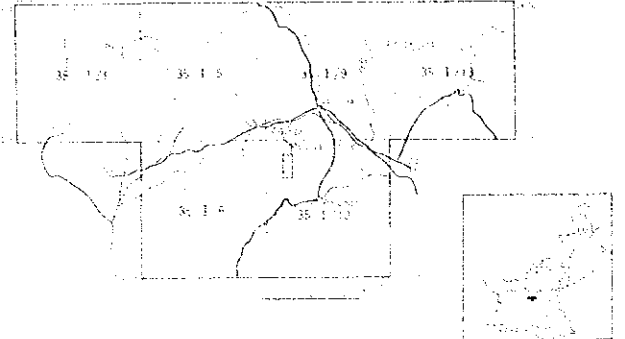


REPORT ON THE COOPERATIVE MINERAL EXPLORATION
IN
KHUZDAR AREA OF BALUCHISTAN
IN
THE ISLAMIC REPUBLIC OF PAKISTAN
PHASE I

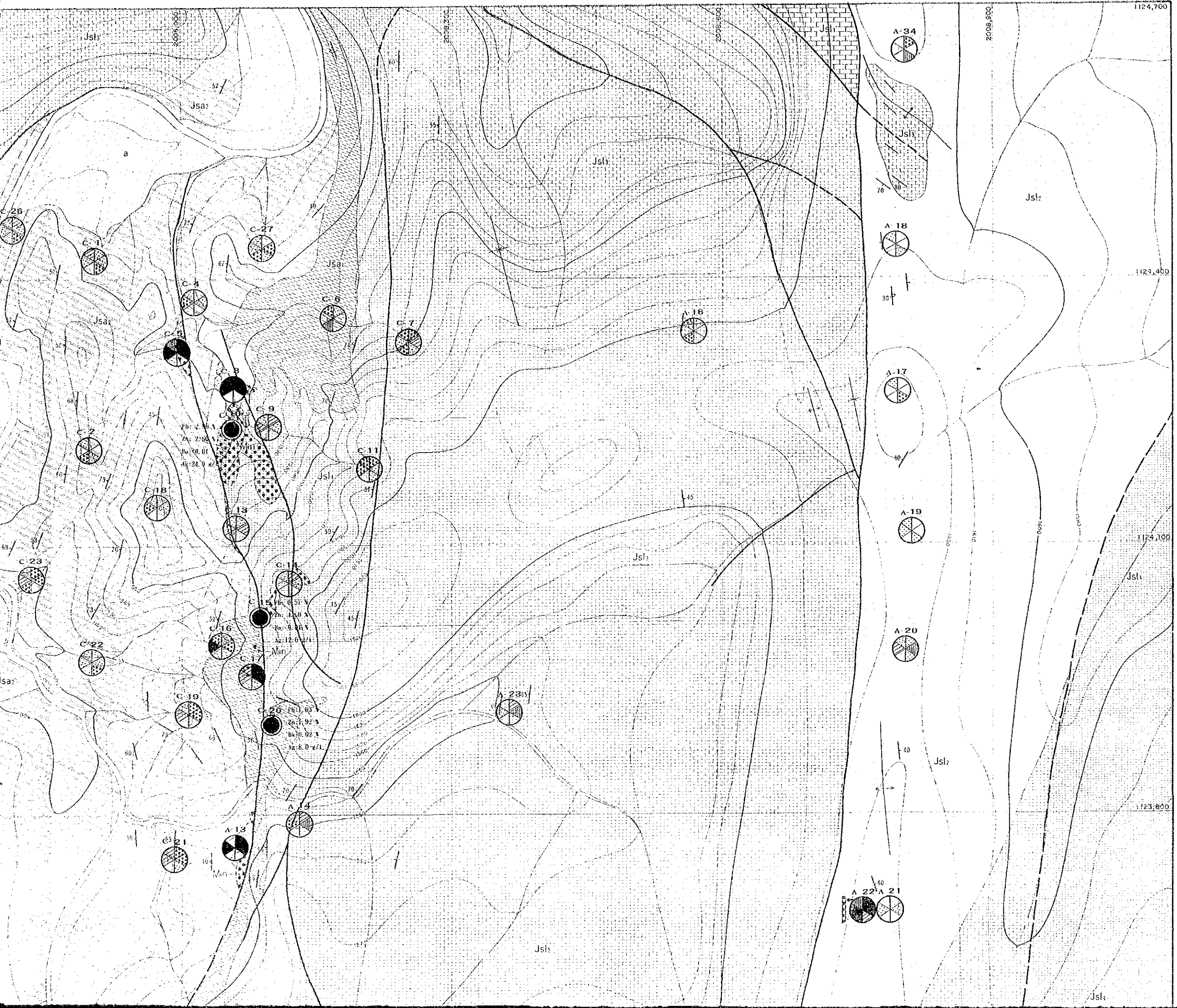
GEOCHEMICAL ANOMALOUS AREA
IN SURMAI SURVEY AREA (SURMAI-II)

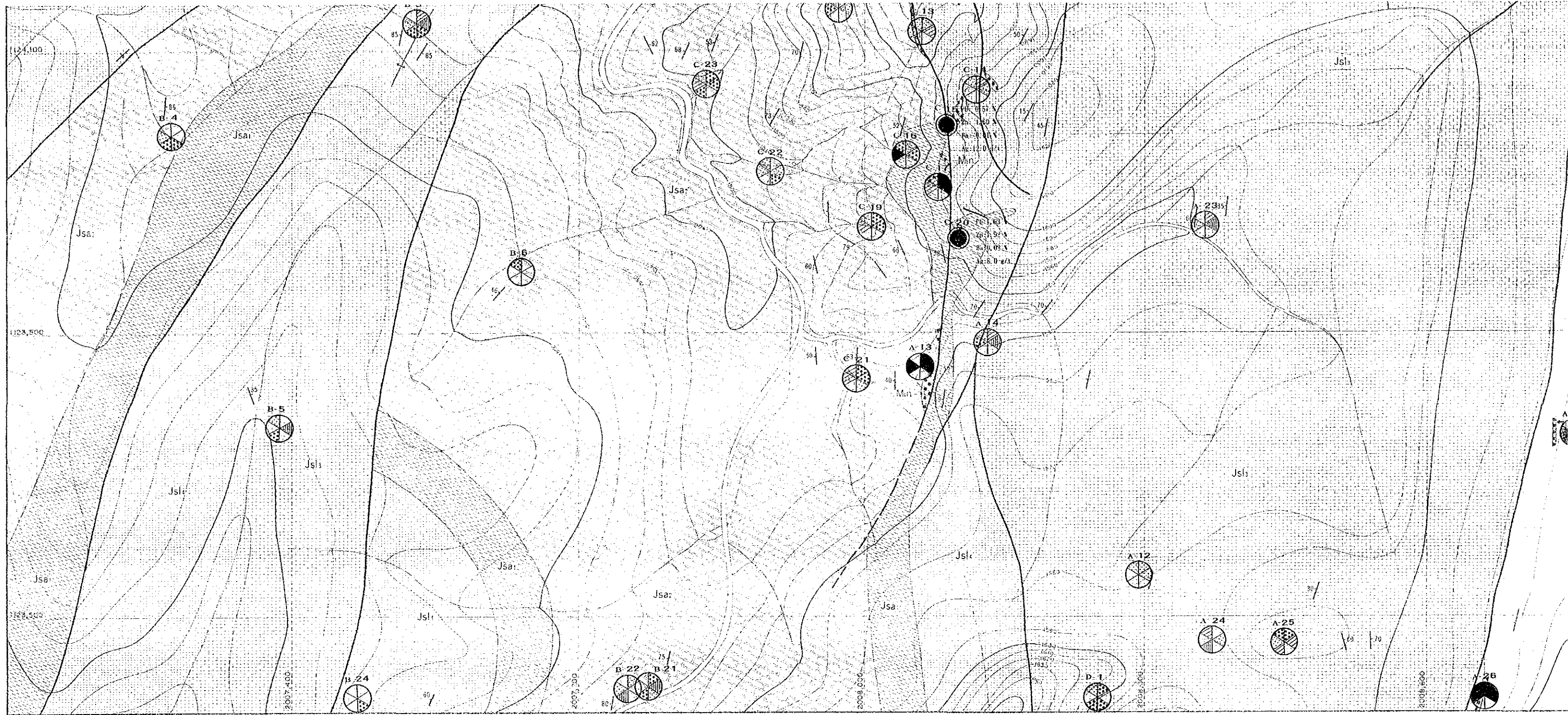


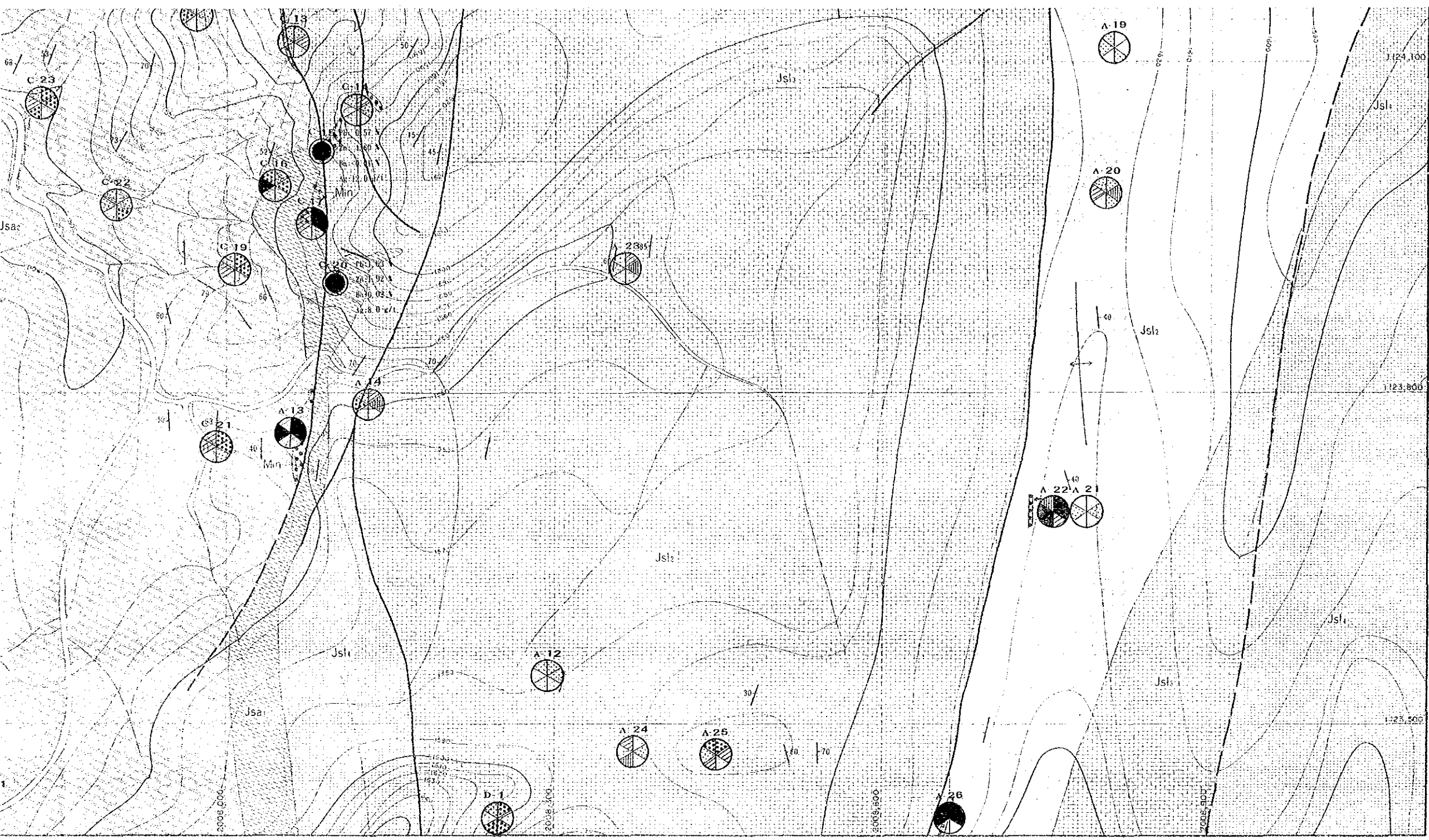
1:2,000

LEGEND

- Age - Sample Number
- Location
- Geological Formations
- Topographic Contours
- Streams
- Boundaries
- Other
- Scale
- North Arrow







LEGEND

Geological Unit

- Jsa: interbedded sandstone and shale (includes thin bedded sandstone and shale)
- Jsl1: interbedded sandstone and shale (includes thin bedded sandstone and shale)
- Jsl2: interbedded sandstone and shale (includes thin bedded sandstone and shale)

Topography

- Contour lines: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300, 310, 320, 330, 340, 350, 360, 370, 380, 390, 400, 410, 420, 430, 440, 450, 460, 470, 480, 490, 500, 510, 520, 530, 540, 550, 560, 570, 580, 590, 600, 610, 620, 630, 640, 650, 660, 670, 680, 690, 700, 710, 720, 730, 740, 750, 760, 770, 780, 790, 800, 810, 820, 830, 840, 850, 860, 870, 880, 890, 900, 910, 920, 930, 940, 950, 960, 970, 980, 990, 1000

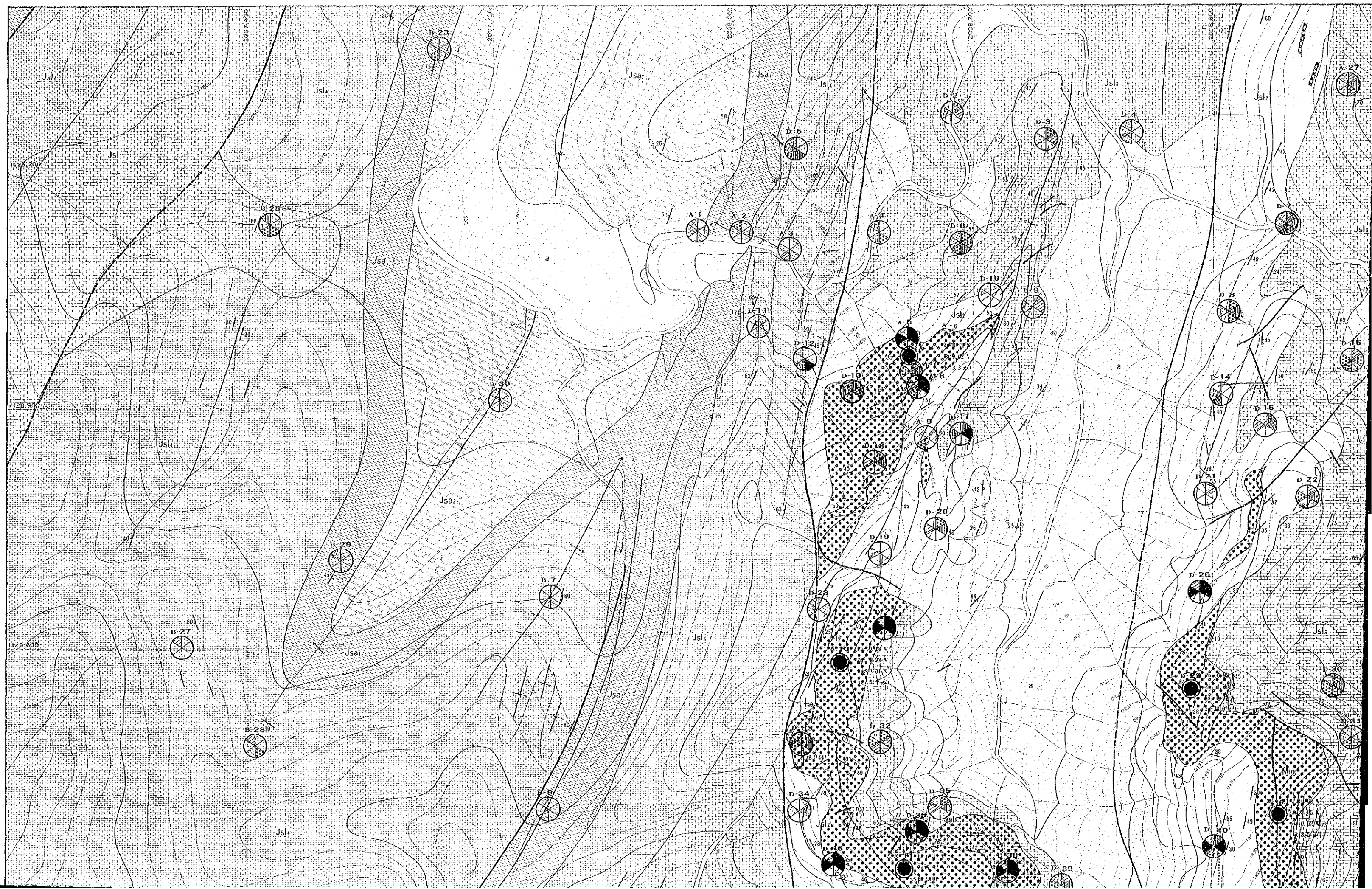
Other Symbols

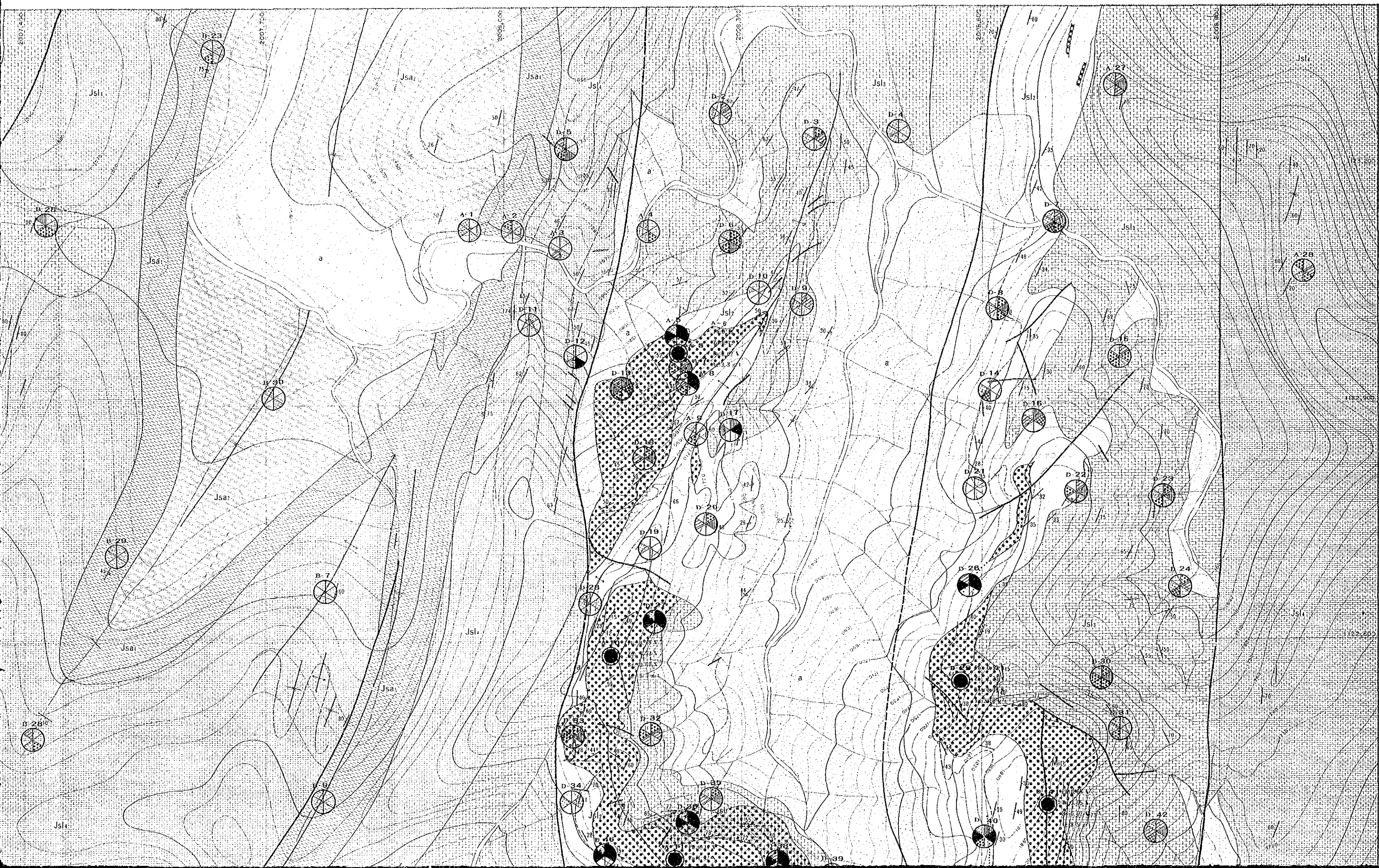
- Well: (circle with cross)
- Stream: (line with arrow)
- Drainage: (line with arrow)
- Boundary: (dashed line)
- Fault: (line with ticks)
- Belong to: (line with dots)

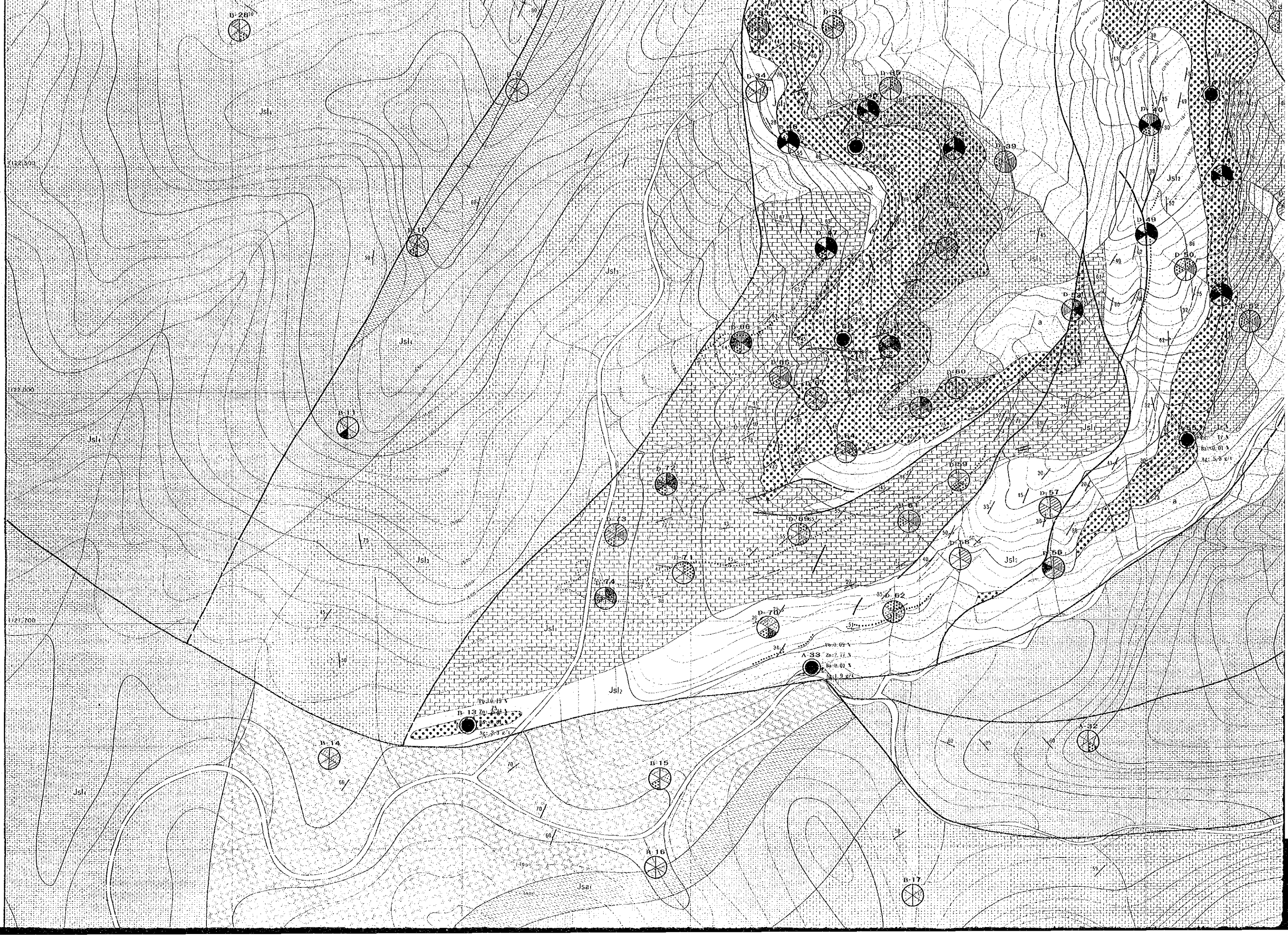
Symbol Mark of Grade

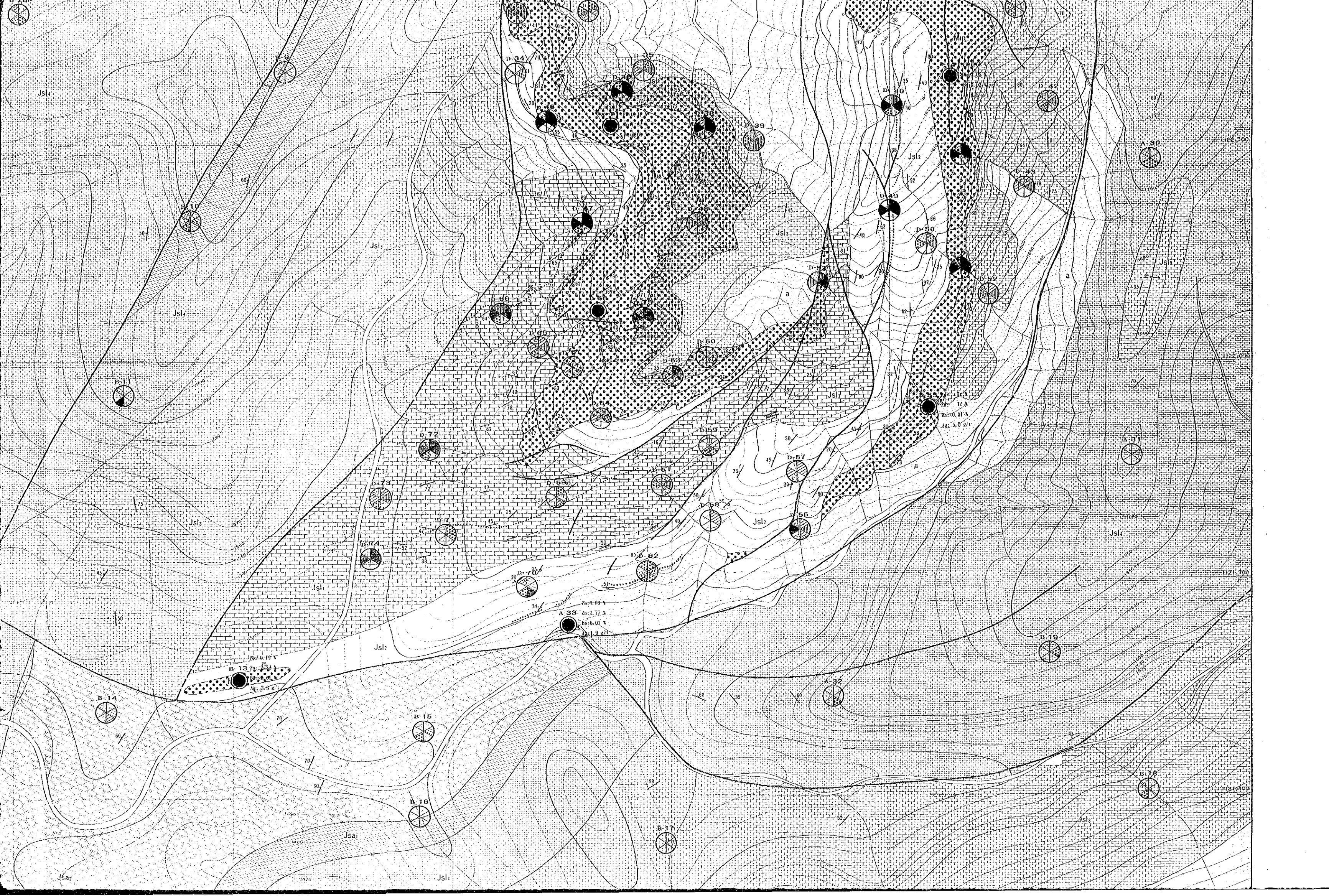
Element	Symbol	Grade Range
Pb	(diagonal lines /)	> 2,450
Pb (ppm)	(diagonal lines \)	2,000-2,449
Zn	(diagonal lines /)	> 2,550
Zn (ppm)	(diagonal lines \)	1,000-2,549
Hg	(diagonal lines /)	> 970
Hg (ppb)	(diagonal lines \)	750-969
	(diagonal lines /)	400-1,999
	(diagonal lines \)	215-999
	(diagonal lines /)	61-399
	(diagonal lines \)	133-214
	(diagonal lines /)	26-66
	(diagonal lines \)	100-132
	(diagonal lines /)	11-25
	(diagonal lines \)	48-99
	(diagonal lines /)	64-106
	(diagonal lines \)	35-63
Ba	(diagonal lines /)	> 900
Ba (ppm)	(diagonal lines \)	569-899
Mg	(diagonal lines /)	> 32,112
Mg (ppm)	(diagonal lines \)	16,850
S	(diagonal lines /)	> 0.128
S (A)	(diagonal lines \)	0.063-0.127
	(diagonal lines /)	420-568
	(diagonal lines \)	10,500-16,659
	(diagonal lines /)	359-419
	(diagonal lines \)	8,546-10,500
	(diagonal lines /)	226-358
	(diagonal lines \)	4,671-8,545
	(diagonal lines /)	204-225
	(diagonal lines \)	4,384-4,670
	(diagonal lines /)	0.009-0.014
	(diagonal lines \)	0.003-0.008

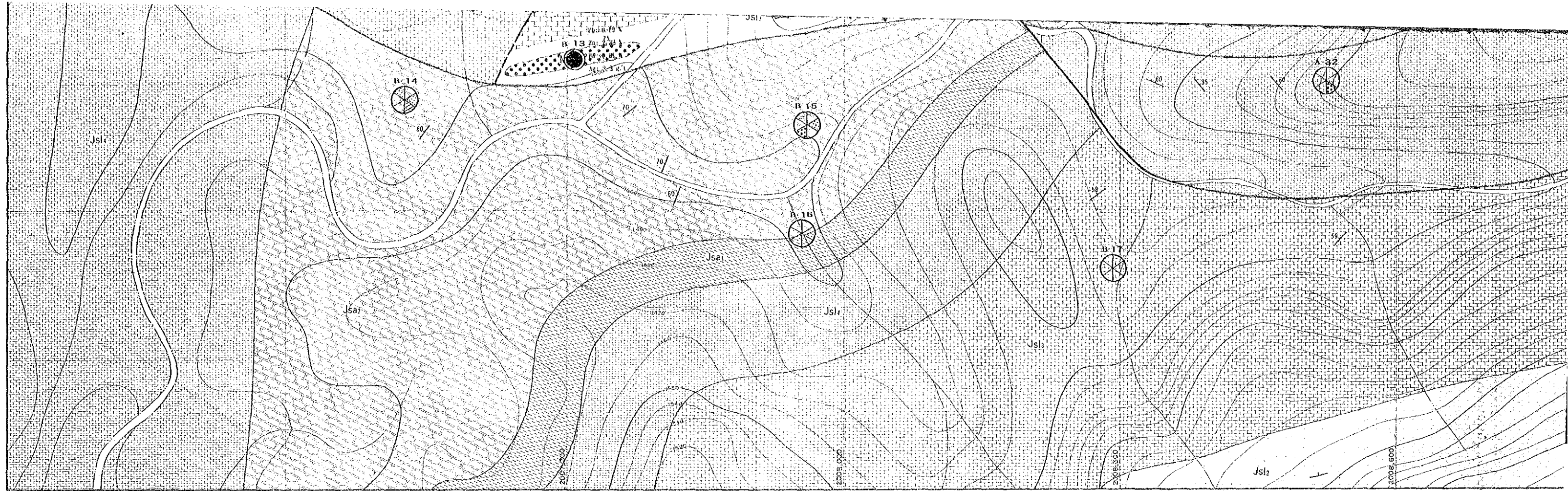
Location of Ore Sample











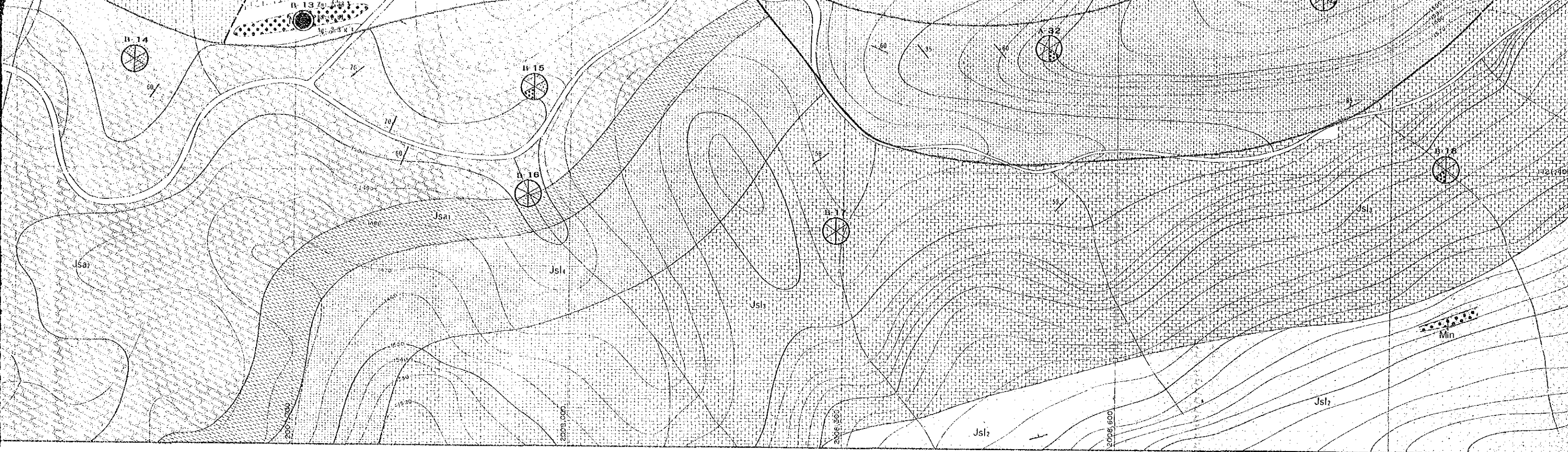
Symbol Mark of Grade

Pb	> 2,450	Ba	> 900
(ppm)	2,000-2,449	(ppm)	569-899
	400-1,999		420-568
	67-399		359-419
	26-66		226-358
	11-25		204-225
Zn	> 2,550	Mg	> 32,112
(ppm)	1,000-2,549	(ppm)	16,650
	215-999		10,500-16,650
	133-214		8,546-10,500
	100-132		4,671-8,545
	48-99		4,384-4,670
Hg	> 970	S	> 0.128
(ppb)	750-969	(%)	0.063-0.127
	400-749		0.036-0.062
	107-399		0.015-0.035
	64-106		0.009-0.014
	35-63		0.003-0.008

Location of Ore Sample

LEGEND

Age	Formation	Symbol	Lithological description
QUATERNARY	Q	[Symbol]	Alluvium-Claystone
	Miocene	Js1	Bedded limestone
		Js2	Interbedded limestone and shale, limestone thin bedded having ammonite fossils
		Js3	Interbedded limestone and shale, limestone thin to thick bedded containing ammonites
LOWER JURASSIC	Shinarump	Js4	Limestone gray, thick to massive, mottled with a zone or thin interbedded limestone and shale
		Js5	Limestone and shale interbedded, limestone dark gray, thin to medium bedded, mottled, fossiliferous
		Js6	Limestone with very minor shale, limestone gray thick to massive with some oolitic beds (s changed to gypsiferous where replaced by circulating solutions)
		Js7	Interbedded limestone and shale with minor marl, limestone gray, thin bedded, mottled and oolitic occasionally, shale of black color
SANGRE DE TORO	Js8	Interbedded sandstone and shale	
	Ms	Miscellaneous	
		[Symbol]	Differential
		[Symbol]	Dip (Quarterly)
		[Symbol]	Anticline
		[Symbol]	Basin
		[Symbol]	Fault
		[Symbol]	Bedding trace



Symbol Mark of Grade

Pb	>2,450	Bz	>900
(ppm)	2,000-2,449	(ppm)	569-899
	400-1,999		420-568
	67-399		359-419
	26-66		226-358
	11-25		204-226
Zn	>2,550	Mg	>32,112
(ppm)	1,000-2,549	(ppm)	16,850
	215-999		10,500-16,659
	133-214		8,546-10,500
	100-132		4,671-8,545
	48-99		4,384-4,670
Hg	>970	S	>0.128
(ppb)	750-969	(%)	0.063-0.127
	400-749		0.035-0.626
	107-399		0.015-0.035
	64-106		0.009-0.014
	35-63		0.003-0.008

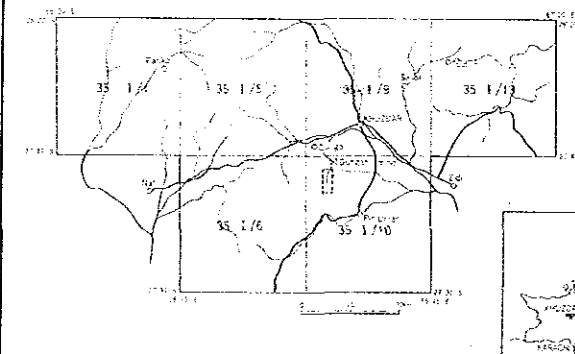
Location of Ore Sample

LEGEND

Age	Formation	Member	Unit	lithological description
QUATERNARY			Q	Alluvium-Deposits
			Jsa1	Reddish limestone
			Jsa2	Interbedded fine-grained sandstone and shale. Limestone thin bedded basing worm-like fossils.
LOWER JURASSIC	Sindhar	Ls1	Jsa	Interbedded limestone and shale. Limestone thin to thick bedded contains ammonites.
			Jsl1	Limestone grey, thick to massive, mottled with a zone or fine interbedded limestone and shale.
			Jsl2	Limestone and shale interbedded. Limestone dark grey, thin to medium bedded, mollusks, fossiliferous.
Sindhar	Ls2	Jsl	Limestone a thin very fine-grained shale. Limestone grey thick to massive with some carbon beds. (is changed to gossan where reworked by circulating solutions)	
		Jsl	Interbedded limestone and shale with minor marl. Limestone grey, thin bedded, mottled and calcitic occasionally. Scale of plank extant.	
		Jsl	Interbedded sandstone and shale.	
			Min	Mineralization
			Do (Normal)	
			Do (Overturned)	
			Anticline	
			Syncline	
			Fault	
			Bolting traces	

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IN
THE ISLAMIC REPUBLIC OF PAKISTAN
PHASE I

GEOCHEMICAL ANOMALOUS AREA
IN SURMAI SURVEY AREA (SURMAI-III)



MAY - 1987

JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

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