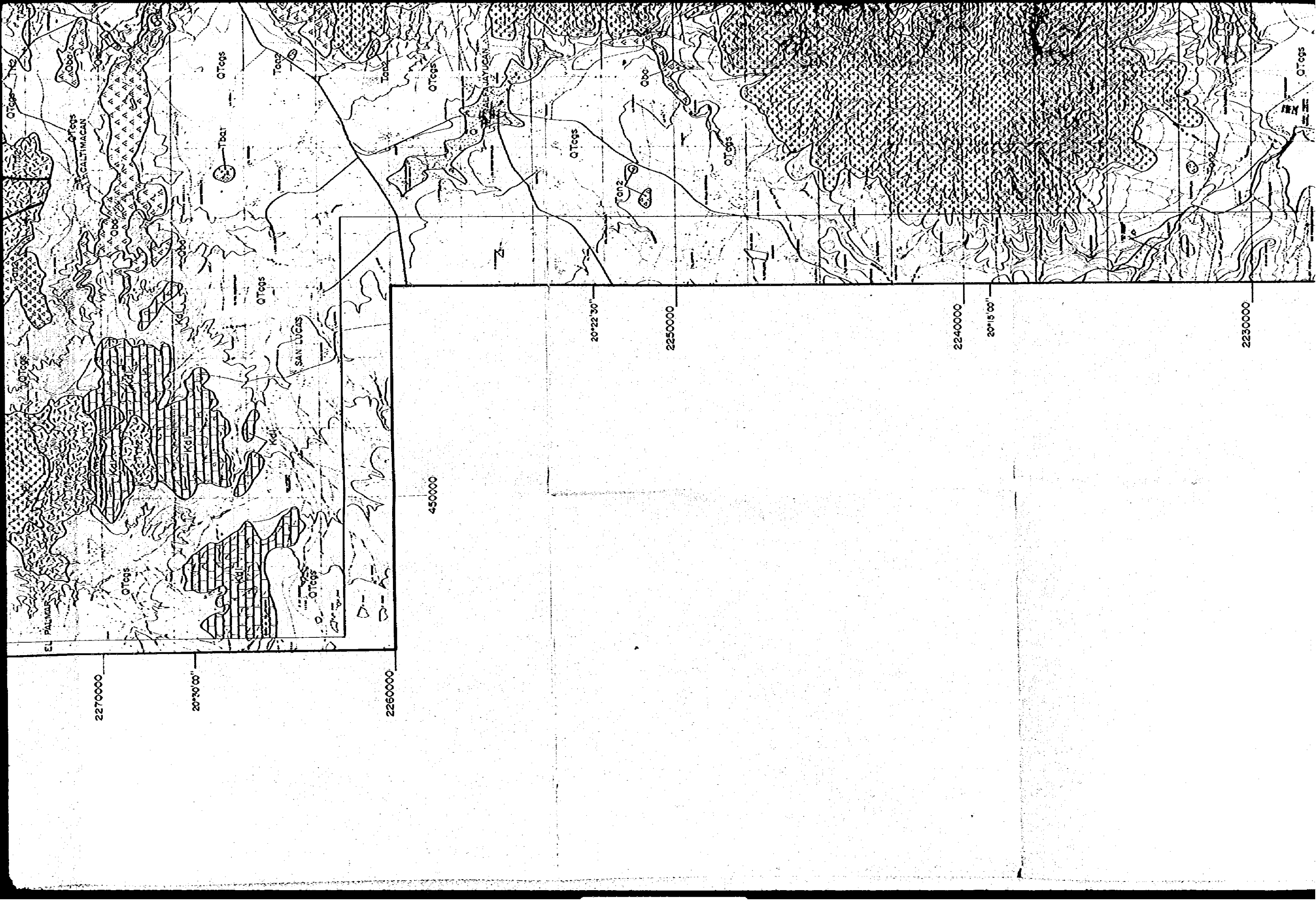
20°37'30"

2280000

2270000

20°30'00"





EL PALMAR

SAN CATALIMACAN

SAN LUCAS

SAN JAYUCAN

2270000

20°20'00"

2260000

450000

20°22'30"

2250000

2240000

20°15'00"

2230000

Tbat

QTcgs

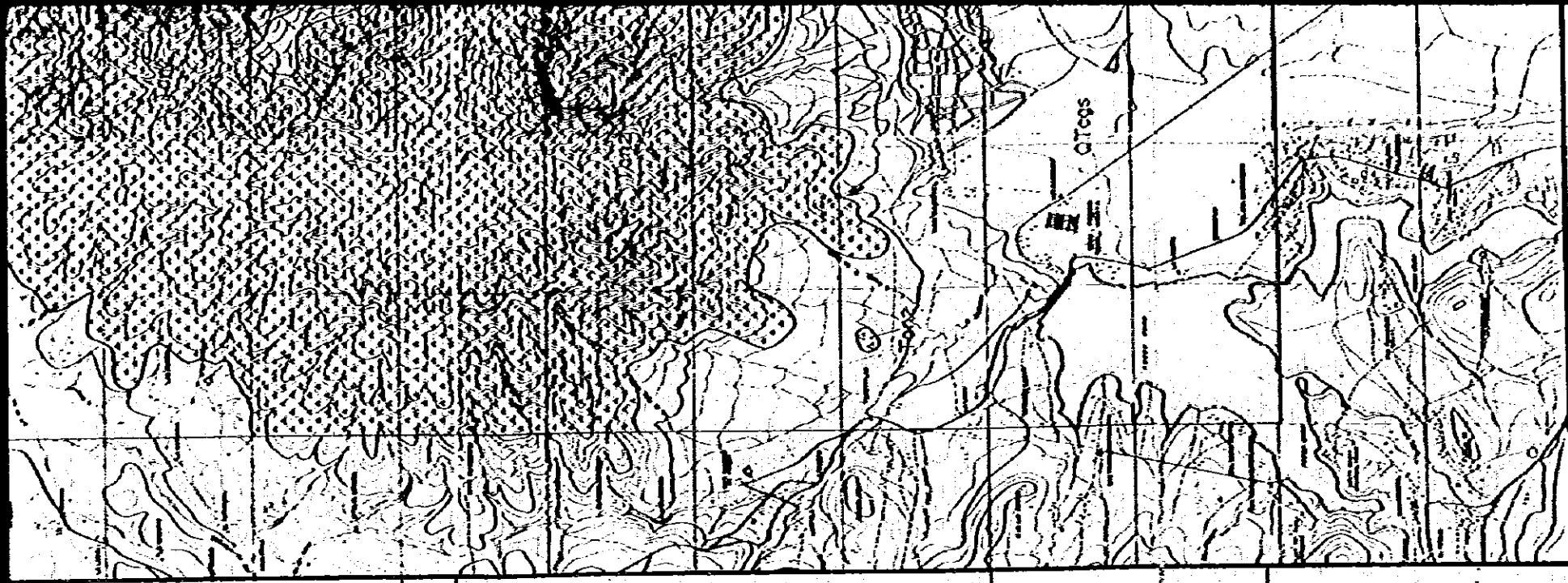
QTcgs

QTcgs

Ton2

QTcgs

QTcgs



2240000

20°15'00"

2230000

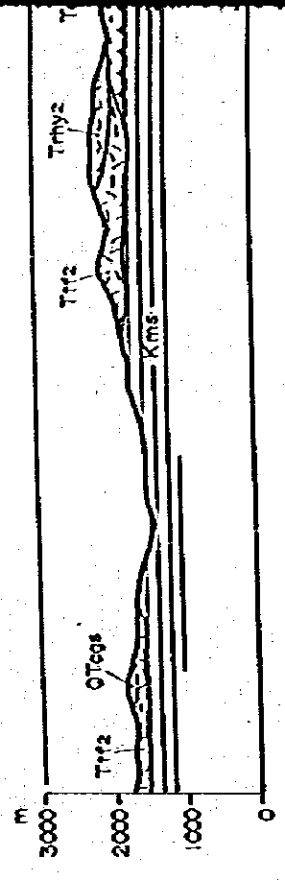
20°07'30"

2220000

99°20'00"

460000

A



B

