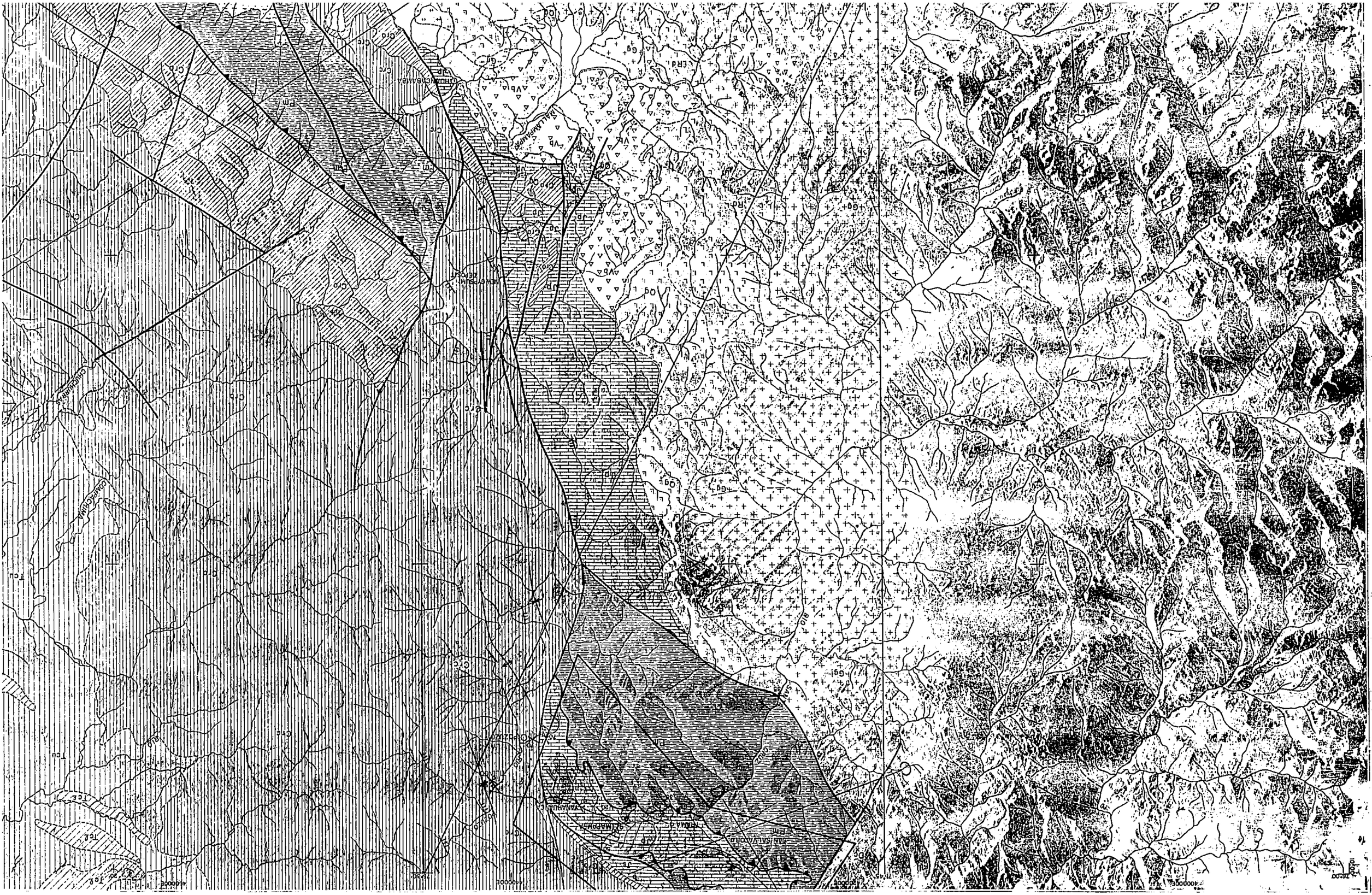
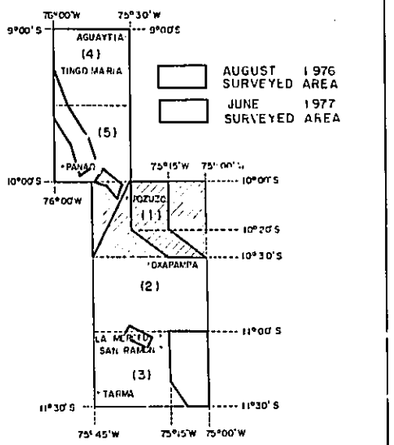


POZUZO — HOJA Nº 21-

PL. I-8(1)

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU
(JUNE 1977)

GEOLOGICAL MAP OF THE RECONNAISSANCE AREA



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, Inc.

Scale 1 : 100,000

0 5 10Km

LEGEND

SEDIMENTARY

	Gravel & sand	Quaternary
Tm	Merced F.	Tertiary
Tcu	Contamana G. (UPPER)	Tertiary
Tcℓ	" (LOWER)	Tertiary
To	Huayabamba G.	Tertiary
Cro	Vivian F.	Cretaceous
Crc	Chonta G.	Cretaceous
Cro	Oriente G.	Cretaceous
Js	Sarayaquillo F.	Jurassic
Tr	Pucara G. (Dolomite)	Triassic
Pm	Mitu G.	Permian
Pcl	Copacabana & Tarma G.	Carboniferous
Cm	Ambo G.	Carboniferous
Ds	Excelcior G.	Devonian

METAMORPHIC

Pm	Schist / Gneiss	Pre Cambrian

IGNEOUS

Vb	Volcanic breccia
Mp	Monzonite porphyry
Rd	Rhyolite o trachite
Qp	Quartz porphyry & Granite-porphyry
Ap	Aplite
Gr	Granite
Dc	Diorite complex
Gd	Granite & Granodiorite
Gc	Granodiorite complex (altered)

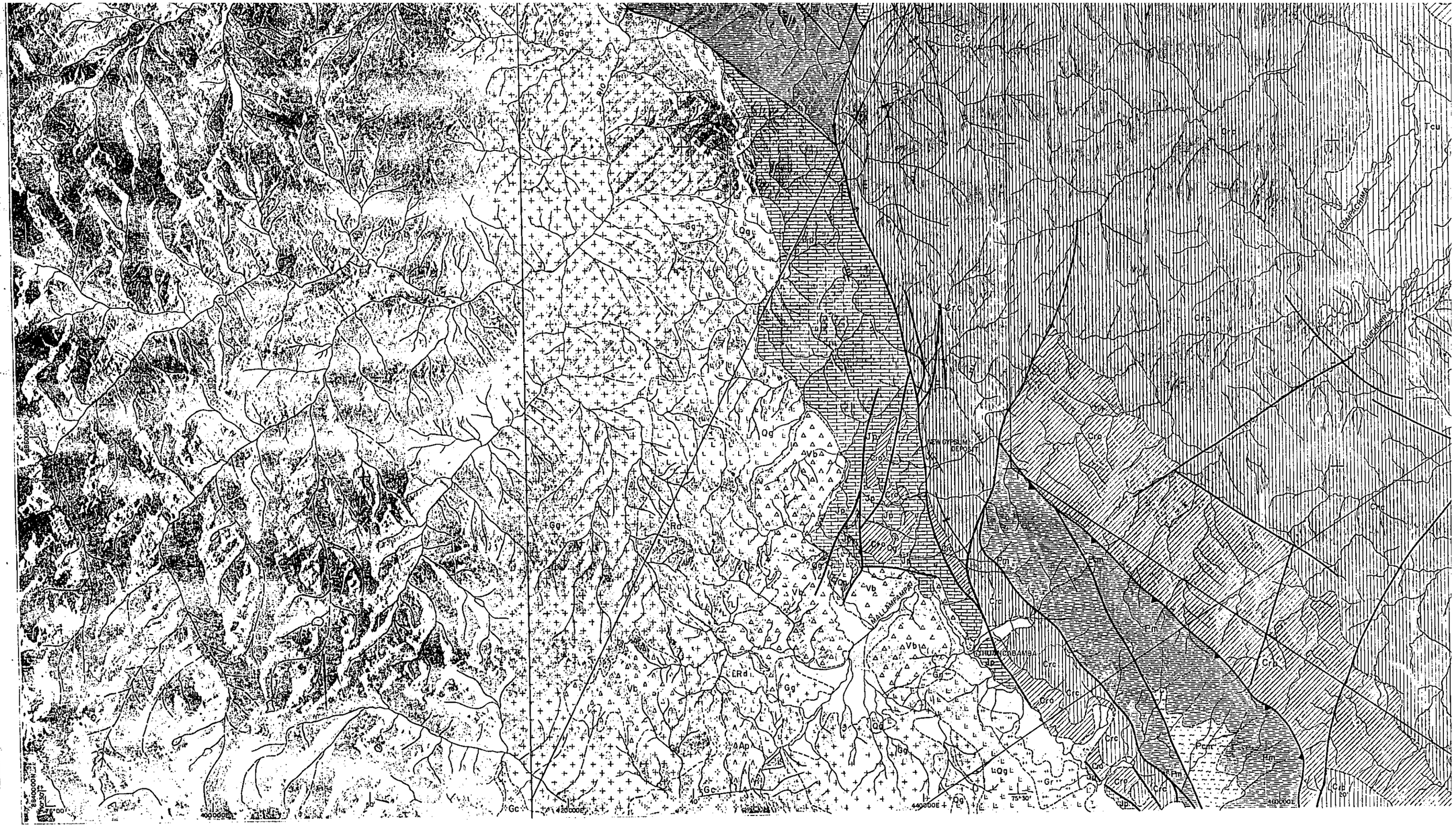
40 strike & dips

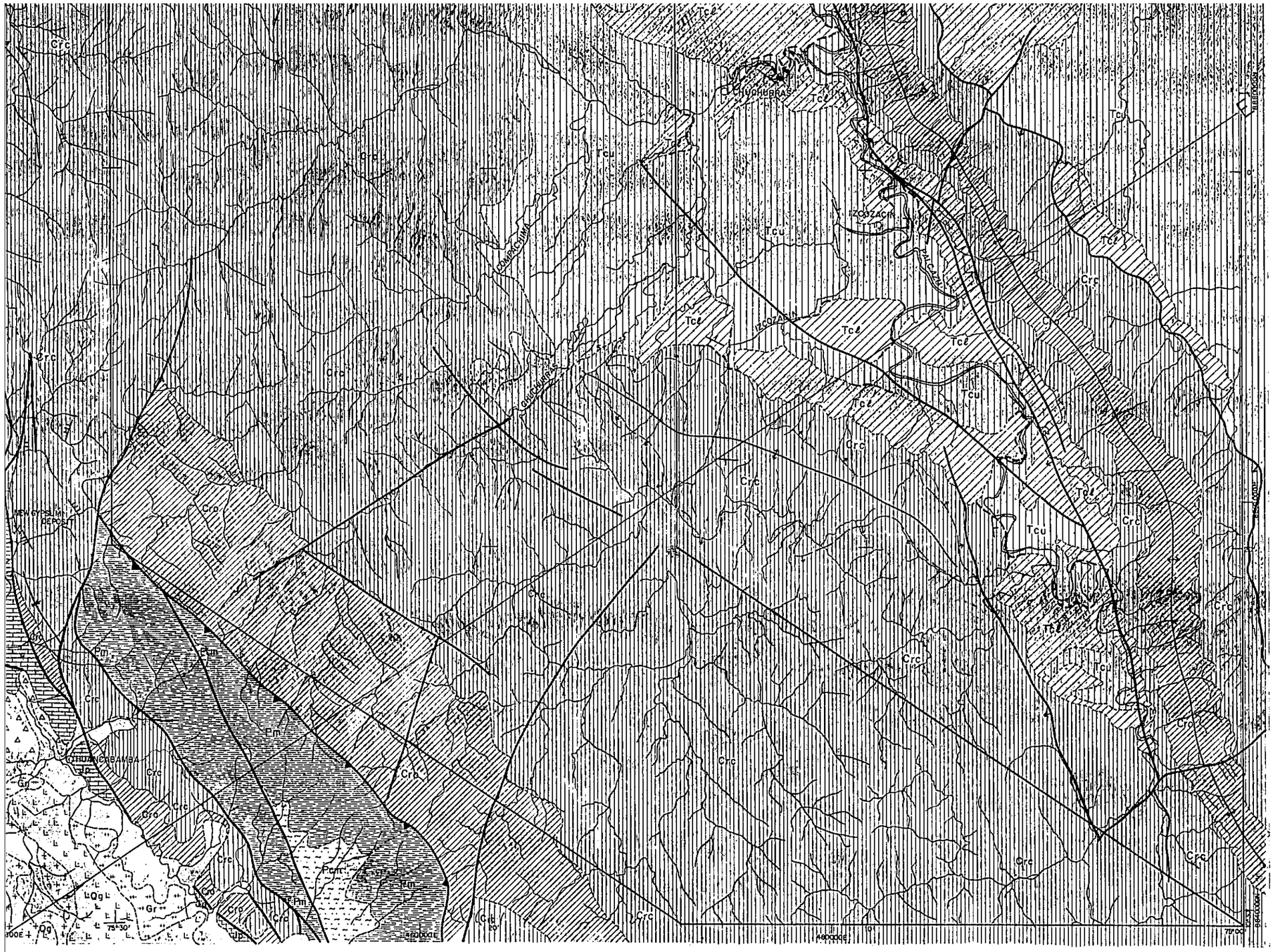
by photo interpretation:
- gentle dip & strike 0°~30°
- moderate dip & strike 31°~60°
- steep dip & strike 61°~89°
- vertical dip & strike

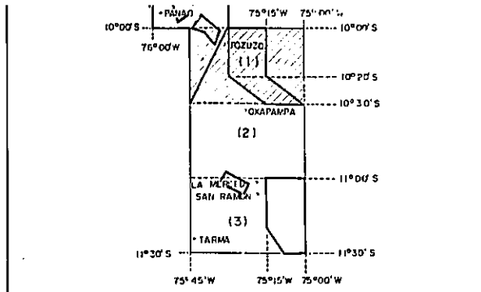
geological boundary

fault

thrust fault







METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, Inc.

Scale 1 : 100,000

0 5 10Km

LEGEND

SEDIMENTARY

- Gravel & sand — Quaternary
- Tm — Merced F. — Tertiary
- Tcu — Contamana G. (UPPER)
- Tcℓ — " " (LOWER)
- Tm — Huayabamba G.
- Crv — Vivian F. — Cretaceous
- Crc — Chonta G.
- Cro — Oriente G.
- Js — Sarayaquillo F. — Jurassic
- Jp — Pucara G. (Dolomite) — Triassic
- Pm — Mitu G. — Permian
- Pcl — Copacabana & Tarma G. — Carboniferous
- Pa — Ambo G.
- Dc — Excelsior G. — Devonian

METAMORPHIC

- Pcm — Schist / Gneiss — Pre Cambrian

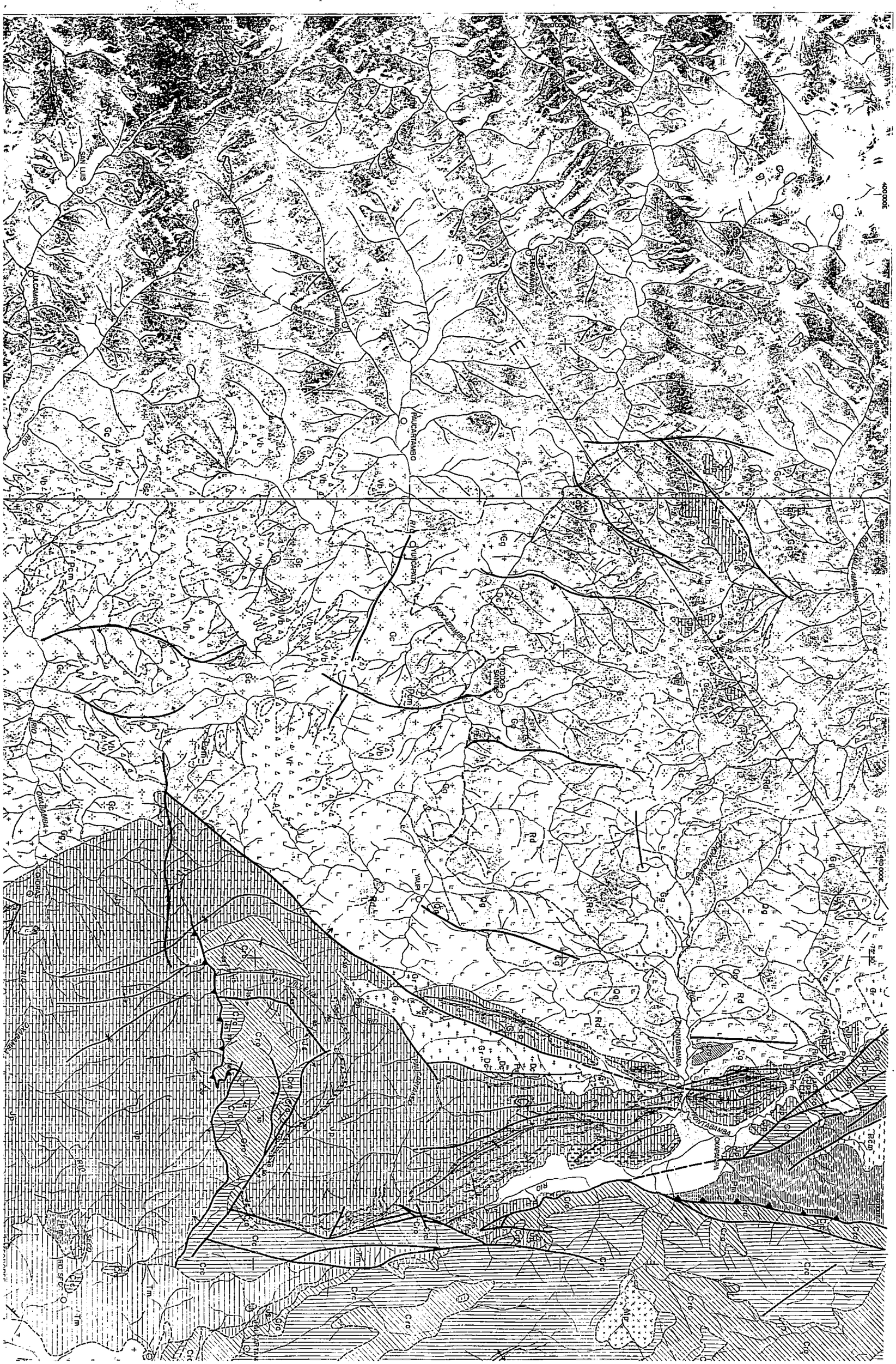
IGNEOUS

- Vb — Volcanic breccia
- Mp — Monzonite porphyry
- Rd — Rhyolite & Dacite
- Qp — Quartz porphyry & Granite-porphyry
- Ap — Aplite
- Gr — Granite
- Ds — Diorite complex
- Gd — Granite & Granodiorite
- Gc — Granodiorite complex (altered)

- 40 — strike & dips
- suave dip & strike 0° ~ 30°
- moderate dip & strike 31° ~ 60°
- steep dip & strike 61° ~ 89°
- vertical dip & strike

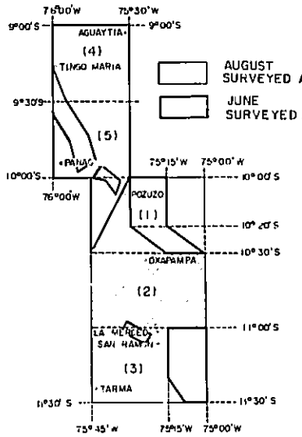
(by photo interpretation)

- geological boundary
- fault
- thrust fault
- anticlinal / synclinal folding axis
- basin structure
- dome structure


SAN LUIS
HUAMACO
PAUCARTAMBO
TODOS SANTOS
YAUPI
OKARAMBA
CHONTABAMBA
OKARAPATA
RIO
Gc
Gb
Vb
Pcm
Cro
Rd
Gr
Dg
Jm
Tm

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU
(JUNE 1977)

GEOLOGICAL MAP OF THE RECONNAISSANCE AREA



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, Inc.

Scale 1 : 100,000

0 5 10Km

LEGEND

SEDIMENTARY

- Gravel & sand — Quaternary
- Tm — Merced F. — Tertiary
- Tcy — Contamana G. (UPPER) — Tertiary
- Tcl — " " (LOWER) — Tertiary
- Th — Huayabamba G — Tertiary
- Cv — Vivian F. — Cretaceous
- Cch — Chonta G. — Cretaceous
- Cro — Oriente G — Cretaceous
- Js — Sarayaquillo F — Jurassic
- Ja — Pucara G (Dolomite) — Triassic
- Pm — Mitu G. — Permian
- Pcl — Copacabana & Tarma G — Carboniferous
- Ck — Ambo G — Carboniferous
- Dc — Excelsior G — Devonian

METAMORPHIC

- Pzm — Schist / Gneiss — Pre Cambrian

IGNEOUS

- Vb — Volcanic breccia
- Mp — Manzanita porphyry
- Rd — Rhyolite & Dacite
- Qz — Quartz porphyry & Granite-porphyry
- Ap — Aplite
- Gr — Granite
- Dc — Diorite complex
- Gg — Granite & Granodiorite
- Gc — Granodiorite complex (altered)

- 40 — strike & dips
- suave dip & strike 0°~30°
- moderate dip & strike 31°~60°
- steep dip & strike 61°~89°
- vertical dip & strike

(by photo interpretation)

- geological boundary
- fault

PURAGMARAY
PAUCARTAMBO
HUAMAG
SAN LUIS
ULCAMAYO
TINGO
TODOS SANTOS
YUNCAPATA
YAUPI
CHONTABAMBA
OXABAMBA
CHORAS
MINA TAMBA
CORORES
RIO SECO
RIO CAMAYO
RIO CHUNCHUSMAYO
RIO
Gc
Vb
Pcm
Gg
Dc
Rd
Qq
Gr
Mp
Cro
Tm
Jp
Js
Pm
Cro/Js
Cro/Jp
Cro/Pm
Jp/Js
Jp/Pm
Pm/Js
400 000E
420 000E
440 000E
450 000E
460 000E
50
40
45
30
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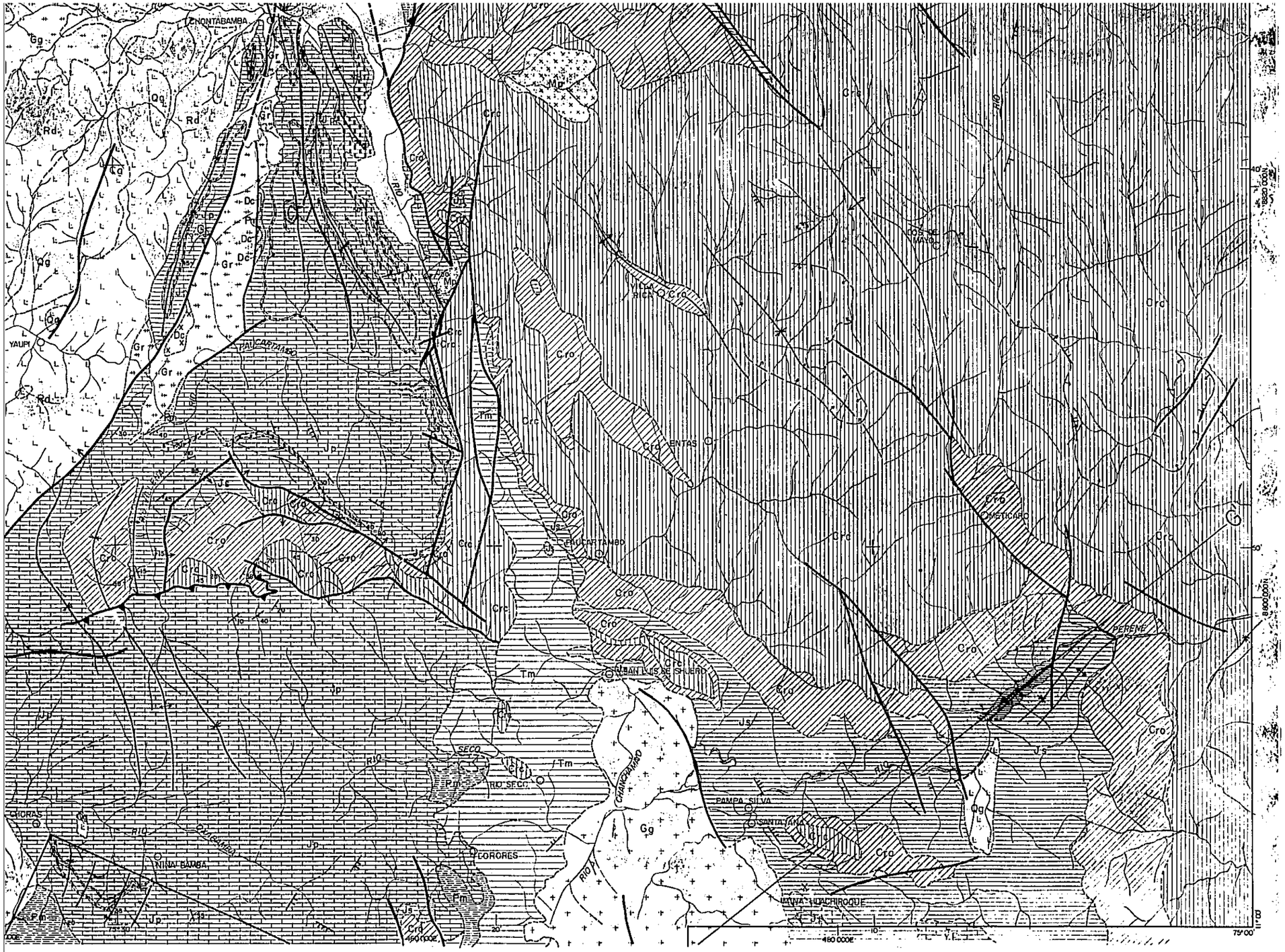
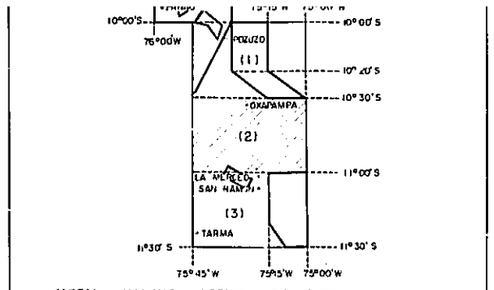
85
90
ES PROPIEDAD DEL
GOODYEAR AEROSPACE
AERO SERVICE





METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, Inc.

Scale 1 : 100,000

0 5 10Km

LEGEND

SEDIMENTARY

Qg	Gravel & sand	Quaternary
Tm	Merced F.	Tertiary
Tpl	Contamana G. (UPPER)	Tertiary
Te.R.	" " (LOWER)	Tertiary
Th	Huayabamba G	Tertiary
Cro	Vivian F.	Cretaceous
Cro	Chonta G.	Cretaceous
Cro	Oriente G.	Cretaceous
Js	Sarayaquillo F.	Jurassic
Jp	Pucara G (Dolomite)	Triassic
Pm	Mitu G.	Permian
Pe.t	Copacabana & Tarma G	Carboniferous
Ca	Ambo G.	Carboniferous
Dx	Excelsior G	Devonian

METAMORPHIC

pCm	Schist / Gneiss	Pre Cambrian

IGNEOUS

Vb	Volcanic breccia
Mp	Monzonite porphyry
Rd	Rhyolite & Dacite
Qp	Quartz porphyry & Granitic-porphyry
Ap	Aplite
Gr	Granite
Dc	Diorite complex
Gg	Granite & Granodiorite
Gc	Granodiorite complex (altered)

40 strike & dips

suave dip & strike 0°~30° | moderate dip & strike 31°~60° | steep dip & strike 61°~89° | vertical dip & strike — by photo interpretation

geological boundary

fault

thrust fault

anticlinal / synclinal folding axis

basin structure

dome structure

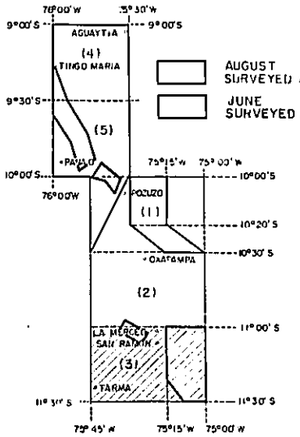
TARMA — LA MERCED

HOJA NO 23-

PL I-8(3)

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL
(JUNE 1977)

GEOLOGICAL MAP OF THE RECONNAISSANCE AREA



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, Inc.

Scale 1 : 100,000

0 5 10Km

LEGEND

SEDIMENTARY

	Gravel & sand	Quaternary
Tm	Merced F.	Tertiary
Tcu	Contamana G. (UPPER)	Tertiary
Tcℓ	" " (LOWER)	Tertiary
Th	Huayabamba G.	Tertiary
Crv	Vivian F.	Cretaceous
Cch	Chonta G.	Cretaceous
Cro	Oriente G.	Cretaceous
Js	Sarayaquillo F.	Jurassic
Tr	Pucara G. (Dolomite)	Triassic
Pm	Mitu G.	Permian
Pcl	Copacabana & Tarma G.	Carboniferous
Ca	Ambo G.	Carboniferous
Da	Excelsior G.	Devonian

METAMORPHIC

Pcm	Schist / Gneiss	Pre Cambrian

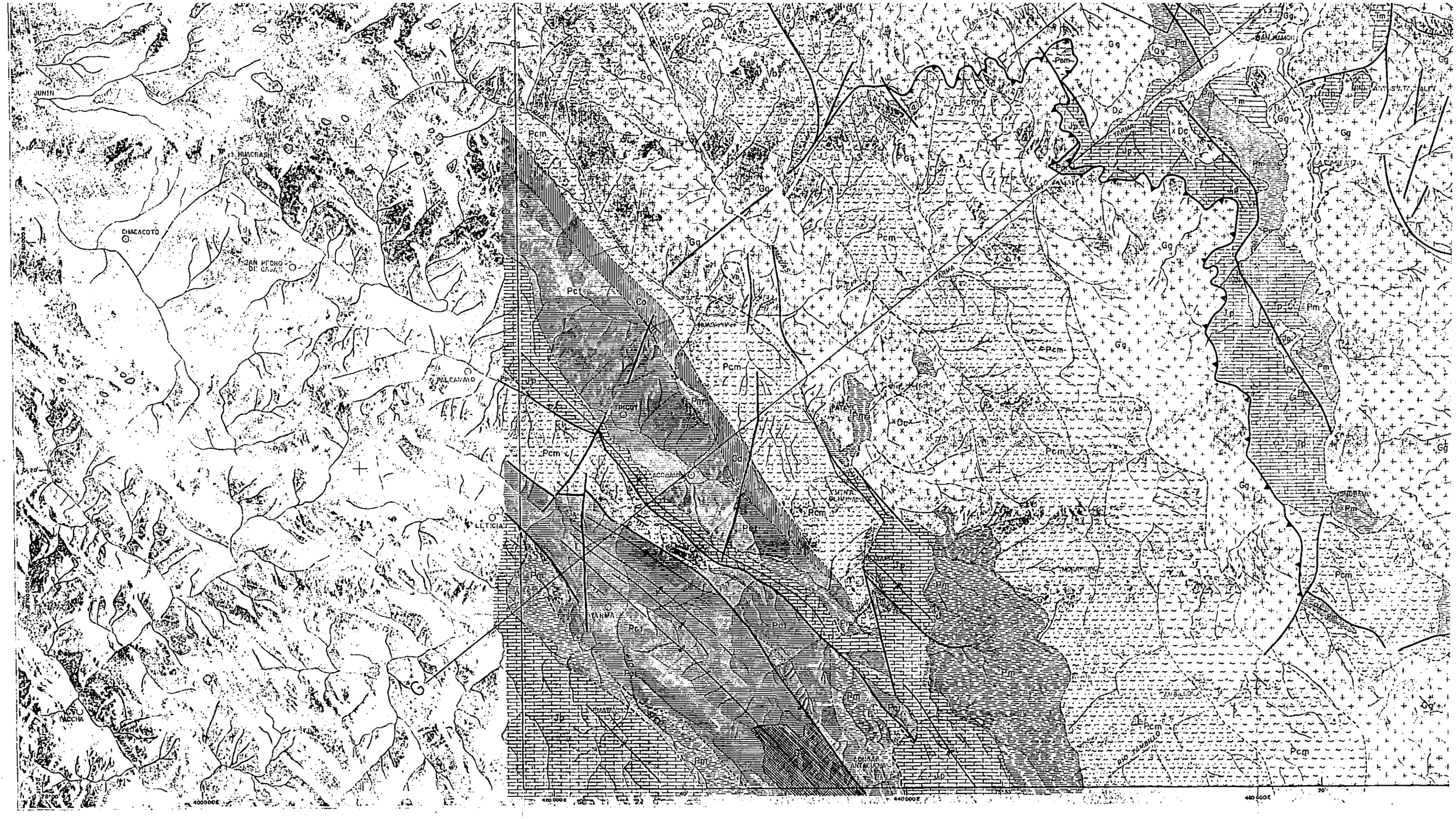
IGNEOUS

Vb	Volcanic breccia
Mp	Monzonite porphyry
Rd	Rhyolite & Dacite
Qp, Gp	Quartz porphyry & Granite-porphyry
Ap	Aplite
Gr	Granite
Dc	Diorite complex
Gg	Granite & Granodiorite
Gc	Granodiorite complex (altered)

- 40 strike & dips
- suave dip & strike 0°~30°
- moderate dip & strike 31°~60°
- steep dip & strike 61°~89°
- vertical dip & strike

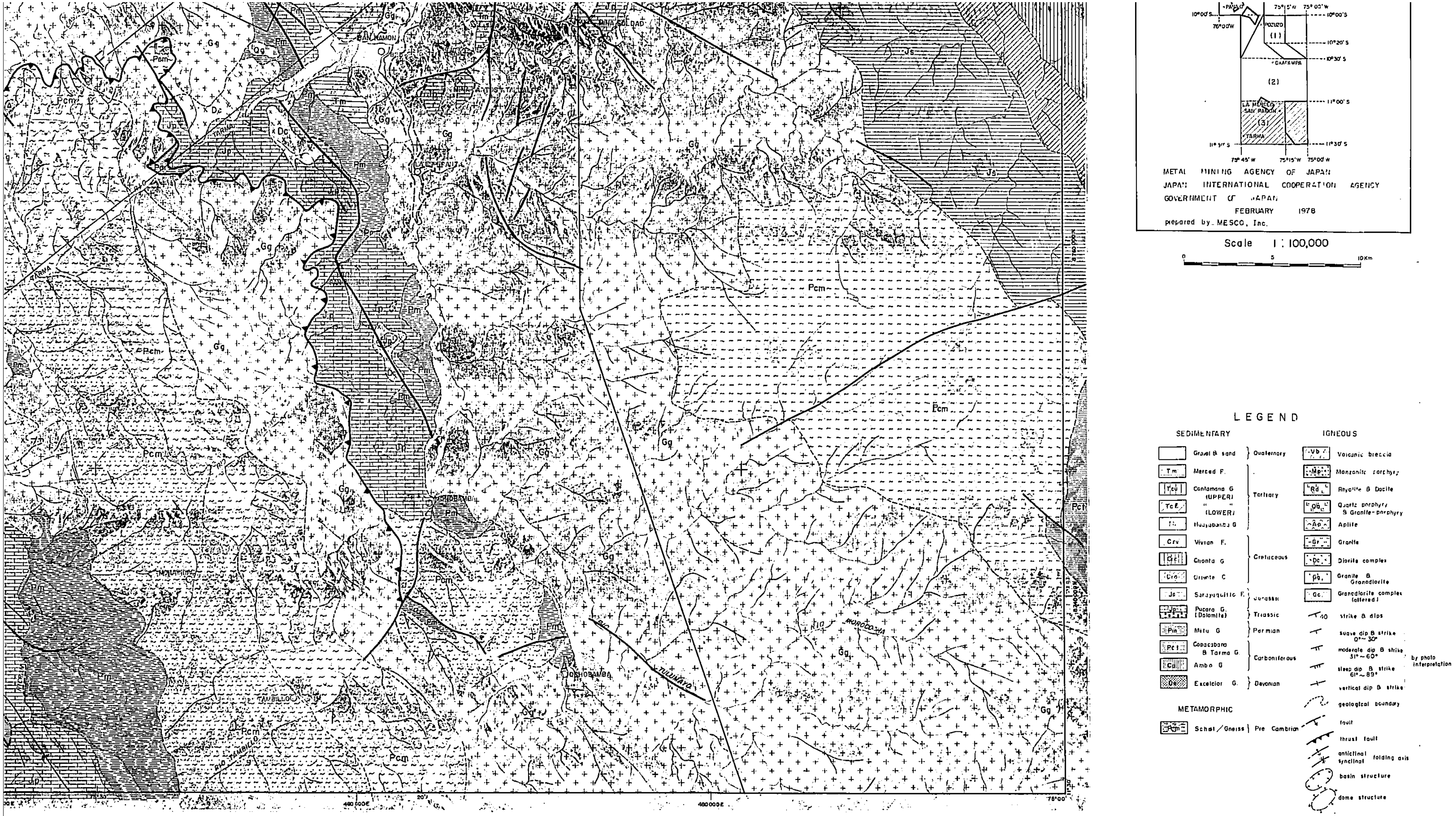
by photo interpretation

- geological boundary
- fault
- thrust fault



GOODYEAR

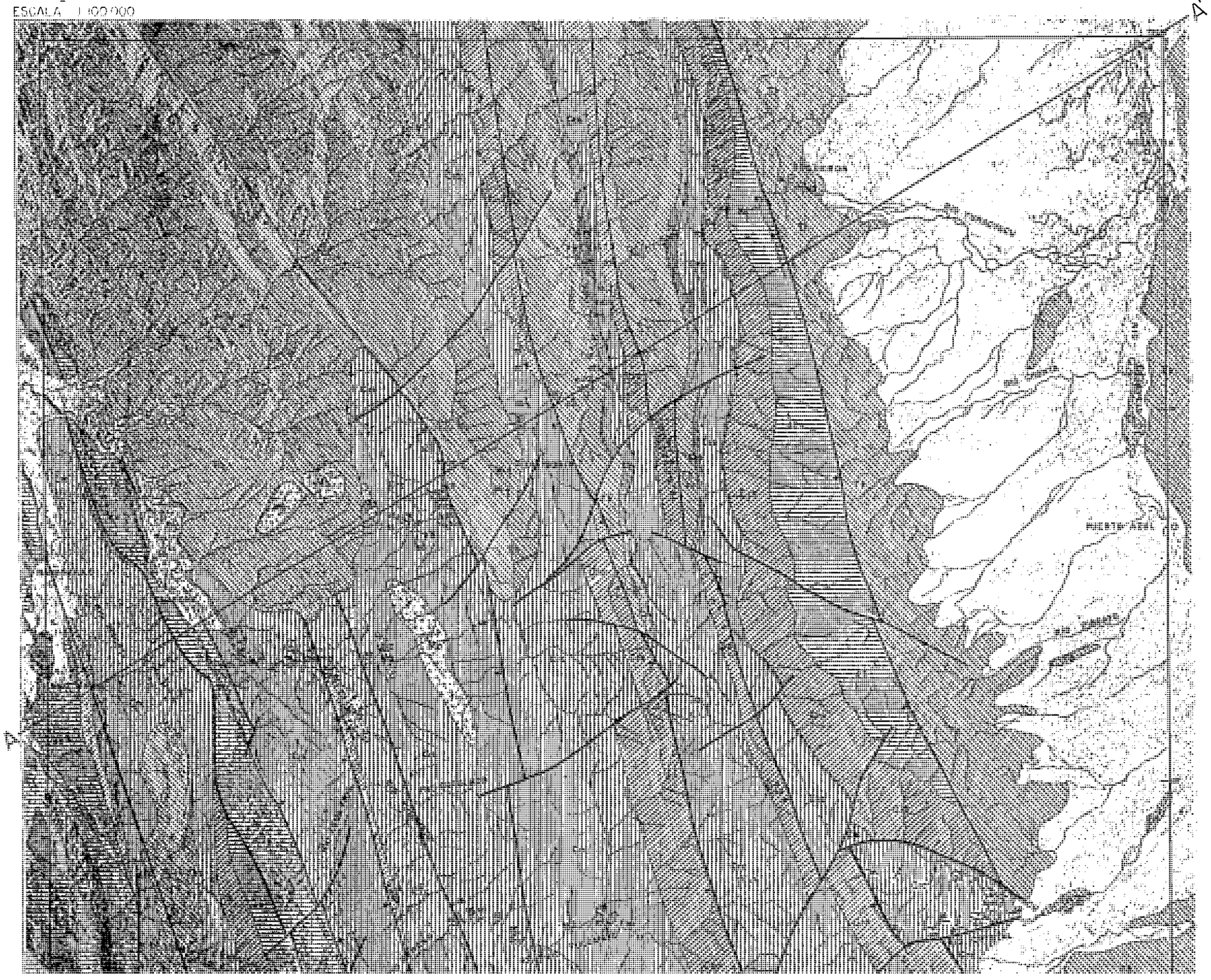
AERO SERVICE



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, Inc.

Scale 1 : 100,000

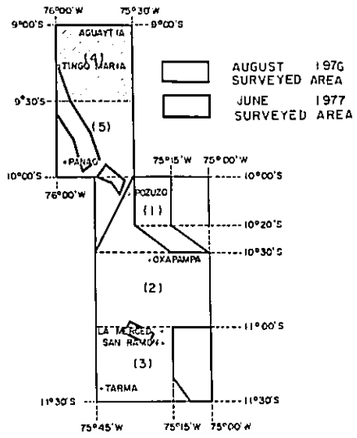
MOSAICO DE RADAR CONTROLADO
ESCALA 1:100,000



PL. I-8(4)

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU
(JUNE 1977)

GEOLOGICAL MAP OF THE RECONNAISSANCE AREA



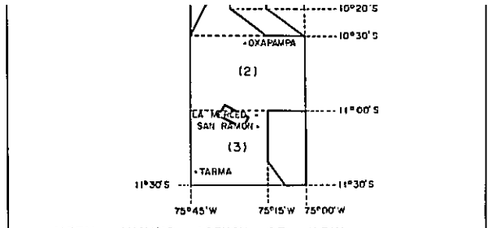
METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, Inc

Scale 1 : 100,000

0 5 10Km

LEGEND

SEDIMENTARY			IGNEOUS	
	Gravel & sand	Quaternary	Vb	Volcanic breccia
Tm	Merced F	Tertiary	Mp	Monzonite porphyry
Tcu	Contamana G (UPPER)		Rd	Rhyolite & Dacite
Tcl	" " (LOWER)		Qp	Quartz porphyry & Granite-porphyry
Th	Huayabamba G.		Ap	Aplite
Cvi	Vivian F	Cretaceous	Gr	Granite
Cch	Chonta G		De	Diorite complex
Cro	Oriente G		Gg	Granite & Granodiorite
Js	Sarayaquillo F	Jurassic	Gc	Granodiorite complex (altered)
Jp	Pucara G (Dolomite)	Triassic	40	strike & dips
Pm	Mitu G	Permian		suave dip & strike



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, Inc.

Scale 1 : 100,000

0 5 10Km

LEGEND

SEDIMENTARY

- Gravel & sand — Quaternary
- Tm — Merced F. — Tertiary
- Tcu — Contamana G. (UPPER) — Tertiary
- Tcl — " " (LOWER) — Tertiary
- Th — Huayabamba G. — Tertiary
- Cv — Vivian F — Cretaceous
- Cch — Chonta G — Cretaceous
- Co — Oriente G — Cretaceous
- Js — Sarayaquillo F — Jurassic
- Ju — Pucara G. (Dolomite) — Triassic
- Pm — Mitu G — Permian
- Pc — Capacabana & Tarma G — Carboniferous
- Ca — Ambo G. — Carboniferous
- De — Escalcior G — Devonian

METAMORPHIC

- PCms — Schist / Gneiss — Pre Cambrian

IGNEOUS

- Vb — Volcanic breccia
- Mp — Monzonite porphyry
- Rd — Rhyolite & Dacite
- Qp — Quartz porphyry & Granite-porphyry
- Ad — Aplite
- Gr — Granite
- Dc — Diorite complex
- Gg — Granite & Granodiorite
- Gc — Granodiorite complex (altered)

- 40 — strike & dips
- suave dip & strike 0°~30°
- moderate dip & strike 31°~60°
- steep dip & strike 61°~89°
- vertical dip & strike
- geological boundary
- fault
- thrust fault
- anticlinal / synclinal folding axis
- basin structure
- dome structure

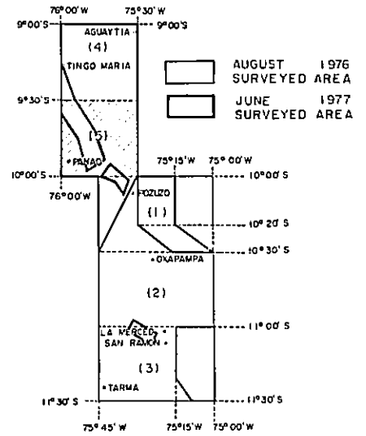
(by photo interpretation)

GOODYEAR AEROSPACE

AERO SERVICE
Litton

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU
(JUNE 1977)

GEOLOGICAL MAP OF THE RECONNAISSANCE AREA



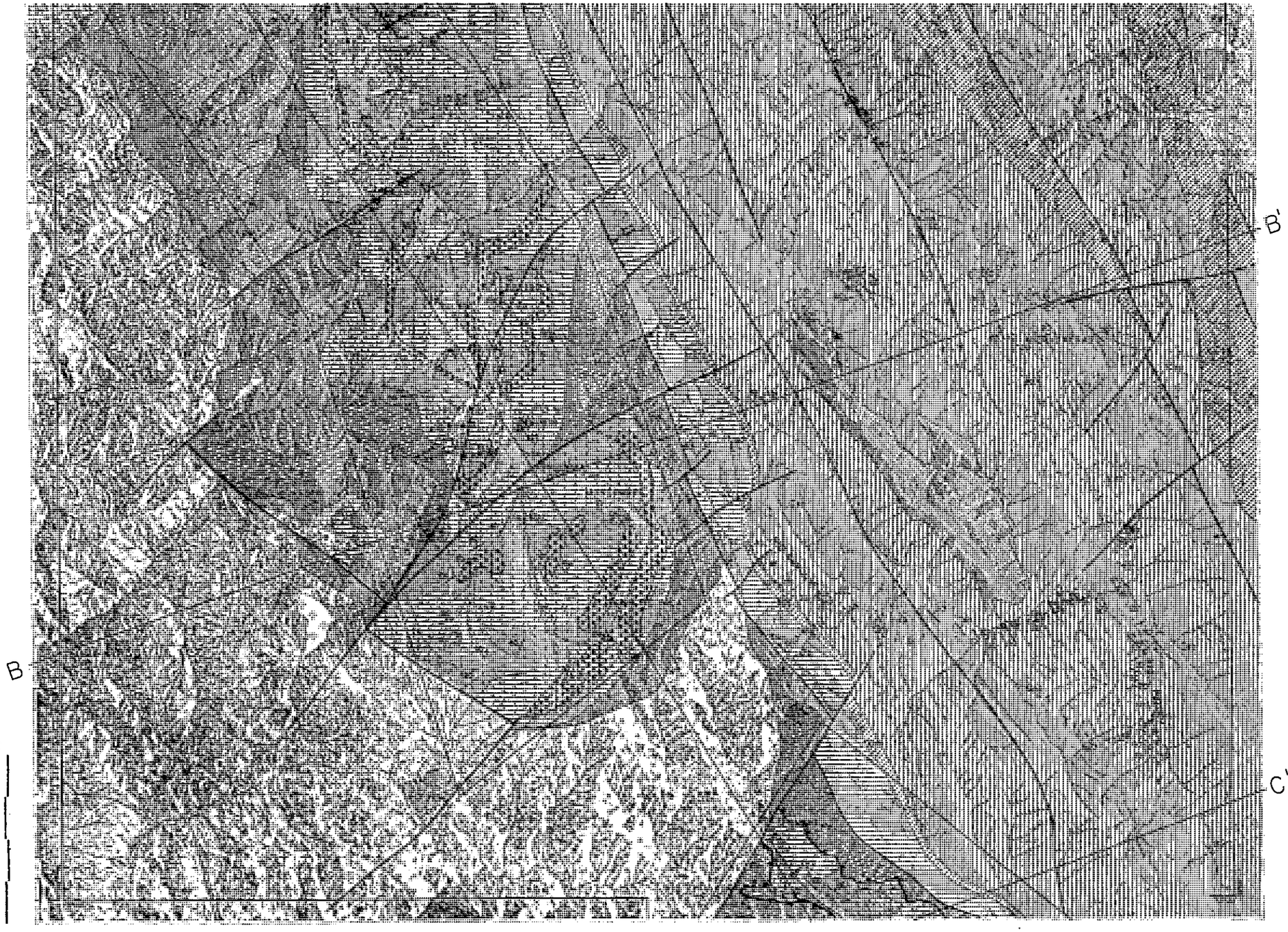
METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, Inc

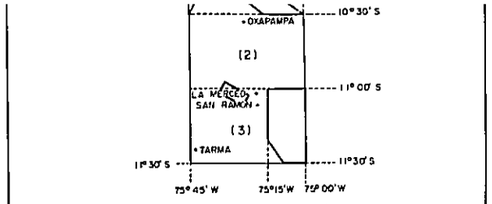
Scale 1 : 100,000

0 5 10Km

LEGEND

SEDIMENTARY		IGNEOUS	
Gravel & sand	Quaternary	Volcanic breccia	
Tm Merced F		Monzonite porphyry	
Tcm Contamana G. (UPPER)	Tertiary	Rhyolite & Dacite	
Tcl " " (LOWER)		Quartz porphyry & Granite-porphyry	
Th Huayabamba G		Aplite	
Kv Vivian F		Granite	
Kch Chonta G	Cretaceous	Diorite complex	
Kcho Chonta G		Granite & Granodiorite	
Js Sarayaquillo F	Jurassic	Granodiorite complex (altered)	
Pucara G (Dolomite)	Triassic	strike & dips	
Pm Mitu G	Permian	suave dip & strike	





METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, Inc.

Scale 1 : 100,000

0 5 10Km

LEGEND

SEDIMENTARY

Gravel & sand	Quaternary	
Merced F.	Tertiary	
Contamana G. (UPPER)	Tertiary	
" " (LOWER)	Tertiary	
Huayabamba G.	Tertiary	
Vivian F.	Tertiary	
Chonta G.	Cretaceous	
Oriente G.	Cretaceous	
Sarayaquillo F.	Jurassic	
Pucara G. (Dolomite)	Triassic	
Mitu G.	Permian	
Copacabana & Tarma G.	Carboniferous	
Ambo G.	Carboniferous	
Excelcior G.	Devonian	

METAMORPHIC

Schist / Gneiss	Pre Cambrian

IGNEOUS

Volcanic breccia	
Monzonite porphyry	
Rhyolite & Dacite	
Quartz porphyry & Granite-porphyry	
Aplite	
Granite	
Diorite complex	
Granite & Granodiorite	
Granodiorite complex (altered)	

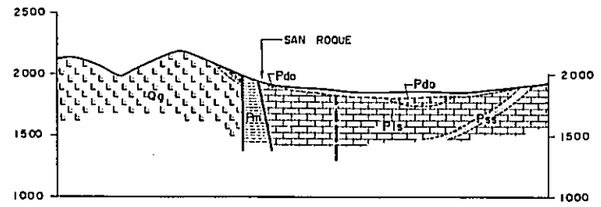
40	strike & dips
	suave dip & strike 0°~30°
	moderate dip & strike 31°~60°
	steep dip & strike 61°~89°
	vertical dip & strike
	geological boundary
	fault
	thrust fault
	anticlinal / synclinal folding axis
	basin structure
	dome structure

* by photo interpretation

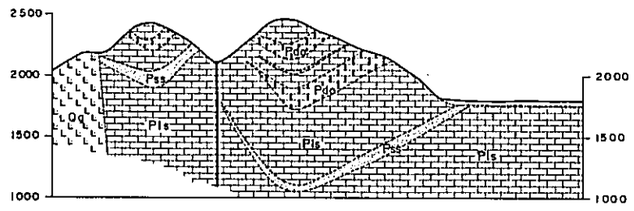
GOODYEAR

AERO SERVICE

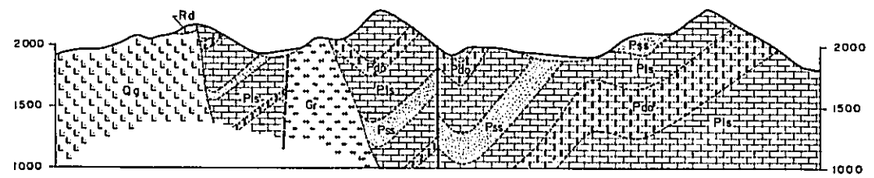
SECTION A – A'



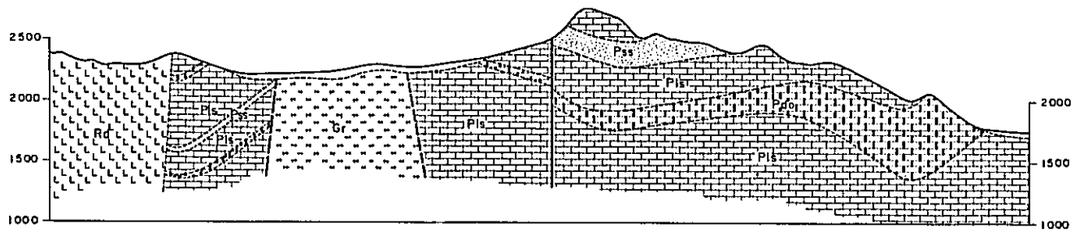
SECTION B – B'



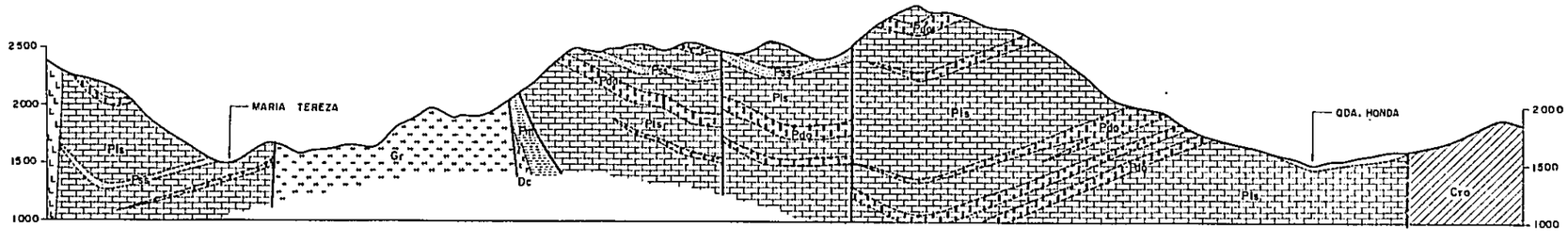
SECTION C – C'



SECTION D – D'



SECTION E – E'



SECTION F – F'

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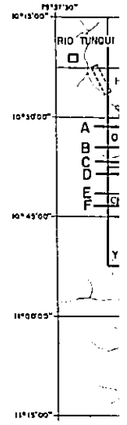


METAL MINING A
JAPAN INTERNATION
GOVERNMENT OF
FEB

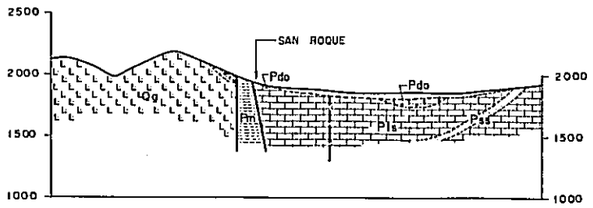
Prepared by MESCO, In

Scal

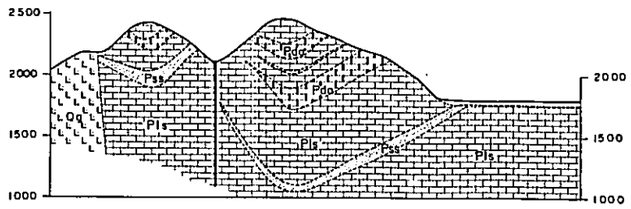
SED

IGNE

SECTION A – A'



SECTION B – B'



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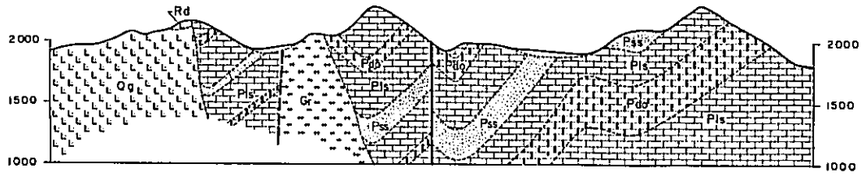

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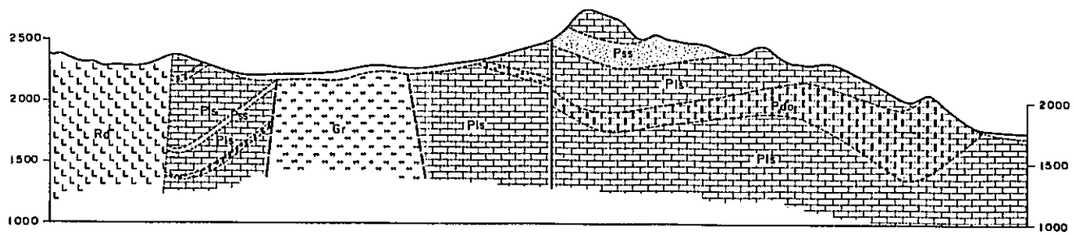
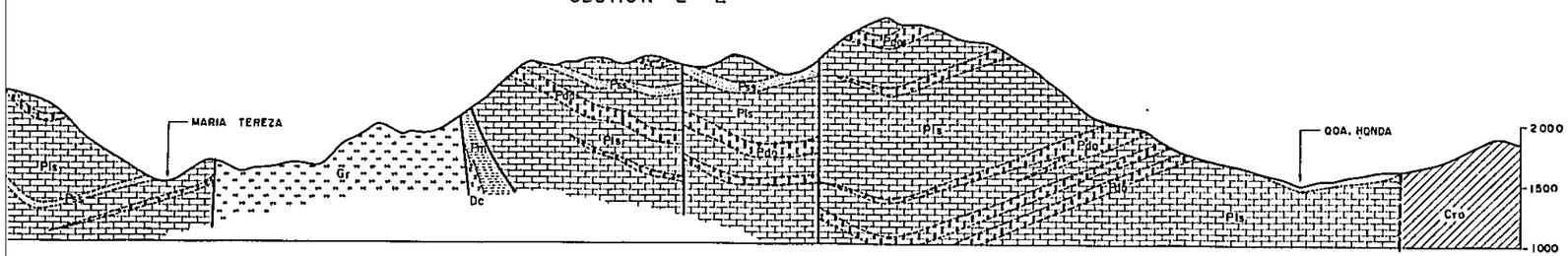


SECTION E – E'

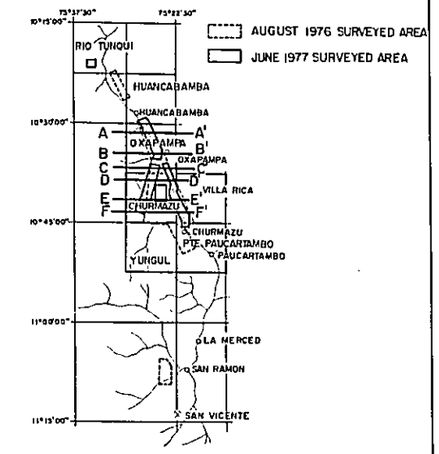


SECTION F – F'

PL. I-9

GEOLOGICAL SURVEY
OF
THE COROILLERA ORIENTAL CENTRAL PERU
(JUNE 1977)

GEOLOGICAL PROFILES OF THE DETAILED SURVEY AREA



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

FEBRUARY 1978

Prepared by MESCO, Inc.

Scale 1: 25,000

0 1 2Km

LEGEND

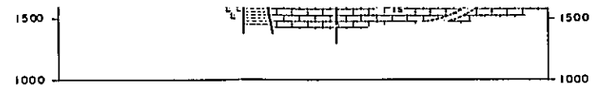
SEDIMENTARY

- Gravel & Sand — Quaternary
- Tm — Merced F. — Tertiary
- Cro — Chonta G. — Cretaceous
- Cro — Oriente G — Cretaceous
- Pls — Limestone, Dolomite, Sandstone — Pucara G. — Jurassic
- Pm — Mitu G. — Triassic

IGNEOUS

- Rd — Rhyolite & Dacite
- Qg — Quartz porphyry & Granite porphyry
- Gr — Granite
- Dc — Diorite complex

- fault — comfirmed / estimated
- geological boundary



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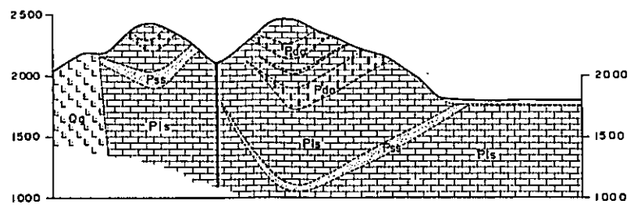

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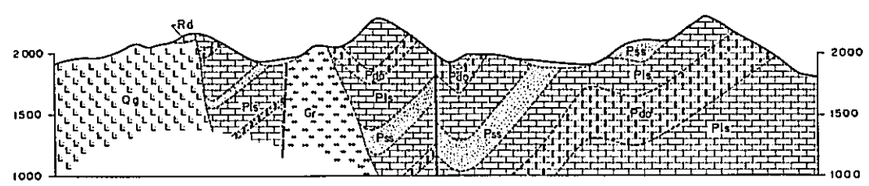

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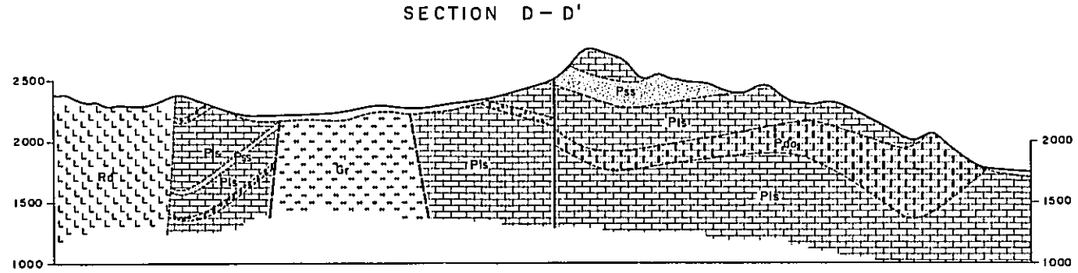
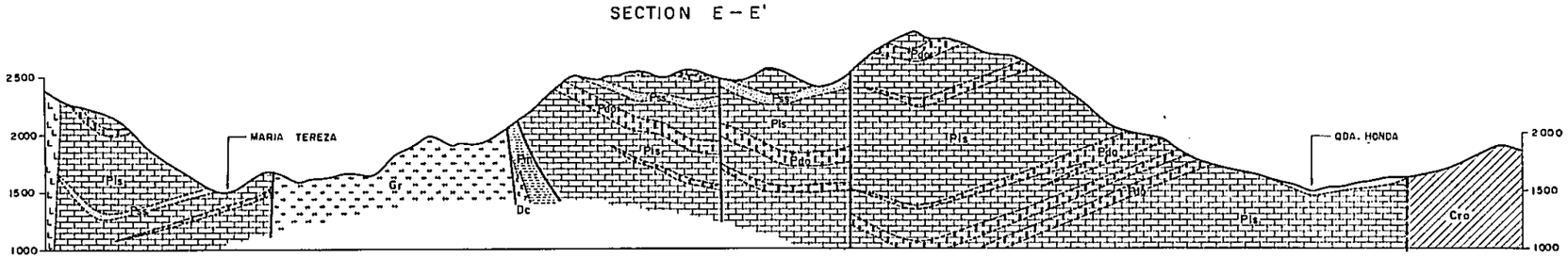
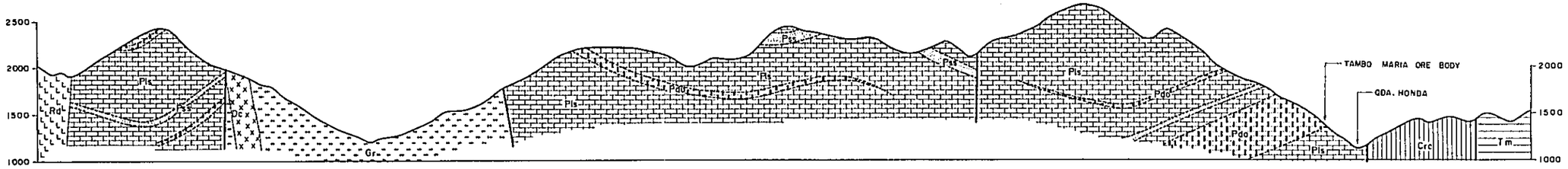


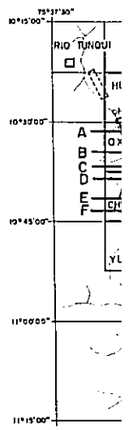
SECTION E – E'



SECTION F – F'



THE DETAILE



METAL MINING AC
JAPAN INTERNATION
GOVERNMENT OF J
FEB

Prepared by MESCO, In

Scal

0

SED

G

M

C

C

Cro

Pls
Pdo
Pss

Pm

M

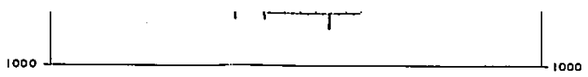
IGNE

Rd

C

G

D



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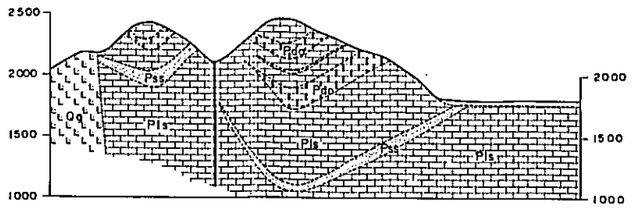
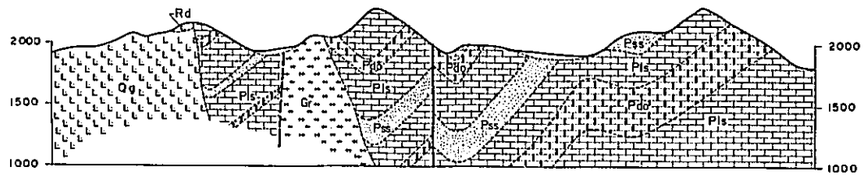
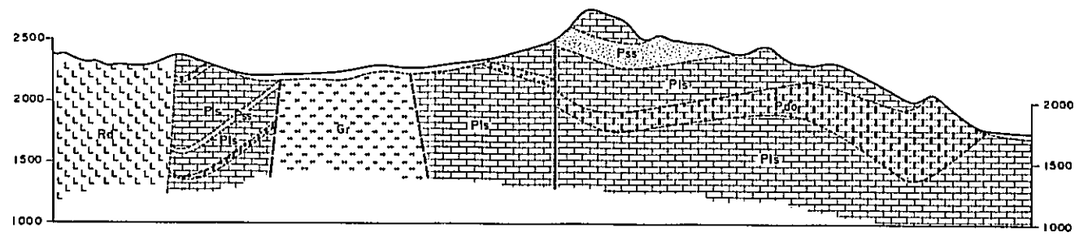


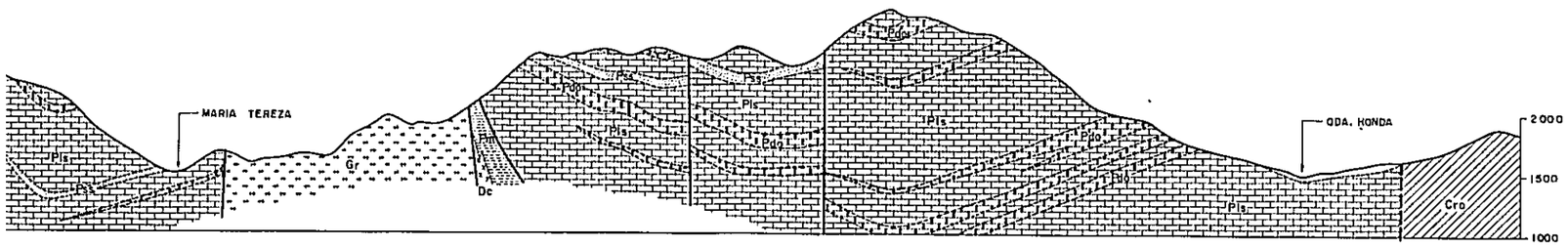
SECTION C – C'



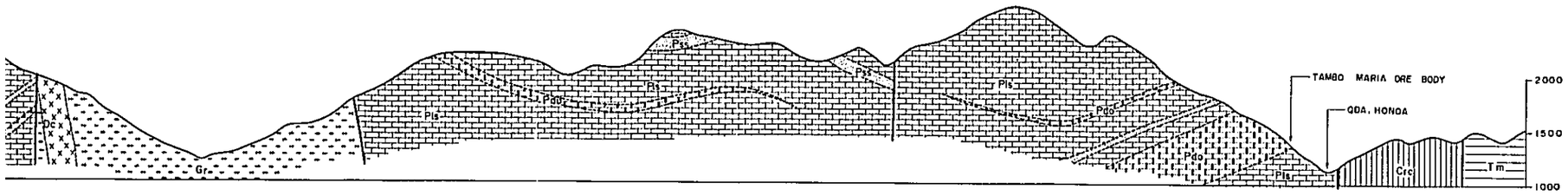
SECTION D – D'



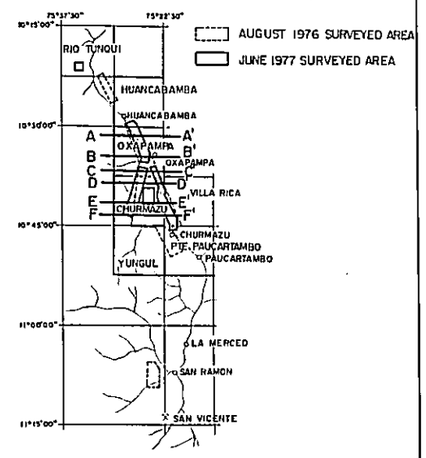
SECTION E – E'



SECTION F – F'



THE DETAILED SURVEY AREA



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

FEBRUARY 1978

Prepared by MESCO, Inc.

Scale 1: 25,000

0 2Km

LEGEND

SEDIMENTARY

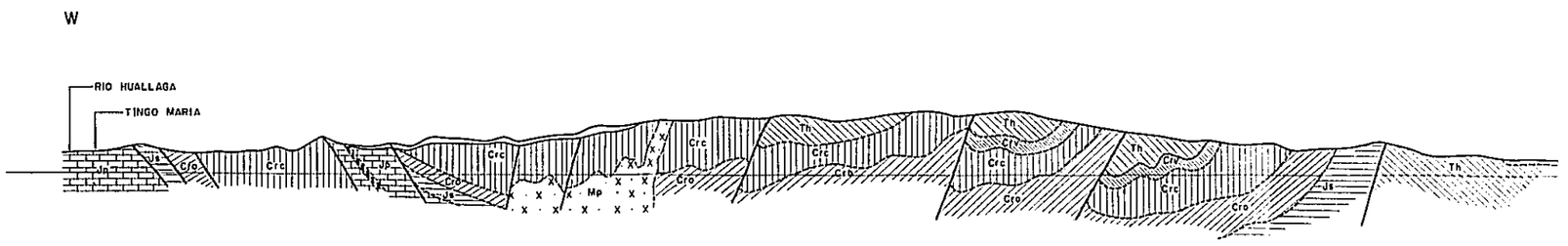
- Gravel & Sand — Quaternary
- Tm — Merced F. — Tertiary
- Crc — Chonta G. — Cretaceous
- Cro — Oriente G. — Cretaceous
- Pls / Pdo / Pss — Limestone, Dolomite, Sandstone — Pucara G. — Jurassic
- Pm — Mitu G. — Triassic

IGNEOUS

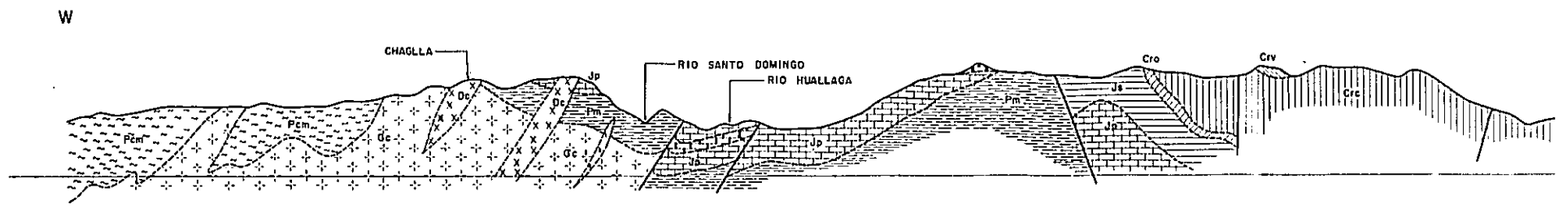
- Rd — Rhyolite & Dacite
- Qg — Quartz porphyry & Granite porphyry
- Gr — Granite
- Dc — Diorite complex

- fault — confirmed / estimated
- geological boundary

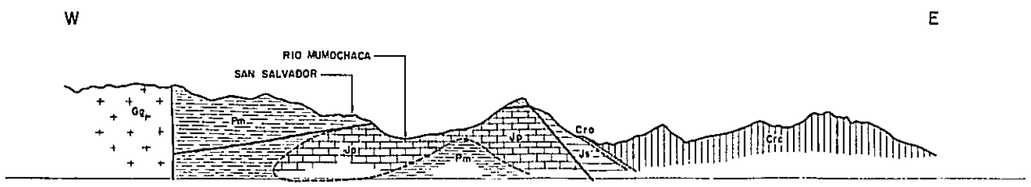
SECTION A – A'



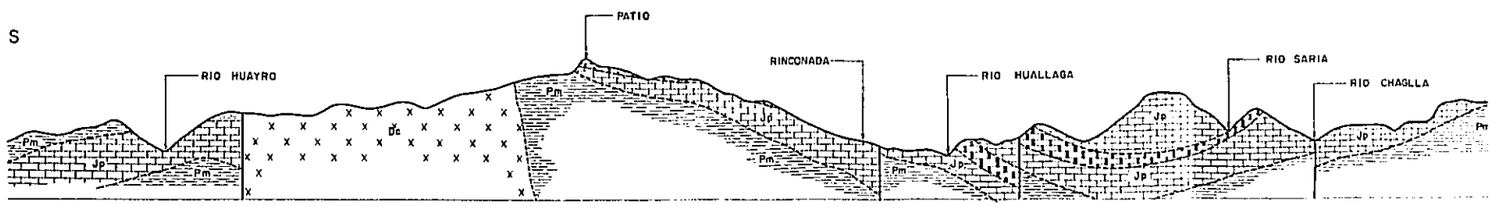
SECTION B – B'



SECTION C – C'



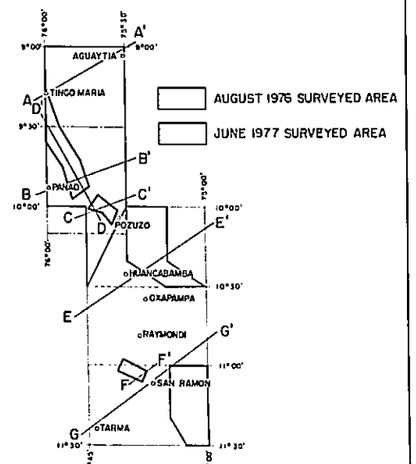
SECTION D – D'



SECTION E – E'

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU
(JUNE 1977)

GEOLOGICAL PROFILES OF THE RECONNAISSANCE AREA



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

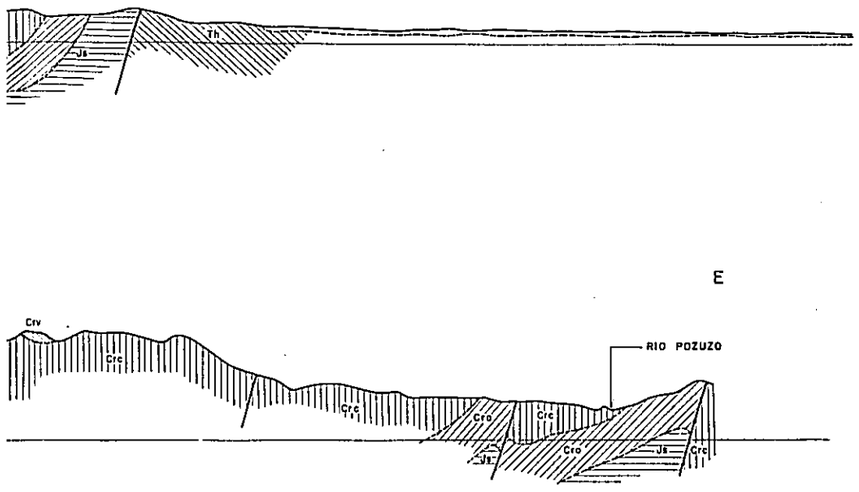
FEBRUARY 1978

prepared by MESCO, Inc.

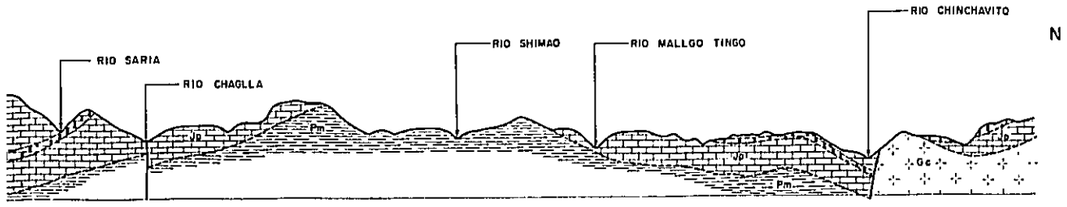
Scale 1 : 100,000

0 5 10Km

E



E



SECTION F – F'

LEGEND

SEDIMENTARY

	Gravel & sand	Quaternary
Tm	Merced F.	Tertiary
Tcu	Contamana G. (UPPER)	Tertiary
Tcl	" " (LOWER)	Tertiary
Th	Huayabamba G.	Tertiary
Civ	Vivian F.	Cretaceous
Cre	Chonta G.	Cretaceous
Cro	Oriente G.	Cretaceous
Js	Sarayaquillo F.	Jurassic
Jp	Pucara G. (Dolomite)	Triassic
Pm	Mitu G.	Permian
Pel	Copacabana & Tarma G.	Carboniferous
Ca	Ambo G.	Carboniferous
Da	Excelcior G.	Devonian

METAMORPHIC

Pcm	Schist / Gneiss	Precambrian

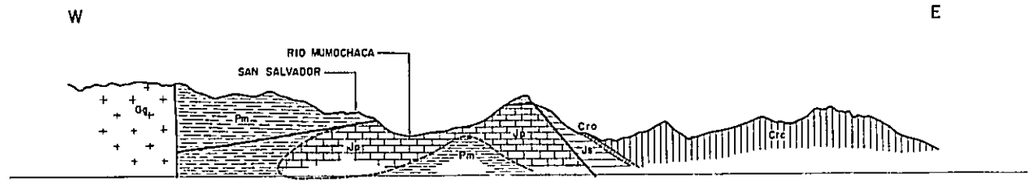
IGNEOUS

Vb	Volcanic breccia
Mp	Monzonite porphyry
Rd	Rhyolite & Dacite
Qp	Quartz porphyry & Granite porphyry
Gr	Granite
Dc	Diorite complex
Gd	Granite & Granodiorite
Gc	Granodiorite complex (altered)

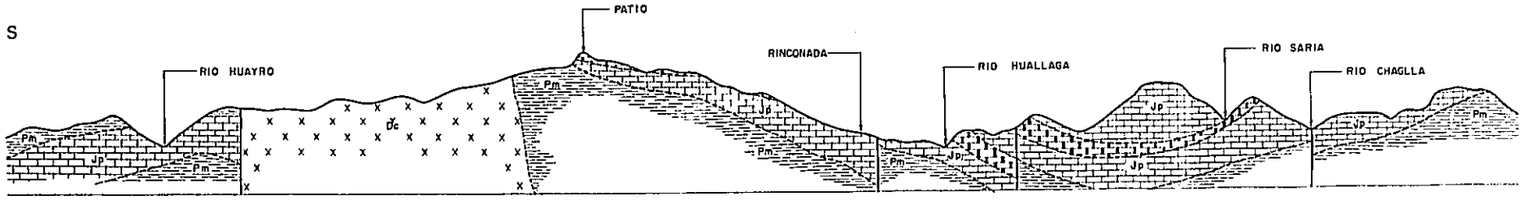
geological boundary

fault

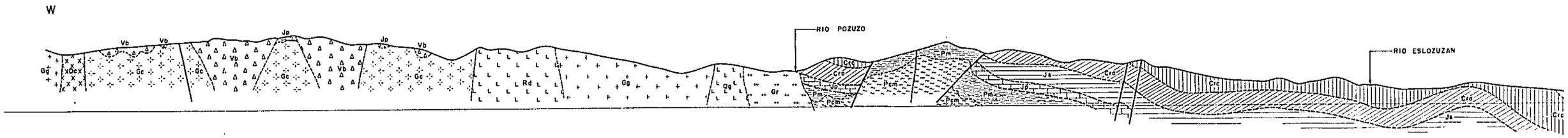
SECTION C – C'



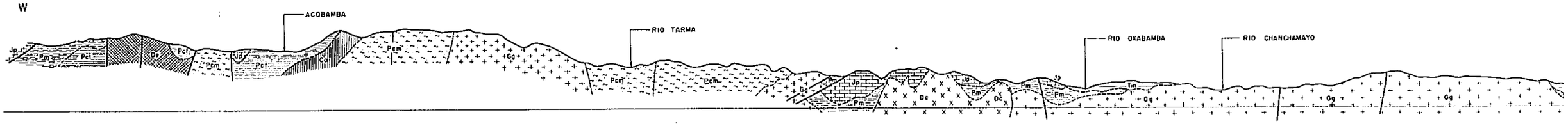
SECTION D – D'



SECTION E – E'



SECTION G – G'



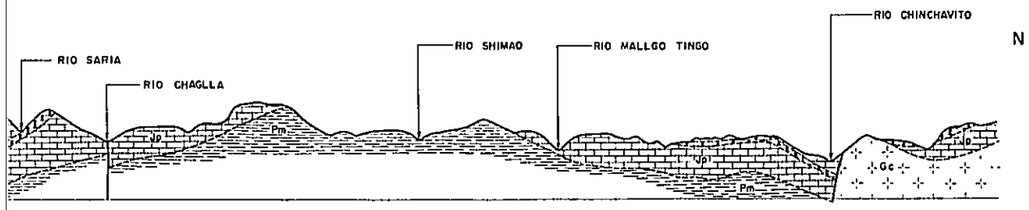
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, Inc.

Scale 1 : 100,000

0 5 10Km

E

RIO SARIA
RIO CHAGLLA
RIO SHIMAO
RIO MALLGO TINGO
RIO CHINCHAVITO
N



LEGEND

SEDIMENTARY

- Gravel & sand — Quaternary
- Tm — Marcel F. — Tertiary
- Tcu — Contamana G. (UPPER) — Tertiary
- Tcl — " " (LOWER) — Tertiary
- Th — Huayabamba G. — Tertiary
- Cri — Vivian F. — Cretaceous
- Crc — Chonta G. — Cretaceous
- Cro — Oriente G. — Cretaceous
- Js — Sarayaquillo F. — Jurassic
- Jp — Pucara G. (Dolomite) — Triassic
- Pm — Mitu G. — Permian
- Pcl — Copacabana & Tarma G. — Carboniferous
- Ca — Ambo G. — Carboniferous
- D — Excelsior G. — Devonian

METAMORPHIC

- Pcm — Schist / Gneiss — Precambrian

IGNEOUS

- Vb — Volcanic breccia
- Mp — Monzonite porphyry
- Rd — Rhyolite & Dacite
- Qd — Quartz porphyry & Granite porphyry
- Gr — Granite
- Dc — Diorite complex
- Gd — Granite & Granodiorite
- Gc — Granodiorite complex (altered)

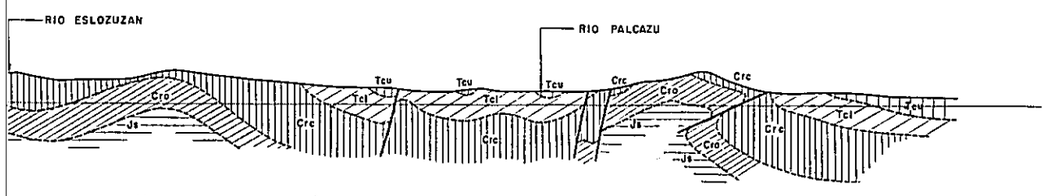
geological boundary

fault

SECTION F — F'

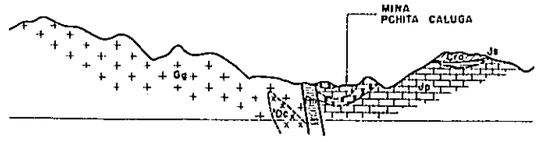
E

RIO ESLOZUZAN
RIO PALCAZU



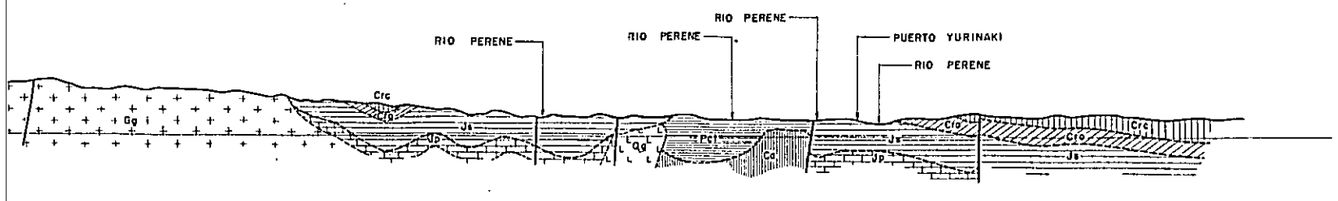
W E

MINA PCHITA CALUGA



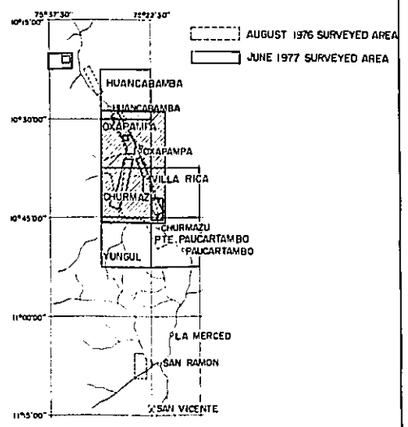
E

RIO PERENE
RIO PERENE
RIO PERENE
PUERTO YURINAKI
RIO PERENE



GEOLOGICAL SURVEY OF THE CORDILLERA ORIENTAL CENTRAL PERU (JUNE 1977)

GEOCHEMICAL MAP OF THE DETAILED SURVEY AREA (ROCKS)

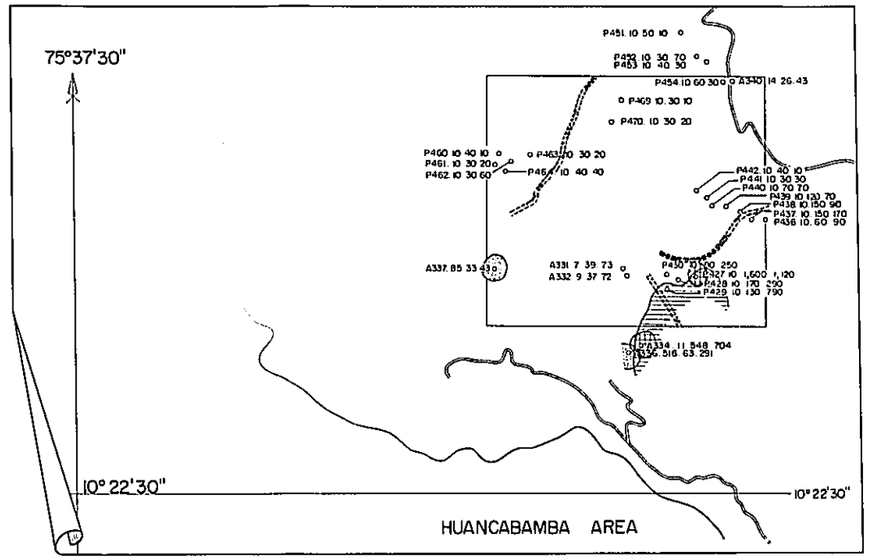


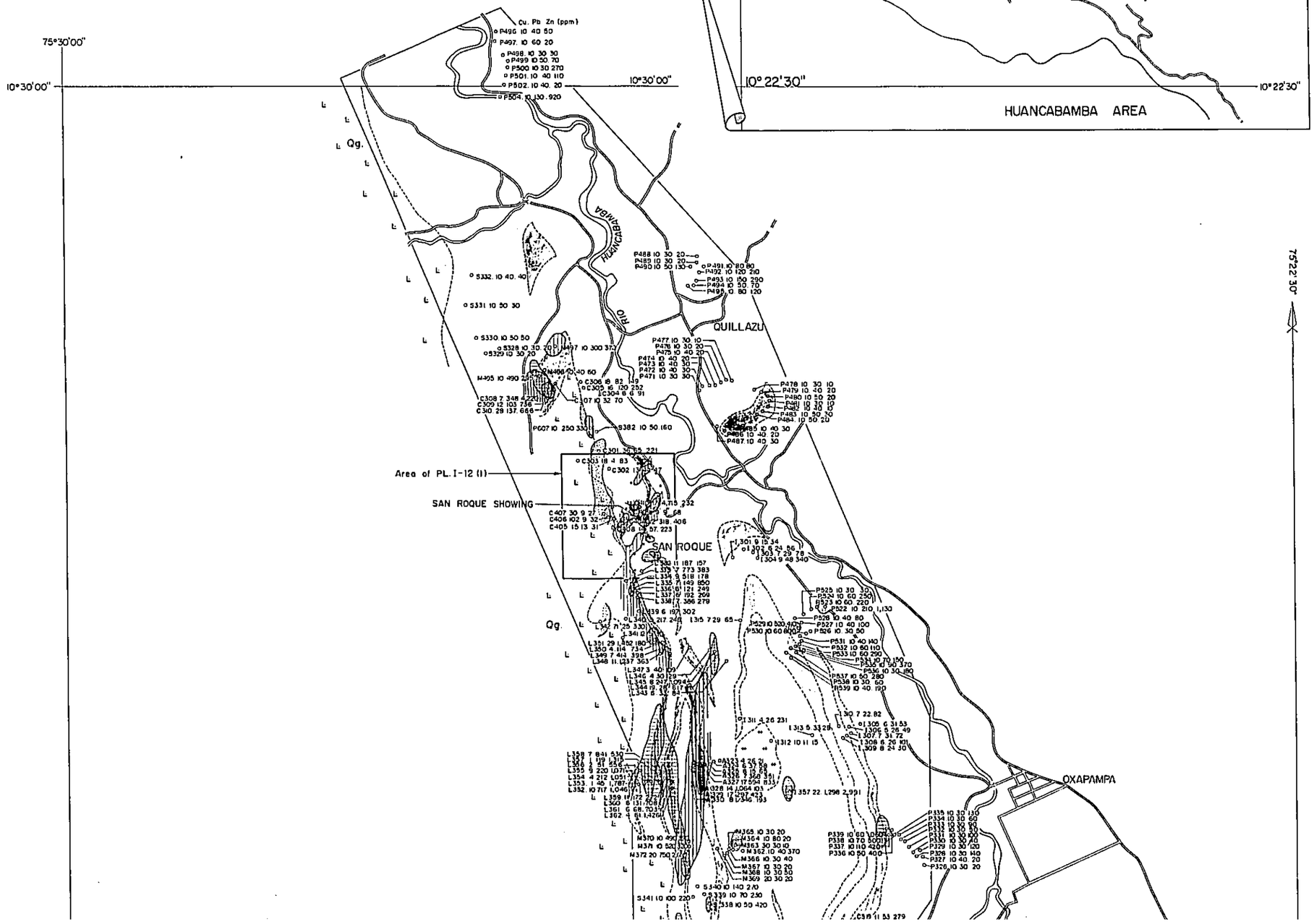
METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978

prepared by MESCO, Inc.

Scale 1 : 25,000

0 1 2 Km





LEGEND

- Dolomite
- Monzonite Porphyry
- Rhyolite & Dacite
- Quartz porphyry & Granite Porphyry
- Granite
- Diorite complex
- Locality of Rock Sample
- A301 5 35 96 Number of Rock Sample & Geochemical Analysis [Cu (ppm), Pb (ppm), Zn (ppm)]
- Gallery
- Road
- River & stream
- June 1977 Surveyed Area
- Specially Detailed Survey Area
- Geochemical anomaly (rocks)
- Cu > 22 ppm (M + 1.5S)
- Pb > 194 ppm (M + 1.5S)

Area of PL. I-12 (I)

SAN ROQUE SHOWING

SAN ROQUE

Qg.

OXAPAMPA

RIO CHONTABAMBA

CHONTABAMBA

Qg.

Qg.

Rd.

Gr.

10°37'30"

10°37'30"

GEOCHEMICAL ASSAY MAP of THE OLD GALLERY

100M

Mp Monzonite Porphyry

Rd Rhyolite & Dacite

Qg Quartz porphyry & Granite Porphyry

Gr Granite

Dc Diorite complex

Locality of Rock Sample

A301. 5. 35.96 Number of Rock Sample & Geochemical Analysis
[Cu (ppm), Pb (ppm), Zn (ppm)]

Gallery

Road

River & stream

June 1977 Surveyed Area

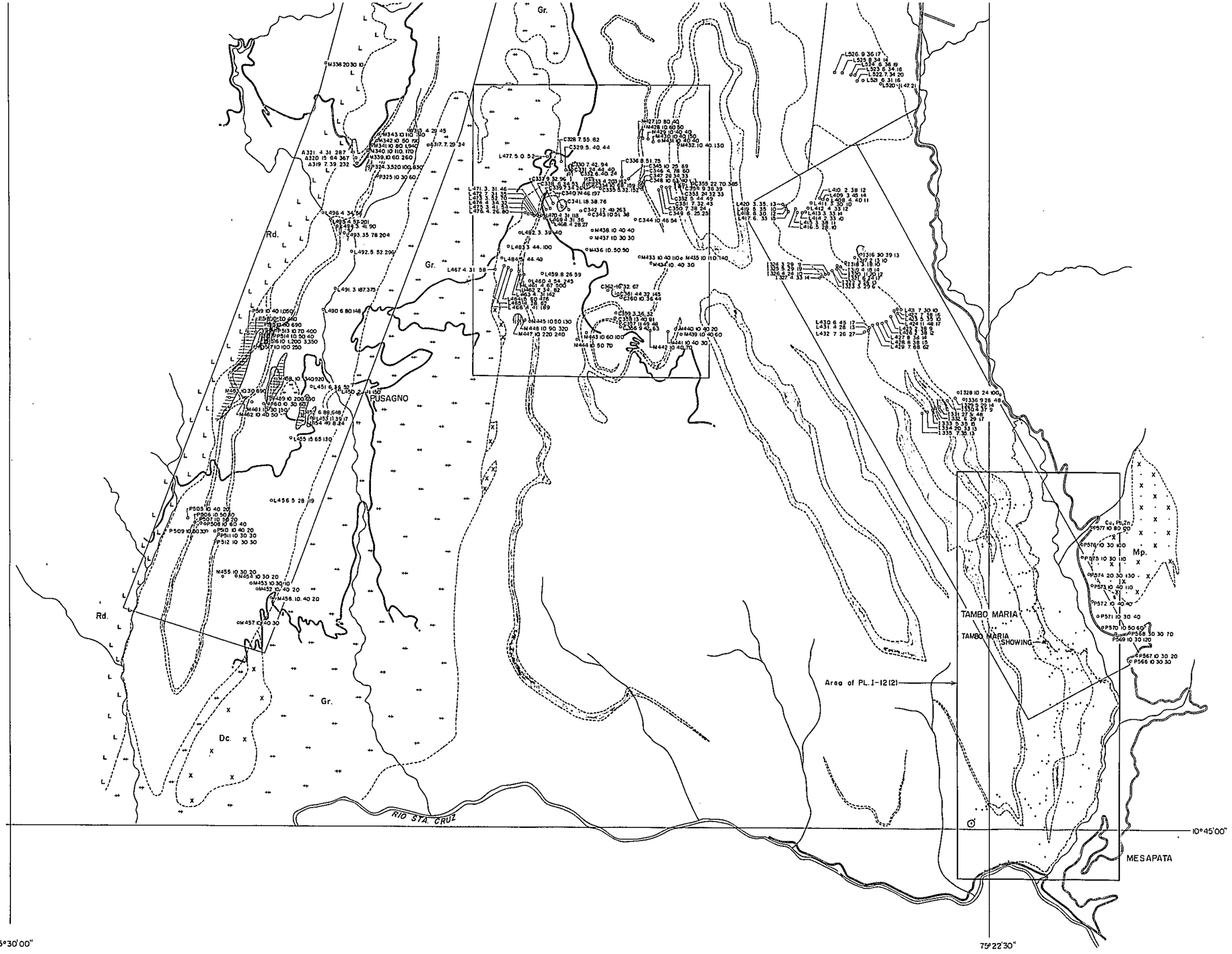
Specialty Detailed Survey Area

Geochemical anomaly (rocks)

Cu > 22 ppm (M + 1.5S)

Pb > 194 ppm (M + 1.5S)

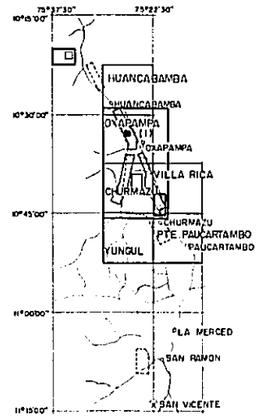
Zn > 412 ppm (M + 1.5S)


Gr.
Rd.
Gr.
FUSAGNO
Rd.
Gr.
Dc.
RIO STA. CRUZ
Area of PL. I-12 (2)
TAMBO MARIA
TAMBO MARIA SHOWING
Mp.
MESAPATA
Cu, Pb, Zn
10°45'00"
75°30'00"
75°22'30"

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL
(JUNE 1977)

GEOCHEMICAL ASSAY MAP
OF
THE SPECIALLY DETAILED SURVEY AREA

(1) SAN ROQUE



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978

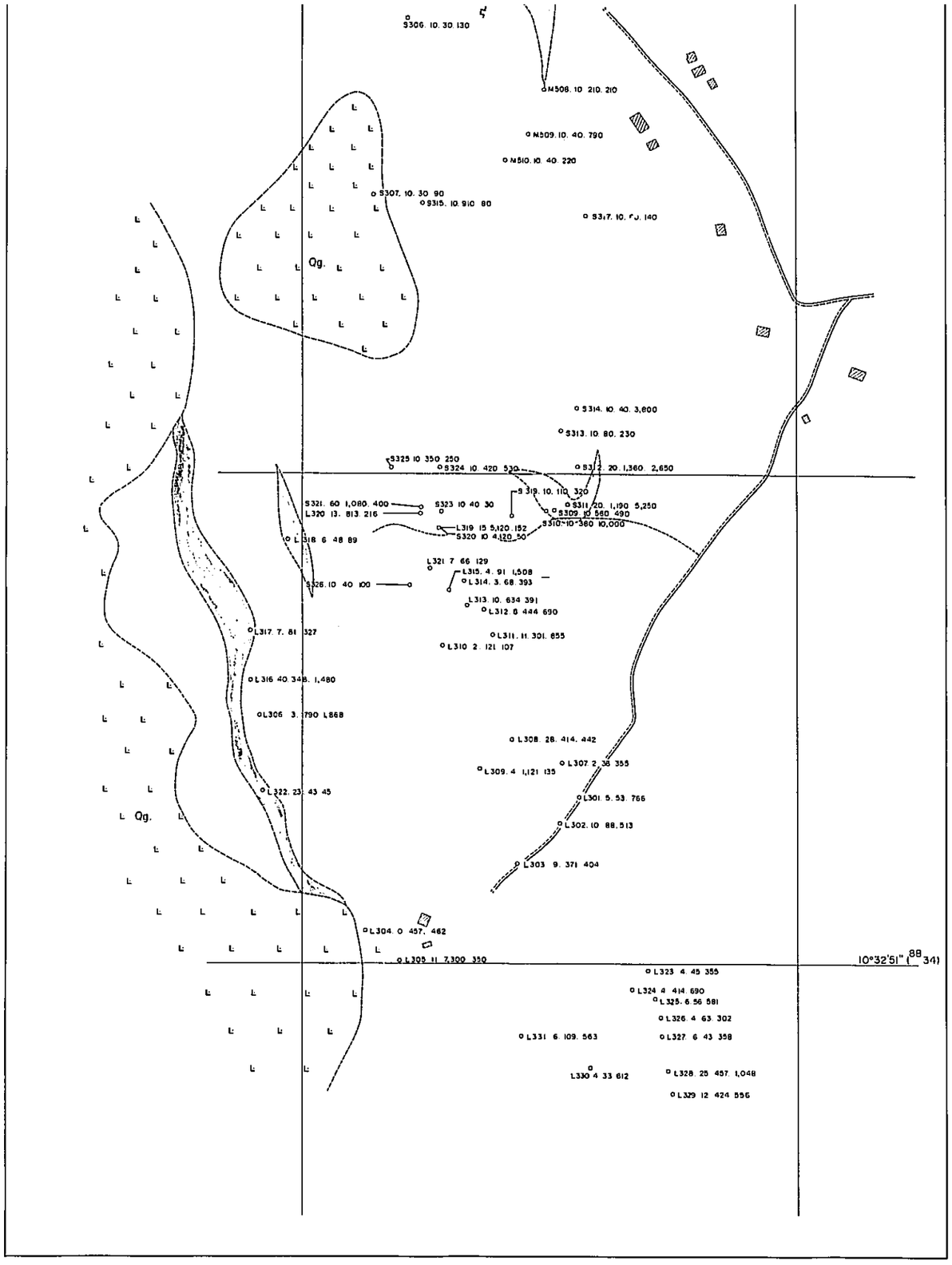
prepared by MESCO, Inc.

Scale 1 : 2,500

0 100 200M

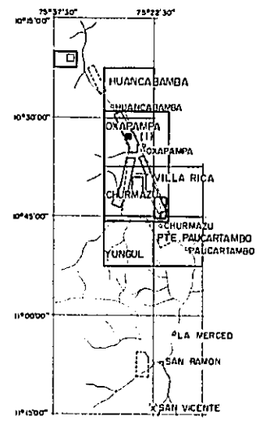
LEGEND

- Dolomite
- Quartz porphyry & Granite porphyry
- Locality of Rock Sample
- S301. 10. 75. 530 Number & Geochemical Analysis [Cu (ppm), Pb (ppm), Zn (ppm)]



THE SPECIALLY DETAILED SURVEY AREA

(1) SAN ROQUE



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978

prepared by MESCO, Inc

Scale 1 : 2,500

0 100 200M

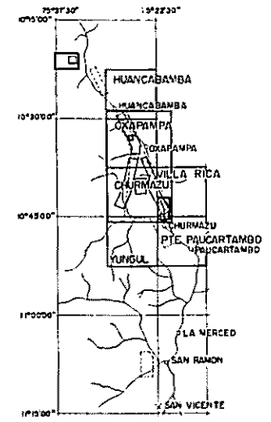
LEGEND

- Dolomite
- Qg. Quartz porphyry & Granite porphyry
- Locality of Rock Sample
- S301. 10. 75. 530 Number & Geochemical Analysis [Cu (ppm), Pb (ppm), Zn (ppm)]

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU
(JUNE 1977)

GEOCHEMICAL ASSAY MAPS OF THE SPECIALLY DETAILED SURVEY AREA

(2) TAMBO MARIA

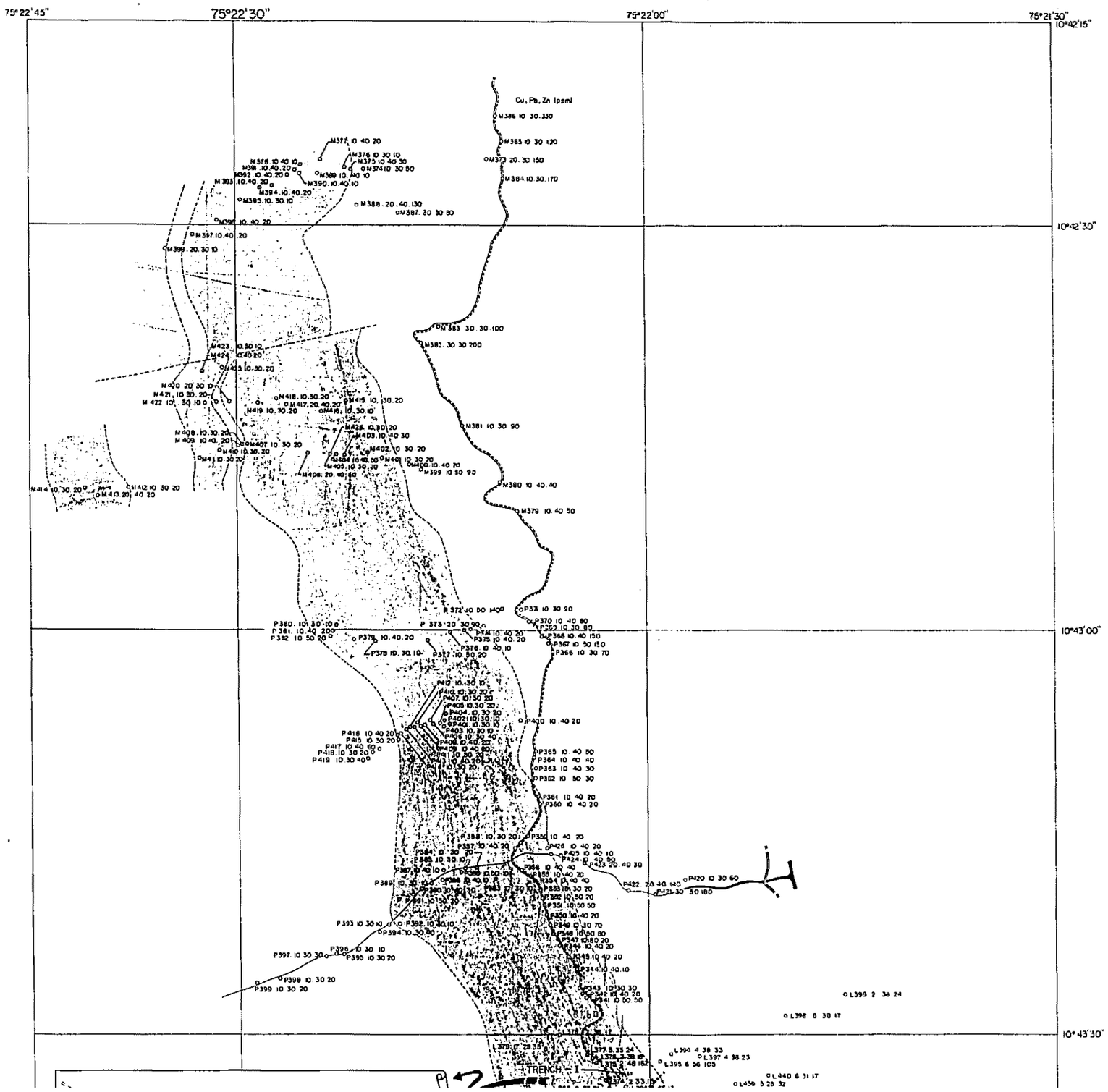


METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978

prepared by MESCO, Inc.

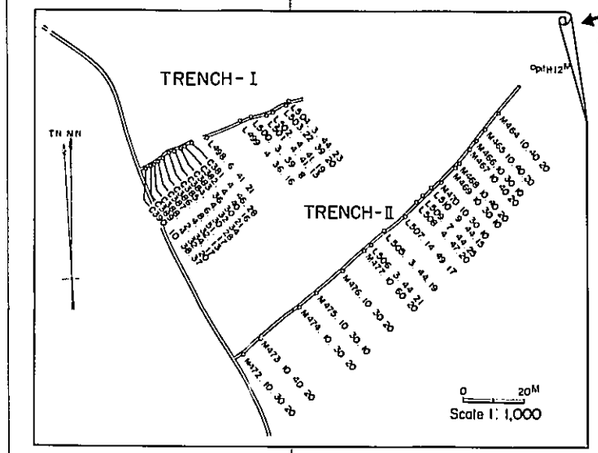
Scale 1 : 5,000

0 100 200 300 400 M



LEGEND

- Dolomite
- Locality of Rock Sample
- L399. 2 38 24 — Number of Rock Sample & Geochemical Analysis [Cu (ppm), Pb(ppm), Zn (ppm)]
- Road
- River



Dolomite

Locality of Rock Sample

L399. 2. 38 24 Number of Rock Sample & Geochemical Analysis
[Cu (ppm), Pb(ppm), Zn (ppm)]

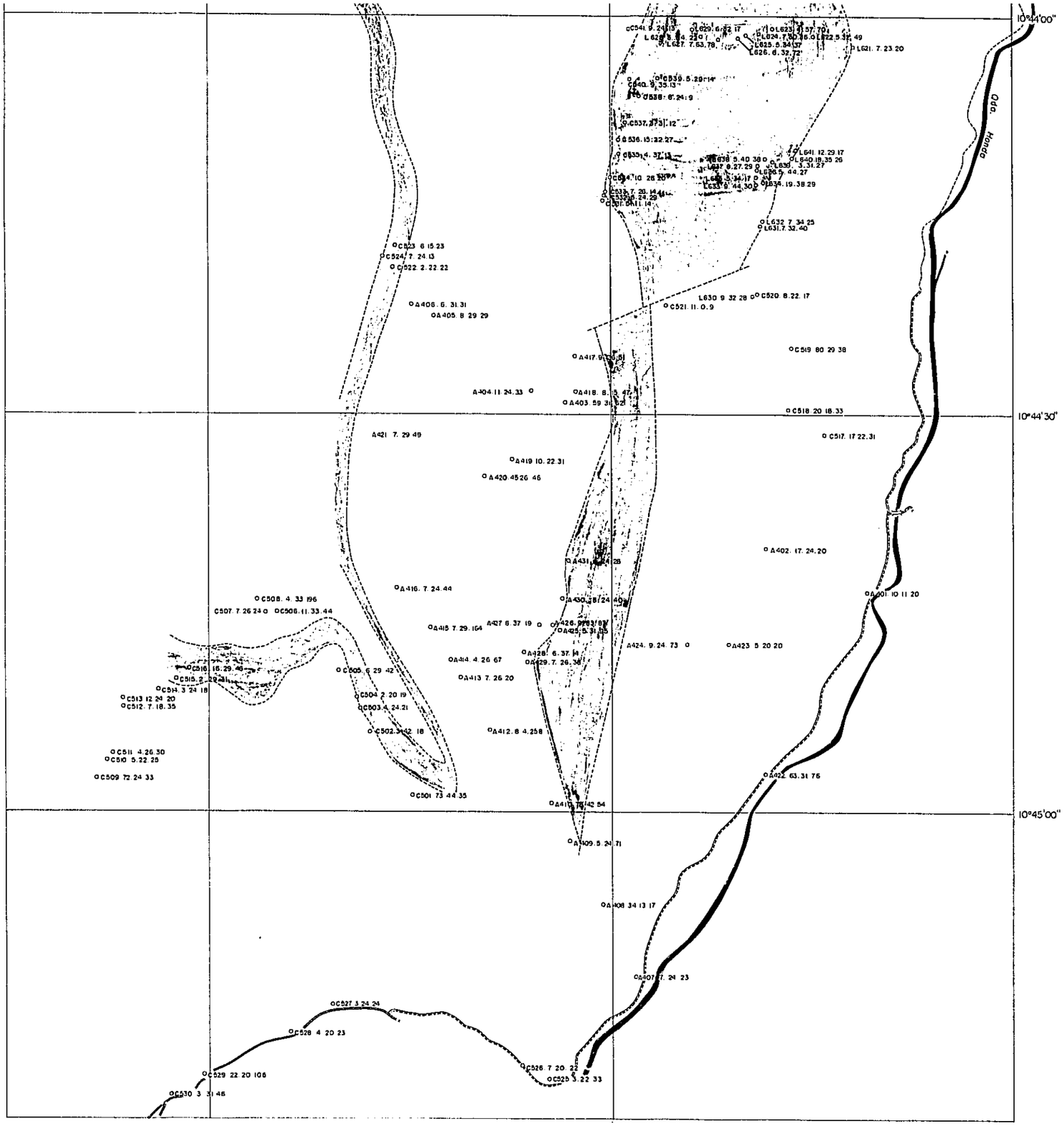
Road

River

10°43'30"

10°44'00"

10°44'30"


10°44'00"
10°44'30"
10°45'00"
HORDA
C541. 9. 24.13
L623. 8. 37. 101
L624. 7. 30. 16. 0
L622. 5. 32. 49
L625. 5. 34. 37
L626. 6. 32. 72
L621. 7. 23. 20
C540. 9. 35. 13
C539. 5. 29. 14
C538. 6. 24. 9
C537. 5. 3. 12
C536. 15. 22. 27
C535. 14. 37. 13
L638. 5. 40. 38. 0
L641. 12. 29. 17
L640. 18. 35. 26
L637. 8. 27. 29
L639. 3. 31. 27
L636. 5. 44. 27
C534. 10. 28. 33. 0
L635. 5. 34. 17. 0
L633. 9. 44. 30. 0
C533. 7. 20. 14. 41
C532. 6. 24. 29
C531. 9. 11. 14
C534. 19. 38. 29
L632. 7. 34. 25
L631. 7. 32. 40
C523. 6. 15. 23
C524. 7. 24. 13
C522. 2. 22. 22
A406. 6. 31. 31
A405. 8. 29. 29
L630. 9. 32. 28
C520. 8. 22. 17
C521. 11. 0. 9
C519. 80. 29. 38
A417. 9. 30. 51
A404. 11. 24. 33
A418. 8. 5. 47. 1
A403. 59. 31. 52
C518. 20. 18. 33
A421. 7. 29. 49
C517. 17. 22. 31
A419. 10. 22. 31
A420. 45. 26. 46
A402. 17. 24. 20
A431. 4. 28
A416. 7. 24. 44
C508. 4. 33. 196
C507. 7. 26. 24. 0
C506. 11. 33. 44
A430. 28. 24. 40
A401. 10. 11. 20
A415. 7. 29. 164
A427. 6. 37. 19. 0
A426. 9. 28. 37. 69
A425. 5. 31. 35
A424. 9. 24. 73. 0
A423. 5. 20. 20
C516. 16. 29. 46
C515. 2. 29. 31
C505. 6. 29. 42
C504. 2. 20. 19
C514. 3. 24. 18
C513. 12. 24. 20
C512. 7. 18. 35
C503. 4. 24. 21
C502. 3. 42. 18
A414. 4. 26. 67
A428. 6. 37. 14
A429. 7. 26. 38
A413. 7. 26. 20
A412. 8. 4. 258
C511. 4. 26. 30
C510. 5. 22. 25
C509. 72. 24. 33
C501. 73. 44. 35
A422. 63. 31. 75
A410. 78. 42. 84
A409. 5. 24. 71
A408. 34. 13. 17
A407. 7. 24. 23
C527. 3. 24. 24
C528. 4. 20. 23
C529. 22. 20. 106
C530. 3. 31. 46
C526. 7. 20. 22
C525. 3. 22. 33

JUNIN 1:25,000

CHURMAZU

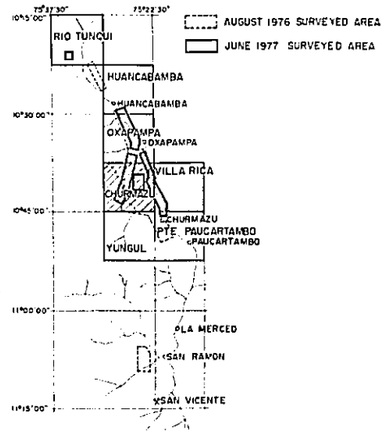
HOJA 22M-IV-SO

PL. I-13.(1)

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU
(JUNE 1977)

GEOCHEMICAL MAP
OF
THE DETAILED SURVEY AREA (Cu)

(ADDICIONALLY COLLECTED AREA ON SOIL IN 1976)



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

FEBRUARY 1978

prepared by MESCO, Inc.

Scale 1: 25,000

0 1 2 Km

Pusaguno

LEGEND

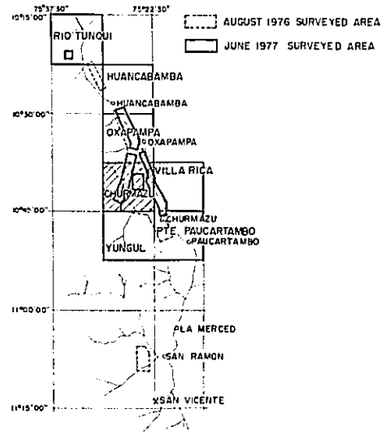
SOILS

140 PPM

70 PPM

30 PPM

OF
THE DETAILED SURVEY AREA (Cu)
(ADDICIONALLY COLLECTED AREA ON SOIL IN 1976)



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

FEBRUARY 1978

prepared by MESCO, Inc.

Scale 1 : 25,000

0 1 2 Km

LEGEND

SOILS

140 PPM

70 PPM

30 PPM

Pusaguno

RIO STA CRUZ

JUNIN 1:25,000

CHURMAZU

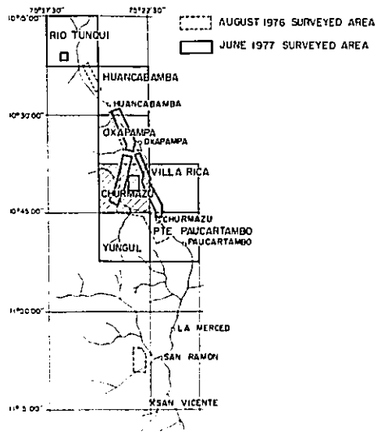
HOJA 22M-IV-SO

PL. I-13.(2)

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU
(JUNE 1977)

GEOCHEMICAL MAP
OF
THE DETAILED SURVEY AREA (Pb)

(ADDICIONALLY COLLECTED AREA ON SOIL IN 1976)



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

FEBRUARY 1978

prepared by MESCO, Inc.

Scale 1: 25,000

0 1 2 Km

LEGEND

SOILS

900 PPM

450 PPM

120 PPM

Pusaguno - A Anomaly

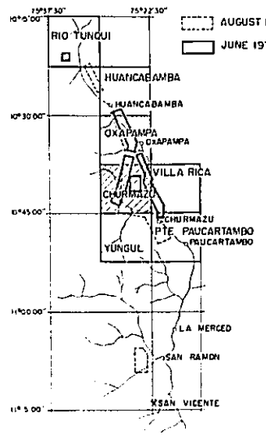
Pusaguno

Pusaguno-B Anomaly

RIO STA CRUZ

OF THE DETAILED SURVEY AREA (Pb)

(ADDICIONALLY COLLECTED AREA ON SOIL IN 1976)



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

FEBRUARY 1978

prepared by MESCO, Inc

Scale 1 : 25,000

0 1 2 Km

LEGEND

SOILS

- 900 PPM
- 450 PPM
- 120 PPM

JUNIN 1:25,000

CHURMAZU

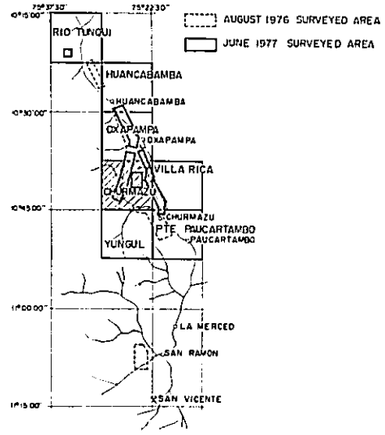
HOJA 22M-IV-SO

PL. I-13.(3)

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU
(JUNE 1977)

GEOCHEMICAL MAP
OF
THE DETAILED SURVEY AREA (Zn)

(ADDICIONALLY COLLECTED AREA ON SOIL IN 1976)



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

FEBRUARY 1978

prepared by MESCO, Inc.

Scale 1 : 25,000

0 2 Km

LEGEND

SOILS

- 4,000 PPM
- 2,000 PPM
- 1,000 PPM
- 400 PPM

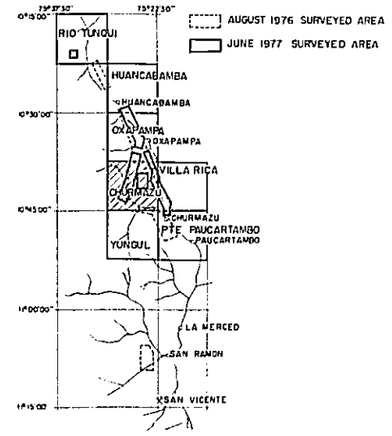
Pusaguno-A Anomaly

Pusaguno

Pusaguno-B Anomaly

RIO STA CRUZ

OF
THE DETAILED SURVEY AREA (Zn)
(ADDICIONALLY COLLECTED AREA ON SOIL IN 1976)



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, Inc.

Scale 1 : 25,000
0 2 Km

LEGEND

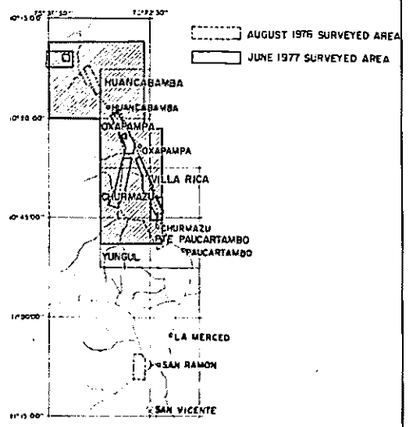
SOILS

4,000 PPM
2,000 PPM
1,000 PPM
400 PPM

PL. I - 4

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU
(JUNE 1977)

CORRELATION MAP BETWEEN THE MINERALIZED ZONE, GEOCHEMICAL ANOMALY AND GEOLOGICAL STRUCTURE OF THE DETAILED SURVEY AREA

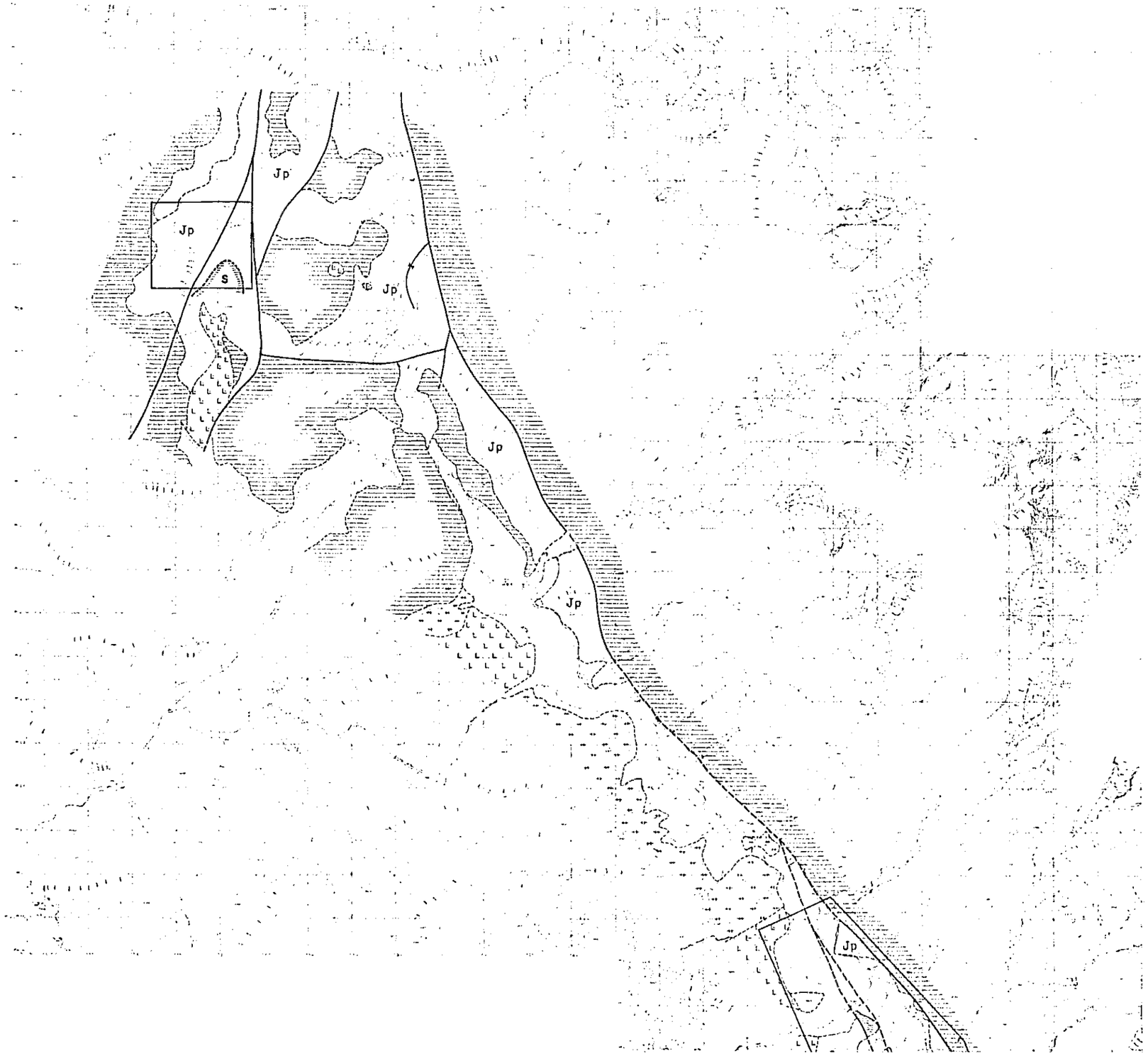


METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978

prepared by MESCO, Inc.

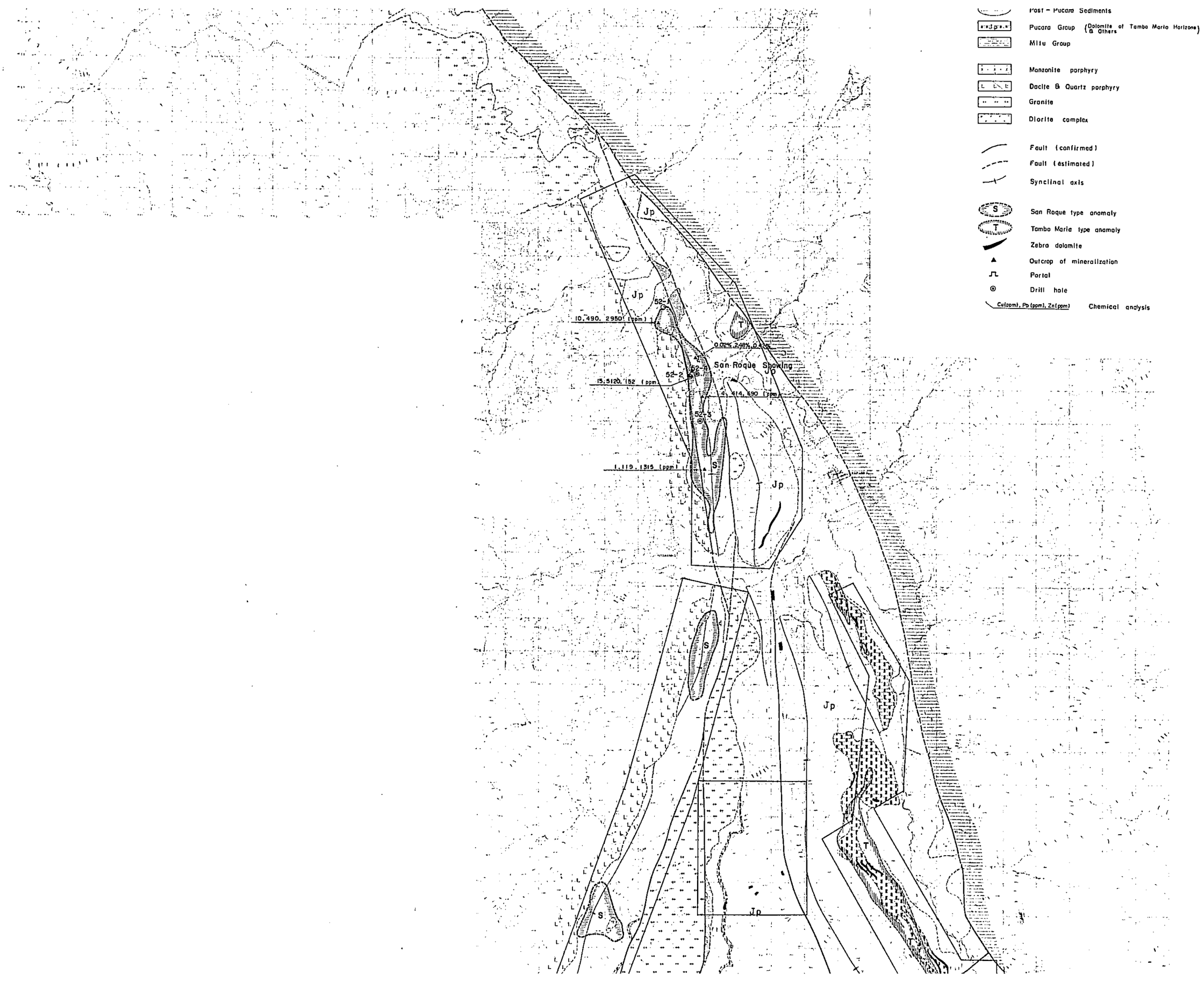
Scale 1 : 50,000

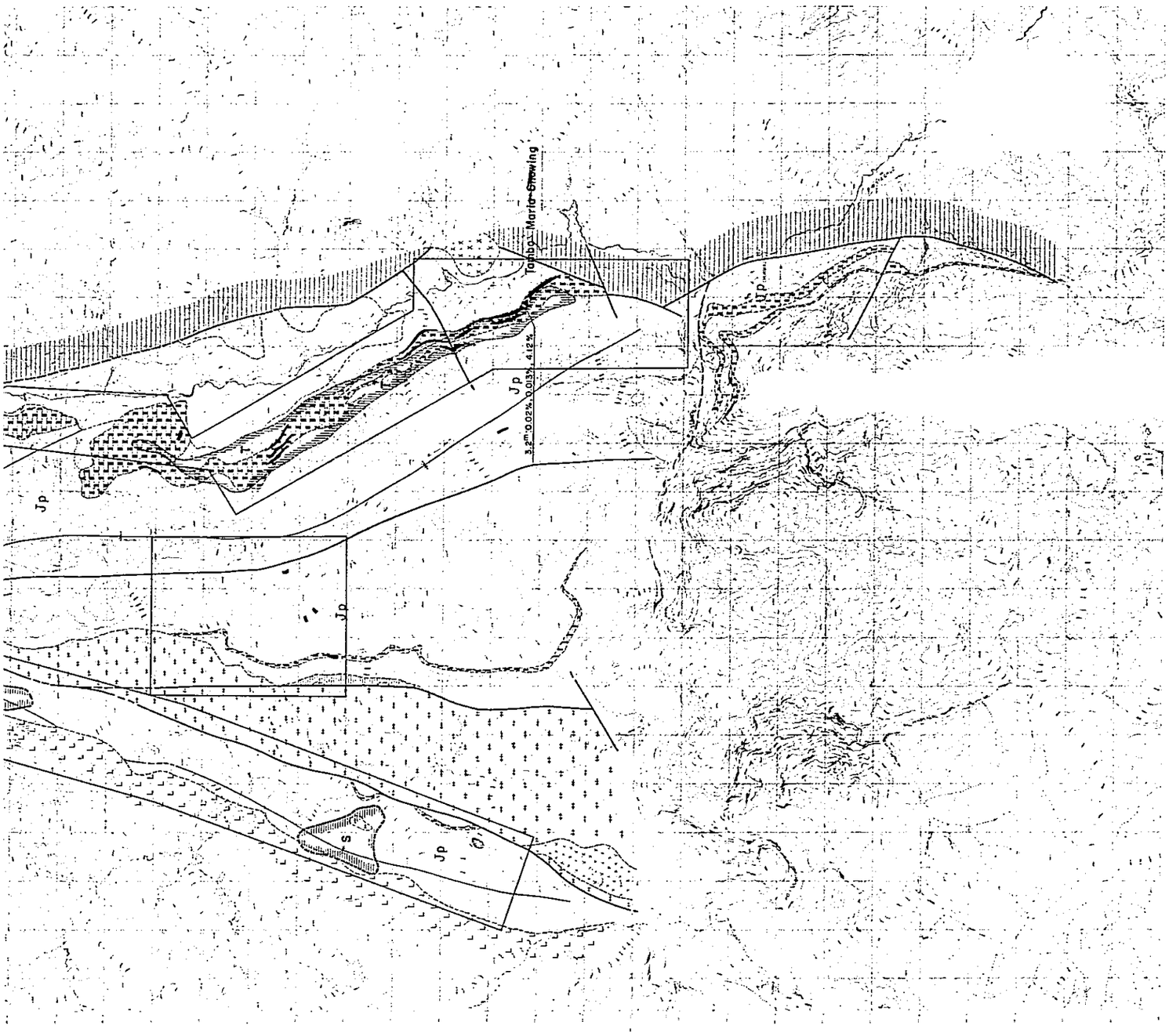
0 5Km



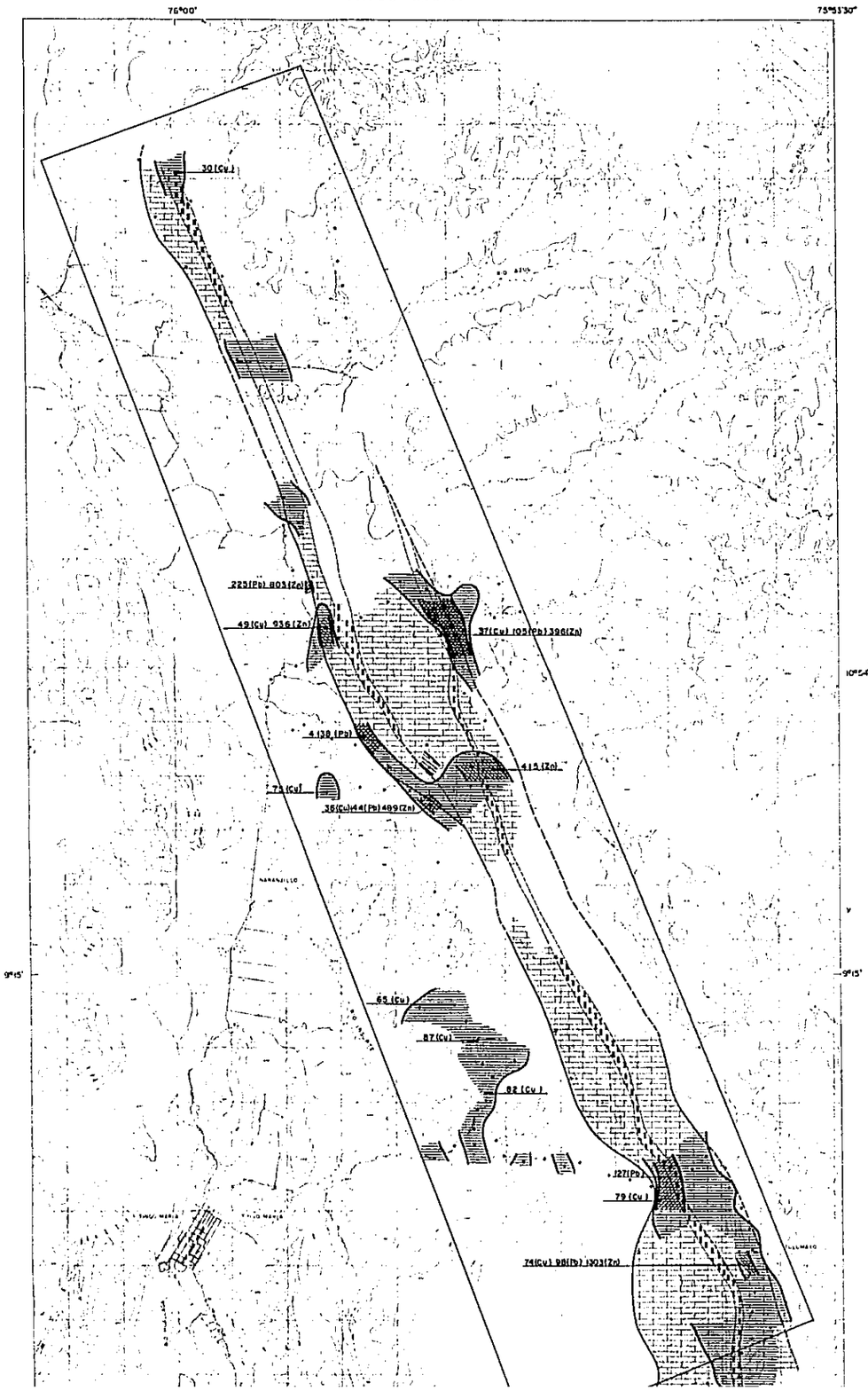
LEGEND

- Post – Pucara Sediments
- Pucara Group (Dolomite of Tambo Maria Horizone & Others)
- Mitu Group
- Monzonite porphyry
- Dacite & Quartz porphyry
- Granite
- Diorite complex
- Fault (confirmed)
- Fault (estimated)
- Synclinal axis
- San Roque type anomaly
- Tambo Maria type anomaly
- Zebra dolomite
- Outcrop of mineralization
- Portal
- Drill hole

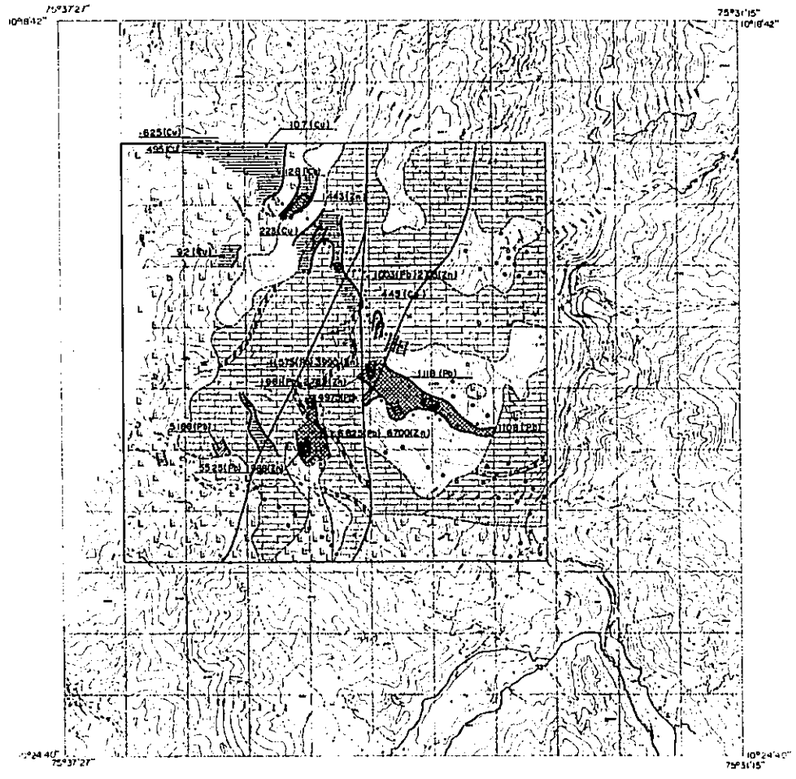

Post – Pucara Sediments
Pucara Group (Dolomite of Tambo Maria Horizone & Others)
Mitu Group
Manzonite porphyry
Dacite & Quartz porphyry
Granite
Diorite complex
Fault (confirmed)
Fault (estimated)
Synclinal axis
San Roque type anomaly
Tambo Maria type anomaly
Zebra dolomite
Outcrop of mineralization
Portal
Drill hole
Cu(ppm), Pb(ppm), Zn(ppm) Chemical analysis
Jp
S
T
52-1
52-2
52-3
10,490, 2950 (ppm)
15,5120, 152 (ppm)
1,119, 1315 (ppm)
4, 414, 690 (ppm)
San Roque Showing


Tondo-Marita-Gmewing
Jp
Jp
Jp
Jp
Jp
Jp
S
Q
3.2m 0.02% 0.013% 4.12%

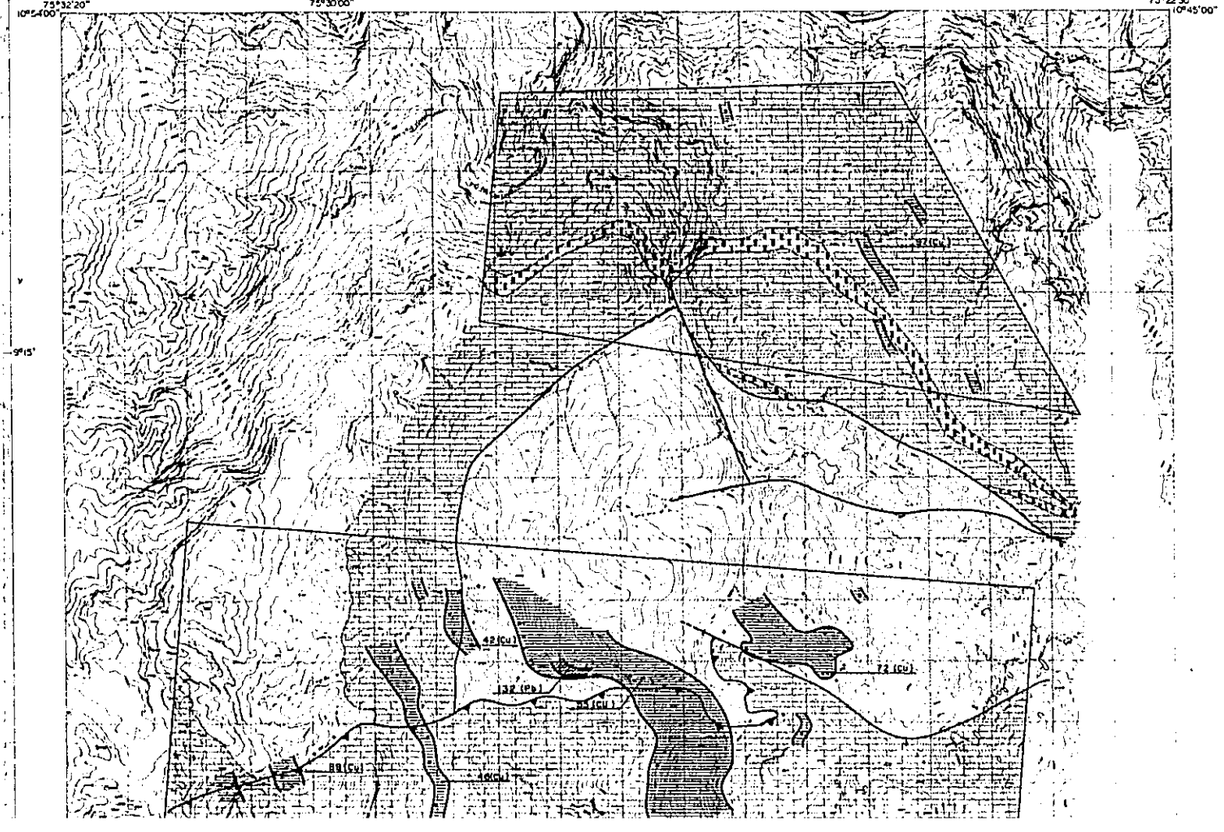
TINGO MARIA



HUANCABAMBA

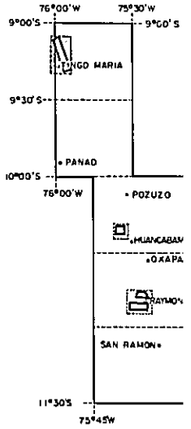


RIO SANTA CURZU, RAYMONDI



GEOLOGICAL SU
OF
THE CORDILLERA ORIENTAL
(JUNE 1977

CORRELATION MAP BETWEE
ZONE, GEOCHEMICAL ANOMA
STRUCTURE OF SEMI-DETA



METAL MINING AGENCY O
JAPAN INTERNATIONAL CO
GOVERNMENT OF JAPAN
FEBRUARY

prepared by MESCO, Inc.

Scale 1 : 5

0

GEOCHEMICAL ANOM

Cu > 28 ppm

Pb > 104 ppm

Zn > 369 ppm

GEOLOGY

Sedimentary rock

Limestone, Dolomite } (Puc

Igneous rock.

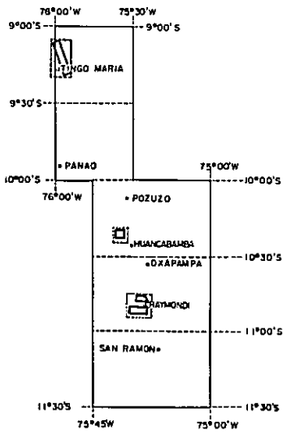
fault { confirmed, estimated

thrust fault

PL. I - 15.

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU
(JUNE 1977)

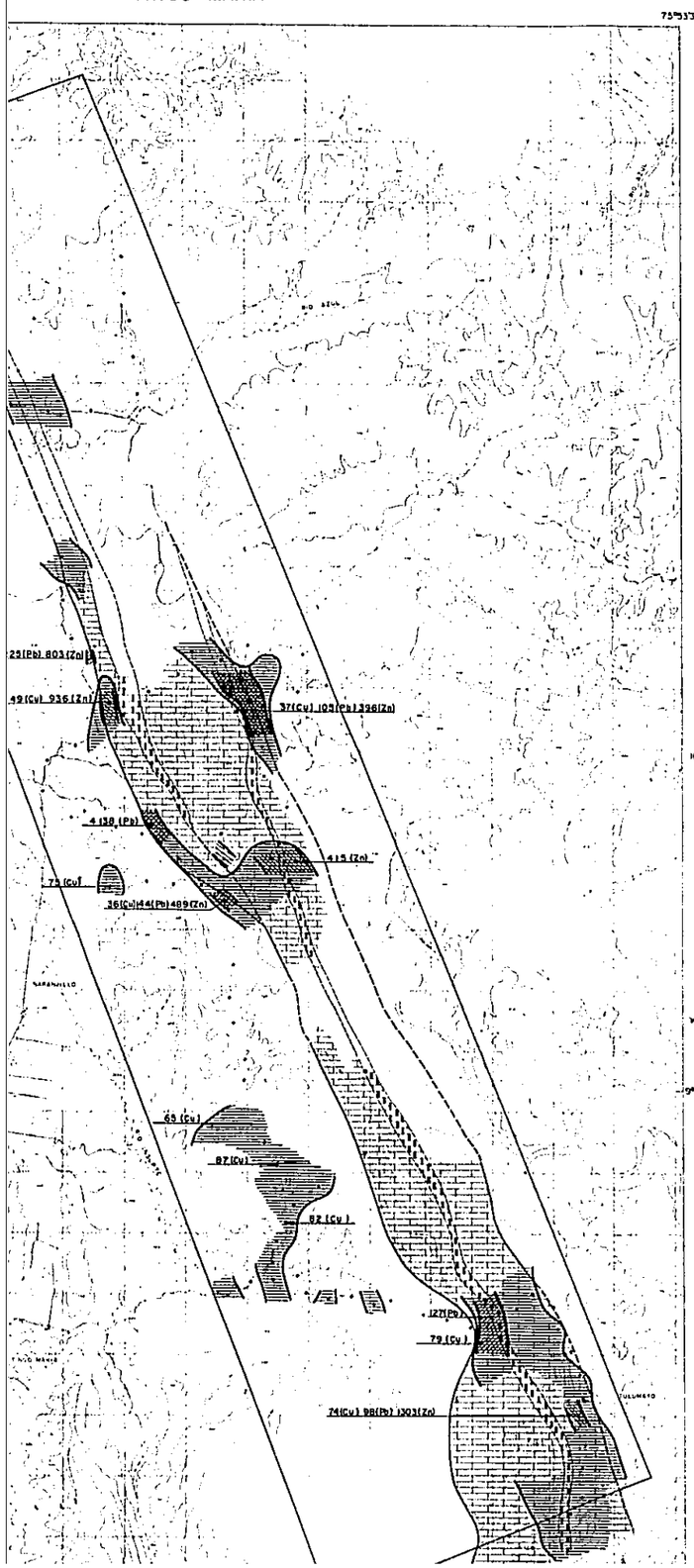
CORRELATION MAP BETWEEN THE MINERALIZED ZONE, GEOCHEMICAL ANOMALY AND GEOLOGICAL STRUCTURE OF SEMI-DETAILED SURVEY AREA



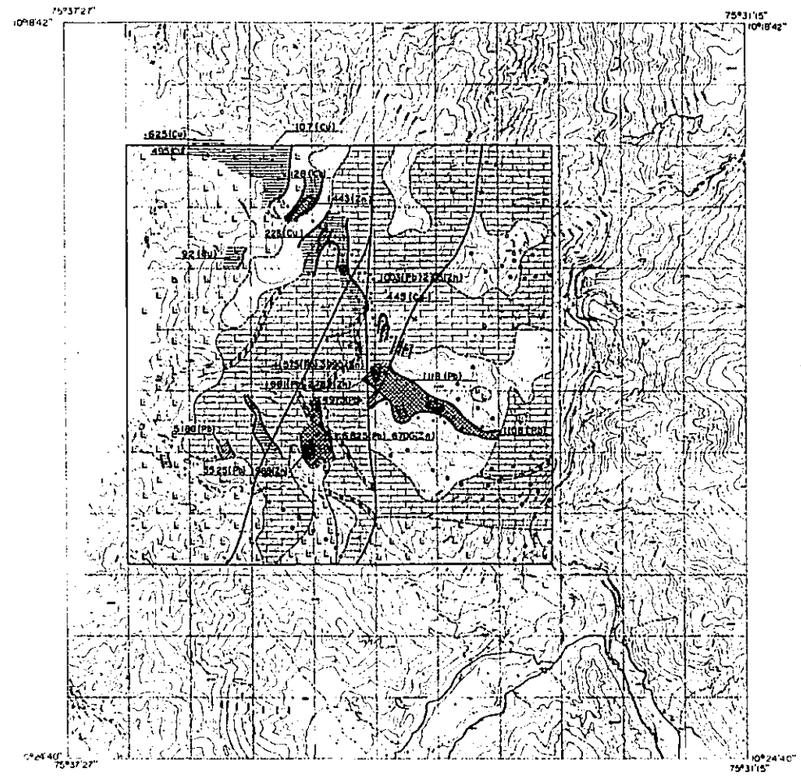
METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, Inc.

Scale 1 : 50,000
0 5 Km

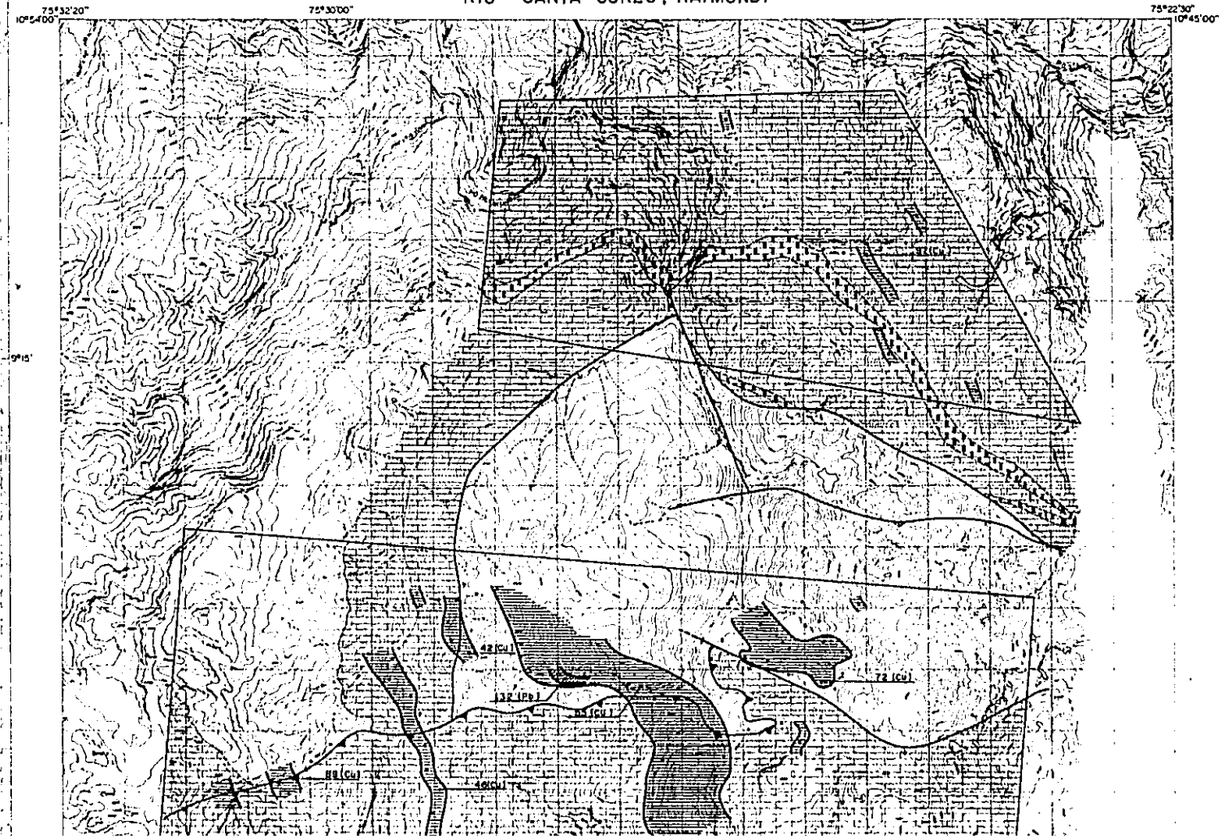
TINGO MARIA



HUANCABAMBA



RIO SANTA CURZU, RAYMONDI

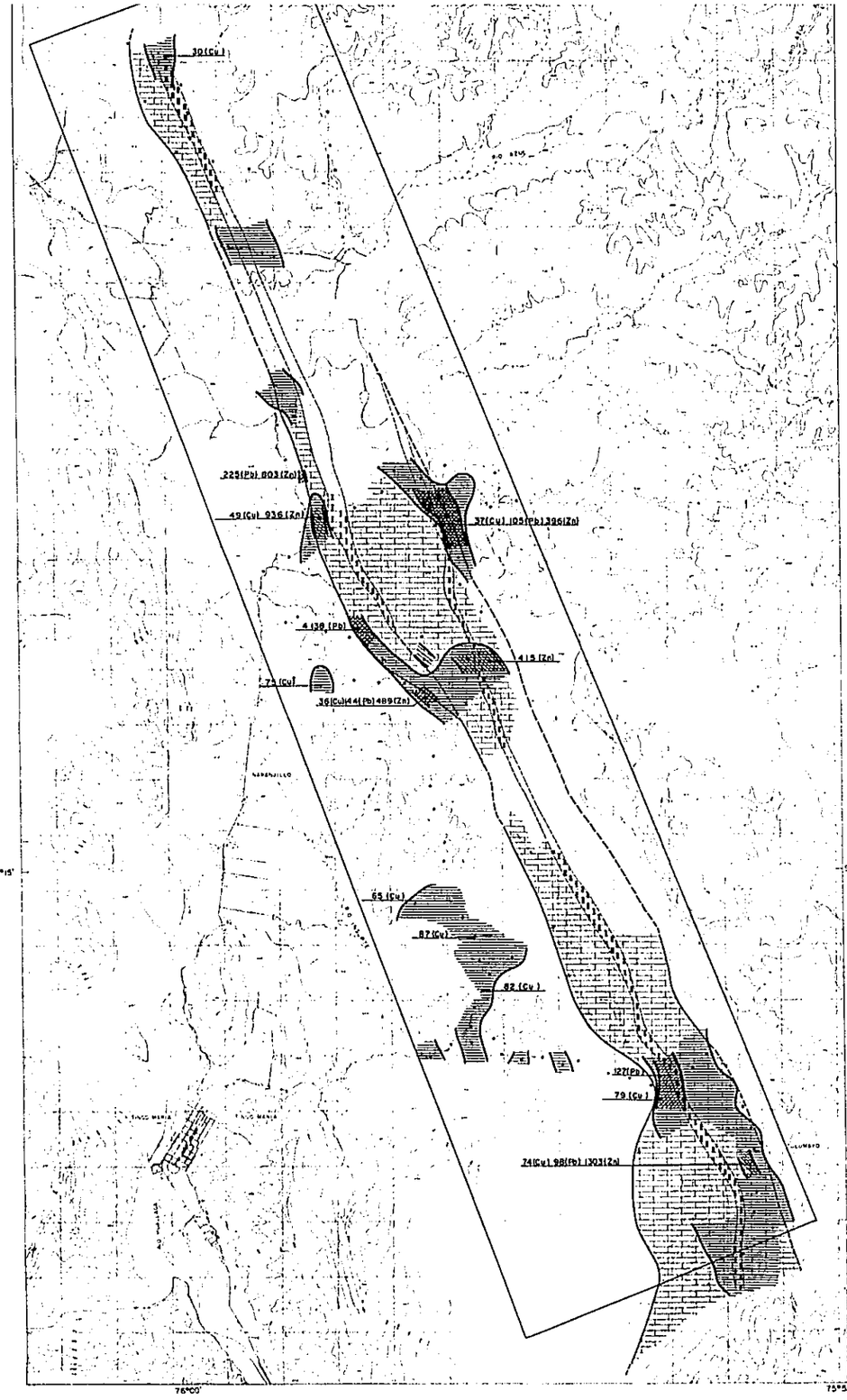


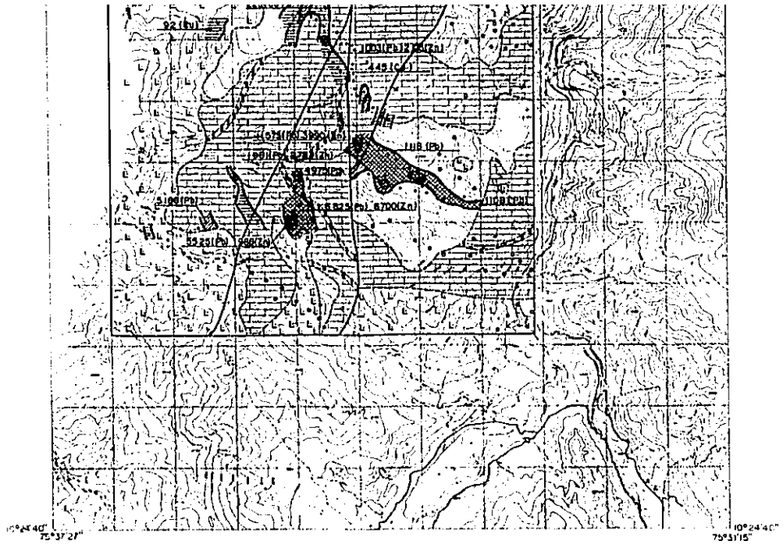
GEOCHEMICAL ANOMALY

Cu	> 28 ppm	(M + 1σ)
Pb	> 104 ppm	(M + 1σ)
Zn	> 369 ppm	(M + 1σ)

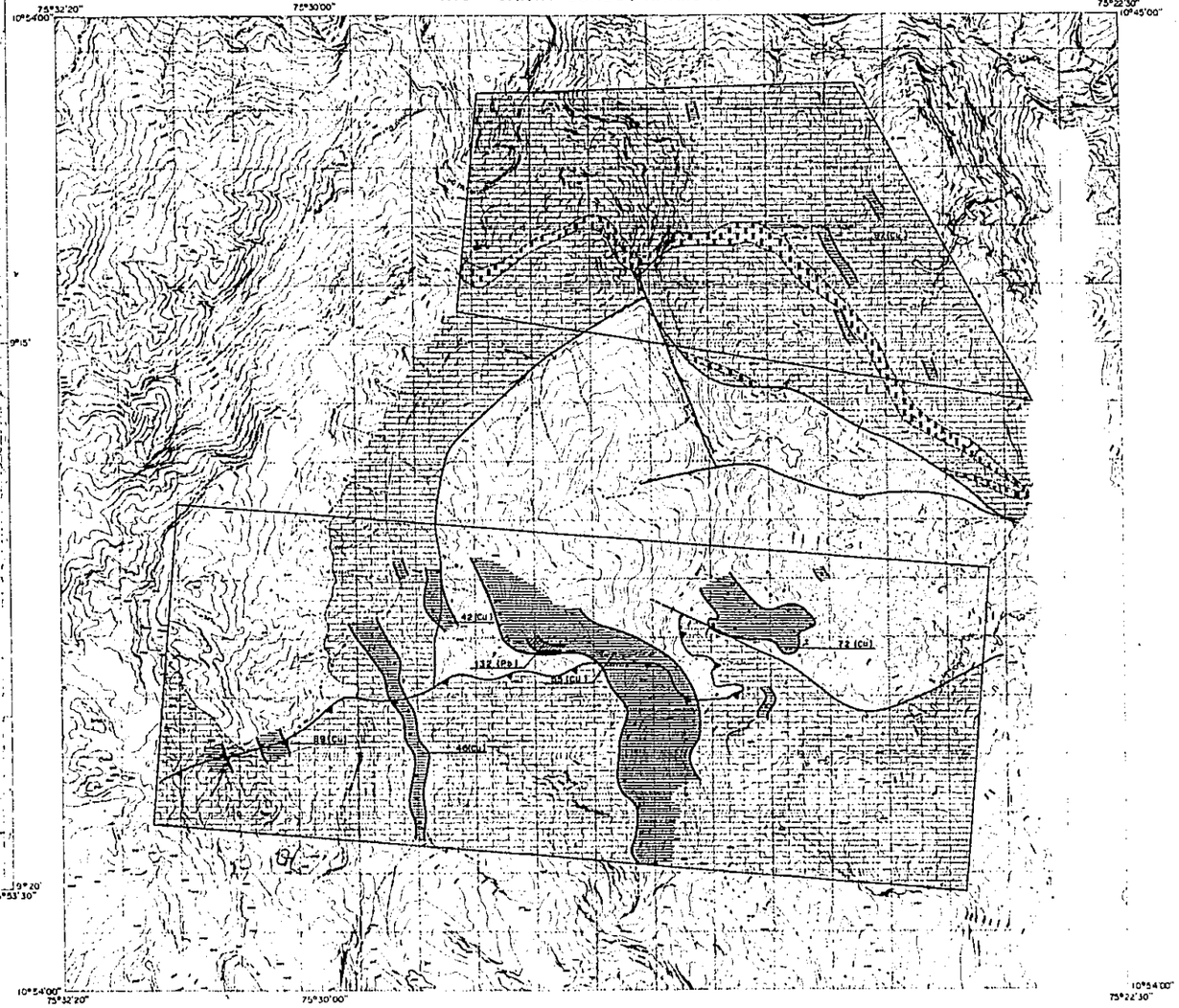
GEOLOGY

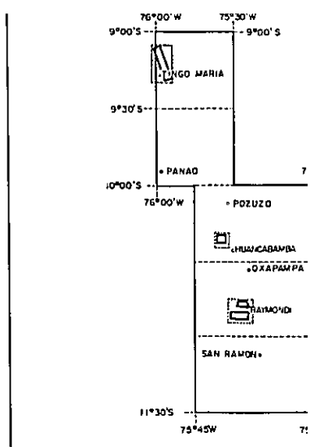
- Sedimentary rock (Post - Pucara)
- Limestone, Dolomite } (Pucara Group)
- Igneous rock.
- fault { confirmed / estimated
- thrust fault





RIO SANTA CURZU, RAYMONDI





METAL MINING AGENCY OF
JAPAN INTERNATIONAL COOPE
GOVERNMENT OF JAPAN
FEBRUARY
prepared by MESCO, Inc.

Scale 1 : 50,

0

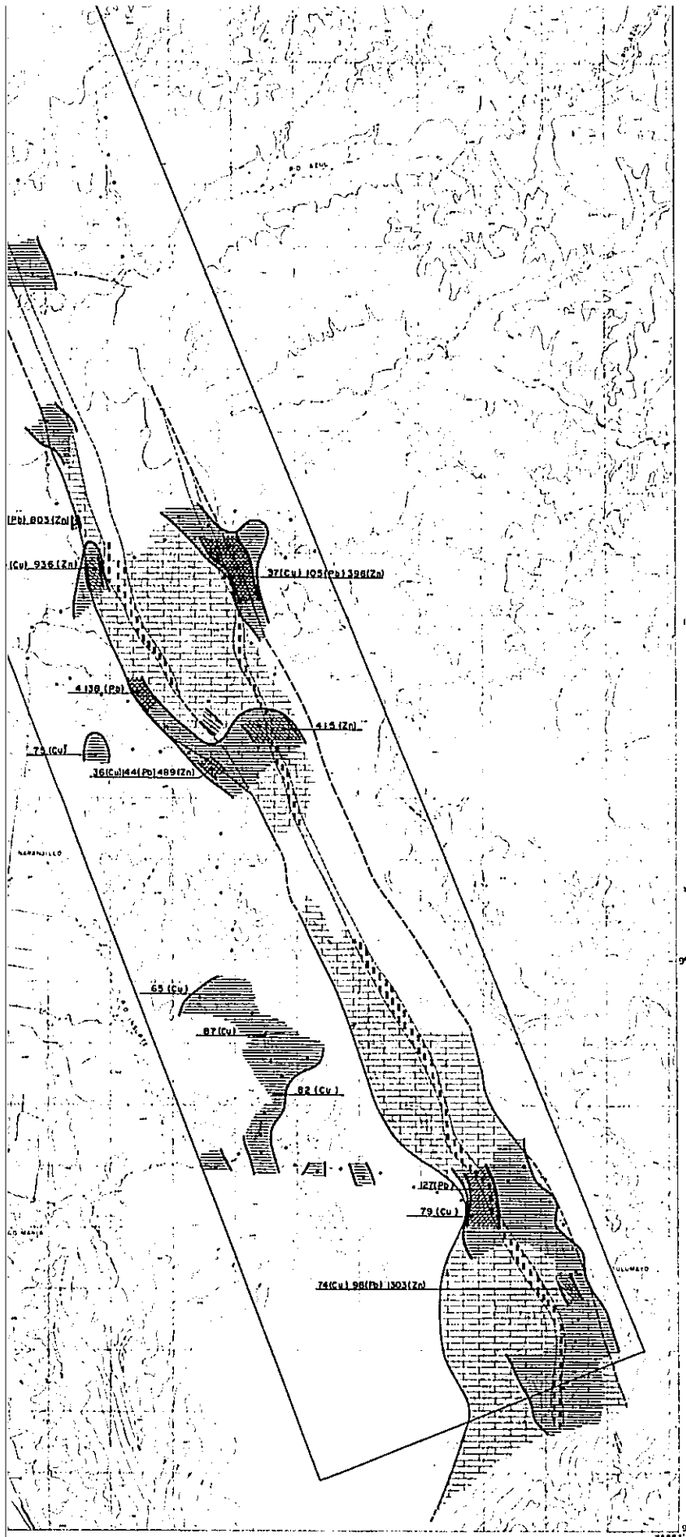
GEOCHEMICAL ANOMAL

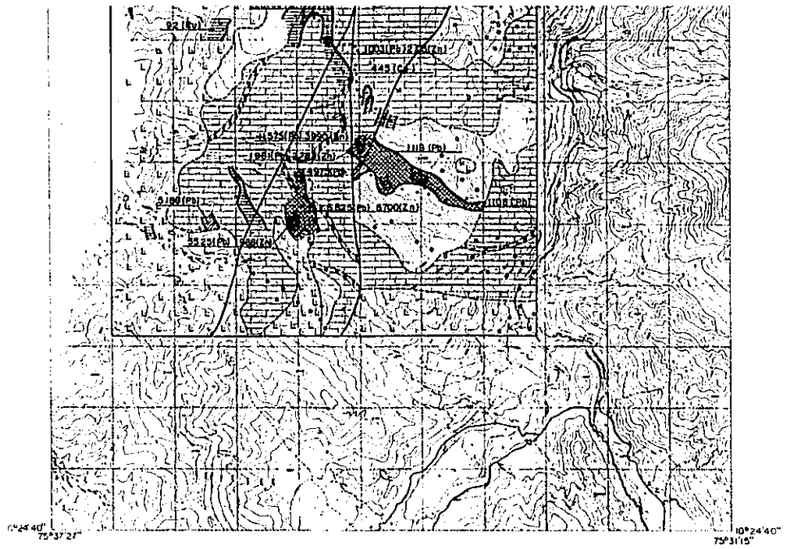
Cu > 28 ppm (
Pb > 104 ppm (
Zn > 369 ppm (

GEOLOGY

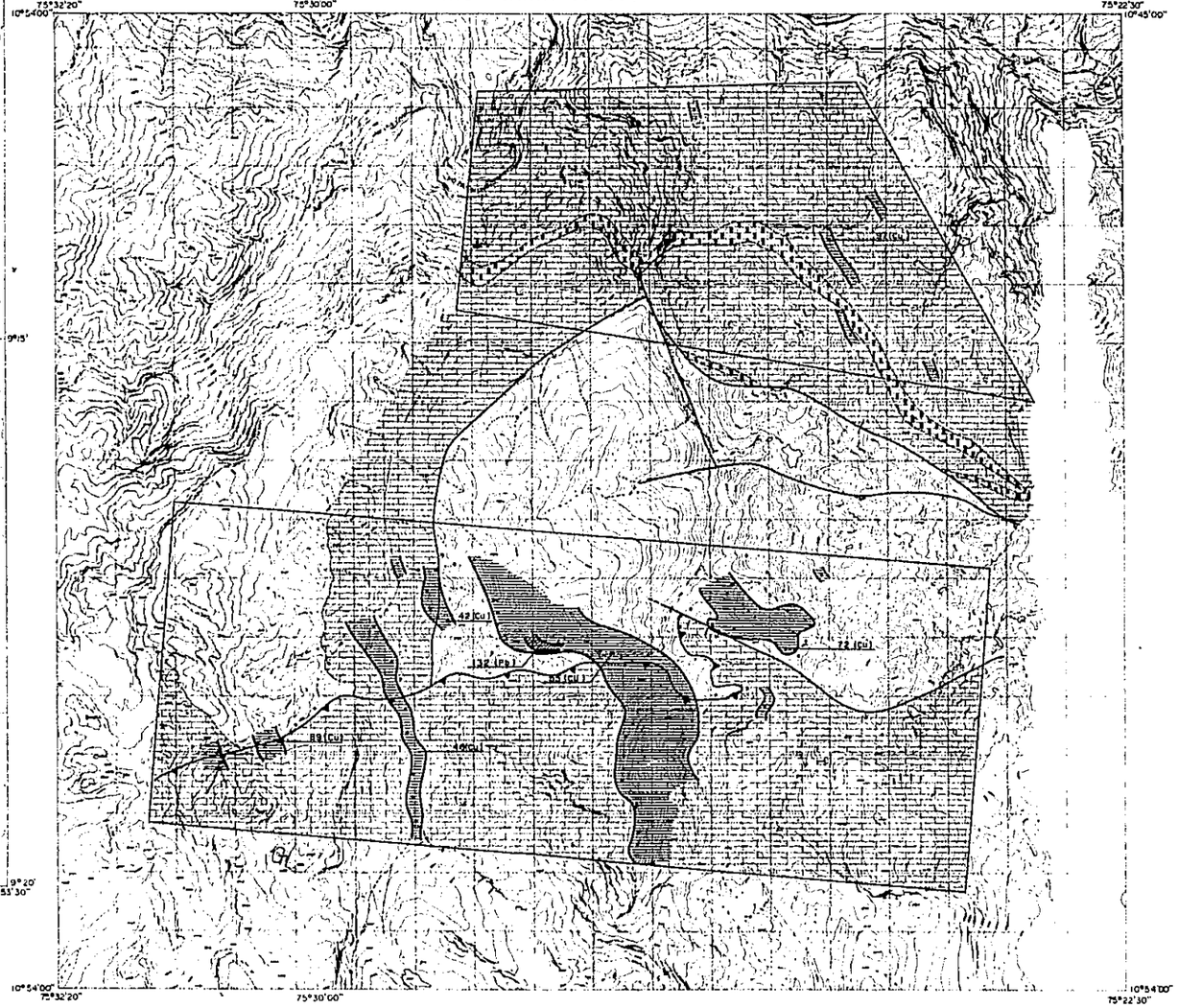
Sedimentary rock (Pc
Limestone
Dolomite } (Pucara
Igneous rock.

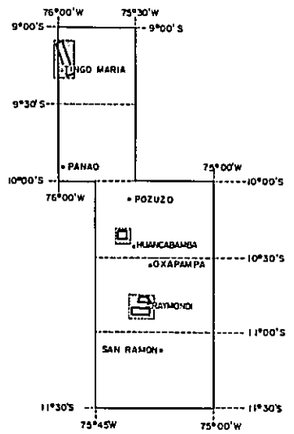
fault { confirmed
estimated
thrust fault





RIO SANTA CURZU, RAYMONDI





METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, Inc.

Scale 1 : 50,000

0 5 Km

GEOCHEMICAL ANOMALY

Cu	> 28 ppm	(M + 1σ)
Pb	> 104 ppm	(M + 1σ)
Zn	> 369 ppm	(M + 1σ)

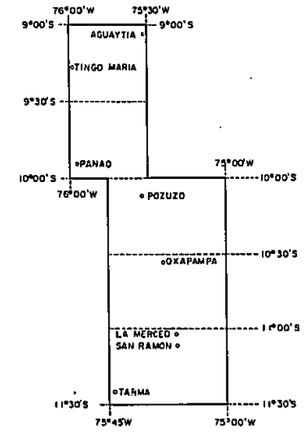
GEOLOGY

- Sedimentary rock (Post - Pucara)
- Limestone, Dolomite } (Pucara Group)
- Igneous rock.
- fault { confirmed / estimated
- thrust fault

PL. I - 16.

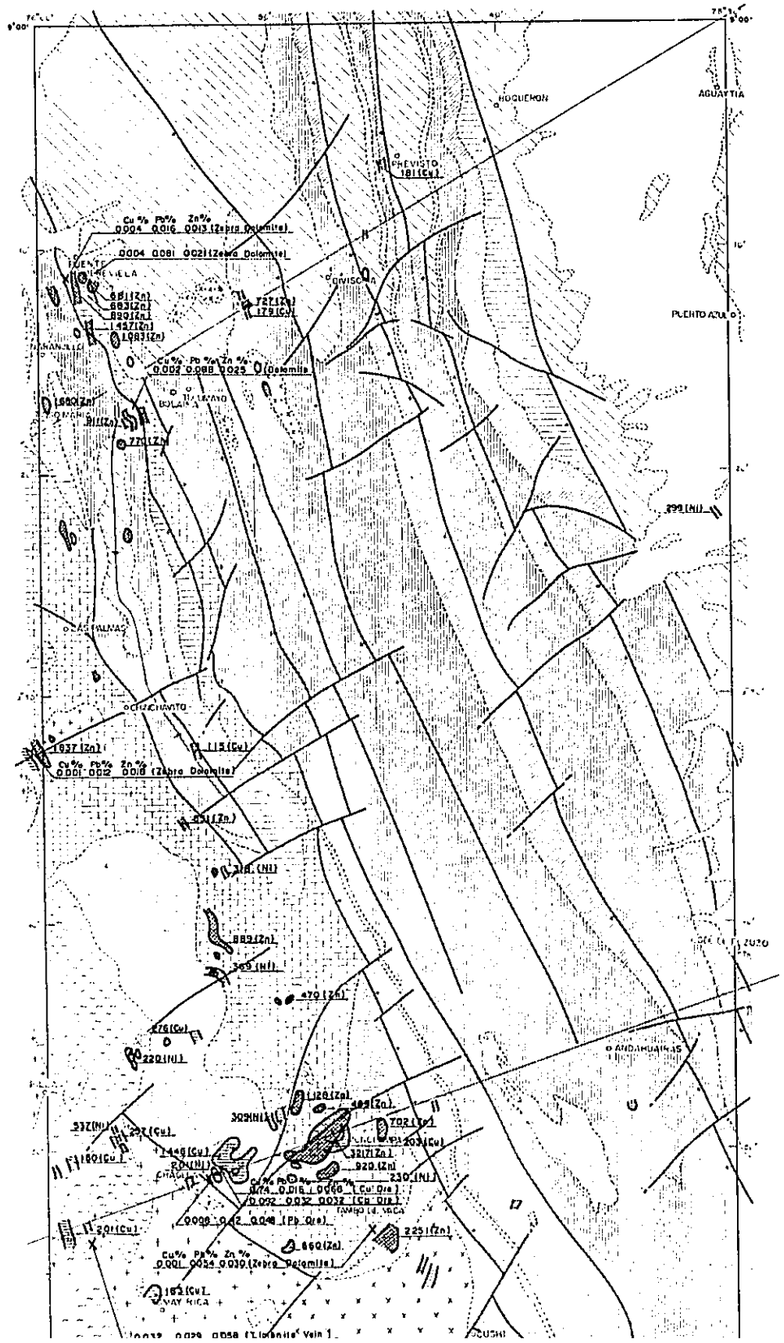
GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL, PERU
(JUNE 1977)

CORRELATION MAP BETWEEN THE MINERALIZED ZONE, GEOCHEMICAL ANOMALY AND GEOLOGICAL STRUCTURE OF THE RECONNAISSANCE AREA



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, Inc.

Scale 1 : 250,000
0 10 20 Km



LEGEND

SEDIMENTARY

Gravel & Sand	Quarternary
Merced F.	Tertiary
Contamana G.	Tertiary
Huayabamba G.	Tertiary
Vivian F.	Cretaceous
Chonta G.	Cretaceous
Oriente G.	Cretaceous
Sarayaquillo F.	Jurassic
Pucara G.	Triassic
Mitu G.	Permian
Copacabana & Tarma G.	Carboniferous
Ambo G.	Carboniferous
Excelcior G.	Devonian

METAMORPHIC

Schist / Gneiss	Precambrian

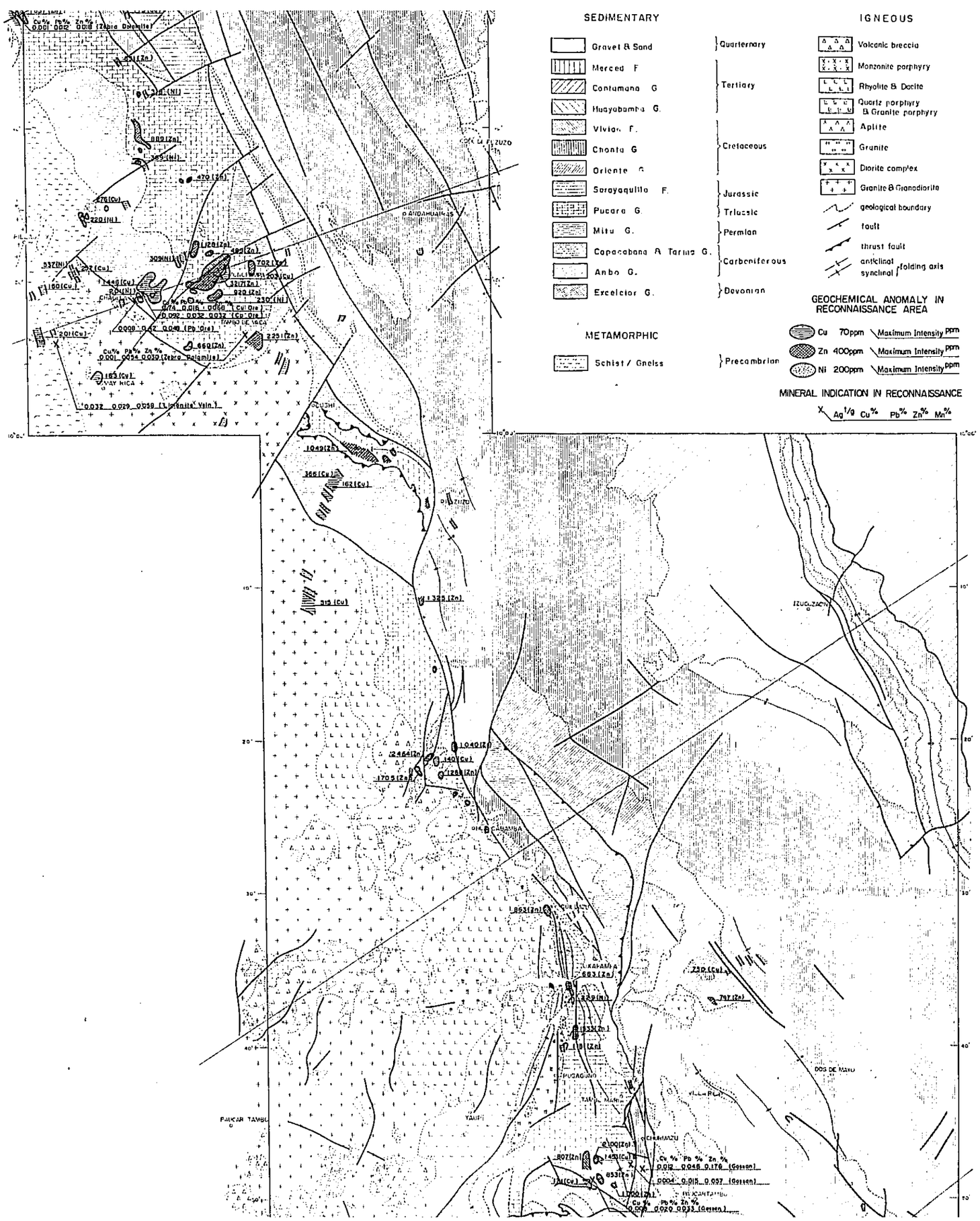
IGNEOUS

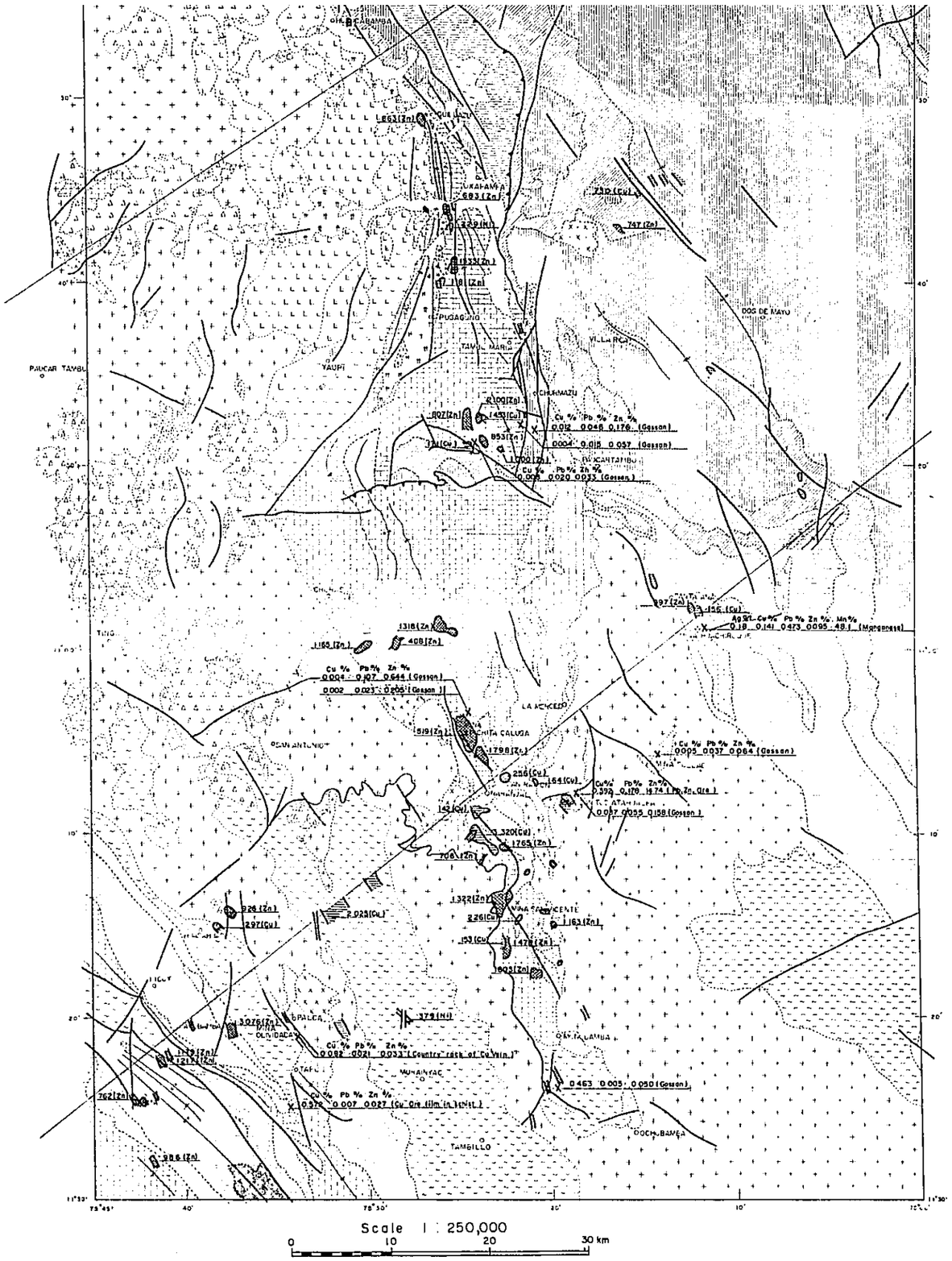
Volcanic breccia	
Monzonite porphyry	
Rhyolite & Dacite	
Quartz porphyry & Granite porphyry	
Aplite	
Granite	
Diorite complex	
Granite & Granodiorite	
geological boundary	
fault	
thrust fault	
anticlinal / synchinal } folding axis	

GEOCHEMICAL ANOMALY IN RECONNAISSANCE AREA

Cu 70ppm \ Maximum Intensity ppm
Zn 400ppm \ Maximum Intensity ppm
Ni 200ppm \ Maximum Intensity ppm

MINERAL INDICATION IN RECONNAISSANCE


SEDIMENTARY
Gravel & Sand
Merced F.
Contumana G.
Huayabamba G.
Vivian F.
Chonta G.
Oriente G.
Sarayaquillo F.
Pucara G.
Mitu G.
Capaccabana & Tarma G.
Anbo G.
Excelcior G.
Quarternary
Tertiary
Cretaceous
Jurassic
Triassic
Permian
Carboniferous
Devonian
METAMORPHIC
Schist / Gneiss
Precambrian
IGNEOUS
Volcanic breccia
Monzonite porphyry
Rhyolite & Dacite
Quartz porphyry & Granite porphyry
Aplite
Granite
Diorite complex
Granite & Granodiorite
geological boundary
fault
thrust fault
anticlinal
synclinal
folding axis
GEOCHEMICAL ANOMALY IN RECONNAISSANCE AREA
Cu 70ppm Maximum Intensity ppm
Zn 400ppm Maximum Intensity ppm
Ni 200ppm Maximum Intensity ppm
MINERAL INDICATION IN RECONNAISSANCE
Ag 1/g Cu% Pb% Zn% Mn%
IZUCUCHACA
CHAMAZU
KAHAMA
PUGAGUN
YAUP
DOS DE MAYO
PAUCAR TAMBO


QUICHABAMBA
LEG1(Zn)
QUE JACU
KAPAMA
693(Zn)
PUGAGUNO
TAMBO MARIA
YAUPI
PAUCAR TAYBL
CHUKMAZU
807(Zn)
453(Cu)
853(Zn)
1000(Zn)
Cu % Pb % Zn %
0.012 0.048 0.176 (Gossan)
0.004 0.015 0.057 (Gossan)
Cu % Pb % Zn %
0.008 0.020 0.033 (Gossan)
YANACANCHA
OJOS DE MAYU
VILLA RICA
210(Cu)
747(Zn)
97(Zn)
125(Cu)
Ag gr Cu % Pb % Zn % Mn %
0.18 0.141 0.473 0.095 48.1 (Manganese)
1318(Zn)
408(Zn)
1163(Zn)
Cu % Pb % Zn %
0.004 0.007 0.644 (Gossan)
0.002 0.023 0.205 (Gossan)
LA ACHCADA
5199(Zn)
CHITA CALUGA
1798(Zn)
256(Cu)
641(Cu)
Cu % Pb % Zn %
0.005 0.037 0.064 (Gossan)
Cu % Pb % Zn %
0.594 0.178 1.674 (Hyp. Zn. Ore)
0.087 0.055 0.158 (Gossan)
1320(Cu)
1765(Zn)
706(Zn)
1322(Zn)
926(Zn)
297(Cu)
2023(Cu)
2261(Cu)
1163(Zn)
153(Cu)
1478(Zn)
903(Zn)
379(Ni)
3076(Zn)
PALCA
OLIVADAS
1149(Zn)
1214(Zn)
Cu % Pb % Zn %
0.082 0.021 0.033 (Country rock of Cu Vein)
Cu % Pb % Zn %
0.576 0.007 0.027 (Cu Ore (lim in) Vein)
762(Zn)
986(Zn)
TAMBILLO
0.463 0.005 0.050 (Gossan)
QUICHABAMBA
Scale 1 : 250,000
0 10 20 30 km

PL. II-1

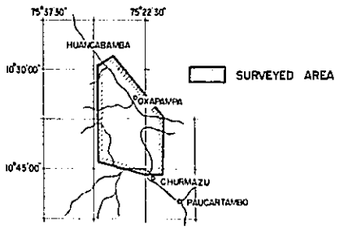
GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU

LOCATION MAP
OF
GRAVITY STATIONS AND IP IN-SITU

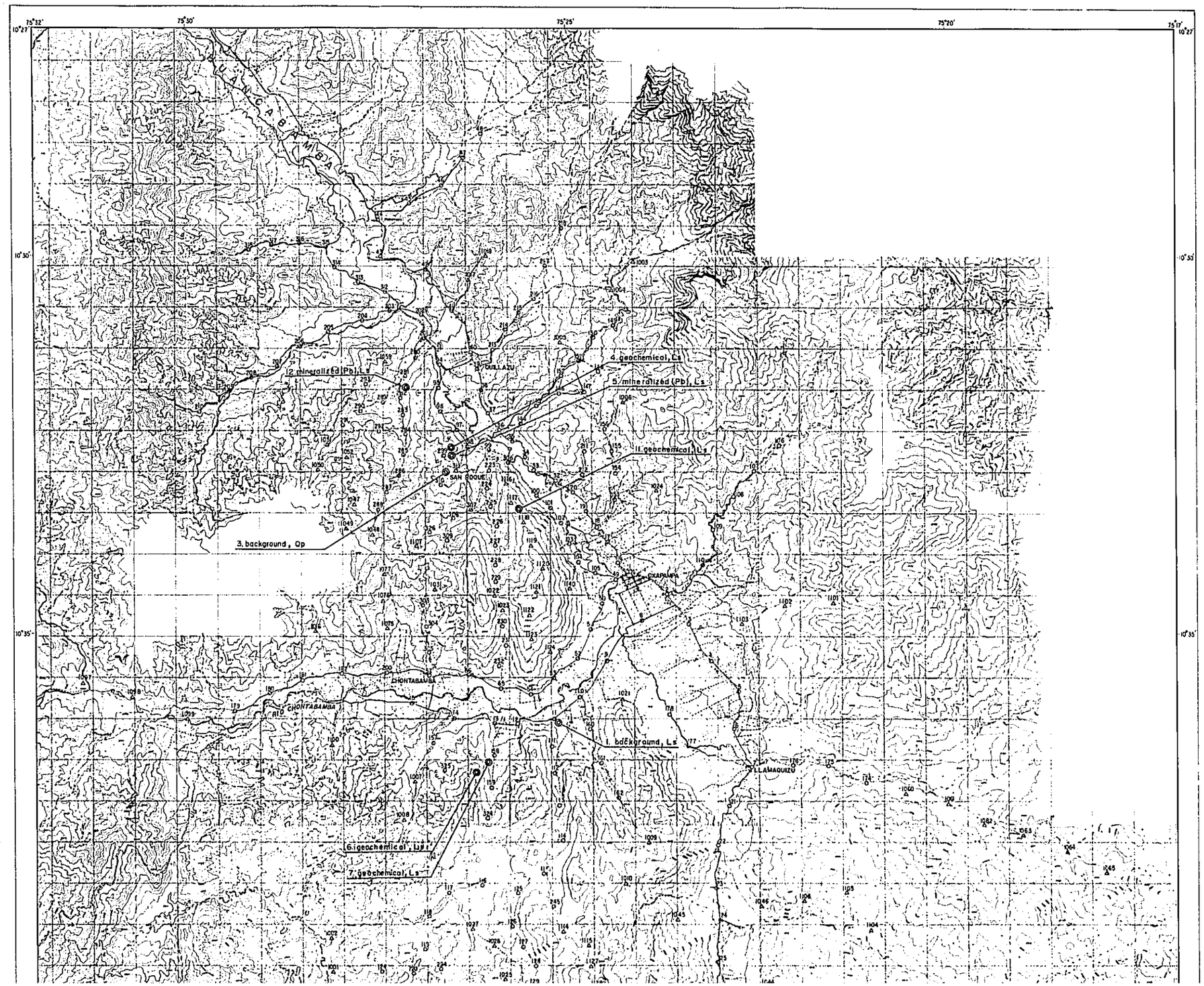
SCALE 1 : 50,000

0 1 2 3 4km

LOCALITY INDEX



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, INC.



LEGEND

GRAVITY SURVEY

123 ○ STATION NUMBER AND GRAVITY STATION BY LEVEL

1123 △ STATION NUMBER AND GRAVITY STATION BY ALTIMETER

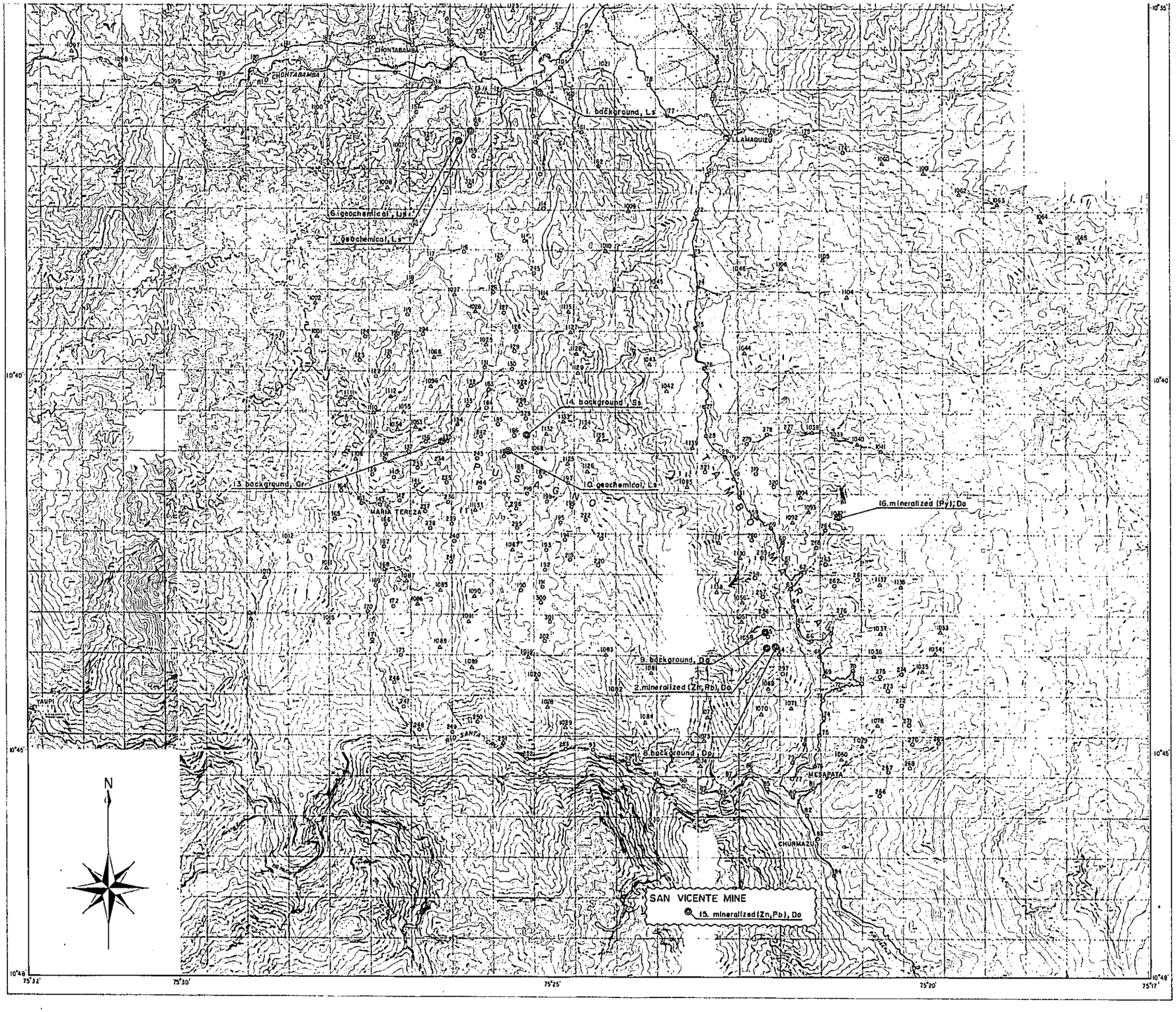
IP IN-SITU

15. mineralized (Zn, Pb), Qp
1 2 3

1 LOCATION NUMBER

2 SORT OF OUTCROP
mineralized (metal name)
geochemical anomaly
background

3 ROCK NAME OF OUTCROP



GRAVITY SURVEY

123 O STATION NUMBER AND GRAVITY STATION BY LEVEL

1123 △ STATION NUMBER AND GRAVITY STATION BY ALTIMETER

IP IN-SITU

15. mineralized (Zn, Pb), Do
1 2 3

1 LOCATION NUMBER

2 SORT OF OUTCROP

mineralized (metal name)

geochemical anomaly

background

3 ROCK NAME OF OUTCROP

Do ..... DOLOMITE
Ls ..... LIMESTONE
Ss ..... SANDSTONE
Gr ..... GRANITE
Qp ..... QUARTZ PORPHYRY

PL. II-2

GEOLOGICAL SURVEY OF THE CORDILLERA ORIENTAL CENTRAL PERU

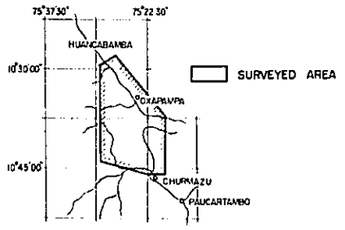
MAP OF BOUGUER ANOMALY

(DENSITY : ρ = 2.67)

SCALE 1 : 50,000

0 1 2 3 4km

LOCALITY INDEX



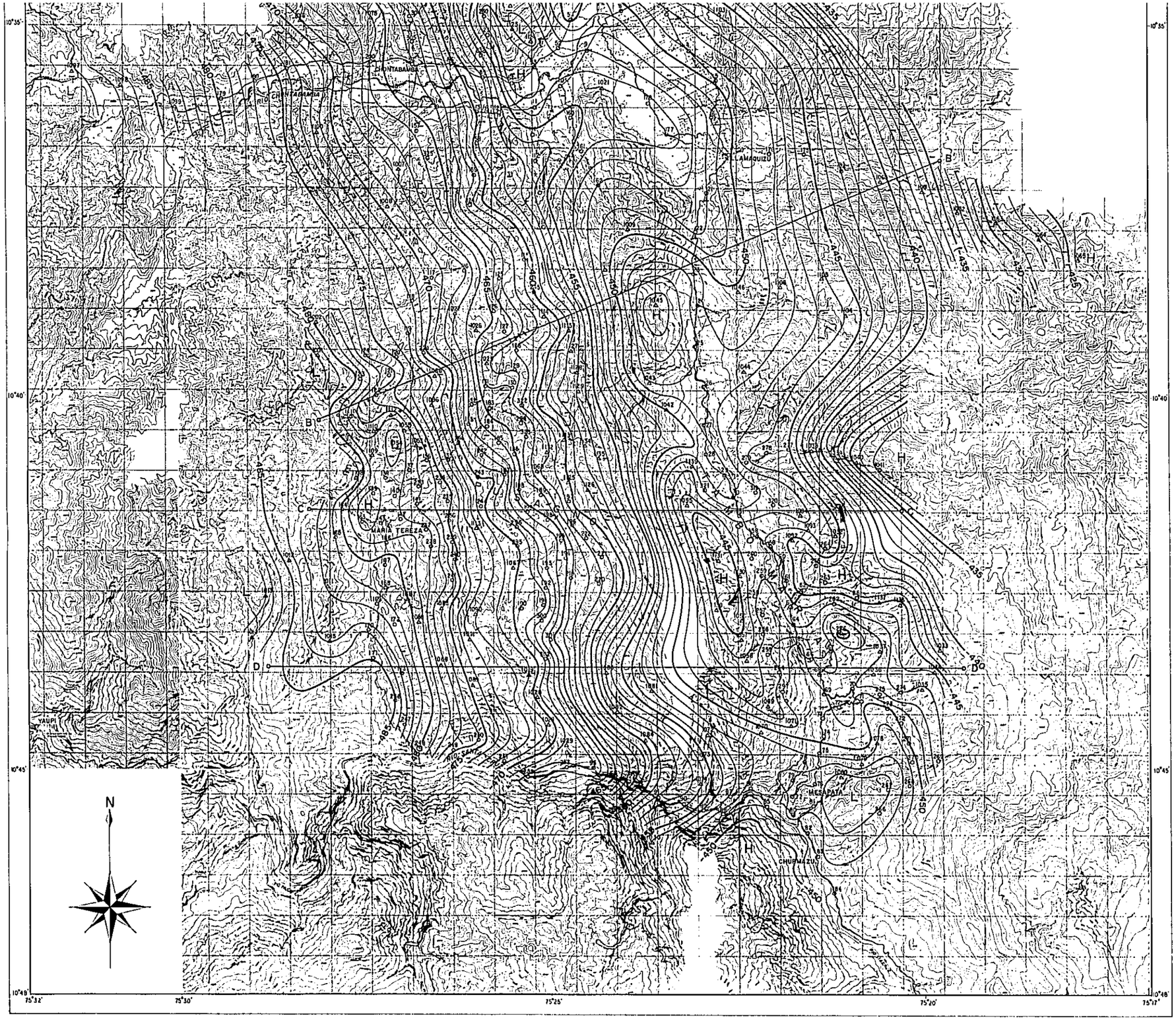
METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, INC.

LEGEND

- STATION NUMBER AND GRAVITY STATION BY LEVEL
- STATION NUMBER AND GRAVITY STATION BY ALTIMETER
- GRAVITY CONTOUR, INTERVAL 5mgal
- GRAVITY CONTOUR, INTERVAL 1mgal
- H HIGH ANOMALY
- L LOW ANOMALY
- A——A' LINE OF PROFILE

LEGEND

- STATION NUMBER AND GRAVITY STATION BY LEVEL
- STATION NUMBER AND GRAVITY STATION BY ALTIMETER
- GRAVITY CONTOUR, INTERVAL 5mgal
- GRAVITY CONTOUR, INTERVAL 1mgal
- H HIGH ANOMALY
- L LOW ANOMALY
- A——A' LINE OF PROFILE



PL. II-3

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU

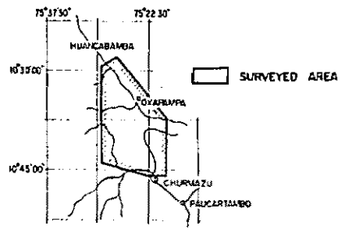
MAP OF BOUGUER ANOMALY

(DENSITY : $\rho = 2.60$)

SCALE 1 : 50,000

0 1 2 3 4 km

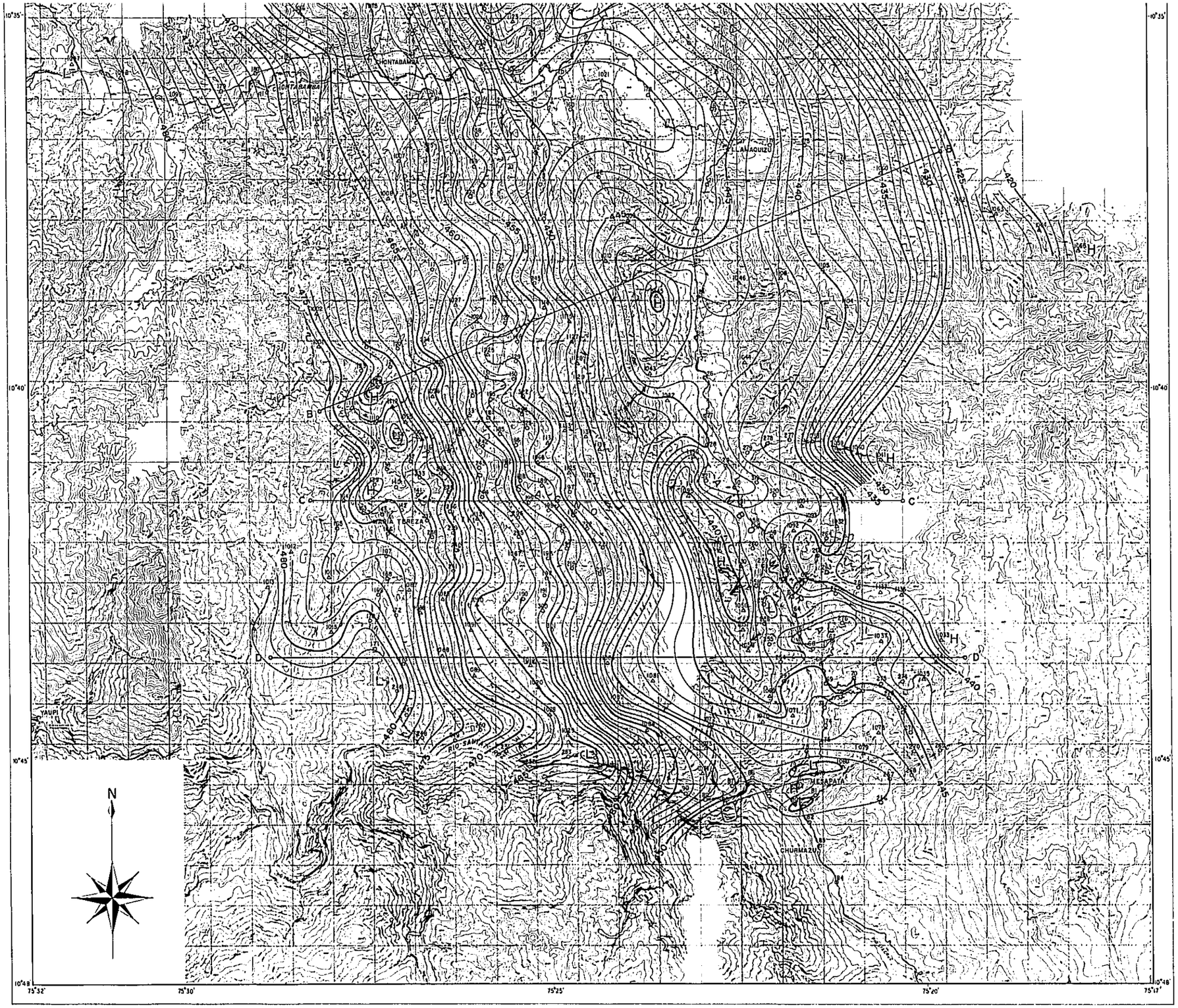
LOCALITY INDEX



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, INC

LEGEND

- STATION NUMBER AND GRAVITY STATION BY LEVEL
- STATION NUMBER AND GRAVITY STATION BY ALTIMETER
- GRAVITY CONTOUR, INTERVAL 5mgal
- GRAVITY CONTOUR, INTERVAL 1mgal
- H HIGH ANOMALY
- L LOW ANOMALY
- A——A' LINE OF PROFILE



LEGEND

- STATION NUMBER AND GRAVITY STATION BY LEVEL
- STATION NUMBER AND GRAVITY STATION BY ALTIMETER
- GRAVITY CONTOUR, INTERVAL 5mgal
- GRAVITY CONTOUR, INTERVAL 1mgal
- H HIGH ANOMALY
- L LOW ANOMALY
- A——A' LINE OF PROFILE

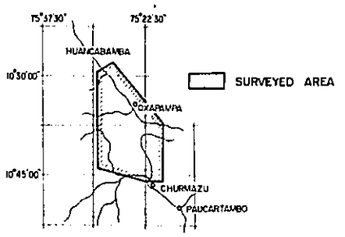
GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU

MAP OF RESIDUAL GRAVITY
(POLYNOMIAL OF THIRD ORDER)
(DENSITY : $\rho = 2.67$)

SCALE 1 : 50,000

0 1 2 3 4km

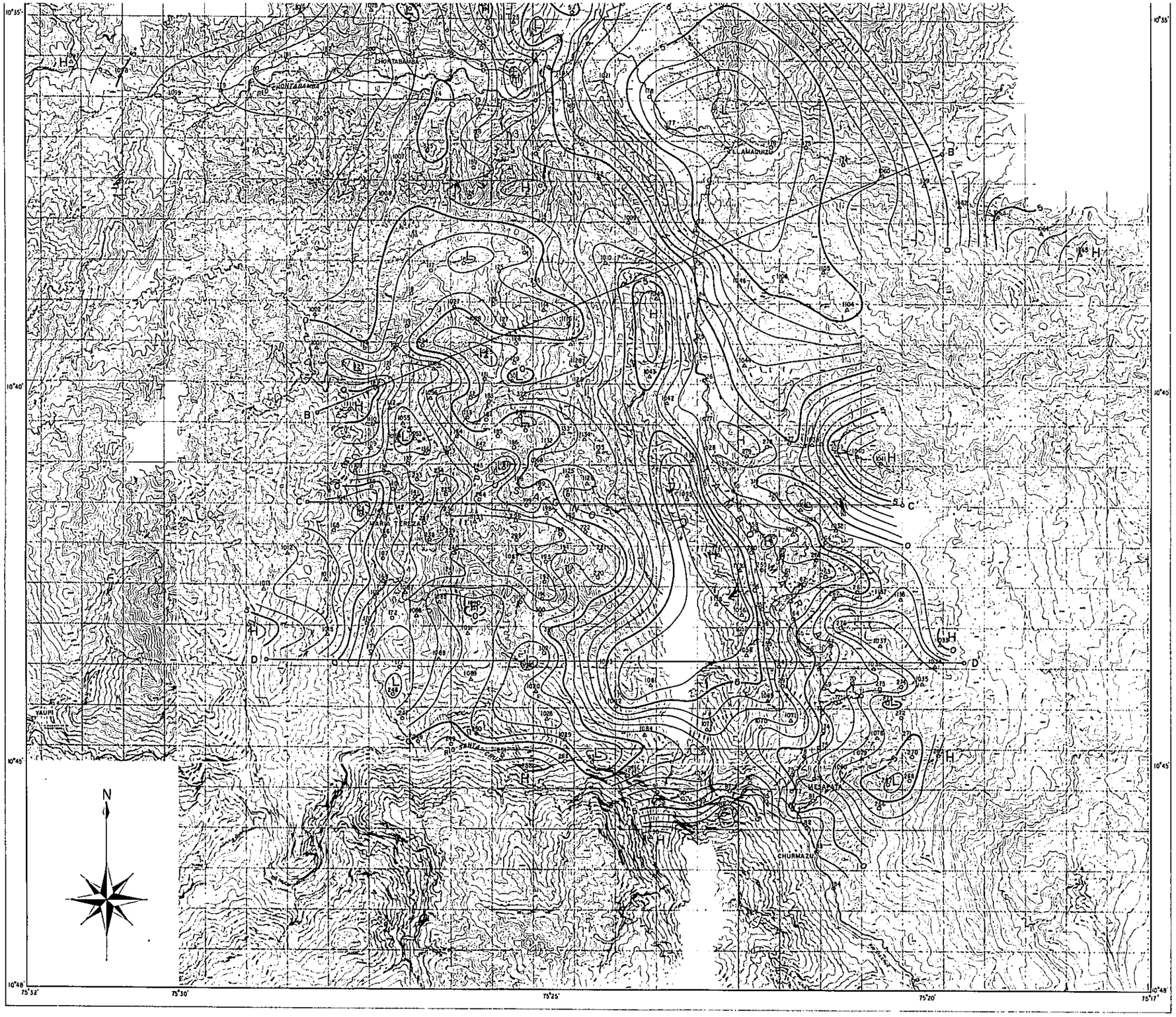
LOCALITY INDEX



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, INC.

LEGEND

- STATION NUMBER AND GRAVITY STATION BY LEVEL
- STATION NUMBER AND GRAVITY STATION BY ALTIMETER
- GRAVITY CONTOUR, INTERVAL 5mgal
- GRAVITY CONTOUR, INTERVAL 1mgal
- H HIGH ANOMALY
- L LOW ANOMALY
- A——A' LINE OF PROFILE



LEGEND

- 123 ○ STATION NUMBER AND GRAVITY STATION BY LEVEL
- 1123 △ STATION NUMBER AND GRAVITY STATION BY ALTIMETER
- GRAVITY CONTOUR, INTERVAL 5mgal
- GRAVITY CONTOUR, INTERVAL 1mgal
- H HIGH ANOMALY
- L LOW ANOMALY
- A——A' LINE OF PROFILE

PL. II-5

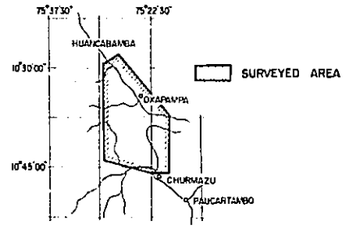
GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU

MAP OF INTERMEDIATE WAVE-LENGTH BOUGUER ANOMALY (MAP OF NORMAL STRUCTURE) (DENSITY : $\rho = 2.67$)

SCALE 1 : 50,000

0 1 2 3 4km

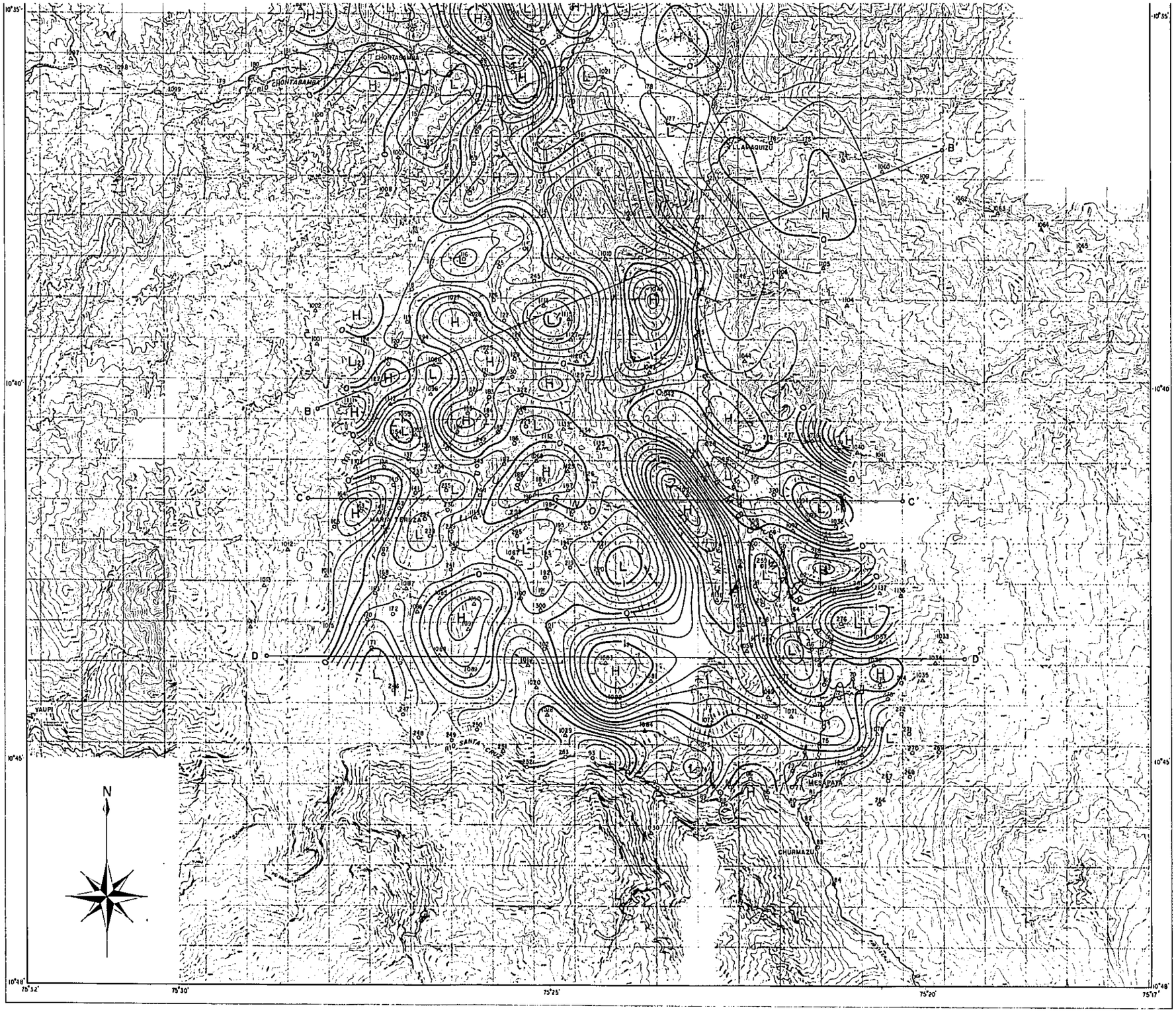
LOCALITY INDEX



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, INC.

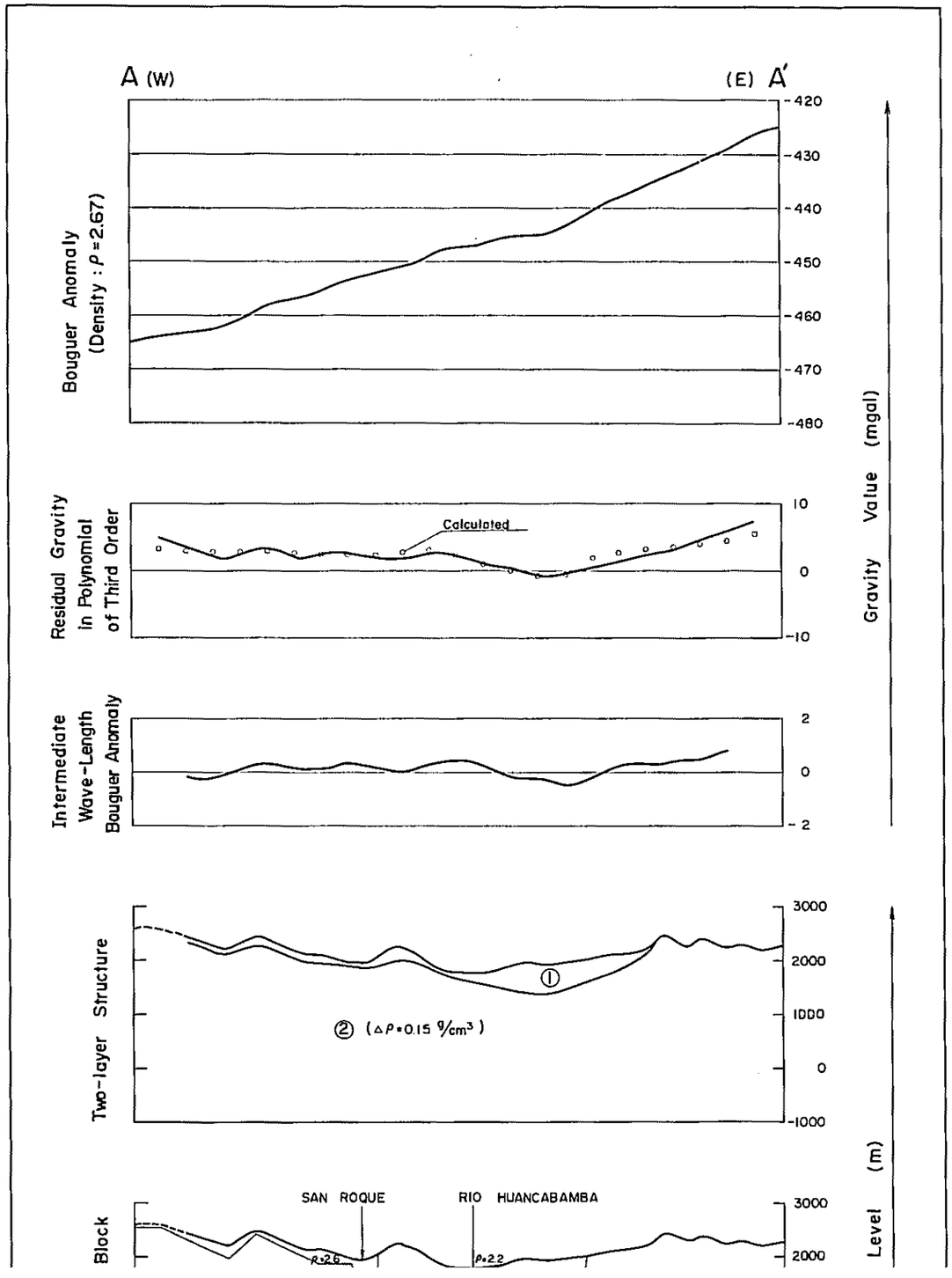
LEGEND

- 123 ○ STATION NUMBER AND GRAVITY STATION BY LEVEL
- 1123 △ STATION NUMBER AND GRAVITY STATION BY ALTIMETER
- GRAVITY CONTOUR, INTERVAL 10mgal
- GRAVITY CONTOUR, INTERVAL 02mgal
- (H) HIGH ANOMALY
- (L) LOW ANOMALY
- A——A' LINE OF PROFILE



LEGEND

- 123 ○ — STATION NUMBER AND GRAVITY STATION BY LEVEL
- 1123 △ — STATION NUMBER AND GRAVITY STATION BY ALTIMETER
- GRAVITY CONTOUR, INTERVAL 10mgal
- GRAVITY CONTOUR, INTERVAL 02mgal
- (H) HIGH ANOMALY
- (L) LOW ANOMALY
- A——A' LINE OF PROFILE



PL. Ⅱ-6

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU

PROFILE OF UNDERGROUND STRUCTURE

A — A'

SCALE 1:50,000

0 1 2 3 4 km

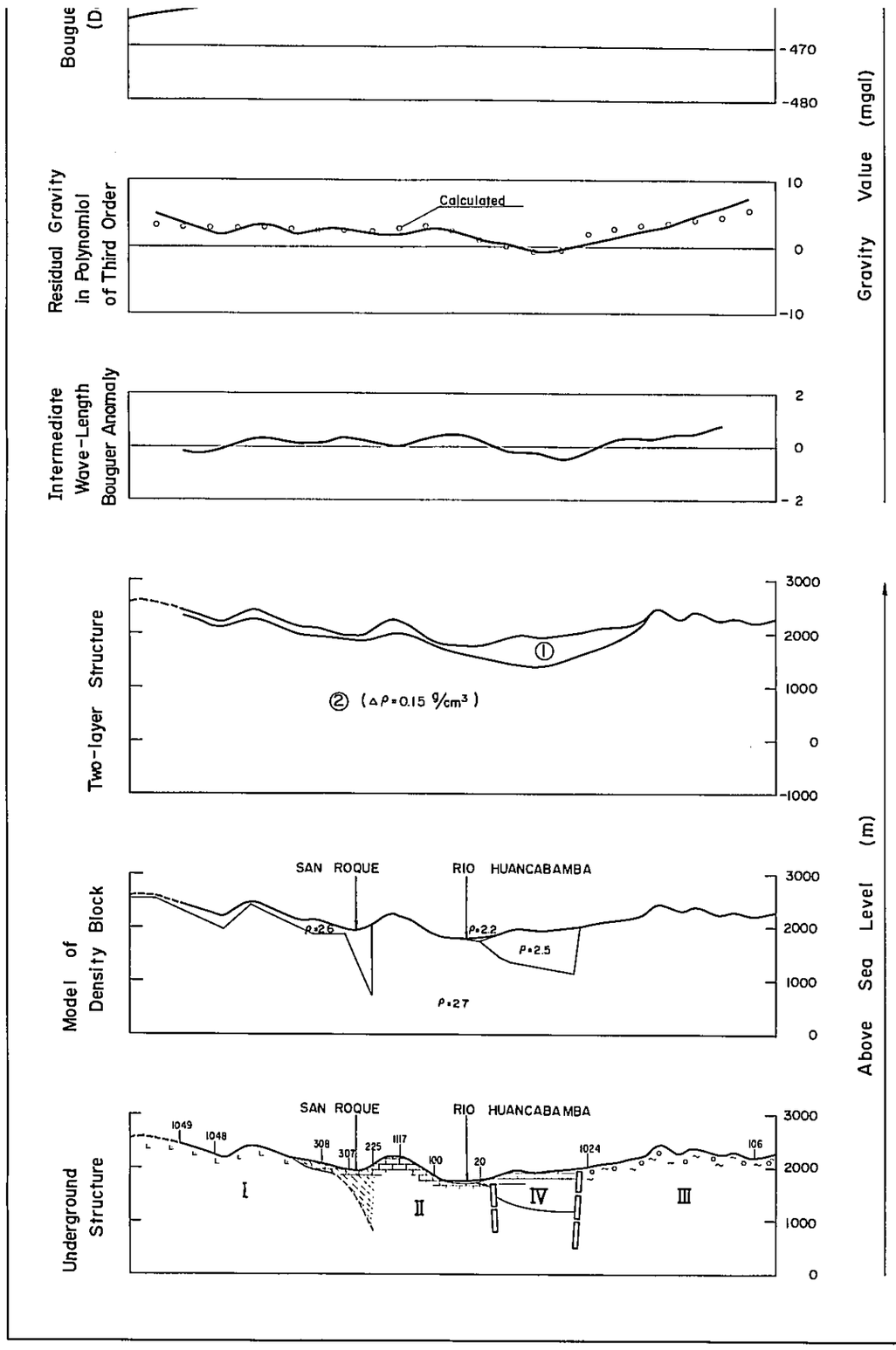
METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, INC.

LEGEND

Geology of Ground Surface

- Quaternary
- Merced Formation
- Chonta Group
- Oriente Group
- Pucara Group
- Mitu Group
- Llaupi Volcanics
- Oxapampa Intrusives
- Pusagno Granite

Fault-like Step Structure



SCALE 1:50,000

0 1 2 3 4 km

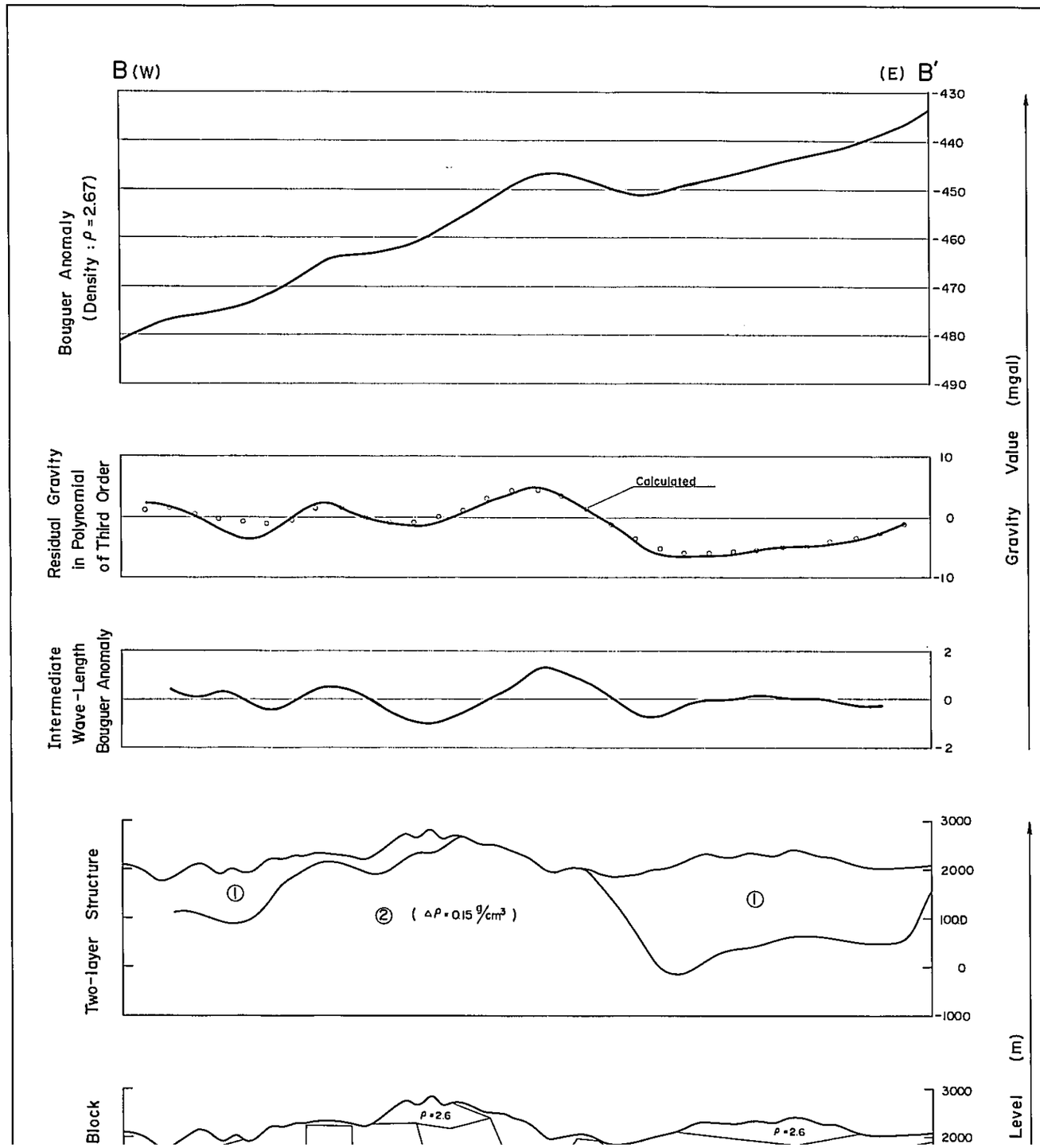
METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, INC.

LEGEND

Geology of Ground Surface

- Quaternary
- Merced Formation
- Chonta Group
- Oriente Group
- Pucara Group
- Mitu Group
- Llaupi Volcanics
- Oxapampa Intrusives
- Pusagno Granite

- Fault-like Step Structure
- High Density Zone
- Low Density Zone
- 308 — Location of Station and its Number



PL. II-7

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU

PROFILE OF UNDERGROUND STRUCTURE

B — B'

SCALE 1:50,000

0 1 2 3 4 km

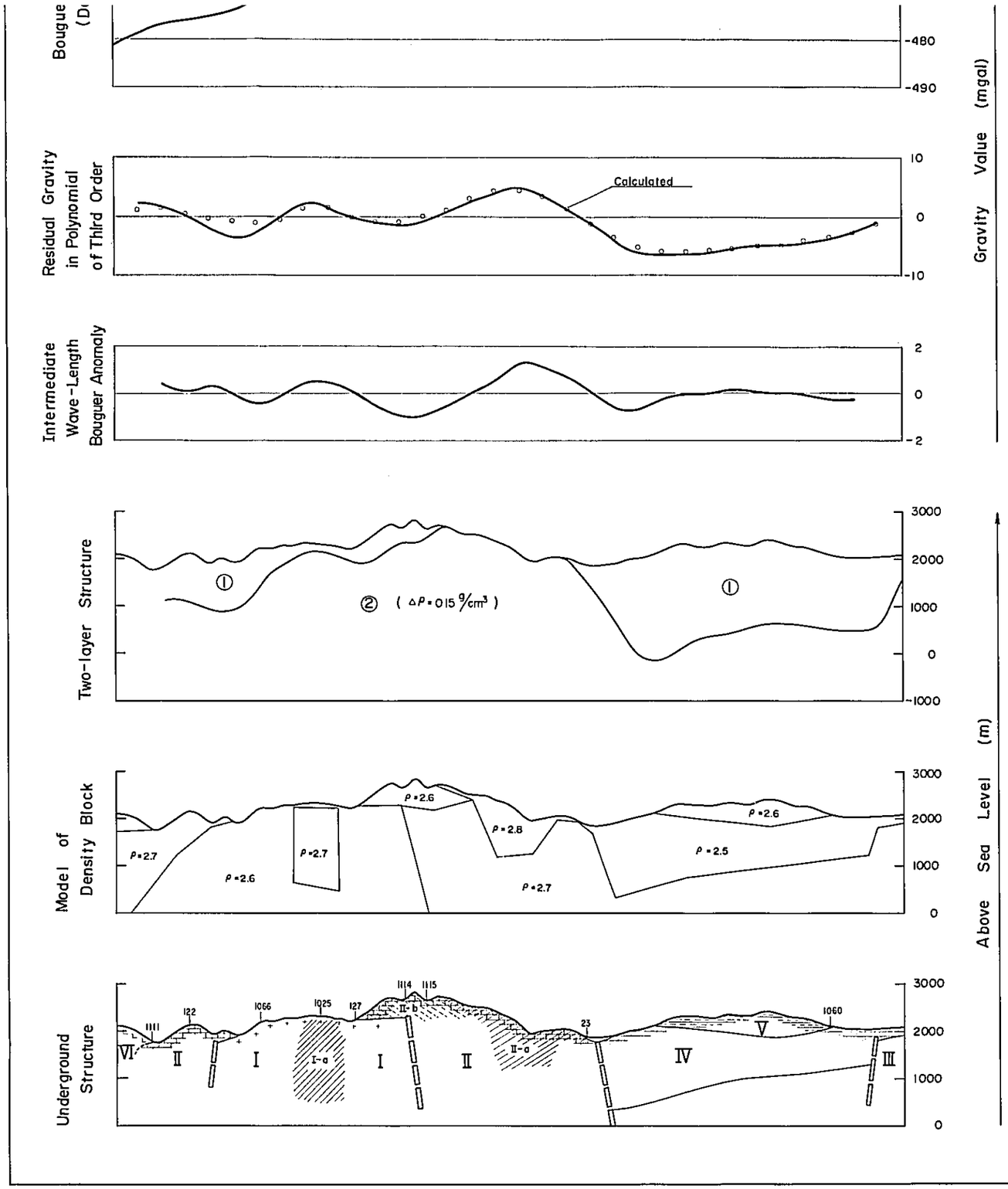
METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1976
prepared by MESCO, INC.

LEGEND

Geology of Ground Surface

- Quaternary
- Merced Formation
- Chonta Group
- Oriente Group
- Pucara Group
- Mitu Group
- Llaupi Volcanics
- Oxapampa Intrusives
- Pusogno Granite

Fault-like Step Structure



SCALE 1:50,000

0 1 2 3 4 km

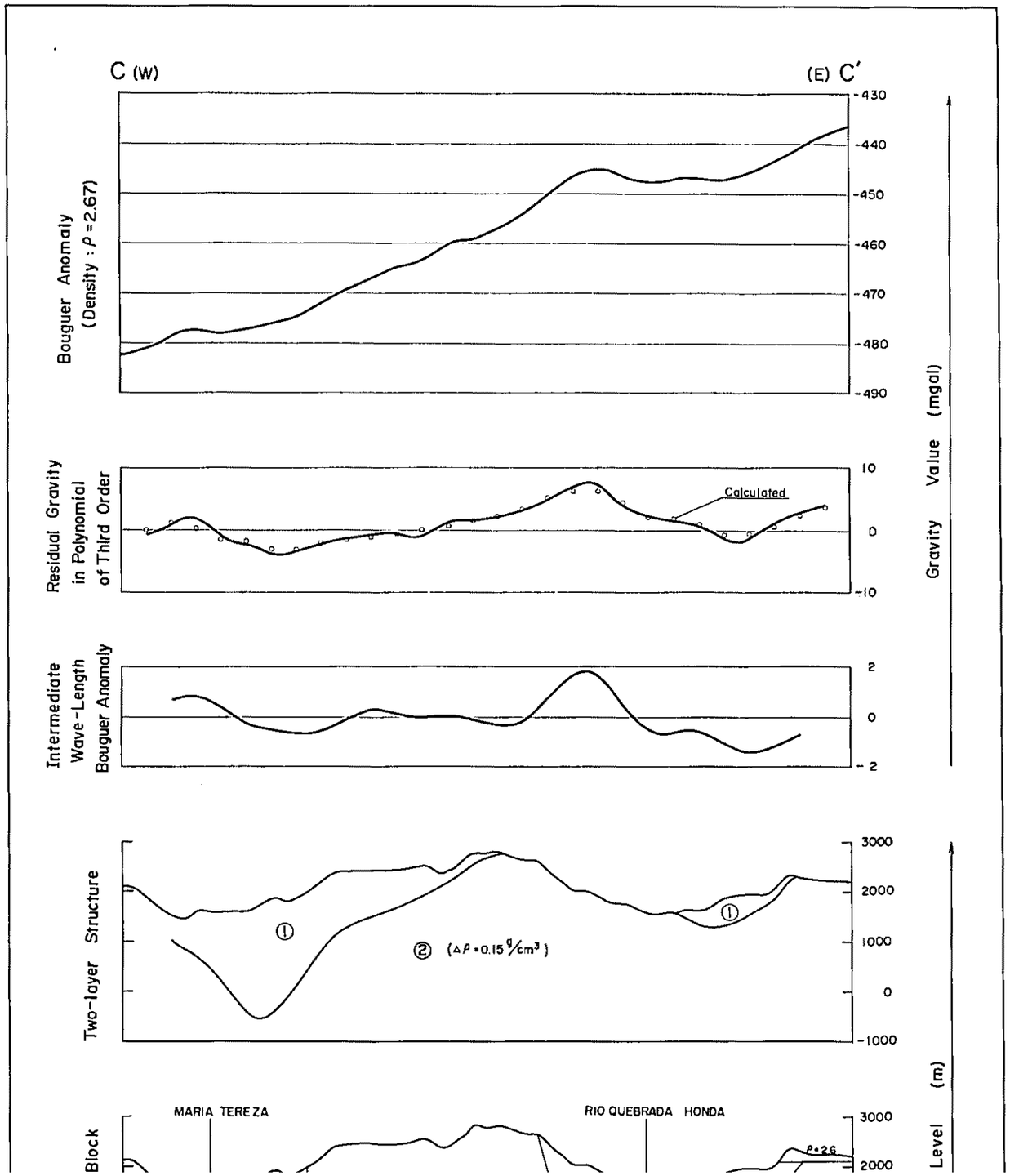
METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, INC.

LEGEND

Geology of Ground Surface

- Quaternary
- Merced Formation
- Chonta Group
- Oriente Group
- Pucara Group
- Mitu Group
- Llaupi Volcanics
- Oxapampa Intrusives
- Pusagno Granite

- Fault-like Step Structure
- High Density Zone
- Low Density Zone
- 308 Location of Station and its Number



PL. II-8

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU

PROFILE OF UNDERGROUND STRUCTURE

C — C'

SCALE 1:50,000

0 1 2 3 4 km

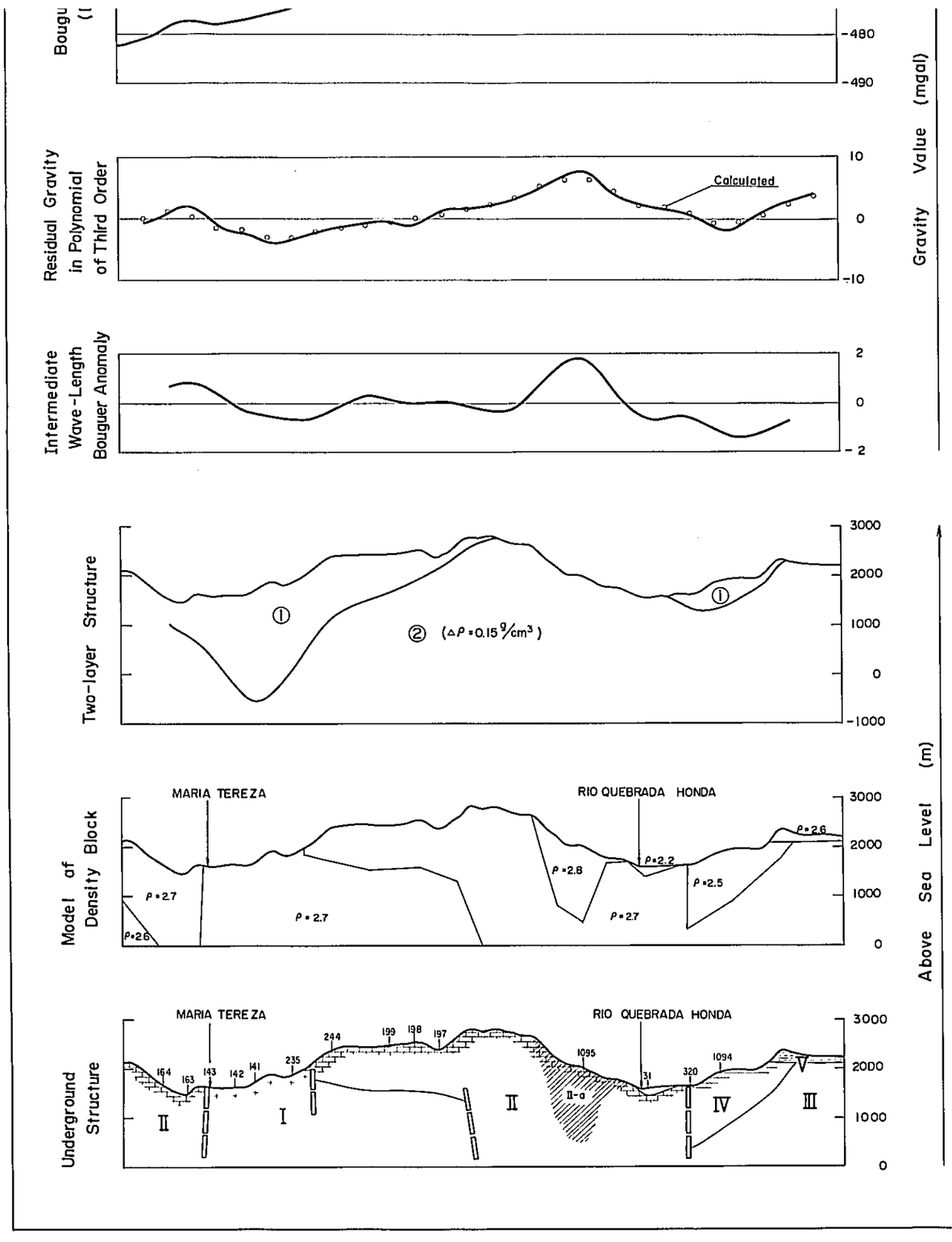
METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, INC.

LEGEND

Geology of Ground Surface

- Quaternary
- Merced Formation
- Chonta Group
- Oriente Group
- Pucara Group
- Mitu Group
- Lloupi Volcanics
- Oxapampa Intrusives
- Pusagno Granite

Fault-like Step Structure



SCALE 1:50,000

0 1 2 3 4 km

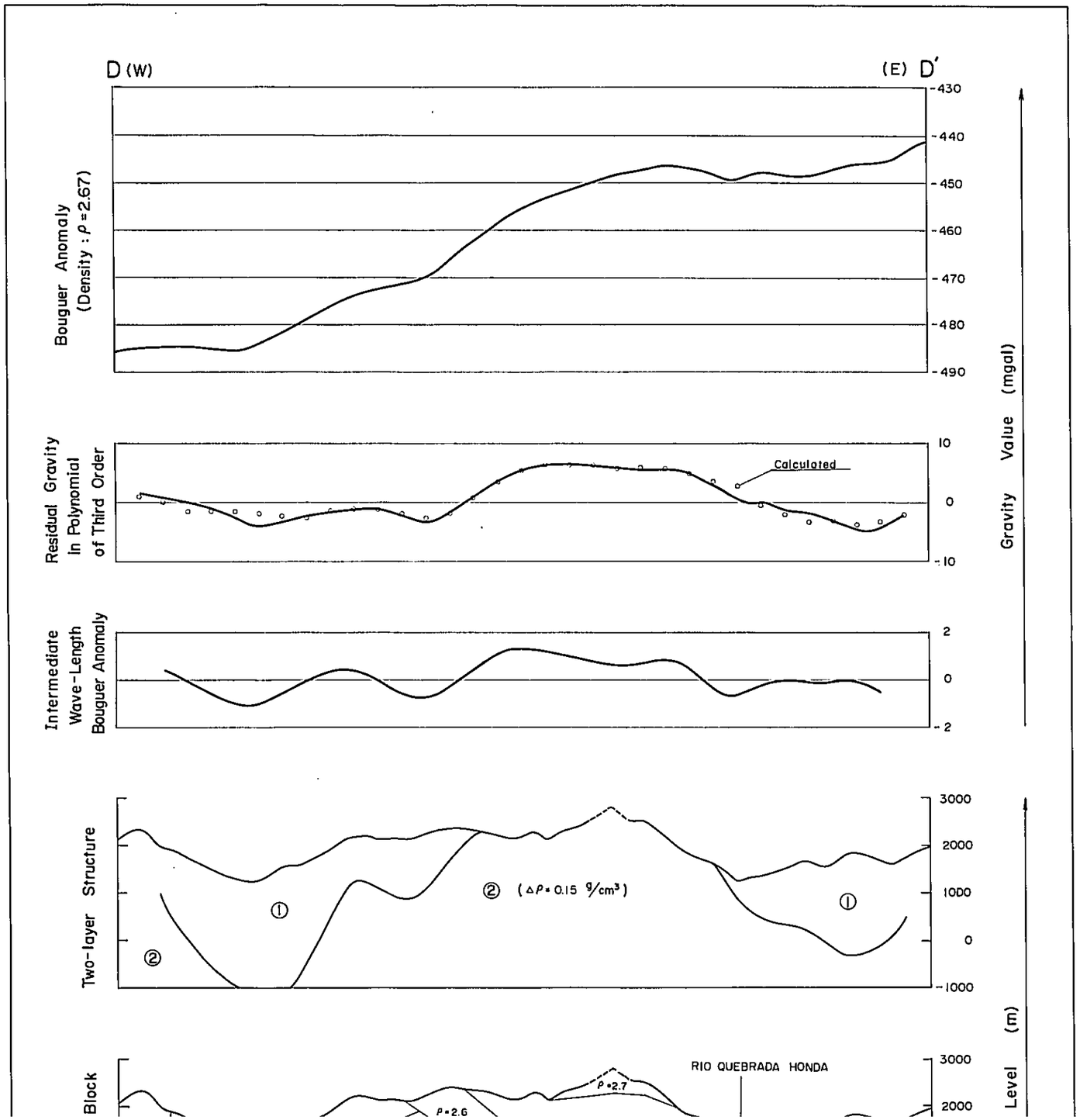
METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, INC.

LEGEND

Geology of Ground Surface

- Quaternary
- Merced Formation
- Chonta Group
- Oriente Group
- Pucara Group
- Mitu Group
- Llaupi Volcanics
- Oxapampa Intrusives
- Pusagno Granite

- Fault-like Step Structure
- High Density Zone
- Low Density Zone
- 308 Location of Station and its Number



PL. II-9

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU

PROFILE OF UNDERGROUND STRUCTURE

D — D'

SCALE 1:50,000

0 1 2 3 4 km

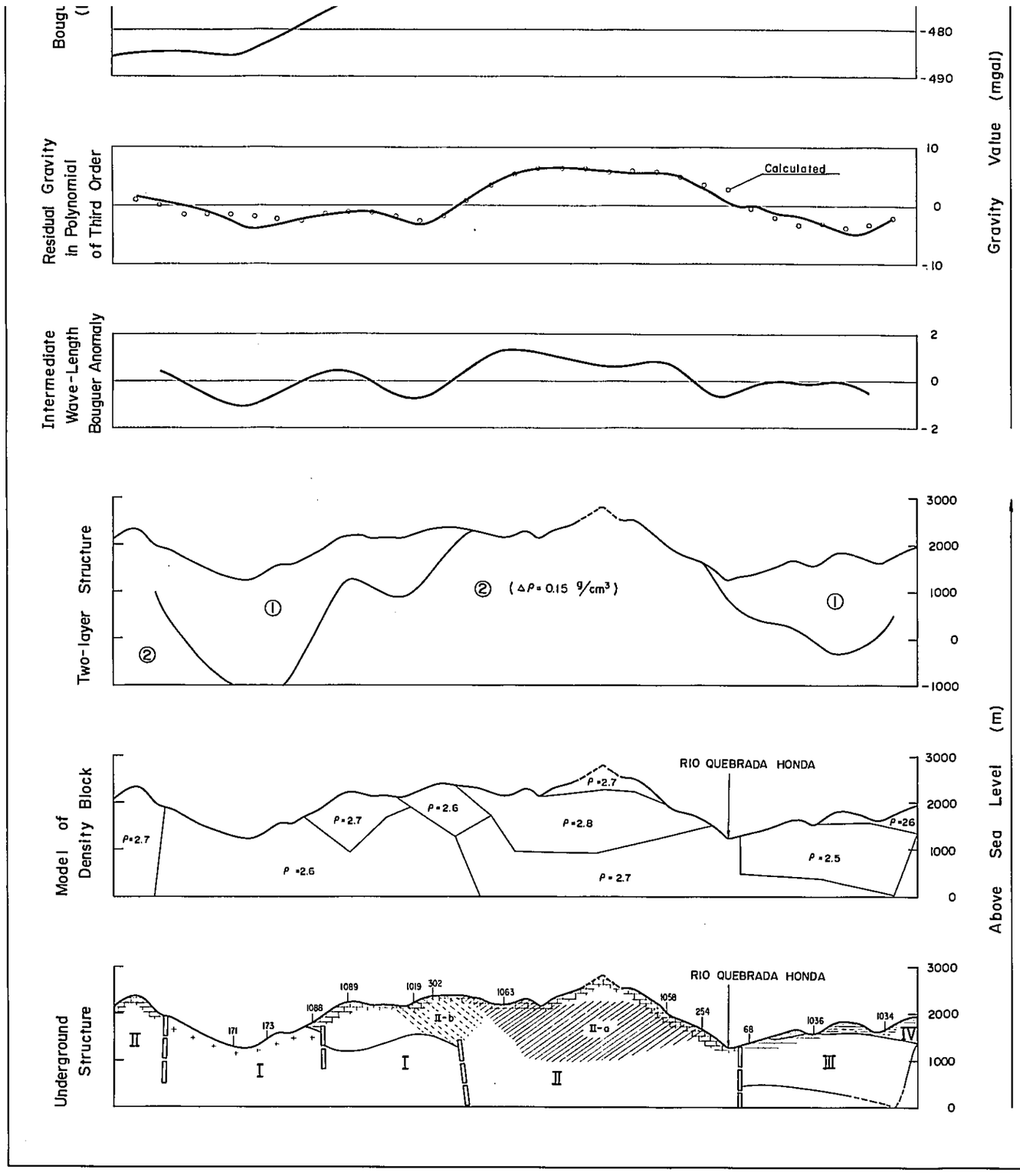
METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, INC.

LEGEND

Geology of Ground Surface

- Quaternary
- Merced Formation
- Chonta Group
- Oriente Group
- Pucara Group
- Mitu Group
- Llaupi Volcanics
- Oxapampa Intrusives
- Pusagno Granite

Fault-like Step Structure



SCALE 1:50,000

0 1 2 3 4 km

METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, INC.

LEGEND

Geology of Ground Surface

- Quaternary
- Merced Formation
- Chonta Group
- Oriente Group
- Pucara Group
- Mitu Group
- Llaupi Volcanics
- Oxapampa Intrusives
- Pusagno Granite

- Fault-like Step Structure
- High Density Zone
- Low Density Zone
- 308 Location of Station and its Number

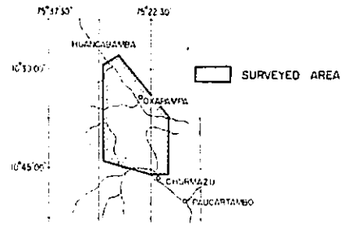
PL. II-10

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU

MAP OF UNDERGROUND STRUCTURE

SCALE 1 : 50,000

LOCALITY INDEX



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, INC.

LEGEND

123 ○ STATION NUMBER AND GRAVITY STATION BY LEVEL

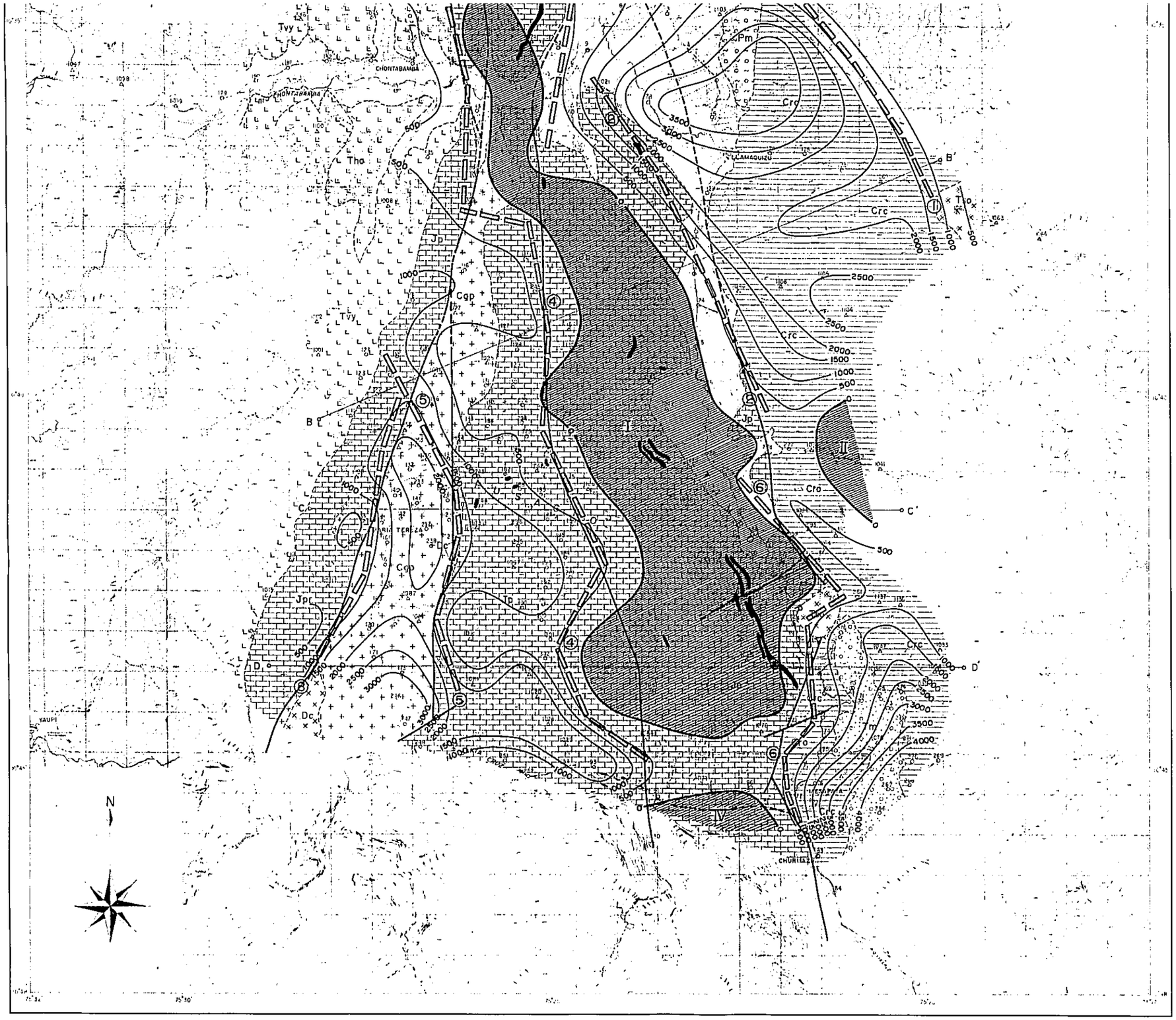
1123 △ STATION NUMBER AND GRAVITY STATION BY ALTIMETER

A ——— A' LINE OF PROFILE

SEDIMENTARY

- QUATERNARY
- Tm — Merced Formation — TERTIARY
- Crc — Chonta Group; Cro — Oriente Group — CRETACEOUS
- Jp — Pucara Group — JURASSIC
- Pm — Mitu Group — PERMIAN

IGNEOUS



LEGEND

- STATION NUMBER AND GRAVITY STATION BY LEVEL
- STATION NUMBER AND GRAVITY STATION BY ALTIMETER
- A——A' LINE OF PROFILE

SEDIMENTARY

- — QUATERNARY
- Tm — Merced Formation — TERTIARY
- Crc — Chonta Group; Cro — Oriente Group — CRETACEOUS
- Jp — Pucara Group — JURASSIC
- Pm — Mitu Group — PERMIAN

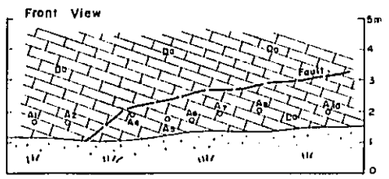
IGNEOUS

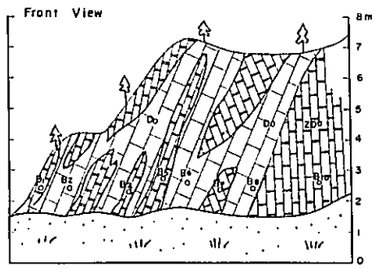
- Tso — Honda Intrusives
- Tvy — Llaupi Volcanics
- Tho — Oxapampa Intrusives
- TERTIARY
- Cgp — Pusagno Granite
- Dc — Diorite Complex
- MESOZOIC ~ PALEOZOIC

- FAULT
- 1000 — DEPTH OF SECOND-LAYER FROM GROUND SURFACE ($\Delta\rho$ = 015 g/cm³ unit = m)
- HIGH DENSITY ZONE
- ⑤ — FAULT-LIKE STEP STRUCTURE
- MINERALIZATION
- ZEBRA DOLOMITE

(a) No. 1 Chontabamba

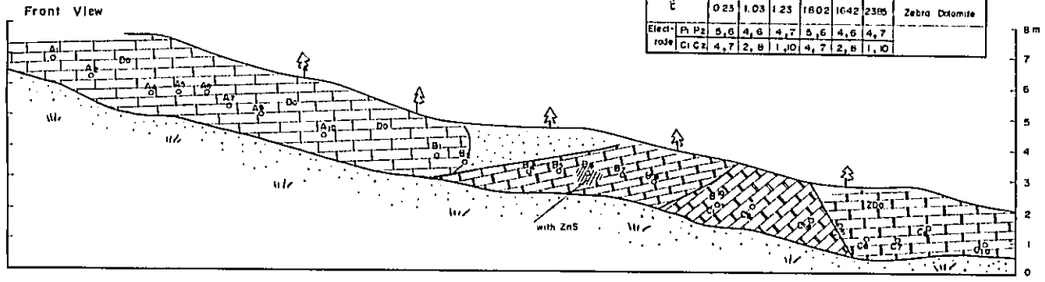
Line	a	F E (%) 1m	2m	3m	Resistivity (Ωm) 1m	2m	3m	Memo
A		027	043	073	2189	4973	6243	Dolomite
B		023	057	073	4023	4129	4510	Zebra Dolomite
Electrode	P1 P2	5,6	4,6	4,7	5,6	4,6	4,7	
	C1 C2	4,7	2,8	1,10	4,7	2,8	1,10	





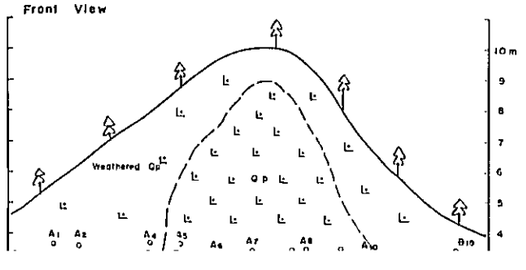
(b) No. 2 Tambo Maria

Line	a	F E (%) 1m	2m	3m	Resistivity (Ωm) 1m	2m	3m	Memo
A		1.30	1.37	0.64	1988	3707	3397	Dolomite
B		0.65	0.93	0.65	2202	2147	1429	Zebra Dolomite with Sphalerite
C		0.23	1.03	1.23	1602	1642	2385	Zebra Dolomite
Electrode	P1 P2	5,6	4,6	4,7	5,6	4,6	4,7	
	C1 C2	4,7	2,8	1,10	4,7	2,8	1,10	



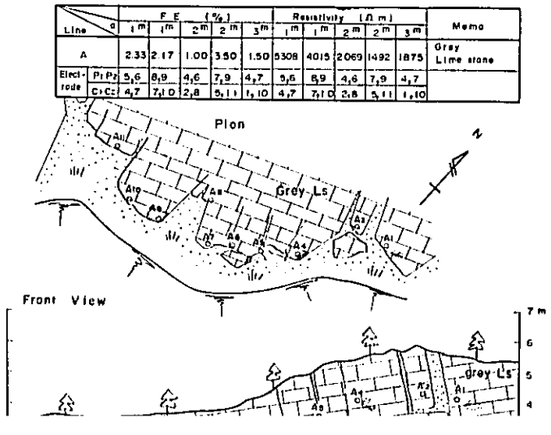
(c) No. 3 San Roque

Line	a	F E (%) 1m	2m	3m	Resistivity (Ωm) 1m	2m	3m	Memo
A		0.83	1.83	2.00	208	162	187	Weathered Quartz Porphyry
B		1.67	0.25	0.25	169	160	204	Weathered QP with Clay
Electrode	P1 P2	5,6	4,6	4,7	5,6	4,6	4,7	
	C1 C2	4,7	2,8	1,10	4,7	2,8	1,10	



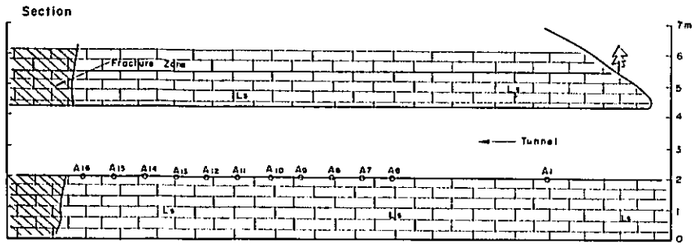
(e) No. 5 San Roque

Line	a	F E (%) 1m	1m	2m	2m	3m	Resistivity (Ωm) 1m	1m	2m	2m	3m	Memo
A		2.33	2.17	1.00	3.50	1.50	5308	4015	2069	1492	1875	Grey Lime stone
Electrode	P1 P2	5,6	6,9	4,6	7,9	4,7	5,6	5,9	4,6	7,9	4,7	
	C1 C2	4,7	7,10	2,8	9,11	1,10	4,7	7,10	2,8	9,11	1,10	



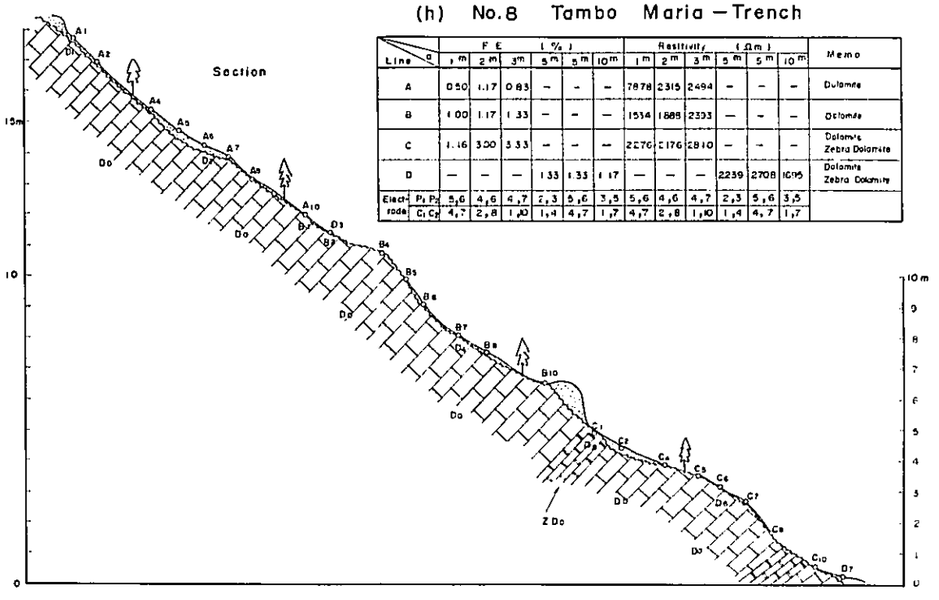
(g) No. 7 Chontabamba -Tunnel

Line	a	F E (%) 1m	2m	3m	5m	Resistivity (Ωm) 1m	2m	3m	5m	Memo
A		2.33	3.00	2.33	2.50	1181	2317	2406	1655	Limestone
Electrode	P1 P2	11,12	10,12	10,13	6,11	11,12	10,12	10,13	6,11	
	C1 C2	10,13	8,14	7,16	1,16	10,13	8,14	7,16	1,16	



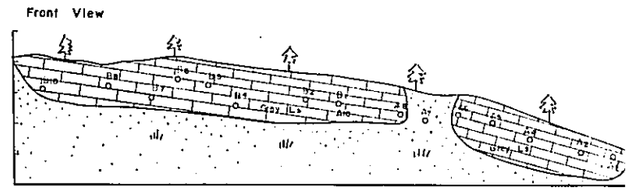
(h) No. 8 Tambo Maria — Trench

Line	a	F E (%) 1m	2m	3m	5m	5m	10m	Resistivity (Ωm) 1m	2m	3m	5m	5m	10m	Memo
A		0.50	1.17	0.83	–	–	–	7878	2315	2494	–	–	–	Dolomite
B		1.00	1.17	1.33	–	–	–	1514	1888	2393	–	–	–	Dolomite
C		1.16	3.00	3.33	–	–	–	2276	2176	2810	–	–	–	Dolomite Zebra Dolomite
D		–	–	–	1.33	1.33	1.17	–	–	–	2239	2708	1095	Dolomite Zebra Dolomite
Electrode	P1 P2	5,6	4,6	4,7	2,3	5,6	3,5	5,6	4,6	4,7	2,3	5,6	3,5	
	C1 C2	4,7	2,8	1,10	1,4	4,7	1,7	4,7	2,8	1,10	1,4	4,7	1,7	



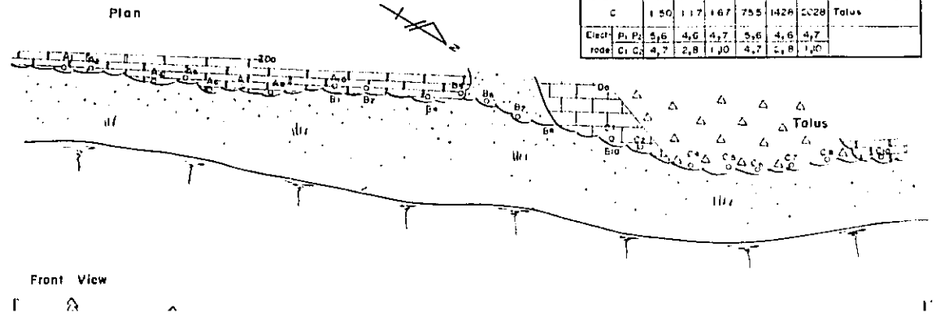
(k) No. 11 San Roque

Line	a	F E (%) 1m	2m	3m	Resistivity (Ωm) 1m	2m	3m	Memo
A		1.40	0.70	1.07	1021	1510	1221	Grey Lime stone
B		0.70	0.85	0.95	3417	1107	809	Grey Lime stone
Electrode	P1 P2	5,6	4,6	4,7	5,6	4,6	4,7	
	C1 C2	4,7	2,8	1,10	4,7	2,8	1,10	



(l) No. 9 Tambo Maria

Line	a	F E (%) 1m	2m	3m	Resistivity (Ωm) 1m	2m	3m	Memo
A		2.67	2.33	1.67	785	1373	1942	Zebra Dolomite
B		2.17	1.50	2.00	442	1237	1910	Zebra Dolomite
C		1.50	1.17	1.67	755	1428	2028	Talus
Electrode	P1 P2	5,6	4,6	4,7	5,6	4,6	4,7	
	C1 C2	4,7	2,8	1,10	4,7	2,8	1,10	



GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU

DETAIL MAP
OF
IP IN-SITU MEASUREMENT

SCALE 1:100

0 2 4 6 8m

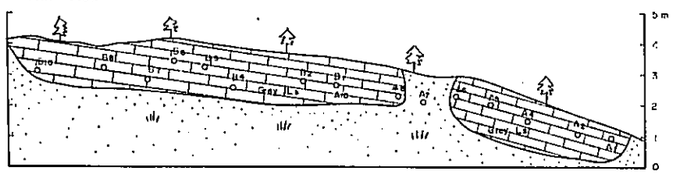
METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

FEBRUARY 1978
prepared by MESCO, INC.

(k) No.11 San Roque

Line	a	FE (%) 1m	2m	3m	Resistivity (Ωm) 1m	2m	3m	Memo
A		1.40	0.70	1.07	1021	1510	1221	Grey Lime stone
B		0.70	0.83	0.95	3437	1107	679	Grey Lime stone
Electrode	P1P2	5,6	4,6	4,7	5,6	4,6	4,7	
	C1C2	4,7	2,8	1,10	4,7	2,8	1,10	

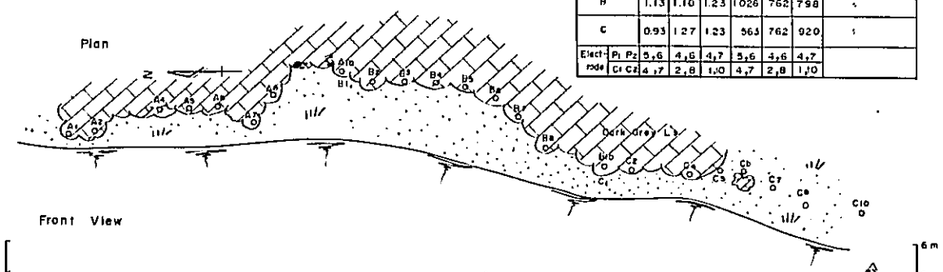
Front View



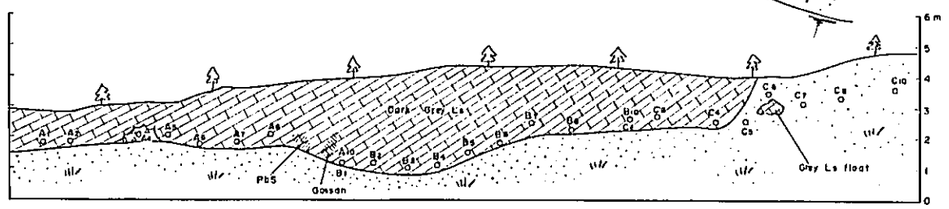
(l) No. 12 San Roque

Line	a	FE (%) 1m	2m	3m	Resistivity (Ωm) 1m	2m	3m	Memo
A		0.70	1.13	1.33	115	564	1072	Dark Grey Ls
B		1.13	1.10	1.23	1026	762	798	〃
C		0.93	1.27	1.23	563	762	920	〃
Electrode	P1P2	5,6	4,6	4,7	5,6	4,6	4,7	
	C1C2	4,7	2,8	1,10	4,7	2,8	1,10	

Plan



Front View



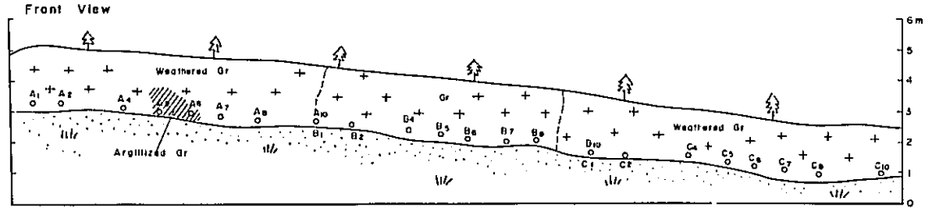
(h) No.8 Tambo Maria — Trench

Line	a	FE (%) 1m	2m	3m	5m	5m	10m	Resistivity (Ωm) 1m	2m	3m	5m	5m	10m	Memo
A		0.50	1.17	0.83	–	–	–	7878	2315	2494	–	–	–	Dolomite
B		1.00	1.17	1.33	–	–	–	1534	1688	2393	–	–	–	Dolomite
C		1.16	3.00	3.33	–	–	–	2276	2176	2810	–	–	–	Dolomite Zebra Dolomite
D		–	–	–	1.33	1.33	1.17	–	–	–	2239	2708	1095	Dolomite Zebra Dolomite
Electrode	P1P2	5,6	4,6	4,7	2,3	5,6	3,5	5,6	4,6	4,7	2,3	5,6	3,5	
	C1C2	4,7	2,8	1,10	1,4	4,7	1,7	4,7	2,8	1,10	1,4	4,7	1,7	

(m) No. 13 Pusagno

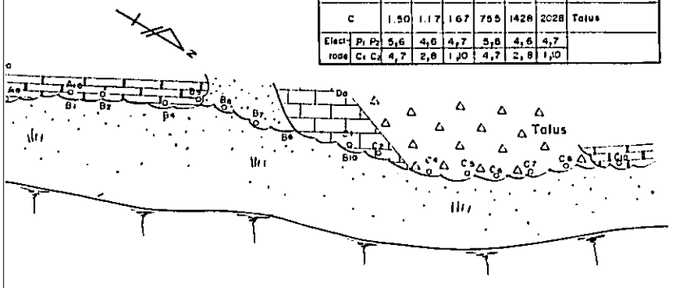
Line	a	FE (%) 1m	2m	3m	Resistivity (Ωm) 1m	2m	3m	Memo
A		2.10	2.00	0.80	1073	1599	1858	Argillized Granite
B		0.20	0.20	0.20	13736	11651	12433	Granite
C		0.20	0.20	0.35	16952	15060	15666	Weathered Granite
Electrode	P1P2	5,6	4,6	4,7	5,6	4,6	4,7	
	C1C2	4,7	2,8	1,10	4,7	2,8	1,10	

Front View



Maria

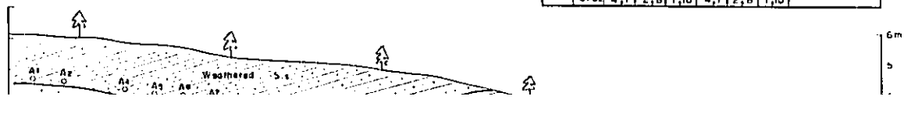
Line	a	FE (%) 1m	2m	3m	Resistivity (Ωm) 1m	2m	3m	Memo
A		2.67	2.33	1.67	785	1373	1942	Zebra Dolomite
B		2.17	1.50	2.00	442	1237	1910	Zebra Dolomite
C		1.50	1.17	1.67	755	1428	2028	Talus
Electrode	P1P2	5,6	4,6	4,7	5,6	4,6	4,7	
	C1C2	4,7	2,8	1,10	4,7	2,8	1,10	



(n) No. 14 Pusagno

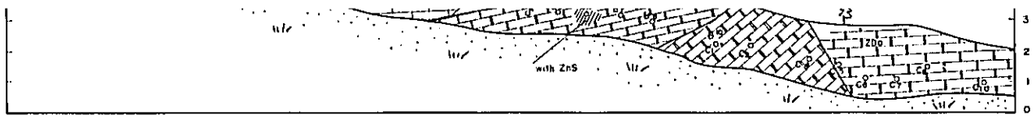
Line	a	FE (%) 1m	2m	3m	Resistivity (Ωm) 1m	2m	3m	Memo
A		1.20	1.40	1.00	2309	2009	2276	Weathered Ss
B		0.40	0.60	0.77	3261	3730	3145	Muddy Ss
C		0.80	1.10	0.97	3634	2738	2214	Weathered Ss
Electrode	P1P2	5,6	4,6	4,7	5,6	4,6	4,7	
	C1C2	4,7	2,8	1,10	4,7	2,8	1,10	

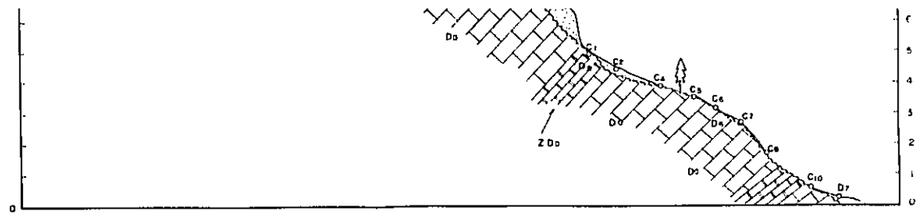
Front View



LEGEND

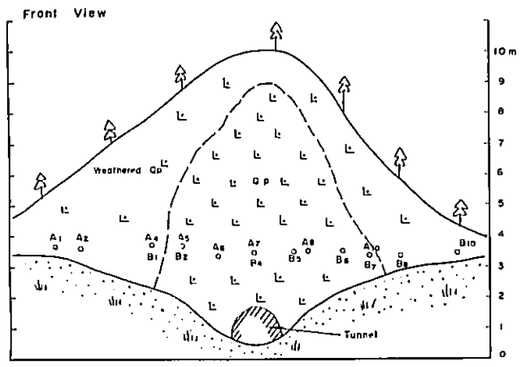
- Soil
- Talus
- Ss — Sandstone
- Ls / Do — Limestone / Dolomite
- ZDo — Zebra Dolomite
- Qp — Quartz Porphyry
- Gr — Granite
- ZnS — Sphalerite
- PbS — Galena
- As / O — Number of Electrode





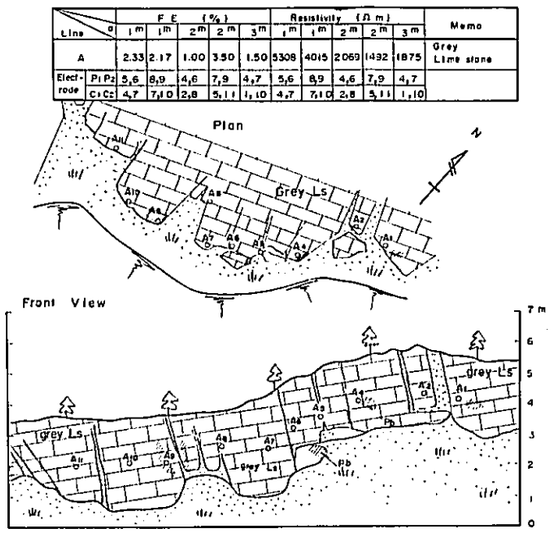
(c) No.3 San Roque

Line		F E (%) 1m	2m	3m	Resistivity (Ωm) 1m	2m	3m	Memo
A		0.83	1.83	2.00	208	162	187	Weathered Quartz Porphyry
B		1.67	0.25	0.25	169	160	204	Weathered Q.P with Clay
Electrode	P1 P2	5,6	4,6	4,7	5,6	4,6	4,7	
	C1 C2	4,7	2,8	1,10	4,7	2,8	1,10	



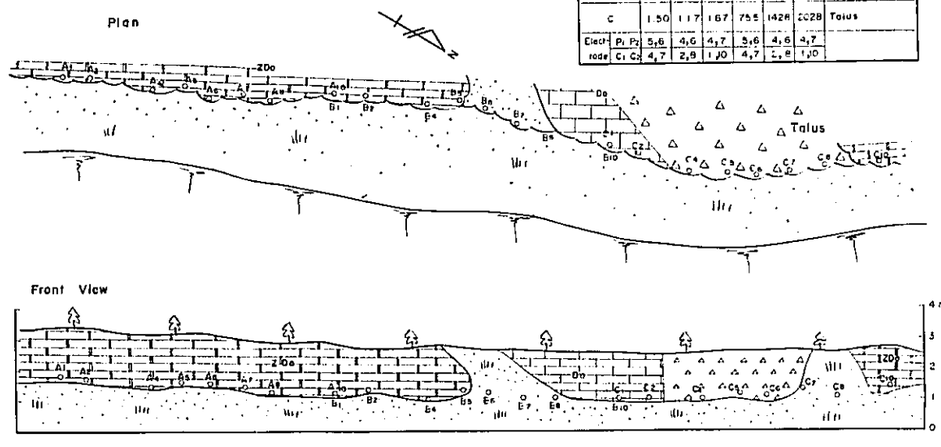
(e) No.5 San Roque

Line		F E (%) 1m	1m	2m	2m	3m	Resistivity (Ωm) 1m	1m	2m	2m	3m	Memo
A		2.33	2.17	1.00	3.50	1.50	5308	4015	2069	1432	1875	Grey Lime stone
Electrode	P1 P2	5,6	8,9	4,6	7,9	4,7	5,6	8,9	4,6	7,9	4,7	
	C1 C2	4,7	7,10	2,8	5,11	1,10	4,7	7,10	2,8	5,11	1,10	



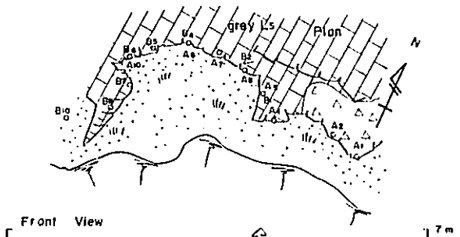
(f) No.1 Tambo Maria

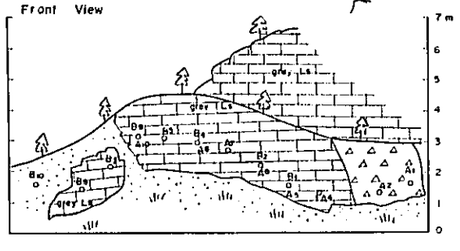
Line		F E (%) 1m	2m	3m	Resistivity (Ωm) 1m	2m	3m	Memo
A		2.67	2.33	1.67	7185	4373	1942	Zebra Dolomite
B		2.17	1.50	2.00	4442	1237	1910	Zebra Dolomite
C		1.50	1.17	1.67	755	1428	2028	Talus
Electrode	P1 P2	5,6	4,6	4,7	5,6	4,6	4,7	
	C1 C2	4,7	2,8	1,10	4,7	2,8	1,10	



(d) No.4 San Roque

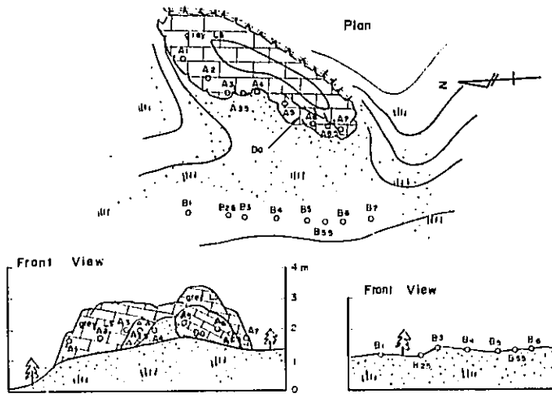
Line		F E (%) 1m	2m	3m	Resistivity (Ωm) 1m	2m	3m	Memo
A		0.50	0.50	0.50	917	570	804	Grey Lime stone
B		2.00	1.67	1.50	489	770	662	Grey Lime stone
Electrode	P1 P2	5,6	4,6	4,7	5,6	4,6	4,7	
	C1 C2	4,7	2,8	1,10	4,7	2,8	1,10	





(f) No.6 Chontabamba

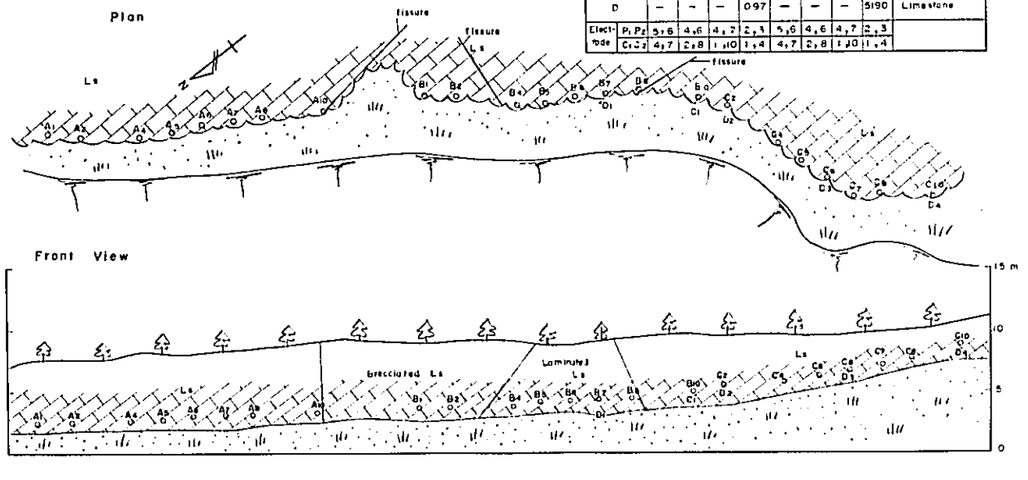
Line		1m	F E (%) 1m	1m	1.5m	1.5m	2m	Resistivity (Ωm) 1m	1m	1m	1m	1.5m	1.5m	2m	Memo
A		–	0.83	1.25	1.33	2.50	–	3.00	2415	2691	1842	2370	1960	–	3269	Lime stone
B		–	–	0.83	–	–	2.33	0.83	–	–	1332	–	–	2484	1659	Soil
Electrode	P1 P2	2,3	3,4	4,5	5,6	35,5	4,55	3,5	2,3	3,4	4,5	5,6	35,5	4,55	3,5	
	C1 C2	1,4	2,5	3,6	4,7	2 ,C1C2 5,7	1,7		1,4	2,5	3,6	4,7	2 ,C1C2 5,7	1,7		

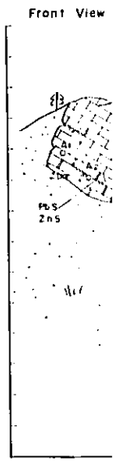


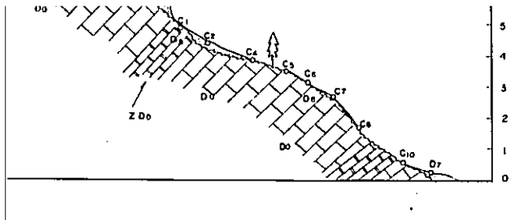
(j) No.10 Pusagno

(scale 1:250)

Line		2.5m	F E (%) 5.0m	7.5m	10m	2.5m	Resistivity (Ωm) 5.0m	7.5m	10m	Memo
A		0.83	0.83	1.07	–	4446	3971	4179	–	Brecciated Ls
B		0.90	1.13	0.87	–	2210	2849	3091	–	Laminated Ls
C		1.00	1.03	0.87	–	1410	1688	3133	–	Limestone
D		–	–	–	0.97	–	–	–	5190	Limestone
Electrode	P1 P2	5,6	4,6	4,7	2,3	5,6	4,6	4,7	2,3	
	C1 C2	4,7	2,8	1,10	1,4	4,7	2,8	1,10	1,4	

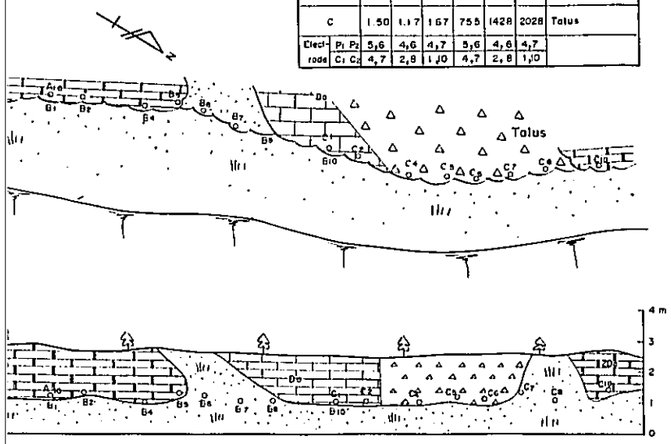


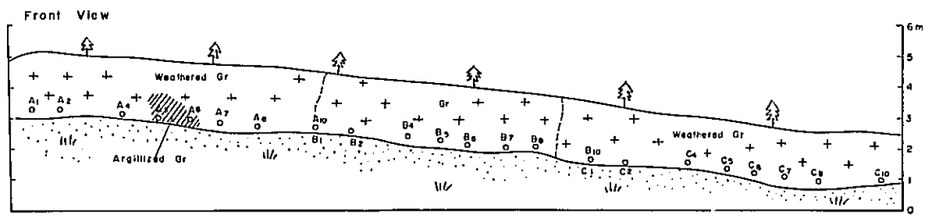




Maria

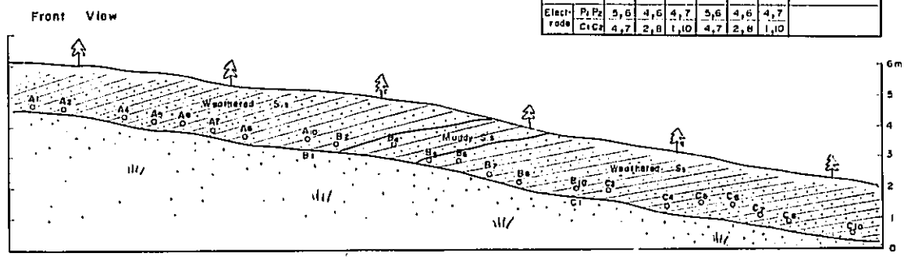
Line	a	F E (%) 1m	2m	3m	Resistivity (Ωm) 1m	2m	3m	Memo
A		2.67	2.33	1.67	785	1373	1942	Zebra Dolomite
B		2.17	1.50	2.00	442	1237	1910	Zebra Dolomite
C		1.50	1.17	1.67	755	1428	2028	Talus
Electrode	P1P2	3,6	4,6	4,7	3,6	4,6	4,7	
	C1C2	4,7	2,8	1,10	4,7	2,8	1,10	





(n) No. 14 Pusagno

Line	a	F E (%) 1m	2m	3m	Resistivity (Ωm) 1m	2m	3m	Memo
A		1.20	1.40	1.00	2309	2009	2276	Weathered Ss
B		0.40	0.60	0.77	3261	3730	3145	Muddy Ss
C		0.80	1.10	0.97	3654	2738	2214	Weathered Ss
Electrode	P1P2	3,6	4,6	4,7	3,6	4,6	4,7	
	C1C2	4,7	2,8	1,10	4,7	2,8	1,10	

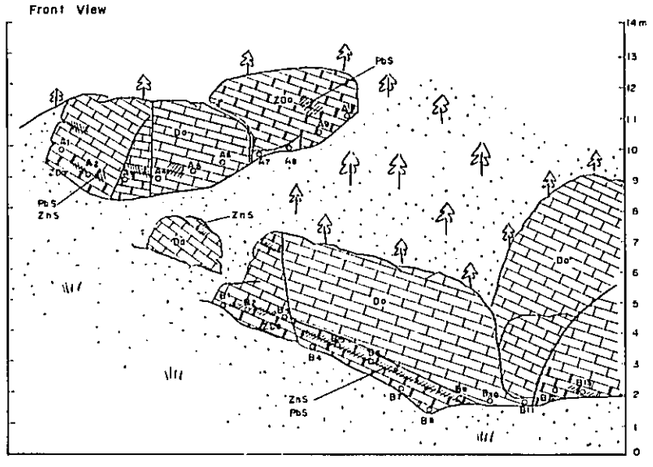


LEGEND

- Soil
- Talus
- Ss — Sandstone
- Ls / Do — Limestone / Dolomite
- ZDo — Zebra Dolomite
- Qp — Quartz Porphyry
- Gr — Granite
- ZnS — Sphalerite
- PbS — Galena
- As — Number of Electrode

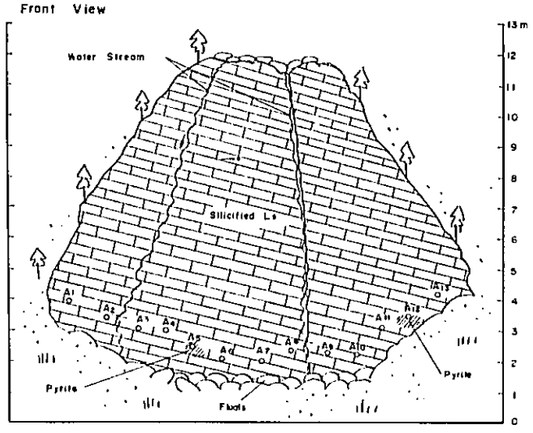
(o) No. 15 San Vicente Mine

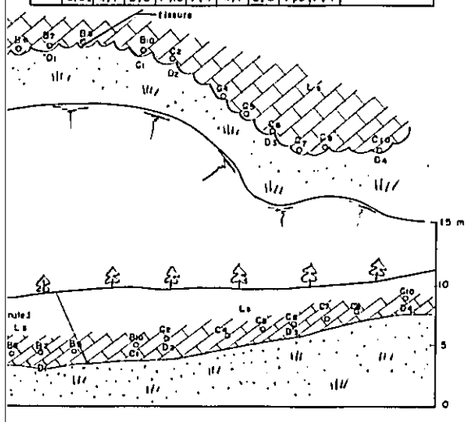
Line	a	F F (%) 1m	2m	3m	4m	Resistivity (Ωm) 1m	2m	3m	4m	Memo
A		0.90	0.90	0.73	—	2868	3087	3496	—	Zebra Dolomite With PbS
B		0.70	0.90	0.43	0.05	3696	2830	4120	5001	Zebra Dolomite With ZnS, PbS
Electrode	P1P2	3,6	4,6	4,7	5,9	3,6	4,6	4,7	5,9	
	C1C2	4,7	2,8	1,10	1,13	4,7	2,8	1,10	1,13	



(p) No. 16 Tambo Maria-Fall

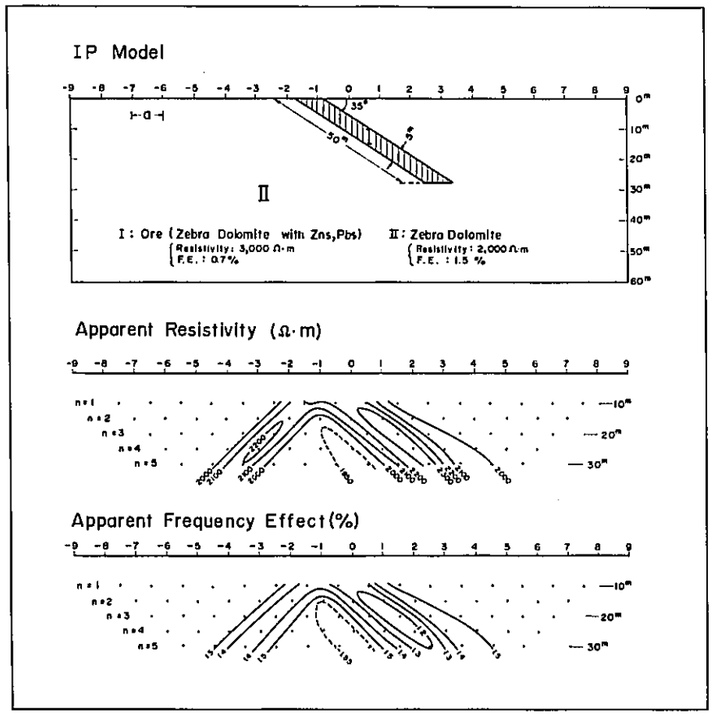
Line	a	F E (%) 1m	1m	2m	3m	Resistivity (Ωm) 1m	1m	2m	3m	Memo
A		1.83	1.47	3.20	2.93	2013	1528	845	1147	Silicified LS With Py
Electrode	P1P2	4,5	11,12	3,5	4,7	4,5	11,12	3,5	4,7	
	C1C2	3,6	10,13	1,7	1,10	3,6	10,13	1,7	1,10	



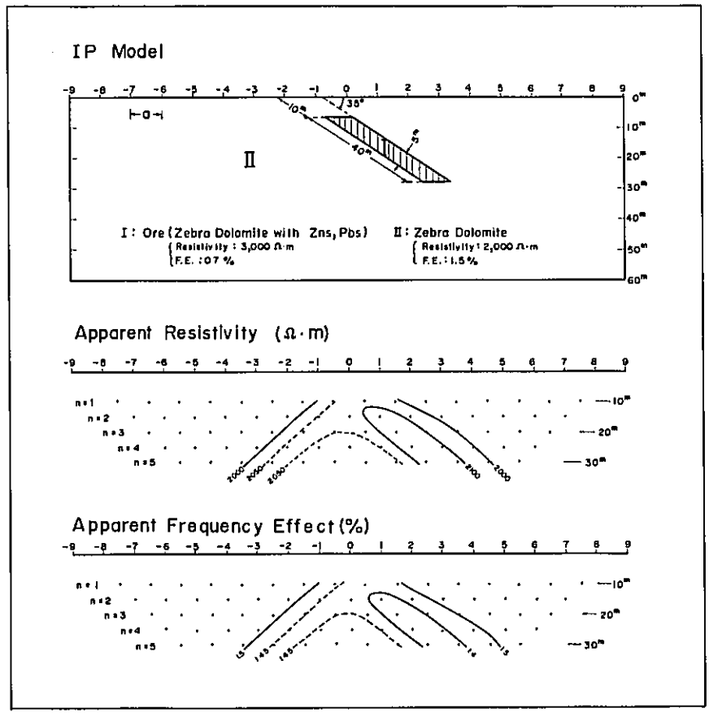


PL. II-12

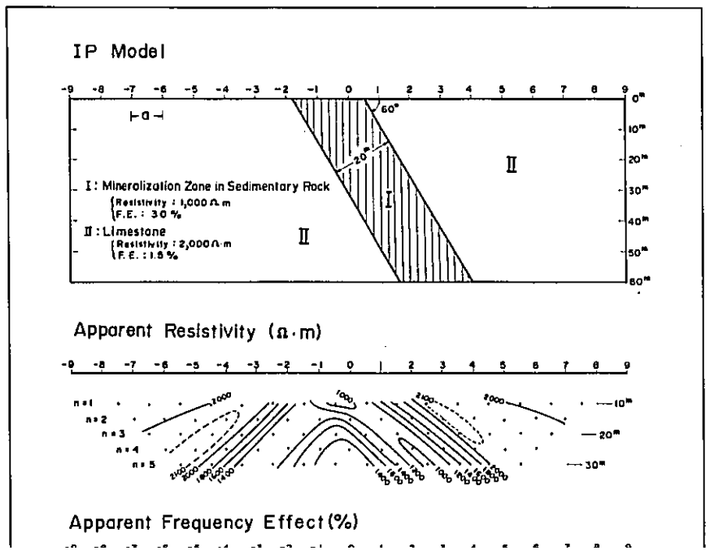
(a) BEDDED DEPOSIT in TAMBO MARIA - (1)



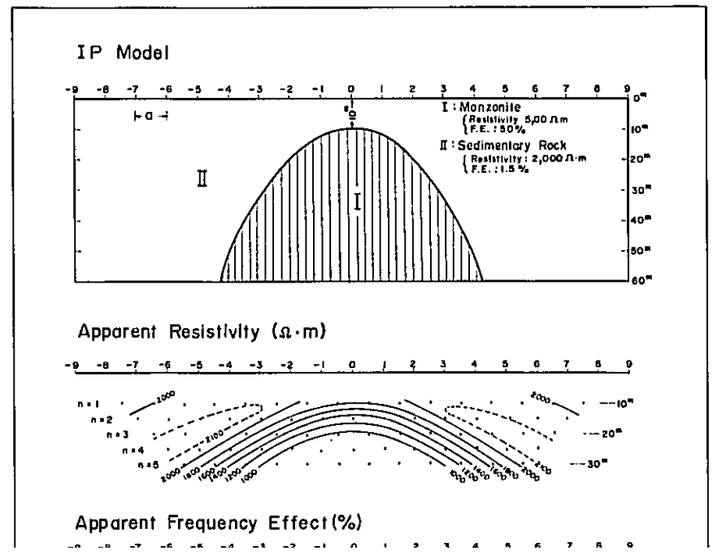
(b) BEDDED DEPOSIT in TAMBO MARIA - (2)



(c) DISSEMINATION ORE DOPOSIT in SAN ROQUE



(d) PORPHYRY COPPER DEPOSIT in TAMBO MARIA



GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL CENTRAL PERU

CALCULATION OF ASSUMED IP MODEL

SCALE 1 : 1,000

0 20 40 60 80m

METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, INC.

LEGEND

Electrode Arroy : Dipole-Dipole

Electrode Interval : a = 10 m

Electrode Separation Factor : n = 1~5

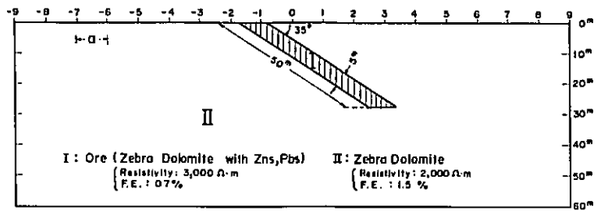
Frequency of Current
- Resistivity : 2.5 Hz
- Frequency Effect : 2.5 - 0.3 Hz

I — Assumed Mineralization Zone

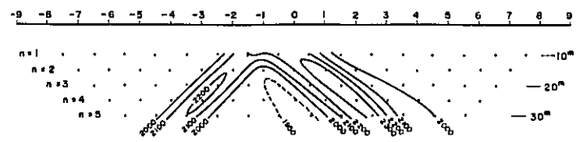
II — Back Ground

5 6 — Position of Electrodes

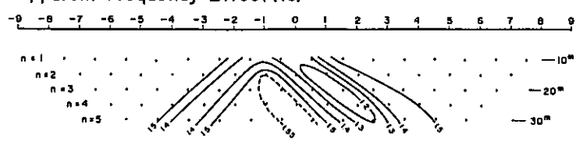
IP Model



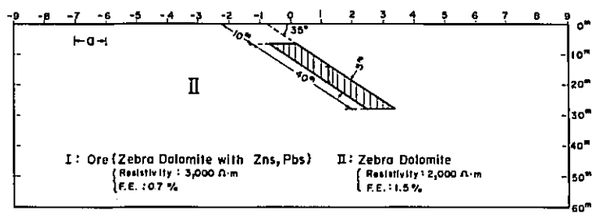
Apparent Resistivity (Ω·m)



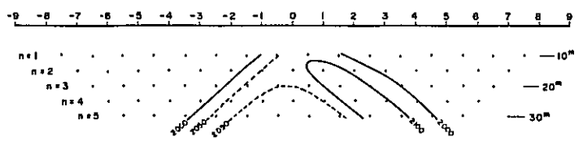
Apparent Frequency Effect (%)



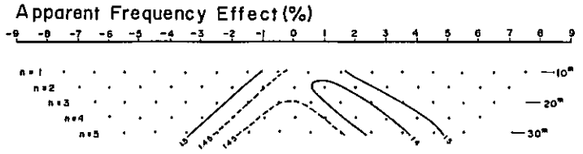
IP Model



Apparent Resistivity (Ω·m)

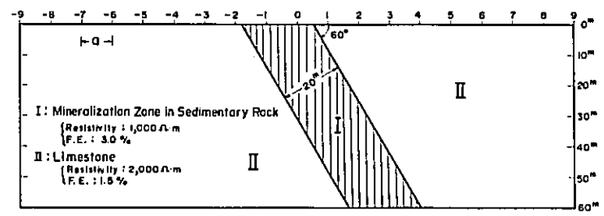


Apparent Frequency Effect (%)

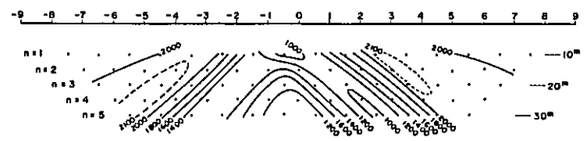


(c) DISSEMINATION ORE DOPOSIT in SAN ROQUE

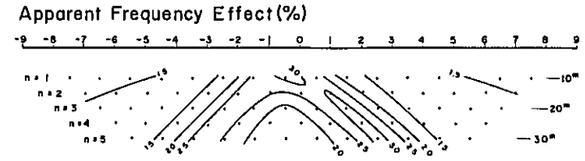
IP Model



Apparent Resistivity (Ω·m)

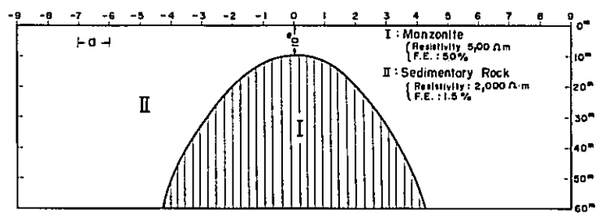


Apparent Frequency Effect (%)

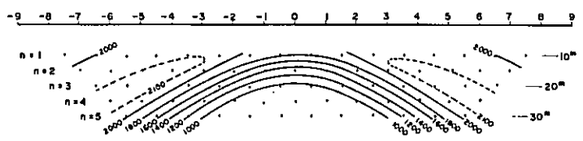


(d) PORPHYRY COPPER DEPOSIT in TAMBO MARIA

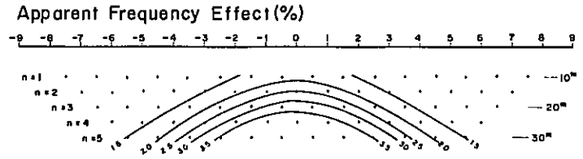
IP Model



Apparent Resistivity (Ω·m)



Apparent Frequency Effect (%)



THE CORDILLERA ORIENTAL CENTRAL PERU

CALCULATION OF ASSUMED IP MODEL

SCALE 1 : 1,000

0 20 40 60 80m

METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN
FEBRUARY 1978
prepared by MESCO, INC.

LEGEND

Electrode Array : Dipole-Dipole

Electrode Interval : a = 10 m

Electrode Separation Factor : n = 1~5

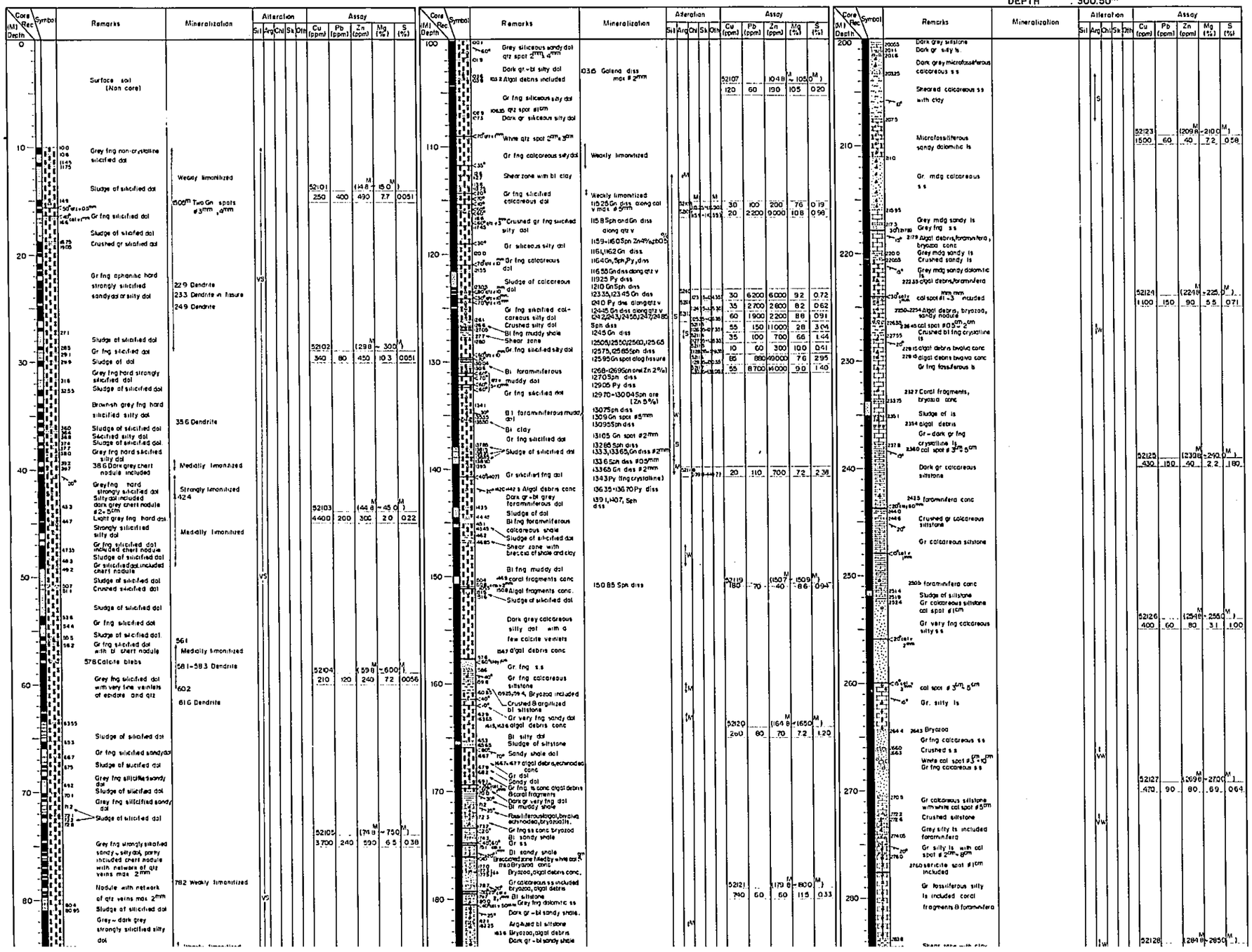
Frequency of Current
- Resistivity : 2.5 Hz
- Frequency Effect : 2.5 — 0.3 Hz

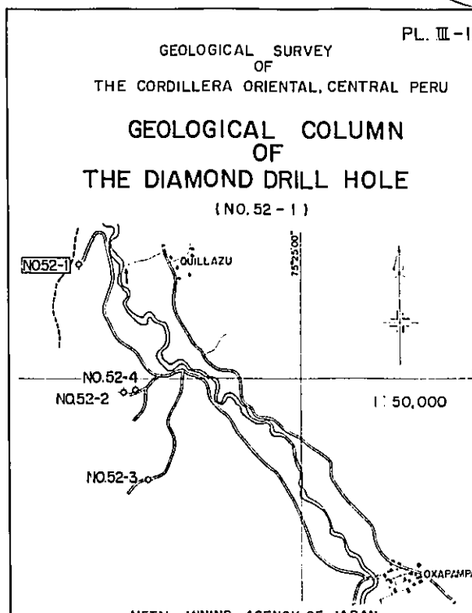
I — Assumed Mineralization Zone

II — Back Ground

5 6 — Position of Electrodes

HOLE NUMBER: NO.52-1
COORDINATE : 8836.500N, 450.910E
ELEVATION : 1870m
DIRECTION : —
INCLINATION: -90°
DEPTH : 300.50m





PL. III-1.(1)

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL, CENTRAL PERU

GEOLOGICAL COLUMN OF THE DIAMOND DRILL HOLE

(NO. 52 - 1)

METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

FEBRUARY 1978

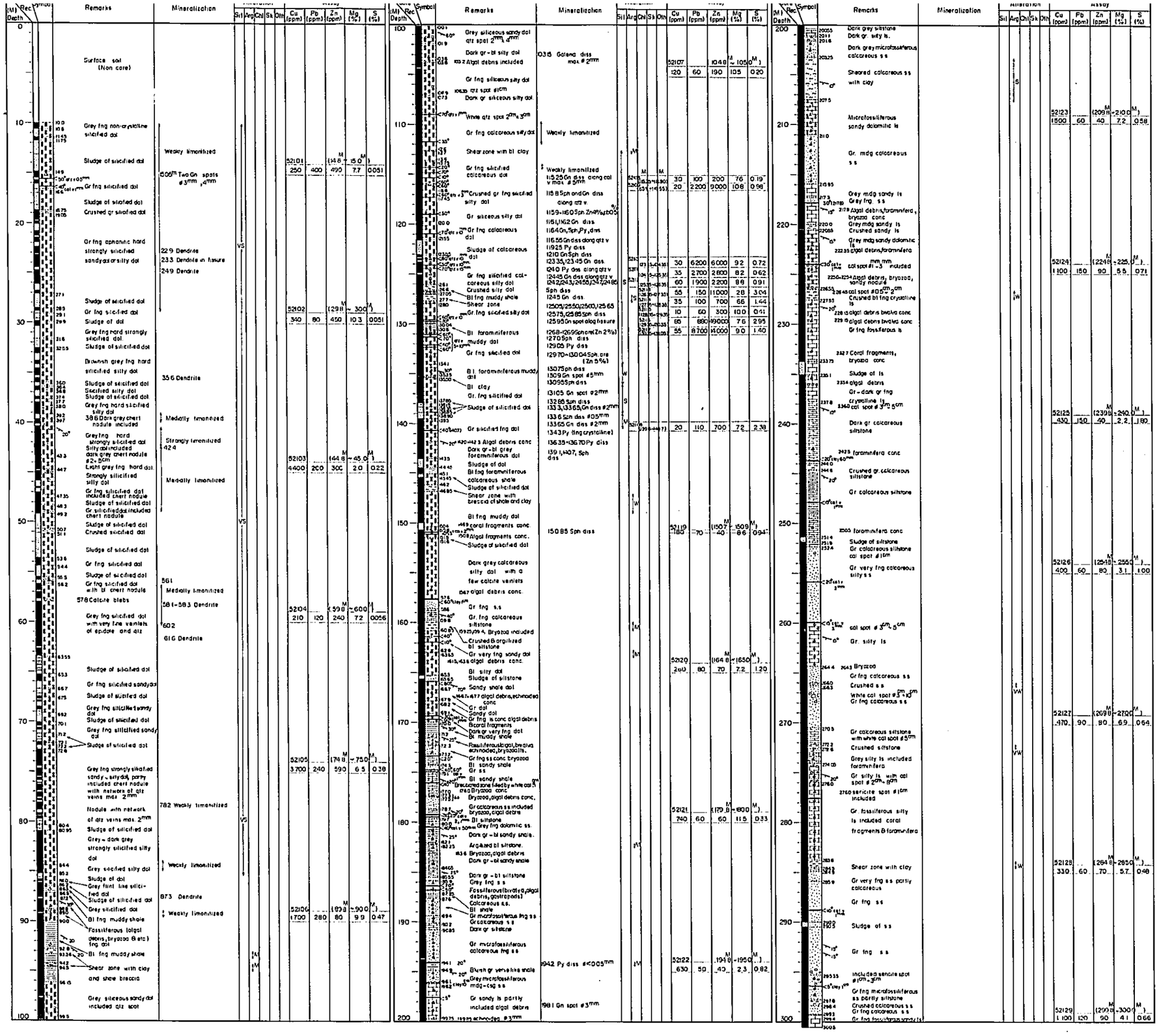
prepared by MESCO, Inc.

LEGEND

Core rec ····· Core recovery
- Recovered
- Sludge
- Lost

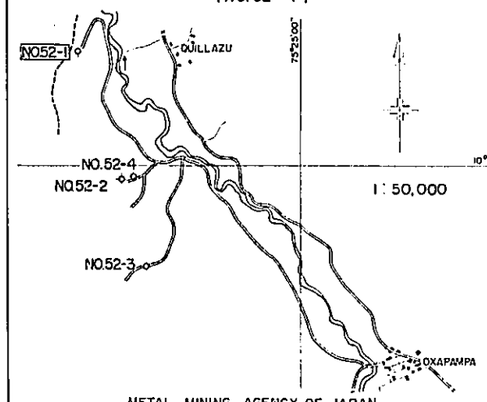
Symbol ····· Symbol of rocks
- LIMESTONE
- DOLOMITIC LIMESTONE
- DOLOMITE
- SANDSTONE
- SANDY SHALE
- SHALE
- VOLCANIC BRECCIA OR VOLCANIC CONGLOMERATE
- QUARTZ PORPHYRY
- SHEAR ZONE OR CRUSHED ZONE
- FOSSIL
- MINERALIZATION
- <30° ANGLE OF THE VEIN TO THE CORE DIRECTION
- 20° STRUCTURE TO THE CORE DIRECTION
- DRUSE
- SPOT, BLEB OR POD

Remarks ····· Bl : Black, Gr : Grey, fng : fine grained, mdg : medium grained, csg : coarse grained, qtz : quartz, cal : calcite, v : vein, ss : sandstone, ls : limestone, vol : volcanic, cgl : conglomerate, por : porphyry



GEOLOGICAL COLUMN OF THE DIAMOND DRILL HOLE

(NO. 52 - 1)



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

FEBRUARY 1978

prepared by MESCO, Inc.

LEGEND

Core rec ····· Core recovery
- ■ Recoverd
- □ Sludge
- □ Lost

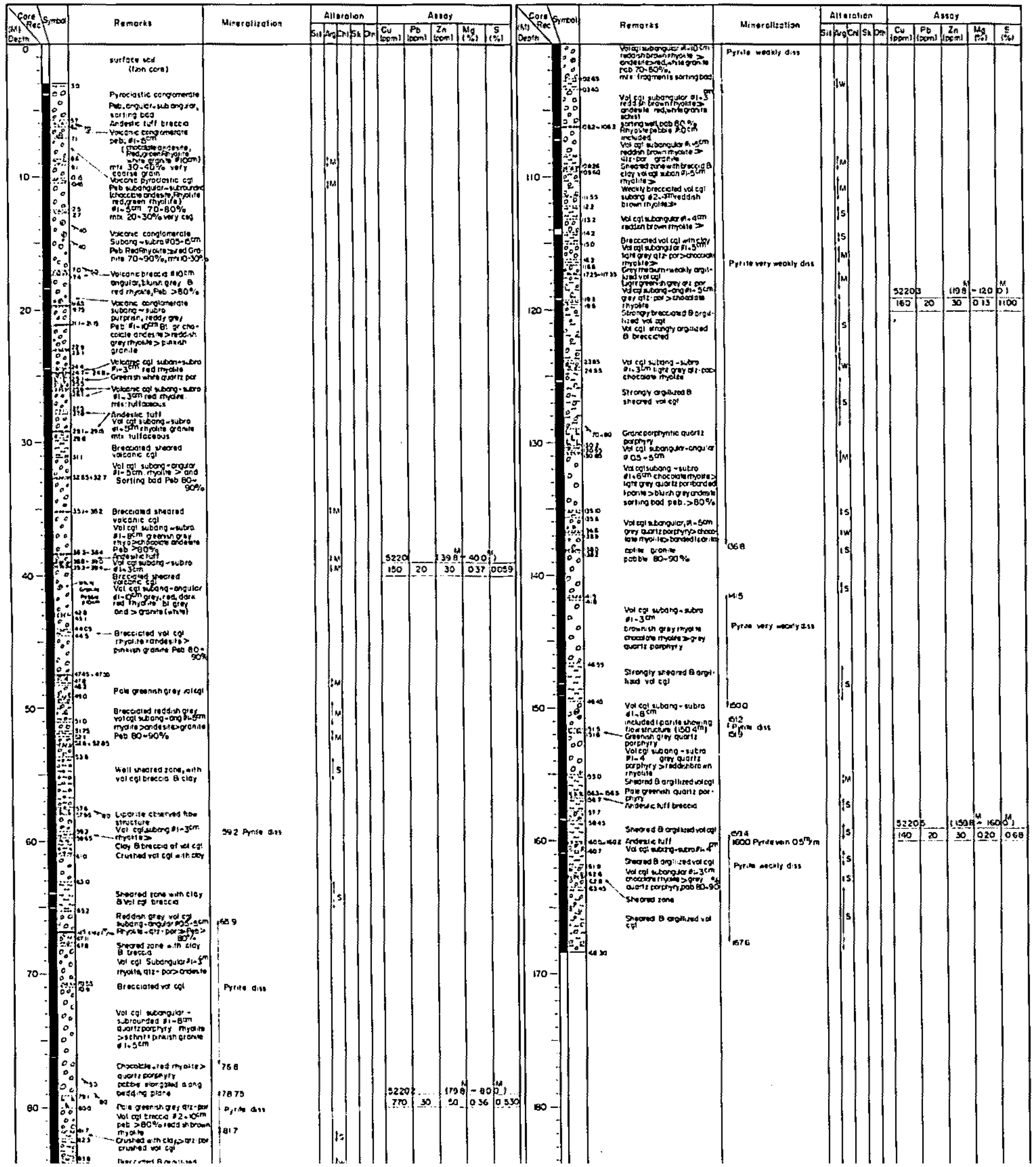
Symbol ····· Symbol of rocks
- LIMESTONE
- DOLOMITIC LIMESTONE
- DOLOMITE
- SANDSTONE
- SANDY SHALE
- SHALE
- VOLCANIC BRECCIA OR VOLCANIC CONGLOMERATE
- QUARTZ PORPHYRY
- SHEAR ZONE OR CRUSHED ZONE
- FOSSIL
- MINERALIZATION
- <30° ANGLE OF THE VEIN TO THE CORE DIRECTION
- 30° STRUCTURE TO THE CORE DIRECTION
- DRUSE
- SPOT, BLEB OR POD

Remarks ····· Bl : Black; Gr : Grey; fng : fine grained; mdg : medium grained; csg : coarse grained; conc. concentrated; mix : matrix; qtz : quartz; cal : calcite; v : vein; ss : sandstone; ls : limestone; max. maximum; peb : pebble; vol : volcanic; cgl : conglomerate; por : porphyry

Alteration ····· Sil : Silicification; Arg : Argillization; Chl : Chlorinization; Sk : Skarnization; Oth : Other alteration; VS : very strong; S : strong; M : medium; W : weak; VW : very weak

Mineralization ····· Sph : Sphalerite; Py : Pyrite; Gn : Galena; diss : disseminated

HOLE NUMBER : NO.52-2
COORDINATE : 8834.^{440} N, 451.^{520} E
ELEVATION : 1950^{m}
DIRECTION : —
INCLINATION : -90°
DEPTH : 168.3^{m}

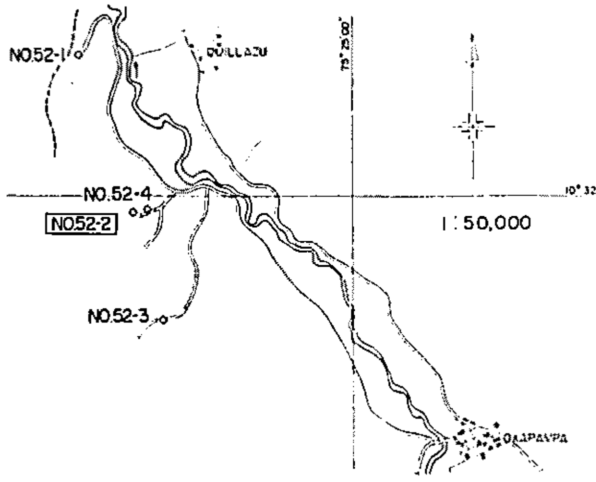


PL. III -1.(2)

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL, CENTRAL PERU

GEOLOGICAL COLUMN OF THE DIAMOND DRILL HOLE

(NO. 52 - 2)



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

FEBRUARY 1978

prepared by MESCO, Inc

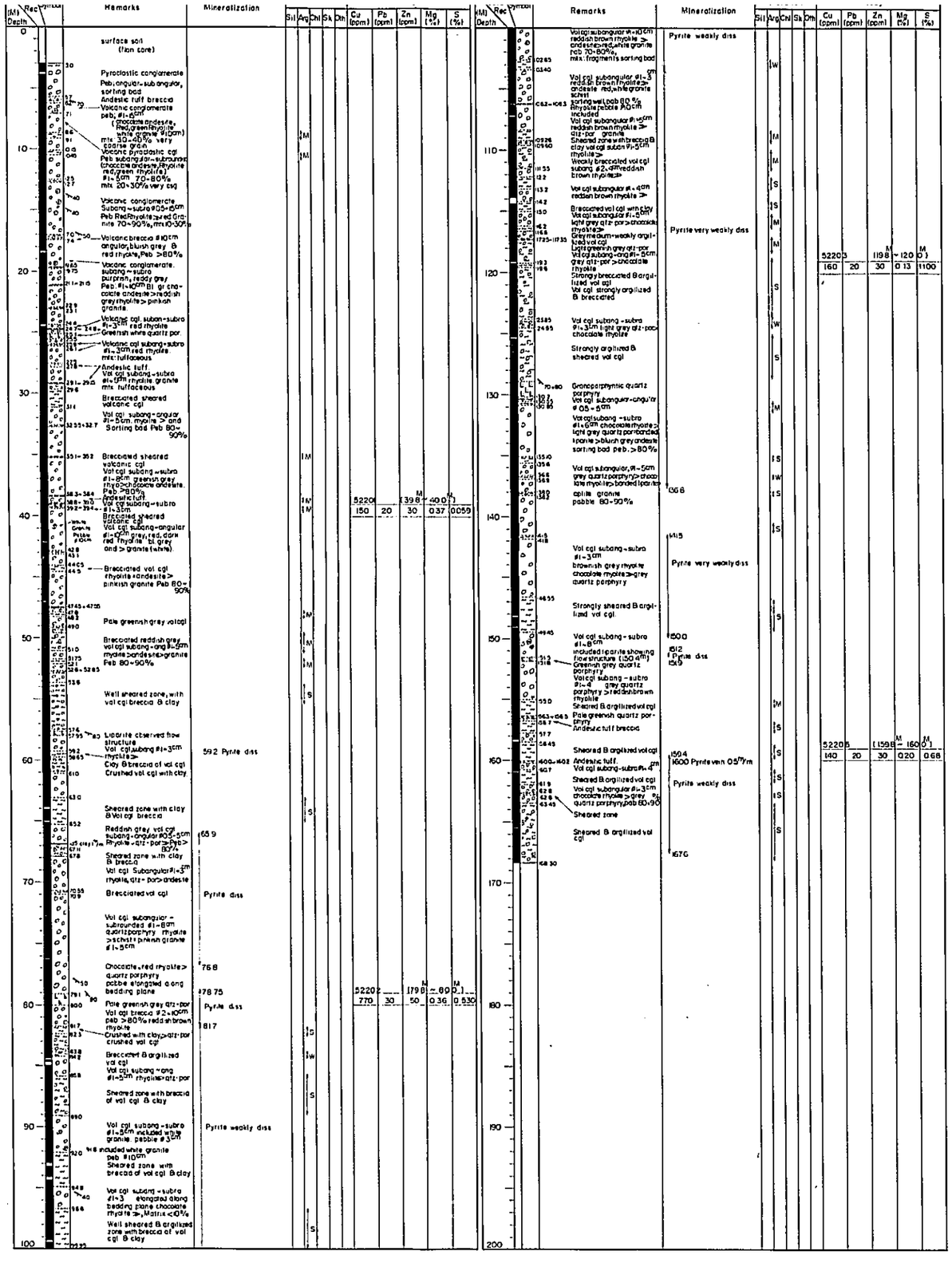
LEGEND

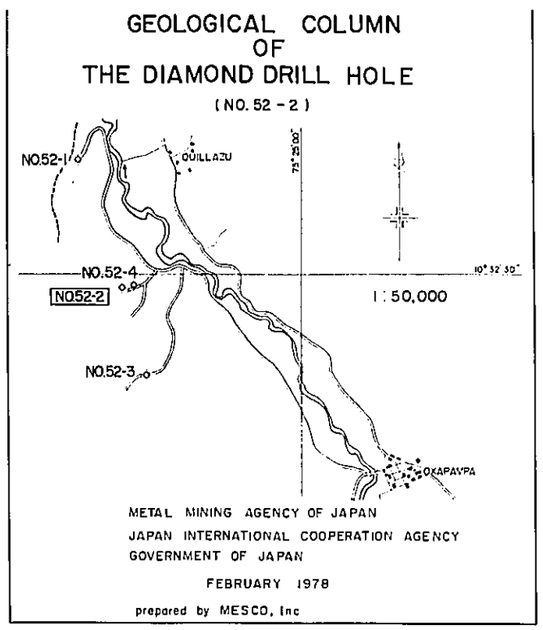
Core rec ············ Core recovery
█ Recoverd
▯ Sludge
▯ Lost

Symbol ············ Symbol of rocks
▦ LIMESTONE
▦ DOLOMITIC LIMESTONE
▦ DOLOMITE
▦ SANDSTONE
▦ SANDY SHALE
▦ SHALE
▦ VOLCANIC BRECCIA OR VOLCANIC CONGLOMERATE
▦ QUARTZ PORPHYRY
▦ SHEAR ZONE OR CRUSHED ZONE
♁ FOSSIL
△ MINERALIZATION
∢ ANGLE OF THE VEIN TO THE CORE DIRECTION
↘ STRUCTURE TO THE CORE DIRECTION
○ DRUSE
○ SPOT, BLEB OR POD

Remarks ·······

Bl	Black	qtz	quartz	vol	volcanic
Gr	Grey	cal	calcite	cgl	conglomerate
fng	fine grained	v	vein	por	porphyry
mdg	medium grained	ss	sandstone		
csg	coarse grained	ls	limestone		





LEGEND

Core rec ····· Core recovery
- Recoverd
- Sludge
- Lost

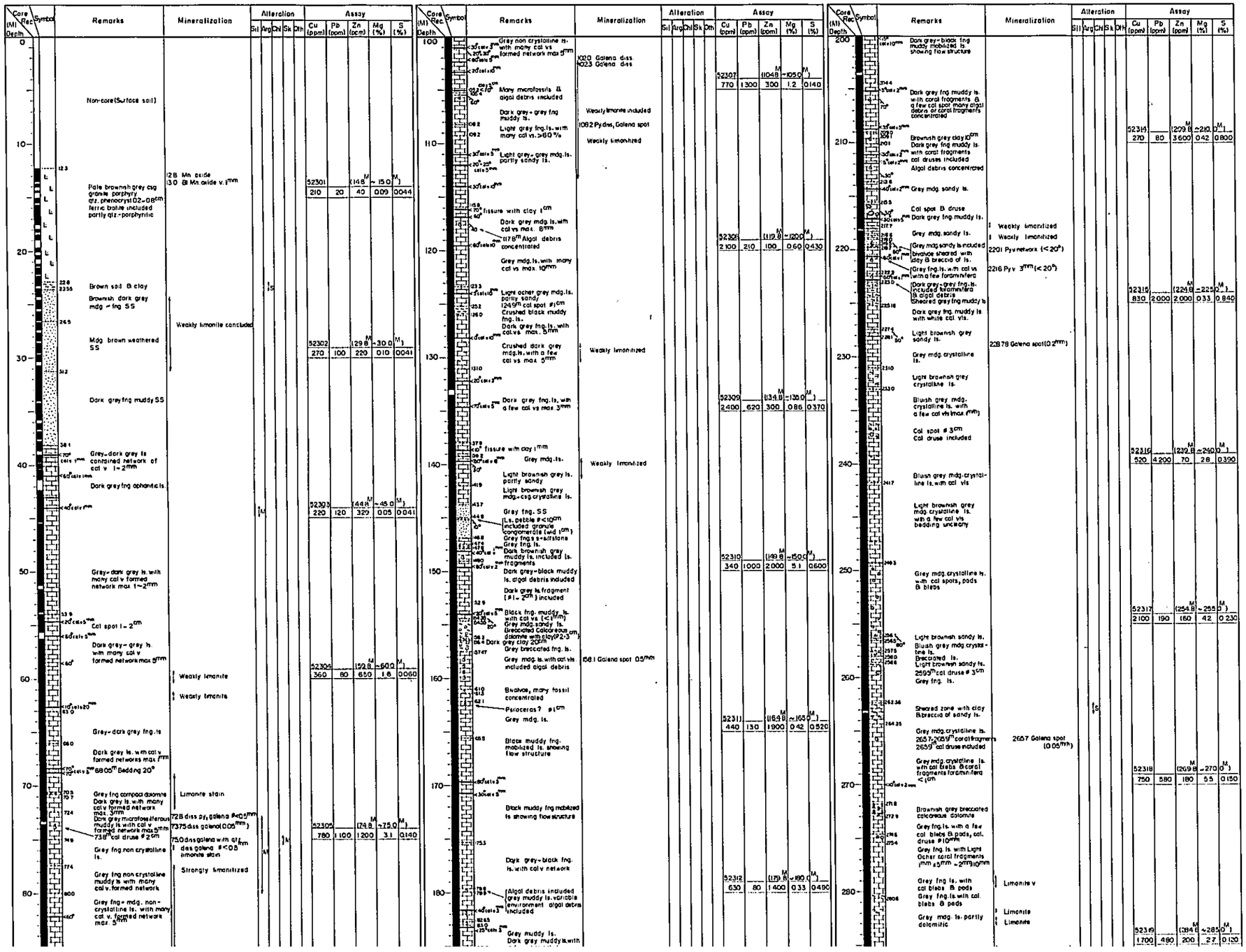
Symbol ····· Symbol of rocks
- LIMESTONE
- DOLOMITIC LIMESTONE
- DOLOMITE
- SANDSTONE
- SANDY SHALE
- SHALE
- VOLCANIC BRECCIA OR VOLCANIC CONGLOMERATE
- QUARTZ PORPHYRY
- SHEAR ZONE OR CRUSHED ZONE
- FOSSIL
- MINERALIZATION
- ANGLE OF THE VEIN TO THE CORE DIRECTION
- STRUCTURE TO THE CORE DIRECTION
- DRUSE
- SPOT, BLEB OR POD

Remarks ····· Bl : Black; Gr : Grey; fng : fine grained; mdg : medium grained; csg : coarse grained; conc : concentrated; mtx : matrix; qtz : quartz; cal : calcite; v : vein; ss : sandstone; ls : limestone; max : maximum; peb : pebble; vol : volcanic; cgl : conglomerate; por : porphyry

Alteration ····· Sil : Silicification; Arg : Argillization; Chl : Chloritization; Sk : Skarnization; Dm : Other alteration; VS : very strong; S : strong; M : modium; W : weak; VW : very weak

Mineralization ····· Sph. : Sphalerite; Gn : Galena; Py : Pyrite; diss. : disseminated

HOLE NUMBER: NO 52 - 3
COORDINATE : 8833.020N, 451.890E
ELEVATION : 2012m
DIRECTION : ——
INCLINATION : -90°
DEPTH : 300.00m

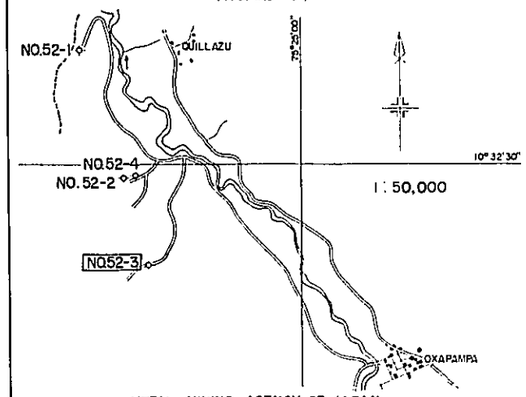


PL. III-1.(3)

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL, CENTRAL PERU

GEOLOGICAL COLUMN OF THE DIAMOND DRILL HOLE

(NO. 52 - 3)



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

FEBRUARY 1978

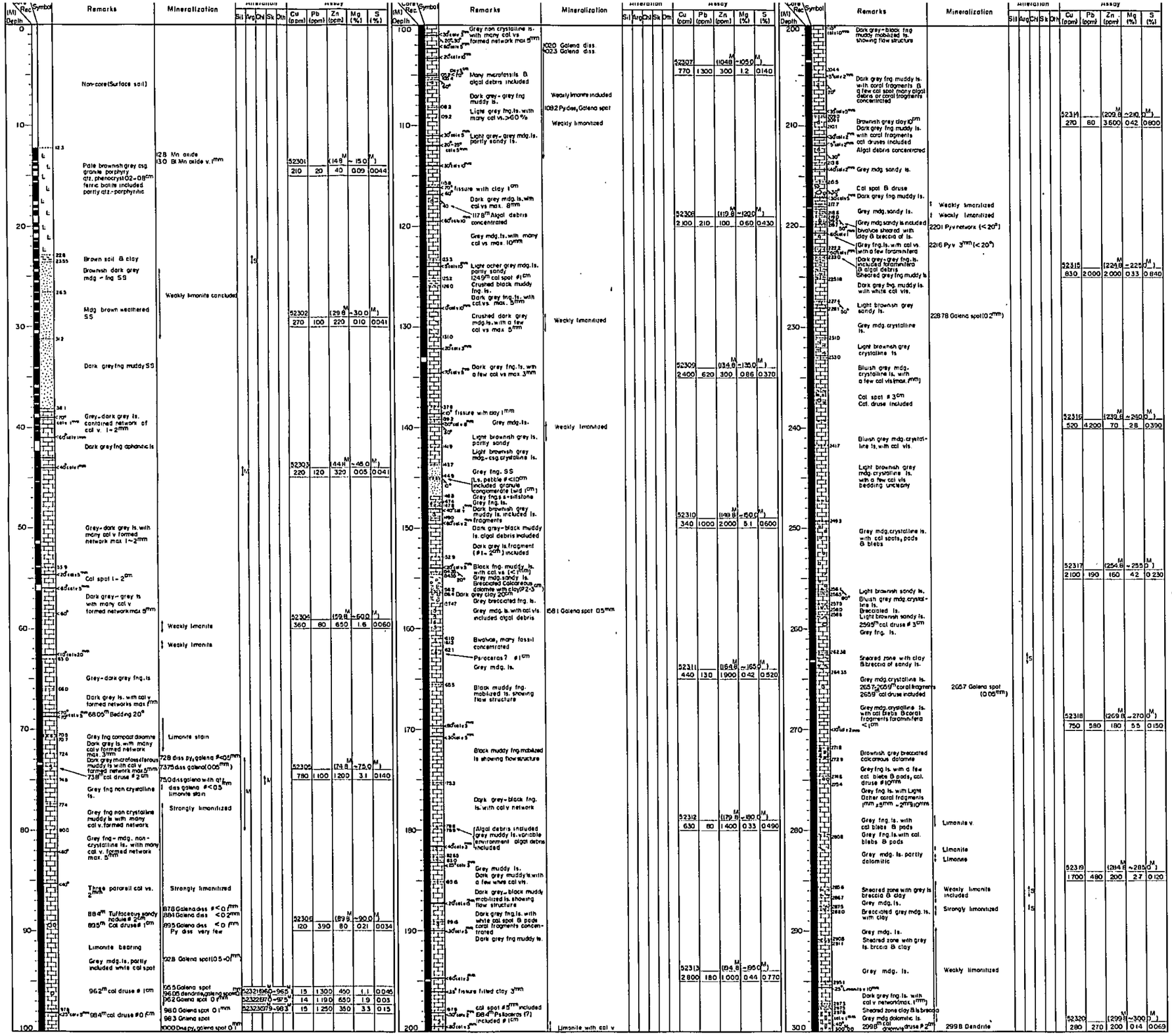
prepared by MESCO, Inc.

LEGEND

Core rec. ····· Core recovery
- Recoverd
- Sludge
- Lost

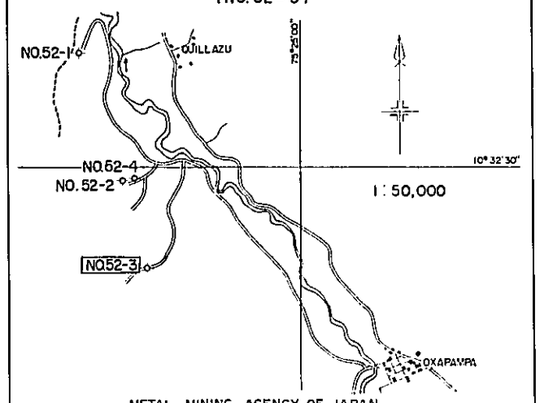
Symbol ····· Symbol of rocks
- LIMESTONE
- DOLOMITIC LIMESTONE
- DOLOMITE
- SANDSTONE
- SANDY SHALE
- SHALE
- VOLCANIC BRECCIA OR VOLCANIC CONGLOMERATE
- QUARTZ PORPHYRY
- SHEAR ZONE OR CRUSHED ZONE
- FOSSIL
- MINERALIZATION
- ANGLE OF THE VEIN TO THE CORE DIRECTION
- STRUCTURE TO THE CORE DIRECTION
- DRUSE
- SPOT, BLEB OR POD

Remarks
- Bl : Black
- Gr : Grey
- fng : fine grained
- mdg : medium grained
- csg : coarse grained
- conc : concentrated
- qtz : quartz
- cal : calcite
- v : vein
- ss : sandstone
- ls : limestone
- max : maximum
- vol : volcanic
- cgl : conglomerate
- por : porphyry



GEOLOGICAL COLUMN OF THE DIAMOND DRILL HOLE

(NO. 52 - 3)



METAL MINING AGENCY OF JAPAN

JAPAN INTERNATIONAL COOPERATION AGENCY

GOVERNMENT OF JAPAN

FEBRUARY 1978

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LEGEND

Core rec. ---------- Core recovery
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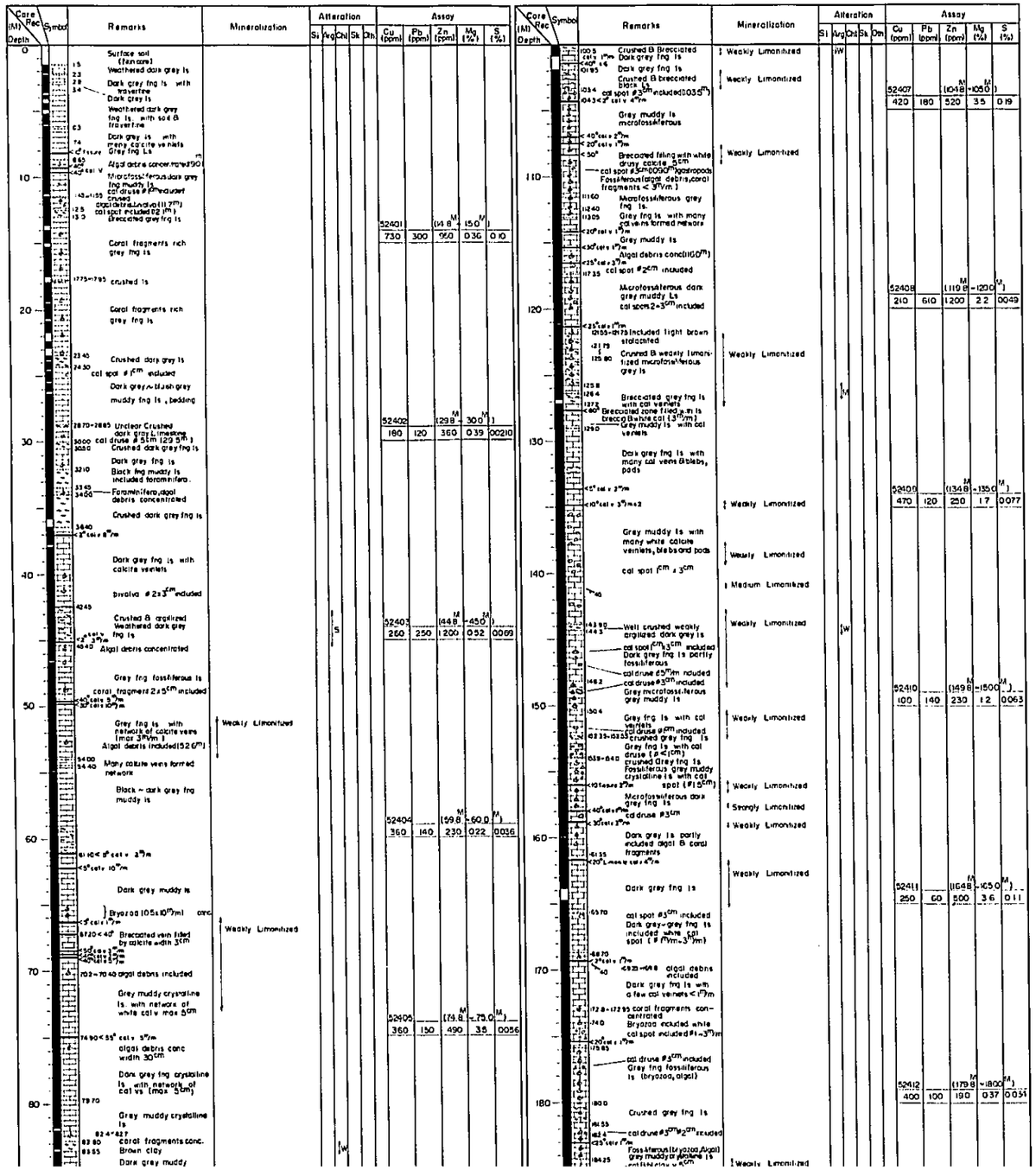
- SHEAR ZONE OR CRUSHED ZONE
- FOSSIL
- MINERALIZATION
- ANGLE OF THE VEIN TO THE CORE DIRECTION
- STRUCTURE TO THE CORE DIRECTION
- DRUSE
- SPOT, BLEB OR POO

Remarks ------ Bl : Black; Gr : Grey; fng : fine grained; mdg : medium grained; csg : coarse grained; conc : concentrated; mtx : matrix; qtz : quartz; cal : calcite; v : vein; ss : sandstone; ls : limestone; max : maximum; peb : pebble; vol : volcanic; cgl : conglomerate; por : porphyry

Alteration ------ Sil : Silicification; Arg : Argillization; Chl : Chloritization; Sk : Skarnization; Oth : Other alteration; VS : very strong; S : strong; M : medium; W : weak; VW : very weak

Mineralization ------ Sph : Sphalerite; Gn : Galena; Py : Pyrite; diss : disseminated

HOLE NUMBER : NO. 52 - 4
COORDINATE : 8834.480N, 451.670E
ELEVATION : 1 922m
DIRECTION : —
INCLINATION : -90°
DEPTH : 200.00m

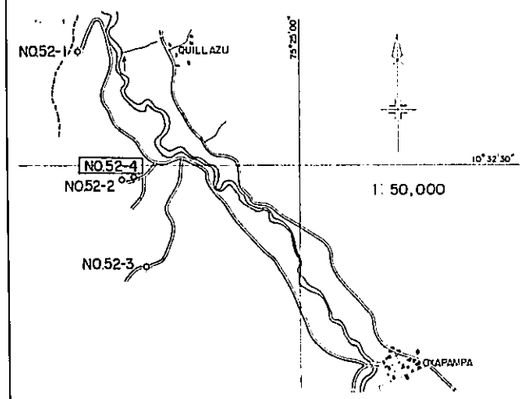


PL. III - 1 (4)

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL, CENTRAL PERU

GEOLOGICAL COLUMN OF THE DIAMOND DRILL HOLE

(NO.52-4)



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

FEBRUARY 1978

prepared by MESCO, Inc.

LEGEND

Core rec. ..... Core recovery
- Recoverd
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Symbol ..... Symbol of rocks
- LIMESTONE
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- SPOT, BLEB OR POD

Remarks .....
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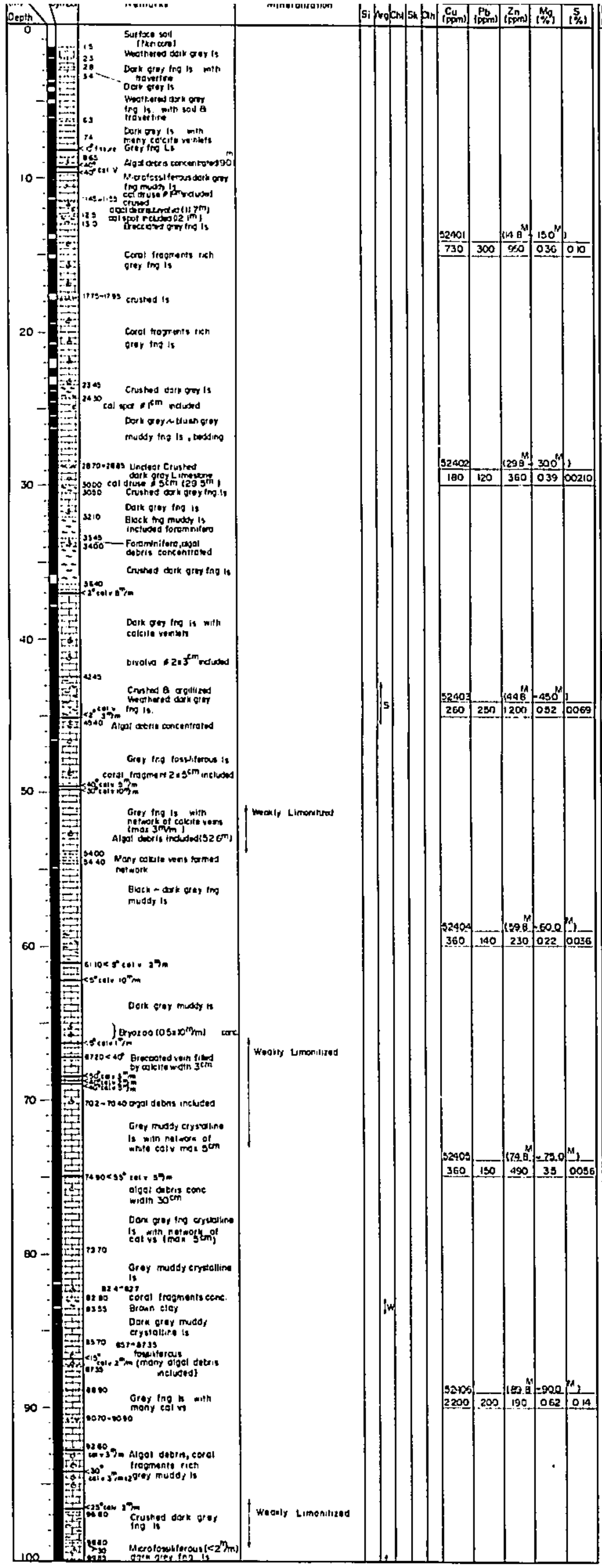
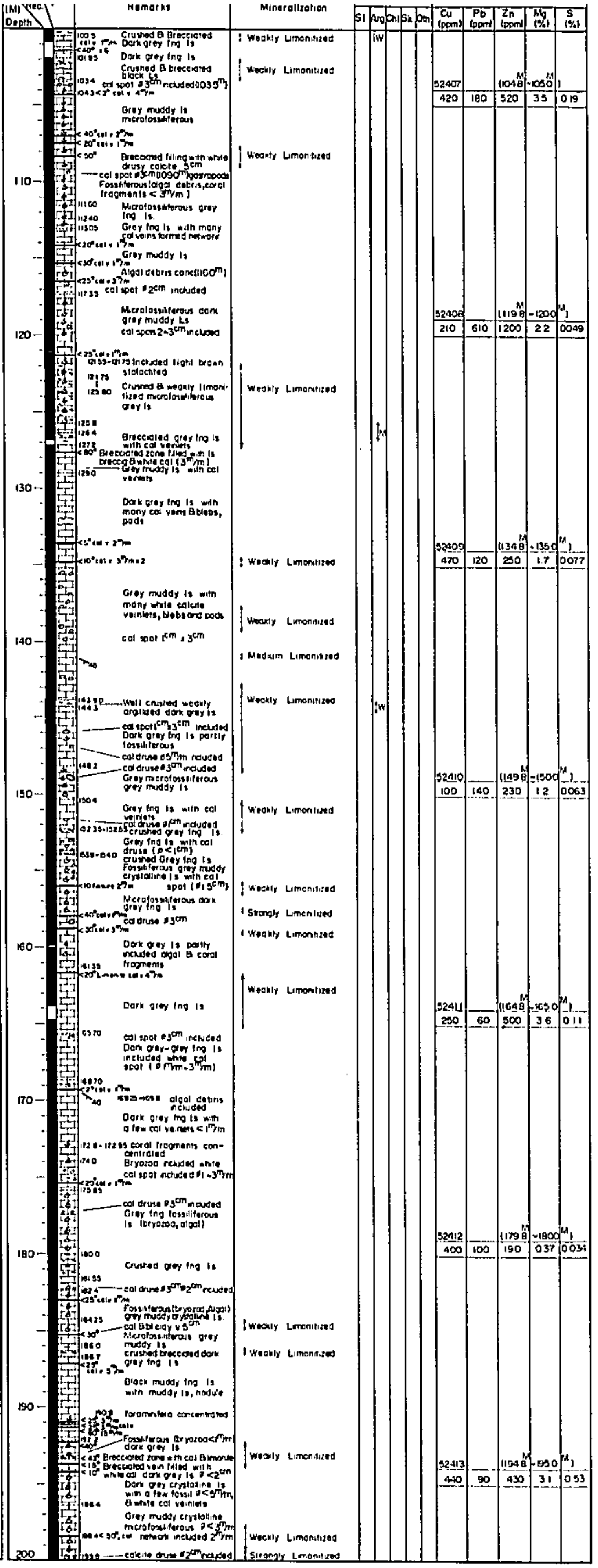
frg : fine grained
mdg : medium grained
csg : coarse grained
conc : concentrated
qtz : quartz
cal : calcite
v : vein
ss : sandstone
ls : limestone
max : maximum



1.5 Surface soil (1km core)
2.5 Weathered dark grey ls
2.8 Dark grey fng ls with travertine
3.4 Dark grey ls
Weathered dark grey fng ls with soil & travertine
6.3 Dark grey ls with many calcite veinlets
7.4 <0° fissure Grey fng Ls
8.65 <40° Algal debris concentrated(9.0m)
<40° cal v Microfossiliferous dark grey fng muddy ls
11.45~11.55 cal druse ⌀1cm included
crused algal debris concentrated(11.7m)
12.5 cal spot included(12 1m)
13.5 Brecciated grey fng ls
Coral fragments rich grey fng ls
17.75~17.95 crushed ls
Coral fragments rich grey fng ls
23.45 Crushed dark grey ls
24.30 cal spot ⌀1cm included
Dark grey~bluish grey muddy fng ls, bedding
28.70~28.85 Unclear Crushed dark grey Limestone
30.00 cal druse ⌀5cm (29.5m)
30.50 Crushed dark grey fng ls
Dark grey fng ls
32.10 Black fng muddy ls included foraminifera
33.45 33.60 Foraminifera, algal debris concentrated
Crushed dark grey fng ls
35.40 <2° cal v 5m/m
Dark grey fng ls with calcite veinlets
bivalva ⌀2×3cm included
42.45 Crushed & argilized Weathered dark grey fng ls.
<2° cal v 3m/m
45.40 Algal debris concentrated
Grey fng fossiliferous ls
coral fragment 2×5cm included
<40° cal v 5m/m
<30° cal v 10m/m
Grey fng ls with network of calcite veins (max 3m/m) — Weakly Limonitized
Algal debris included(52.6m)
54.00 54.40 Many calcite veins formed network
Black ~ dark grey fng muddy ls
61.10 <5° cal v 3m/m
<5° cal v 10m/m
Dark grey muddy ls
Bryozoa (0.5×10m/m) conc.
<5° cal v 1m/m
67.20 <40° Brecciated vein filled by calcite width 3cm — Weakly Limonitized
<50° cal v 5m/m
<40° cal v 5m/m
<40° cal v 5m/m
70.2~70.40 algal debris included
Grey muddy crystalline ls with network of white cal v max 5cm
74.90 <55° cal v 5m/m
algal debris conc width 30cm
Dark grey fng crystalline ls with network of cal vs (max 5cm)
79.70
Grey muddy crystalline ls
82.4~82.7
82.80 coral fragments conc.
83.55 Brown clay
Dark grey muddy crystalline ls
85.70 85.7~87.35 fossiliferous
<15° cal v 2m/m (many algal debris included)
87.35
88.90 Grey fng ls with many cal vs
90.70~90.90
92.60 cal v 3m/m Algal debris, coral fragments rich
<30° cal v 3m/m×2 grey muddy ls
<25° cal v 2m/m
96.60 Crushed dark grey fng ls — Weakly Limonitized
98.80 ↘30 Microfossiliferous(<2m/m)
99.85 dark grey fng ls

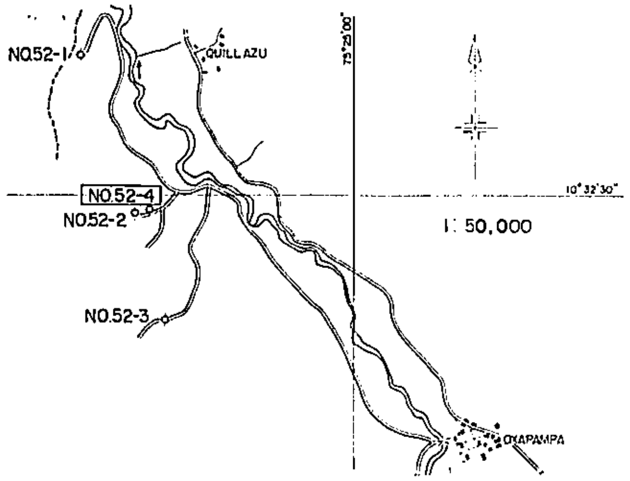


100.5 Crushed & Brecciated — Weakly Limonitized
cal v 1m/m Dark grey fng ls
<40° ×6
101.95 Dark grey fng ls
Crushed & brecciated black Ls — Weakly Limonitized
103.4 cal spot ⌀3cm included(103.5m)
104.3 <3° cal v 4m/m
Grey muddy ls microfossiliferous
<40° cal v 2m/m
<20° cal v 1m/m
<50° Brecciated filling with white drusy calcite 5cm — Weakly Limonitized
cal spot ⌀3cm(109.0m) gastropods
Fossiliferous(algal debris, coral fragments < 3m/m)
111.60 Microfossiliferous grey fng ls.
112.40
113.05 Grey fng ls with many cal veins formed network
<20° cal v 1m/m
Grey muddy ls
<30° cal v 1m/m
Algal debris conc(116.0m)
<25° cal v 3m/m
117.35 cal spot ⌀2cm included
Microfossiliferous dark grey muddy Ls
cal spots 2~3cm included
<25° cal v 1m/m
121.55~121.75 included light brown stalactited
121.75 ~ 125.80 Crushed & weakly limonitized microfossiliferous grey ls — Weakly Limonitized
125.8
126.4 Brecciated grey fng ls with cal veinlets
127.2
<80° Brecciated zone filled with ls breccia & white cal (3m/m)
129.0 Grey muddy ls with cal veinlets
Dark grey fng ls with many cal veins & blebs, pods
<5° cal v 2m/m
<10° cal v 3m/m×2 — Weakly Limonitized
Grey muddy ls with many white calcite veinlets, blebs and pods — Weakly Limonitized
cal spot 1cm ~ 3cm
↘45 — Medium Limonitized
142.90 144.3 Well crushed weakly argilized dark grey ls — Weakly Limonitized
cal spot 1cm~3cm included
Dark grey fng ls partly fossiliferous
cal druse ⌀5m/m included
148.2 cal druse ⌀3cm included
Grey microfossiliferous grey muddy ls
150.4 Grey fng ls with cal veinlets — Weakly Limonitized
cal druse ⌀1cm included
152.35~152.55 crushed grey fng ls.
Grey fng ls with cal druse (⌀<1cm)
153.5~154.0 crushed Grey fng ls
Fossiliferous grey muddy crystalline ls with cal
<10° fissure 2m/m spot (⌀1.5cm) — Weakly Limonitized
Microfossiliferous dark grey fng ls
<40° cal v 1m/m — Strongly Limonitized
cal druse ⌀3cm
<30° cal v 3m/m — Weakly Limonitized
Dark grey ls partly included algal & coral fragments
161.35
<20° Limonite cal v 4m/m — Weakly Limonitized
Dark grey fng ls
165.70 cal spot ⌀3cm included
Dark grey~grey fng ls included white cal spot (⌀1m/m~3m/m)
168.70
<2° cal v 1m/m
↘40 169.25~169.8 algal debris included
Dark grey fng ls with a few cal veinlets <1m/m
172.8~172.95 coral fragments concentrated
174.0 Bryozoa included white cal spot included ⌀1~3m/m
<20° cal v 1m/m
175.85
cal druse ⌀3cm included
Grey fng fossiliferous ls (bryozoa, algal)
180.0 Crushed grey fng ls
181.55
182.4 cal druse ⌀3cm ⌀2cm included
<25° cal v 1m/m
Fossiliferous (bryozoa, Algal) grey muddy crystalline ls.
184.25 cal & black clay v 5cm — Weakly Limonitized
<30° Microfossiliferous grey muddy ls
186.0 crushed brecciated dark grey fng ls — Weakly Limonitized
186.7
<25° cal v 5m/m
Black muddy fng ls with muddy ls, nodule
190.8 foraminifera concentrated
<25° 3m/m
<25° 1m/m cal v
<40° 1.5m/m
192.2 Fossiliferous (bryozoa<1m/m)
<40° dark grey ls
<45° Brecciated zone with cal & limonite — Weakly Limonitized
<15° Brecciated vein filled with
<10° white cal dark grey ls ⌀<2cm
Dark grey crystalline ls with a few fossil ⌀<5m/m, & white cal veinlets
196.4
Grey muddy crystalline microfossiliferous ⌀<3m/m
198.4 <50°, cal network included 2m/m — Weakly Limonitized
199.8 calcite druse ⌀2cm included — Strongly Limonitized

		Cu (ppm)	Pb (ppm)	Zn (ppm)	Mg (%)	S (%)
52401	(14 8M - 15 0M)	730	300	950	036	0 10
52402	(29 8M - 30 0M)	180	120	360	039	00210
52403	(44 8M - 45 0M)	260	250	1200	052	0069
52404	(59 8M - 60 0M)	360	140	230	022	0036
52405	(74 8M - 75 0M)	360	150	490	35	0056
52406	(89 8M - 90 0M)	2200	200	190	062	0 14
52407	(104 8M - 105 0M)	420	180	520	35	0 19
52408	(119 8M - 120 0M)	210	610	1200	22	0049
52409	(134 8M - 135 0M)	470	120	250	1.7	0077
52410	(149 8M - 150 0M)	100	140	230	12	0063
52411	(164 8M - 165 0M)	250	60	500	36	0 11
52412	(179 8M - 180 0M)	400	100	190	037	0034
52413	(194 8M - 195 0M)	440	90	430	31	0 53

GEOLOGICAL COLUMN OF THE DIAMOND DRILL HOLE

(NO.52-4)



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

FEBRUARY 1978

prepared by MESCO, Inc.

LEGEND

Core rec. ··············Core recovery
■ Recoverd
▯ Sludge
□ Lost

Symbol ··············Symbol of rocks
▦ LIMESTONE
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▦ DOLOMITE
▦ SANDSTONE
▦ SANDY SHALE
▦ SHALE
▦ VOLCANIC BRECCIA OR VOLCANIC CONGLOMERATE
▦ QUARTZ PORPHYRY
▦ SHEAR ZONE OR CRUSHED ZONE
б FOSSIL
△ MINERALIZATION
<50° ANGLE OF THE VEIN TO THE CORE DIRECTION
↘20° STRUCTURE TO THE CORE DIRECTION
○ DRUSE
∘ SPOT, BLEB OR POD

Remarks ··········
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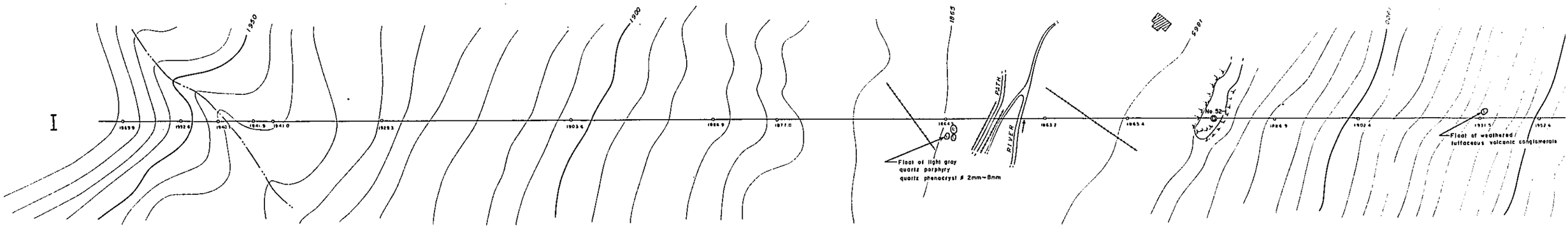
mdg : medium grained
csg : coarse grained
conc. : concentrated
qtz : quartz
cal : calcite
v : vein
s s : sandstone
ls : limestone
max : maximum

Alteration ··········
Sil : Silicification
Arg : Argillization
Chl : Chloritization
Sk : Skarnization
Oth : Other alteration
VS : very strong
S : strong
M : medium
W : weak
VW : very weak

Mineralization·······
Sph : Sphalerite
Gn : Galena
Py : Pyrite
diss : disseminated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1932.6
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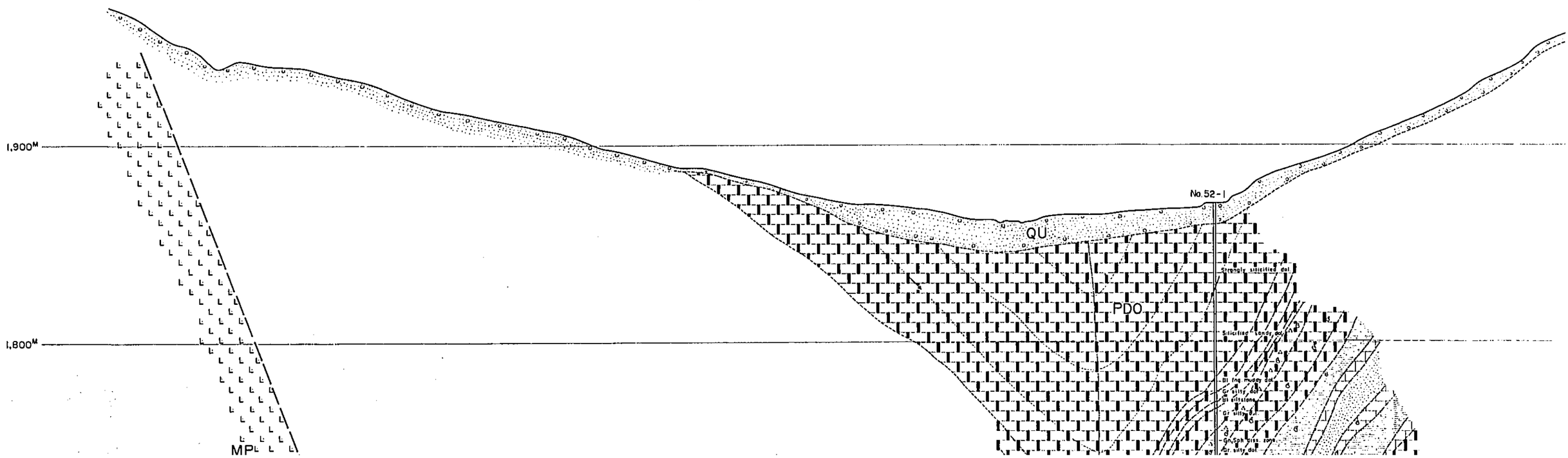
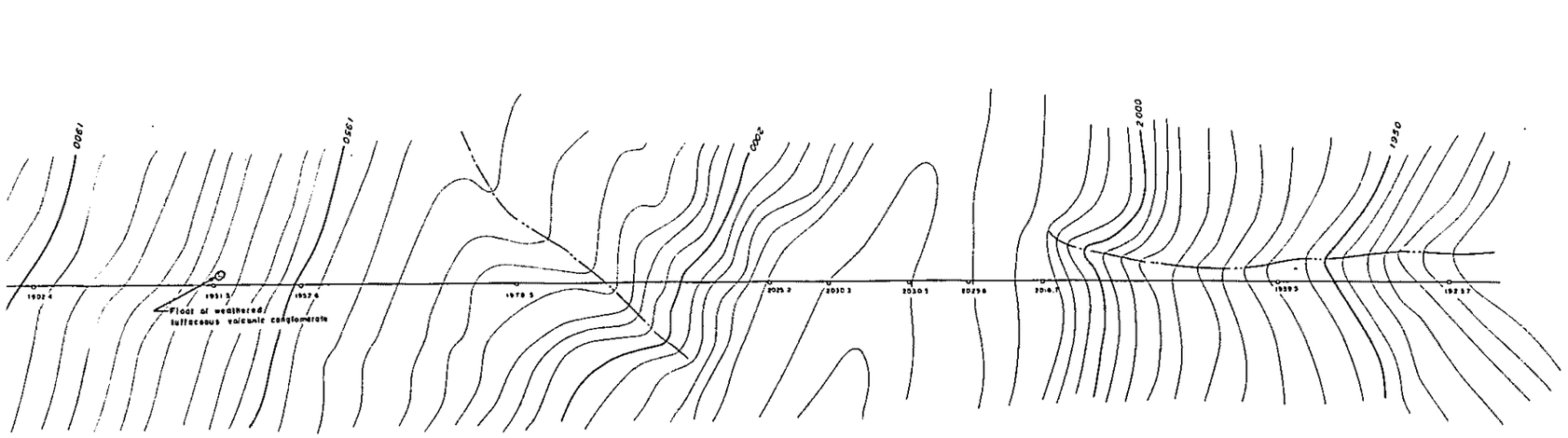
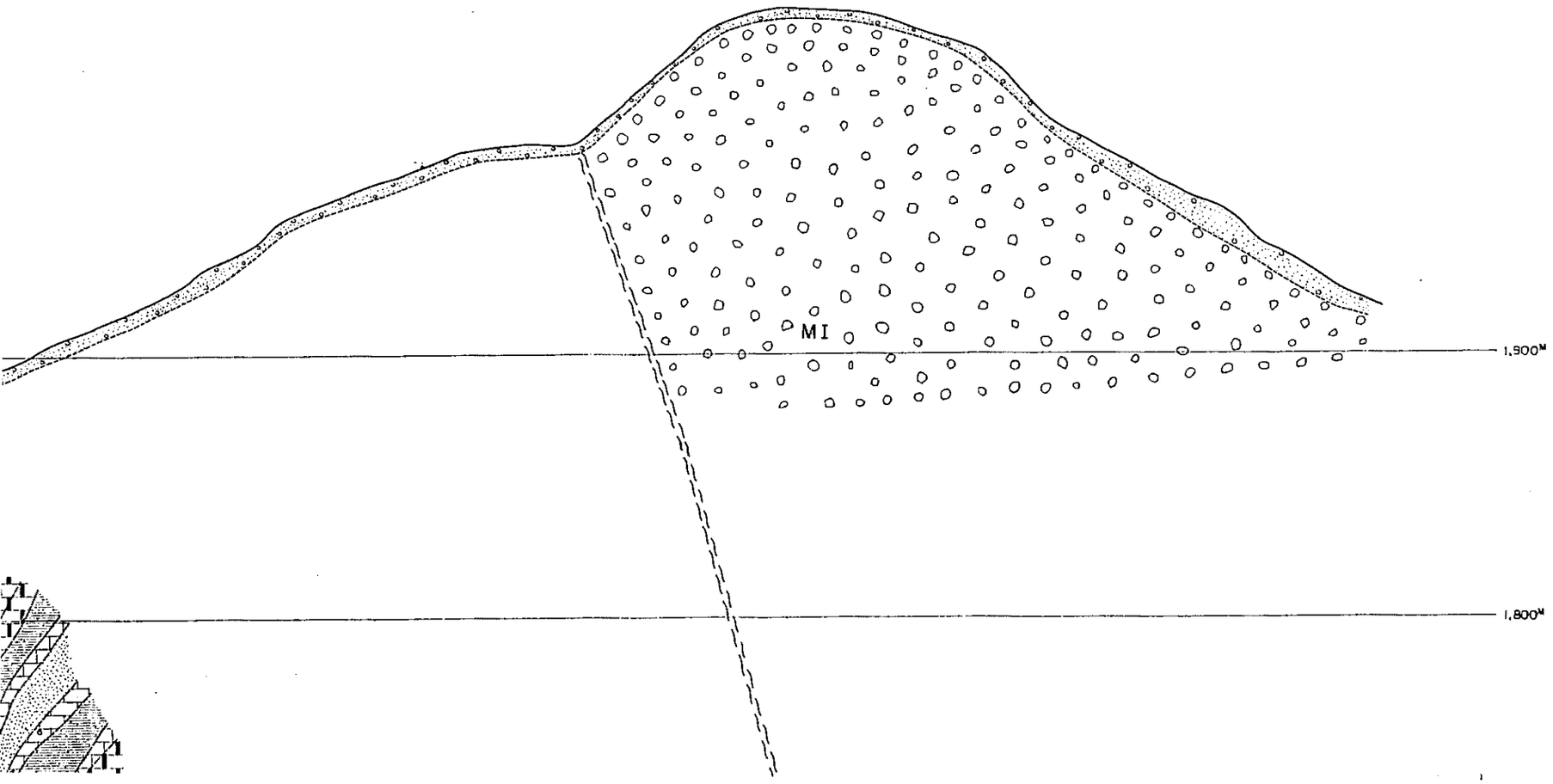
1941.3
1941.0
1928.3
1903.6
1884.9
1877.0
1864.4
RIVER
1863.2
1865.4
No. 52
1884.9
1902.4
1931.3
1952.4
Float of light gray quartz porphyry quartz phenocryst ø 2mm~8mm
Float of weathered tuffaceous volcanic conglomerate


I
I'
1,900M
1,800M
MP
QU
PDO
No. 52-1
Strongly silicified dol
Silicified sandy dol
dr fng muddy dol
dr silty dol
dr siltstone
dr silty dol
Sh,Sph rich zone
dr silty dol



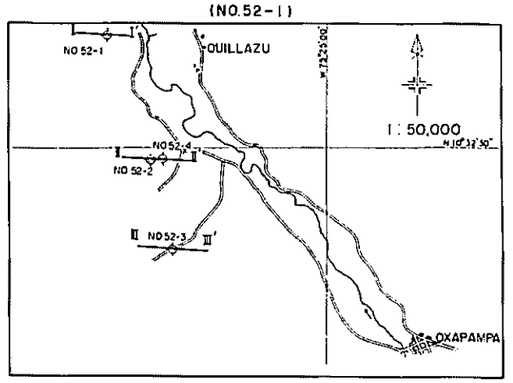


PL III-2.(1)

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL, CENTRAL PERU
(SEPTEMBER 1977)

GEOLOGICAL PROFILE OF THE DIAMOND DRILL HOLE

(NO.52-1)



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

FEBRUARY 1978

prepared by MESCO, Inc

SCALE 1 : 1 000

0 50 100m

INDEX

- QUATERNARY (QU)
- LIMESTONE (PLS)
- DOLOMITE (PDO)
- SANDSTONE (PSS)
- SANOY SHALE OR SILTSTONE
- SHALE

} PUCARA GROUP

- VOLCANIC CONGLOMERATE OR BRECCIA (MITU GROUP)
- QUARTZ PORPHYRY (MP) (POST CRETACEOUS)
- MINERALIZATION, FOSSIL
- SHEAR ZONE

ABBREVIATION

Bl	Black	ls	limestone
Gr.	Grey	dol	dolomite
fng.	fine grained	ss	sandstone
mdg	medium grained	cgl	conglomerate
csg	coarse grained	por.	porphyry

1,900M

1,800M

1,700M

1,600M

MPL

?

QU

PDO

PSS

No. 52-1

Strongly silicified dol.

Silicified sandy dol.

Lt. frg. muddy dol.

Gr. silty dol.

Lt. siltstone

Gr. silty dol.

Gr-Grn. Sph. bloss. zone

Gr. silty dol.

Gr. frg. silicified dol.

Lt. fossiliferous dol.

Dark grey sdy. silty dol.

Gr. fossiliferous sandy sh.

Sandy to f. textured limestone

Gr. Shaly zone

Calcareous s.s.

Dolomite bearing coral fragments

Grey calcareous siltstone

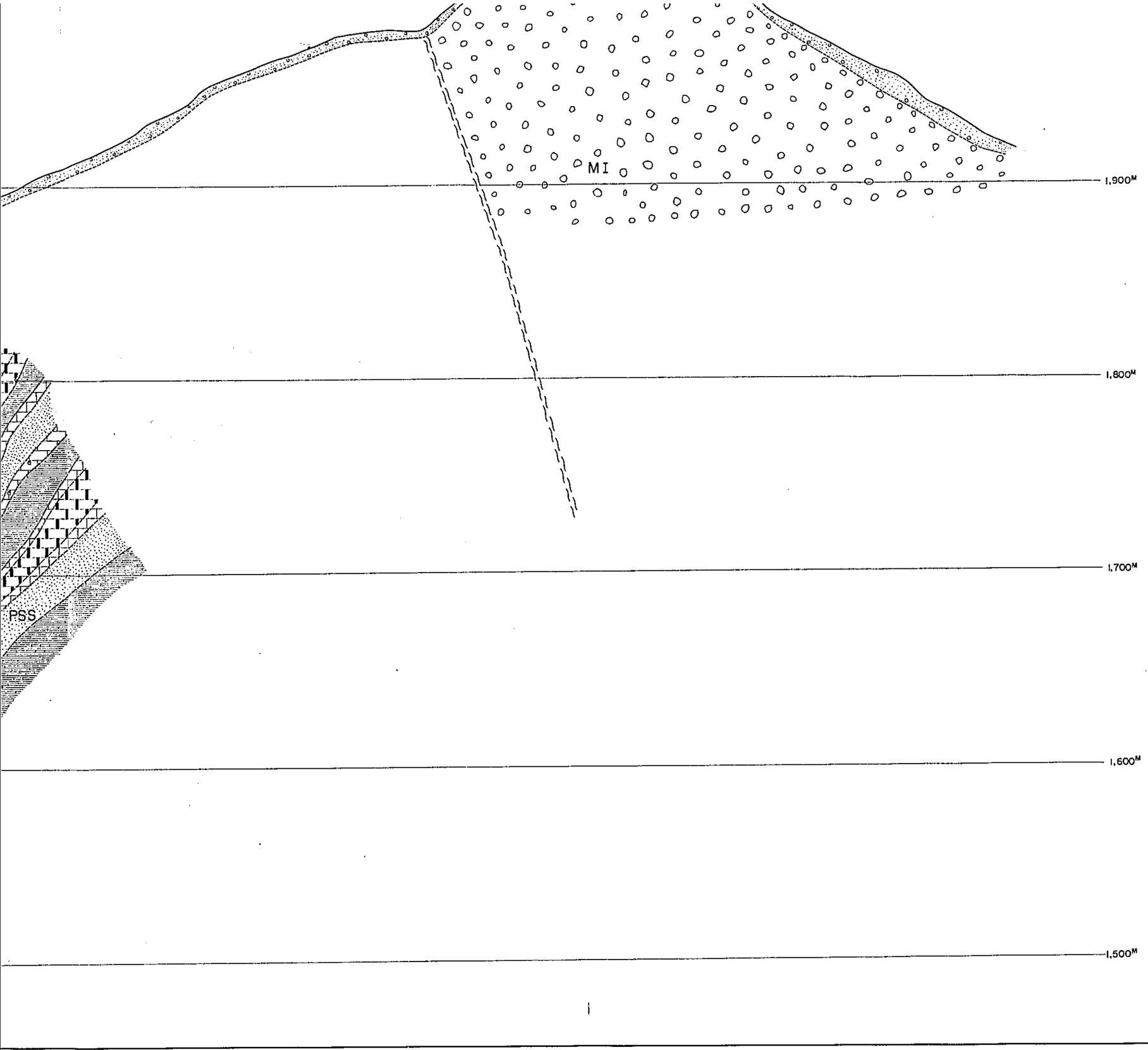
Silty lt. Calcareous sandy dol.

Silty lt.

Very frg. s.s.

Microfossiliferous siltstone

300.30M



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- LIMESTONE (PLS)
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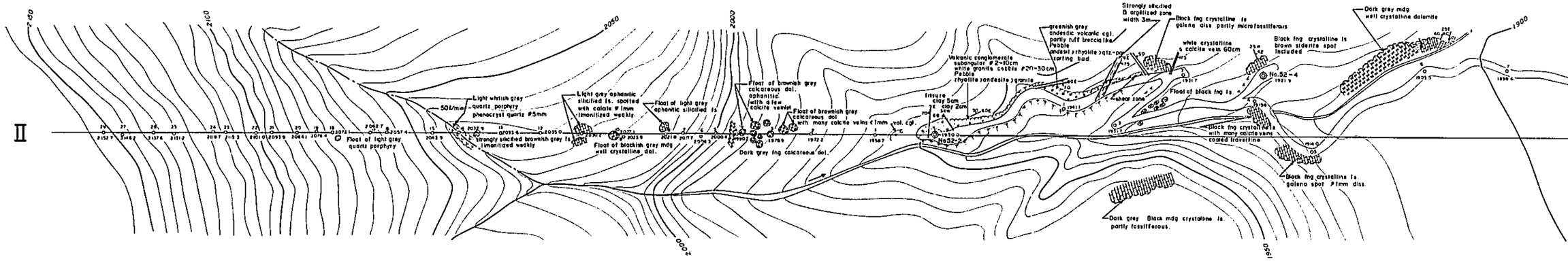
- SANDSTONE (PSS)
- SANDY SHALE OR SILTSTONE
- SHALE

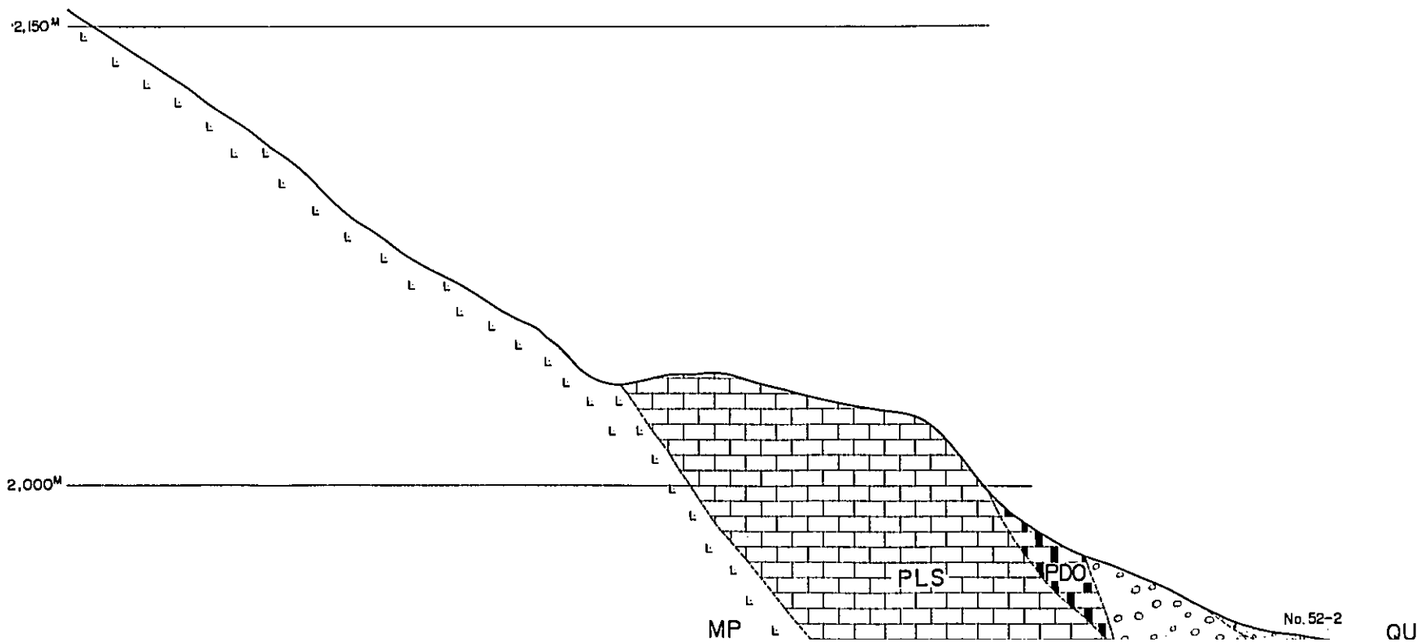
} PUCARA GROUP

- VOLCANIC CONGLOMERATE OR BRECCIA (MITU GROUP)
- QUARTZ PORPHYRY (MP) (POST CRETACEOUS)
- △ ⊕ MINERALIZATION, FOSSIL
- ~~~~ SHEAR ZONE

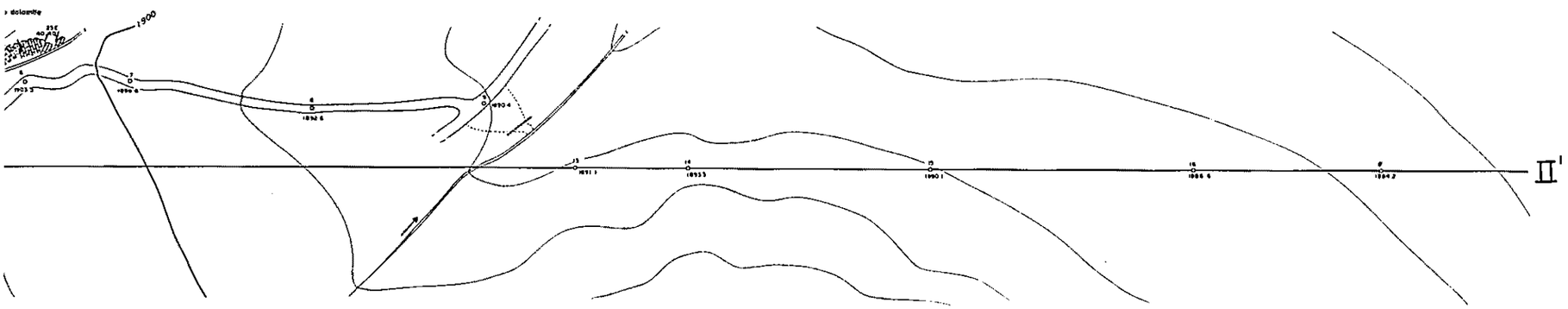
ABBREVIATION

Bl.	: Black	ls.	: limestone
Gr.	: Grey	dol.	: dolomite
fng.	: fine grained	s.s.	: sandstone
mdg.	: medium grained	cgl.	: conglomerate
csg.	: coarse grained	por.	: porphyry
qtz.	: quartz	Sph.	: sphalerite
cal.	: calcite	Gn.	: galena
vol.	: volcanic	diss.	: disseminated


II
2150
2100
2050
2000
1950
1900
Float of light grey quartz porphyry
50E/mm
Light whitish grey quartz porphyry phenocryst quartz Ø5mm
Strongly silicified brownish grey ls. limonitized weakly
Light grey aphanitic silicified ls. spotted with calcite Ø 1mm limonitized weakly
Float of blackish grey mdg well crystalline dol.
Float of light grey aphanitic silicified ls.
Float of brownish grey calcareous dol. aphanitic with a few calcite veinlet
Dark grey fng. calcareous dol.
Float of brownish grey calcareous dol with many calcite veins < 1mm
Fissure clay 5cm clay 2cm
No.52-2
Volcanic conglomerate subangular Ø 2~10cm white granite cobble Ø20~30 cm
Pebble rhyolite)andesite) granite
greenish grey andesitic volcanic cgl. partly tuff breccia like
Pebble andesite) rhyolite) qtz-por sorting bad
Strongly silicified & argillized zone width 3m
Black fng crystalline ls galena diss partly microfossiliferous
white crystalline ls calcite vein 60cm
Shear zone
Float of black fng ls.
No.52-4
Black fng crystalline ls brown siderite spot included
Dark grey mdg well crystalline dolomite
Black fng crystalline ls galena spot Ø1mm diss.
Dark grey Black mdg crystalline ls. partly fossiliferous.


2,150M
2,000M
MP
PLS
PDO
No.52-2
QU

II ——— II'

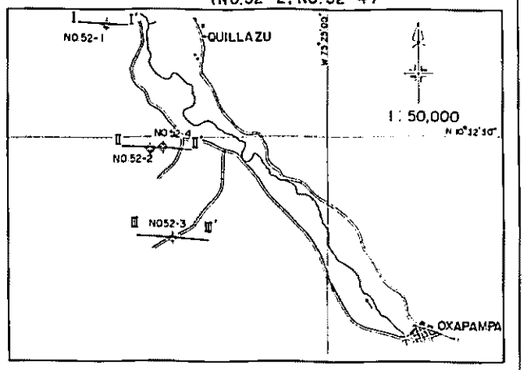


PL III-2.(2)

GEOLOGICAL SURVEY
OF
THE CORDILLERA ORIENTAL, CENTRAL PERU
(SEPTEMBER 1977)

GEOLOGICAL PROFILE OF THE DIAMOND DRILL HOLE

(NO.52-2, NO.52-4)



METAL MINING AGENCY OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

FEBRUARY 1978

prepared by MESCO, Inc.

SCALE 1 : 1000

0 50 100m

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- SHEAR ZONE

ABBREVIATION

Bl.	Black	ls	limestone
Gr.	Grey	dol.	dolomite
fng.	fine grained	s.s.	sandstone
mdg.	medium grained	cgl.	conglomerate
csg.	coarse grained	por.	porphyry
qtz.	quartz	Sph.	sphalerite

II ——— II'

2,150M

2,000M

1,900M

1,800M

1,700M

PLS

PDO

MP

MI

QU

No.52-2

No.52-4

Surface soil

Volcanic cgl.

Qtz. por. andesitic tuff.

Vol. cgl.

Qtz. por.

Vol. cgl.

Vol. cgl.

Vol. cgl.

Qtz. por.

Vol. cgl.

168.3M

Fossiliferous ls

Muddy fine ls

Algal debris

Dark grey ls

Brecciated Algal debris

Microfossiliferous ls

Grey mdg. ls

Microfossiliferous

Grey mdg. ls

Microfossiliferous ls

Algal debris

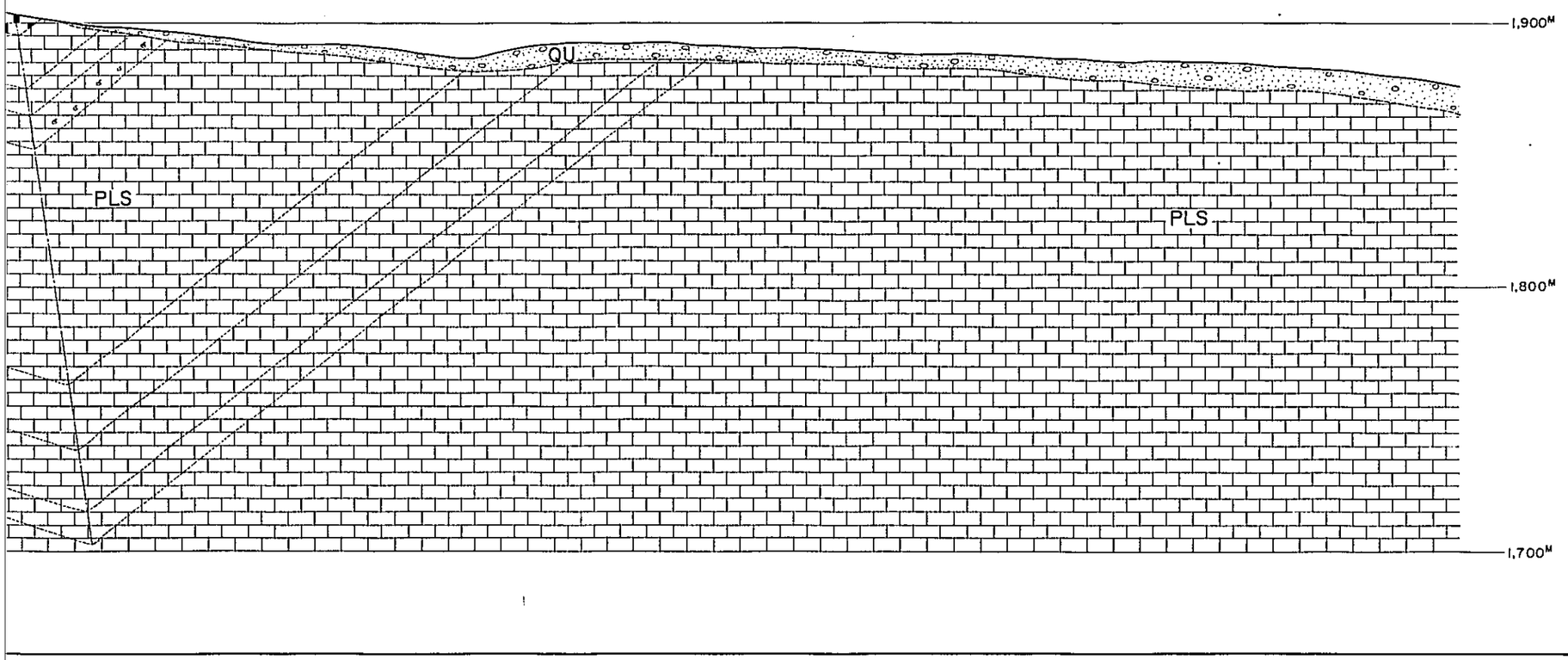
Brecciated Algal debris

Bl. Muddy ls

Fossiliferous ls

200.0M

II'



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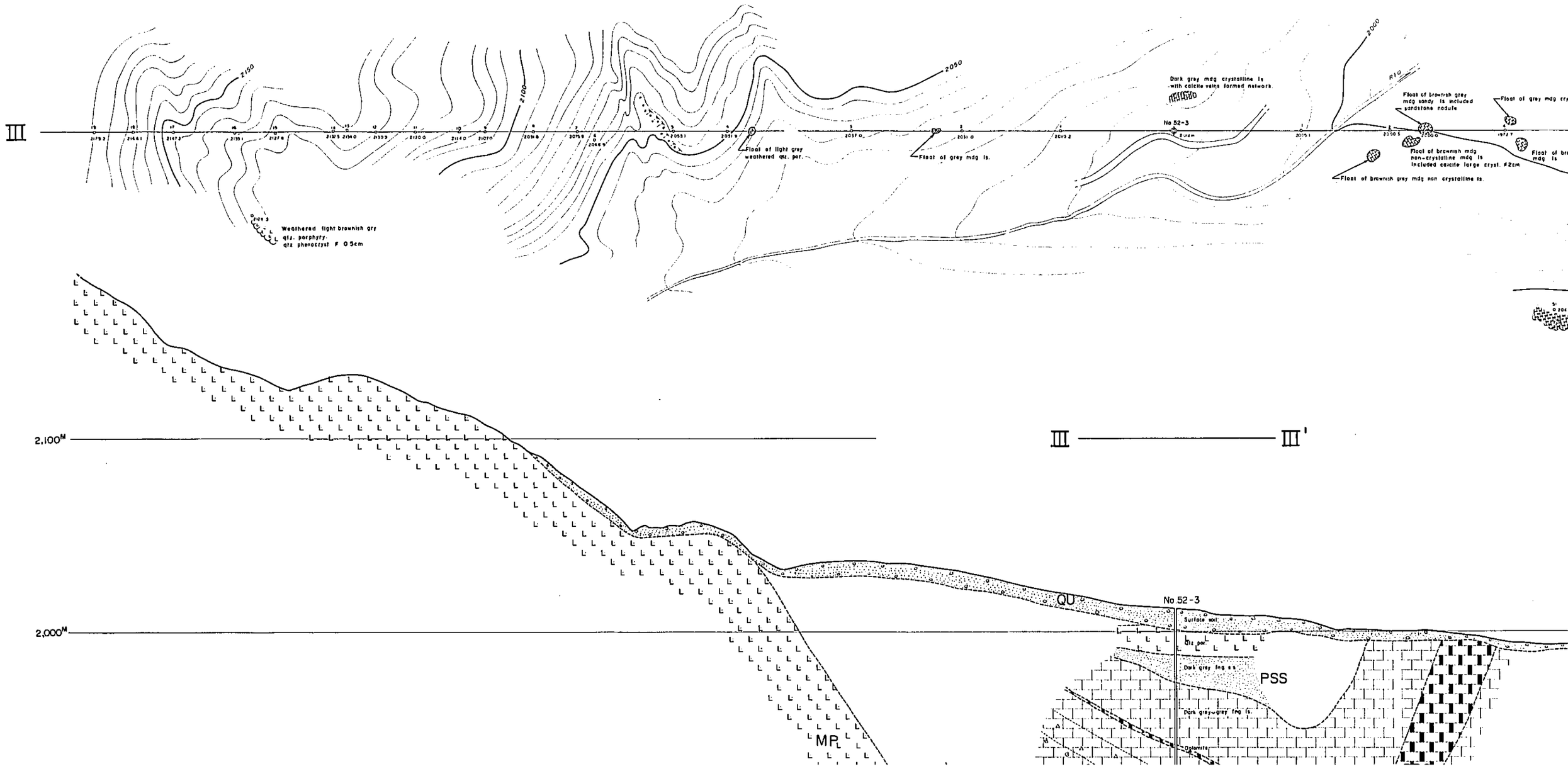
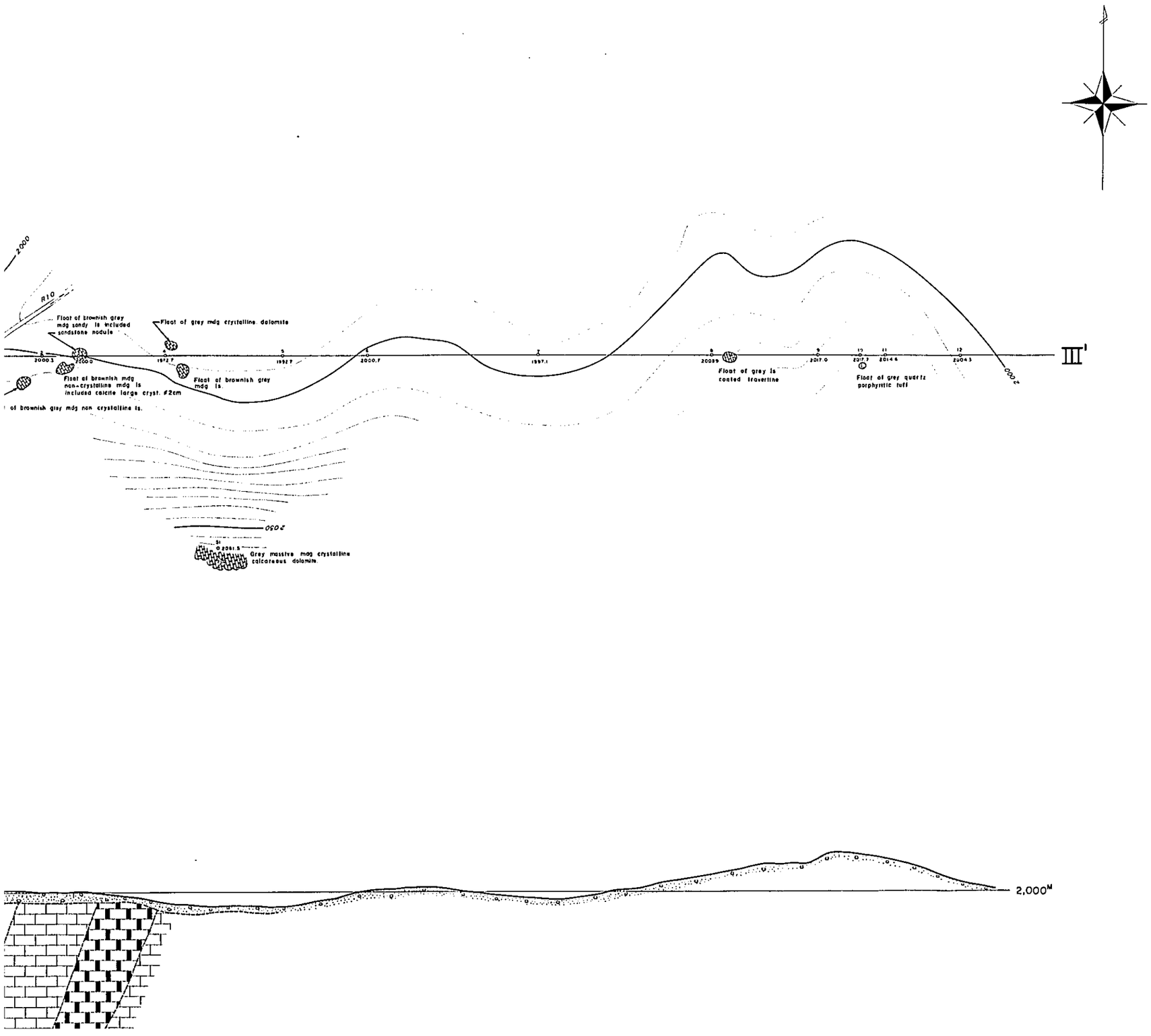
Bl.	Black	ls.	limestone
Gr.	Grey	dol.	dolomite
fng.	fine grained	s.s.	sandstone
mdg	medium grained	cgl.	conglomerate
csg.	coarse grained	por.	porphyry
qtz.	quartz	Sph	sphalerite
col.	calcite	Gn.	galena
vol.	volcanic	diss.	disseminated


III
2150
2100
2050
2000
Weathered light brownish grey qtz. porphyry qtz phenocryst ∅ 0.5cm
Float of light grey weathered qtz. por.
Float of grey mdg ls.
Dark grey mdg crystalline ls with calcite veins formed network
No 52-3
Float of brownish grey mdg sandy ls included sandstone nodule
Float of brownish mdg non-crystaline mdg ls included calcite large cryst. ∅2cm
Float of brownish grey mdg non crystalline ls.
2,100M
2,000M
III
III'
QU
MP
PSS
No.52-3
Surface soil
Dark grey-grey fmg ls
Dolomite



PL.III-2.(3)

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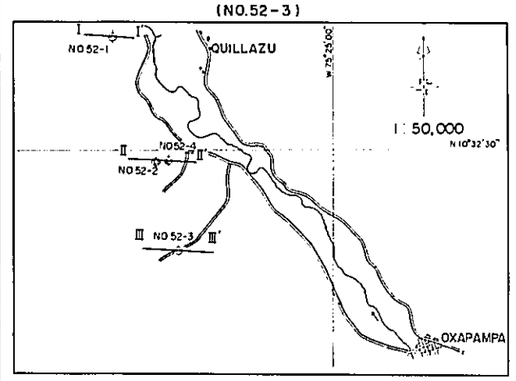
GEOLOGICAL PROFILE OF THE DIAMOND DRILL HOLE

(NO.52-3)



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FEBRUARY 1978

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SCALE 1 : 1000

0 50 100m

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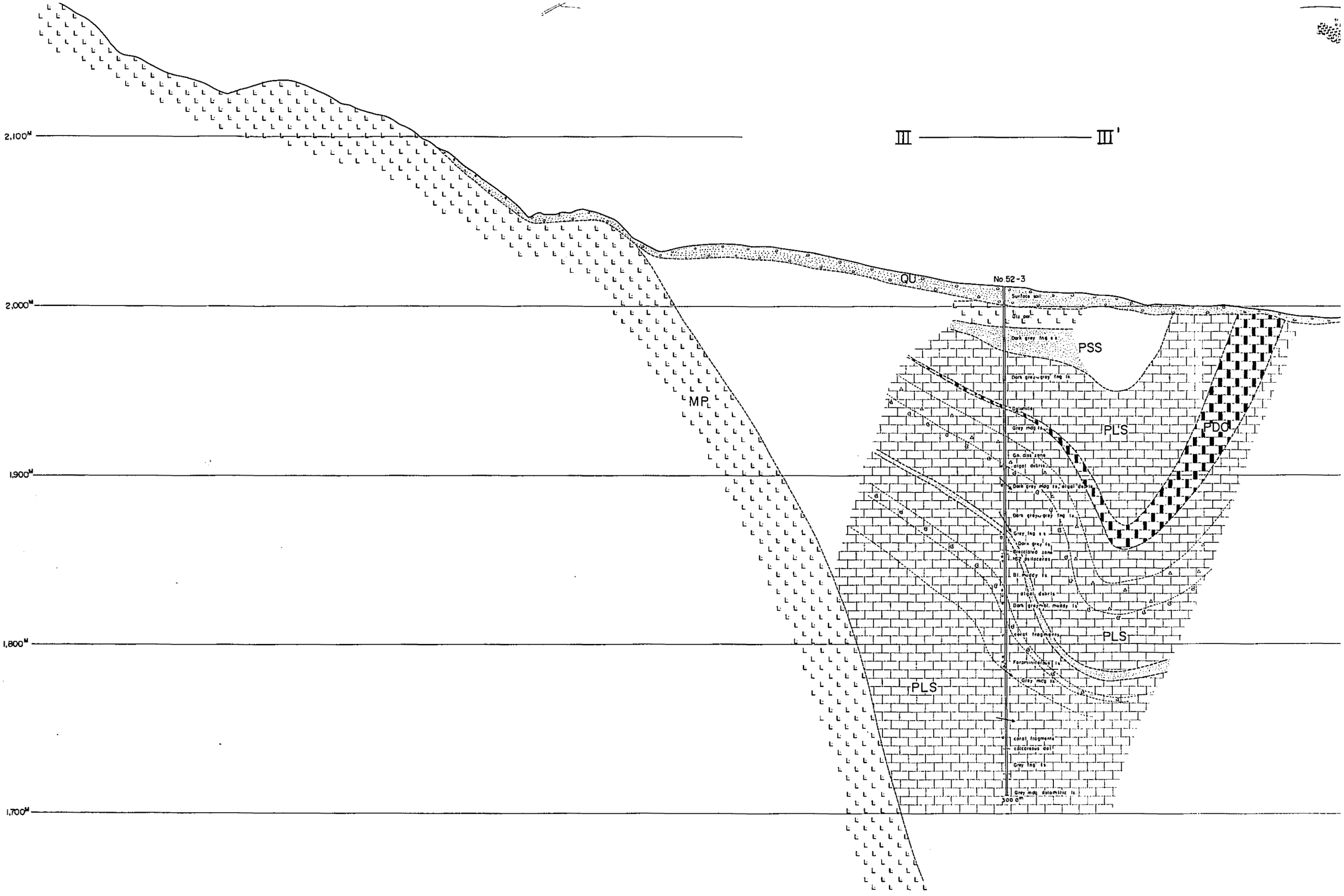
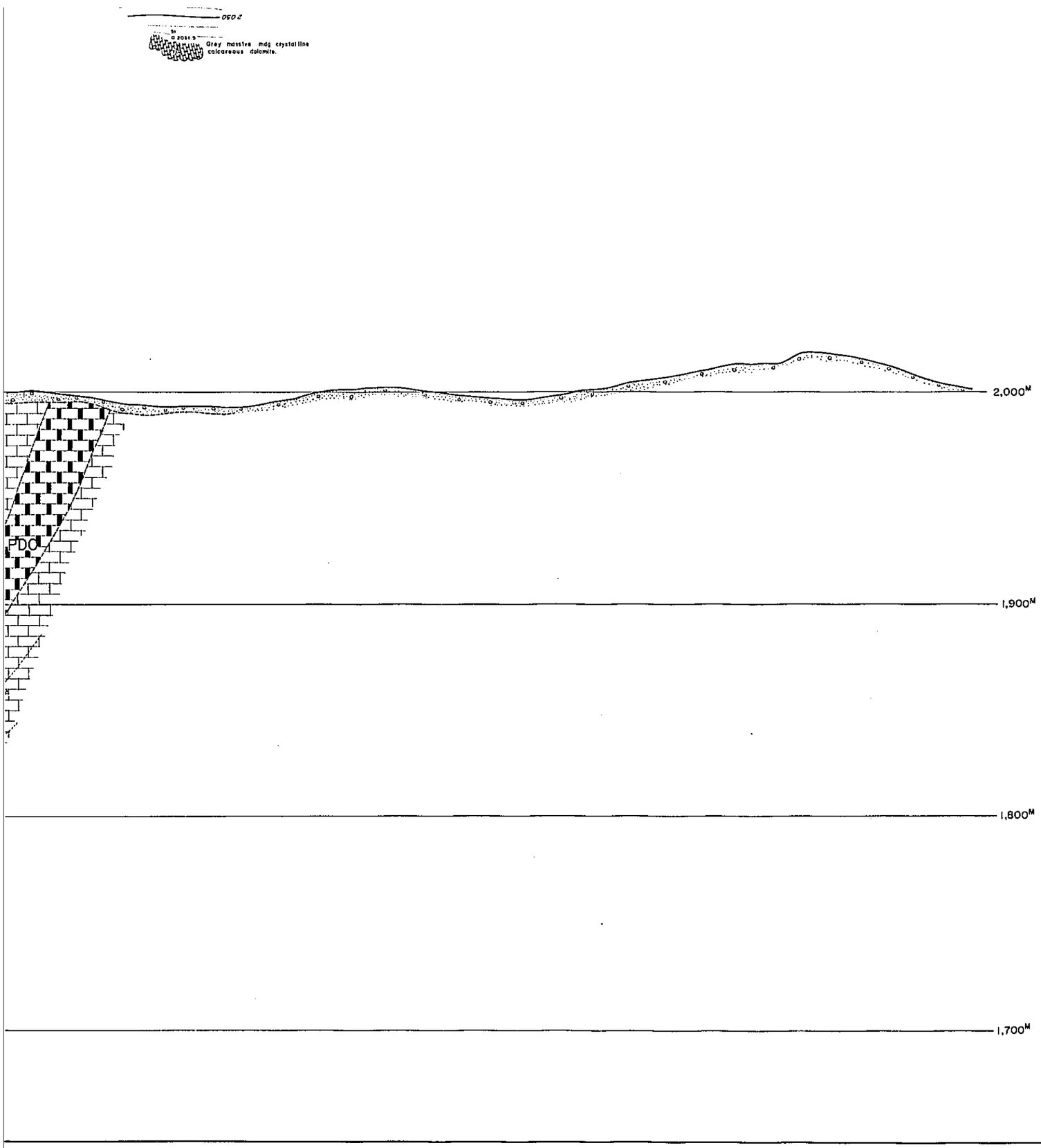
csg.	: coarse grained	por	porphyry
qtz.	: quartz	Sph.	: sphalerite


2,100M
2,000M
1,900M
1,800M
1,700M
III
III'
QU
MPL
PSS
PLS
PDC
No 52-3
Surface soil
Dark grey fine s.s.
Dark grey~grey fine ls
Dolomite
Grey mdg ls
Gn. dss zone
algal debris
Dark grey mdg ls, algal debris
Dark grey~grey fine ls
Grey fine s.s
Dark grey ls
Brecciated zone
Mgy pellaceous
Bl. muddy ls
algal debris
Dark grey~bl. muddy ls
Local fragments
Foraminiferous ls
Grey mdg ls
coral fragments
calcareous dol
Grey fine s.s
Grey mdg dolomitic ls
300.0m



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vol.	volcanic	diss.	disseminated