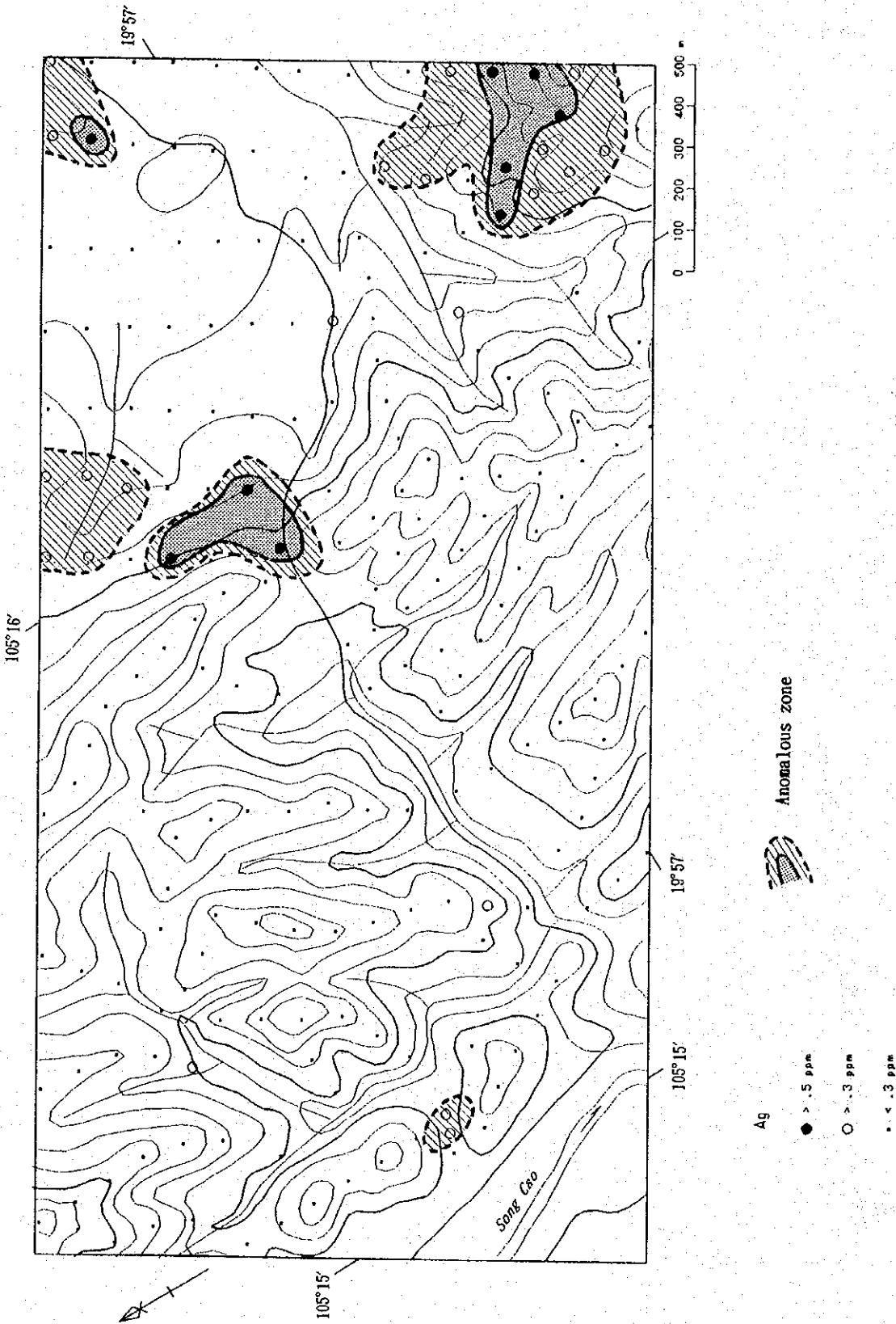
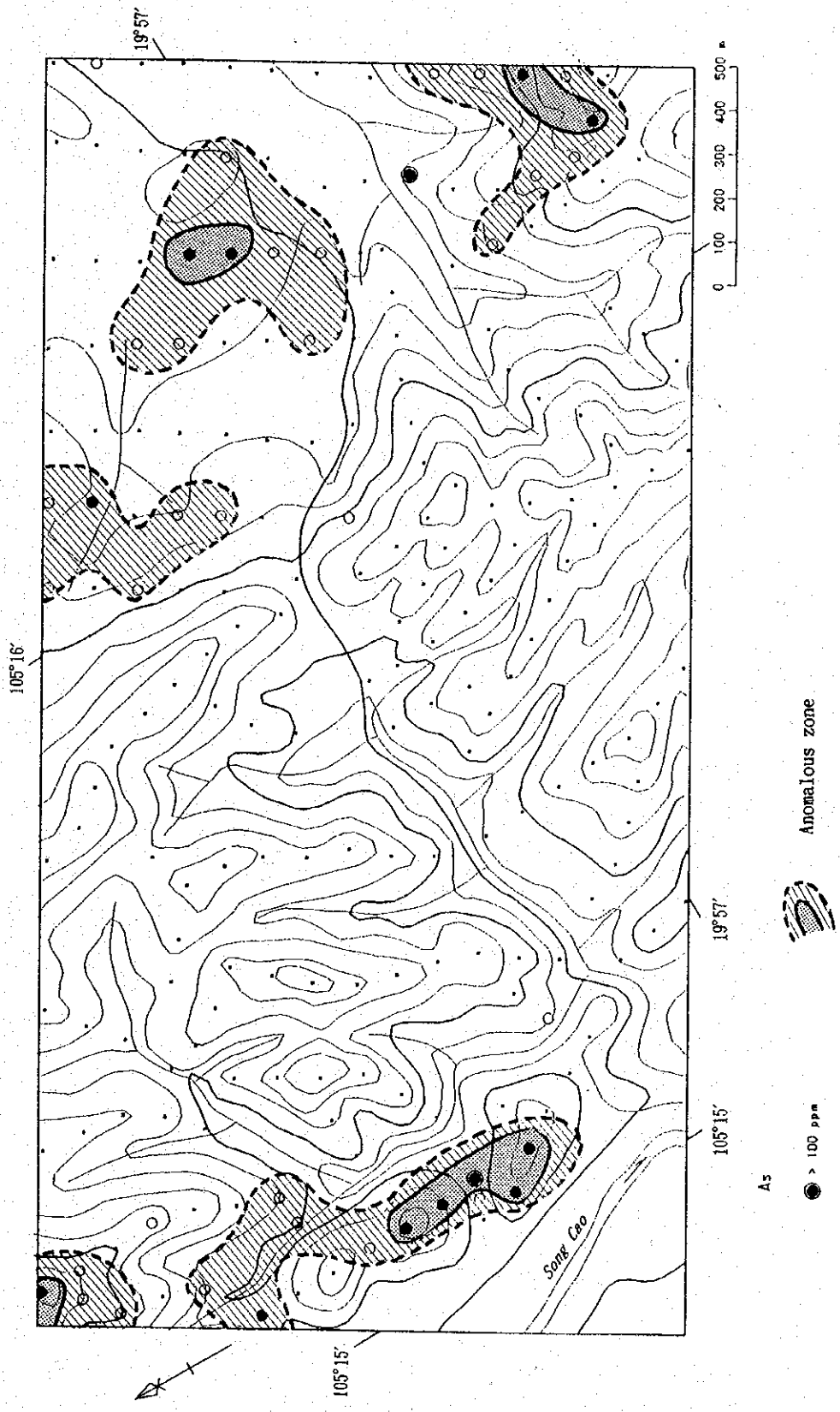



16. Anomaly Map of Soil Geochemistry in the Luong Son Mineralization Zone (1):Au



16. Anomaly Map of Soil Geochemistry in the Luong Son Mineralization Zone (2):Ag



- A5
- > 100 ppm
 - > 50 ppm
 - > 20 ppm
 - < 20 ppm

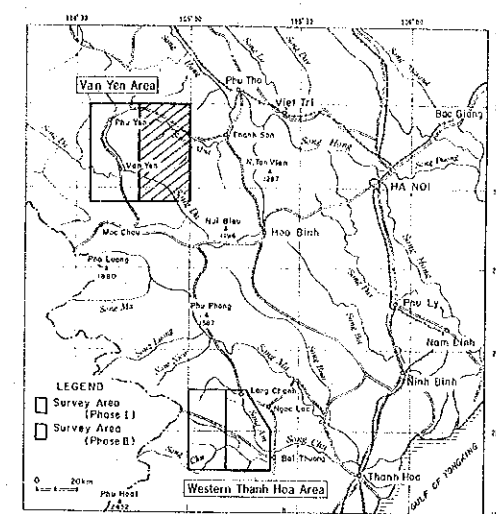
 Anomalous zone

16. Anomaly Map of Soil Geochemistry in the Luong Son Mineralization Zone (3):As

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IN THE VAN YEN AND WESTERN THANH HOA AREAS,
THE SOCIALIST REPUBLIC OF VIETNAM

PHASE II

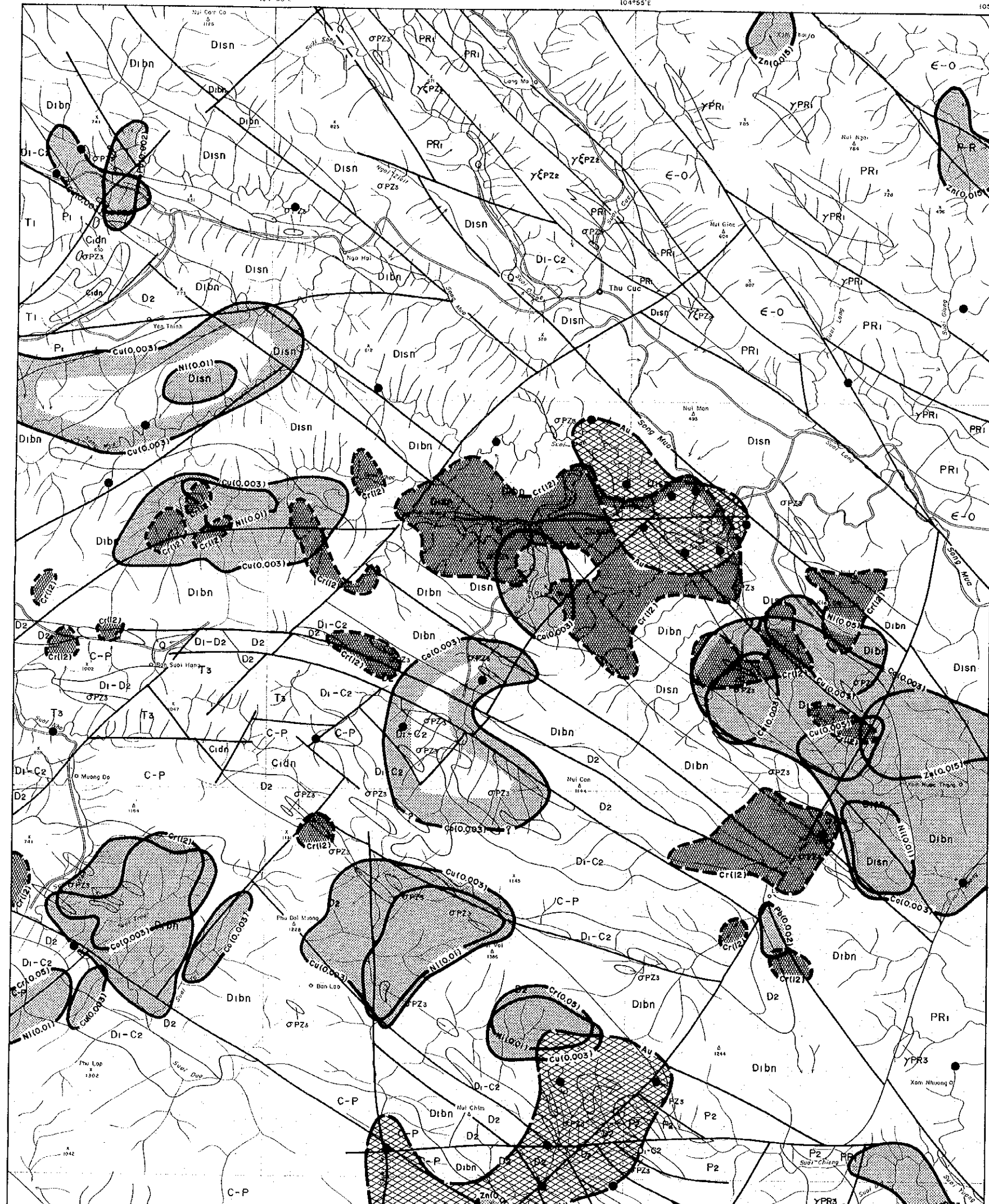
COMPREHENSIVE INTERPRETATION MAP OF THE AVAILABLE RELEVANT
DATA IN THE VAN YEN AREA



FEBRUARY 1995

JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

Scale 1:50,000



LEGEND

Quaternary	Q	Gravel, sand, silt. clay
Triassic	T ₁	Sandstone, siltstone, limestone, coal (T ₁ -rb; T ₁ -rb; Sool Bang Formation)
	T ₂	Andesite, basalt, basaltic tuff, trachyte, rhyolite, dacite (T ₂ -n; Viet Nam Formation)
Permian	P ₁	Limestone (P ₁ -c; Hung Gan Formation)
	P ₂	Limestone, siliceous limestone (P ₂ -r; Ban Diet Formation)
Carboniferous to Permian	C-P	Limestone (C-P; de; Ba Hai Formation)
Carboniferous	C _{dn}	Sandstone, siltstone, siliceous limestone (C _{dn} -ba; Bang Formation)
Devonian to Carboniferous	D ₁ -C ₁	Limestone, siltstone (D ₁ -C ₁ ; Ban Cai Formation)
Devonian	D ₂	Limestone, siliceous limestone (D ₂ -b; Ban Pap Formation)
	D ₃ a	Limestone, siliceous limestone (D ₃ -a; Sool Khong, D ₃ -a; Ban Xuyen Formation)
	D ₃ b	Conglomerate, sandstone, siltstone (D ₃ -b; Sool Nhon Formation, D ₃ -b; Song Ban Formation)
Silurian	S ₁	Siltstone, sandstone, limestone, marl (S ₁ -b; So Hiep Formation)
Ordovician to Silurian	O ₁ -O ₂	Conglomerate, sandstone, siltstone (O ₁ -v; O ₂ -v; Sinh Nhon Formation)
Carbonian	E-O	Shale (E-O; Nui Giac Formation)
Proterozoic	T ₁	Gneiss, Quartzite, amphibolite (T ₁ -v; Sool Chien Formation/P ₁ -v; Sinh Xuyen Formation)
	Y ₁	Granite (Y ₁ -v; Ban Xuyen complex: granosyenite, granite)
	Y ₂	Granite (Y ₂ -v; Ban Giac complex: granite, granosyenite)
	Y ₃	Granite (Y ₃ -v; Ca Vinh complex: granite, granodiorite)
	U	Ultrabasic rock (U; Ban Bang complex: diorite, peridotite, pyroxenite)

Geochemical anomalies zone

Rank of soil anomalies(A)
10.003
Cu(0.003) < 0.003
Cu(0.005) < 0.003 - 0.005
Pb(0.002) < 0.002
Zn(0.015) < 0.015
Ni(0.01) < 0.01
Ni(0.05) < 0.01 - 0.05
Co(0.003) < 0.003



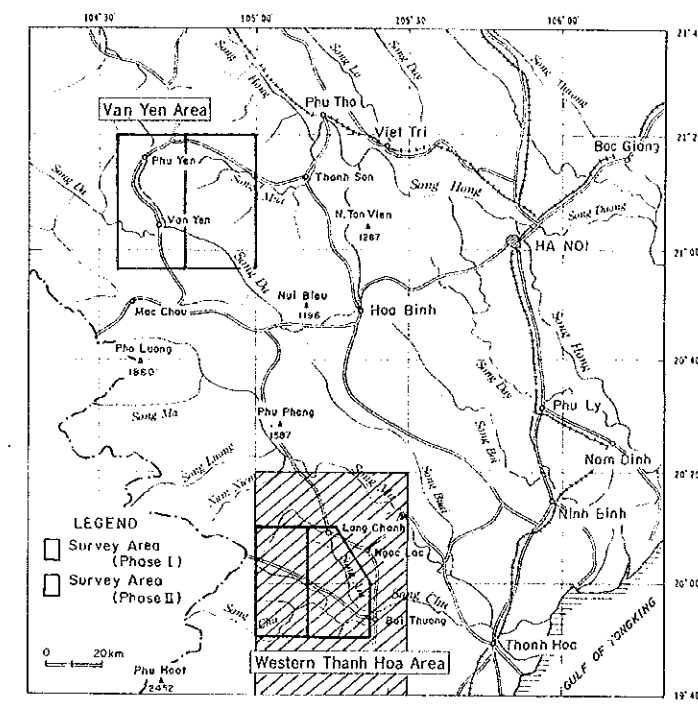
Carboniferous to Permian	C-P	Limestone (C-P, da; Pa Hai Formation)
Carboniferous	C, Dn	Sandstone, siltstone, siliceous limestone (C, Dn, Da Heng Formation)
Permian to Carboniferous	D1, C1	Limestone, siltstone (D1, C1, bc; Ban Hai Formation)
Devonian	D1	Limestone, siliceous limestone (D1, D1b, Ban Hai Formation)
	D1bn	Limestone, siliceous limestone (D1bn, Suoi Khong, D1bn, D1bn; Ban Ngan Formation)
	D1bn	Conglomerate, sandstone, siltstone (D1bn, Suoi Khong Formation, D1bn, Suoi Khong Formation)
Silurian	S1	Siltstone, sandstone, limestone, etc. (S1b; Bo Heng Formation)
Ordovician to Silurian	O1-S1	Conglomerate, sandstone, siltstone (O1, S1, O1, S1, etc.; Sinh Hinh Formation)
Cambrian	E-O	Shale (E-O, ng; Nui Giac Formation)
Proterozoic	PR1	Gneiss, Quartzite, amphibolite (PR1, etc.; Suoi Khong Formation, etc.; Sinh Hinh Formation)
	YPR2	Granite (YPR2, ba; Ban Ngan complex; granodiorite, granite)
	YPR3	Granite (YPR3, xa; Ban Ngan complex; granite, granodiorite)
	YPR4	Granite (YPR4, etc.; Ca Tinh complex; granite, granodiorite)
	YPR5	Ultrabasic rock (YPR5, ba; Ban Ngan complex; dunite, peridotite, pyroxenite)

- Geochemical anomalous zone**
- Rank of soil anomalies (%)
 - Cu(0.003) < 0.003
 - Cu(0.005) < 0.003-0.005
 - Pb(0.002) < 0.002
 - Zn(0.015) < 0.015
 - Ni(0.01) < 0.01
 - Ni(0.05) < 0.01-0.05
 - Co(0.003) < 0.003
 - Cr(0.05) < 0.05
 - High density zone of grains confirmed (panned concentrate)
 - Locality of Au grains confirmed
 - Cr(12):Cr(12g/m²)
- Abbreviations**
- Au: Gold
 - Cu: Copper
 - Pb: Lead
 - Zn: Zinc
 - Ni: Nickel
 - Cr: Chromium
 - Co: Cobalt

21°10'N
21°05'N
21°00'N
20°56'N

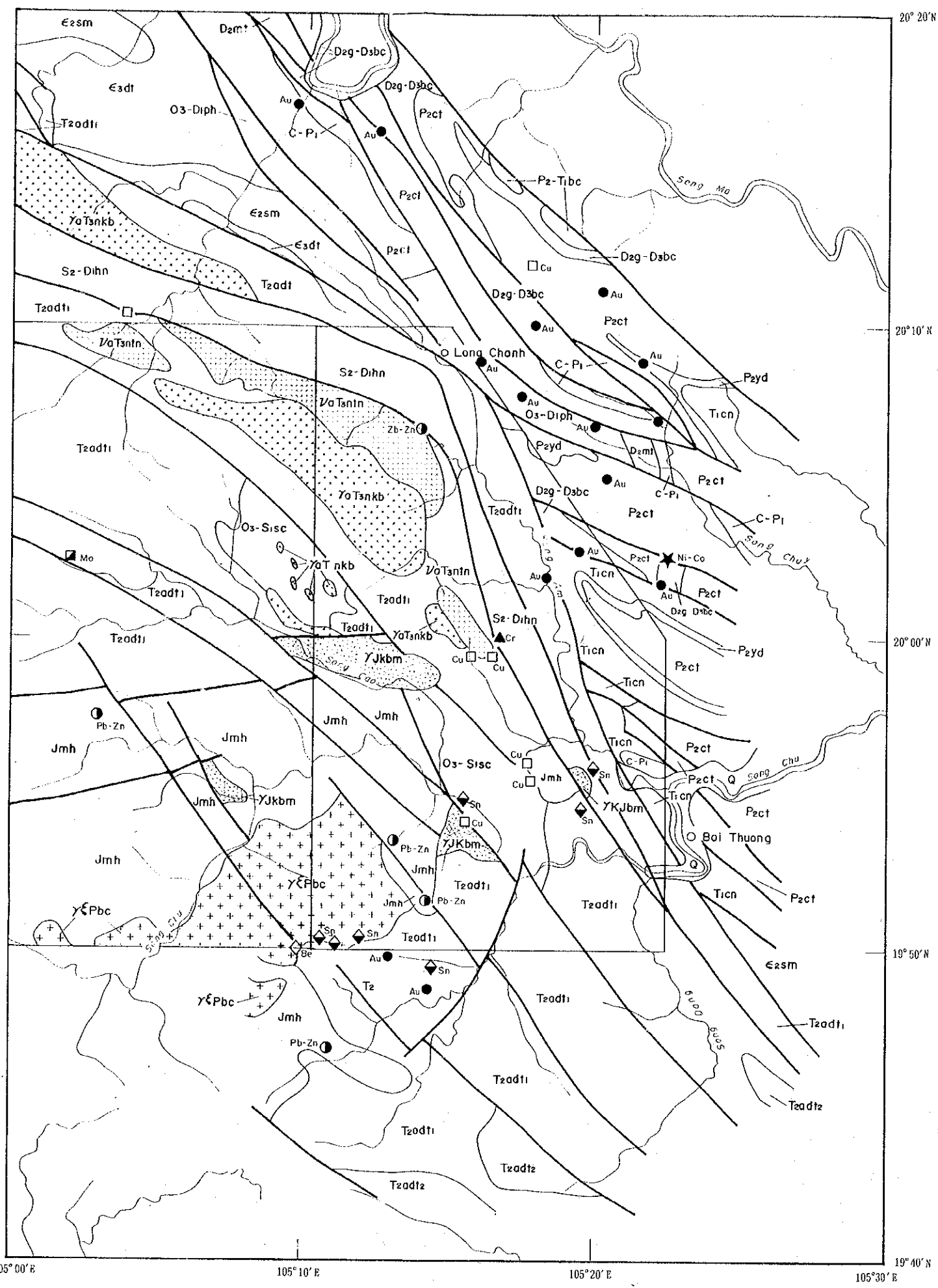
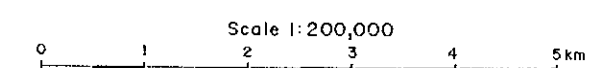
REPORT ON THE COOPERATIVE MINERAL EXPLORATION
IN THE VAN YEN AND WESTERN THANH HOA AREAS,
THE SOCIALIST REPUBLIC OF VIETNAM
PHASE II

COMPREHENSIVE INTERPRETATION MAP OF THE AVAILABLE RELEVANT
DATA IN THE WESTERN THANH HOA AREA
(GEOLOGY AND MINERALIZATION)



FEBRUARY 1995

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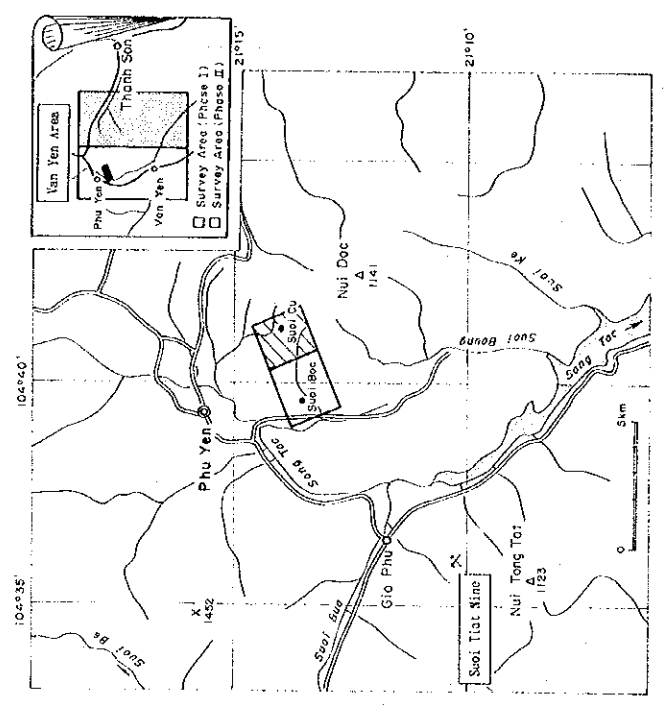


LEGEND

- | | | |
|--------------------------|----------|---|
| Quaternary | Q | Gravel, sand and soil |
| Jurassic | Jmh | Acidic volcanic rock, acidic tuff and conglomerate |
| Triassic | T2adt2 | Shale, silt and limestone with intercalation of shale |
| | T2adt1 | Sandstone and tuffaceous sandstone with conglomerate, acidic volcanic rocks, chert and lenticular limestone |
| Persian to Triassic | T1cn | Conglomerate, sandstone, siltstone and shale with fine bedded chert |
| | P2-T1bc | Sericitic shale with beds of iron ore, sandstone, siltstone and shale |
| Carboniferous to Permian | P2yd | Limestone and coal |
| | P2ct | Basic volcanic rocks with lenticular limestone at the upper part and volcanic breccia |
| Devonian | C-P1 | White and greyish black limestone with black chert (at the lower part) |
| | D2g-D3bc | Limestone with blocks of fine bedded chert and lenticular manganese ore |
| Silurian | D2at | Grey limestone |
| | S2-D1bn | Clayish shale and effusive rocks |
| Ordovician to Devonian | O2-D1ph | Limestone, volcanic rocks and shale |
| Cambrian | E2dt | Mainly sandstone with shale |
| | E2sn | Sandstone, siltstone, shale, limestone and shale with coal and basic volcanic rocks |
| Intrusive rocks | r2pbc | Ban Chiang Complex: Biotite granite, porphyritic granite |
| | r2kbc | Ban Kuong Complex: Biotite granite, porphyritic granite |
| | r2t1nkh | Kin Boi Complex: Two mica granite and biotite granite |
| | r2t1ntr | Tri Nang Complex: Gabbro, diabase |
| Mineralization | Au | Gold |
| | Sn | Tin |
| | Be | Beryllium |
| | Pb-Zn | Lead-Zinc |
| | Ni-Co | Nickel-Cobalt |
| | Cr | Chromium |
| | Cu | Copper |
| | Mo | Molybdenum |
| | [Symbol] | Survey Area (Phase I) |
| | [Symbol] | Survey Area (Phase II) |

PL. 3
 REPORT ON THE COOPERATIVE MINERAL EXPLORATION
 IN THE VAN YEN AND WESTERN THANH HOA AREAS,
 THE SOCIALIST REPUBLIC OF VIETNAM
 PHASE II

COMPREHENSIVE INTERPRETATION MAP OF THE AVAILABLE RELEVANT
 DATA IN THE SUOI CU MINERAL SHOWING

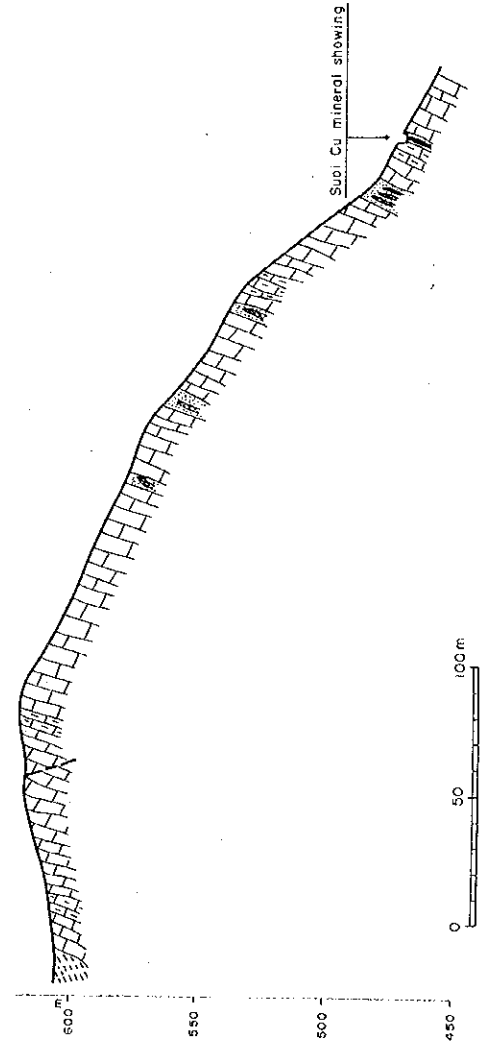
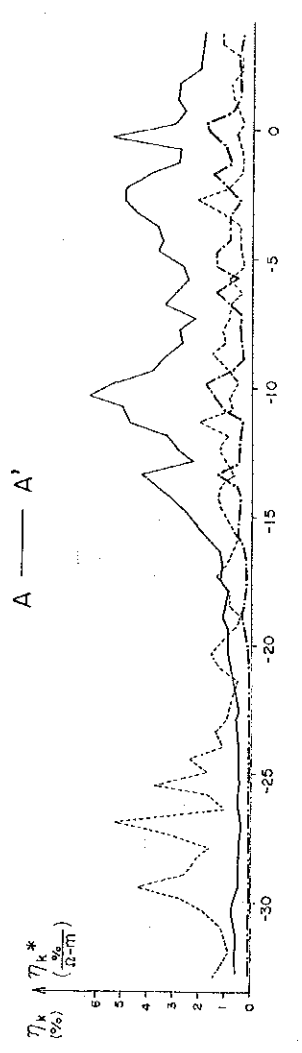
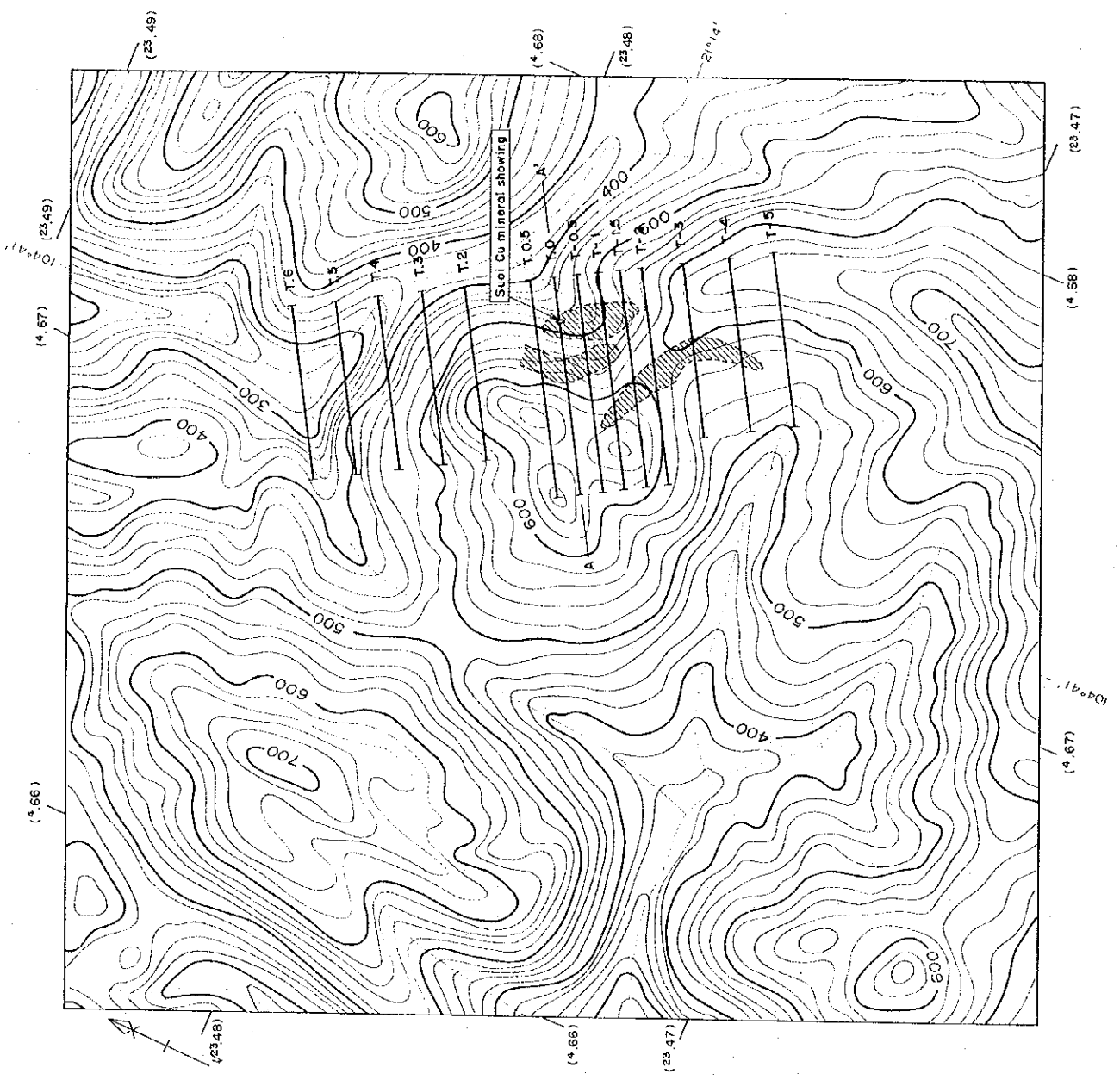


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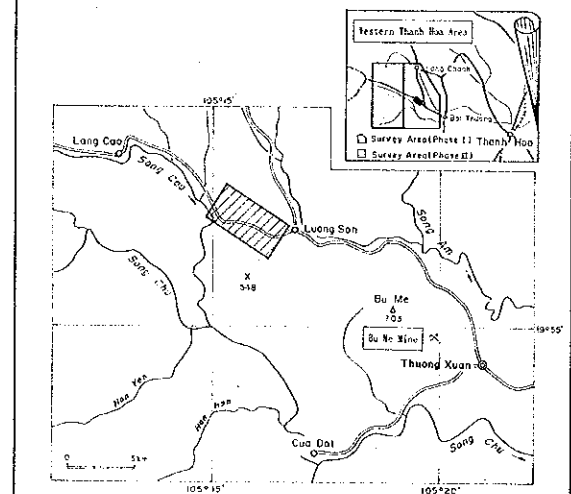
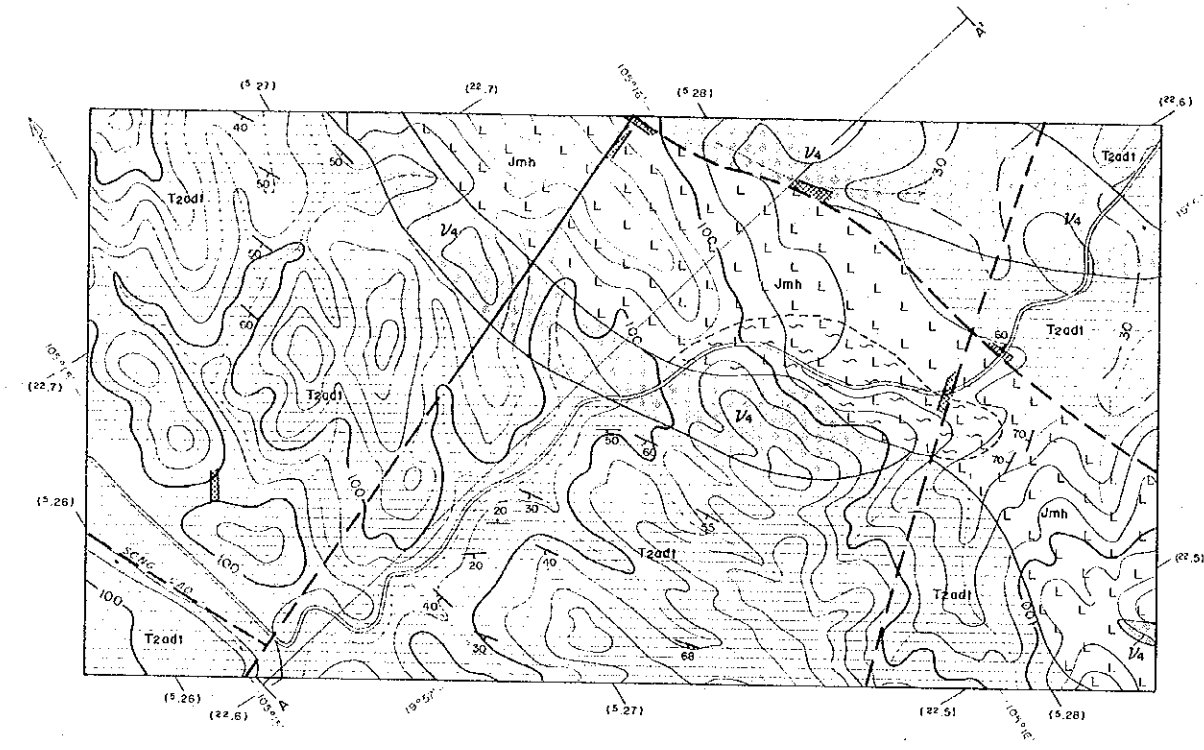
LEGEND

- Limestone
- Marl
- Sandstone, siltstone
- Pb-Zn Ore
- Pb-Zn Ore based on geophysical data
- Trench with Pb-Zn Ore
- Fault
- IP Anomalous zone
- FE (Frequency effect; %)
- MCF (Metal conduction factor; $\eta_k^* = \frac{\rho_k}{\Omega \cdot m}$)
- Resistivity ($\rho_k = \Omega \cdot m$)
- Geophysical survey line

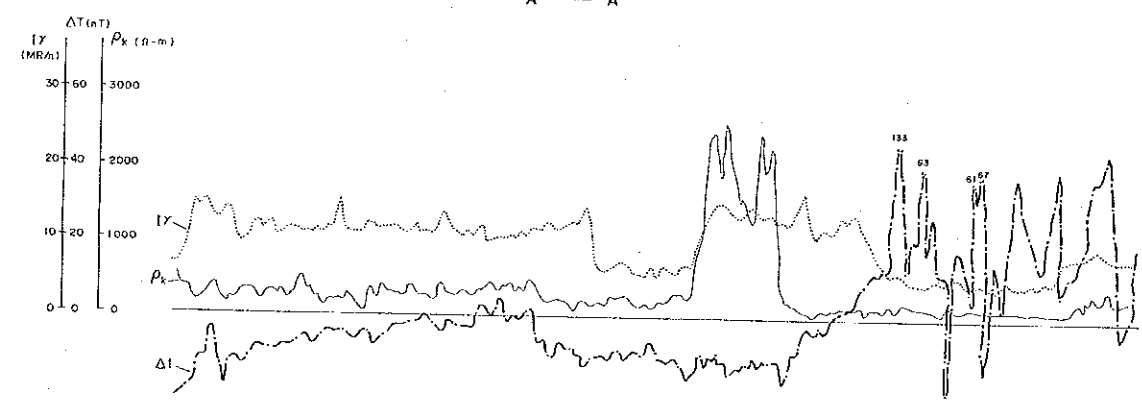
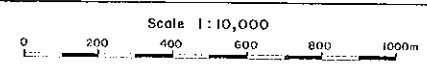


REPORT ON THE COOPERATIVE MINERAL EXPLORATION
IN THE VAN YEN AND WESTERN THANH HOA AREAS,
THE SOCIALIST REPUBLIC OF VIETNAM
PHASE II

COMPREHENSIVE INTERPRETATION MAP OF THE AVAILABLE RELEVANT
DATA IN THE LUONG SON MINERALIZATION ZONE



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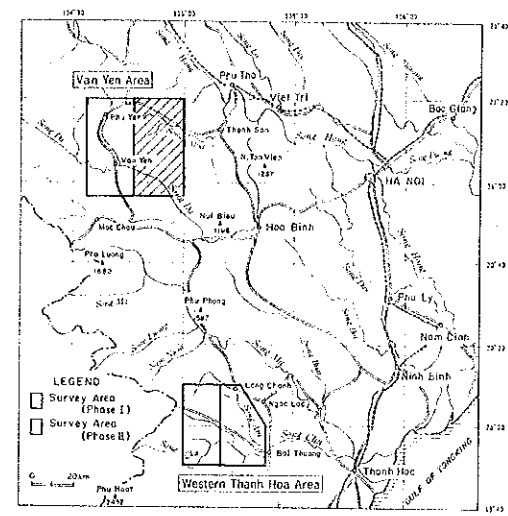


LEGEND

- Jurassic System
- Middle Triassic Series
- Gabbro, diabase
- Dip and strike of bed
- Fault (confirmed/inferred)
- Quartz vein
- Kaolinization zone
- ρ_k : Resistivity
- ΔI : Total magnetic intensity
- $I\gamma$: Radioactive intensity

REPORT ON THE COOPERATIVE MINERAL EXPLORATION
 IN THE VAN YEN AND WESTERN THANH HOA AREAS,
 THE SOCIALIST REPUBLIC OF VIETNAM
 PHASE II

GEOLOGIC MAP OF THE VAN YEN AREA

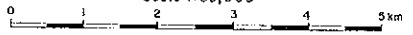


LEGEND
 Survey Area (Phase I)
 Survey Area (Phase II)

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 METAL MINING AGENCY OF JAPAN

Scale 1:50,000



LEGEND

- STRATIGRAPHY
- Quaternary (Q)
 - Upper Triassic (T₃)
 - Lower Triassic (T₂)
 - Lower Permian (P₁)
 - Carboniferous to Permian (CP)
 - Middle Devonian (D₂)
 - Lower Devonian (D₁)
 - Upper Ordovician to Silurian (O₃)
 - Upper Cambrian to Lower Ordovician (O₁, O₂)
 - Proterozoic (PR)

- INTRUSIVE ROCKS
- Cretaceous
 - Granite (G₆)
 - Syenite (S₆)
 - Early Triassic
 - Gabbro (G₃)
 - Permian
 - Ultramafic rocks (U₁)
 - Proterozoic
 - Granite (G₂)

- OTHERS
- Fault (certain / inferred or covered by the Quaternary)
 - Dip and strike of bed
 - Dip and strike of schistosity and gneissosity



- Upper Triassic
- Lower Triassic
- Lower Permian
- Carboniferous to Permian
- Middle Devonian
- Lower Devonian
- Upper Ordovician to Silurian
- Upper Cambrian to Lower Ordovician
- Proterozoic

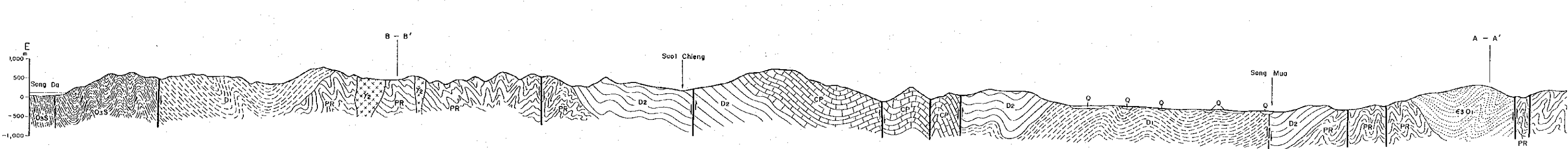
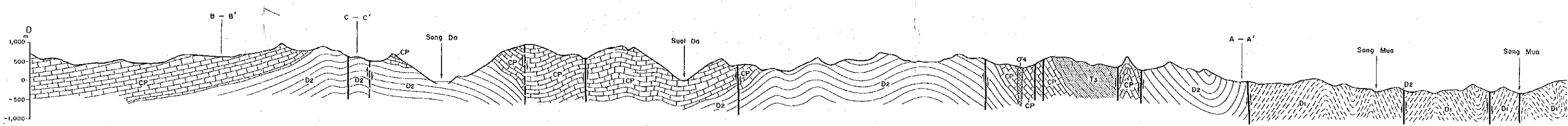
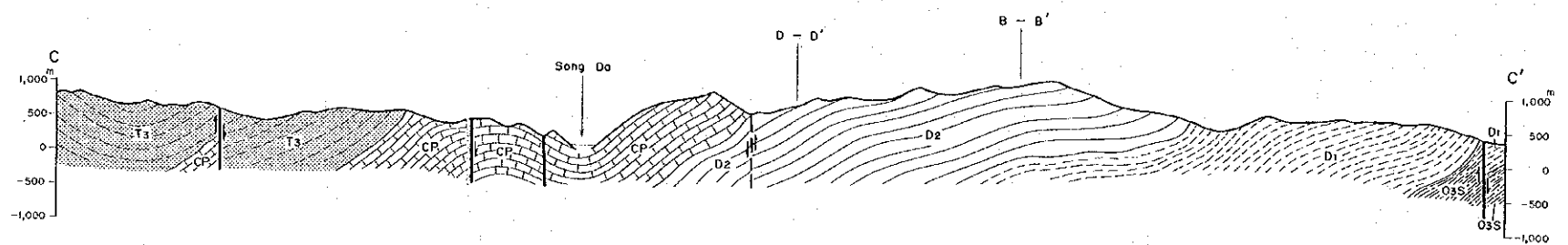
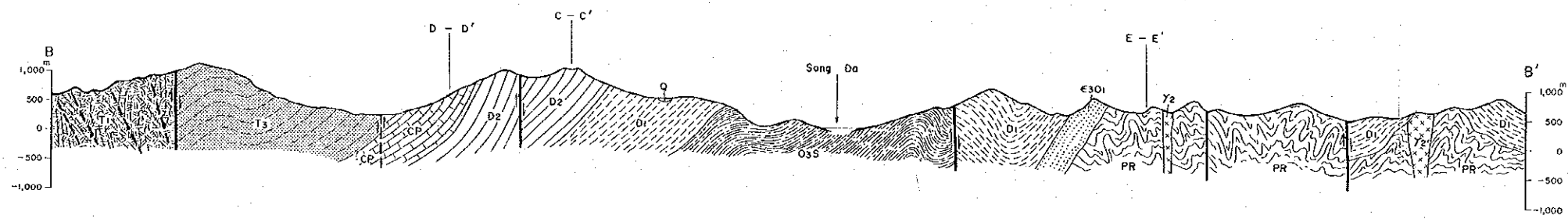
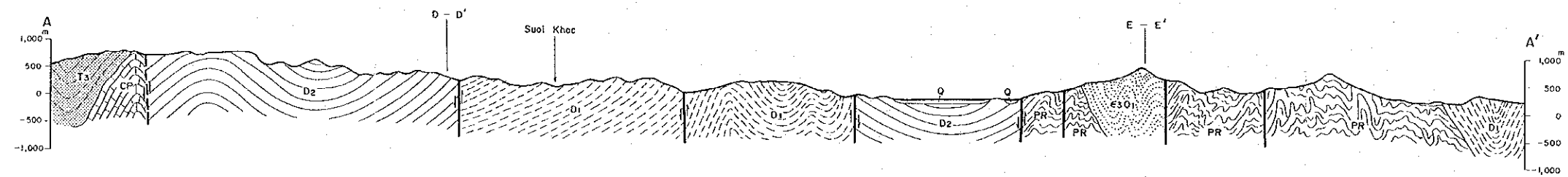
INTRUSIVE ROCKS

- Cretaceous**
- Granite
- Syenite
- Early Triassic**
- Gabbro
- Permian**
- Ultramafic rocks
- Proterozoic**
- Granite

OTHERS

- Fault (certain / inferred or covered by the Quaternary)
- Dip and strike of bed
- Dip and strike of schistosity and gneissosity
- Quartz (-sulfide) vein
- Mineralization
- Lead and zinc mineralization
- A-A' Geologic section line

21°10'N
21°05'N
21°00'N
20°55'N



LEGEND

STRATIGRAPHY

- Q Quaternary
- T3 Upper Triassic
- T2 Lower Triassic
- P1 Lower Permian
- CP Carboniferous to Permian
- D2 Middle Devonian
- D1 Lower Devonian
- OxS Upper Ordovician to Silurian
- e3D1 Upper Cambrian to Lower Ordovician
- PR Proterozoic

INTRUSIVE ROCKS

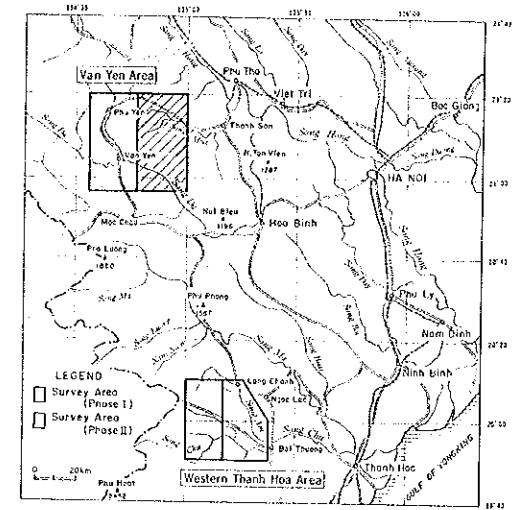
- Cretaceous**
 - γ1 Granite
 - γ2 Syenite
- Early Triassic**
 - γ4 Gabbro
- Permian**
 - γ5 Ultramafic rocks
- Proterozoic**
 - γ2 Granite

OTHERS

- Fault (certain / inferred or covered by the Quaternary)

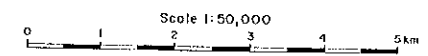
REPORT ON THE COOPERATIVE MINERAL EXPLORATION
IN THE VAN YEN AND WESTERN THANH HOA AREAS,
THE SOCIALIST REPUBLIC OF VIETNAM
PHASE II

GEOLOGIC SECTIONS OF THE VAN YEN AREA



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LEGEND

STRATIGRAPHY

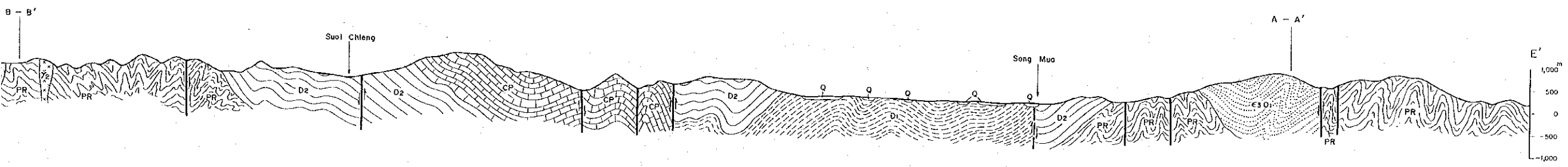
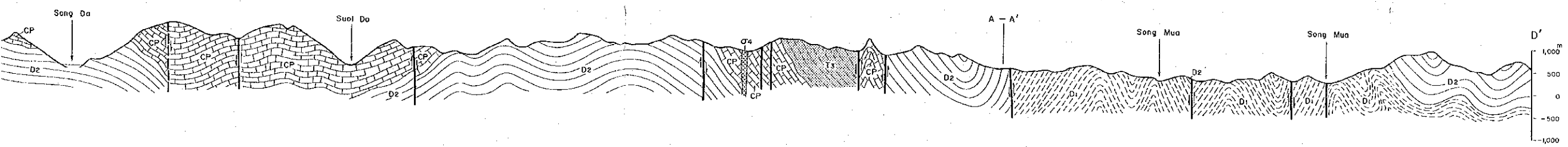
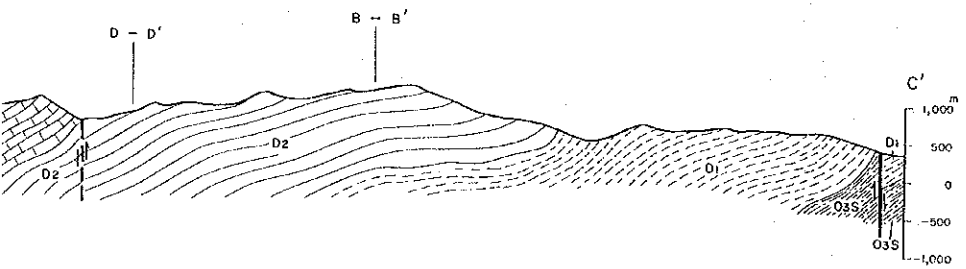
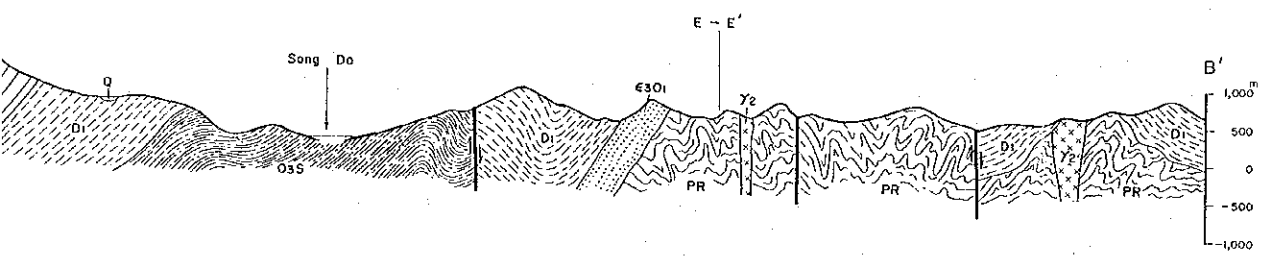
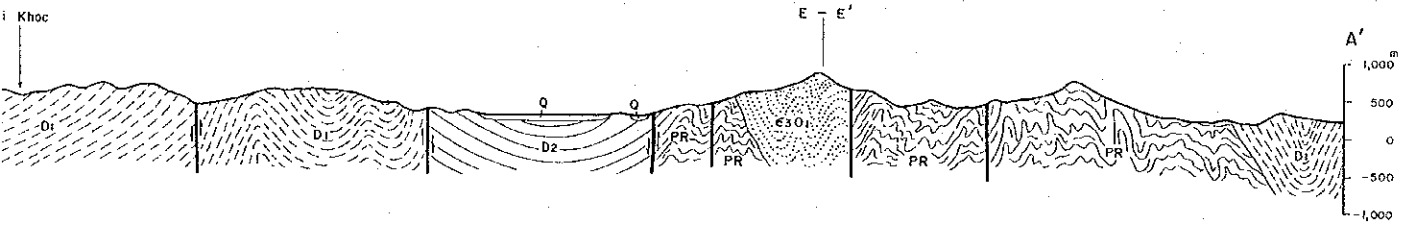
- Quaternary
- Upper Triassic
- Lower Triassic
- Lower Permian
- Carboniferous to Permian
- Middle Devonian
- Lower Devonian
- Upper Ordovician to Silurian
- Upper Cambrian to Lower Ordovician
- Proterozoic

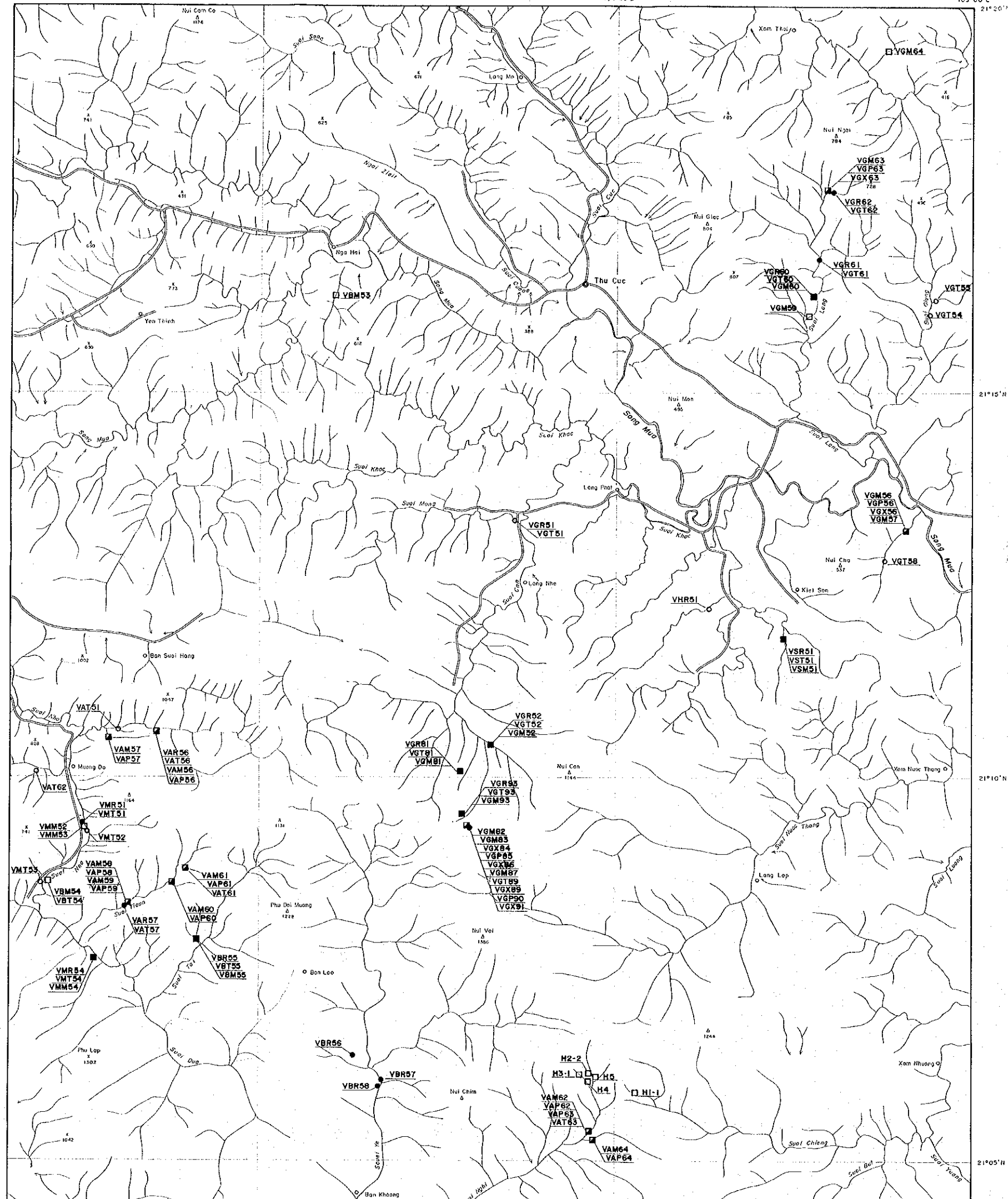
INTRUSIVE ROCKS

- Cretaceous
 - Granite
 - Syenite
- Early Triassic
 - Gabbro
- Permian
 - Ultramafic rocks
- Proterozoic
 - Granite

OTHERS

- Fault (certain / inferred or covered by the Quaternary)

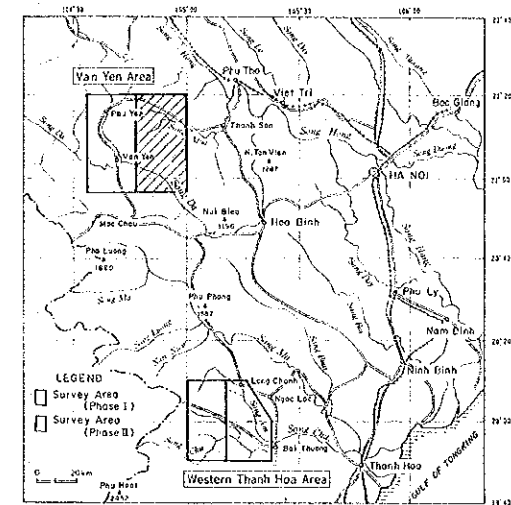




REPORT ON THE COOPERATIVE MINERAL EXPLORATION
 IN THE VAN YEN AND WESTERN THANH HOA AREAS,
 THE SOCIALIST REPUBLIC OF VIETNAM

PHASE II

LOCALITY MAP OF SAMPLES FOR LABORATORY STUDIES IN THE
 VAN YEN AREA



FEBRUARY 1995

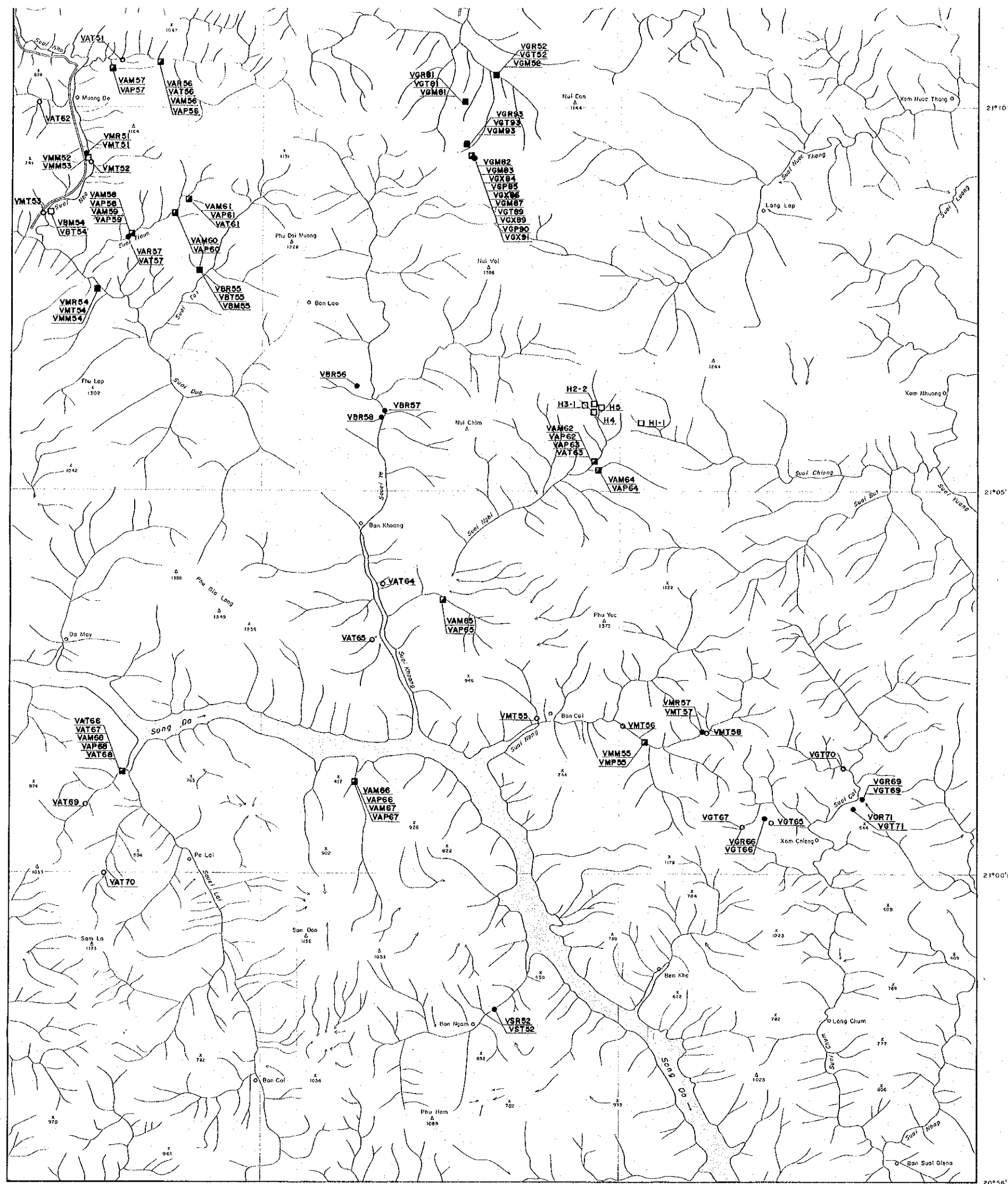
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LEGEND

- VGT51 Location and number of rock samples for thin section
- VGR51 Location and number of rock samples for whole rock analysis and thin section
 upper : whole rock analysis sample
 lower : thin section sample
- VGM51 Location and number of ore samples for chemical analysis
- VGM51 Location and number of ore samples for chemical analysis and polished section
 upper : chemical analysis sample
 lower : polished section sample
- VGR51 Location and number of rock samples for whole rock analysis and thin section, and ore samples for chemical analysis
 upper : whole rock analysis sample
 middle : thin section sample
 lower : chemical analysis sample
- ⊕ VGX51 Location and number of rock samples for X-ray diffraction analysis



VGP51 chemical analysis and polished section
 upper : chemical analysis sample
 lower : polished section sample

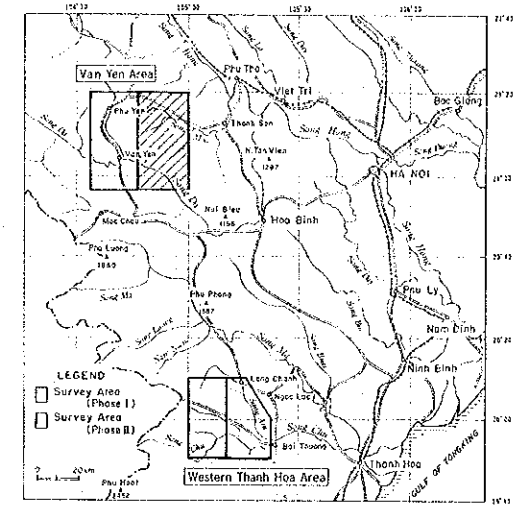
VGR51 Location and number of rock samples for whole rock analysis
 VGT51 and thin section, and one sample for chemical analysis
 VGM51 upper : whole rock analysis sample
 middle : thin section sample
 lower : chemical analysis sample

VGX51 Location and number of rock samples for X-ray diffraction analysis

21°10' N
 21°05' N
 21°00' N
 20°56' N

REPORT ON THE COOPERATIVE MINERAL EXPLORATION
 IN THE VAN YEN AND WESTERN THANH HOA AREAS,
 THE SOCIALIST REPUBLIC OF VIETNAM
 PHASE II

LOCALITY MAP OF STREAM SEDIMENT AND PANNED CONCENTRATE
 SAMPLES IN THE VAN YEN AREA



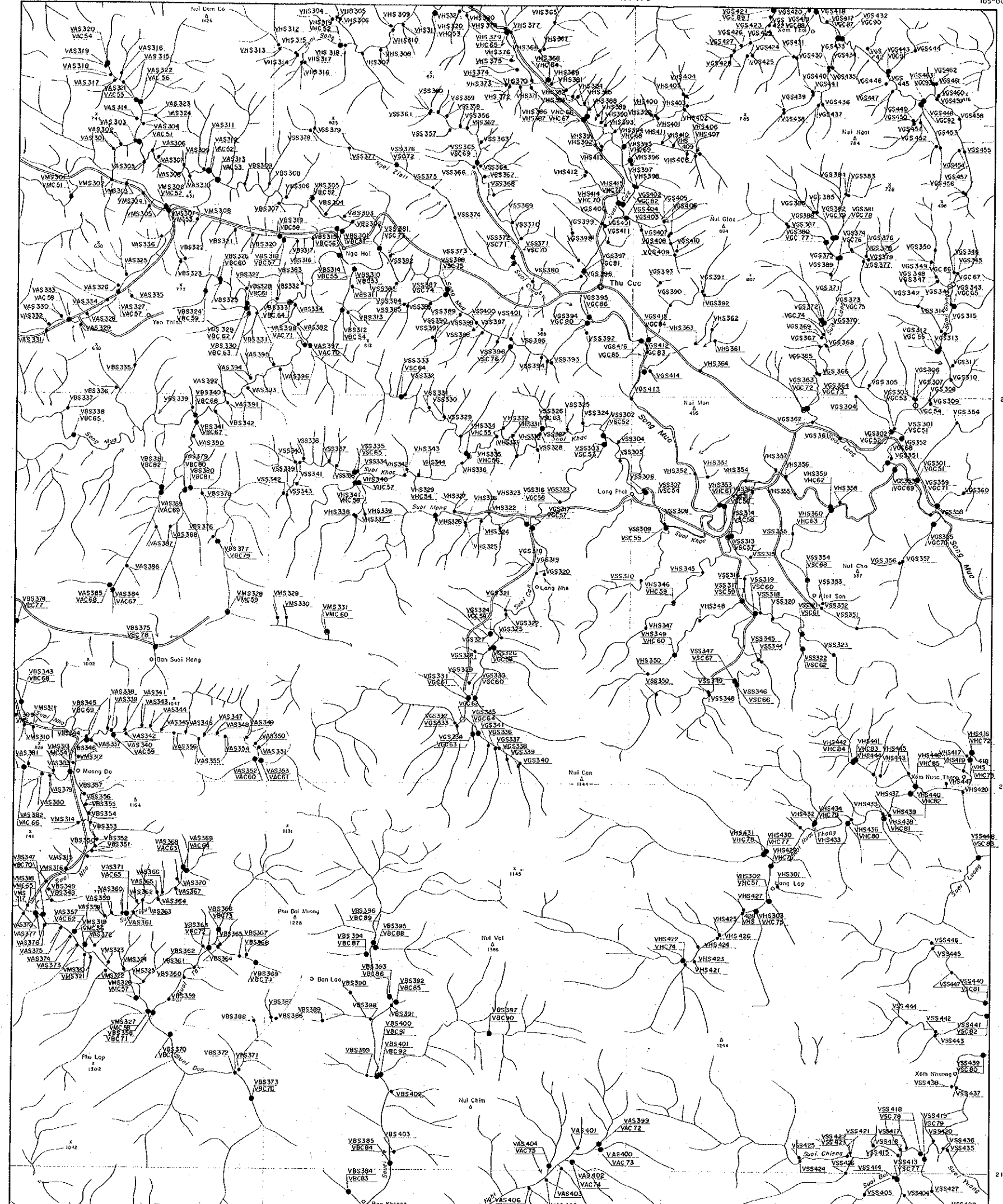
FEBRUARY 1995

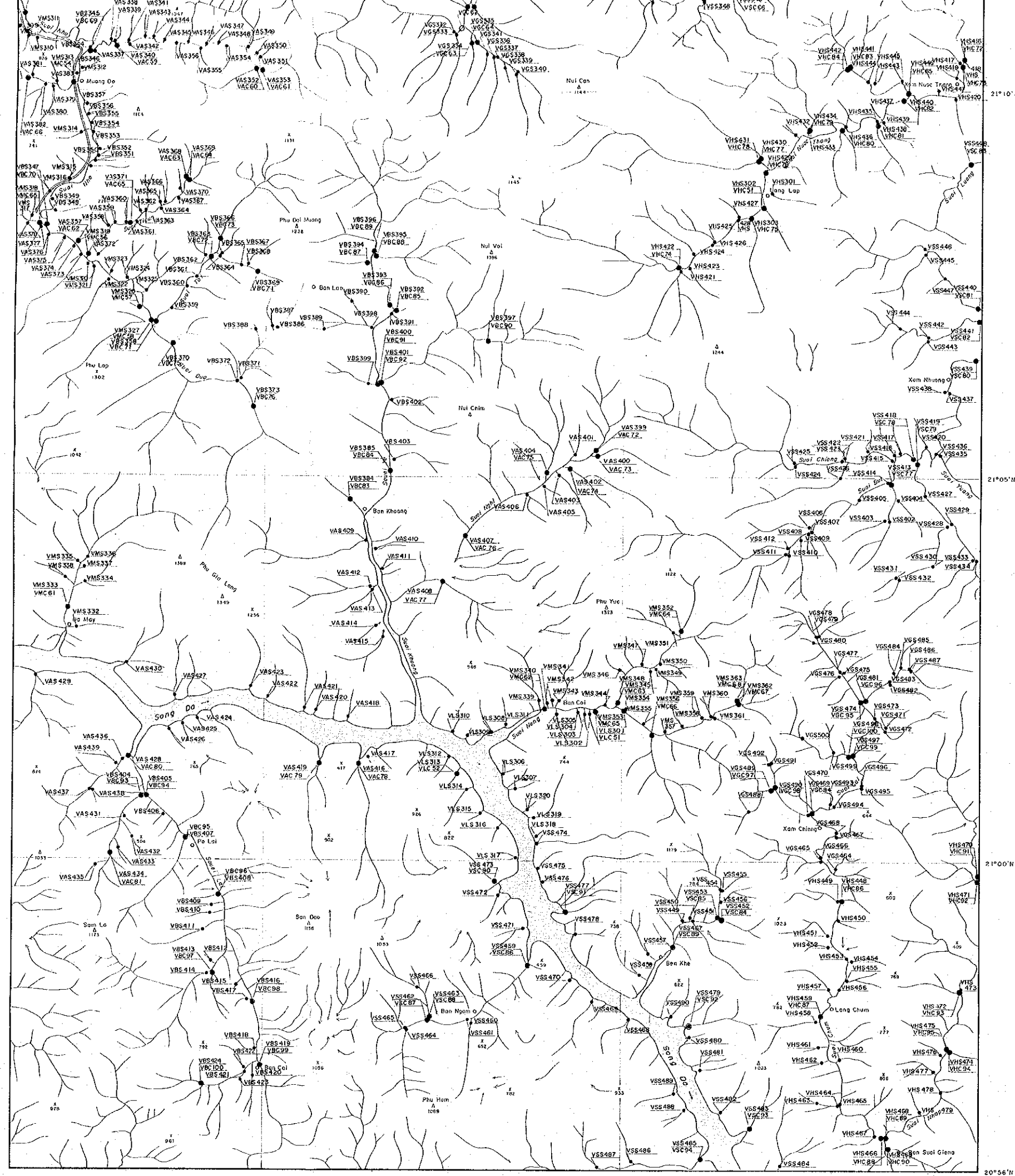
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 METAL MINING AGENCY OF JAPAN

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LEGEND

- VMS301 Location and number of both stream sediment and panned concentrate samples
 upper : stream sediment sample
 lower : panned concentrate sample
- VMS302 Location and number of stream sediment samples
- VMC 52 Location and number of panned concentrate samples





VMC 51 and paired concentrate samples
 upper: stream sediment sample
 lower: paired concentrate sample

● VMS 302 Location and number of stream sediment samples
 ○ VMC 52 Location and number of paired concentrate samples

21°10'N

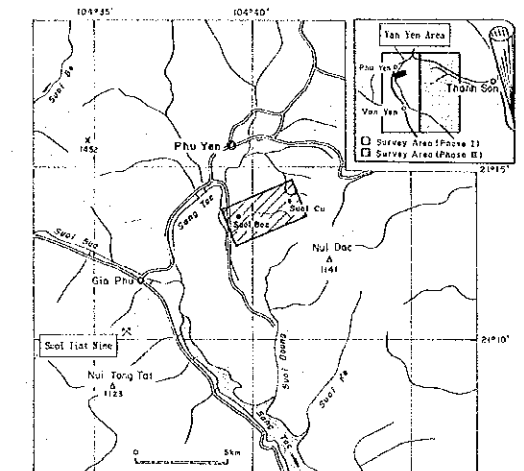
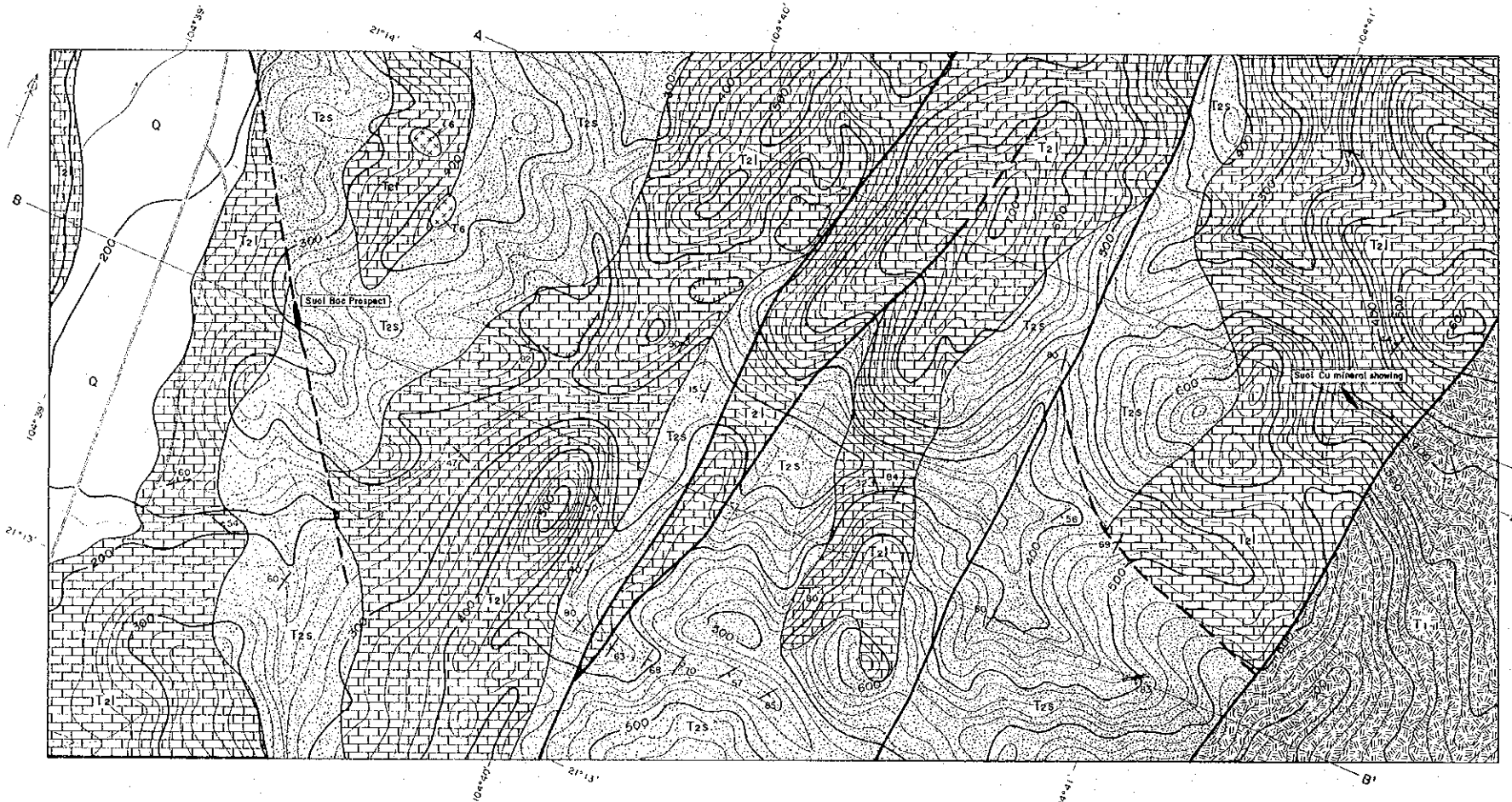
21°05'N

21°00'N

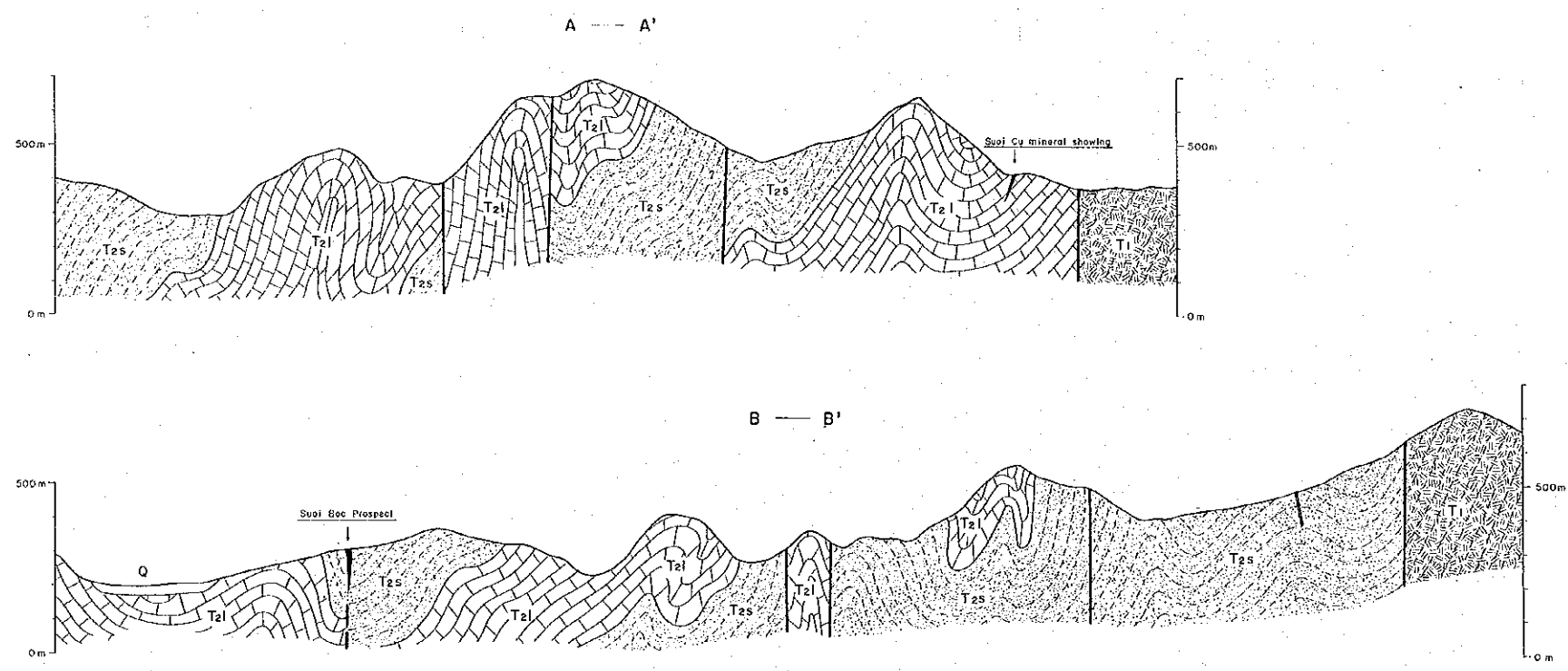
20°56'N

REPORT ON THE COOPERATIVE MINERAL EXPLORATION
 IN THE VAN YEN AND WESTERN THANH HOA AREAS,
 THE SOCIALIST REPUBLIC OF VIETNAM
 PHASE II

GEOLOGIC MAP AND SECTIONS OF THE SUOI BOC - SUOI CU
 MINERALIZATION ZONE



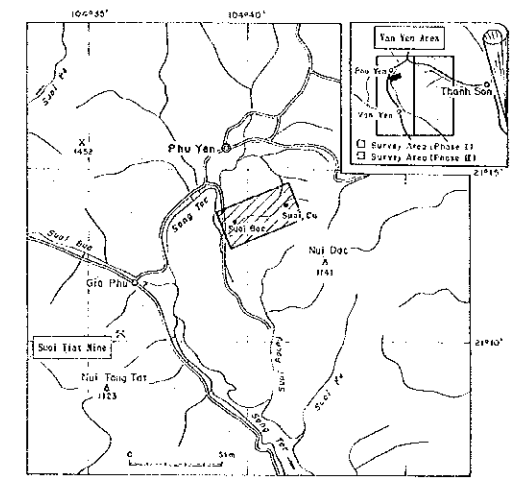
FEBRUARY 1995
 JAPAN INTERNATIONAL COOPERATION AGENCY
 METAL MINING AGENCY OF JAPAN
 Scale 1:10,000
 0 200 400 600 800 1000m



- LEGEND**
- STRATIGRAPHY**
- Quaternary: Gravel, sand, clay (Q)
 - Middle Triassic: Limestone (T2l)
 - Middle Triassic: Mudstone, sandstone, siltstone, conglomerate (T2s)
 - Early Triassic: Trachybasalt, trachybasaltic tuff, limestone (T1)
- INTRUSIVE ROCK**
- Cretaceous?: Dacite porphyry (T6)
- OTHERS**
- Dip and strike of bed
 - Fault (certain / inferred or covered by the Quaternary)
 - Lead and Zinc mineralization
 - Quartz vein
 - Geologic section line (A-A')

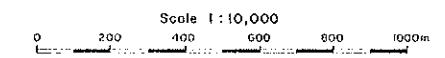
REPORT ON THE COOPERATIVE MINERAL EXPLORATION
 IN THE VAN YEN AND WESTERN THANH HOA AREAS,
 THE SOCIALIST REPUBLIC OF VIETNAM
 PHASE II

LOCALITY MAP OF SOIL SAMPLES AND SAMPLES FOR LABORATORY
 STUDIES IN THE SUOI BOC - SUOI CU MINERALIZATION ZONE



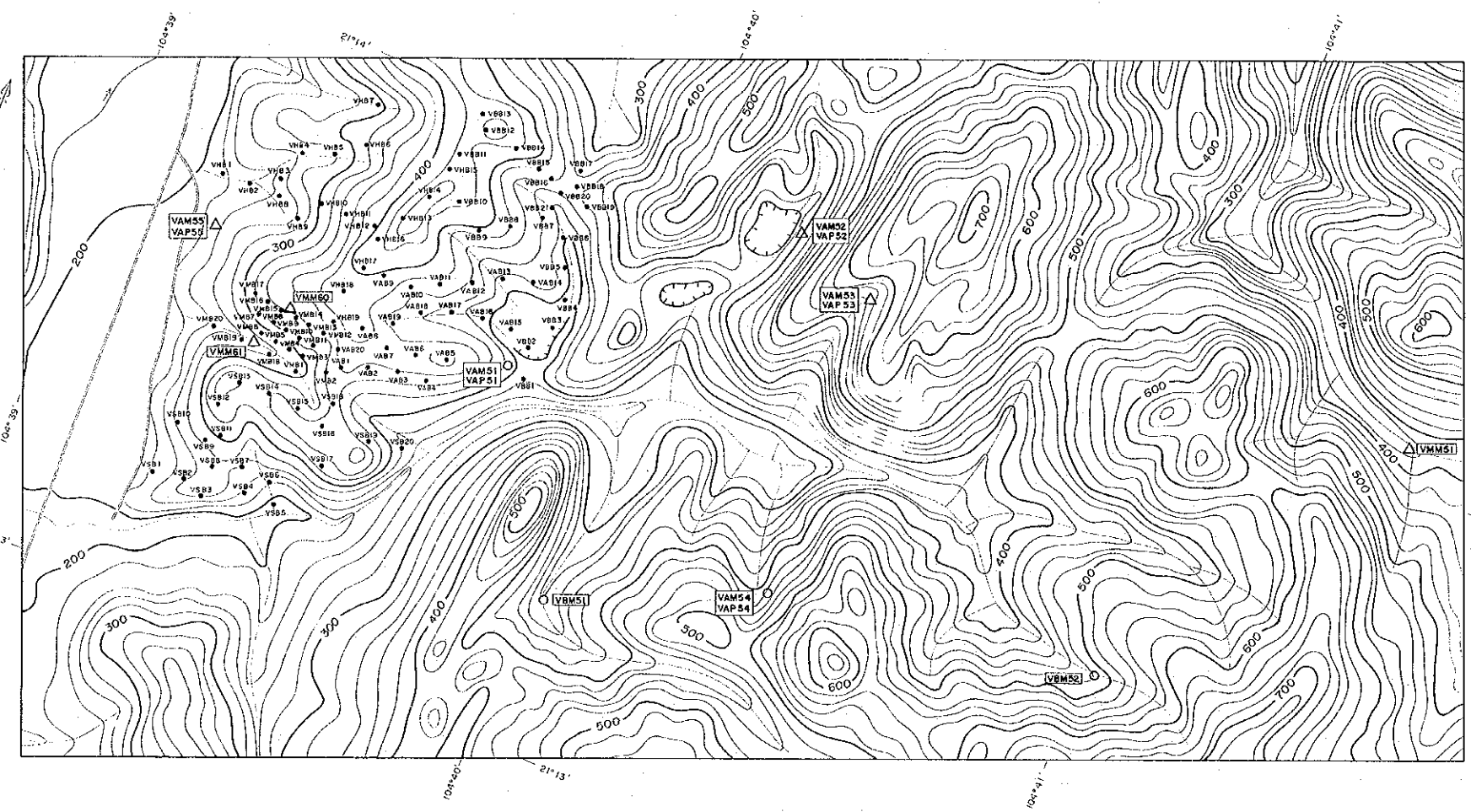
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LEGEND

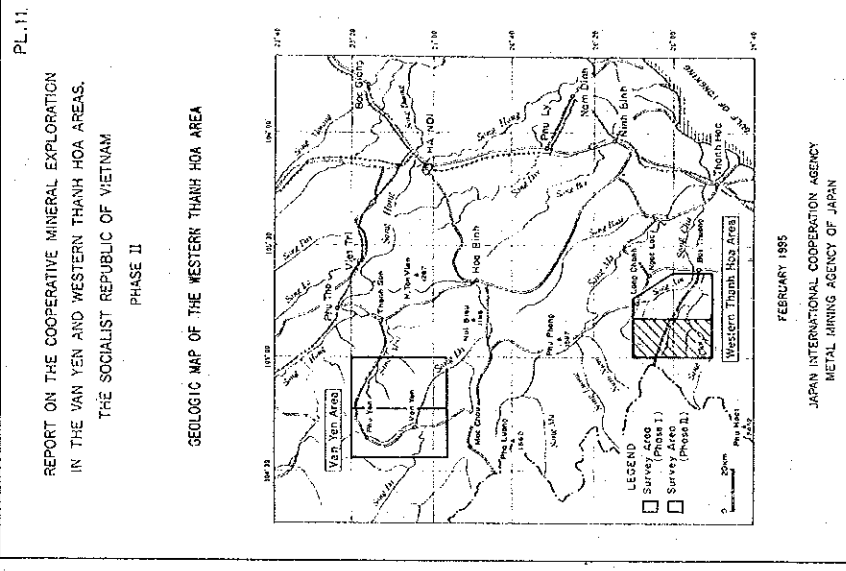
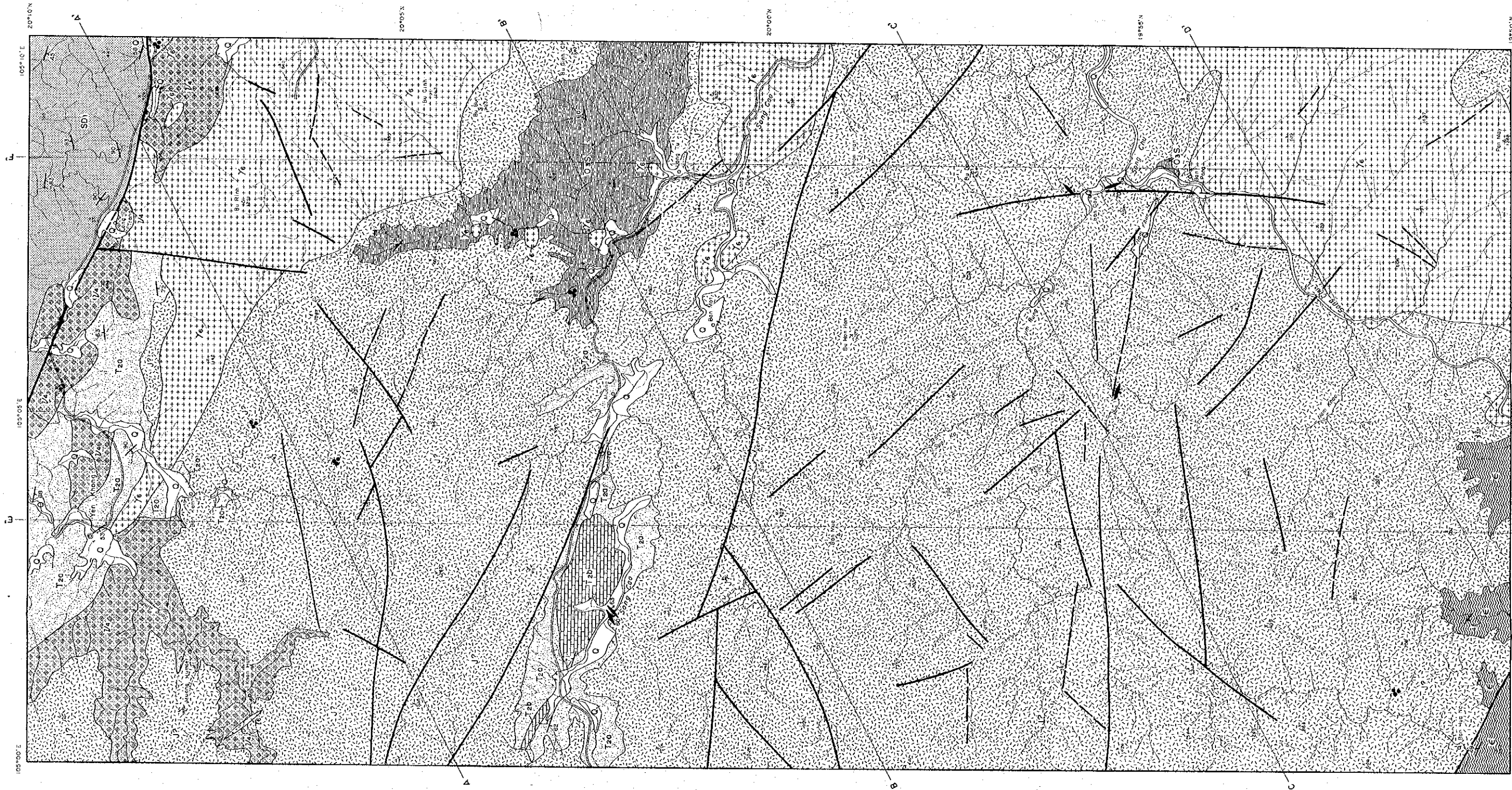
- VAB2 Location and number of soil samples
- VAM51 Location and number of ore samples for chemical analysis and polished section
- △ VAP51 upper : chemical analysis sample
lower : polished section sample



sample NO.	sd (a)	Occurrence	Host rock	Strike and dip	Minerals	Su	Ag	Cu	Pb	Zn	Si	Cr	Mn	Pt
VAB21	0.1	Flint(Fein)	ls?		Qt, Lis	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
VAB22	0.1	Flint(Fein)	Sst?		Qt, Lis, Cp	0.002	0.005	0.005	0.019	0.032	0.032	0.032	0.032	0.032
VAB23	0.1	Flint(Fein)	Sst?		Qt, Lis	0.001	0.005	0.005	0.001	0.002	0.002	0.002	0.002	0.002
VAB24		Diss	ls		Cal	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
VAB25		Flint(Diss)	ls		Cal	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
VAB26		Flint(Diss)	ls		Cal	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
VAB27		Diss	ls		Cal	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
VAB28		Flint(Diss)	ls		Cal	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
VAB29		Diss	ls		Cal	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
VAB30	0.1	Fein	Ca	S62 E-84'55	Qt	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001

[Abbreviations]
 Diss: dissolution, ls: limestone
 Ss: sandstone, Y: andesite
 Cg: conglomerate, Qt: quartz
 Lis: limonite, Cp: chalcocoprite
 Cal: calcite, Py: pyrite

So and Pt are in ppm, Ag in ppm, and other elements in percent.



LEGEND

STRATIGRAPHY

- Quaternary
- Unconsolidated Jurassic (mainly basic andesite tuff)
- Middle Triassic
 - a: sedimentary rocks excluding limestone
 - b: limestone
- Shinarump to Lower Devonian
- Upper Ordovician to Silurian
- Cambrian

INTRUSIVE ROCKS

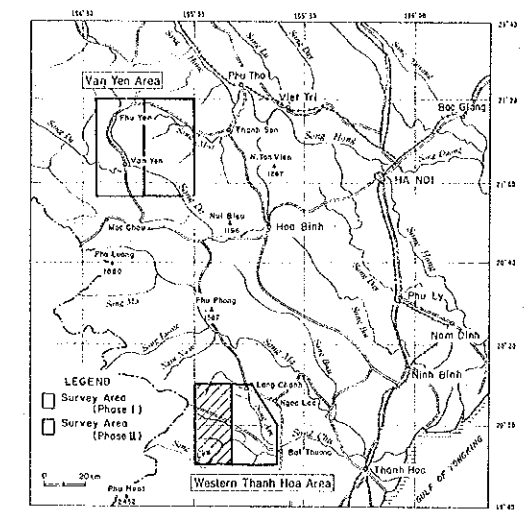
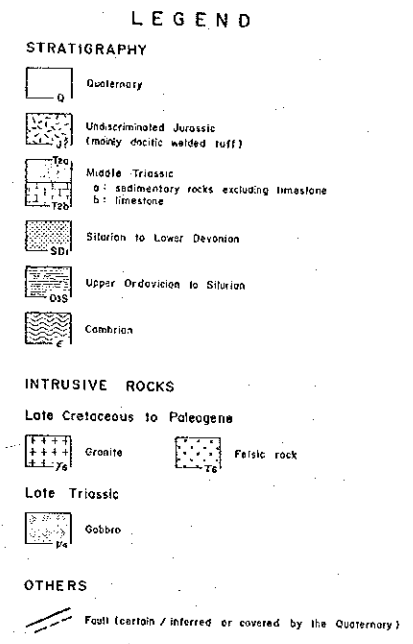
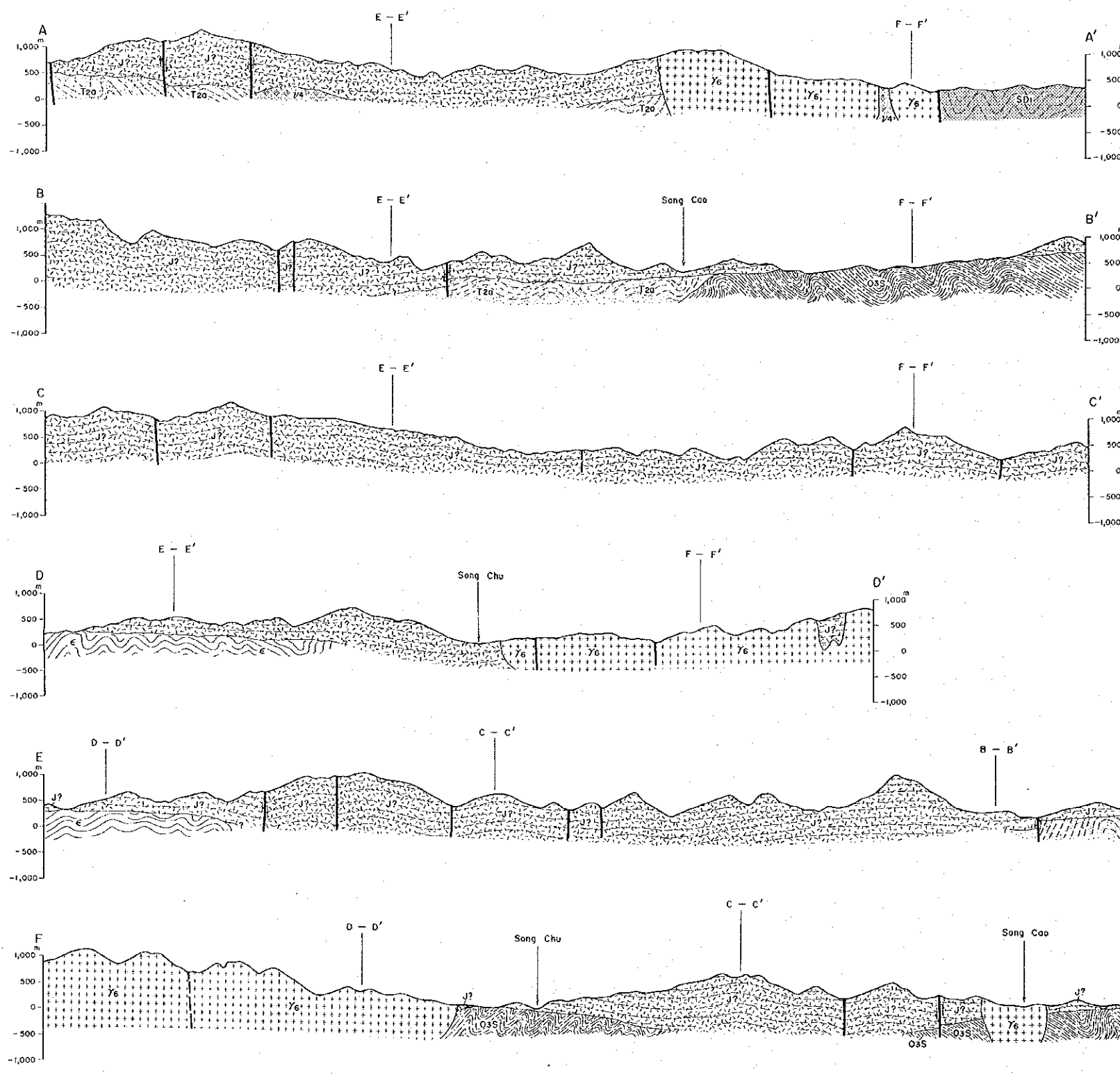
- Late Cretaceous to Paleogene
 - Granite
 - Felsic rock
- Late Triassic
 - dabie

OTHERS

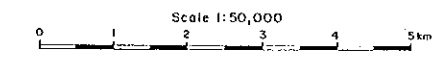
- Fault (certain, inferred or covered by the Quaternary)
- Dip and strike of bed
- Dip and strike of sedimentary and gneissosity
- Quartz (-surface) vein
- Mineralization
- A — A' Geologic section line

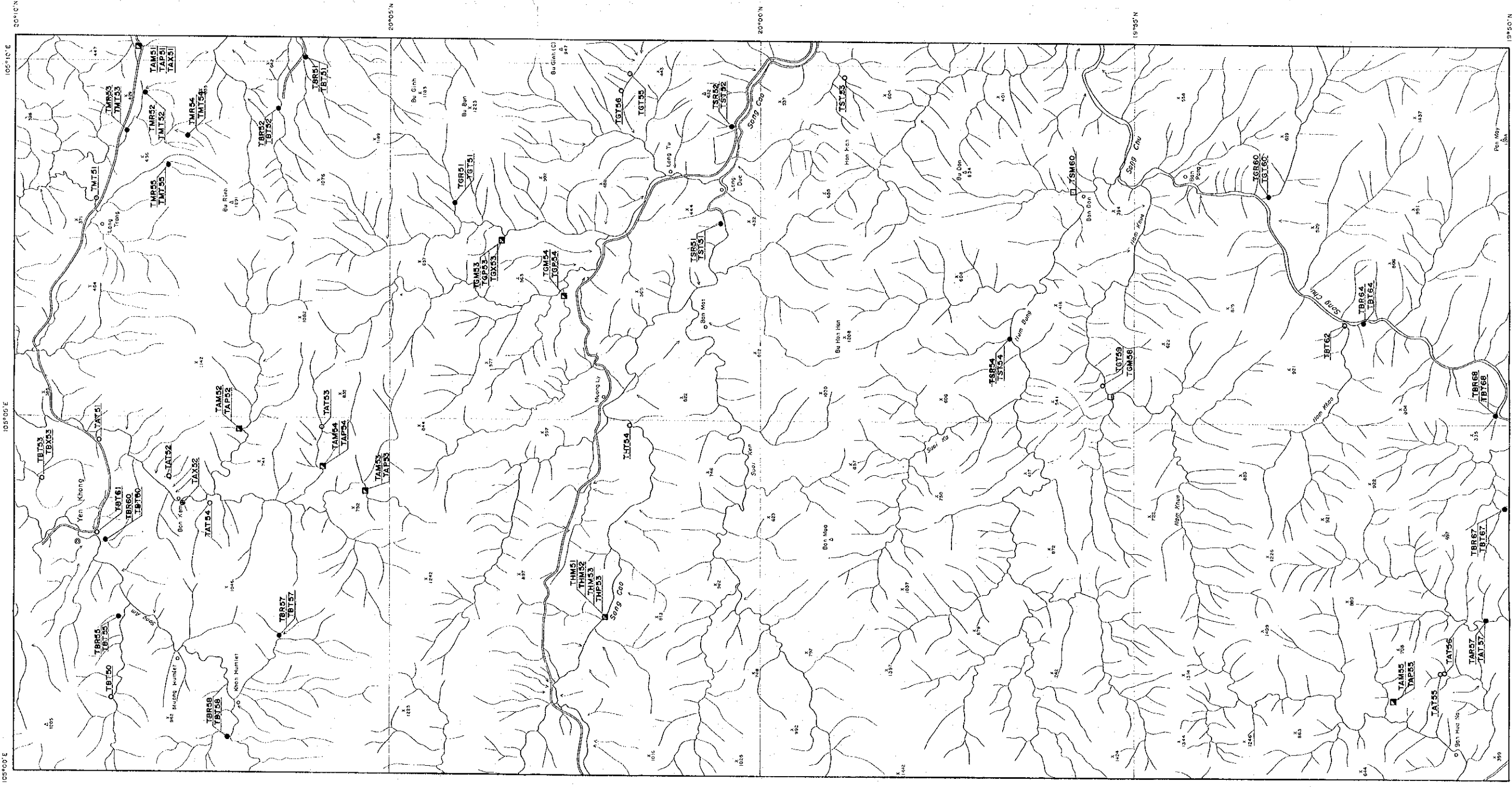
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GEOLOGIC SECTIONS OF THE WESTERN THANH HOA AREA



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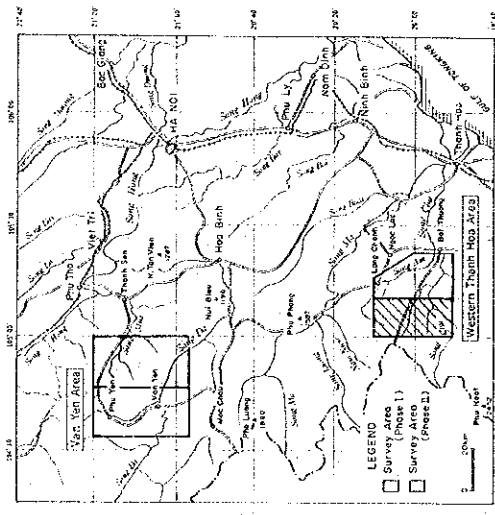




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IN THE VAN YEN AND WESTERN THANH HOA AREAS,
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PHASE II

LOCALITY MAP OF SAMPLES FOR LABORATORY STUDIES IN THE
WESTERN THANH HOA AREA



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LEGEND

- TAT51 Location and number of rock samples for thin section
- TAM51 Location and number of rock samples for whole rock analysis; and thin section
○ TAT51 upper : whole rock analysis sample
○ TAT51 lower : thin section sample
- TAM51 Location and number of ore samples for chemical analysis
- ▣ TAM51 Location and number of ore samples for chemical analysis and polished section
○ TAP51 upper : chemical analysis sample
○ TAP51 lower : polished section sample
- ⊙ TAX51 Location and number of rock samples for X-ray diffraction analysis