and three Pakistani personnel. Both Japanese and Pakistani team each rented a house in Khuzdar, used them as camps and commuted by Jeep to the site.

(4) Transportation of equipment and material

Most of the equipment were transported from Japan by sea and landed at Karachi. From here, the equipment was transported overland to Khuzdar and the material dismounted. From Khuzdar to Gunga, for 16 km, the equipment was transported by truck using existing road. The six kilometers between Gunga and Surmai-I ~III was negotiated by truck using a road newly constructed by GSP. Also during the monsoon season, the road was destroyed at several localities and the supply of water was hindered several times by heavy rain.

(5) Water for drilling

The water necessary for drilling was transported by trucks. During the earlier part of the operation, water was obtained from a river near the Khuzdar town. After the arrival of the monsoon season, water was available in the vicinity of the site.

(6) Withdrawal

After the completion of the operations, most of the equipment was stored at the drilling site. The cores were stored in the GSP camp in Khuzdar town.

2 - 1 - 1 - 2 Progress of drilling

The progress of each drilling was as follows. Various relevant data are laid out in tables and charts, namely working time analysis of the drilling operation(Table II-2-5), record of the drilling operation (Table II-2-6~11), summary of the drilling operation(Table II-2-12~17), chart of drilling progress(Fig. II-2-4~9).

(1) MJP-1

HX diamond bit and bentonite mud were used for soil and weathered

horizon down to 4.10 m, the hole reamed by HX casing metal to 4.10 m and HX casing pipe inserted. For the bedrock, NQ wireline with bentonite mud and mud oil were used. Since the limestone in the shallower parts had fractures developed which often caused total loss of water, the hole was reamed by NX casing shoe every 3~6 m, and casing pipe inserted to 53.10 m. After attaining the depth of 111.4 m, five days from 16 May to 20 May were Islam Eid and the operation was suspended. When the work resumed after the five-day recess, the friable shale had collapsed at 69~73 m and it was difficult to clean. Therefore, the hole was reamed by NX casing shoe to 77.10 m and NX casing pipe extended to that depth. After that, NQ wireline was used down to 240.10 m and BX casing pipe inserted. Then, the remainder down to 401.00 m was drilled by BQ wireline with bentonite and mud oil. As measures countering the loss of fluid after inserting the casing pipe, Tel-stop and cement milk were injected.

(2) MJP-2

HX diamond bit and bentonite mud were used for soil and weathered rocks down to 4.10 m, then the hole was reamed by HX casing metal to the same depth and casing pipe inserted. Reaming and extension by NX casing shoe were carried out simultaneously with drilling and NX casing pipe was set at 28.10 m. After attaining 210.10 m, BX casing pipe was inserted. Below that depth, BQ wirline with bentonite mud and mud oil was used down to 351.00 m. During limestone penetration, total fluid was often lost and Tel-stop and cement milk were injected at each loss.

(3) MJP-3

HX diamond bit and bentonite mud were used for soil and weathered rocks to the depth of 4.10 m. Then the hole was reamed by HX casing metal to 4.10 m and HX casing pipe set. Below that depth down to 22.10 m, NQ wireline with bentonite mud and mud oil were used, reamed by NX casing shoe and NX casing pipe was inserted. Down to 180.10 m, NQ wireline drilling method was used and BX casing pipe was set. Then BQ wireline with bentonite mud and oil was used to 300.80 m. Fluid was often lost, with total a loss below 290 m, Tel-stop and cement milk were injected at each occurrence.

(4) MJP-4

HX diamond bit and bentonite mud were used for soil and weathered rocks to the depth 4.10 m. The hole was reamed by HX casing metal to 1.60 m and HX casing pipe set. Below the depth down to 33.10 m, NQ wireline with bentonite mud and oil were used, reamed by NX casing set and NX casing pipe inserted. Down to 240.50 m, NQ wireline drilling method was used and BX casing pipe was set. Then BQ wireline with bentonite mud and mud oil was used to 401.00m. Fluid was often lost and Tel-stop, cement milk were injected at each occurrrence. After the completion of drilling, recovery of BX casing pipe become difficult and it had to be cut at 210.00 m and the pipe above that depth was recovered.

(5) MJP-5

HX diamond bit and bentonite mud were used for soil and weathered rocks to the depth of 4.10 m. The hole was reamed by HX casing metal to 4.10 m and HX casing pipe set. Below that depth down to 54.10 m, NQ wireline with bentonite mud and mud oil were used, reamed by NX casing set and NX casing pipe inserted. After drilling down to 231.50 m, BX casing pipe was inserted. The BQ wireline with bentonite mud and mud oil was used to the depth of 401.00m. Tel-stop and cement milk were injected whenever fulid was lost. The loss of fulid at 126.90m could not be stopped by large amount of Tel-stop, cement milk and straw. It was stoppde by dropping cement balls in plastic bags into the leaking parts and stabbing it with rod. In this hole, the recovery of NX casing pipe become difficult and the lower 30 m was abandoned together with diamond shoe.

(6) MJP-6

HX diamond bit and bentonite mud were used for soil and weathered rocks to the depth 4.10 m. The hole was reamed by HX casing metal to 3.10 m and HX casing pipe set. Below that depth down to 42.10 m NQ wireline with bentonite mud and mud oil were used, reamed by NX casing shoe and NX casing pipe was inserted. Wireline drilling continued below that depth, but the drill was often jammed between 180 to 200 m by collapse of the

mineralized fractured zone. Therefore, BX casing pipe was inserted at 210.50 m. After this, BQ wireline with bentonite milk and mud oil were used to the depth of 401.00 m. Tel-stop and cement milk were injected whenever loss of fluid occured. The recovery of the NX casing pipe become difficult in this hole and lower 39.00 m and daimond shoe were abandoned.

Table Ⅱ—2—2 Drilling Machine and Equipment Used

Drilling Machine Model "L-38"	1 set		
Specifications:			
Capacity	700m (BQ-WL)		
Dimensions L x W x H	2,150mmx1,170mmx1,450mm		
Hoisting capacity	4,000kg		
Spindle speed	Forward 211,438,803,1,000rpm		
Engine Model "F3L912"	51ps/2,200rpm		
Drilling Pump Mdel "WLMG-15h"	1 set		
Specifications:			
Piston diameter	68mm		
Stroke	100mm		
Capacity	discharge capacity 100ℓ/min		
Dimensions L x W x H	2,350mmx720mmx1,120mm		
Engine Model "NS-130C"	13ps/2,200rpm		
Wire line Hoist Model "SK-1-110"	1 set		
Specifications:			
Rope capacity	500m		
Hoisting speed	8~105m/min		
Engine Model "NF-110"	11ps/2,200rpm		
Mud mixer Mdel "HM-250"	1 set		
Specifications:			
Capacity	200ℓ/600rpm		
Engine Model "NS-65C"	7ps/2,400rpm		
Generator Model "YSG-10E"	1 set		
Specifications:			
Capacity	10KVA 8KW 100~200V		
Generator Model "YSG3000B"	1 set		
Specifications:			
Capacity	2.7KW 100V		
Water supply pump Model "U-40KI"	2 set		
Specifications:			
Capacity	discharge capacity 300ℓ/min		
Derrick	1 set		
Specifications:			
Height	9.5m		
Max load capacity	4,000KG		
Drilling tools			
Drilling rod	NQ-WL	3m	80pcs
	BQ-WL	3m	134pcs
Casing pipe	HX	1m	1pc
	HX	1.5m	2pcs
	NX	1m	2pcs
	NX	3m	25pcs
	BX	3m	80pcs

Table Ⅱ-2- 3 Drilling Meterage of Diamond Bits Used

Item	Size	Bit No.	Drilling Meterage by Unit :Meter						Total (m)
			MJP-1	MJP-2	MJP-3	MJP-4	MJP-5	MJP-6	
Diamond bit	HX	185674	4.10	4.10	4.10	4.10	4.10	4.10	24.60
		Total	Drilling length/bit (24.10/1)						24.10
	NQ	NNZ-18		24.20	27.80				52.00
		NNZ-19			46.10				46.1
		NNZ-20			59.20				59.20
		NNZ-21			42.90				42.90
		NNZ-22		44.20				36.20	80.40
		NNZ-23		60.20					60.20
		NNZ-24		55.80					55.80
		NNZ-25		21.60			44.00		65.00
		NNZ-26	71.60						71.60
		NNZ-27	66.70						66.70
		NNP- 1	73.00						73.00
		NNP- 2	25.10			33.70			58.80
		NNP- 3				76.30			76.30
		NNP- 4				74.00			74.00
		NNP- 5				52.40			52.40
		NNP- 6					69.60		69.60
		NNP- 7					63.90		63.90
		NNP- 8					49.90		49.90
		NNP- 9						90.20	90.20
		NNP-10						80.00	80.00
			236.40	206.00	176.00	236.40	227.40	206.40	1,288.60
		Total	Drilling length/bit (1,288.60/20)						64.43
	BQ	NS-301			34.60	46.90			81.50
		NS-302			53.50		31.40		84.90
		NS-303			32.60		50.20		82.80
		NS-304		69.80					69.80
		NS-305		71.10					71.10
		NS-306	66.20						66.20
		NS-307	70.30						70.30
		NS-309	24.00					59.90	83.90
		NBP- 1				78.60			78.60
		NBP- 2				35.00		53.50	88.50
		NBP- 3					87.90		87.90
		NBP- 4						77.10	77.10
			160.50	140.90	120.70	160.50	169.50	190.50	942.60
		Total	Drilling length/bit (942.60/12)						78.55
Diamond shoe	NX	187869	73.00	24.00	18.00				115.00
		187870				29.00	50.00	38.00	117.00
			73.00	24.00	18.00	29.00	50.00	38.00	232.00
		Total	Drilling length/bit (232.00/2)						116.00

Table Ⅱ－2－4　　Eependable Items Used

Description	Specifications	Unit	Quantity						Total
			MJP-1	MJP-2	MJP-3	MJP-4	MJP-5	MJP-6	
Light oil		ℓ	2,520	1,755	2,400	1,725	2,280	2,305	12,985
Petrol		ℓ	180	-	-	120	180	160	640
Hydraulic oil		ℓ	-	12	36	10	12	-	70
Engine oil		ℓ	18	28	48	18	30	36	178
Greas		kg	15	12	14	10	18	16	85
Bentonite		kg	2,250	1,450	2,575	1,500	1,675	3,425	12,875
C M C		kg	25	22	39	19	36	47	188
Tel-stop		kg	39	48	69	36	96	112	400
Mud oil		ℓ	90	96	72	108	474	234	1,074
Cement		kg	600	700	1,050	700	2,350	2,400	7,800
Diamond bit	HX-SW	pc	-	-	1	-	-	-	1
Diamond bit	NQ-WL	pc	4	5	4	4	4	3	24
Diamond bit	BQ-WL	pc	3	2	3	3	3	3	17
Diamond reamer	NQ-WL	pc	2	1	1	2	2	2	10
Diamond reamer	BQ-WL	pc	1	1	1	2	1	2	8
Casing diamond shoe	NX	pc	1	1	1	1	1	1	6
Casing metal shoe	HX	pc	1	1	1	1	1	1	6
Casing metal shoe	BX	pc	1	1	1	1	1	1	6
Core barrel Ass'y	NQ-WL	set	-	-	1	1	-	1	3
Core barrel Ass'y	BQ-WL	set	-	-	1	1	-	1	3
Inner tube	NQ-WL	pc	2	-	1	1	-	1	5
Inner tube	BQ-WL	pc	2	-	1	2	1	-	6
Core lifter case	NQ-WL	pc	4	4	4	4	4	4	24
Core lifter case	BQ-WL	pc	4	4	2	4	4	4	22
Core lifter	NQ-WL	pc	6	4	4	4	4	6	28
Core lifter	BQ-WL	pc	4	4	4	4	4	4	24
Thrust ball bearing	NQ-WL	pc	4	4	4	2	2	4	20
Thrust ball bearing	BQ-WL	pc	4	4	4	4	4	4	24
Innertube stabilizer	NQ-WL	pc	1	1	1	2	1	1	7
Innertube stabilizer	BQ-WL	pc	1	1	1	2	1	1	7
Chack piece	NQ-WL	set	-	-	1	1	-	-	2
Chack piece	BQ-WL	set	-	-	1	1	-	-	2
Cylinder liner	MG-15h 68mm	pc	-	2	-	2	2	-	6
Piston rod	MG-15h	pc	-	2	-	2	2	-	6
Piston rubber	MG-15h 68mm	pc	-	4	-	4	4	4	16
Valve seat	MG-15h	pc	8	-	8	-	-	-	16
Steel ball	MG-15h	pc	8	-	8	-	-	8	24
V-packing	MG-15h	pc	-	14	-	14	-	14	42
Waste		kg	15	15	10	15	20	10	85
Wire rope	6mm x 600m	roll	-	-	1	1	-	-	2
Core box	NQ-WL	pc	37	32	27	36	47	43	222
Core box	BQ-WL	pc	17	15	13	17	30	34	126

TableⅡ-2-5 Working Time Analysis of the Drilling Operation

Hole No	Bit siz	Drilling length (m)	Core length (m)	Shift Drilling (shift)	Shift Total (shift)	Working man Engineer (man)	Working man Worker (man)	Working Time Drilling (h)	Other working (h)	Recovering (h)	Total (h)	Removing (h)	Water transportation (h)	Road construction and others (h)	G.Total (h)
MJP-1	HX	4.10	0.10	1	2	4	12	1°50′	5°10′	-	7°00′	9°00′		-	16°00′
	NQ	236.40	235.00	35	39	52	152	173°40′	129°50′	9°30′	313°00′	-		-	313°00′
	BQ	160.50	160.00	17	19	27	82	103°20′	40°40′	-	144°00′	9°00′		-	153°00′
	Total	401.00	395.10	53	60	83	246	278°50′	175°40′	9°30′	464°00′	18°00′	(149°00′)	-	482°00′
MJP-2	HX	4.10	3.00	1	3	10	30	2°30′	5°30′	-	8°00′	18°00′		-	26°00′
	NQ	206.00	204.40	28	28	37	109	156°30′	67°30′	-	224°00′	-		-	224°00′
	BQ	140.90	139.60	18	20	28	82	102°20′	49°40′	3°00′	155°00′	6°00′		-	161°00′
	Total	351.00	347.00	47	51	75	221	261°20′	122°40′	3°00′	387°00′	24°00′	(210°00′)	-	411°00′
MJP-3	HX	4.10	1.80	1	7	28	69	2°30′	5°30′	-	8°00′	59°30′		-	67°30′
	NQ	176.00	173.90	32	33	43	110	172°20′	91°40′	-	264°00′	-		-	264°00′
	BQ	120.70	120.40	22	25	36	87	108°00′	84°00′	-	192°00′	9°00′		-	201°00′
	Total	300.80	296.10	55	65	107	266	282°50′	181°10′	-	464°00′	68°30′	(302°00′)	-	532°30′
MJP-4	HX	4.10	2.00	1	3	10	30	2°00′	3°00′	-	5°00′	18°00′		-	23°00′
	NQ	236.40	233.30	26	26	34	105	136°10′	75°20′	5°30′	211°00′	-		-	211°00′
	BQ	160.50	158.80	18	20	31	95	98°20′	60°40′	-	159°00′	7°00′		-	166°00′
	Total	401.00	394.10	45	49	75	230	236°30′	139°00′	5°30′	375°00′	25°00′	(97°00′)	-	400°00′
MJP-5	HX	4.10	0.60	1	1	3	9	1°30′	2°30′	-	4°00′	5°00′		-	9°00′
	NQ	227.40	220.10	32	34	46	136	145°20′	128°40′	-	274°00′	-		-	274°00′
	BQ	169.50	169.40	21	26	42	125	114°40′	69°20′	-	184°00′	27°00′		-	211°00′
	Total	401.00	390.10	54	61	91	270	261°30′	200°30′	-	462°00′	32°00′	(121°00′)	-	494°00′
MJP-6	HX	4.10	0.20	1	6	22	66	2°30′	3°00′	-	5°30′	48°30′		-	54°00′
	NQ	206.40	200.50	29	32	42	121	126°00′	134°30′	-	260°00′	-		-	260°30′
	BQ	190.50	190.30	24	27	39	117	110°50′	103°10′	-	214°00′	4°00′		-	218°00′
	Total	401.00	391.00	54	65	103	304	239°20′	240°40′	-	480°00′	52°30′	(234°00′)	-	532°30′
Grand Total		2,255.80	2,213.40	308	351	534	1,537	1,554°20′	1,059°40′	18°00′	2,632°00′	220°00′	(1,113°00′)	-	2,852°00′

Table II-2-6 Record of the Drilling Operation on MJP-1

	Drilling length			Total		Shift		Working man	
	Shift 1	Shift 2	Shift 3	Drilling	Core length	Drilling	Total	Engineer	Worker
	m	m	m	m	m	shift	shift	man	man
May									
10	Reassemb	-	7.00	7.00	3.00				
11	4.50	6.90	7.00	18.40	18.40				
12	6.20	5.50	5.40	17.10	17.10				
13	6.30	7.10	8.60	22.00	22.00				
14	7.90	9.30	8.70	25.90	25.90	13	14	20	59
15	8.20	7.90	4.90	21.00	21.00				
16	Holi day								
17	Holi day								
18	Holi day								
19	Holi day								
20	Holi day								
21	Reaming	Reaming	2.30	2.30	2.30	4	6	8	24
22	8.00	6.50	6.90	21.40	21.40				
23	7.30	6.50	7.50	21.30	20.50				
24	4.00	6.80	9.30	20.10	19.70				
25	5.80	5.50	6.20	17.50	17.40				
26	7.90	7.50	7.00	22.40	22.40				
27	7.70	4.70	4.60	17.00	16.90				
28	7.10	Int-C.P	Int-C.P	7.10	7.10	19	21	28	81
29	10.50	9.30	9.30	29.10	29.10				
30	9.30	9.30	8.90	27.50	27.50				
31	8.50	9.30	9.10	26.90	26.60				
June 1	9.30	9.40	10.90	29.60	29.50				
2	10.80	9.40	11.20	31.40	31.30				
3	10.60	5.40	Out-C.P	16.00	16.00				
4	Dismant					17	19	27	82
Total	139.90	126.30	134.80	401.00	395.10	53	60	83	246

Abbreviation

Trans	:Transportation	Ins-C.P	:Inserting casing pipe
Tra-Reas	:Transportation and Reassemblage	Out-C.P	:Taking out casing pipe
Reassemb	:Reassemblage	Reaming	:Reaming for casing pipe
Dismant	:Dismantlement	Stoping	:Stoping for water leakage

Table Ⅲ-2-7 Record of the Drilling Operation on MJP-2

	Drilling length			Total		Shift		Working man	
	Shift 1	Shift 2	Shift 3	Drilling	Core length	Drilling	Total	Engineer	Worker
	m	m	m	m	m	shift	shift	man	man
April 21	Reassemb								
22	Reassemb								
23	4.60	5.80	4.90	15.30	13.60	3	5	12	36
24	5.20	3.20	4.60	13.00	12.20				
25	9.00	7.90	5.70	22.60	22.40				
26	6.90	9.70	6.90	23.50	23.50				
27	7.60	6.90	8.50	23.00	23.00				
28	9.10	8.40	8.80	26.30	26.30				
29	8.50	7.40	6.50	22.40	22.40				
30	6.10	9.00	8.10	23.20	23.20	21	21	28	83
May 1	9.50	8.90	9.00	27.40	27.40				
2	9.00	4.40	5.00	18.40	18.40				
3	8.00	6.20	9.30	23.50	23.50				
4	11.90	9.50	7.20	28.60	28.40				
5	5.60	6.50	5.90	18.00	18.00				
6	6.80	7.50	8.10	22.40	21.40				
7	9.40	10.40	8.90	28.70	28.60	21	21	28	82
8	8.90	5.80	Out-C.P	14.70	14.70				
9	Dismant					2	4	7	20
Total	126.10	117.50	107.40	351.00	347.00	47	51	75	221

Table II-2-8 Record of the Drilling Operation on MJP-3

	Drilling length			Total		Shift		Working man	
	Shift 1	Shift 2	Shift 3	Drilling	Core length	Drilling	Total	Engineer	Worker
	m	m	m	m	m	shift	shift	man	man
May 25	Transpor								
26	Tra-Reas						2	8	20
27	Tra-Reas								
28	Tra-Reas								
29	Tra-Reas								
30	Tra-Reas								
31	4.10			4.10	1.80				
April 1	6.50	4.40	3.60	14.50	13.70				
2	2.50	4.00	6.80	13.30	12.80	7	11	28	69
3	5.30	5.70	5.00	16.00	16.00				
4	6.10	4.00	6.20	16.30	16.30				
5	5.20	7.20	5.90	18.30	18.30				
6	5.20	7.00	5.80	18.00	17.60				
7	6.10	6.10	4.40	16.60	16.60				
8	4.90	6.70	5.10	16.70	16.70				
9	6.00	6.00	4.70	16.70	16.70	21	21	28	70
10	6.70	5.00	5.20	16.90	16.90				
11	8.90	3.80	Ins-C.P	12.70	12.30				
12	1.90	7.70	8.40	18.00	18.00				
13	6.60	4.60	5.40	16.60	16.60				
14	7.30	7.30	6.20	20.80	20.80				
15	4.30	6.20	6.20	16.70	16.70				
16	7.50	8.00	6.70	22.20	22.20	20	21	28	70
17	4.80	3.50	5.70	14.00	13.70				
18	4.60	1.60	0.50	6.70	6.70				
19	5.70	Out-C.P	Out-C.P	5.70	5.70				
20	Dismant					7	10	15	37
Total	110.20	98.80	91.80	300.80	296.10	55	65	107	266

Table Ⅱ-2-9 Record of the Drilling Operation on MJP-4

	Drilling length			Total		Shift		Working man	
	shift 1	shift 2	shift 3	Drilling	Core length	Drilling	Total	Engineer	Worker
	m	m	m	m	m	shift	shift	man	man
June 5	Reassemb								
6	Reassemb								
7	7.00	3.70	8.50	19.20	15.30				
8	7.60	3.30	7.70	18.60	18.60				
9	11.20	12.90	12.30	36.40	35.10				
10	11.00	1.60	8.40	21.00	21.00				
11	9.60	12.40	12.40	34.40	34.40	15	17	28	86
12	11.20	9.40	10.20	30.80	30.80				
13	10.70	8.20	8.80	27.70	27.70				
14	9.50	10.60	8.40	28.50	28.50				
15	9.30	9.30	5.30	23.90	23.90				
16	1.60	9.60	10.90	22.10	22.10				
17	10.10	8.80	5.90	24.80	23.70				
18	8.70	9.30	8.60	26.60	26.10	21	21	28	85
19	8.70	9.30	10.40	28.40	28.40				
20	11.30	10.30	11.50	33.10	33.00				
21	10.30	9.30	5.90	25.50	25.50				
22	Out-C.P								
23	Dismant					9	11	19	59
Total	137.80	128.00	135.20	401.00	394.10	45	49	75	230

Table II-2-10 Record of the Drilling Operation on MJP-5

	Drilling length			Total		Shift		Working man	
	Shift 1	Shift 2	Shift 3	Drilling	Core length	Drilling	Total	Engineer	Worker
	m	m	m	m	m	shift	shift	man	man
July	Reassemb								
20	4.10	-	5.30	9.40	4.60				
21	6.00	5.30	5.40	16.70	12.40				
22	5.70	4.60	5.60	15.90	15.20				
23	6.10	6.10	6.00	18.20	17.40	11	11	16	47
24	10.10	6.70	-	16.80	16.80				
25	Holi day								
26	0.50	11.00	12.70	24.20	24.10				
27	7.20	9.30	9.80	26.30	26.30				
28	Stoping	Stoping	4.00	4.00	4.00				
29	9.10	8.50	8.60	26.20	26.20				
30	8.90	9.20	5.80	23.90	23.80	15	17	23	68
31	7.80	8.20	8.10	24.10	24.10				
August 1	7.20	8.20	9.40	24.80	24.80				
2	1.00	3.00	9.50	13.50	13.50				
3	8.30	10.60	2.60	21.50	21.50				
4	7.10	9.20	9.10	25.40	25.30				
5	4.60	8.30	9.30	22.20	22.20				
6	6.40	11.20	10.60	28.20	28.20	21	21	28	84
7	9.60	10.80	7.20	27.60	27.60				
8	8.00	9.30	9.10	26.40	26.40				
9	5.70	Out-C.P	Out-C.P	5.70	5.70				
10	Dismant								
11	Dismant								
12	Dismant					7	12	24	71
Total	123.40	139.50	138.10	401.00	390.10	54	61	91	270

Table Ⅱ-2-11 Record of the Drilling Operation on MJP-6

	Drilling length			Total		Shift		Working man	
	Shift 1	Shift 2	Shift 3	Drilling	Core length	Drilling	Total	Engineer	Worker
	m	m	m	m	m	shift	shift	man	man
June 24	Tra-Reas								
25	Tra-Reas						2	8	24
26	Tra-Reas								
27	Tra-Reas								
28	Tra-Reas								
29	7.10	6.00	5.20	18.30	11.60				
30	5.00	7.90	2.90	15.80	15.70				
July 1	6.20	4.70	10.60	21.50	21.20				
2	11.60	3.00	Stoping	14.60	14.20	11	15	28	82
3	2.20	7.10	8.00	17.30	17.20				
4	6.30	8.20	12.20	26.70	26.50				
5	8.70	10.10	8.00	26.80	26.80				
6	9.80	8.30	6.20	24.30	24.30				
7	8.10	7.40	4.70	20.20	18.40				
8	7.30	5.80	5.80	18.90	18.70				
9	6.10	Int-C.P	Int-C.P	6.10	6.10	19	21	28	81
10	8.00	10.50	6.60	25.10	25.10				
11	10.20	11.10	11.80	33.10	33.10				
12	10.20	Stoping	8.00	18.20	18.20				
13	8.80	12.40	8.70	29.90	29.90				
14	7.10	9.10	9.90	26.10	26.10				
15	2.80	0.80	5.60	9.20	9.20				
16	8.80	6.60	2.40	17.80	17.80	20	21	28	84
17	8.00	8.60	10.00	26.60	26.40				
18	4.50	Out-C.P	-	4.50	4.50				
19	Dismant	-	-			4	6	11	33
Total	146.80	127.60	126.60	401.00	391.00	54	65	103	304

Table Ⅲ-2-12 Summary of the Drilling Operation on MJP-1

	Survey Period				Total man day	
	Period	Days	Work day	Off day	Engineer	Worker
Operation			days	days	man	man
Preparation	10.5.1988 ~10.5.1988	0.5	0.5	0	3	9
Drilling	10.5.1988 ~ 3.6.1988	24.5	Drilling 19	5	74	218
			Recovering 0.5	0	3	9
Removing	4.6.1988 ~ 4.6.1988	1	1	0	3	10
Total	10.5.1988 ~ 4.6.1988	26	21	5	83	246

Drilling length			
Length planed	400.00 m	Overburden	1.10 m
Increase or Decrease in length	m	Core length	395.10 m
Length drilled	401.00 m	Core recovery	98.7 %

Core recovery of 100 m hole		
Depth of hole (m)	Core recovery (%)	Core recovery cumulated (%)
0 ~ 100	97.0	97.0
100 ~ 200	98.7	97.8
200 ~ 300	99.9	98.5
300 ~ 401	99.5	99.0

Working hours	h	%	%
Drilling	278°50′	60.1	57.8
Other working	175°40′	37.9	36.4
Recovering	9°30′	2.0	2.0
Total	464°00′	100	96.2
Reassemblage	9°00′		1.9
Dismantlement	9°00′		1.9
Water transportation	(149°00′)		
Road construction and others			
G.Total	482°00′		100

Efficiency of Drilling	
Total m/work period(m/day)	401.00 m/ 19 days (21.11 m/day)
Total m/total shift (m/shift)	401.00 m/ 53 shifts (7.57 m/shift)

Drilling length/bit(each sized bit)			
Bit size	HX	NQ	BQ
Drilled length	4.10	236.40	160.50
Core length	0.10	235.00	160.00

Casing pipe inserted			
Size	Meterage (m)	Meterage drilling length × 100 (%)	Recovery (%)
HX	4.10	1.0	100
NX	77.10	19.2	100
BX	240.50	60.0	100

Table II-2-13 Summary of the Drilling Operation on MJP-2

	Survey Period				Total man day	
	Period	Days	Work day	Off day	Engineer	Worker
Operation			days	days	man	man
Preparation	21.4.1988 ~22.4.1988	2	2	0	8	24
Drilling	23.4.1988 ~ 8.5.1988	16	Drilling 16	0	64	189
			Recovering			
Removing	9.5.1988 ~ 9.5.1988	1	1	0	3	8
Total	21.4.1988 ~ 9.5.1988	19	19	0	75	221

Drilling length			
Length planed	350.00 m	Overburden	0.90 m
Increase or Decrease in length	m	Core length	347.00 m
Length drilled	351.00 m	Core recovery	% 99.1

Core recovery of 100 m hole

Depth of hole (m)	Core recovery (%)	Core recovery cumulated (%)
0 ~ 100	98.1	98.1
100 ~ 200	100	99.0
200 ~ 300	98.8	98.9
300 ~ 350	99.8	99.1

Working hours	h	%	%
Drilling	261°20′	67.5	63.6
Other working	122°40′	31.7	29.8
Recovering	3°00′	0.8	0.7
Total	387°00′	100	94.1
Reassemblage	18°00′		4.4
Dismantlement	6°00′		1.5
Water transportation	(210°00′)		
Road construction and others			
G.Total	411°00′		100

Efficiency of Drilling

Total m/work period(m/day)	351.00 m/16 days (21.93m/day)
Total m/total shift (m/shift)	351.00 m/47 shifts (7.46m/shift)

Drilling length/bit(each sized bit)

Bit size	HX	NQ	BQ
Drilled length	4.10	206.00	140.90
Core length	3.00	204.40	139.60

Casing pipe inserted

Size	Meterage (m)	Meterage drilling length × 100 (%)	Recovery (%)
HX	1.10	0.3	100
NX	28.10	8.0	100
BX	210.10	60.0	100

Table Ⅱ-2-14 Summary of the Drilling Operation on MJP-3

	Survey Period			Total man day	
	Period	Days	Work day / Off day	Engineer	Worker
Operation			days / days	man	man
Preparation	25.3.1988 ~ 30.3.1988	6	6 / 0	24	59
Drilling	31.3.1988 ~ 19.4.1988	20	Drilling 20 / 0	80	200
			Recovering		
Removing	20.4.1988 ~ 20.4.1988	1	1 / 0	3	7
Total	25.3.1988 ~ 20.4.1988	27	27 / 0	107	266

Drilling length				
Length planed	300.00 m	Overburden	1.00 m	
Increase or Decrease in length	m	Core length	296.10 m	
Length drilled	300.80 m	Core recovery	98.7 %	

Core recovery of 100 m hole		
Depth of hole (m)	Core recovery (%)	Core recovery cumulated (%)
0 ~ 100	96.9	96.9
100 ~ 200	99.6	98.2
200 ~ 300.8	99.7	98.7

Working hours	h	%	%
Drilling	282°50′	61.0	53.1
Other working	181°10′	39.0	34.0
Recovering			
Total	464°00′	100	87.1
Reassemblage	59°30′		11.2
Dismantlement	9°00′		1.7
Water transportation	(302°00′)		
Road construction and others			
G.Total	532°30′		100

Efficiency of Drilling	
Total m/work period(m/day)	300.80 m/20 days (15.04m/day)
Total m/total shift (m/shift)	300.80 m/55 shifts (5.47m/shift)

Drilling length/bit(each sized bit)

Bit size	HX	NQ	BQ
Drilled length	4.10	176.00	120.70
Core length	1.80	173.90	120.40

Casing pipe inserted

Size	Meterage (m)	Meterage drilling length × 100 (%)	Recovery (%)
HX	4.10	1.4	100
NX	22.10	7.3	100
BX	180.10	60.0	100

Table Ⅱ-2-15 Summary of the Drilling Operation on MJP-4

	Survey Period		Total man day	
	Period	Days	Engineer	Worker
Operation			man	man
Preparation	5.6.1988 ~ 6.6.1988	2	8	25
Drilling	7.6.1988 ~ 22.6.1988	16	60	184
Removing	23.6.1988 ~ 23.6.1988	1	4	12
Total	5.6.1988 ~ 23.6.1988	19	75	230

Work day	Off day
days	days
2	0
Drilling 15	0
Recovering 1	0
1	0
19	0

Drilling length			
Length planed	400.00 m	Overburden	0 m
Increase or Decrease in length	m	Core length	394.10 m
Length drilled	401.00 m	Core recovery	98.2 %

Core recovery of 100 m hole		
Depth of hole (m)	Core recovery (%)	Core recovery cumulated (%)
0 ~ 100	94.8	94.8
100 ~ 200	100	97.4
200 ~ 300	98.4	97.7
300 ~ 401	99.9	98.2

Working hours	h	%	%
Drilling	230°30′	61.5	57.6
Other working	139°00′	37.0	34.7
Recovering	5°30′	1.5	1.4
Total	375°00′	100	93.7
Reassemblage	18°00′		4.4
Dismantlement	7°00′		1.8
Water transportation	(97°00′)		
Road construction and others			
G.Total	400°00′		100

Efficiency of Drilling	
Total m/work period(m/day)	401.00 m/15 days (26.73m/day)
Total m/total shift (m/shift)	401.00 m/45 shifts (8.91m/shift)

Drilling length/bit(each sized bit)

Bit size	HX	NQ	BQ
Drilled length	4.10	236.40	160.50
Core length	2.00	233.30	158.80

Casing pipe inserted

Size	Meterage (m)	Meterage drilling length × 100 (%)	Recovery (%)
HX	1.60	0.4	100
NX	33.10	8.3	100
BX	240.50	60.0	87.5

Table II-2-16 Summary of the Drilling Operation on MJP-5

	Survey Period			Total man day	
	Period	Days	Work day / Off day	Engineer	Worker
Operation			days / days	man	man
Preparation	20.7.1988 ~ 20.7.1988	0.5	0.5 / 0	2	9
Drilling	20.7.1988 ~ 9.8.1988	20.5	Drilling 19.5 / 1 Recovering	77	226
Removing	10.8.1988 ~ 12.8.1988	3	3 / 0	12	35
Total	20.7.1988 ~ 12.8.1988	24	23 / 1	91	270

Drilling length			
Length planed	400.00 m	Overburden	0 m
Increase or Decrease in length	m	Core length	390.10 m
Length drilled	401.00 m	Core recovery	97.2 %

Core recovery of 100 m hole		
Depth of hole (m)	Core recovery (%)	Core recovery cumulated (%)
0 ~ 100	89.3	89.3
100 ~ 200	99.9	94.6
200 ~ 300	99.9	96.3
300 ~ 401	100	97.2

Working hours	h	%	%
Drilling	261°30′	56.6	59.9
Other working	200°30′	43.4	40.6
Recovering			
Total	462°00′	100	93.5
Reassemblage	5°00′		1.0
Dismantlement	27°00′		5.5
Water transportation	(121°00′)		
Road construction and others			
G.Total	494°00′		100

Efficiency of Drilling	
Total m/work period(m/day)	401.00 m/19.5 days (20.56m/day)
Total m/total shift (m/shift)	401.00 m/54 shifts (7.43m/shift)

Drilling length/bit(each sized bit)

Bit size	HX	NQ	BQ
Drilled length	4.10	227.40	169.50
Core length	0.60	220.10	169.40

Casing pipe inserted

Size	Meterage (m)	Meterage drilling length × 100 (%)	Recovery (%)
HX	4.10	1.0	100
NX	54.10	13.5	27
BX	231.50	57.7	100

Table Ⅱ-2-17 Summary of the Drilling Operation on MJP-6

	Survey Period			Total man day	
	Period	Days	Work day / Off day	Engineer	Worker
Operation			days / days	man	man
Preparation	24.6.1988 ~ 28.6.1988	5	5 / 0	20	60
Drilling	29.6.1988 ~ 18.7.1988	20	Drilling 20 / 0 Recovering	79	233
Removing	19.7.1988 ~ 19.7.1988	1	1 / 0	4	11
Total	24.6.1988 ~ 19.7.1988	26	26 / 0	103	304

Drilling length			
Length planed	400.00 m	Overburden	3.10m
Increase or Decrease in length	m	Core length	391.00 m
Length drilled	401.00 m	Core recovery	98.2 %

Core recovery of 100 m hole

Depth of hole (m)	Core recovery (%)	Core recovery cumulated (%)
0 ~ 100	95.1	95.1
100 ~ 200	98.0	96.6
200 ~ 300	100	97.7
300 ~ 401	99.8	98.2

Working hours	h	%	%
Drilling	239°20′	49.9	44.9
Other working	240°40′	50.1	45.2
Recovering			
Total	480°00′	100	90.1
Reassemblage	48°30′		9.1
Dismantlement	4°00′		0.8
Water transportation	(234°00′)		
Road construction and others			
G.Total	532°30′		100

Efficiency of Drilling

Total m/work period(m/day)	401.00 m/20 days (20.05m/day)
Total m/total shift (m/shift)	401.00 m/54 shifts (7.43m/shift)

Drilling length/bit(each sized bit)

Bit size	HX	NQ	BQ
Drilled length	4.10	206.40	190.50
Core length	0.20	200.50	190.30

Casing pipe inserted

Size	Meterage (m)	Meterage drilling length × 100 (%)	Recovery (%)
HX	3.10	0.8	100
NX	42.10	10.5	28.7
BX	210.50	52.5	100

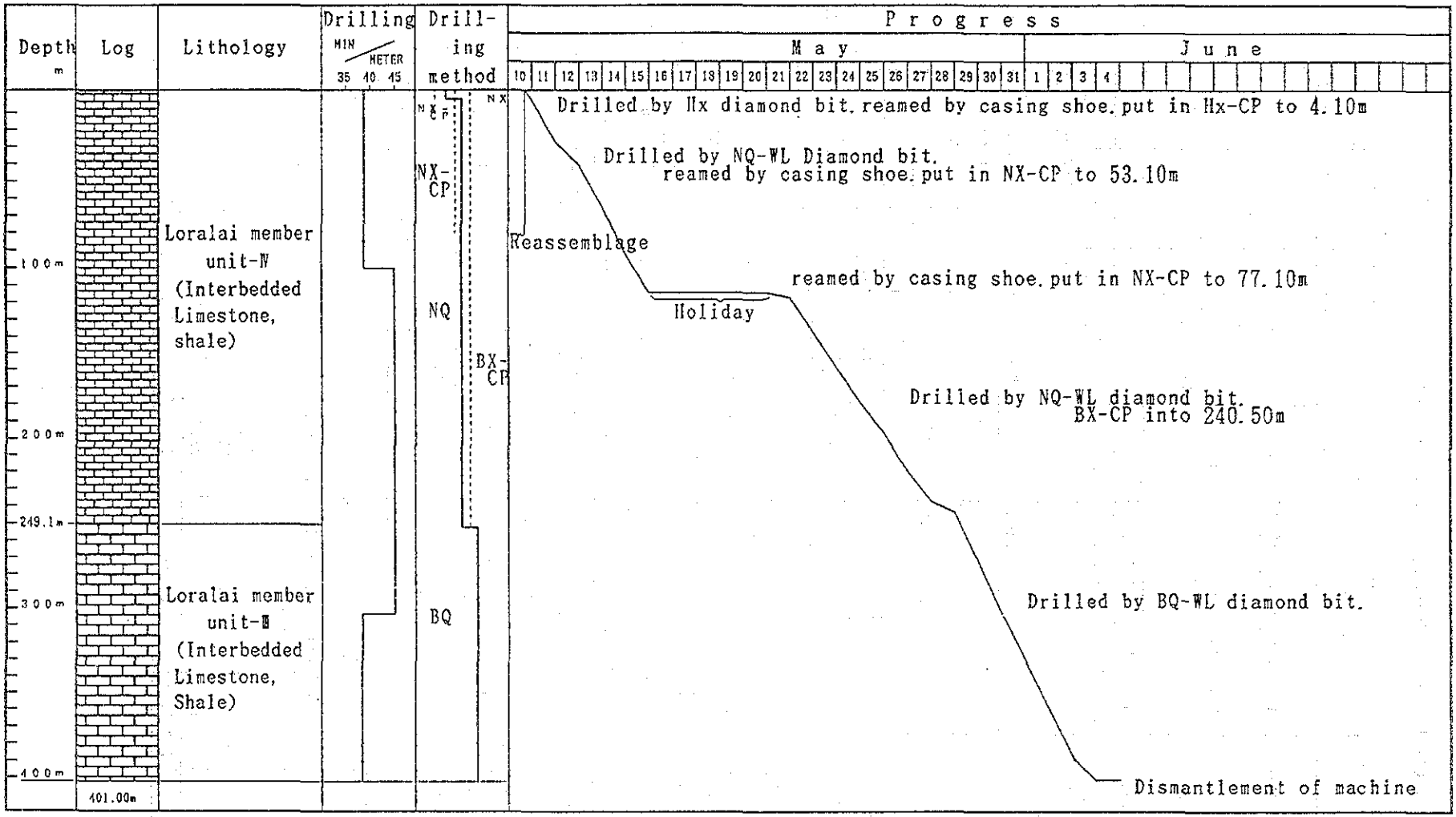


Fig. Ⅱ-2-4 Drilling Progress of MJP-1

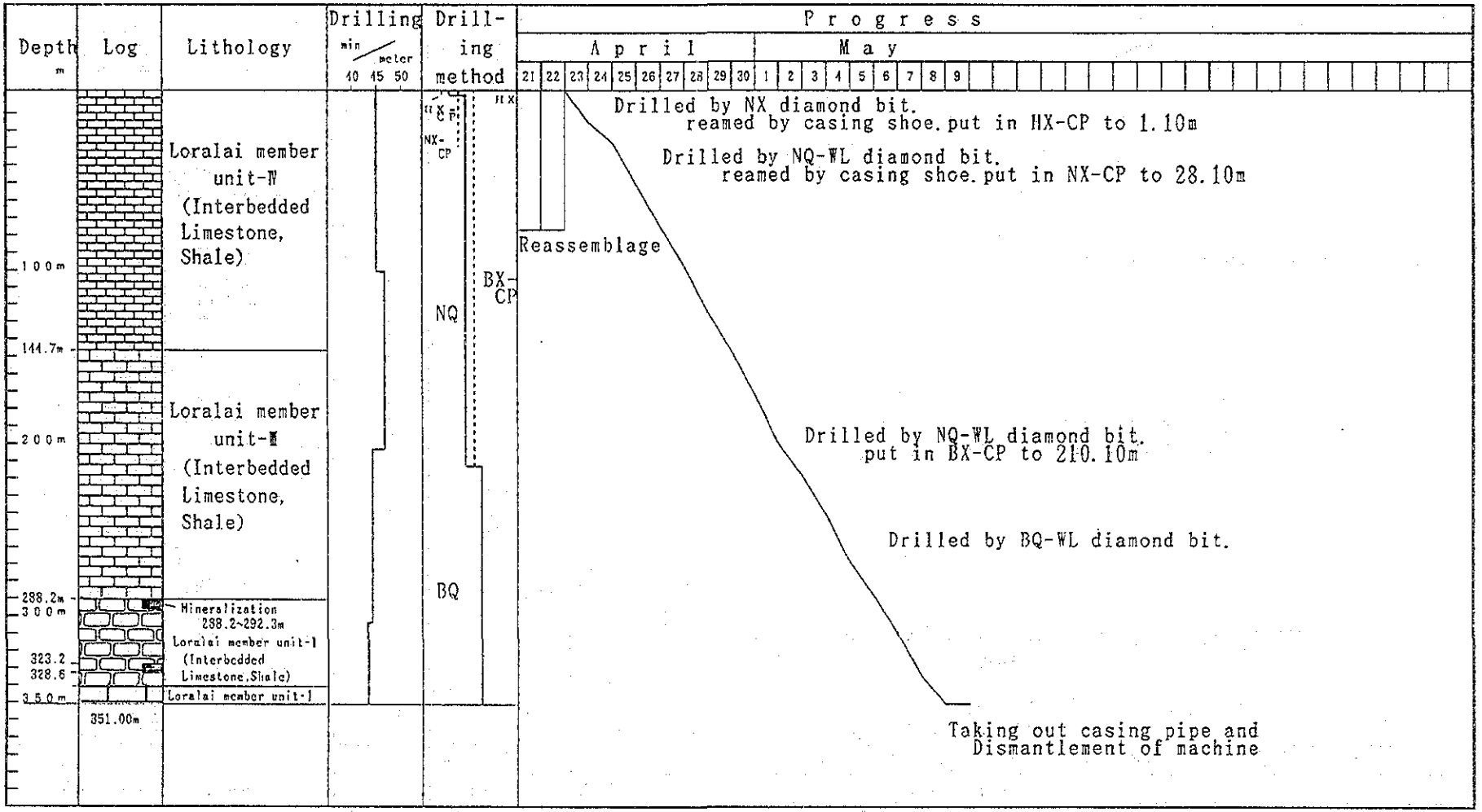


Fig. Ⅱ-2-5 Drilling Progress of MJP-2

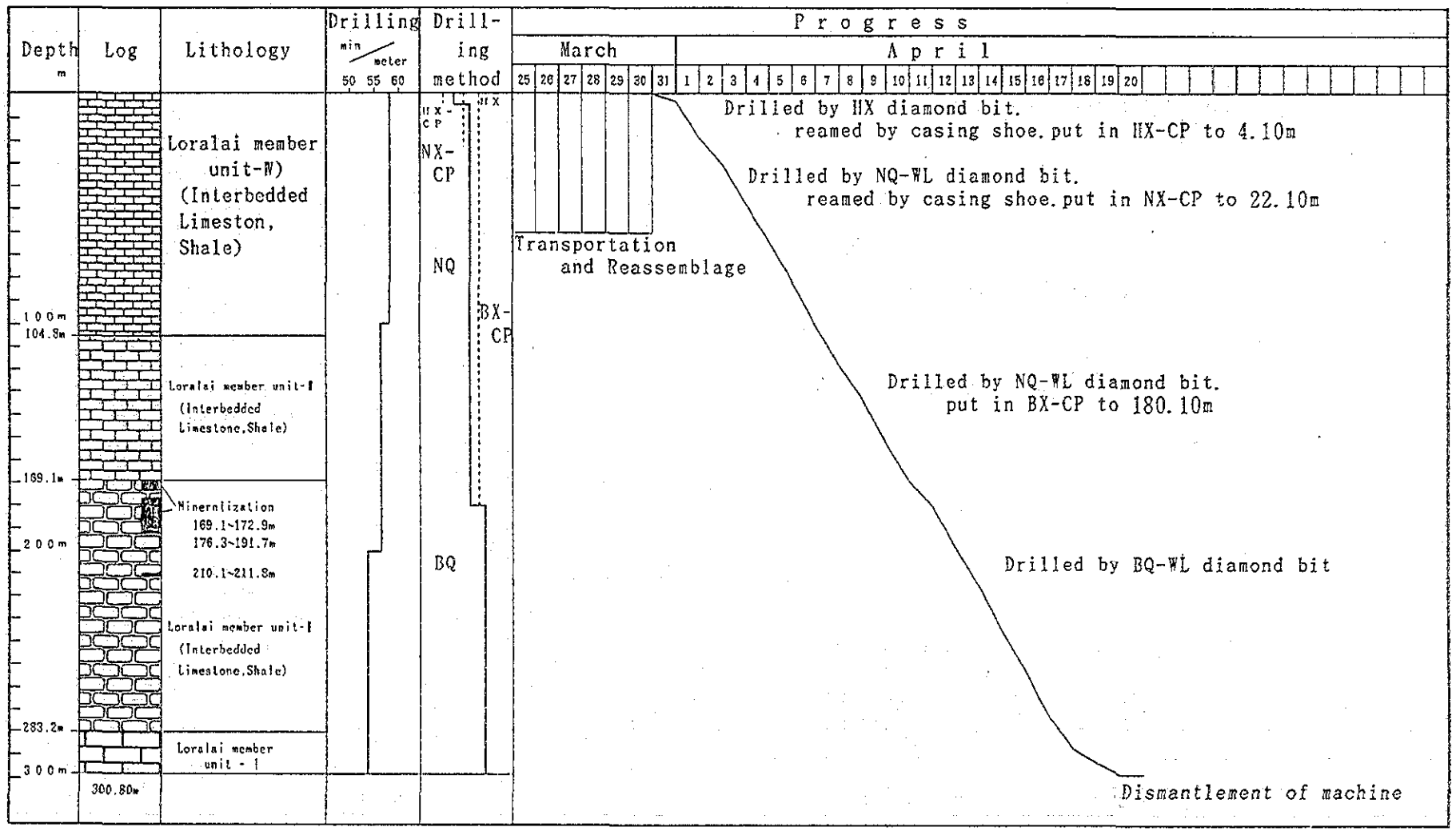


Fig. II-2-6 Drilling Progress of MJP-3

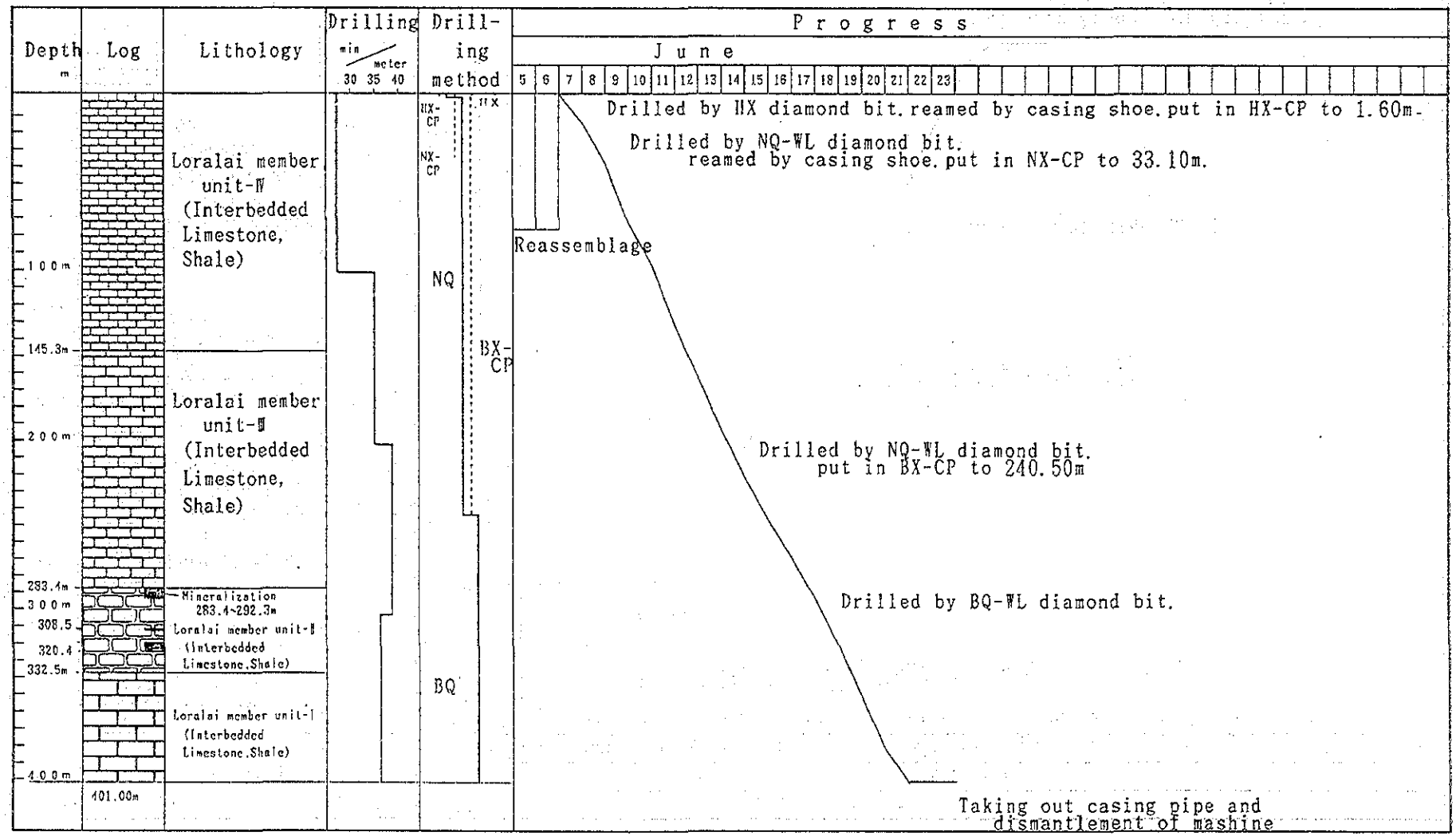


Fig. Ⅱ-2-7 Drilling Progress of MJP-4

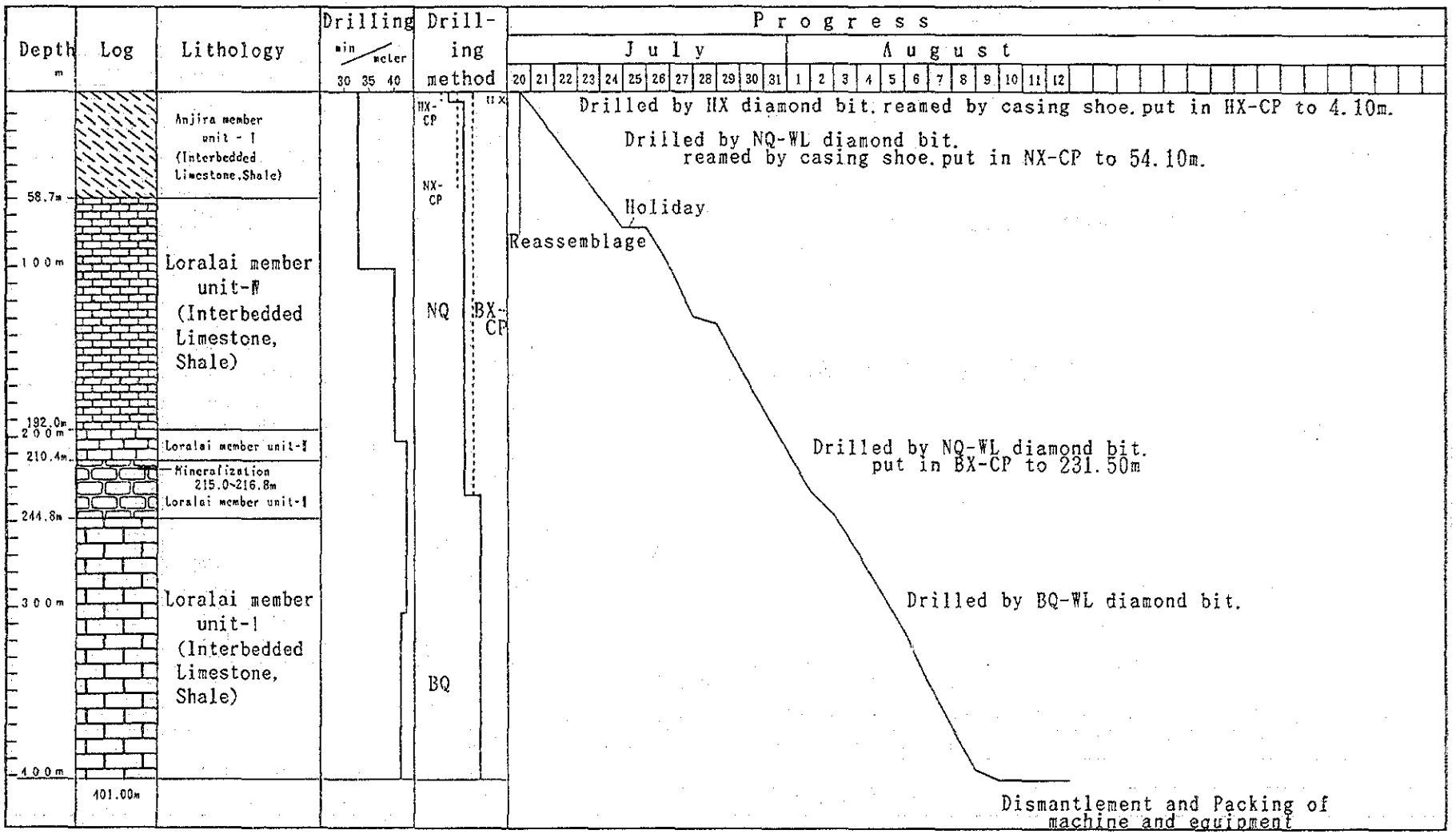


Fig. Ⅱ-2-8 Drilling Progress of MJP-5

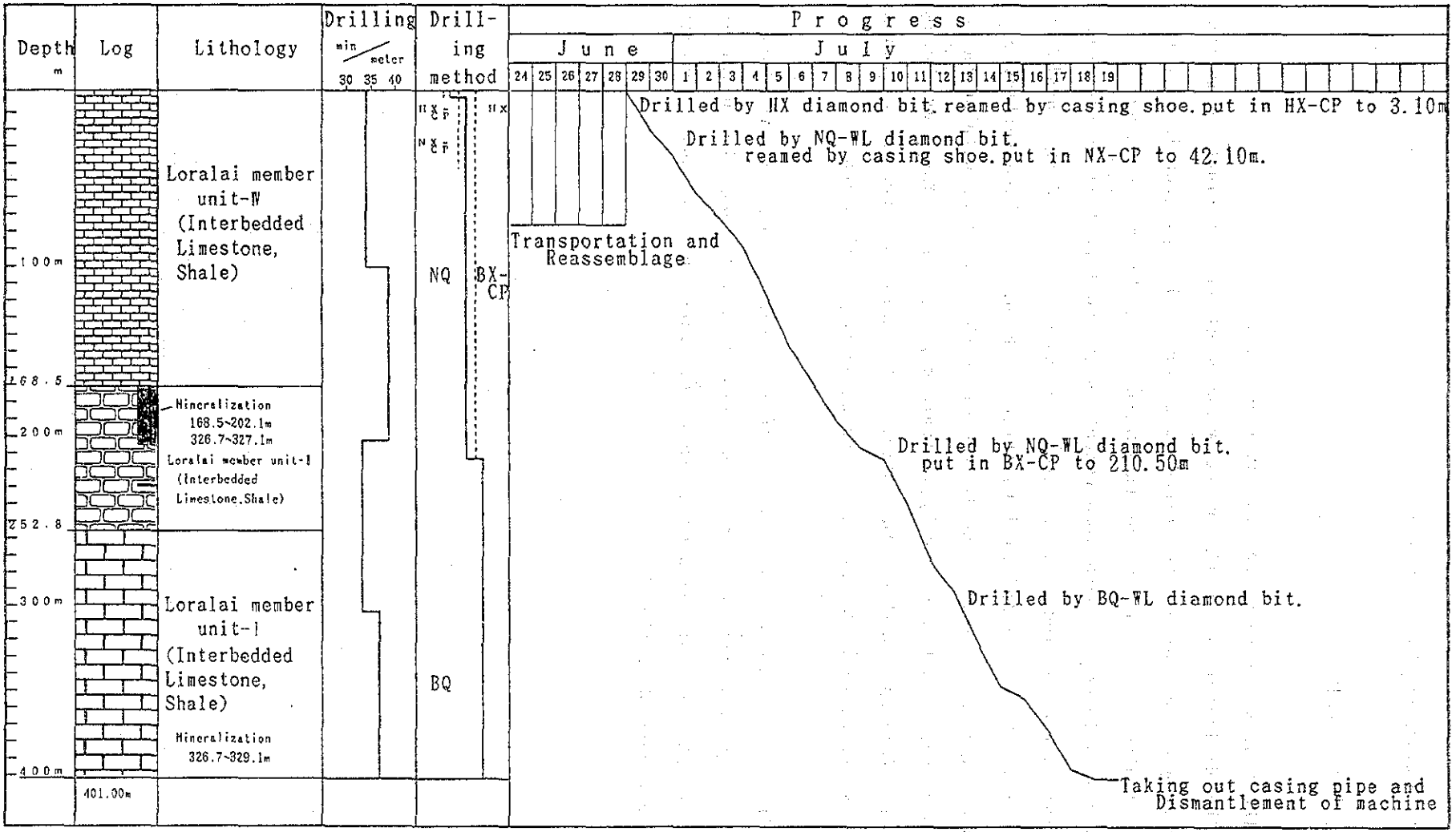


Fig. Ⅱ-2-9 Drilling Progress of MJP-6

2－2 Geology and Mineralization

2－2－1 Geology

The geology of this area is outlined below.

The distribution of the three members of the Shirinab Formation in this area,can be largely described as follows. The Spingwar is distributed in a limited area in the northeastern part, Anjira in three separate occurrences in north-south arrangement in the western half of the area and Loralai in the remainder of the area. We have subdivided the Loralai into four units Ⅰ~Ⅳ and Anjira into three Ⅰ~Ⅲ by the charactertics of the strata. This area form the western limb of the anticline with north-south trending axis and has a largely westward dipping strata.There are however, intense folding locally. The strata of Surmai-Ⅲ has a particularly complex structure with two anticlines extending north-south.

The topography of this area reflects the geological structure and steep ridges are developed in north-south direction along the anticlines. Stratigraphic map of the area is shown in Figure Ⅱ-2-10 and a geological map in Figure Ⅱ-2-11～12.

Geologic age	Group			Lithology	Thickness (m)	Columnar Section	Mineralization
	Formation	Member	Unit				
Quaternaly			Stream bed deposits	boulder, cobble, pebble, sand, silt.			
			Alluvial deposits	sand, silt, clay, detritus.			
			Terrace deposits	boulder, pebble sand, silt clay			
				Unconformity			
Early Jurassic	Shirinab	Anjira	Ⅲ	Limestone, thick bedded	+50		Gu
			Ⅱ	Interbedded limestone and shale, contains ammonites.	100~180		SⅡ
			Ⅰ	Interbedded limestone and shale. Limestone thin to thick bedded contains ammonite.	30~50		
		Loralai	Ⅳ	Limestone grey, thick to massive, motteled with a zone of thin interbedded limestine and shale.	80~100		
			Ⅲ	Limestone and shale interbedded. Limestone dark grey, thin to med bedded, motteled, fossiliferous.	100~150		SⅢ
			Ⅱ	Limestone with very minor shale. Limestone grey thick to massive with some oolitic bed.	100~120		
			Ⅰ	Interbedded limestone and shale with minor marl. Limestone grey, thin bedded, motteled and ooloitic occaisionally. Shale of black colour.	100~150		
		Spingwar		Interbedded sandostone and shale.	+200		SⅠ

Note Gu: Gunga, SⅠ: Surmai-Ⅰ, SⅡ: Surmai-Ⅱ, SⅢ: Surmai-Ⅲ

Mineralization

| : Large bedded type mineralization.

⋮ : Small mineralization in faults, fractures, joints and bedding planes.

Fig. Ⅱ-2-10 Stratigraphy of Surmai Area

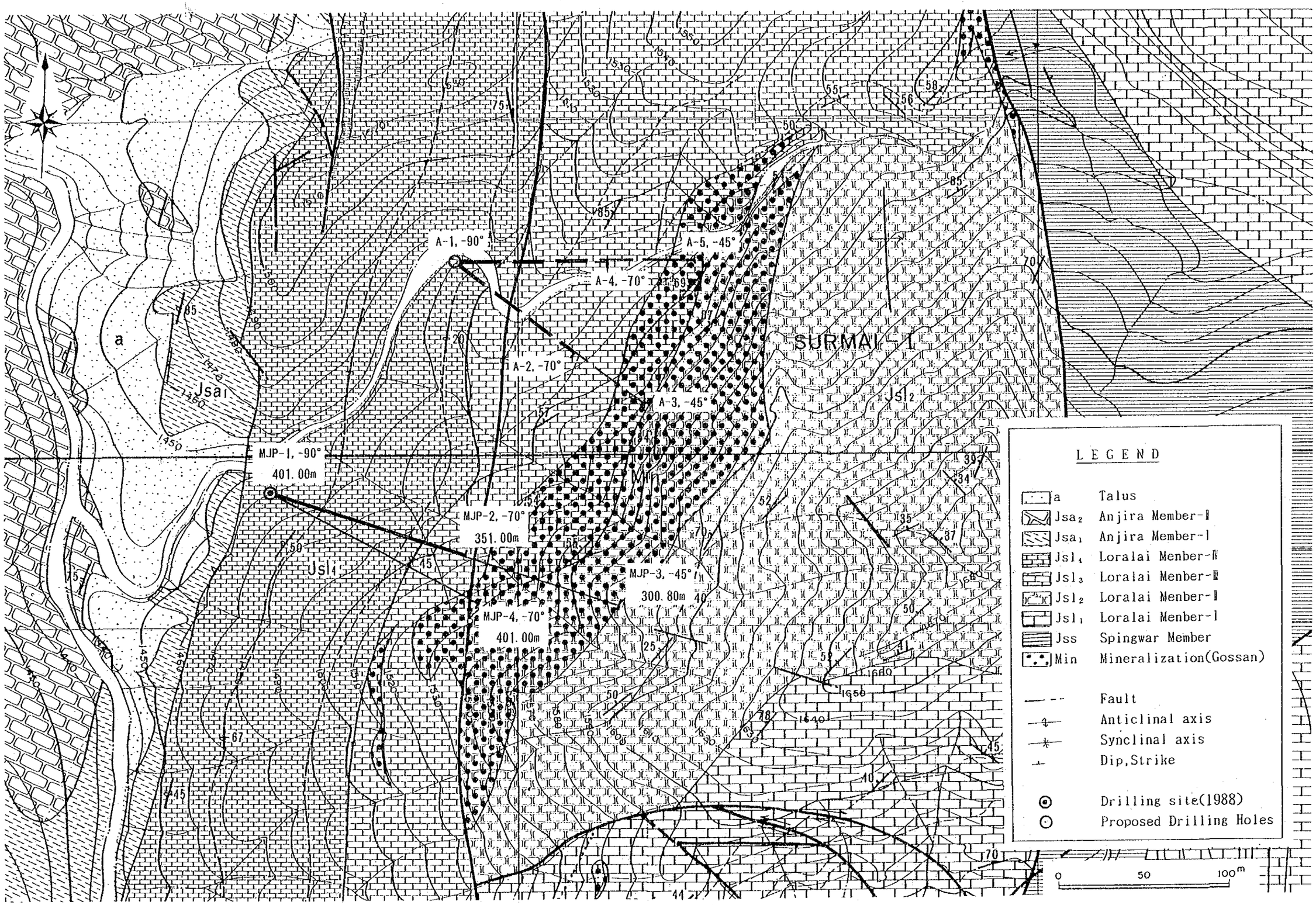


Fig. Ⅱ-2-11 Geological Map of Surumai-I Area with Locations of Phase-Ⅱ Drillings and Proposed Drillings for Phase-Ⅲ (scale 1:2,000)

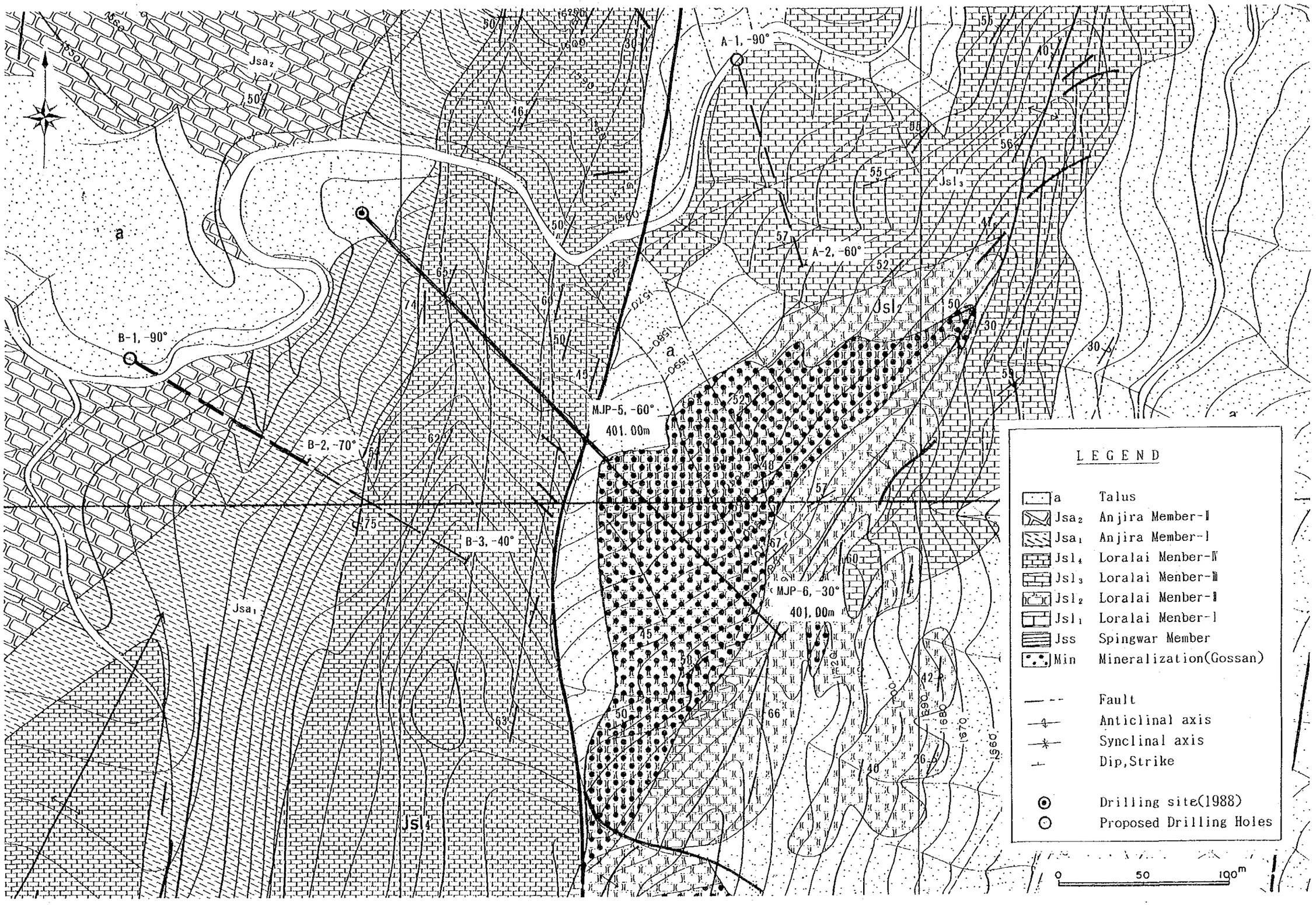


Fig. Ⅱ-2-12 Geological Map of Surumai-Ⅲ Area with Locations of Phase-Ⅱ Drillings and Proposed Drillings for Phase-Ⅲ (scale 1:2,000)

2 - 2 - 2 Mineralization

The surface manifestation of the mineralization of this area is described below.

Three mineral showings occur along a north-south trending zone which extends for 4k m. They are Surmai Ⅰ, Ⅱ, Ⅲ. The showings consist of dark reddish brown gossan and they occur in all members of the Shirinab Formation except in Anjira-Ⅲ (Figs. Ⅱ-2-1, and 2). The gossans are considered to be the weathered and oxidized products of primary lead-zinc replacement deposits. They consist mostly of porous to massive limonite and other oxides. Large-scale gossan bodies occur along the bedding in thick beds replacing the host rock, these occur from the upper part of Unit-Ⅱ to the lower part of Unit-Ⅲ of Loralai. Small scale gossan bodies occur along faults in the Surmai-Ⅱ area, but these are not promising.

In gossans, limonite, calcite, siderite and quartz are generally found and smaller amount of marcasite, pyrite and galena, together with white powdery material in small druses which could be smithonite are observed by the unaided eyes. Sphalerite was not found. By x-ray diffraction, a large amount of quartz, less but substantial amount of calcite and goethite, and minor amount of hematite and dolomite were detected. Also small to minor amount of hemimorphite was detected.

(1) Surmai-Ⅰ

The gossan bodies are distributed within an area of 900 m north-south and 300 m east-west. In the northern half of the area, the gossan of the major ore body (henceforth ; the Main Orebody) occur in a 450 m northsouth and 60~80 m east-west zone and the strike and dip are 30°E, 50°～70°W, concordant with the host rocks. In the southern half, small gossan bodies occur along the bedding of the host rock and small faults, but these are not promising. The gossan of the Main Orebody occurs at the boundary of Units-Ⅱ and Ⅲ of Loralai along the bedding of both units and they form thick beds to massive bodies. The highest assay values of the gossan

samples from the Main Orebody collected during the first phase are Pb 0.23 and Zn 5.64 %.

(2) Surmai-III

The gossan bodies occur in an area of 1.5 km north-south and 0.6 km east-west. They are divided into the East Deposit and the West deposit. Both Deposit occur along the boundary of Units-II and III of Loralai along the bedding of both units and form thick beds to massive bodies. The West Deposit extends 1.5 km along the strike and is 50～60 m thick. Its northern end is located at the western limb of the western anticline while other parts occur at the eastern limb of the same anticline. The East Deposit extends 1.1 km along the strike and is 30～50 m thick. It is located at the eastern limb of the eastern anticline. Both Deposit are believed to be connected at the central part of the area covered by Quaternary formations with synclinal structure in conformity with the host rocks.

The northern half of the West Deposit shows the strongest mineralization in the area, and is grouped into the northernmost part dipping westward(henceforth ; the Northwest Orebody) and the southern part with eastward dip. The northern part dips 40°～60°W, is 60～70 m thick and extends 400 m along the strike. The downward extension of the ores is anticipated. The other body dips 40°～50°E, is 30～40 m thick, extends 300 m along the strike and the assay show fairly high grade of Pb+Zn 5 %. But the extension of the ore into the deeper parts cannot be expected. The southern half of the West Deposit is distributed over a large area, but the concentration and the grade is low.

The East Deposit is linearly exposed on the eastern slope of the north-south extending ridge with steep cliff with 50°～80°E slope. The average assay of three samples of gossan collected during the first phase survey is Pb 0.52, Zn 1.02 %.

There are small gossan bodies along the fractures, bedding and faults of the host rocks in the vicinity of the above east and west orebodies,

but they show very small possibilities.

2－3 Objectives of Drill Holes

(1) Surmai-I

It was found during the first phase survey that the surface gossan of the Main Orebody of Surmai-I is strongly mineralized, and thus the existence of Mississippi Valley type lead-zinc sulfide deposits in the lower parts was anticipated. Also rank A anomaly was obtained by geochemical prospecting from the lower part of the body which is believed to be from sulfide concentration.

Four holes were drilled (MJP-1～4) here in order to confirm the sulfide ores under the Main Orebody and to clarify the continuity, grade and the geochemical structure.

(2) Surmai-Ⅲ

It was found by the first phase survey that the surface gossan of the Northwest Orebody of Surmai-Ⅲ was strongly mineralized and thus the existence of Mississippi Valley type lead-zinc sulfide deposits in the lower parts was anticipated. Also rank A anomaly was obtained by geophysical prospecting from the lower parts of the body which is believed to be from sulfide concentration.

Two holes were drilled (MJP-5～6) here in order to confirm the sulfide ores in the lower parts and to clarify the continuity, grade and the geological structure.

2－4 Results of the Survey.

2－4－1 Geology and Mineralization of the Drill Cores

2－4－1－1 Outline of geology.

The horizons confirmed by this drilling range are from Loralai Member Unit-I to Anjira Member Unit-I. The rocks of these units are basically limestone and shale. Marly shale forms alternations with the above two rocks and these are divided by lithology into alternation A and B. The four rock types are described below and the core sketches each of them are shown in Figures II-2-13. The columns (Scale 1:200) of each drill holes are shown in II-2-14～19.

(1) Limestone : Usually grey, in same cases pale grey or dark gray. Compact and hard. Mostly micric, locally oomicritic or biomicritic. Generally contains irregular 2～10 cm patches of shale～marly shale. The boundary between the patches and the limestone is clear for shale and gradual in case of marly shale. These patches selectively become reddish brown to orange by hematitization between the surface and 100 m depth. Also calcite veinlets occur through the limestone.

(2) Shale : Dark grey to black, weakly argillic and soft. Lamination developed with 0.5～1 mm thick laminae and fissile. Partly marly, massive and grey to dark grey.Generally contains powdery or nodular(1 mm diameter) pyrite which is considered to be of primary origin and the nodules are concentration of powdery material.Often flat limestone nodules with 1~3 cm diameter (henceforth:limestone nodules) and trails of 1~3 mm diameter of tubular creatures (henceforth: tubular trails) occur in the shale immediately below the boundary with limestone.

(3) Alternation A (henceforth:AA) : Regular alternation of shale and marly shale, individual beds are 0.5~3 mm thick. The shale is dark grey to black and the marly shale grey to dark grey.

(4) Alternation B (henceforth:AB) : Alternation of limestone and marly shale with limestone predominant. Individual beds are 5~10 mm thick, marly shales are 1~2 mm. Limestone is grey and marly limestone dark grey.

2 - 4 - 1 - 2 Stratigraphy

The strata investigated by drilling are correlated to Loralai Unit-I to Anjira Unit-I . The correlation chart of the drill holes are shown in Figure II -2-20. In correlating the strata, the lithology, thickness, the angle between the bedding and the drill cores (henceforth: cross angle), distribution of limestone nodules, tubular trails and other factors were considered. The stratigraphic correlation chart (scale 1:200) is shown in PL.II -2-1. The stratigraphic correlation of the surface and of the drill holes were made and drilled geologic cross sections (scale 1:1,000) were prepared (PL.II -2-2~4). Then this was somewhat simplified to scale 1:2,000 cross section (Figs.II -2-21~23).

The characteristics of the individual units are as follows.

(1) Loralai Unit-I ; 120~150 m thick. Alternation of limestone with AA or AB or shale. Limestone predominant in the upper and middle parts, AA predominant in lower part. Thickness of individual beds, limestone 1~7 m, AA 1~10 m, AB and shale 1~2 m. They tend to become sandy in the lower parts.

(2) Loralai Unit-II ; 100~120 m thick. The upper part, limestone and shale alternation with limestone predominant, thickness of individual beds, limestone 1~15 m and shale 0.5~1 m. The lower part, alternation of limestone and AA with AA predominant, thickness limestone 1~2 m, AA 1~10 m.

(3) Loralai Unit-III ; 100~150 m thick, alternation of limestone and shale with shale predominant. Thickness of individual beds, limestone 0.5~2 m, shale 1~7 m.

(4) Loralai Unit-Ⅳ; 100～130 m thick, alternation of limestone and shale, upper part limestone predominat, lower part shale. Thickness individual beds, both limestone and shale 1～5 m.

(5) Anjira Unit-Ⅰ; 50 m thick, limestone with shale intercalation. Limestone beds 1～2 m thick.

2－4－1－3 Geology and mineralization of the drill holes.

The geology and mineralization of the drill holes are described below. In describing the mineralization, only the concentrated parts are mentioned regarding calcite and pyrite. The true thickness is mentioned in this report with all available facters such as cross angle being considered.

(1) MJP-1

【Geology】

0～249.1 m; Correlated to Loralai Unit-Ⅳ.Alternation of limestone and shale, limestone predominant between 85 m and 125 m, otherwise shale predominant. Thickness of individual beds, limestone 0.5~5 m, shale 0.2~5 m. Hematitization in limestone at 0~82 m and 130~143 m. Bivalve fossils occur throughout, often coquina beds 5~10 cm thick formed in shale. Cross angle generally low,locally 0~10°.

249.1～401.0 m; Correlated to Loralai Unit-Ⅲ,alternation of limestone and shale with shale predominant. Thickness of individual beds, limestone 0.5~5 m, shale 0.2~5 m.Shale at 260~300 m contains coquina beds consisting of bivalve fossils. Tubular trails at the uppermost part of each shale bed at 354~385 m.

【Mineralization】

Lead-zinc mineralization and siderite veinlets not observed in this hole. Limestone, and calcite veinlet concentration near 106 m and 235 m.

(2) MJP-2

【Geology】

0～144.7 m; Correlated to Loralai Unit-Ⅳ,alternation of limestone and shale,limestone predominant near 40 m elsewhere shale major component. Individual beds, limestone 0.5~5 m thick, shale 0.2~5 m thick. Hematitization observed in limestone at 0~85 m and 118.6~132 m. Bivalve fossils present throughout and often forms coquina beds 5~10 cm thick.

144.7～288.2 m; Correlated to Loralai Unit-Ⅲ,alternation of limestone and shale with shale predominant. Individual beds, limestone 0.5~5 m thick and shale 0.2~5 m thick. Two beds of AA occur at 239.6~254.1 m, as they are correlated to shale in MJP-4 and MJP-1, the AA is considered to be a local lithofacies change of the shale. In the shale at 145~175 m, coquina beds consisting of bivalve fossills are found. Tubular trails occur at the uppermost part of the shale beds at 228~241 m. Rocks at 265~288 m are fractured and accompaied by clay, thus the existence of fault is inferred.

288.2～340.7 m; Correlated to Loralai Unit-Ⅱ, limestone and shale at 288.2~294.2 m with limestone and shale bed 0.5~1 m thick, alternation of limestone, shale and AA with AA predominant. Limestone beds 0.5~2 m thick, AA mostly 1~3 m, but a thick bed correlated to other four holes occur at 303.4~314.9 m. The shale at 294.2~296.1 m gradually changes to the underlying AA.

340.7～351.0 m; Correlated to Loralai Unit-Ⅰ,alternation of limestone, shale and AA with limestone predominant. Individual beds limestone 2~4 m thick, shale and AA 0.5～1 m thick.

【Mineralization】

Lead-zinc sulfide mineralization occurs at 288.2~291.0 m and 323.2~328.6 m. Both occur in fractured limestone as dissemination of sphalerite and small amount of pyrite, there are also siderite and calcite veinlets cutting through. No mineralization observed in shale intercalated in limestone. Concentration of calcite veinlets in limestone near 70 m. Pyrite concentration in shale near 145,180 and 195 m.

(3) MJP-3

【Geology】

0～104.8 m; Correlated to Loralai Unit-Ⅳ,alternation of limestone

and shale with the latter predominant. Individual beds, limestone 0.5~5 m thick and shale 0.2~5 m thick. Hematitization in limestone at 0~95 m. Gastropod and bivalve fossils occur in shale at 50~70 m. Limestone nodules occur at the uppermost part of individual shale beds at 70~90 m.

104.8~169.1 m; Correlated to Loralai Unit-Ⅲ, alternation of limestone and shale with the latter predominant. Individual beds, limestone 0.5~5 m thick and shale 0.2~5 m thick. Coquina beds consisting of bivalves occur in shale at 110~125 m. Fractured and clayey zone at 167.8~169.1 m and the existence of fault is inferred.

169.1~283.3 m; Correlated to Loralai Unit-Ⅱ, limestone and shale alternation with the former predominant at 169.1~232.7 m. Individual beds, usually limestone 1~3 m thick, but fractured limestone continuous at 171.9~186.3 m. Shale beds 0.5~1 m thick. Alternation of limestone and AA with AA predominant at 232.7~283.3 m. Individual beds, limestone 0.5~2 m thick, AA normaly 1~3 m thick, but thick bed occurs at 251.5~262.3 m and this can be correlated to other four drill holes. Shale at 243.3~245.0 m gradually changes to the underlying AA. Bivalve fossils occur throughout.

288.3~300.8 m; Correlated to Loralai Unit-Ⅰ, alternation of limestone, shale and AA, limestone predominant. Individual beds, limestone 2~4 m thick and shale, AA 0.5~1 m thick.

【Mineralization】

Lead-zinc sulfide mineralization occurs at 169.1~191.7 m and 201.1~211.8 m. These mineralized zones are composed of sphalerite and minor galena disseminated in fractured limestone, with siderite and calcite veinlets cutting through. Mineralization is not observed in shale intercalated in limestone. Calcite veinlets are concentrated in the limestone near 26,80,104,131 and 166 m. Powdery pyrite occurs relatively abundantly in shale near 100~108,129 and 140~160 m. Also small amount of pyrite is associated with calcite veinlets in limestone.

(4) MJP-4

【Geology】

0~145.3 m; Correlated to Loralai Unit-Ⅳ, limestone and shale

alternation, former predominant at 0~50 m and latter major component below. Individual beds, limestone 0.5~5 m thick and shale 0.2~5 m thick. Limestone hematitized at 0~85 m and near 122.4~130.4 m. Bivalves fossils form coquina beds in shale at 75~145 m. Limestone nodules with tubular trails occur at the uppermost part of shale beds at 96.9~138.5 m.

145.3~283.4 m; Correlated to Loralai Unit-Ⅲ, limestone and shale alternation with shale predominant. Individual beds, limestone 0.5~3 m and shale 0.2~5 m thick, coquina beds consisting of bivalve fossils occur in shale at 151.9~176.9 m.

283.4~332.5 m; Correlated to Loralai Unit-Ⅱ, limestone and shale alternation with individual limestone beds 1~2 m thick and shale beds 1m thick at 283.4~290.3 m, limestone, shale and AA form alternation with AA predominant at 290.3~332.5 m. At this depth, the thickness of individual beds are limestone 0.5~3 m, AA usually 1~3 m with a thick bed correlated to other four drill holes at 297.5~308.5 m. Shale at 289.6~290.3 m gradually changes to the underlying AA. Coquina beds consisting of bivalve fossils occur in shale at 321.3~324.3m.

332.5~401.0 m; Correlated to Loralai Unit-Ⅰ, alternation of limestone, shale and AA with limestone predominant. Individual beds, limestone 2~4 m, shale and AA 0.5~1 m thick. Shale and AA are transitional.

【Mineralization】

Lead-zinc sulfide mineralization occur at 283.4~291.1 m, 308.5~310.4 m and 316.2~320.4 m. These zones are all composed of sphalerite and small amount of galena disseminated in the host rocks and siderite and calcite veinlets cutting through. At 283.4~291.1 m, the host rock is fractured and the mineralization extends into the shale intercalated in limestone. The mineralization occurs selectively in limestone in other two zones. Concentration of calcite veinlets in limestone is observed near 62 m and calcite film in shale near 192 m.

(5) MJP-5

【Geology】

0~58.7 m; Correlated to Anjira Unit-Ⅰ, mostly limestone, shale

occurs at 7.0~11.5 m and weathered soily shale beds 10~20 cm thick observed in several places. This unit consists of a succession of 1~2 m thick limestone beds at the surface near this site. Hematitization occurs at 0~18 m and near 53 m, but weaker than in Loralai.

58.7~193.0 m; Correlated to Loralai Unit-Ⅳ, limestone and shale alternation with the latter predominant. Individual beds, limestone 0.5~5 m and shale 0.2~5 m thick. Hematitization in limestone occurs at 63 m to near 100 m. Bivalve fossils occur in limestone at 68.4~95 m. At 140~190 m, bivalve fossils occur and limestone nodules with tubular trails occur in the uppermost part of the shale beds.

193.0~210.4 m; Fractured fault zone. Limestone and shale alternation, and individual beds are 0.5~2 m thick. Most of the shale is fractured and accompanied by clay and the cross angle fluctuates between 10°~80°, thus this part is concluded to be a fault fractured zone.

210.4~244.8 m; Correlated to Loralai Unit-Ⅱ, limestone and shale alternation at 210.4~223.9 m with thickness of individual beds 0.3~2 m for both rocks. Alternation of limestone, shale, AA and AB with AA predominant at 223.9~244.8 m. Individual beds, limestone 0.2~1 m, shale 2 m, AA 1~3 m and AB 1~1.5 m thick. Shale, AA and AB are mutually transitional.

244.8~401.0 m; Correlated to Loralai Unit-Ⅰ, alternation of limestone, shale, AA and AB, limestone predominant at 244.8~281.9 m, below which AA is the major unit. Thickness of individual beds are limestone 0.2~6 m, shale 0.2~6 m, AA 0.5~10 m, and AB 0.2~2 m. Shale, AA, AB are mutually transitional.

【Mineralization】

Lead-zinc sulfide mineralization occurs at 215.0~216.8 m. This is composed of shalerite and small amount of pyrite dissemination in the host rocks and siderite, calcite veinlets cutting through. Also, there are seven concentrations of siderite veinlets with thickness of 20~80 cm at 238.1~276.4 m.

(6) MJP-6

【Geology】

0~47.0 m ; Correlated to Anjira Unit-I , mostly limestone, 10~20 cm thick weathered soily shale observed at several points. This unit is composed of a sequence of 1~2 m thick limestone beds near this site at the surface. Hematitization observed at 0~47.0 m, but weaker than in Loralai.

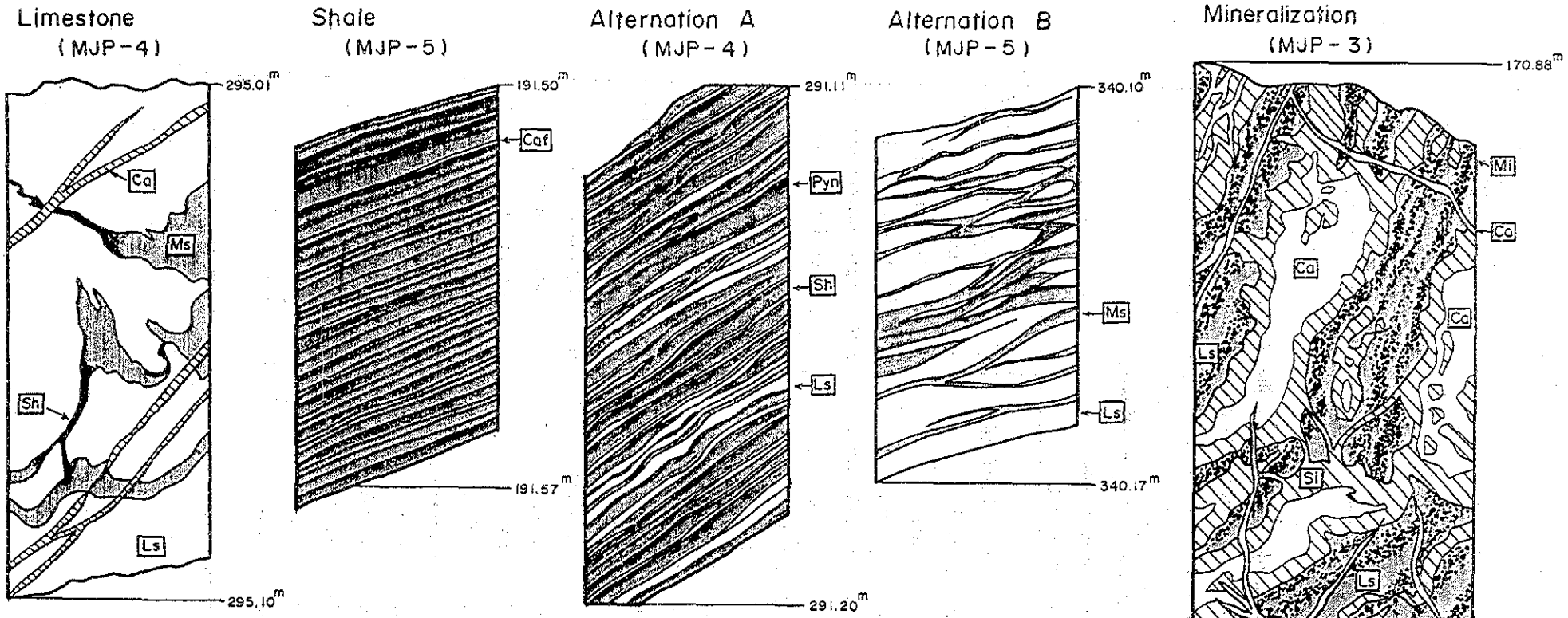
47.0~168.5 m; Correlated to Loralai Unit-IV , limestone and shale alternation with latter predominant. Individual beds of both limestone and shale 0.2~5 m thick. Hematitization observed in limestone from 47.0 m to 130 m. Bivalve fossils occur mainly in shale at 50~90 m and 157~167 m. At 90~150 m, limestone nodules with tubular trails occur at the uppermost part of the shale beds.

168.5~252.8 m; Correlated to Loralai Unit-II , limestone and shale alternation with limestone predominant at 168.5~206.6 m. Individual beds of limestone 1~2 m and shale 0.2~1 m thick. Alternation of limestone and AA with the latter predominant at 206.6~252.8 m. Individual beds here are limestone 0.2~2 m and AA 1~12 m thick.

252.8~401.0 m; Correlated to Loralai Unit-I , alternation of limestone, shale, AA and AB, limestone predominant at 252.8~285.0 m and 349.6~375.8 m and AA predominant below 375 m. Individual beds are limestone 0.3~7 m, shale 0.2~1 m, AA 0.5~4 m and AB 0.5~2 m. Shale, AA and AB are mutually transitional.

【Mineralization】

Lead-zinc sulfide mineralization occurs at 168.5~202.1 m. This zone is composed of dissemination of sphalerite and small amount of galena in the host rocks. Mineralization is not observed in shale intercalated in shale. There are siderite and calcite veinlets at 326.7~327.1 m. Calcite veinlets are concentrated in limestone at 38~45 m, 67~80 m and 111~118 m. Powderry pyrite is concentrated in shale at 146~151 m.



(wtbos)

with thin beds (& patches) of (marly) Shale.

Ls : Limestone, grey ~ light grey (micrite)

Ms : Marly Shale, grey.

Sh : Shale, black.

Ca : Calcite veinlet.

(shale)

black ~ dark grey, laminated, argillaceous.

Caf : Calcite film

(raosm)

rhysmic alternation of (marly) Shale & (marly) Limestone

Sh : Shale (marly)

Ls : Limestone (marly)

Pyn : Pyrite nodule

(aolm)

alternation of Limestone & marly Shale.

Ls : Limestone, grey ~ light grey. (micrite)

Ms : marly Shale, grey.

Mi : Sphalerite dissemination

Si : Siderite

Ca : Calcite

Ls : Limestone

Fig. II-2-13 Sketch of Drilling Cores

Scale 1 : 1

LEGEND FOR DRILLING COLUMNS (MJP-1~6)

Ls : Limestone
Sh : Shale
raosm : Rhythmic alternation of (marly,)black Shale & (marly,)light grey Limestone. Thicknesses of each beds are 0.1~3.0mm.
aolm : Alternation of grey Limestone(tk:2~10mm) & dark gery marly Shale(tk:1~2mm).
wtbos : with thin beds(& patches) of (marly)Shale.
Sha : Alternation-A. Alternation by raosm.
Lsa : Alternation-B. Alternation by aolm.

aln : alternate	lam : well lamnated	: limestone
arg : argillaceous	lgt : light	: shale
bed : well bedded	mly : marly	: Alternation-A
brc : brecciated	Mc : marcasite	: Alternation-B
bk : black	min : mineralization	∠45° : Angle between drilling direction and some boundary plane.
bw : brown	ntwk : network	∠45° : Angle between drilling direction and bedding plane.
Ca : calcite	nod : nodule	I : Pb, Zn mineralization
cmp : compact	olc : oolitic	o : fossiliferous
cly : clayey	peb : pebble	oo : *coquina bed (cq)*
crs : coarse	Py : pyrite	X : core crushed
dk : dark	pos : porous	Δ : brecciated
dis : disseminated	rd : red	∤ : nodule of Limestone
dmt : dominate	*Sp : sphalerite*	: : tubular trails
fos : fossiliferous	sg : strong	~ : clay
flm : film	sft : soft	mineralization etc
fis : fissile	Si : siderite	Ⅱ : storong
fin : fine	tk : thickness	Ⅰ : medium
gr : grey	vn : vein	⁞ : weak
Ga : galena	vnt : veinlet	
Hm : hematite	whd : weathered	
Hmz : hematitization	wh : with	
hrd : hard	wk : weak	
hvy : heavy		

Drill Hole No	: MJP-1		
Location	: SURMAI-I	Elevation	: 1,461.01m
Coordinate Point	: N=1,125,382 E=2,008,151	Inclination	: -90°
Depth	: 401.0m	Core Recovery	: 98.53%
Drilling Machine	: L-38	Term	: MAY 10 '88 ~ JUN 3 '88

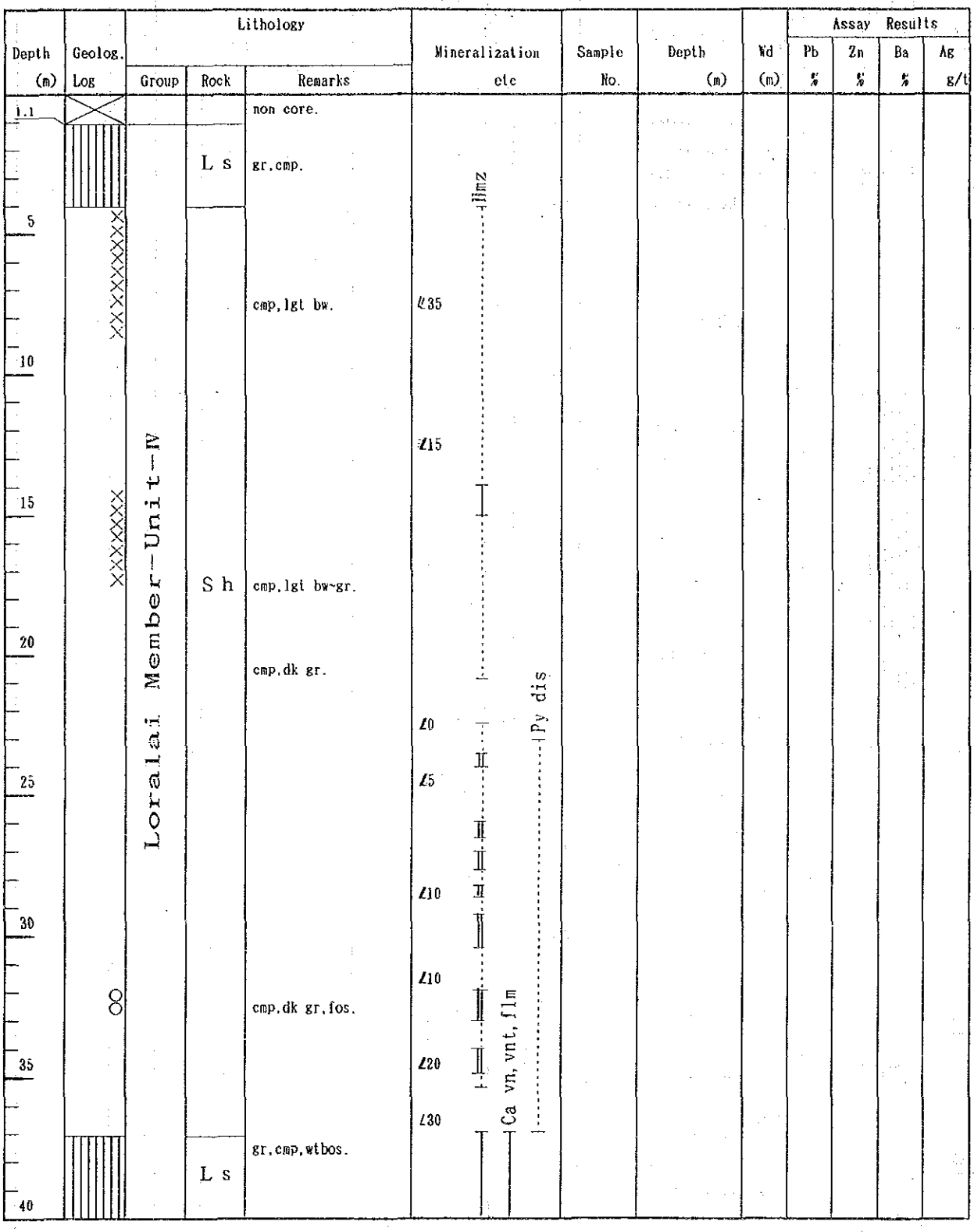
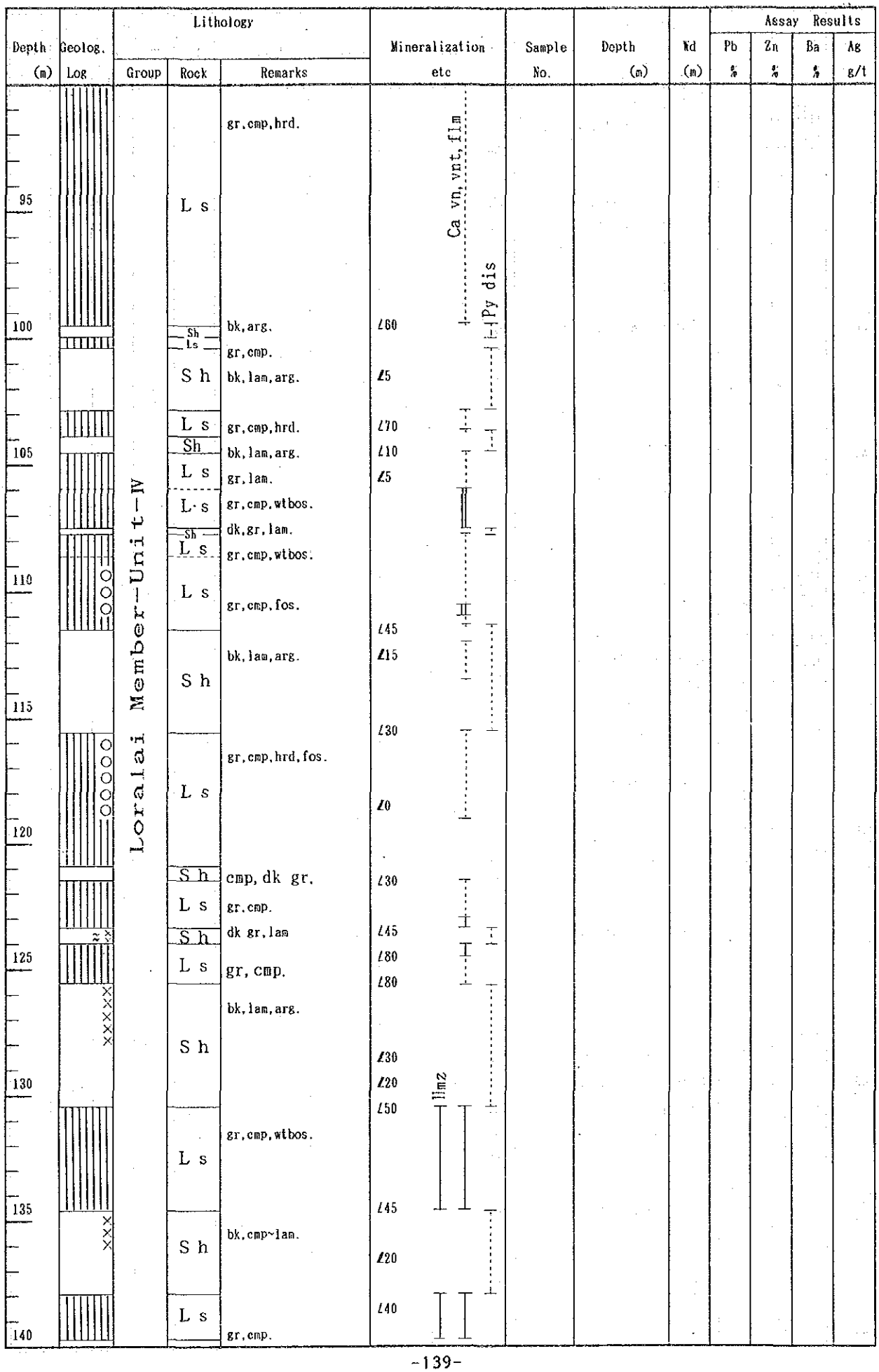


Fig. II-2-14 Drilling Columns of MJP-1

Depth (m)	Geolog. Log	Lithology: Group	Lithology: Rock	Lithology: Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
		Loralai Member-Unit-IV	L s	gr,cmp,wtbos.	Hmz, Ca vn,vnt,flm, Py dis							
45			S h	cmp,dk gr~bk.	∠10							
			S h	dk gr,lam.								
				gr,cmp,wtbos.	∠40							
			Sh	dk gr,lam.	∠20							
50			Ls	gr,cmp,wtbos	∠70							
			S h	bk~dk gr,lam	∠10							
55			S h	cmp,dk gr.	∠5							
					∠15							
60			L s	gr,cmp,wtbos.								
65				gr,cmp,wtbos.								
70			S h	bk,lam,arg.	∠40							
				fos.	∠10							
75					∠10							
80					∠70							
			Ls	gr,cmp.								
			S h	bk,arg.	∠5							
85			L s	gr,cmp,hrd.								
			S h	bk,arg,fis.								
90			L s	gr,cmp,hrd.								


Depth (m)
Geolog. Log
Lithology
Group
Rock
Remarks
Mineralization etc
Sample No.
Depth (m)
Wd (m)
Assay Results
Pb %
Zn %
Ba %
Ag g/t
Loralai Member-Unit-IV
95
100
105
110
115
120
125
130
135
140
L s
Sh
S h
gr,cmp,hrd.
bk,arg.
gr,cmp.
bk,lam,arg.
gr,cmp,hrd.
bk,lam,arg.
gr,lam.
gr,cmp,wtbos.
dk,gr,lam.
gr,cmp,wtbos.
gr,cmp,fos.
bk,lam,arg.
gr,cmp,hrd,fos.
cmp, dk gr.
gr,cmp.
dk gr,lam
gr, cmp.
bk,lam,arg.
gr,cmp,wtbos.
bk,cmp~lam.
gr,cmp.
Ca vn,vnt,flm
Py dis
llmz

Depth (m)	Geolog. Log	Lithology: Group	Rock	Remarks	Mineralization etc	Sample No.	Depth (m)	Kd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
			Sh	dk gr,cmp~lam.								
			Ls	gr,cmp,fos,wtbos.	Hmz, Py dis							
					∠30							
145				dk gr~bk.	∠30							
				cmp~lam,fos.	∠40							
					∠35							
150			Sh	bk,cmp~lam,fos.	∠30							
					∠35							
					∠25							
					∠15							
155				bk,lam,fos.	∠5							
					∠10							
					∠20							
					∠35	Ca vn, vnt, flm						
160			Ls	gr,cmp,wtbos.								
			Sh	bk,cly.								
			Ls	gr,fos,wtbos	∠35.							
					∠80							
			Sh									
165			Ls	dk gr,lam,arg.								
				gr,fos,wtbos.								
			Sh	dk gr,arg.								
				cmp~lam.								
170			Ls	gr,wtbos.	∠60							
					∠40							
			Sh	dk gr,cmp~lam.								
175					∠5							
					∠35							
					∠40							
			Ls	gr,fos,wtbos.	∠40							
180			Sh	dk gr,cmp~lam.								
					∠30							
			Ls	gr,cmp,fos.wtbos.	∠30							
					∠50							
185			Sh	dk gr,cmp~lam.	∠30							
					∠30							
					∠5							
			Ls	gr,cmp,fos,wtbos.								
190					∠40							

Loralai Member-Unit-IV

Depth (m)	Geolog. Log	Lithology: Group	Lithology: Rock	Lithology: Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
			Sh	dk gr,cmp~lam.	∠25							
195					∠10							
	○		Ls	gr,cmp,hrd,fos,wtbos.	∠45							
				dk gr,cmp~lam.	∠30							
					∠15							
200												
					∠5							
			Sh		∠0							
205												
					∠0							
				dk gr,cmp~lam.								
210												
			Ls	gr,wtbos.	∠30							
					∠60							
215			Sh	dk gr,lam~cmp.	∠40							
					∠40							
					∠20							
220			Sh	gr,cmp,wtbos.								
	△		Sh	bk,lam,arg.	∠40							
					∠35							
225					∠30							
			Ls	gr,cmp,hrd,fos.								
			Sh	bk,lam								
					∠55							
230			Ls	gr~lgt gr,wtbos.								
	△				∠40							
			Sh	bk,lam~cmp.	∠45							
					∠60							
			Ls	gr,wtbos.	∠35							
235					∠50							
			Sh	bk,lam,arg,fos.								
	△		Ls	gr,wtbos,brc.	∠60							
			Sh	dk gr,cmp~lam.	∠30							
240			Ls	gr,hrd,wtbos.								

Ca vn, vnt, flm
Py dis

Loralai Member–Unit–IV

Depth (m)	Geolog. Log	Lithology: Group	Lithology: Rock	Lithology: Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
		Loralai Member-Unit-N	Ls	gr,hrd,wtbos.	45							
			Sh	dk gr~bk,cmp~fis.	45 Py dis							
			Ls	gr,cmp,wtbos.	Ca vn,vnt,flm							
245				bk,lam,cq.								
			Sh									
			Ls	gr,cmp,wtbos.								
			Sh									
			Ls	bk,lam,cq.	50							
			Sh									
249.1			Ls	gr,cmp.	60							
250		Loralai Member-Unit-M		bk,cq.	70							
			Sh	gr,cmp,fos.	50							
					70							
				bk,cmp,fos.								
					80							
255			Ls	gr,cmp,wtbos.								
					50							
			Sh	bk,cmp.								
					45							
260			Ls	gr,cmp,fos,wtbos.								
					50							
					40							
				dk gr~bk,fos,lam~cmp.	40							
					60							
265			Sh									
				gr,cmp,fos,wtbos.								
270			Ls		50							
				dk gr~bk,fos,lam~cmp.								
			Sh		40							
275					35							
					40							
			Ls	gr,cmp.								
					45							
280			Sh	bk,lam~cmp,fos.	40							
					45							
			Ls	gr,cmp,wtbos.								
285					45							
			Sh	bk,cmp~lam,fos.	40							
290			Ls		45							

Depth (m)	Geolog. Log	Lithology: Group	Rock	Remarks	Mineralization etc	Sample No.	Depth (m)	Nd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
		Loralai Member-Unit-III	Ls	gr,wtbos.	∠40							
			Sh	bk,cmp~lam.	∠45							
					∠40							
			Ls	gr,cmp,wtbos.	∠45							
295					∠40							
			Sh	bk,cly,fos.	∠35							
			Ls	gr,cmp,wtbos.	∠35							
			Sh	dk gr,lam,fis.	∠60							
			Ls	gr,cmp,wtbos.	∠40							
300			Sh	dk gr,lam,fis.	∠60							
				dk gr,lam~cmp.								
305			Ls	gr,cmp,wtbos.	∠50							
			Sh	dk gr,lam.								
					∠5							
					∠30							
310			Sh	cmp,gr.	∠30							
			Ls	gr,cmp,wtbos.								
					∠50							
			Sh	dk gr,cmp~lam.	∠50							
315					∠45							
				gr,cmp,wtbos.	∠40							
			Ls									
			Sh	bk,lam,fis.	∠45							
			Ls	gr,cmp.								
					∠60							
320			Sh	dk gr,cmp~lam.	∠5							
					∠20							
			Ls	gr,cmp,wtbos.	∠25							
					∠20							
			Sh	dk gr,cmp.	∠70							
325			Ls	gr,cmp,wtbos.	∠45							
					∠50							
			Sh	cmp,gr~dk gr.								
					∠40							
330			Ls	gr,wtbos.								
			Sh	cmp,gr~dk gr.								
335					∠15							
			Ls	gr,cmp,wtbos.								
340			Sh									

Ca vn, vnt, flm
Py dis
Sp ?

Depth (m)	Geolog. Log	Lithology: Group	Lithology: Rock	Lithology: Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
345		Loralai Member-Unit-III	S h	cmp,gr~dk gr.	Ca vn,vnt,fim; Py dis							
			L s	gr,cmp,wtbos.								
350			S h	cmp,gr~dk gr.								
			L s	gr,cmp,wtbos,fos.	∠45							
355			S h	cmp,gr~dk gr.	∠45							
					∠55							
360												
365			L s	gr,cmp,wtbos.	∠50							
			S h	cmp,gr~dk gr.	∠35							
					∠50							
			L s	gr,cmp,fos,wtbos.								
370			S h	cmp,gr~dk gr.								
			L s	gr,cmp.	∠50							
			S h	cmp~lam,gr~dk gr.	∠50							
					∠40							
375					∠45							
					∠40							
380				fos.	∠35							
					∠35							
			L s	gr,cmp,fos,wtbos.	∠45							
			S h	dk gr~bk,cmp~lam.								
385												
			L s	gr,cmp,wtbos.	∠40							
390			Sh									

Depth (m)	Geolog. Log	Lithology: Group	Lithology: Rock	Lithology: Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
395		Loralai Member-Unit-Ⅲ	Sh	dk gr~bk,cmp~lam.	∠45 Ca vn,vnt,flm ∠50 Py dis							
400			Ls	gr,cmp,wtbos.	∠45							
401.0												

Drill Hole No	: MJP-2		
Location	: SURMAI-I	Elevation	: 1,461.01m
Coordinate Point	: N=1,125,382 E=2,008,151	Inclination	: -70°
Depth	: 351.0m	Core Recovery	: 98.86%
Drilling Machine	: L-38	Term	: APR 23 '88 ~ MAY 8 '88

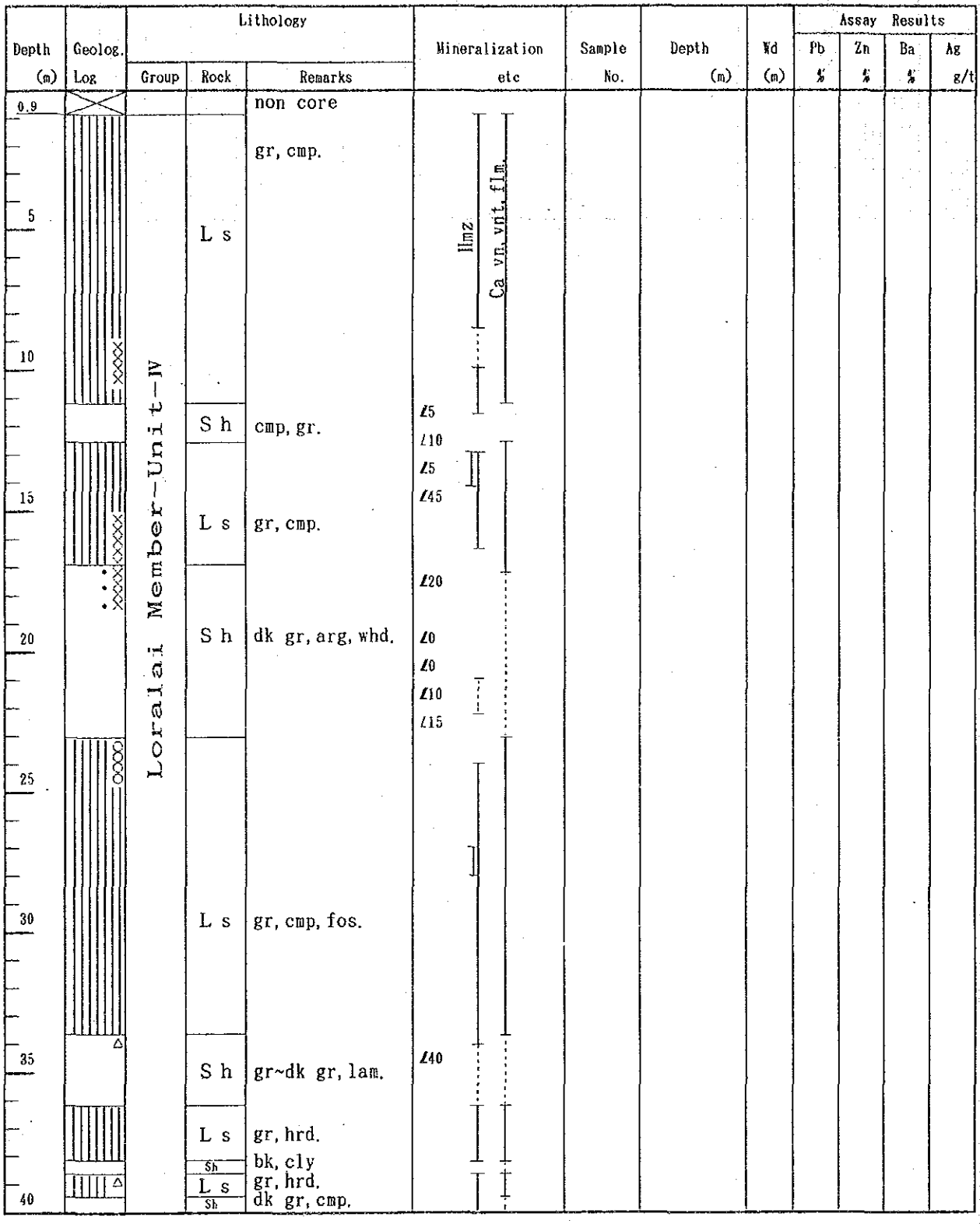


Fig. II-2-15 Drilling Columns of MJP-2

Depth (m)	Geolog. Log	Lithology: Group	Lithology: Rock	Lithology: Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
			Sh									
			Ls	gr,cmp.	∠60							
			Sh	dk gr.	∠60 Hmz							
			Ls	gr,wtbos.								
			S h	dk gr, lam.	∠45							
45					∠40							
					∠45 Ca vn,vnt,flm.							
			L s	gr, cmp.								
			Sh	sk,cly								
			L s	gr, hrd, fos.	Py dis							
			S h	cmp, dk gr~bk.	∠50							
50			S h	bk, lam.	∠35							
					∠15							
			S h	cmp, dk gr~bk.	∠40							
					∠30							
55			L s	gr, cmp, fos.	∠20							
					∠40							
			S h	dk gr~bk, fos.								
			S h	cmp, dk gr.	∠40							
			Ls	gr, wtbos.	∠45							
60			S h	dk gr~bk, fos.								
					∠45							
			L s	gr, hrd, fos.	∠55							
65			S h	dk gr~bk, lam, fos.								
			L s	gr, cmp, fos.	∠40							
					∠50							
			S h	dk gr~bk, lam, fos.	∠40							
70			L s	gr, hrd.	∠45							
			S h	dk gr, arg.								
			L s	gr, hrd, wtbos.	∠40							
			S h	cmp, dk gr, fos.	∠60							
75												
					∠45							
			S h	dk gr~bk, fos. wh cq.								
80					∠45							
					∠55							
					∠40							
			L s	gr, cmp.								
85			S h	dk gr~bk, fos.								
					∠40							
			L s	gr, hrd, fos.	∠45							
			S h	dk gr, lam, fos.	∠40							
90			L s	gr, hrd, fos.	∠30							

Loralai Member-Unit-IV

Depth (m)	Geolog. Log	Lithology Group	Rock	Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results Pb %	Zn %	Ba %	Ag g/t
95		Loralai Member-Unit-IV	S h	dk gr~bk, lam, fos.	∠50 ∠50 ∠45							
			ls	gr, wtbos.	∠45							
			S h	dk gr~bk, fos, wh cq, lam~cmp.	∠45 ∠45 ∠45							
100			L s	gr, cmp.								
			S h	dk gr, lam~cmp.	∠40							
			L s	gr, cmp.								
105			S h	dk gr, lam~cmp.								
			L s	gr, cmp.	∠40							
110			S h	dk gr, lam, fos.	∠40 ∠30 ∠40							
			LS	gr, cmp.	∠45 ∠30							
115			S h	dk gr, lam, fos.	∠35 ∠45 ∠60 ∠45 ∠65							
120			L s	gr, cmp.	∠50							
			S h	cmp~lam, gr.	∠60 ∠50							
125			L s	gr, cmp.								
			S h	dk gr, lam.	∠60							
			L s	gr, cmp, wtbos.								
130			S h	gr~dk gr, lam~cmp.								
			L s	gr, cmp.	∠45 ∠70 ∠70							
135			S h	gr~dk gr, cmp~lam.								
			L s	gr, cmp, wtbos.	∠65 ∠60							
			S h	dk gr~bk, lam, fos	∠50							
140			L s	gr, cmp, wtbos.	∠50							

Ca vn, vnt, flm.
Py dis
Umz

Depth (m)	Geolog. Log	Lithology: Group	Lithology: Rock	Lithology: Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
		Loralai Member-Unit-IV	L s	gr, cmp, wtbos.	∠60							
			Sh	dk gr~bk, cq.	∠60							
144.7			L s	gr, cmp, wtbos, fos, cq.	∠45							
145					∠50							
			S h	dk gr, lam, fos, cq.	∠45							
					∠60							
			L s	gr, cmp.	∠45							
150			S h	dk gr, lam, cq.	∠15							
					∠35							
			L s	gr, cmp.								
			S h	dk gr, lam.	∠40							
155					∠45							
					∠60							
					∠60							
			L s	gr, cmp.	∠55							
			S h	dk gr, lam.								
160			L s	gr, cmp.								
					∠45							
			S h	cq, dk gr, lam.	∠45							
					∠45							
					∠40							
165			L s	gr, cmp, wtbos.								
			S h	dk gr~bk, arg.	∠50							
			L s	gr, cmp, wtbos, fos.	∠45							
170												
				cq.	∠45							
				cq.	∠45							
				cq.	∠70							
175					∠60							
			S h	dk gr, cmp~lam.	∠50							
			L s	gr, cmp, wtbos.	∠40							
180					∠30							
			S h	dk gr, lam.	∠5							
					∠0							
					∠45							
					∠60							
185			L s	gr, cmp, wtbos.								
			Sh	dk gr~bk.								
			L s	gr, cmp, wtbos.	∠10							
					∠5							
190			S h	dk gr, lam.	∠30							

Ca vn, vnt, flm

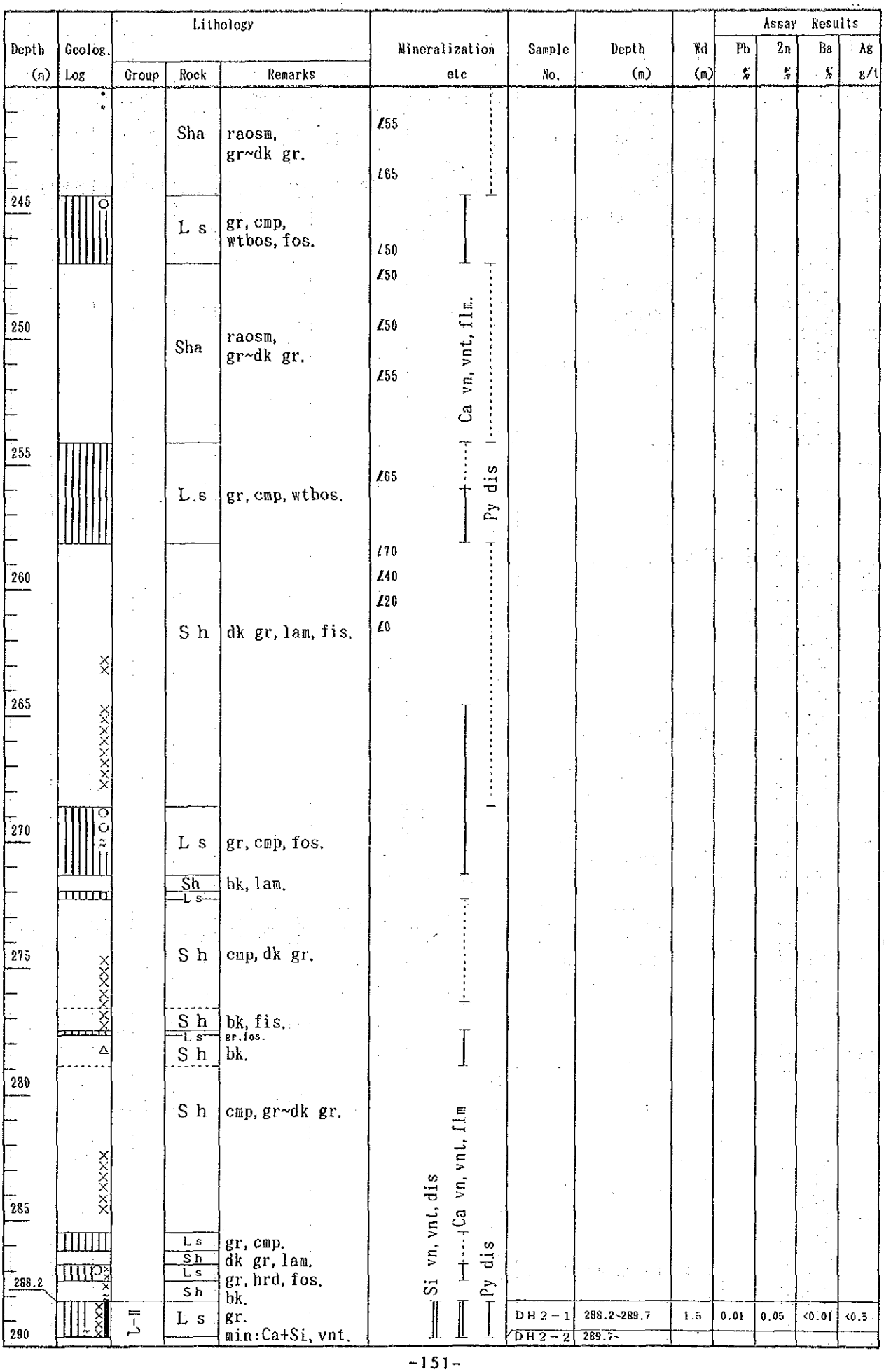
Py dis

Depth (m)	Geolog. Log	Lithology Group	Rock	Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results Pb %	Zn %	Ba %	Ag g/t
			S h	dk gr, lam.	∠30							
			L s	gr, cmp, wtbos.	∠60							
					∠30							
195			S h	dk gr~bk, cmp.	∠25							
					∠30							
			L s	gr, hrd.	∠50							
200					∠45							
			S h	cmp~lam, dk gr.	∠55							
					∠60							
					∠70							
			L s	gr, cmp.								
205			S h	cmp, gr~dk gr.	∠45							
			L s	gr, cmp, fos.								
			S h	cmp~lam, gr~dk gr.	∠25							
210			L s	gr, cmp, wtbos, fos.	∠50							
					∠45							
			S h	cmp~lam, dk gr,	∠55							
215			L s	gr, cmp, fos.	∠50							
					∠45							
220			S h	cmp~lam, dk gr.								
					∠50							
225			L s	gr, cmp, fos.	∠45							
			S h	cmp, dk gr.	∠45							
			L s	gr, cmp, fos.	∠60							
230			S h	cmp, dk gr.	∠45							
			L s	gr, fos.	∠75							
			S h	cmp, dk gr.								
235					∠70							
			L s	gr, fos.								
			S h	cmp, dk gr.								
240			Ls Sha	gr, fos. raosm.	∠60							

Loralai Member-Unit-III

Ca vn, vnt, flm.

Py dis.


Depth (m)
Geolog. Log
Lithology
Group
Rock
Remarks
Mineralization etc
Sample No.
Depth (m)
Wd (m)
Assay Results
Pb %
Zn %
Ba %
Ag g/t
245
250
255
260
265
270
275
280
285
288.2
290
Sha raosm, gr~dk gr.
L s gr, cmp, wtbos, fos.
Sha raosm, gr~dk gr.
L.s gr, cmp, wtbos.
S h dk gr, lam, fis.
L s gr, cmp, fos.
Sh bk, lam.
L s
S h cmp, dk gr.
S h bk, fis.
L s gr, fos.
S h bk.
S h cmp, gr~dk gr.
L s gr, cmp.
Sh dk gr, lam.
L s gr, hrd, fos.
Sh bk.
L-Ⅱ
L s gr.
min:Ca+Si, vnt.
∠55
∠65
∠50
∠50
∠50
∠55
∠65
∠70
∠40
∠20
∠0
Ca vn, vnt, flm.
Py dis
Si vn, vnt, dis
Ca vn, vnt, flm
Py dis
DH 2－1 288.2~289.7 1.5 0.01 0.05 <0.01 <0.5
DH 2－2 289.7~

Depth (m)	Geolog. Log	Lithology: Group	Lithology: Rock	Lithology: Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
291.0		Loralai Member-Unit-II	Sh / Ls	bk, lam. / gr, bed.	∠50	DH2－2	289.7~290.4	0.7	0.01	<0.01	<0.01	<0.5
				min:Sp,Ca,Si,Py dis.		DH2－3	290.4~291.0	0.6	0.23	5.74	<0.01	3.9
			Sh	bk, lam. min:Sp,Ca,Si wk dis.	∠50	Dh2－4	291.0~292.3	1.3	0.01	0.09	<0.01	<0.5
292.3			Ls	gr, olc.	∠60							
			Sh	bk, lam.	∠50							
			Ls	gr, olc.	∠50	DH2-1~4	288.2~292.3	4.1	0.04	0.89	<0.01	1.0
295			Sh	lam, dk gr~bk.	Sp dis. Ca dis. Si vn, vnt, dis.							
			Sha	raosm, gr~dk gr.	∠60							
			Ls	gr, hrd.								
300			Sha	raosm.	∠55							
			Ls	lgt gr~gr, cmp, wtbos.								
					∠55							
305			Sha	raosm, gr~dk gr.	∠55							
310					∠55							
					∠55							
315					∠55							
			Ls	gr, hrd, fos, cq.	∠65							
			Sha	raosm, Ls dmt, lgt gr~gr.	∠60							
320			Sha	raosm, Sh dmt, gr~dk gr.	∠55 ∠50 ∠65 Sp dis. Ga dis. Si vn, vnt, dis. Ca vn, vnt, flm. Py dis							
			Ls	gr, cmp, wtbos, fos.		DH2－5	323.2~323.4	0.2	0.01	0.03	<0.01	<0.5
323.2			Sh	min:Si dis along bed bk, lam.		DH2－6	323.4~323.9	0.5	0.01	0.41	<0.01	<0.5
325			Ls	gr, cmp, wtbos. min:Si>Ca>Sp,Ga, Py dis along bed.	∠40	DH2－7	323.9~326.0	2.1	0.01	0.56	<0.01	<0.5
						DH2－8	326.0~328.6	2.6	0.06	1.54	<0.01	0.8
328.6				gr, cmp, wtbos.	∠45							
330			Sh	dk gr~bk, lam.	∠70 ∠60 ∠50	DH2-5~8	323.2~328.6	5.4	0.03	1.00	<0.01	0.6
			Ls	gr, cmp, wtbos.	∠50 ∠60							
335			Sha	raosm, gr~dk gr.	∠50 ∠70 ∠70 ∠70 ∠55							
340					∠60							

Depth (m)	Geolog. Log	Lithology: Group	Rock	Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
340.7			Sha	raosm, gr~dk gr.	∠70							
		Loralai Member – Unit – I	L s	gr, cmp, wtbos.	Ca vn, vnt, flm. Py dis. ∠60							
345			S h	bk, lam.	∠55							
			L s	gr, cmp, wtbos.	∠60							
350			Sha	raosm, gr~dk gr.	∠55							
351.0			Ls	gr, cmp, wtbos.								

Drill Hole No	: MJP-3		
Location	: SURMAI-1	Elevation	: 1,461.01m
Coordinate Point	: N=1,125,382 E=2,008,151	Inclination	: -45°
Depth	: 300.8m	Core Recovery	: 98.44%
Drilling Machine	: L-38	Term	: MAR 31 '88.~ APR 19 '88

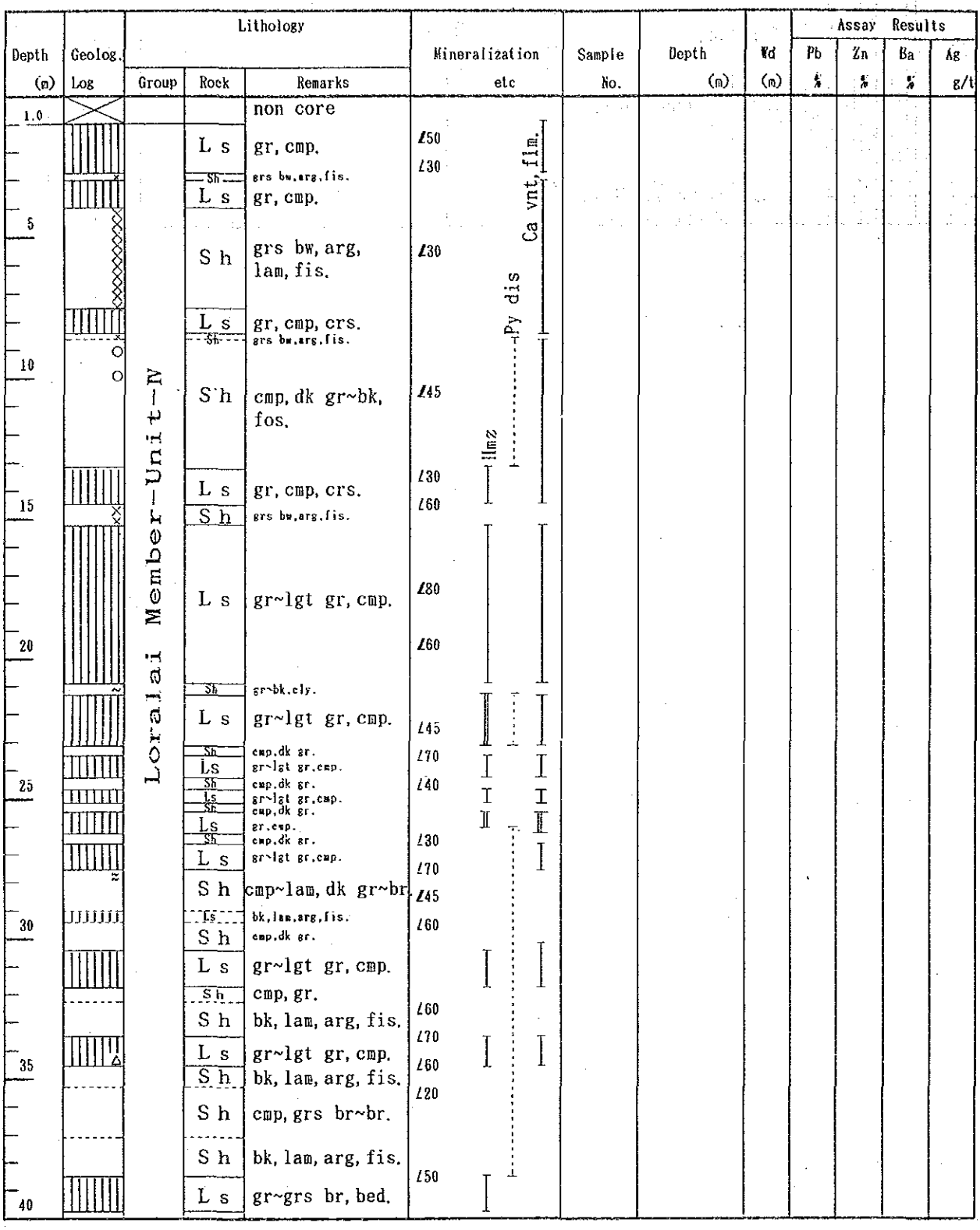
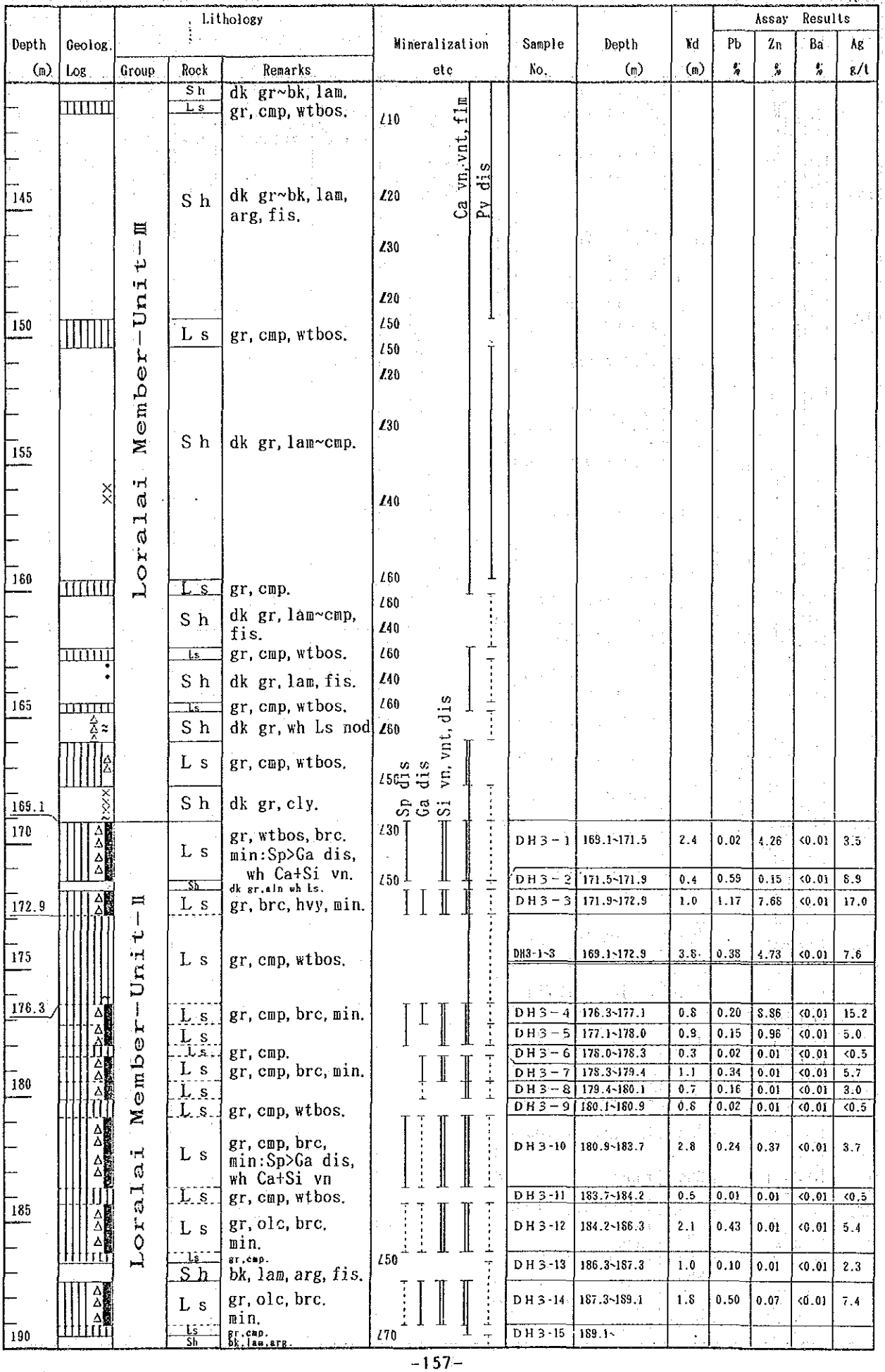


Fig. II-2-16 Drilling Columns of MJP-3

Depth (m)	Geolog. Log	Lithology: Group	Rock	Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
		Loralai Member-Unit-IV	S h	dk gr ~bk, lam, arg.	∠65 py dis ∠45 Hmz							
			L s	gr, cmp.								
45			S h	dk gr~bk, lam, arg.	∠45 Ca vn, vnt, flm							
			L s	gr, cmp.								
			Sh	dk gr.arg.	∠45							
			Ls	gr, cmp.	∠50							
50	○		S h	dk gr~bk, lam, arg, fos:Bp, φ0.5~1.0cm	∠60							
	○											
	○											
55	○		L s	gr~dk gr, cmp, fos.								
	≈		S h	dk gr~bk, arg, lam, fos.	∠70							
	○		L s	gr, cmp.	∠70							
			Sh	bk,lam,arg.								
			Ls	gr,cmp.								
60	○				∠45							
	○				∠55							
	○		S h	dk gr~bk, lam, arg, fos:Bp, φ0.5~1.0cm	∠50							
65			L s	gr, cmp.								
			Sh	dk gr~bk, arg.								
			L s	gr, cmp.	∠50							
			S h	dk gr~bk, lam, arg, fos.	∠50							
	○		Ls	gr, cmp.	∠70							
70	△		S h	dk gr, arg.								
	○		L s	gr, cmp.	∠60							
	△		S h	gr~bk, lam, arg.	∠55							
75					∠60							
					∠70							
			L s	gr, cmp.								
80			S h	dk gr, lam~cmp.								
			L s	gr, cmp.								
85	△		S h	bk, arg, sft.	∠70							
	≈				∠60							
			L s	gr, cmp.	∠60							
	△		S h	dk gr~bk, lam.	∠55							
90					∠60							

Depth (m)	Geolog. Log	Lithology Group	Rock	Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results Pb %	Zn %	Ba %	Ag g/t
		Loralai Member－Unit－IV	L s	gr, cmp, fos, wtbos.	Hmz Py dis Ca vn, vnt, flm							
			S h	dk gr~bk.								
95			L s	gr, cmp, wtbos.	∠50							
			Sh	cmp, gr.	∠45							
			L s	gr, cmp, wtbos.	∠40							
			S h	dk gr~bk, lam, arg.	∠45							
100			L s	gr, cmp.								
			Sh	bk, lam, arg.	∠30 100.2m Sp vn, Wd 2 cm, Wh Ca vn.							
			L s	gr~dk gr, cmp, wtbos.	∠80							
			S h	dk gr, arg.	∠45							
104.8			L s	gr, cmp, wtbos.								
		Loralai Member－Unit－III	S h	dk gr~bk, lam~cmp.	∠70							
110			L s	gr, cmp, wtbos.	∠60							
			S h	dk gr, lam~cmp, fos.	∠50							
			L s	gr, cmp, wtbos.	∠60							
			S h	gr~dk gr, lam~cmp, fos:113.8~114.1 Cqb, Bp, φ0.5~1.0cm	∠50 ∠55							
115			L s	gr, cmp, wtbos.	∠70							
			S h	dk gr~bk, lam, Cqb.	∠50							
120			L s	gr, cmp.	∠45							
			Sh	dk gr, Cqb.	∠50							
			L s	gr, cmp, wtbos.	∠60							
125			S h	dk gr~bk, fos.	∠45							
			L s	gr, cmp, wtbos.	∠40							
130			S h	dk gr~bk, arg.	∠45 ∠10							
			L s	gr, cmp, wtbos.	∠0							
135			S h	dk gr~bk, lam, arg.	∠40 ∠40 ∠60							
			L s	gr, cmp, wtbos.								
140			S h	dk gr~bk, lam.	∠45							



Sample No.	Depth (m)	Wd (m)	Assay Results Pb %	Zn %	Ba %	Ag g/t
DH3－1	169.1~171.5	2.4	0.02	4.26	<0.01	3.5
DH3－2	171.5~171.9	0.4	0.59	0.15	<0.01	8.9
DH3－3	171.9~172.9	1.0	1.17	7.66	<0.01	17.0
DH3-1~3	169.1~172.9	3.8	0.38	4.73	<0.01	7.6
DH3－4	176.3~177.1	0.8	0.20	3.86	<0.01	15.2
DH3－5	177.1~178.0	0.9	0.15	0.96	<0.01	5.0
DH3－6	178.0~178.3	0.3	0.02	0.01	<0.01	<0.5
DH3－7	178.3~179.4	1.1	0.34	0.01	<0.01	5.7
DH3－8	179.4~180.1	0.7	0.16	0.01	<0.01	3.0
DH3－9	180.1~180.9	0.8	0.02	0.01	<0.01	<0.5
DH3-10	180.9~183.7	2.8	0.24	0.37	<0.01	3.7
DH3-11	183.7~184.2	0.5	0.01	0.01	<0.01	<0.5
DH3-12	184.2~186.3	2.1	0.43	0.01	<0.01	5.4
DH3-13	186.3~187.3	1.0	0.10	0.01	<0.01	2.3
DH3-14	187.3~189.1	1.8	0.50	0.07	<0.01	7.4
DH3-15	189.1~					

Depth (m)	Geolog. Log	Lithology: Group	Lithology: Rock	Lithology: Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
			Sh	bk, lam, arg.	∠50	DH3-15	~191.0	1.9	0.02	0.01	<0.01	<0.5
191.7			Ls	gr, brc, min.	∠70	DH3-16	191.0~191.7	0.7	0.63	4.52	<0.01	15.3
			Ls	lgt gr, wtbos, wh olc parts.	∠70 Sp dis, Ga dis, Si vn, vnt, dis, Py diss	DH3-4~16	176.3~191.7	15.4	0.25	0.80	<0.01	4.9
195												
			Sh	bk, lam, fis.	∠45							
			Ls	gr, cmp.	∠70							
			Sh	bk, lam, fis.	∠70							
			Ls	lgt gr, wtbos. fos, ocl.	∠70							
200												
			Sh	bk, lam, arg.	∠70							
			Ls	lgt gr, wtbos. wh olc, mly parts.	∠80 Ca vn, vnt							
205					∠70							
			Sh	bk, lam, arg, fis.								
			Ls	lgt gr, wtbos.	Sp dis, Ga dis, Si vn, vnt, dis							
210.1			Sha	raosm.	∠75							
			Ls	gr, wtbos. min: Sp>Ga dis, Ca+Si	∠80	DH3-17	210.1~211.8	1.7	0.54	2.02	<0.01	5.7
211.8			Ls	lgt gr, wtbos.	∠60							
			Sh	cmp, gr.	∠70							
			Sh	bk, lam, arg, fis.	∠80							
			Ls	lgt gr, cmp, olc.	∠75							
215			Sh	bk, lam, arg, fis.								
			Ls	lgt gr, cmp, wtbos, olc.								
			Sh	cmp, gr.	∠80							
			Ls	lgt gr, cmp, wtbos, olc.	∠60							
220			Sh	dk gr~bk, lam, arg.	∠70							
			Ls	lgt gr, cmp, wtbos.	∠75							
			Sh	gr~bk, lam, arg.	∠70							
225			Ls	lgt gr, cmp, wtbos.	∠70							
			Sh	bk, lam, arg, fis.	∠75							
			Ls	lgt gr, cmp, wtbos.	∠70							
230			Sh	bk, lam, arg, fos.	∠70							
			Ls	lgt gr, cmp, fos.	∠70							
			Sha	raosm.	∠75							
235			Ls	lgt gr, cmp, wtbos, fos.	∠75							
			Sha	raosm.	∠70							
			Ls	lgt gr, wtbos.								
			Sha	raosm.	∠70							
			Ls	lgt gr, wtbos.	∠75							
240			Sha	raosm.	∠60							

Loralai Member-Unit-II

Depth (m)	Geolog. Log	Lithology Group	Rock	Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results Pb %	Zn %	Ba %	Ag g/t
		Loralai Member－Unit－II	Ls	lgt gr, olc, fos.	∠75							
			Sh	bk, lam, arg, fis.	∠75							
			Ls	lgt gr, olc, fos.	∠80							
					∠75							
245			Sh	bk, lam, arg.								
			Sha	raosm, fos.	∠70							
					∠75							
			Ls	lgt gr, fos.	∠70							
			Sha	raosm.	∠70							
250			Ls	lgt gr, cmp. wtbos.	∠75							
					∠75							
					∠75							
255					∠70							
			Sha	raosm.								
260					∠70							
			Ls	lgt gr, olc, fos.	∠70							
265			Sha	raosm, ml, dmt.								
			Sha	raosm, sh dmt.								
			Ls	lgt gr, wtbos, fos								
			Sh	lam, bk, fos.	∠70							
270					∠75							
			Ls	lgt gr, olc, fos.								
					∠70							
			Sh	bk, lam, fis, fos.	∠65							
275			Ls	lgt gr, wtbos.								
					∠65							
280			Sha	raosm, partly fos.	∠70							
283.3					∠70							
285		Loralai Member －Unit-I	Ls	lgt gr, wtbos.								
			Sh	bk, lam, arg, fis.	∠70							
			Ls	lgt gr, cmp, wtbos	∠70							
290												

Ca vn, vnt, flm.
Py dis

Depth (m)	Geolog. Log	Lithology Group	Rock	Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results Pb %	Zn %	Ba %	Ag g/t
		Loralai Member -Unit-I	Sha	raosm.	∠80							
			L s	lgt gr, wtbos.	∠70 Ca vn, vnt, flm. Py dis.							
295			Sha	raosm.	∠65							
			L s	lgt gr, cmp, wtbos.	∠70							
300			Sha	raosm.	∠70							
300.8			L s	gr, cmp, wtbos.	∠70							

Drill Hole No	: MJP-4	Elevation	: 1,461.01m
Location	: SURNAI-I	Inclination	: -70°
Coordinate Point	: N=1,125,382 E=2,008,151	Core Recovery	: 98.28%
Depth	: 401.0m	Term	: JUN 7 '88 ~ JUN 21 '88
Drilling Machine	: L-38		

Depth (m)	Geolog. Log	Lithology: Group	Lithology: Rock	Lithology: Remarks	Mineralization etc	Sample No.	Depth (m)	Nd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
5		Loralai Member-Unit-IV	L s	gr, cmp, wtbos.	Hmz Ca vn, vnt, flm							
10			S h	gr, lam, fis.								
15			L s	gr, pos, wtbos.								
20			S h	dk gr, lam, fis.	∠10 Py dis							
25			S h	cmp~lam, dk gr.	∠25 ∠30							
30			L s	gr, cmp, wtbos.	∠60							
35			S h	cmp~lam, dk gr.	∠70							
40			L s	gr, cmp, wtbos.								

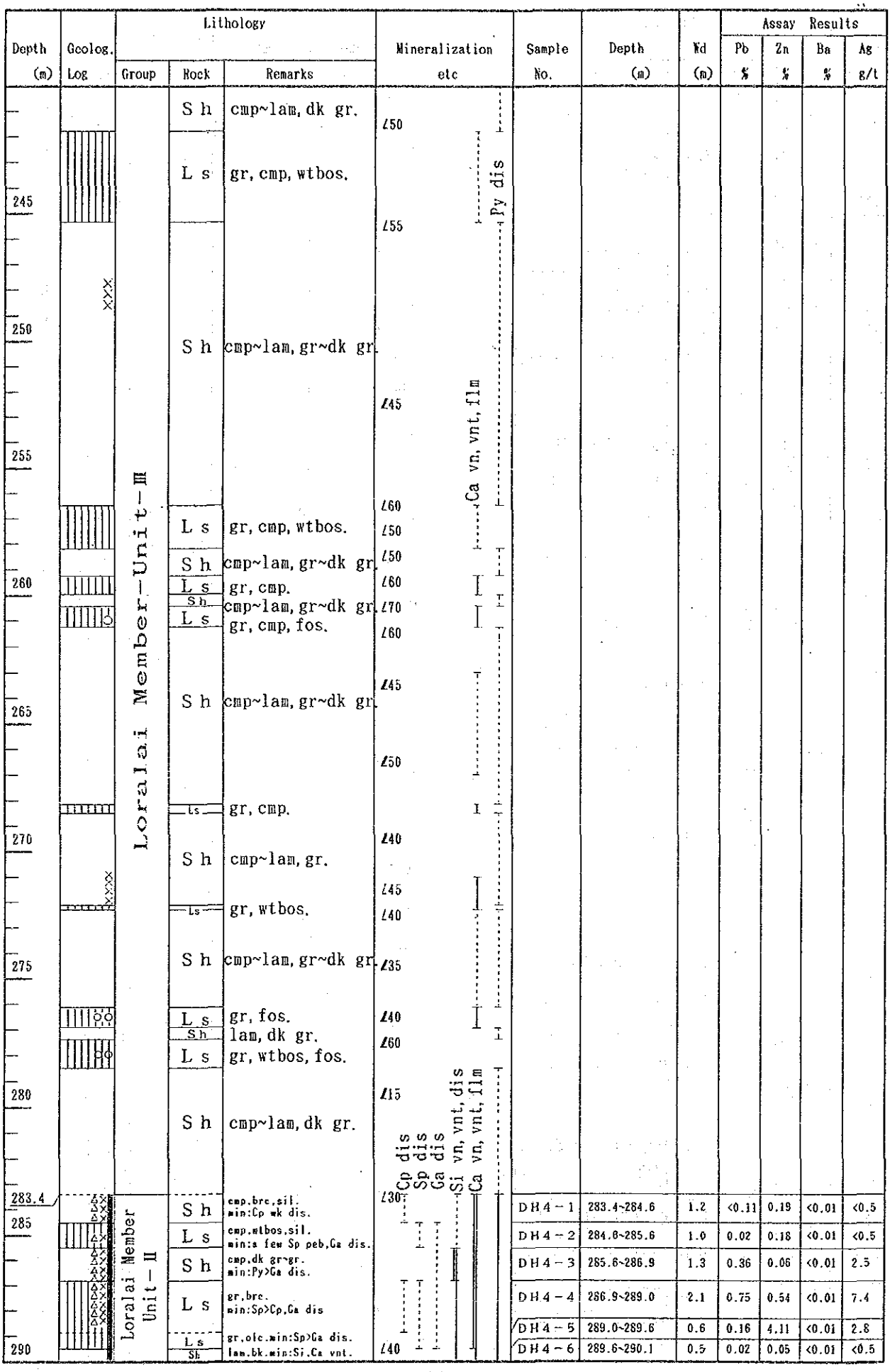
Fig. II-2-17 Drilling Columns of MJP-4

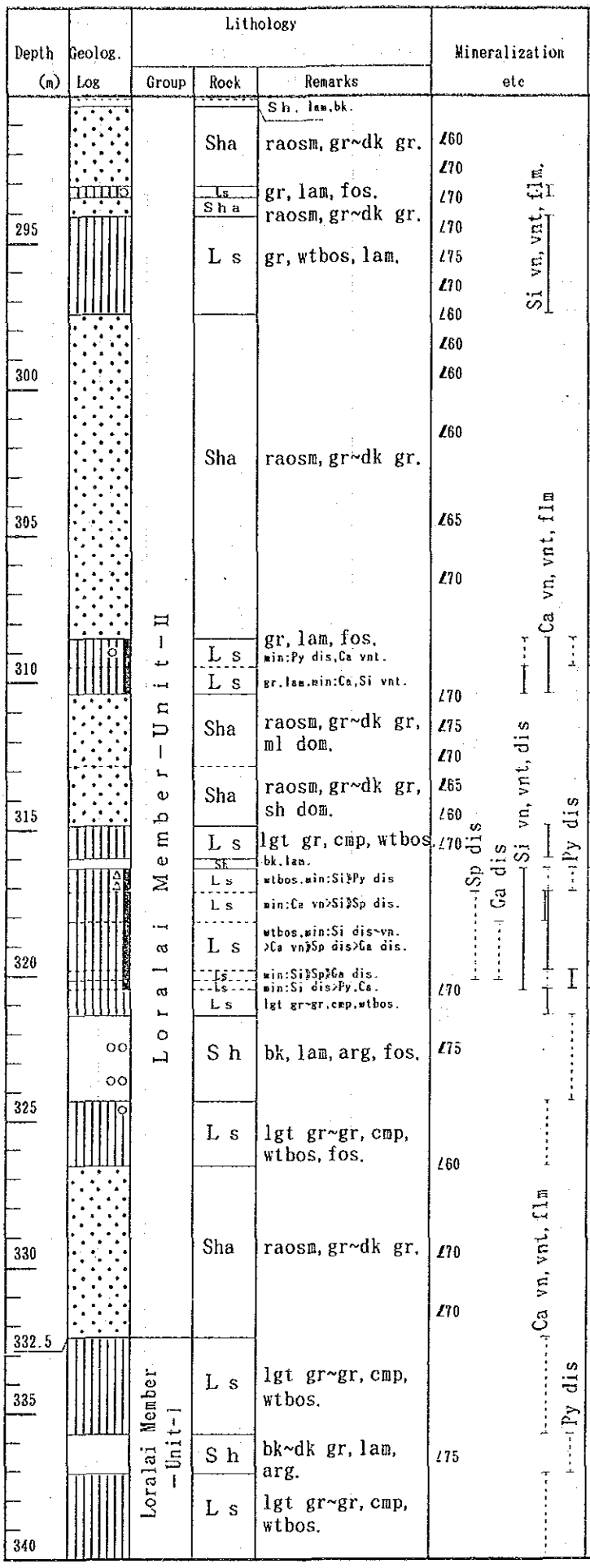
Depth (m)	Geolog. Log	Lithology: Group	Rock	Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
		Loralai Member-Unit-IV	L s	gr, cmp, wtbos.								
			Sh	dk gr, fis.								
			L s	gr, cmp, wtbos.								
			S h	dk gr, lam, fos.	∠20							
45			L s	gr, cmp.	∠20							
			S h	cmp~lam, dk gr~bk.	∠50 ∠60 Ca vn, vnt, flm, Py dis							
			L s	gr, cmp.								
50			S h	cmp, gr.	∠60							
			S h	lam, arg, dk gr~bk.	∠30 Hmz							
			L s	gr, cmp.	∠25							
55			S h	lam~cmp, bk~gr.								
			L s	gr, cmp, wtbos.	∠45							
			S h	cmp, gr.	∠30 ∠60							
60			S h	lam, bk, fis.	∠45							
			L s	gr, cmp, wtbos, fos.								
			S h	cmp, gr.	∠70							
65			S h	lam. dk gr~bk, fis.								
			S h	cmp, gr~dk gr.	∠50							
			L s	gr, cmp.								
70			Sh	lam, dk gr~bk.								
			S h	cmp, gr.								
			L s	gr, cmp.	∠60							
			Sh	lam, dk gr, cly.	∠45							
			L s	gr, cmp, wtbos.	∠70							
75			S h	cmp~lam, dk gr~bk, fos.	∠45 Ca vn, vnt, flm, Py dis							
80					∠45 ∠50 ∠45 ∠60 Hmz							
			L s	gr, cmp.								
85			S h	lam, bk~dk gr, fos.	∠50 ∠45							
90			L s	gr, cmp.	∠50							

Depth (m)	Geolog. Log	Lithology: Group	Lithology: Rock	Lithology: Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
		Loralai Member-Unit-W	L s	gr, cmp, fos.	Py dis							
95			S h	cmp~lam, dk gr, fos.								
			L s	gr, wtbos.								
100			S h	cmp~lam, dk gr, fos.	Ca vn, vnt, flm							
			L s	gr, wtbos, fos.								
			S h	cmp~lam, dk gr.								
105			L s	gr, cmp, fos.								
			S h	cmp~lam, dk gr.								
			L s	gr, cmp, wtbos, fos.								
110			S h	cmp~lam, dk gr.								
			L s	gr, wtbos.								
115			S h	cmp~lam, dk gr~bk.								
			L s	gr, cmp, wtbos.								
120			S h	lam, dk gr~bk.	Py dis							
			L s	gr, cmp, wtbos. fos.	Ilmz							
125			S h	lam~cmp, bk~dk gr.								
			L s	gr, cmp, wtbos.								
			S h	lam, bk~dk gr.								
130			L s	gr, cmp, wtbos, fos.								
			S h	cmp~lam, dk gr~bk.								
135			L s	gr, cmp, wtbos.								
			S h	cmp~lam, gr~bk.								
140			L s	gr, cmp, wtbos.								

Depth (m)	Geolog. Log	Lithology Group	Rock	Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results Pb %	Zn %	Ba %	Ag g/t
145.3		Loralai Member－Unit－IV	L s	gr, cmp, wtbos.	Ca vn,vnt, flm							
			Sh	lam, bk, cq.								
			L s	gr, cmp, wtbos.								
			Sh	lam,bk,cq.								
			L s	gr,cmp.								
			Sh	lam,bk,cq.								
			L s	gr,cmp,wtbos.								
			S h	lam~cmp, dk gr~bk.	Py dis							
150			L s	gr, cmp, wtbos.								
			S h	cmp~lam, dk gr. cq.								
155			L s	gr, cmp.								
			S h	lam~cmp, dk gr~bk.								
160			L s	gr, cmp, wtbos.								
		Loralai Member－Unit－III	S h	cmp~lam, dk gr~bk. cq.	Py dis							
165				cmp, dk gr, fos.								
			L s	gr, cmp, wtbos.								
170			S h	cmp~lam, dk gr~bk.	Ca vn, vnt, flm.							
			L s	gr, cmp.								
			Sh	lam,cq.								
			L s	gr,cmp.								
175			Sh	lam,bk,fos.								
			L s	gr,cmp.								
			S h	lam~cmp, dk gr~bk.								
			Ls	cq.								
				gr, cmp.								
180			S h	cmp~lam, dk gr, fos.								
			L s	gr, cmp, wtbos.								
185			S h	lam~cmp, bk~dk gr, cly.								
			L s	gr, cmp, wtbos, fos.								
190			Sh									

Depth (m)	Geolog. Log	Lithology: Group	Lithology: Rock	Lithology: Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
195		Loralai Member-Unit-III	S h	lam, bk, cly.								
			L s	gr, cmp.	I							
			S h	lam, bk, fis, cly.								
			S h	cmp~lam, dk gr.								
			L s	gr, wtbos.	I							
200			S h	cmp~lam, dk gr~bk.	Py dis							
205			L s	gr, wtbos; fos.								
			S h	cmp~lam, dk gr.								
			L s	gr, wtbos.								
210			S h	cmp~lam, dk gr~bk.								
			L s	gr, wtbos, fos.								
215			S h	cmp~lam, dk gr~bk, fis.								
			L s	gr, cmp, wtbos, fos.	I							
220			S h	cmp~lam, gr~dk gr.	Py dis Ca vn, vnt, flm							
225			L s	gr, cmp, wtbos.								
			S h	cmp, dk gr~gr.								
			L s	gr, wtbos, fos.								
			S h	cmp~lam, dk gr~bk.								
230			L s	gr, cmp, wtbos.								
			S h	cmp~lam, bk~dk gr, fos.								
235			L s	gr, cmp, wtbos, fos.								
			S h	cmp~lam, dk gr.								
			L s	gr, cmp.	I							
240			S h	cmp~lam, dk gr.								


Depth (m)
Geolog. Log
Lithology
Group
Rock
Remarks
Mineralization etc
Sample No.
Depth (m)
Wd (m)
Assay Results
Pb %
Zn %
Ba %
Ag g/t
Loralai Member－Unit－III
Loralai Member Unit－II
S h cmp~lam, dk gr.
L s gr, cmp, wtbos.
S h cmp~lam, gr~dk gr.
L s gr, cmp, wtbos.
S h cmp~lam, gr~dk gr.
L s gr, cmp.
S h cmp~lam, gr~dk gr.
L s gr, cmp, fos.
S h cmp~lam, gr~dk gr.
Ls gr, cmp.
S h cmp~lam, gr.
Ls gr, wtbos.
S h cmp~lam, gr~dk gr.
L s gr, fos.
Sh lam, dk gr.
L s gr, wtbos, fos.
S h cmp~lam, dk gr.
S h cmp,brc,sil. min:Cp wk dis.
L s cmp,wtbos,sil. min:a few Sp peb,Ga dis.
S h cmp,dk gr~gr. min:Py>Ga dis.
L s gr,brc. min:Sp>Cp,Ga dis
L s gr,oic.min:Sp>Ga dis.
Sh lam,bk.min:Si,Ca vnt.
Py dis
Ca vn, vnt, flm
Cp dis
Sp dis
Ga dis
Si vn, vnt, dis
Ca vn, vnt, flm
DH4－1 283.4~284.6 1.2 <0.11 0.19 <0.01 <0.5
DH4－2 284.6~285.6 1.0 0.02 0.18 <0.01 <0.5
DH4－3 285.6~286.9 1.3 0.36 0.06 <0.01 2.5
DH4－4 286.9~289.0 2.1 0.75 0.54 <0.01 7.4
DH4－5 289.0~289.6 0.6 0.16 4.11 <0.01 2.8
DH4－6 289.6~290.1 0.5 0.02 0.05 <0.01 <0.5



Sample No.	Depth (m)	Wd (m)	Assay Results Pb %	Zn %	Ba %	Ag g/t
DH4-1~6	283.4~290.1	6.7	0.33	0.62	<0.01	3.3
DH4-7	308.5~309.6	1.1	0.01	0.03	<0.01	<0.5
DH4-8	309.6~310.4	0.8	0.01	0.03	<0.01	<0.5
DH4-7~8	308.5~310.4	1.9	0.01	0.03	<0.01	<0.5
DH4-9	316.2~317.1	0.9	0.01	<0.01	<0.01	<0.5
DH4-10	317.1~318.1	1.0	0.01	0.02	<0.01	<0.5
DH4-11	318.1~319.9	1.8	0.08	0.72	<0.01	0.5
DH4-12	319.9~320.2	0.3	0.06	11.10	<0.01	5.6
DH4-13	320.2~320.4	0.2	0.02	0.12	<0.01	0.5
DH4-9~13	316.2~320.4	4.2	0.04	1.11	<0.01	0.9

Depth (m)	Geolog. Log	Lithology: Group	Rock	Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
			L s	lgt gr~gr, cmp, wtbos.	∠70							
			Sha	raosm, gr~dk gr.								
345			L s	lgt gr~gr, cmp, wtbos.	∠70							
			Sha	raosm, gr~dk gr.	∠70							
			L s	lgt gr~gr, cmp, wtbos.	∠70							
350					∠75							
			Sha	raosm, gr~dk gr.	∠75							
			L s	lgt gr~gr, cmp, wtbos.	∠80							
355					∠70							
			Sha	raosm, gr.	∠70							
			L s	lgt gr~gr, cmp, wtbos.	∠75							
360					∠70							
			Sha	raosm, gr.	∠75							
			Ls	gr, wtbos.	∠75							
			Sha	raosm, gr.	∠70							
			Sh	bk~dk gr, lam.	∠70							
365			Ls	gr, fos.								
			Sha	raosm, gr~dk gr.	∠70							
			L s	lgt gr~gr, cmp, wtbos.	Ca vn, vnt, flm							
370					∠70							
			Sha	raosm, gr~dk gr.	∠70							
			S h	bk, lam.	∠70							
			L s	gr, cmp, wtbos.	∠70							
375			Sha	raosm, lgt gr~gr.	∠60							
			S h	bk, lam, fis, arg.	∠70							
			L s	lgt gr~gr, cmp, wtbos, fos.	∠60							
			S h	bk, lam, fis, arg.	∠70							
380			L s	lgt gr~gr, cmp, wtbos.	∠80							
			Sh	bk, lam, fis.	∠70							
			L s	lgt gr~gr, cmp, wtbos.	∠75							
385					∠70							
			Sha	raosm, gr~lgt gr.	∠60							
			L s	lgt gr~gr, cmp, wtbos.	∠60							
					∠70							
390			Sha	raosm, gr~lgt gr.	∠70							

Loralai Member－Unit－1

Py dis

Depth (m)	Geolog. Log	Lithology: Group	Rock	Remarks	Mineralization etc	Sample No.	Depth (m)	Wd (m)	Assay Results: Pb %	Zn %	Ba %	Ag g/t
		Loralai Member —Unit-I	Sh	bk, lam, fis.	∠75							
			L s	lgt gr~gr, cmp, wtbos.	∠65							
			S h	bk, lam, fis.	∠70							
395			L s	lgt gr~gr, cmp, wtbos.	∠70 Ca vn, vnt, flm; Py dis							
			S h	bk, lam, fis.	∠70							
			L s	lgt gr~gr, cmp, wtbos.	∠70							
400												
401												