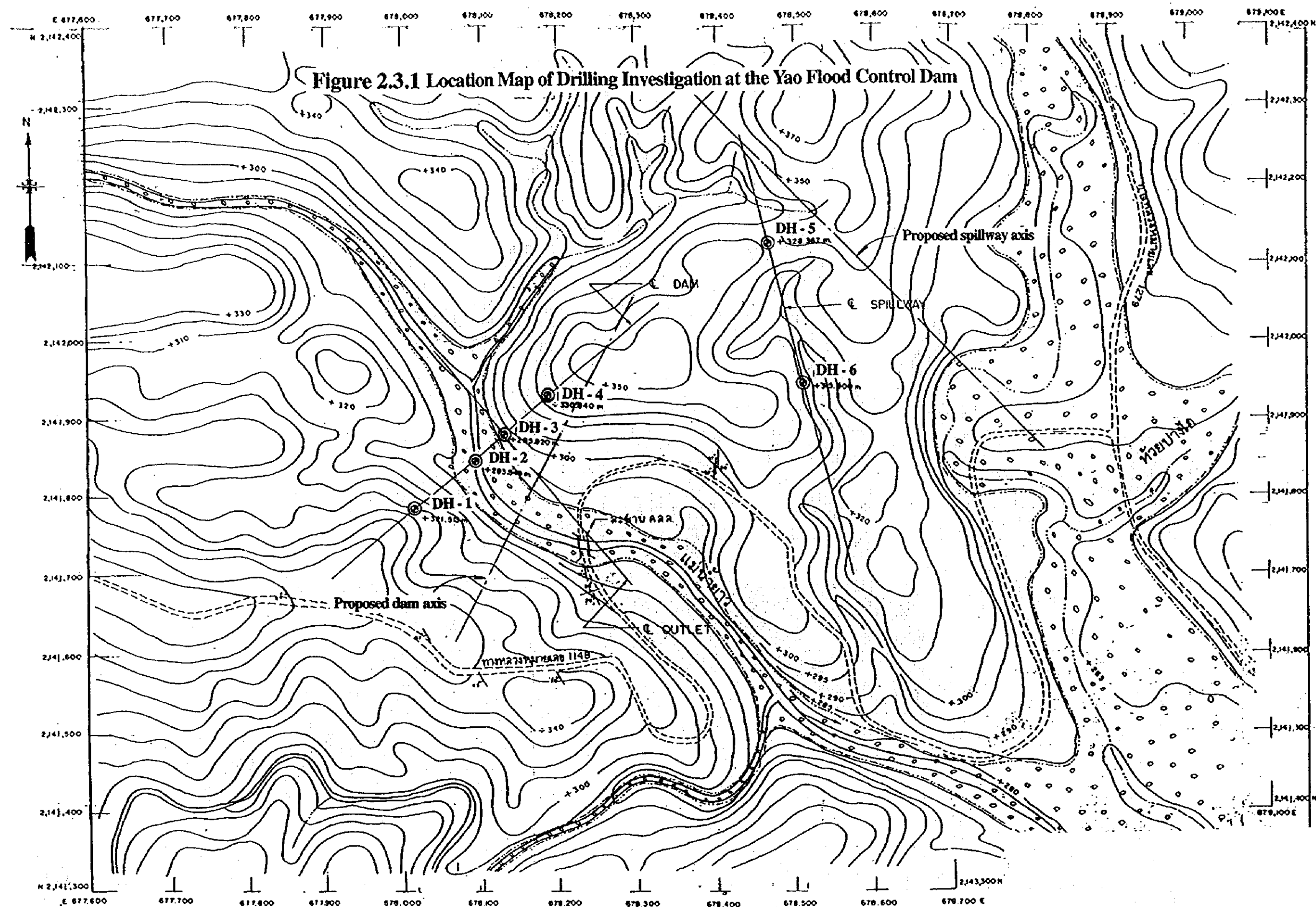
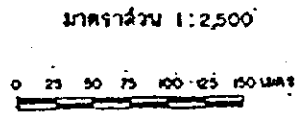


2.3. Location Map of Geological Investigation (Yao Flood Control Dam)



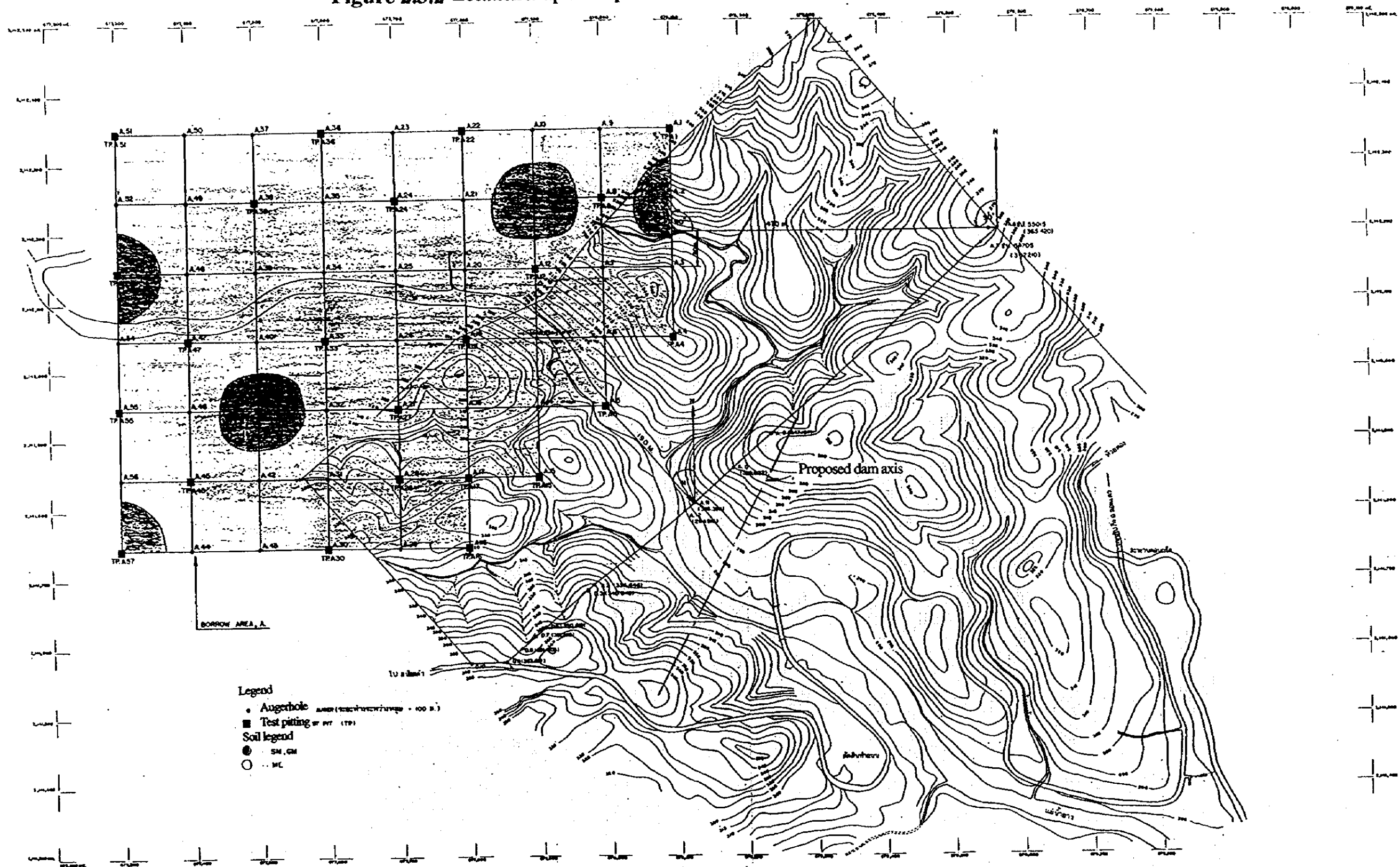
LEGEND

- Borehole location
- Existing road
- River
- Strike and dip
- Alluvial deposit
- Residual deposit

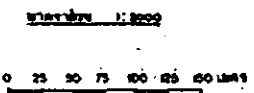


THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
Location Map of Drilling Investigation at the Yao Flood Control Dam	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	

Figure 2.3.2 Location Map of Proposed Borrow Area at the Yao Flood Control Dam



- Legend**
- Augerhole (ขนาดหน้าตัดวงกลม - 100 มม.)
 - Test pitting or pit (TP)
 - Soil legend**
 - SM, GM
 - MC



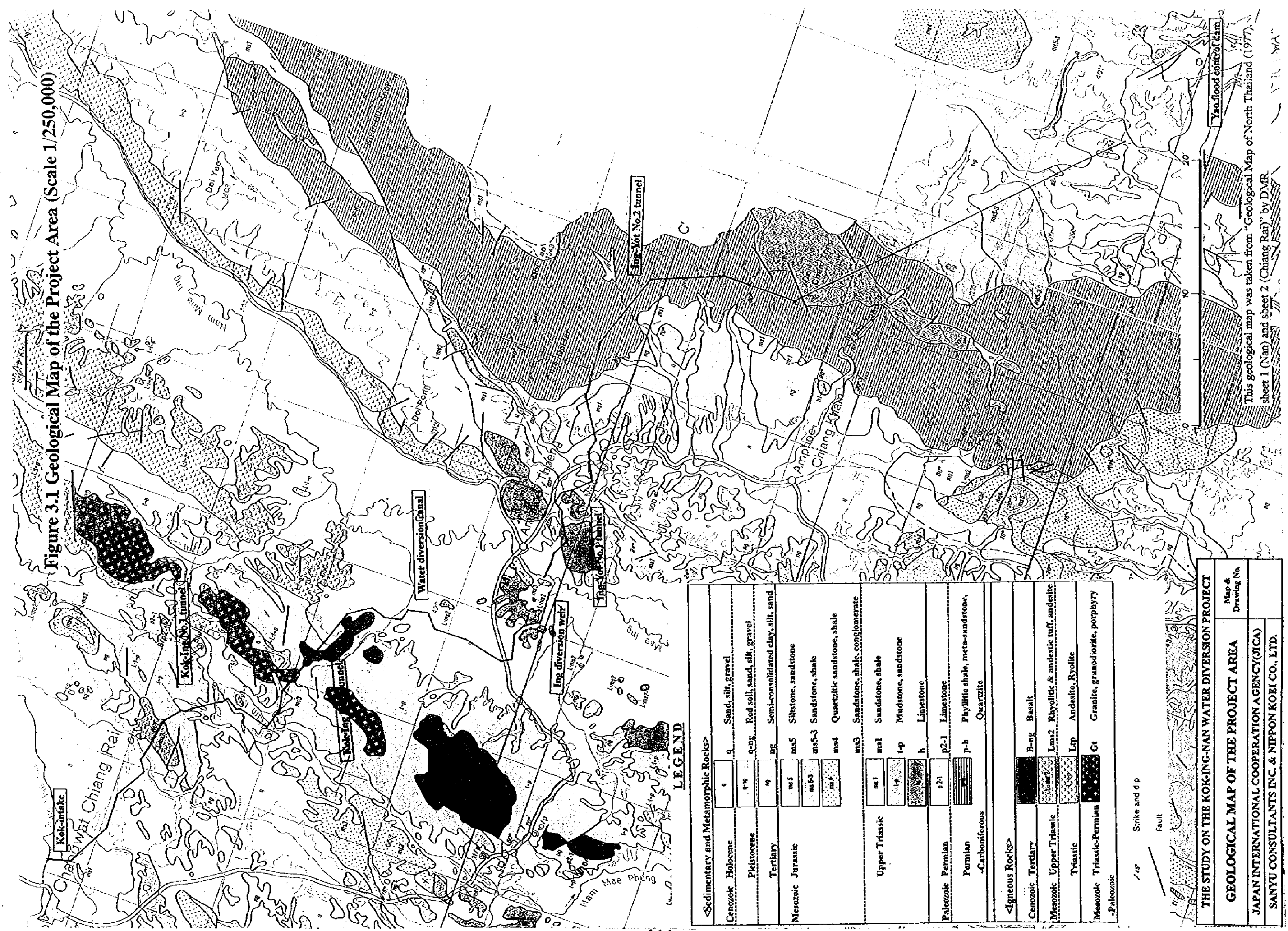
THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
Location Map of Proposed Borrow Area at the Yao Flood Control Dam	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	

3. Geological Map



3.1. Geological Map of the Project Area
(Scale 1/250,000)

Figure 3.1 Geological Map of the Project Area (Scale 1/250,000)



This geological map was taken from "Geological Map of North Thailand (1977), sheet 1 (Nan) and sheet 2 (Chiang Rai)" by DMR

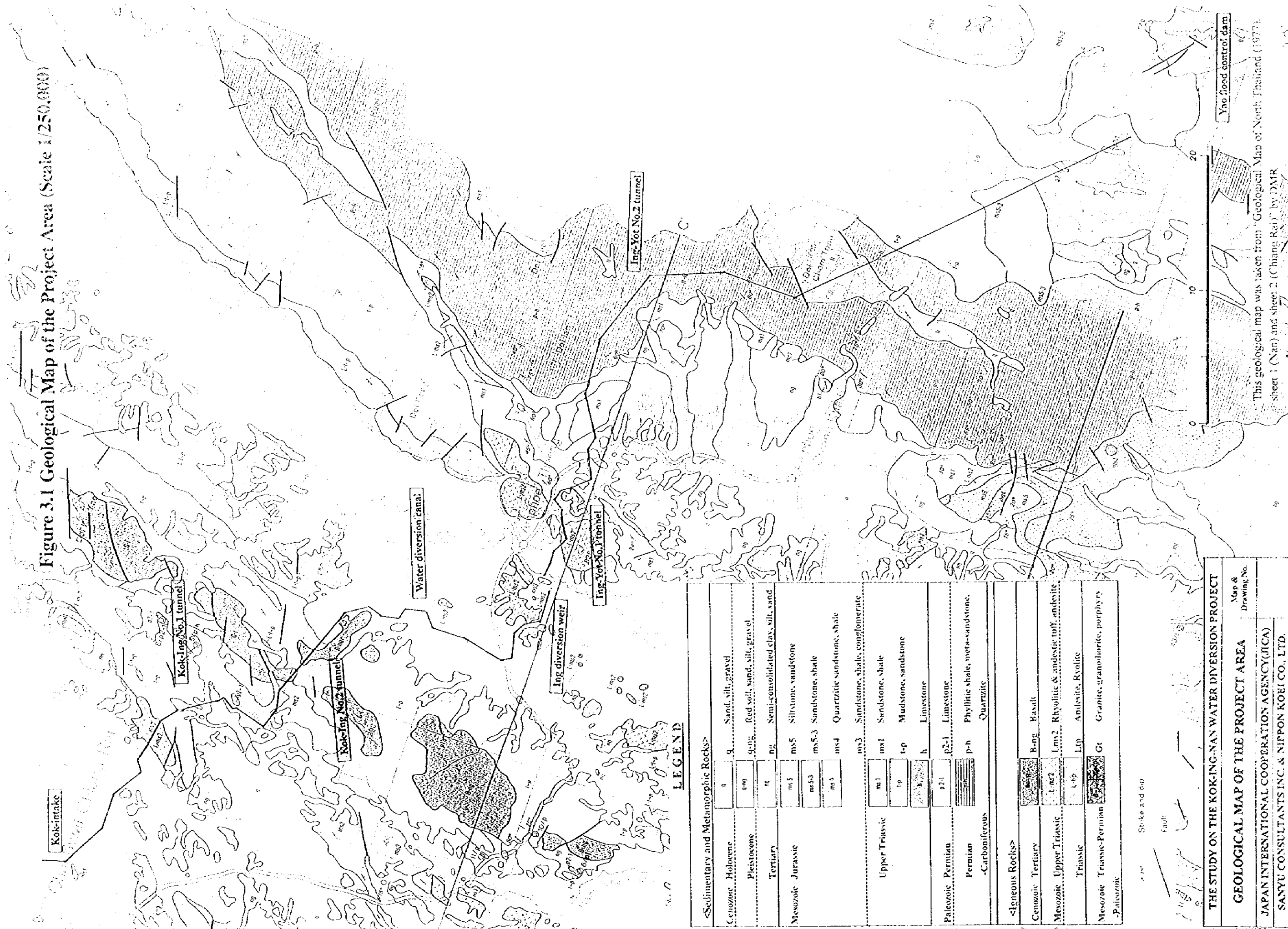
LEGEND

<Sedimentary and Metamorphic Rocks>	
Cenozoic - Holocene	q Sand, silt, gravel
Plistocene	q-ng Red soil, sand, silt, gravel
Tertiary	ng Semi-consolidated clay, silt, sand
Mesozoic - Jurassic	ms5 Siltstone, sandstone
	ms5-3 Sandstone, shale
	ms4 Quartzitic sandstone, shale
	ms3 Sandstone, shale, conglomerate
Upper Triassic	ms1 Sandstone, shale
	tp Mudstone, sandstone
	h Limestone
Paleozoic - Permian	p2-1 Limestone
Permian	p-h Phyllitic shale, meta-sandstone, Quartzite
<Igneous Rocks>	
Cenozoic - Tertiary	B-ng Basalt
Mesozoic - Upper Triassic	Lms2 Rhyolitic & andesitic ruff, andesite
Triassic	Lyp Andesite, Ryolite
Mesozoic - Triassic-Permian	Gt Granite, granodiorite, porphyry
-Paleozoic	

1/45 Strike and dip
Fault

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT
GEOLOGICAL MAP OF THE PROJECT AREA
 Map & Drawing No.
 JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
 SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.

Figure 3.1 Geological Map of the Project Area (Scale 1/250,000)



LEGEND

<Sedimentary and Metamorphic Rocks>	
Cenozoic: Holocene	q Sand, silt, gravel
Pleistocene	q-og Red soil, sand, silt, gravel
Tertiary	n _g Semi-consolidated clay, silt, sand
Mesozoic: Jurassic	ms ₅ Siltstone, sandstone
	ms ₅₋₃ Sandstone, shale
	ms ₄ Quartzitic sandstone, shale
	ms ₃ Sandstone, shale, conglomerate
Upper Triassic	ms ₁ Sandstone, shale
	t-p Mudstone, sandstone
	h Limestone
Paleozoic: Permian	p ₂₋₁ Limestone
Permian	p-h Phyllite shale, meta-sandstone, Quartzite
-Carboniferous	
<Igneous Rocks>	
Cenozoic: Tertiary	B-ng Basalt
Mesozoic: Upper Triassic	l-ms ₂ Rhyolitic & andesitic tuff, andesite
Triassic	l-p Andesite, Ryolite
Mesozoic: Triassic-Permian	Gt Granite, granodiorite, porphyry
-Paleozoic	

Scale and dip
Fault

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT
GEOLOGICAL MAP OF THE PROJECT AREA
 Map & Drawing No.
 JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)
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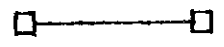
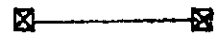
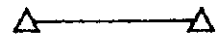
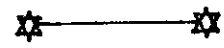


This geological map was taken from "Geological Map of North Thailand (1977), sheet 1 (Nan) and sheet 2 (Chiang Rai)" by DMIR

3.2. Geological Map of the Project Area
(Scale 1/50,000)

Figure 3.2.1 Legend of Geological Map

Geological Age	Formation	Acronym of map	Symbol	Rock Facies	DMR geological map
Holocene	Alluvial deposit	Qa		River gravel, Sand and Clay	Qa
	Flood plain deposit	Qf		Unconsolidated Sand, Silt and Gravel	Qf
Pleistocene	Terrace deposit	Qt		Unconsolidated red soil, Sand, Silt and Gravel	Qt
Tertiary	Huai Sieo	Ths		Semiconsolidated clay, Silt with Sandstone	ng
Jurassic	Mae Tam	Jmt		Shale, Sandstone	ms5
	ms 5-3	ms5-3		Tuff, Shale and Sandstone	ms5-3
	Phu Kham	Jpk		Quartzitic sandstone, Shale	ms4
	ms 3-5	ms3-5		Sandstone, Shale, Tuff	ms3-5
	Na Ngan	Jnn		Sandstone, Shale, Conglomerate	ms3
	ms 3	ms3		Conglomerate, Sandstone	ms1
Middle-Upper	Doi Pong Nok	TRpn		Sandstone, Shale, Tuff and Lapilly Tuff	ms1
Triassic	Pa Lae	TRpl		Limestone	h,p2-1
	Huai Fak	TRhf		Sandstone, Tuff interbedded with Shale	t-p
Triassic-Permian	PTR	PTR		Sandstone, Shale and Tuff	t-p
Permian	P3	P3		Sandstone, Shale, Slate, Tuff and Limestone	t-p
	P2	P2		Limestone	p2-1
Permian-Carboniferous	Huai Krai	CPhk		Metasandstone interbedded with Slate	p-h
	Nam Bong	CPnb		Slate, Quartzitic interbedded with Sandstone foliated	p-h
	Doi Mun	CPdm		Schist, Phyllite, Slate interbedded with Metasandstone	p-h

Legend

-  Tunnel alignment
-  Canal alignment
-  Borehole location
-  Refraction survey
-  Reflection survey
-  TMB (Time domain electromagnetic survey for shallow portion)
-  TDEM (Time domain electromagnetic survey for deep portion)
-  PS (Point sounding)
-  Fault line (presumed)

Igneous Rocks







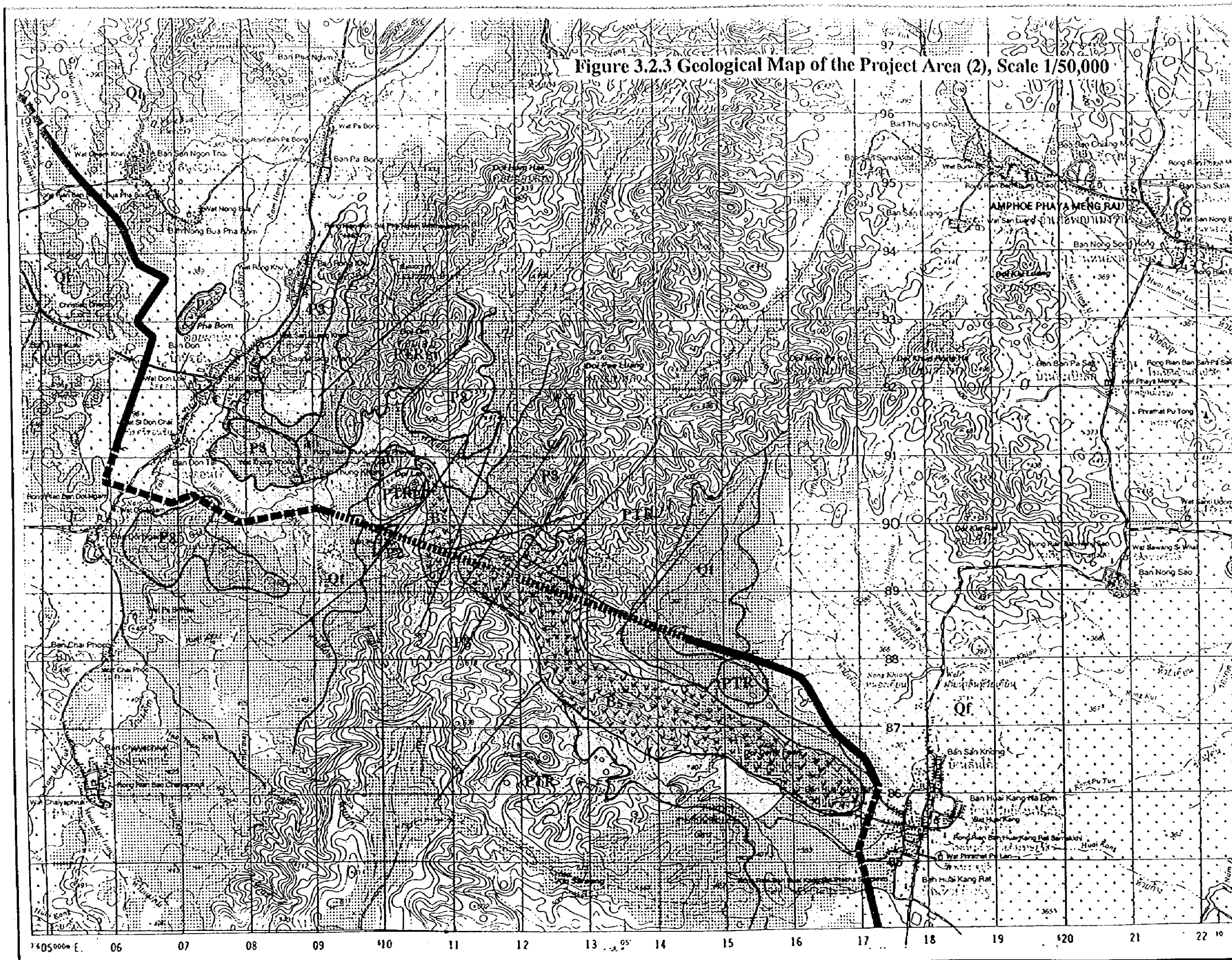
Tertiary	Basalt	Bs		Basalt	B-ng
Jurassic	Tuff	Jv,ms _v		Rhyolite, Tuff	Lms2
	Andesite	an		Andesite	Ltp
Triassic-Permian	ms2	ms2		Conglomerate, Andesite and Rhyolitic tuff	ms2
	PTRv	PTRv		Andesite, Rhyolite, Dacite, Tuff and Agglomerate	Lms2
	Granite	PTRgr		Granite, Porphyry, Granite porphyry, Granodiorite porphyry	Gt

Figure 3.2.3 Geological Map of the Project Area (2), Scale 1/50,000



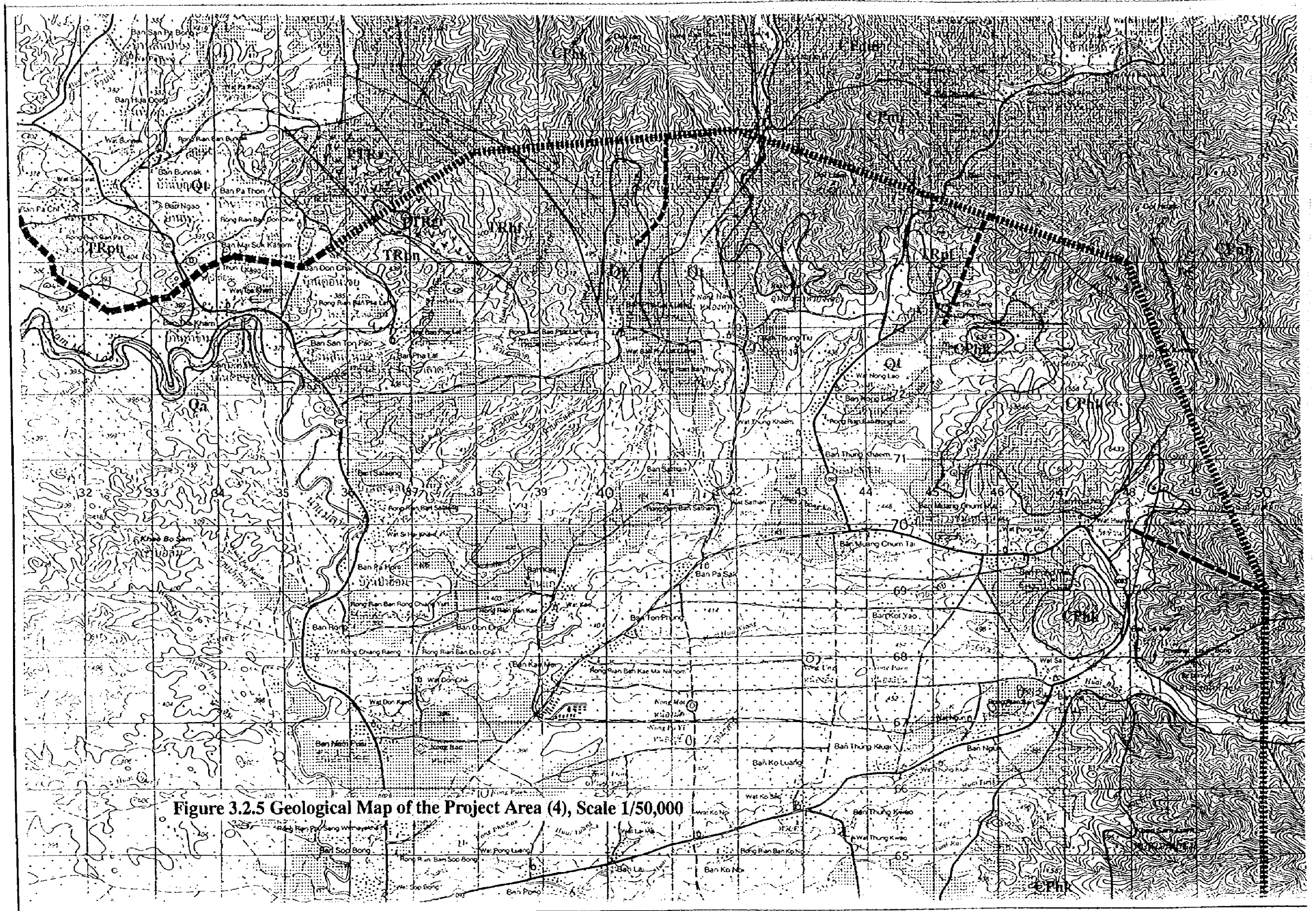


Figure 3.2.5 Geological Map of the Project Area (4), Scale 1/50,000

