Structural Formation Comlex

Orogenic belt

Oceanic Stage (Early Geosynclinal)

(Transitional stage)

Formation

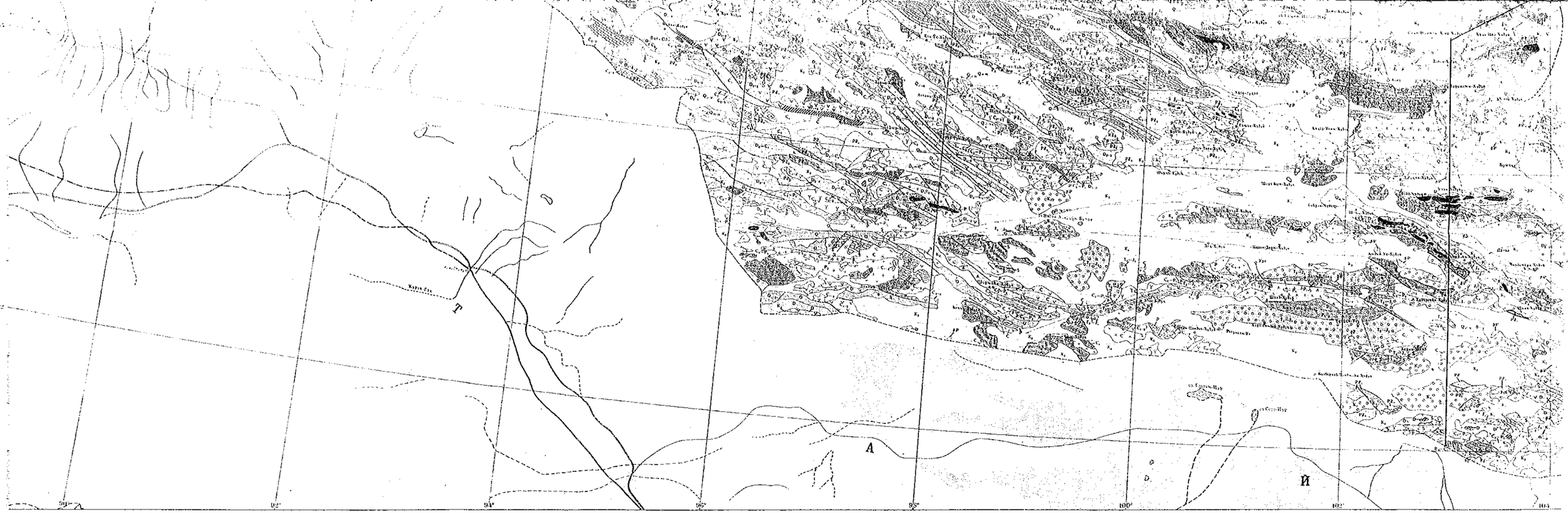
		PR₃	R₃—C₁	PZ₁	PZ₂	PZ₃		PR₃	R₃—C₁	PZ₁	PZ₂	PZ₃	
Sedimentary							Siliceous shale						Terrigenous (including greywacke, flysch and tuff-terrigeneous)
							Greenshale with black shale						Jasper-Silica-terrigeneous
													Carbonate (organic, reef limestone) Siliceous Carbonate (chemical)
													Cabonate-terrigeneous
													Carbonate-terrigenous with Volcanics
Volcanics	Low K series						Metabasaltic green rock						
							Spilite & keratophyre						
	Calc-alkaline series Normal Alkaline												Basalt, Basaltic andesite, andesite
													Dacitic andesite, rhyolitic dacite
													Rhyolitic dacite, rhyolite
	Calc-alkaline series High alkaline												
	Alkaline series												
Plutonics	Low K series						Ultrabasic & Gabbro (age unknown)						
	Calc-alkaline series Normal Alkaline												Peridotite-pyroxenite-gabbroic, partly gabbro-norite
													Tonalite-plagiogranite
													Granodiorite
													Granodiorite-granite, granite

Gneiss-amphibolite with granulite

Carbonate-quartzite with amphibolite & gneiss

Gabbro-anorthosite

Undivided Precambrian intrusive rocks



Gneiss-Amphibolite with granulite

Carbonate-quartzite with amphibolite & gneiss

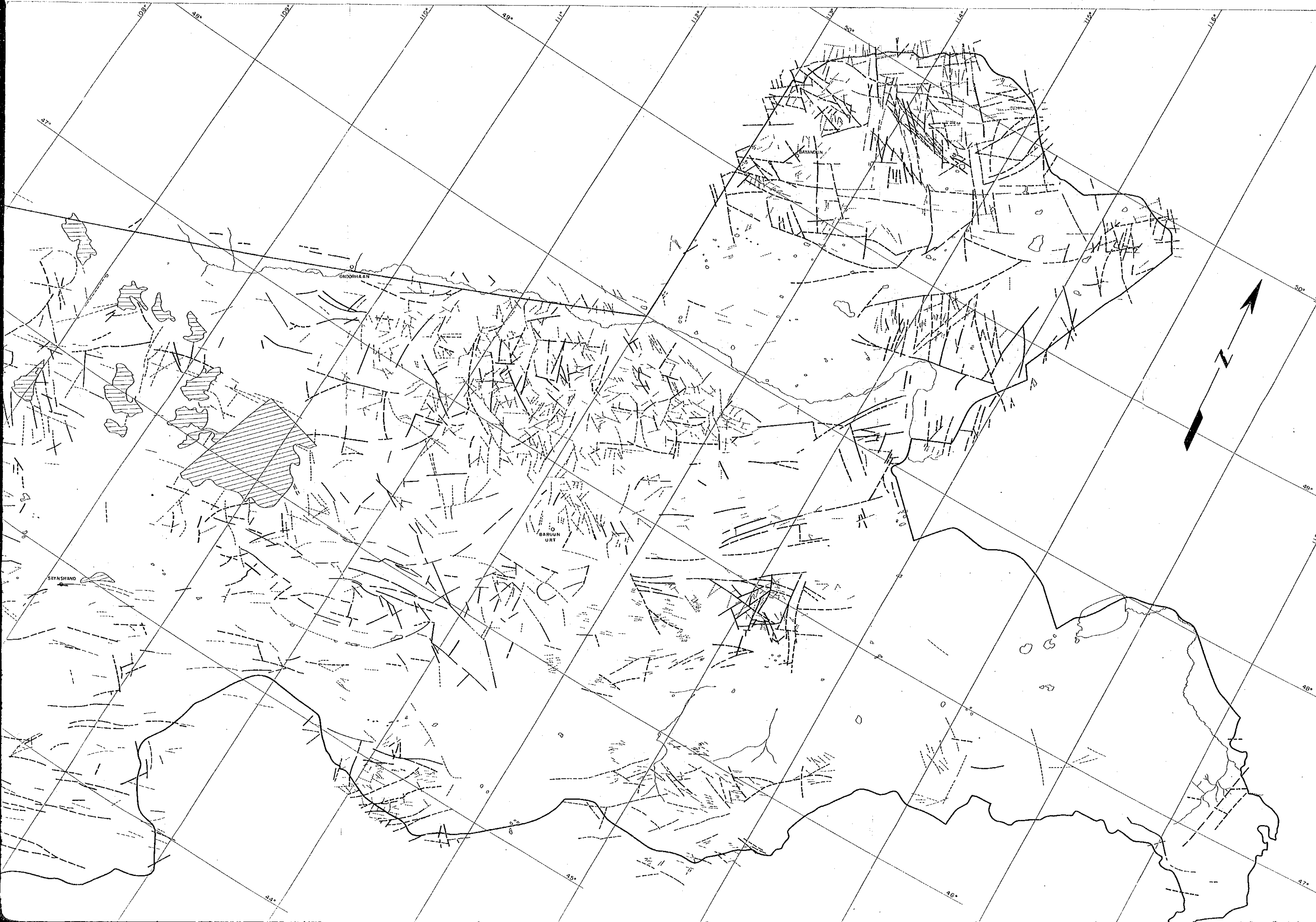
Gabbro-anorthosite

Undivided Precambrian intrusive rocks

Structural Formation Comlex													
		Oceanic Stage (Early Geosynclinal)						Orogenic belt (Transitional stage)					
		PR_3	R_3—C_1	PZ_1	PZ_2	PZ_3		PR_3	R_3—C_1	PZ_1	PZ_2	PZ_3	
Formation	Sedimentary						Siliceous shale						Terrigenous (including greywacke, flysch and tuff-terrigeneous)
							Greenshale with black shale						Jasper-Silica-terrigeneous
													Carbonate (organic, reef limestone) Siliceous Carbonate (chemical)
													Cabonate-terrigeneous
													Carbonate-terrigenous with Volcanics
	Volcanics — Low K series						Metabasaltic green rock						
							Spillite & keratophyre						
	Calc-alkaline series — Normal Alkaline												Basalt, Basaltic andesite, andesite
													Dacitic andesite, rhyolitic dacite
													Rhyolitic dacite, rhyolite
	Calc-alkaline series — High alkaline												
	Alkaline series												
	Plutonics — Low K series						Ultrabasic & Gabbro (age unknown)						
	Calc-alkaline series — Normal Alkaline												Peridotite-pyroxenite-gabbroic, partly gabbro-norite
													Tonalite-plagiogranite
													Granodiorite
													Granodiorite-granite, granite
	Calc-alkaline series — High alkaline												
	Alkaline series												

r-3528

45°
103°
104°
46°
105°
106°
107°
108°
47°
109°
44°
43°
42°
101°
41°
100°
MANDAL OVOO
DALAND ZADAGAD
SAYNSHAND
HÖVSGÖL
ONJORHAA



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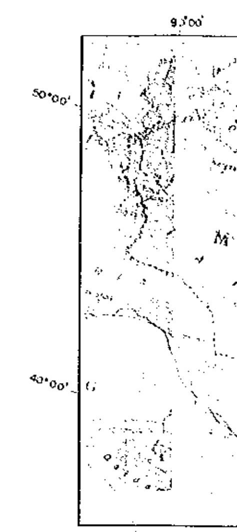

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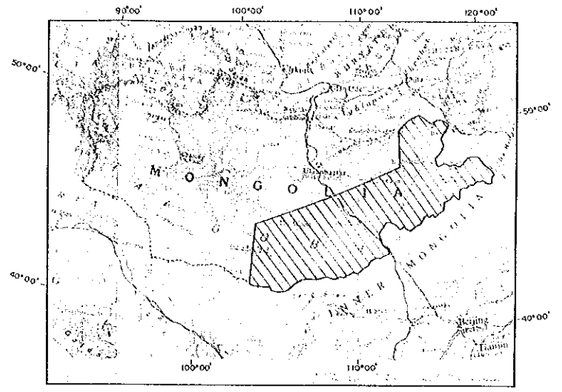
PL. II-1-2

MINERAL EXPLORATION
IN
UUDAM - TAL AREA
THE MONGOLIAN PEOPLE'S REPUBLIC

DISTRIBUTION MAP OF LINEAMENTS ON LANDSAT IMAGERY



JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

JANUARY 1992

BAYANDUN

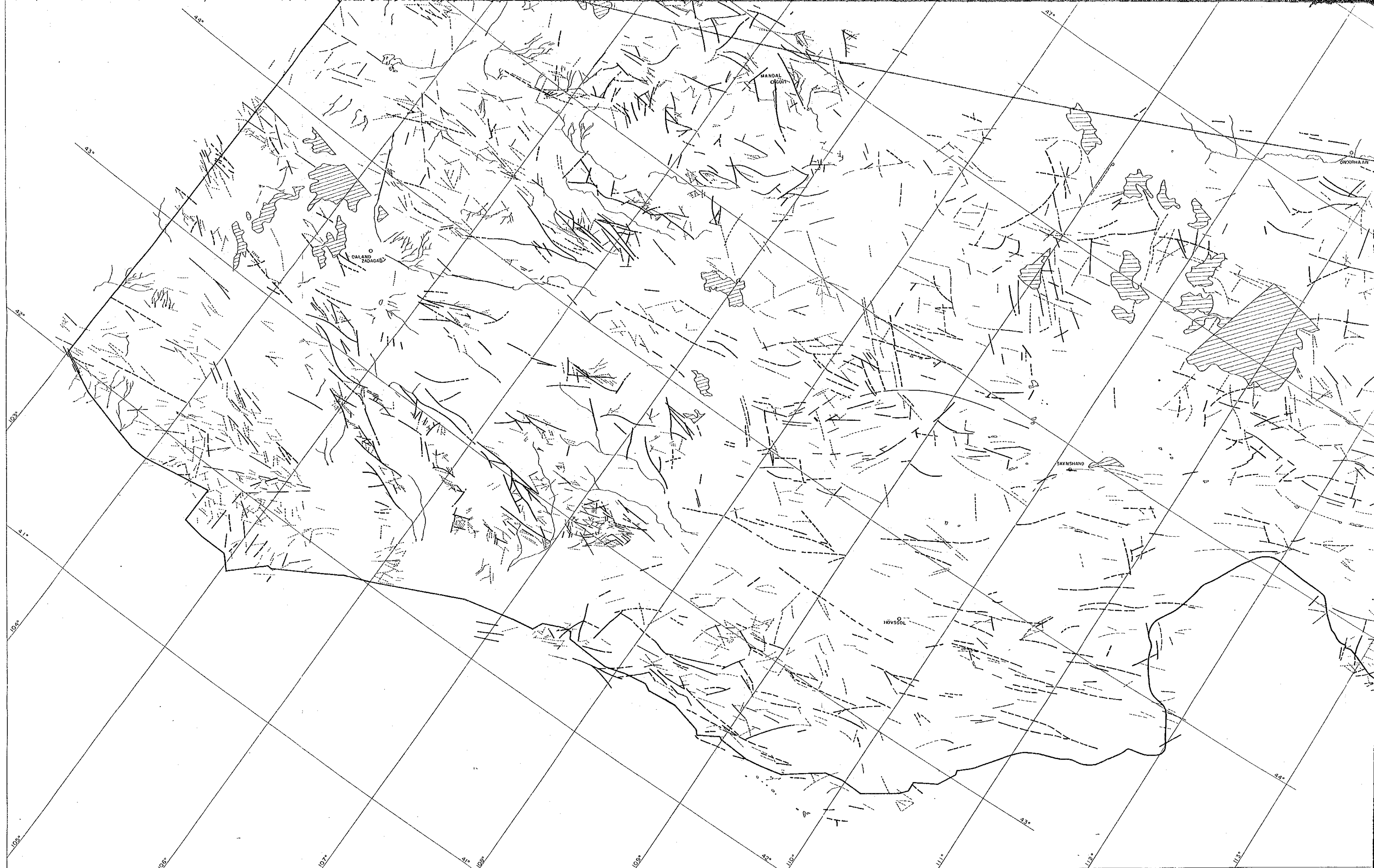
ONDORHIA AN

BARUUN URT

N

LEGEND

- fault
- inferred fault
- major lineament
- minor lineament
- drainage
- lake
- cloud cover
- town



MANDAL
DALAND ZADAGAD
SAYNSHAND
HÖVSGOL
ONDORHAAN
44°
43°
42°
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104°
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107°
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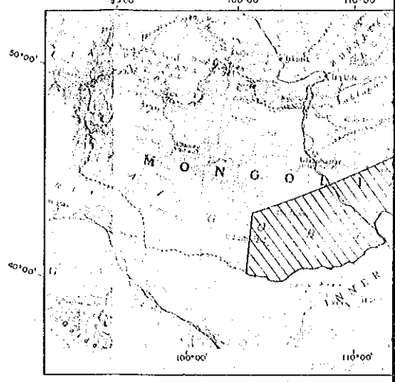
110°
111°
112°
113°

ON LANDSAT IMAGE



JAPAN INTERNATIONAL COOPERATIO
METAL MINING AGENCY OF JA

JANUARY 1992

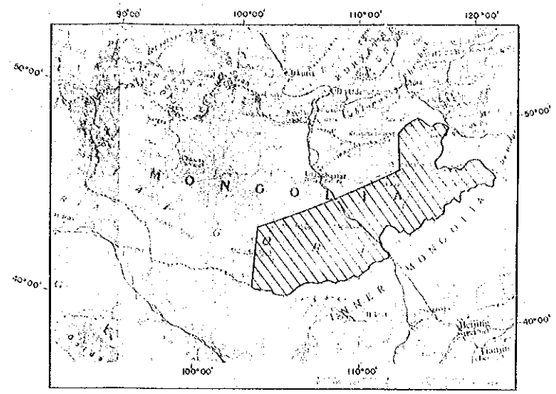
LEGEND

- fault
- inferred fault
- major lineament
- minor lineament
- drainage
- lake
- cloud cover
- town

0 50

1 : 1,000,000

ON LANDSAT IMAGERY



JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

JANUARY 1992

LEGEND

- fault
- inferred fault
- major lineament
- minor lineament
- drainage
- lake
- cloud cover
- town

0 50 100 km

1 : 1,000,000

45°
103°
104°
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107°
108°
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109°
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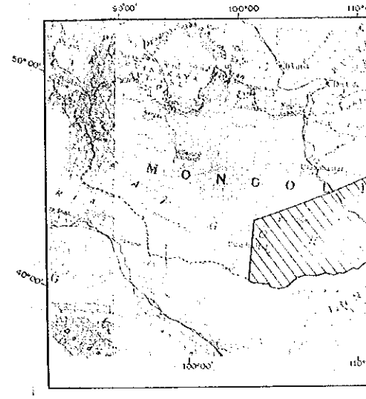
42°
41°
MANDAL
GOVI
DALAND
ZADAGAN
SAYKHAND
HÖVSGÖL

MINERAL EXPLORATI
IN
UUDAM - TAL AREA
THE MONGOLIAN PEOPLE'S

GEOLOGICAL INTERPRETA
OF LANDSAT IMAG



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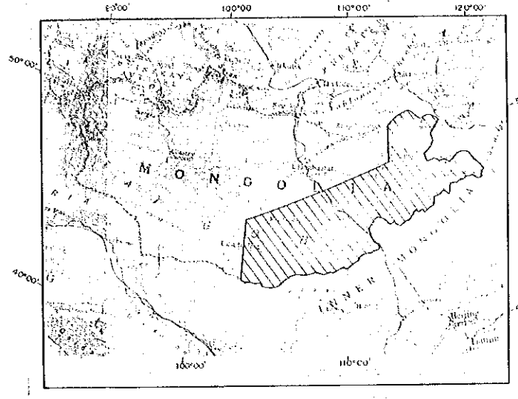
METAL MINING AGENCY O

JANUARY 1992

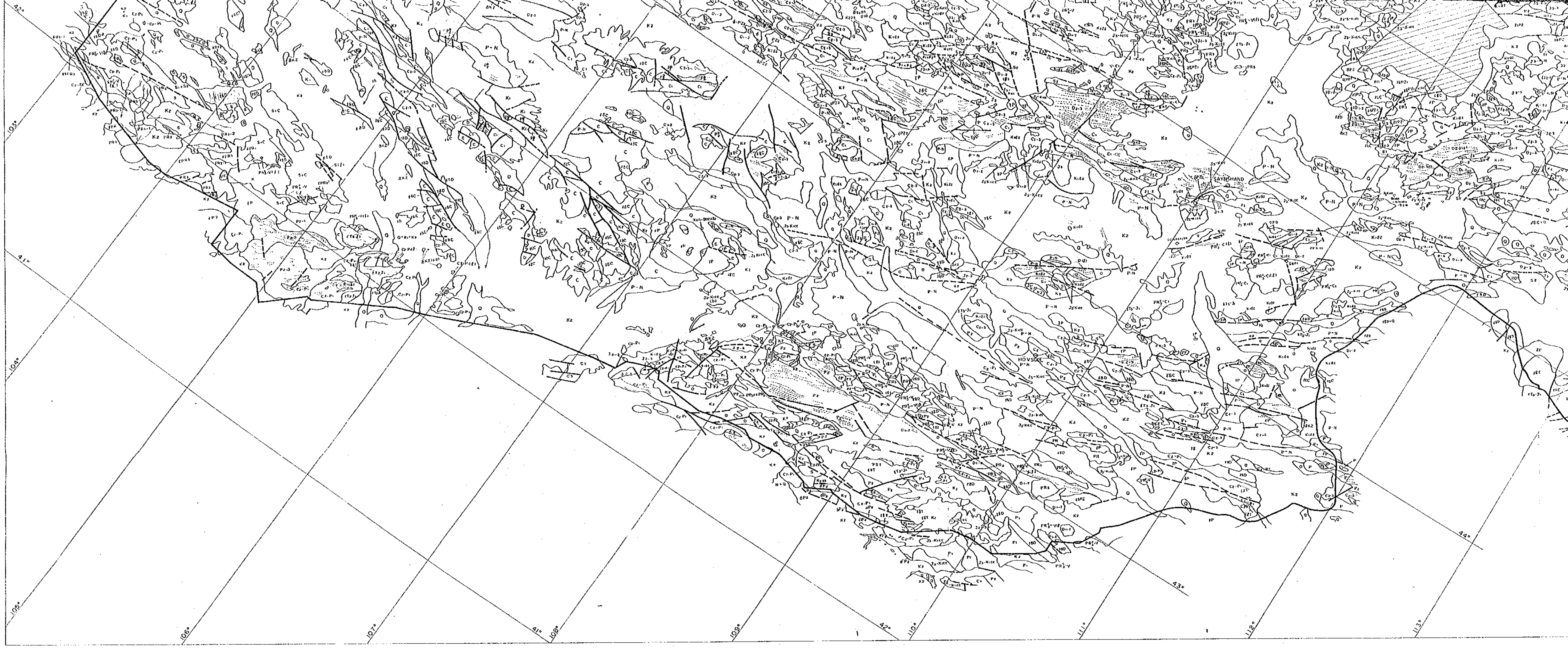
MINERAL EXPLORATION
IN
UUDAM - TAL AREA
THE MONGOLIAN PEOPLE'S REPUBLIC

GEOLOGICAL INTERPRETATION MAP OF LANDSAT IMAGERY



JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

JANUARY 1992



LEGEND

Erathem	System	Series or Subsystem	Symbol	Rock Types
			βZ	basaltic rocks
Cenozoic	Quaternary	Holocene	Q	gravel, sand, loam, sandy loam, clay, mud, solonetz loam
		Pleistocene ~ Pliocene	β(N-Q)	basaltic rocks
	Tertiary	Neogene	N	clay, sand, silt, gravel, conglomerate, marl (rare), limestone
		Neogene ~ Paleocene	P-N	clay, silt, sand, sandstone, conglomerate
		Paleocene	P	silt, sand, conglomerate, marl
Mesozoic	Cretaceous	U. Cretaceous	K_2	siltstone, argillite, clay, sandstone, conglomerate, sand
		L. Cretaceous	K_1	grey sandstone, clay, silt, conglomerate, clayey shale, coal (rare)
			K_1dz	dark greenish grey clay, clayey bituminous shale
		L. Cretaceous ~ U. Jurassic	J_3-K_1	greenish grey and light grey sandstone, clay, siltstone, conglomerate (rare), marl, basalt, andesite, rhyolite
	Jurassic	U. Jurassic	J_3	conglomerate, sandstone, clay (rare), siltstone
		M. ~ U. Jurassic	J_{2-3}	rhyolite, tuff, basalt, andesite, tuffaceous conglomerate, tuffaceous sandstone
		L. ~ M. Jurassic	J_{1-2}	sandstone, conglomerate, siltstone, carbonaceous clayey shale, coal, basalt (rare), rhyolite
	Triassic		T	sandstone, conglomerate, clayey shale, siltstone
		L. Triassic ~ U. Permian	P_2-T_1	andesite, basalt, rhyolite, tuff
	Permian		P	andesite, dacite, rhyolite, tuff, tuffaceous conglomerate, tuffaceous sandstone, sandstone, conglomerate, siltstone
		U. Permian	P_2	andesite, dacite, basalt, tuff, tuffite, tuffaceous conglomerate, sandstone, siltstone, conglomerate
			P_2^b	sandstone, conglomerate, siltstone
Paleozoic		L. ~ U. Permian	P_{1+2}	sandstone, siltstone, conglomerate, rhyolite, andesite, tuff, dacite, tuffite
		L. Permian	P_1	rhyolite, andesite, tuff, sandstone, conglomerate, siltstone
		L. Permian ~ M. Carboniferous	C_2-P_1	andesite, dacite, tuff, rhyolite, sandstone, conglomerate
			[illegible]	limestone
	Carboniferous		C	andesite, rhyolite, tuff
		M. ~ U. Carboniferous	C_{2-3}	sandstone, conglomerate, carbonaceous clayey shale, coal, argillite, siltstone, andesite, dacite, tuff
		L. ~ M. Carboniferous	C_{1-2}	sandstone, siltstone, argillite, conglomerate (rare), andesite, dacite, rhyolite, tuff
		L. Carboniferous	C_1	sandstone, siltstone, conglomerate, limestone (rare), carbonaceous clayey shale, coal, tuffite, jasper
	Devonian		D	sandstone, siltstone, clayey shale, jasper, andesite, tuff (rare), rhyolite, conglomerate, dacite, siliceous shale
		M. ~ U. Devonian	D_{2-3}	sandstone, siliceous siltstone, clayey shale, conglomerate (rare), tuffite, rhyolite, jasper, andesite, tuff
			[illegible]	limestone
		M. Devonian	D_2	rhyolite, andesite, tuff, sandstone, siltstone, conglomerate, limestone
		L. ~ M. Devonian	D_{1-2}	andesite, dacite, rhyolite, tuff, sandstone, conglomerate, siltstone, clayey shale, siliceous shale, jasper, altered extrusive rocks
			[illegible]	limestone
		L. Devonian	D_1	andesite, dacite, rhyolite, tuff, tuffaceous conglomerate, sandstone, clayey shale, siltstone, conglomerate
			S	siliceous clayey shale, sericite - chlorite slate, jasper, sandstone, basic extrusive rocks
			S(l)	limestone
	Silurian	U. Silurian	S_2	altered extrusive rocks, siliceous shale, sandstone, clayey shale
			$S_2(l)$	limestone
		L. Silurian	S_1	sericite - chlorite slate, clayey shale, sandstone, basic altered extrusive rocks
			$S_1(l)$	limestone
	Ordovician		O	sandstone, conglomerate, phyllite, clayey shale, metasiltstone, metasandstone, basic ~ intermediate altered extrusive rocks
			O(l)	limestone
		M. ~ U. Ordovician	O_{2-3}	sandstone, siltstone, contaminated extrusive rocks and tuff, clayey shale, limestone, rhyolite
	Cambrian	L. Cambrian ~ U. Precambrian	[illegible]	basic ~ intermediate altered extrusive rocks and tuff, limestone, sandstone, phyllite, chert, andesite, dacite, tuff
			[illegible]	phyllite, metasandstone, chert, basic altered extrusive rocks
			[illegible]	limestone
Proterozoic			PR	gneiss, crystalline schist, amphibolite
			[illegible]	metasandstone, siltstone, acidic ~ intermediate extrusive rocks and tuff
			[illegible]	limestone
			PR_2	gneiss, metaslate, limestone
			PR_3^c	metaslate, metasandstone, siltstone, limestone
			PR_3^b	crystalline limestone, marble, chert, crystalline schist
			PR_3^a	gneiss, crystalline schist, amphibolite

Intrusive Rocks

Era or Subera	Period	Subperiod	Symbol	Rock Types
Mesozoic	Jurassic	L. Jurassic	[illegible]	granite, alaskite, granosyenite, alkali granite (rare), adamellite, diorite, monzonite
			[illegible]	diorite, gabbro, monzonite, syenite
		E. Jurassic	[illegible]	granite, alaskite
	Triassic	E. Jurassic ~ L. Triassic	[illegible]	granite, adamellite, alaskite
			δT	granodiorite, granite, adamellite, diorite (rare), monzonite, granosyenite, syenite
			νT	gabbro, diorite
Late Paleozoic	Permian	L. Permian	[illegible]	serpentinite, peridotite, dunite
			[illegible]	granite, granosyenite, granodiorite, monzonite (rare), syenite, alkali granite, diorite
	Carboniferous		δC	granodiorite, granite, adamellite, plagiogranite, quartz diorite, monzonite, syenite (rare)
			νC	gabbro, diorite
Middle Paleozoic			[illegible]	serpentinite, peridotite, dunite
	Devonian		γδD	granodiorite, granite, adamellite, plagiogranite, quartz diorite, diabase
		E. ~ M. Devonian	[illegible]	granite, granodiorite, quartz syenite, syenite (rare), adamellite, alkali granite
	Silurian		[illegible]	granodiorite, adamellite, granite, quartz diorite, plagiogranite, diorite
Early Paleozoic			[illegible]	granodiorite, granite, plagiogranite, adamellite, quartz diorite, granosyenite
			[illegible]	diorite, gabbro, pyroxenite
		E. Cambrian	[illegible]	gabbro, diabase
Late Proterozoic			[illegible]	gneissose granite, granodiorite, granite gneiss, granodiorite gneiss, gneissose diorite and gabbro

0 50 100km

1 : 1.000.000

Intrusive Rocks

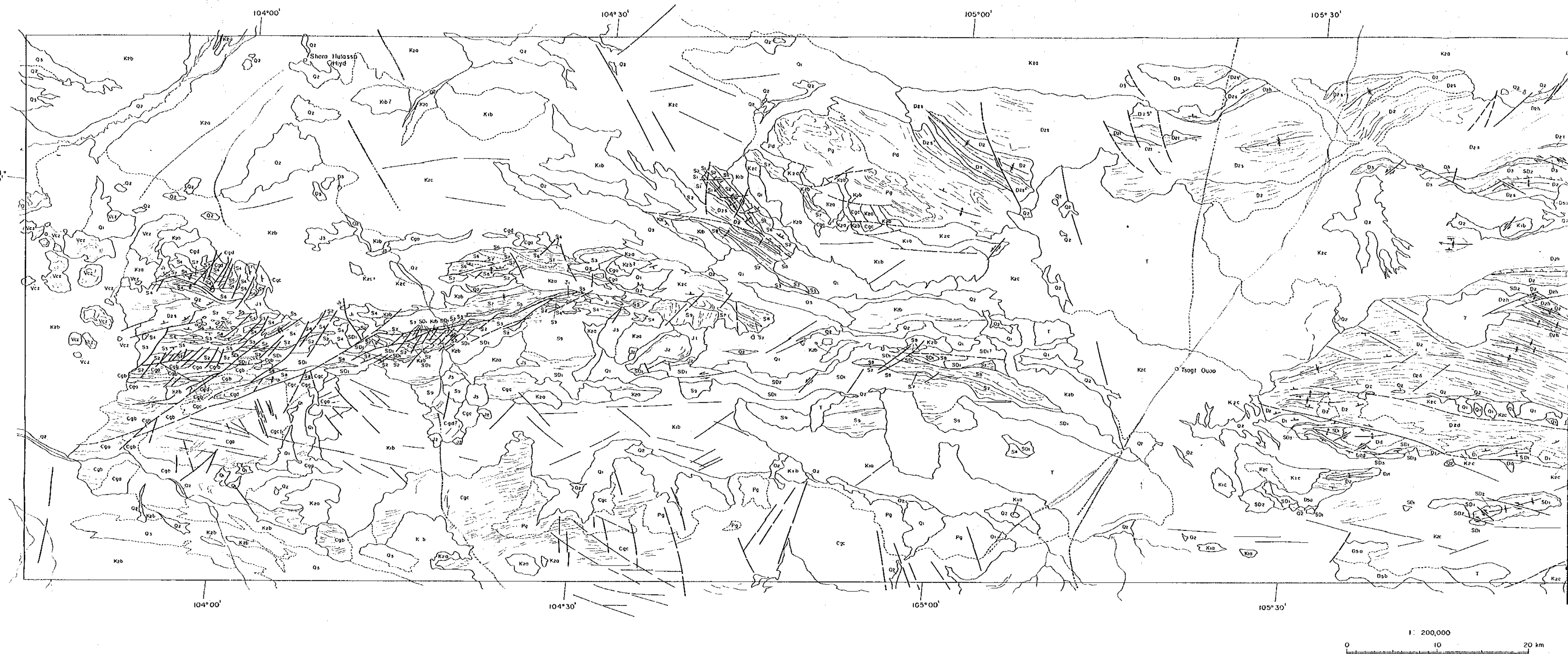
Subperiod	Rock Types
L. Jurassic	granite, alaskite, granosyenite, alkali granite (trace), adamellite, diorite, monzonite
	diorite, gabbro, monzonite, syenite
E. Jurassic	granite, alaskite
E. Jurassic – L. Triassic	granite, adamellite, alaskite
	granodiorite, granite, adamellite, diorite (trace), monzonite, granosyenite, syenite
	gabbro, diorite
L. Permian	serpentinite, peridotite, dunite
	granite, granosyenite, granodiorite, monzonite (trace), syenite, alkali granite, diorite
	granodiorite, granite, adamellite, plagiogranite, quartz diorite, monzonite, syenite (trace)
	gabbro, diorite
	serpentinite, peridotite, dunite
	granodiorite, granite, adamellite, plagiogranite, quartz diorite, diabase
E.–M. Devonian	granite, granodiorite, quartz syenite, syenite (trace) adamellite, alkali granite
	granodiorite, adamellite, granite, quartz diorite, plagiogranite, diorite
	granodiorite, granite, plagiogranite, adamellite, quartz diorite, granosyenite
	diorite, gabbro, pyroxenite
E. Cambrian	gabbro, diabase
	gneissose granite, granodiorite, granite gneiss, granodiorite gneiss, gneissose diorite and gabbro

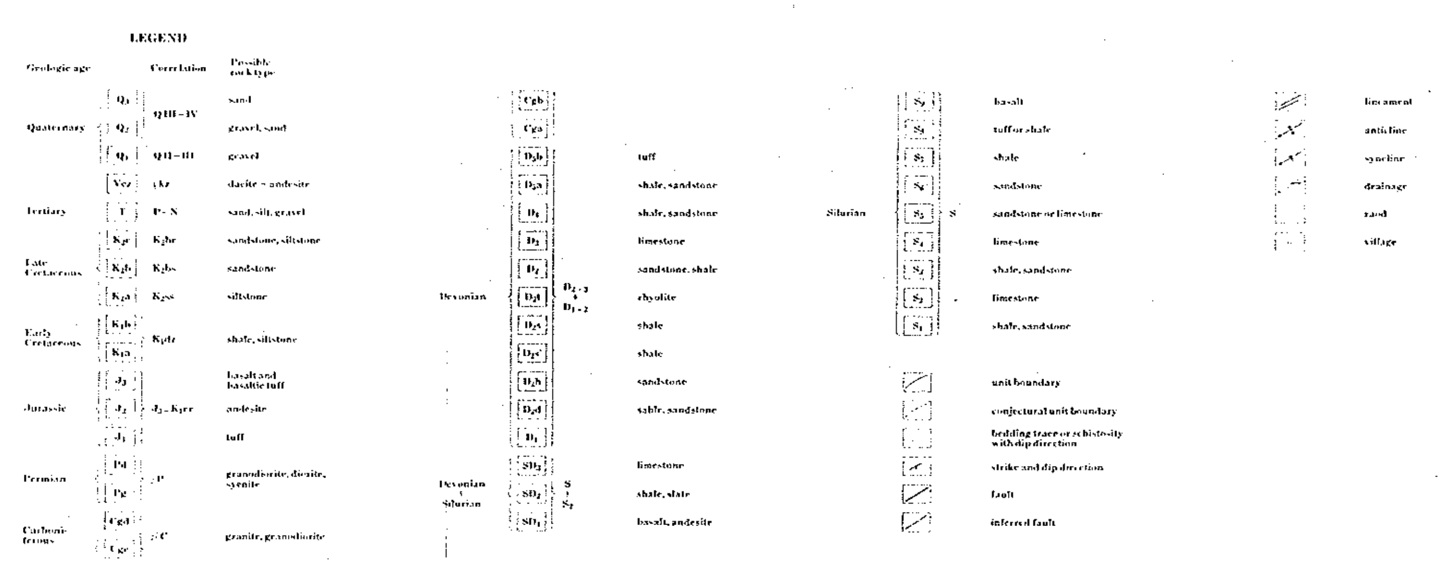
- unit boundary and symbol
- bedding trace with dip direction
- strike and dip direction
- schistosity, joint or fracture
- fault
- inferred fault
- anticlinal axial trace with direction of plunge
- synclinal axial trace with direction of plunge
- drainage
- lake
- cloud cover

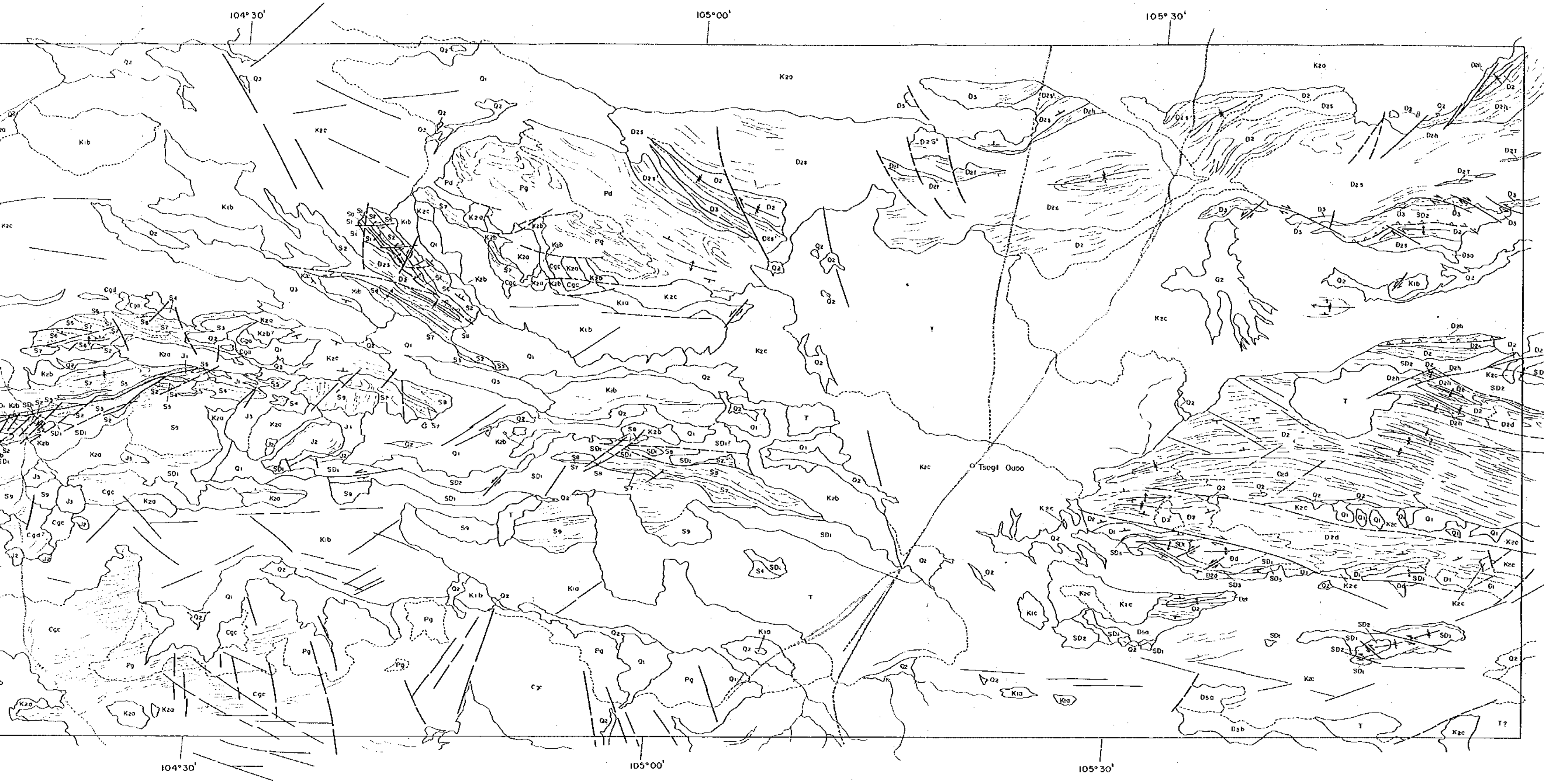
- unit boundary and symbol
- bedding trace with dip direction
- strike and dip direction
- schistosity, joint or fracture
- fault
- inferred fault
- anticlinal axial trace with direction of plunge
- synclinal axial trace with direction of plunge
- drainage
- lake
- cloud cover

0 50 100km

1 : 1,000,000


104°00'
104°30'
105°00'
105°30'
44°30'
Shara Hulassn Hiyd
Tsogt Ovoo
1: 200,000
0
10
20 km

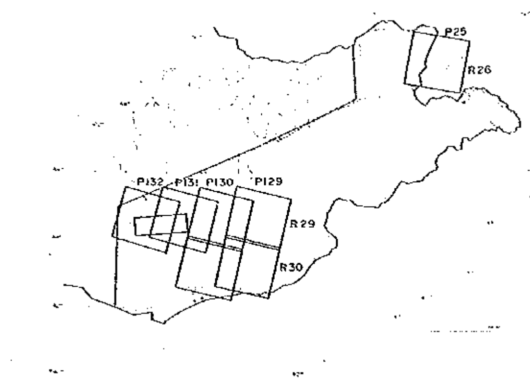

LEGEND
Geologic age
Correlation
Possible rock type
Quaternary
Q3 sand
Q2 gravel, sand
QIII–IV
Q1 QII–III gravel
Vcz dacite – andesite
Tertiary
T P–N sand, silt, gravel
Late Cretaceous
K2c K2br sandstone, siltstone
K2b K2bs sandstone
K2a K2ss siltstone
Early Cretaceous
K1b
K1a
K1dz shale, siltstone
Jurassic
J3 basalt and basaltic tuff
J2 J3–K1cr andesite
J1 tuff
Permian
Pd
Pg
granodiorite, diorite, syenite
Carboniferous
Cgd
Cgc
granite, granodiorite
Cgb
Cga
Devonian
D3b tuff
D3a shale, sandstone
D3 shale, sandstone
D2 limestone
D2 sandstone, shale
D2t rhyolite
D2s shale
D2s' shale
D2h sandstone
D2d sable, sandstone
D1
D2–3
D1–2
Devonian Silurian
SD3 limestone
SD2 shale, slate
SD1 basalt, andesite
S
S2
Silurian
S
S9 basalt
S8 tuff or shale
S7 shale
S6 sandstone
S5 sandstone or limestone
S4 limestone
S3 shale, sandstone
S2 limestone
S1 shale, sandstone
unit boundary
conjectural unit boundary
bedding trace or schistosity with dip direction
strike and dip direction
fault
inferred fault
lineament
anticline
syncline
drainage
road
village



PL. II-1-4

MINERAL EXPLORATION
IN
UUDAM - TAL AREA
THE MONGOLIAN PEOPLE'S REPUBLIC

GEOLOGICAL INTERPRETATION OF LANDSAT IMAGERY OF ULZIIT AREA



JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

JANUARY 1992

1: 200,000
0 10 20 km

Possible rock type

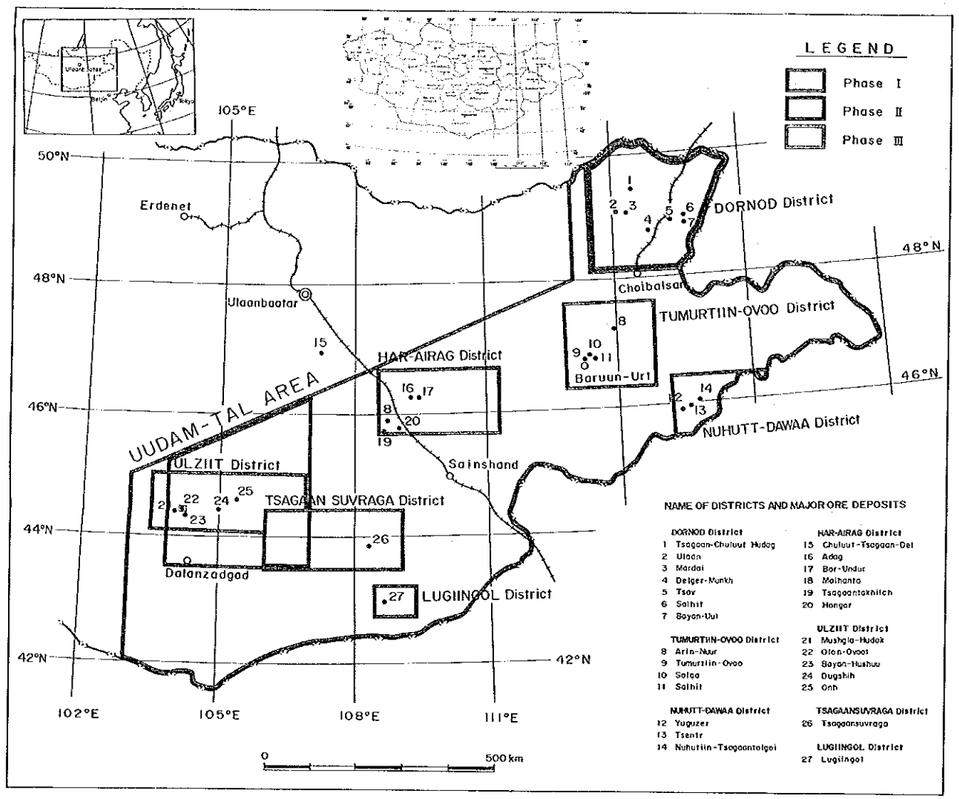
Possible rock type		Unit			Unit			Symbol
sand		Cgb		Silurian	S9	basalt		lineament
gravel, sand		Cga			S8	tuff or shale		anticline
gravel		D3b	tuff		S7	shale		syncline
dacite ~ andesite		D3a	shale, sandstone		S6	sandstone		drainage
sand, silt, gravel		D3	shale, sandstone		S5	sandstone or limestone		road
sandstone, siltstone		D2	limestone		S4	limestone		village
sandstone		D2	sandstone, shale		S3	shale, sandstone		
siltstone	Devonian	D2	rhyolite		S2	limestone		
		D2s	shale		S1	shale, sandstone		
shale, siltstone		D2s'	shale					
basalt and basaltic tuff		D2h	sandstone			unit boundary		
andesite		D2d	sahle, sandstone			conjectural unit boundary		
tuff		D1				bedding trace or schistosity with dip direction		
granodiorite, diorite, syenite		SD3	limestone			strike and dip direction		
	Devonian ~ Silurian	SD2	shale, slate			fault		
granite, granodiorite		SD1	basalt, andesite			inferred fault		

GEOLOGY AND ORE DEPOSITS OF THE UUDAM TAL AREA, MONGOLIA

THE COOPERATIVE MINERAL EXPLORATION BY JICA/MMAJ-(MGMR). 1991—1993

EXPLANATORY NOTE ON THE GEOLOGY AND DEPOSITES OF THE UUDAM TAL AREA, MONGOLIA

INDEX MAP OF THE SURVEY AREA



NAME OF DISTRICTS AND MAJOR ORE DEPOSITS

DORNOD District
1 Tsagaan-Chuluut Hudag
2 Ulaan
3 Mardai
4 Delger-Munkh
5 Tsav
6 Salhit
7 Bayan-Uul

TUMURTIIN-OVOO District
8 Arin-Nuur
9 Tumurtiin-Ovoo
10 Salaa
11 Salhit

NUHUTT-DAWAA District
12 Yuguzer
13 Tsentr
14 Nuhutiin-Tsagaantolgoi

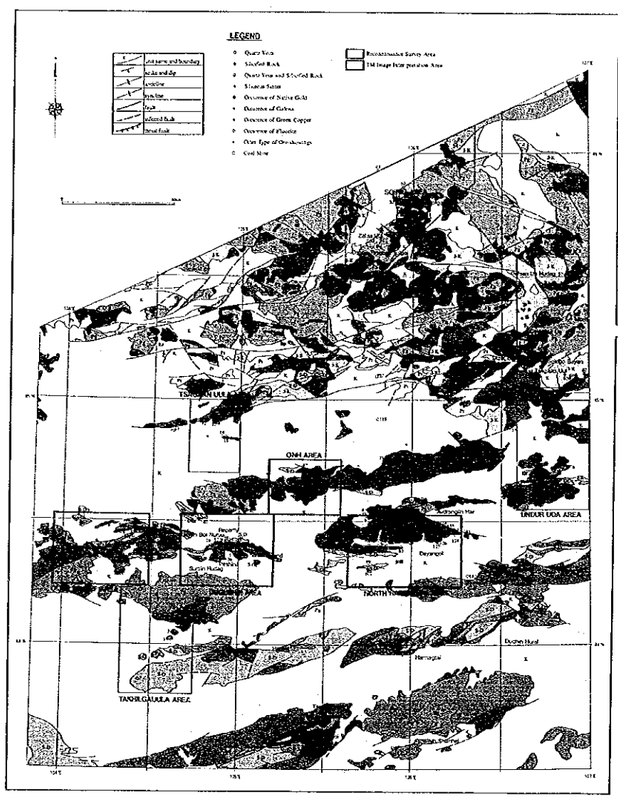
HAR-AIRAG District
15 Chuluut-Tsagaan-Del
16 Adag
17 Bor-Undur
18 Maihanta
19 Tsagaantokhilch
20 Hanger

ULZIIT District
21 Mushgio-Hudag
22 Olon-Ovoot
23 Bayan-Hushuu
24 Dugshih
25 Onh

TSAGAANSUVRAGA District
26 Tsagaansuvraga

LUGIINGOL District
27 Lugiingol

GEOLOGIC MAP OF THE ULZIIT AREA (PHASE II)



REPORT ON THE MINERAL EXPLORATION IN THE UUDAM TAL AREA
MONGOLIA
PREPARED BY JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
AND METAL MINING AGENCY OF JAPAN (MMAJ) IN COOPERATION
WITH THE MINISTRY OF GEOLOGY AND MINERAL RESOURCES OF
MONGOLIA (MGMR) FEBRUARY, 1994.

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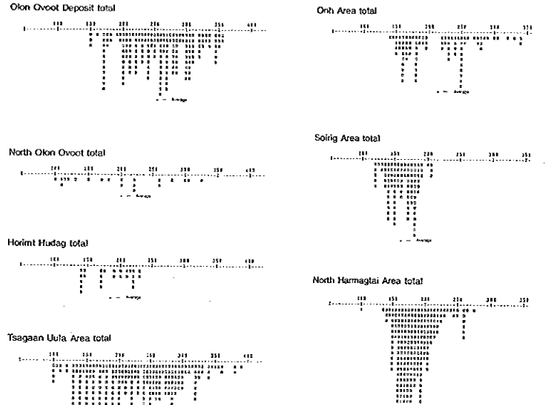
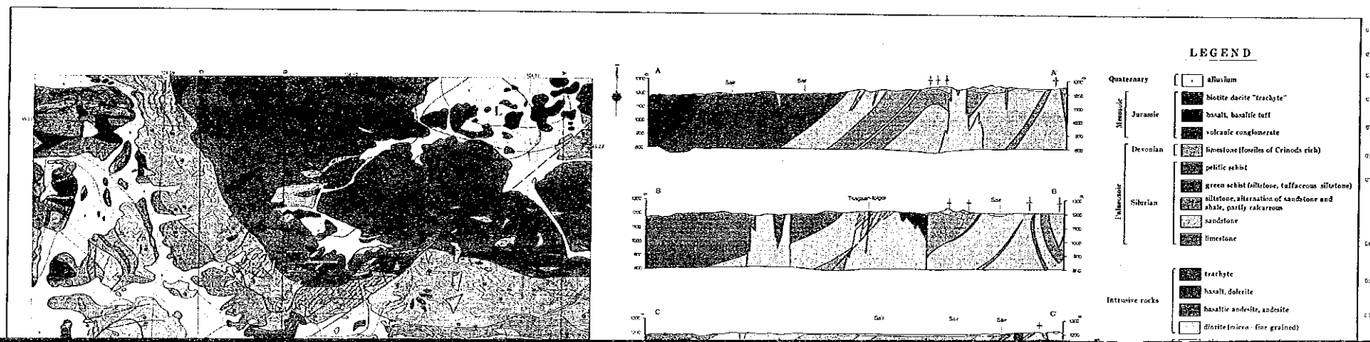
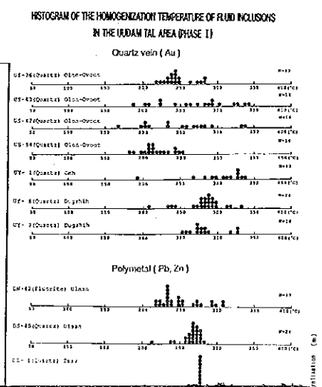
HISTOGRAM OF THE HOMOGENIZATION TEMPERATURE OF FLUID INCLUSIONS IN THE ULZIIT AREA (PHASE II)



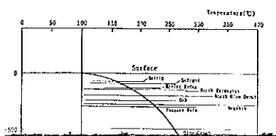
GEOLOGIC MAP OF THE SEMIDETAILED SURVEY AREA (PHASE II)



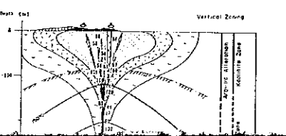
HISTOGRAM OF THE HOMOGENIZATION TEMPERATURE OF FLUID INCLUSIONS IN THE UUDAM TAL AREA (PHASE II)



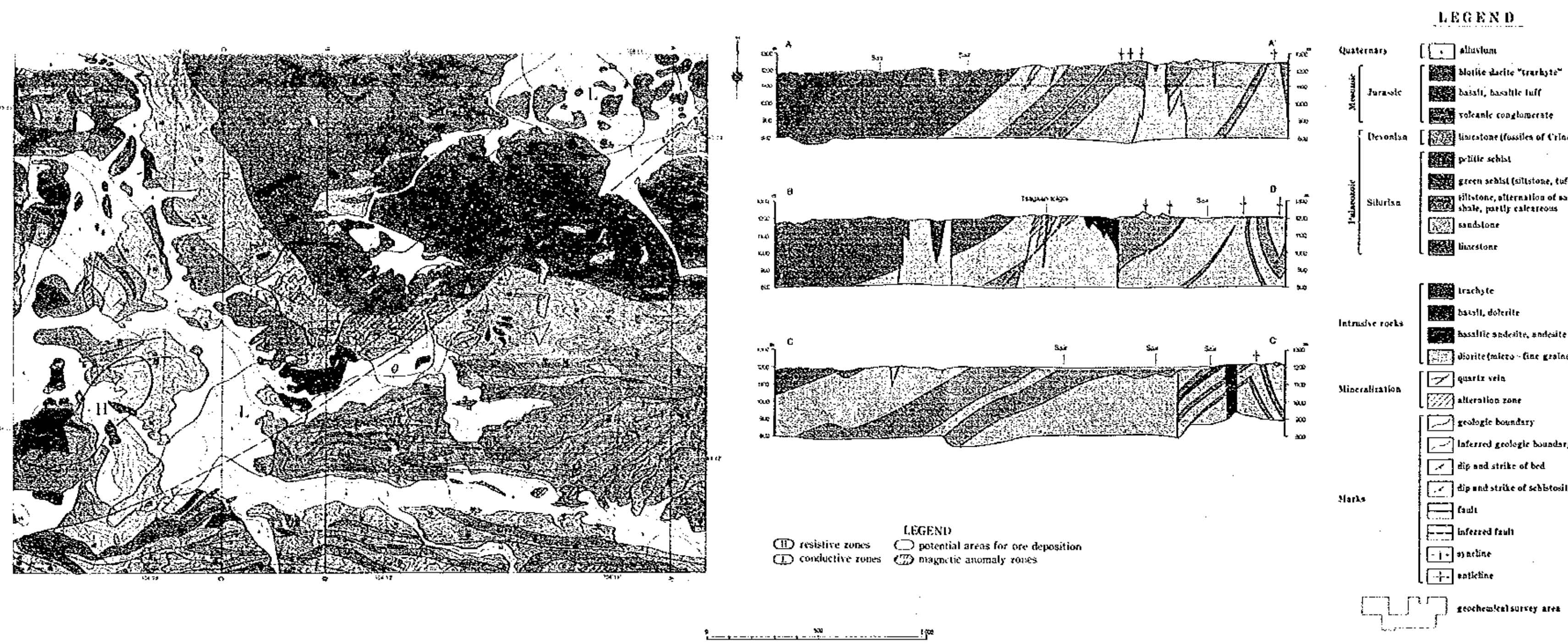
INFERRED DEPTH OF ORE FORMATION IN RELATION TO THE FILLING TEMPERATURES OF FLUID INCLUSIONS IN SELF-SEALING MODEL

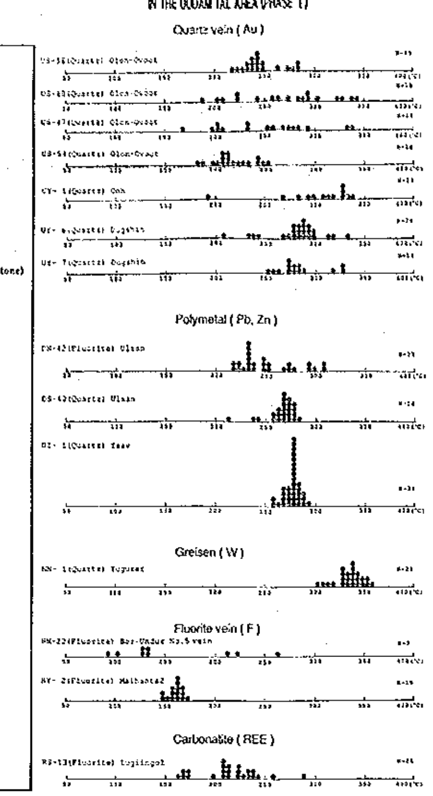


INFERRED EROSION LEVEL OF THE ORE-SHOWINGS IN THE ULZIIT AREA

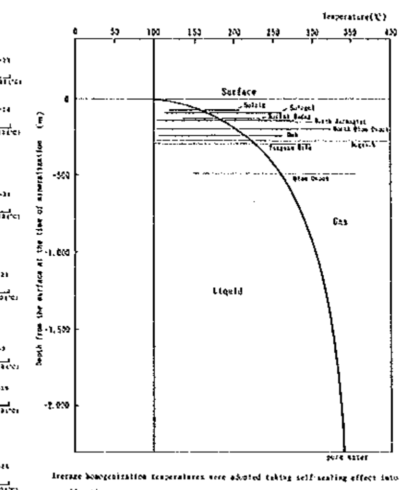


GEOLOGIC MAP OF THE SEMIDETAILED SURVEY AREA (PHASE II)



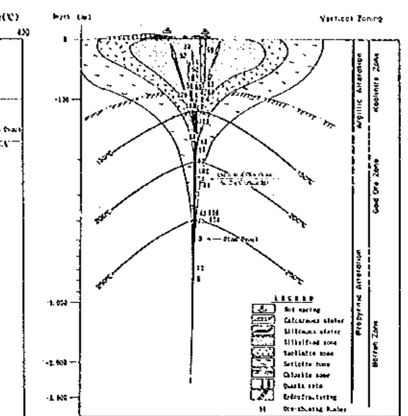


INFERRED DEPTH OF ORE FORMATION IN RELATION TO THE FILLING TEMPERATURES OF FLUID INCLUSIONS IN SELF-SEALING MODEL



Average homogenization temperatures were adopted taking self-sealing effect into consideration.

INFERRED EROSION LEVEL OF THE ORE-SHOWINGS IN THE ULZIIT AREA



RESULTS OF DATING BY K-Ar, Pb-Pb METHOD (PHASE I)

No.	SAMPLE No.	LOCALITY	COORDINATES NORTH	COORDINATES EAST	ROCK	MEDIA	RESULT DETERMINED AGE (Ma)	RESULT GEOLOGIC TIME	NOTE
(K-Ar method)									
1	[illegible]	Tsagaan Chuluut Bnd	[illegible]	[illegible]	Granite porphyry	K-feldspar	[illegible]	M~U Jur	[illegible]
2	[illegible]	Tsav	[illegible]	[illegible]	Monzodiorite	Hornblende	155 ± 4	M~U Jur	DDH, [illegible]
3	[illegible]	Tsav			Granite porphyry	Whole rock	163 ± 7	L Jur~L Cret	DDH, [illegible]
4	[illegible]	Tsav			Schistose granite	Biotite	161 ± 8	M Jur	DDH, [illegible]
5						Whole rock	163 ± 4	M Jur	
6	[illegible]	Ulaan area	[illegible]	[illegible]	Granite	K-feldspar	192 ± 10	L Jur	[illegible]
7	[illegible]	Ugtlingol	[illegible]	[illegible]	Nepheline syenite	Biotite	[illegible]	L~M Trl	[illegible]
8	[illegible]	Ugtlingol	[illegible]	[illegible]	Syenite	Biotite	229 ± 11	M~U Trl	[illegible]
9						Hornblende	226 ± 11	M~U Trl	
10						K-feldspar	[illegible]	U Perm~M Trl	
11						Whole rock	[illegible]	U Perm~L Trl	
12	[illegible]	Ugtlingol			Nepheline syenite	Nepheline	[illegible]	L~M Trl	[illegible]
13						Biotite	218 ± 11	M~U Trl	
14	[illegible]	Tsagaansuvraga	[illegible]	[illegible]	Greisen	Muscovite	[illegible]	U Dev~L Carb	Ore stock pile
15	[illegible]	Tsagaansuvraga	[illegible]	[illegible]	Quartz monzonite	K-feldspar	[illegible]	L~M Carb	"Leuco granite"
16	[illegible]	Tsagaansuvraga area	[illegible]	[illegible]	Quartz monzonite	Hornblende	333 ± 11	U Dev~L Carb	[illegible]
17	[illegible]	Salaa	[illegible]	[illegible]	Granite	K-feldspar	181 ± 12	L Jur	DDH, [illegible]
18	[illegible]	Tumurtiin Ovoo area	[illegible]	[illegible]	Granite	K-feldspar	181 ± 13	L Jur	[illegible]
19	[illegible]	[illegible]	[illegible]	[illegible]	Alkali granite	Hornblend	[illegible]	U Carb~L Perm	[illegible]
20	[illegible]	Mukhgia-Bulak	[illegible]	[illegible]	Syenite	Nepheline	152 ± 7	U Jur~L Cret	[illegible]
21	[illegible]	Olon-Ovoot area	[illegible]	[illegible]	Graphic granite	Albite	[illegible]	L Ord~U Carb	[illegible]
22	[illegible]	Olon-Ovoot area	[illegible]	[illegible]	Gabbro	Whole rock	[illegible]	U Dev~L Perm	[illegible]
23	[illegible]	Mukhgia-Bulak	[illegible]	[illegible]	Granite	K-feldspar	[illegible]	U Perm~M Trl	[illegible]
24	[illegible]	Olon-Ovoot area	[illegible]	[illegible]	Granodiorite	Biotite	[illegible]	U Carb~L Perm	[illegible]
25	[illegible]	Tsagt-Ovoo	[illegible]	[illegible]	Granite	Whole rock	[illegible]	M~U Trl	Tsagt-Ovoo massif
(Pb-Pb method)									
26	[illegible]	Tsav	[illegible]	[illegible]	Plymtl vein ore	Galena	[illegible]	L Cret	[illegible]
27	[illegible]	Tsav	[illegible]	[illegible]	Plymtl vein ore	Galena	[illegible]	L Cret	Ore stock pile
28	[illegible]	Tsav			Plymtl vein ore	Galena	[illegible]	L Cret	[illegible]
29	[illegible]	Ulaan	[illegible]	[illegible]	Plymtl brecpia ore	Galena	[illegible]	M Jur	Ore stock pile
30	[illegible]	[illegible]	[illegible]	[illegible]	Gar-mgt sk ore	Galena	[illegible]	L Cret	DDH

(ABBREVIATIONS) T.S.:Tsagaansuvraga, T.O.:Tumurtiin-Ovoo, O.O.:Olon-Ovoot, M.B.:Mukhgia-Bulak, U:Upper, M:Middle, L:Lower
Cret:Cretaceous, Jur:Jurassic, Trl:Triassic, Perm:Permian, Carb:Carboniferous, Ord:Ordovician
DDH:Boring core, Plymtl:Polymetal, Gar-mgt sk:Garnet-magnetite skarn, Brecpia:Breccia pipe
*:Coordinates of core storage yard or ore stock pile.
**:Pb-Pb age were calculated using the formular taken from "Principles of Isotope Geology" by Gunter Faure, 1977.

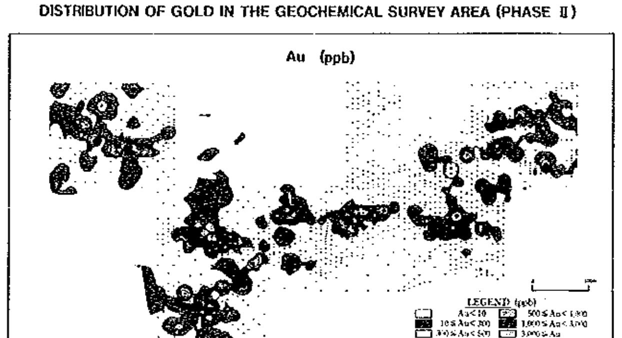
RESULTS OF DATING BY K-Ar METHOD (PHASE II)

No.	SAMPLE No.	LOCALITY	COORDINATES NORTH	COORDINATES EAST	ROCK	MEDIA	RESULT DETERMINED AGE (Ma)	RESULT GEOLOGIC TIME	NOTE
1	[illegible]	Geochemical survey area	co-ordinated on the detailed survey grid (refer to [illegible])		Schist	Whole rock	[illegible]	Upper Carboniferous	
2	[illegible]	Sub-regional survey area			Muscovite schist	"	[illegible]	Lower Permian	
3	[illegible]	Olon ovoot regional survey area	[illegible]	[illegible]	Biotite rhyolite	"	[illegible]	Lower Jurassic	Sub-regional co-ordinate [illegible]
4	[illegible]	Sub-regional survey area	[illegible]	[illegible]	Sericite schist	"	[illegible]	Lower Permian	
5	[illegible]	Sub-regional survey area	[illegible]	[illegible]	Andesite	"	[illegible]	Lower Permian	
6	[illegible]	Solrig regional survey area	[illegible]	[illegible]	Granodiorite	"	[illegible]	Middle Jurassic	
7	[illegible]	Solrig regional survey area	[illegible]	[illegible]	Andesite	"	[illegible]	Upper Triassic	
8	[illegible]	Sologoi regional survey area	[illegible]	[illegible]	Aplite	"	[illegible]	Lower Jurassic	
9	[illegible]	Sologoi regional survey area	[illegible]	[illegible]	Muscovite granite	"	[illegible]	Middle Triassic	
10	[illegible]	[illegible] regional survey area	[illegible]	[illegible]	Sericite schist	"	[illegible]	Lower Permian	

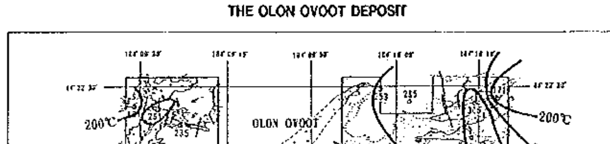
RESULTS OF DATING BY K-Ar METHOD (PHASE III)

No.	SAMPLE No.	LOCALITY Boring No.	LOCALITY Depth (m)	ROCK NAME	MEDIA	RESULT DETERMINED AGE (Ma)	RESULT GEOLOGIC TIME	NOTE
1	[illegible]	MJMU-1	[illegible]	White clay	Whole rock	245 ± 12	Lower Triassic	Hydrothermal
2	[illegible]	MJMU-7	97.70- 99.10	Alt microdio	Whole rock	284 ± 14	Lower Permian	cag-py dissem
3	[illegible]	MJMU-8	95.20- 96.50	Gry-grn colored fresh microdio	Whole rock	326 ± 16	Lower Carboniferous	

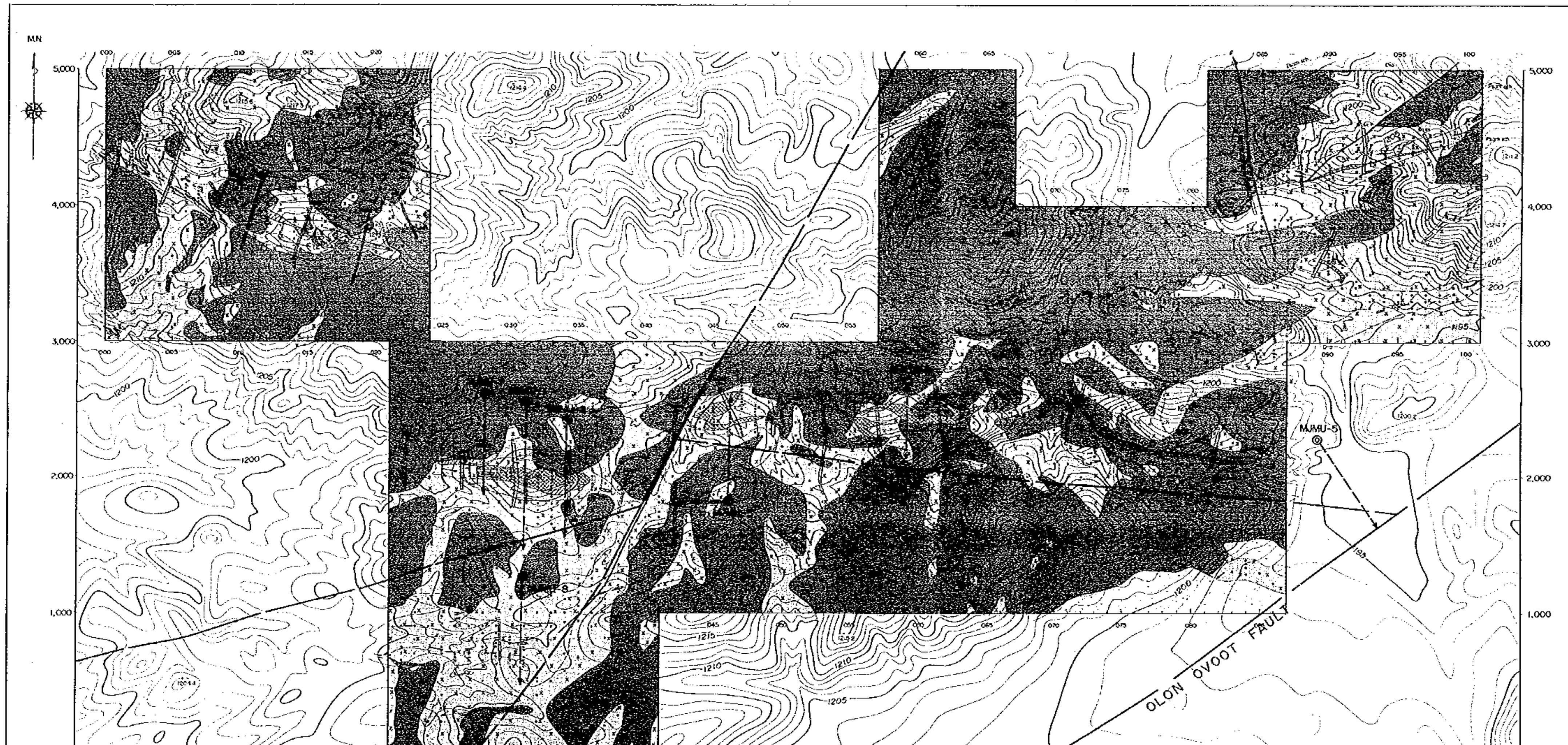
DISTRIBUTION OF GOLD IN THE GEOCHEMICAL SURVEY AREA (PHASE II)

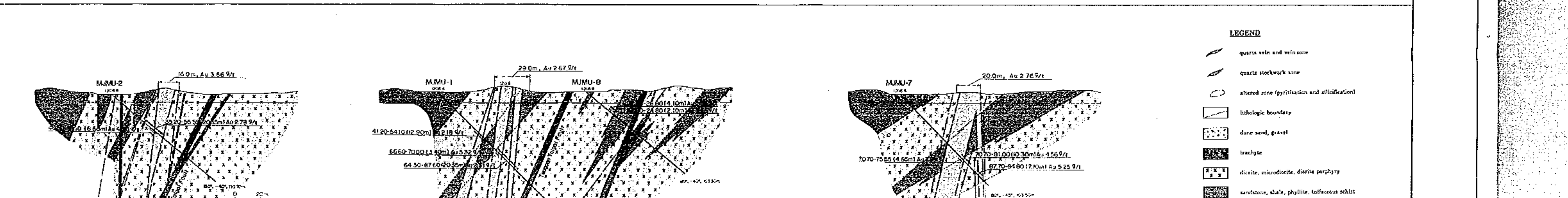


HOMOGENIZATION TEMPERATURE OF THE FLUID INCLUSIONS AT THE SURFACE OF THE OLON OVOOT DEPOSIT



GEOLOGIC MAP OF THE GEOCHEMICAL SURVEY AREA



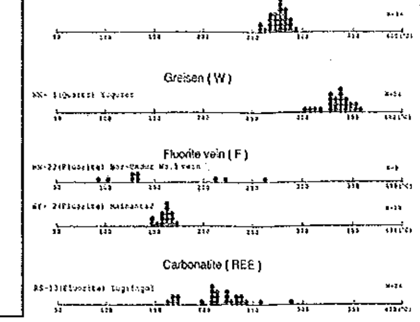


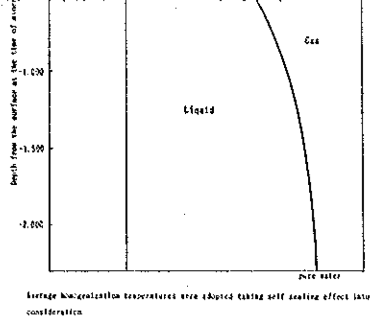
LEGEND

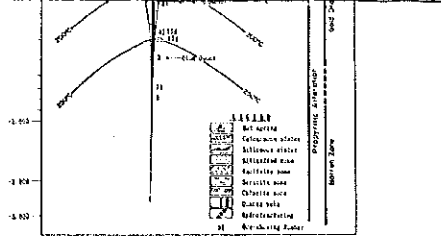
(B) resistive zones
(C) conductive zones
potential areas for ore deposition
magnetic anomaly zones

Mineralization
- quartz vein
- alteration zone
- geologic boundary
- inferred geologic boundary
- dip and strike of bed
- dip and strike of schistosity

Marks
- fault
- inferred fault
- syncline
- anticline
- geochemical survey area







RESULTS OF DATING BY K-Ar, Pb-Pb METHOD (PHASE I)

No.	SAMPLE No.	LOCALITY	COORDINATES NORTH	COORDINATES EAST	ROCK	MEDIA	RESULT DETERMINED AGE (Ma)	RESULT GEOLOGIC TIME	NOTE
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

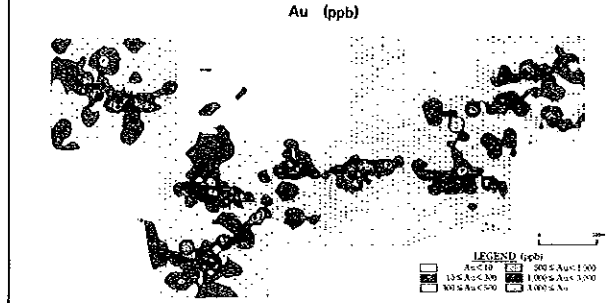
RESULTS OF DATING BY K-Ar METHOD (PHASE II)

No.	SAMPLE No.	LOCALITY	COORDINATES NORTH	COORDINATES EAST	ROCK	MEDIA	RESULT DETERMINED AGE (Ma)	RESULT GEOLOGIC TIME	NOTE
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

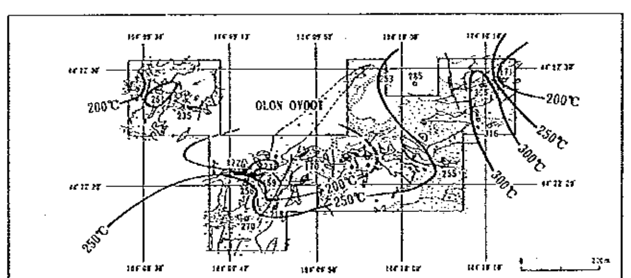
RESULTS OF DATING BY K-Ar METHOD (PHASE III)

No.	SAMPLE No.	LOCALITY Boring No.	LOCALITY Depth (m)	ROCK NAME	MEDIA	RESULT DETERMINED AGE (Ma)	RESULT GEOLOGIC TIME	NOTE
1	[illegible]	MJMU-1	49.50	White clay	Whole rock	215 ± 12	Lower Triassic	Hydrothermal
2	[illegible]	MJMU-7	87.70- 89.70	Alt microdio	Whole rock	284 ± 14	Lower Permian	qtz-py dissem
3	[illegible]	MJMU-8	55.20- 55.50	Gry-grn colored fresh microdio	Whole rock	325 ± 15	Lower Carboniferous	

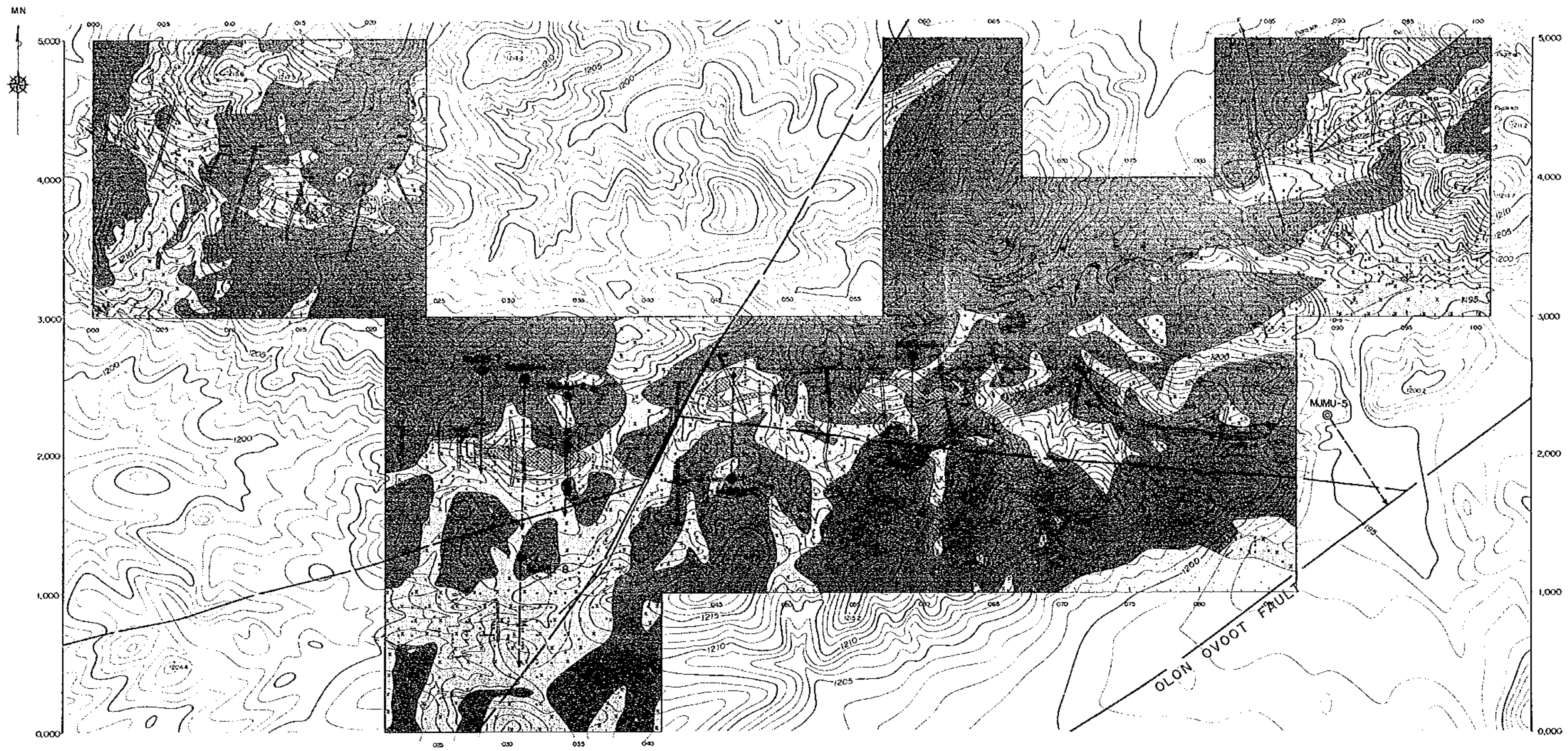
DISTRIBUTION OF GOLD IN THE GEOCHEMICAL SURVEY AREA (PHASE II)

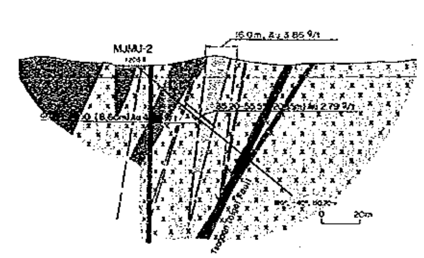


HOMOGENIZATION TEMPERATURE OF THE FLUID INCLUSIONS AT THE SURFACE OF THE OLON OVOOT DEPOSIT

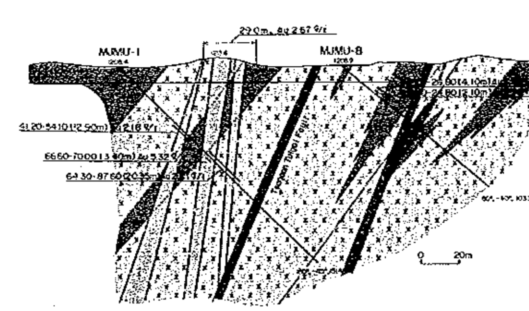


GEOLOGIC MAP OF THE GEOCHEMICAL SURVEY AREA

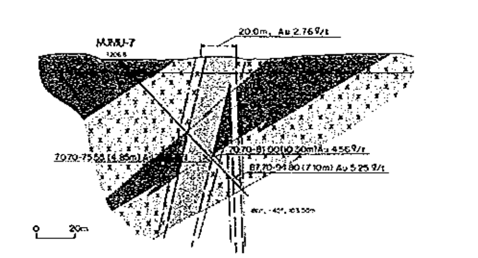




Highest ore grade
MJMU-2 40.50m~42.50m (2.00m) Au 7.8g/t



Highest ore grade
MJMU-1 72.90m~74.30m (1.40m) Au 8.70g/t
MJMU-8 24.60m~24.80m (0.20m) Au 8.99g/t



Highest ore grade
MJMU-7 73.85m~75.55m (1.70m) Au 15.10g/t
92.65m~94.80m (2.15m) Au 8.32g/t

LEGEND

- quartz vein and vein zone
- quartz stockwork zone
- altered zone (pyritization and silicification)
- lithologic boundary
- dune sand, gravel
- trachyte
- diorite, microdiorite, diorite porphyry
- sandstone, shale, phyllite, tuffaceous schist
- fault
- trench
- borehole
- sampling point

Surveyed by Mitsui Mineral Development Engineering Co., LTD (MINDECO)