

Figure A-5-1 H-V Curve of Capayas Dam

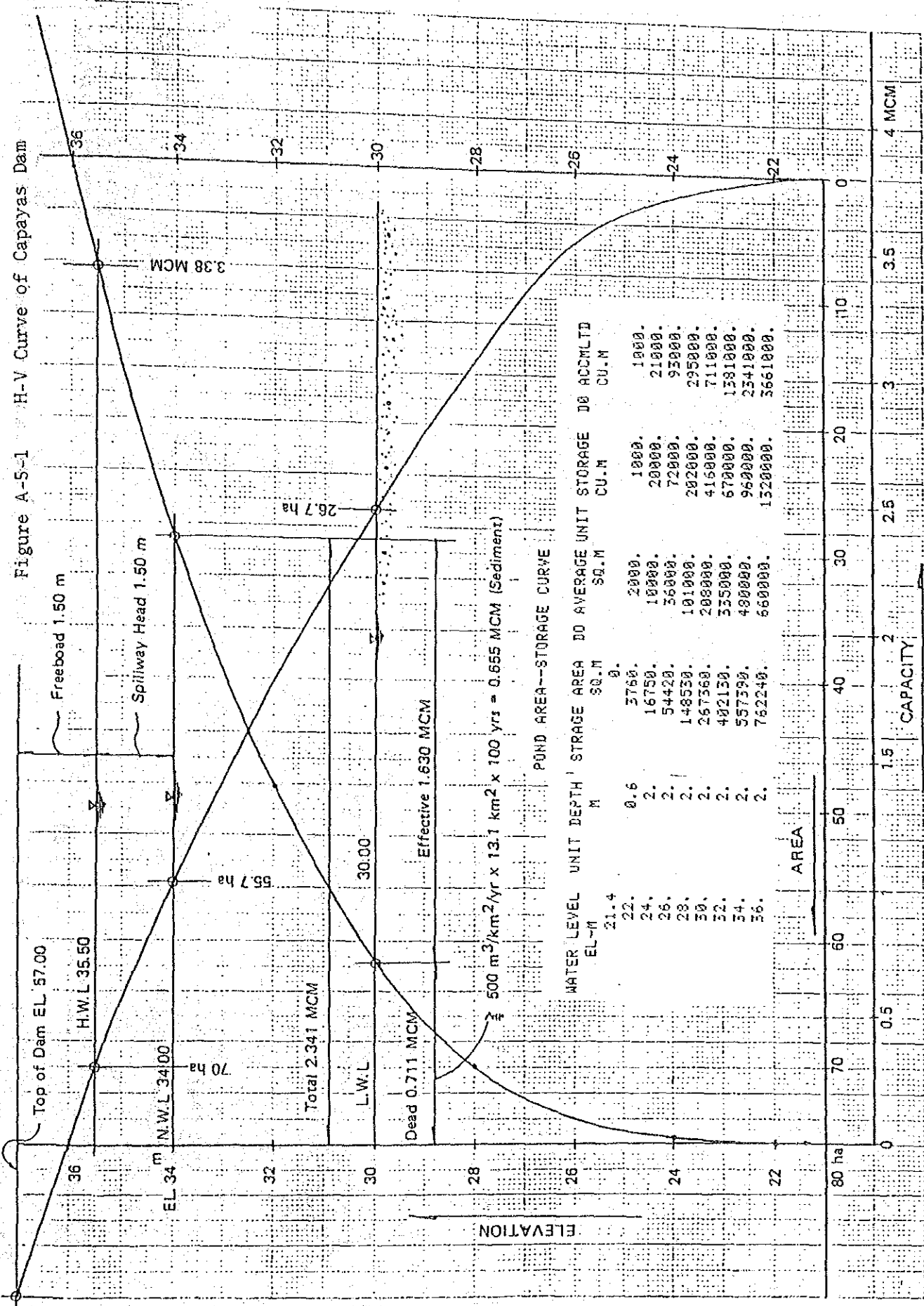
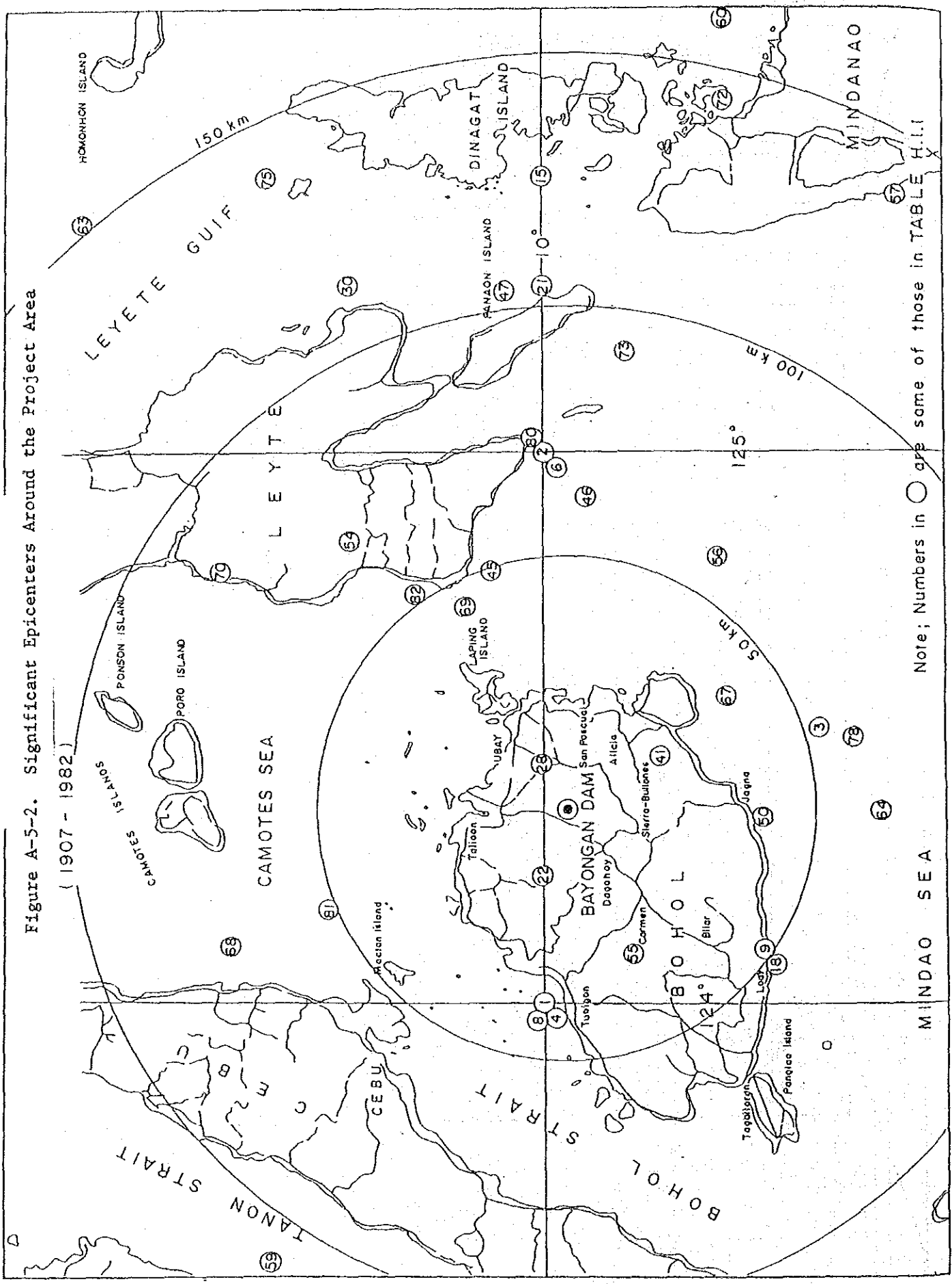


Figure A-5-2. Significant Epicenters Around the Project Area

(1907 - 1982)



Note; Numbers in  are same of those in TABLE H.I.I

Figure A-5-3 Probability of Earthquakes at Dam Site

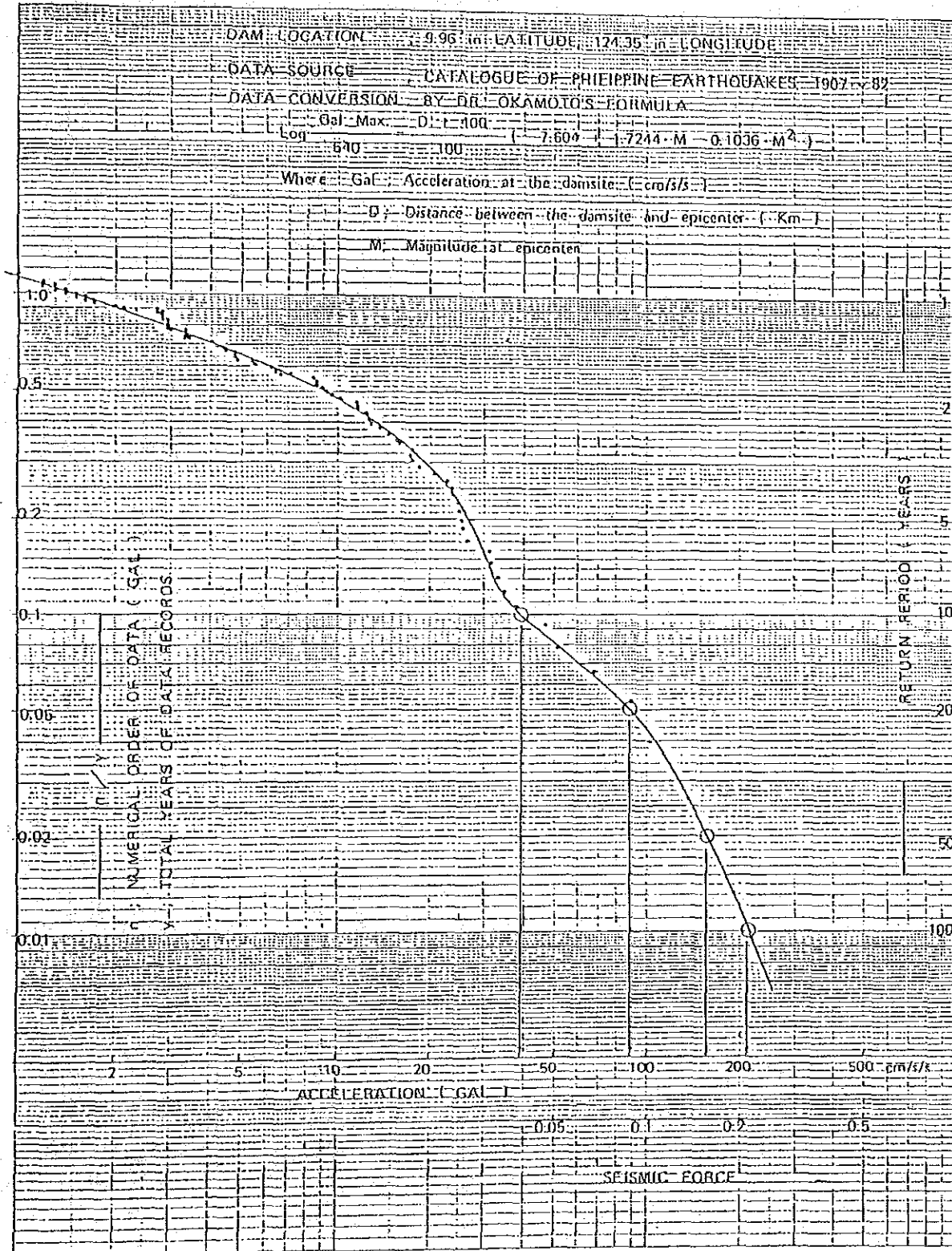


Figure A-5-4. Cropping Pattern by Farm Types

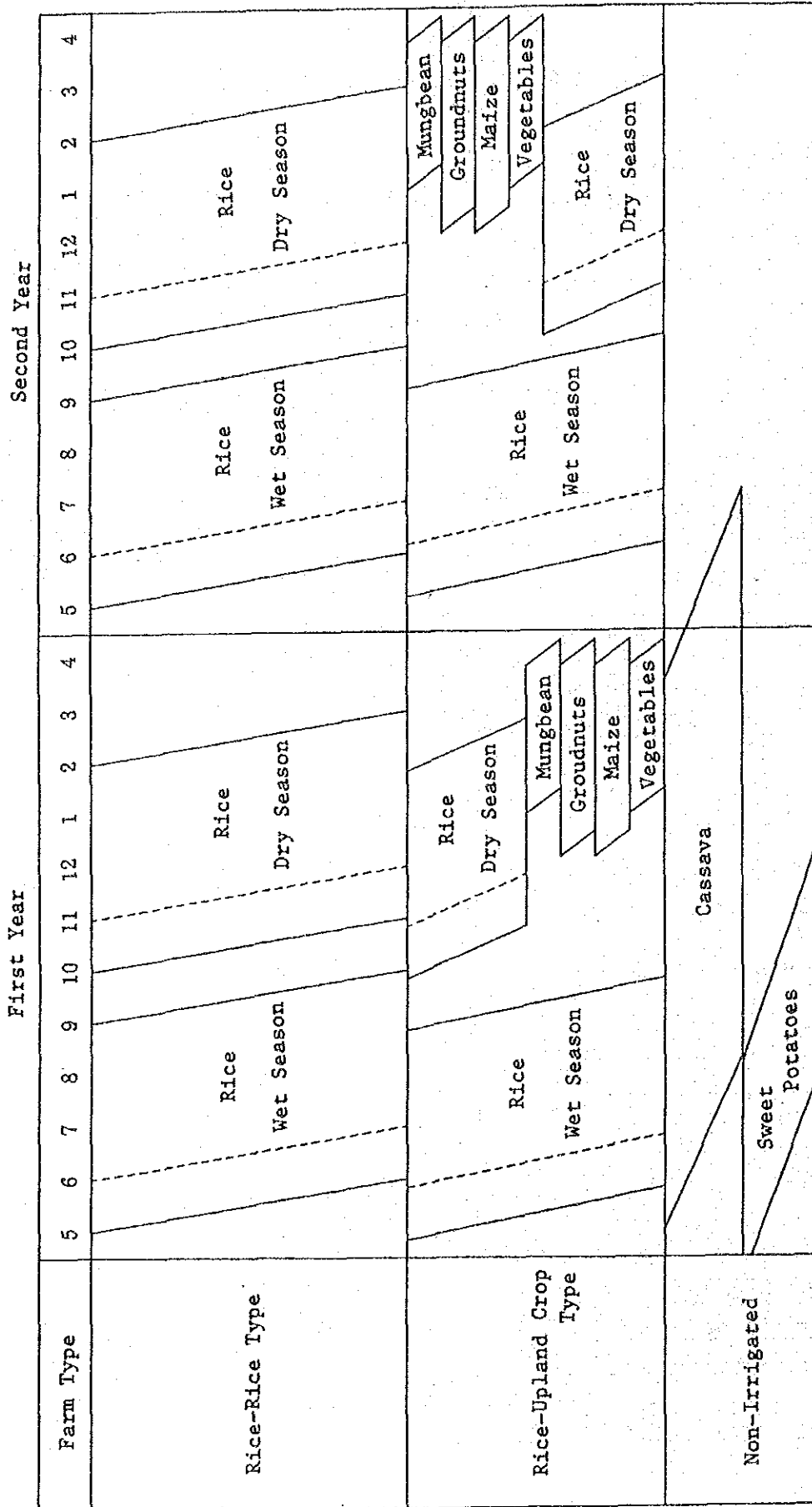


Figure A-5-5. Unit Water Requirement by 10-days of Wet and Dry Season Rice

MONTH	MAY	JUNE	JULY	AUG.	SEP.	OCT.																
10-DAY CROP WATER REQUIREMENT (mm)	$W_1 = 76.0$	$W_2 = 67.0$	$W_3 = 65.0$	$W_4 = 66.0$	$W_5 = 58.0$	$W_6 = 58.0$																
GROWING STAGE OF PADDY																						
IRRIGATION SCHEDULE							(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	
CALCULATION OF WEIGHTED CROP WATER REQUIREMENT							$WR = 19P_2 / 40$	$WR = (20P_2 + 9P_1 + 3P) / 40$	$WR = (20P_2 + 10P_1 + 10P + 5W_2) / 40$	$WR = (20P_2 + 10P_1 + 10P + 20W_2) / 40$	$WR = (P_2 + 10P_1 + 10P + 20W_2 + 10W_3) / 40$	$WR = (P_1 + 7P + 20W_3 + 20W_2) / 40$	$WR = (15W_2 + 30W_3) / 40$	$WR = (30W_3 + 10W_4) / 40$	$WR = (20W_3 + 20W_4) / 40$	$WR = (10W_3 + 30W_4) / 40$	$WR = (30W_4 + 10W_5) / 40$	$WR = (20W_4 + 20W_5) / 40$	$WR = (10W_4 + 20W_5) / 40$	$WR = 20W_5 / 40$	$WR = 10W_5 / 40$	

MONTH	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.																
10-DAY CROP WATER REQUIREMENT (mm)	$W_1 = 58.0$	$W_2 = 59.0$	$W_3 = 54.0$	$W_4 = 63.0$	$W_5 = 60.0$	$W_6 = 69.0$																
GROWING STAGE OF PADDY																						
IRRIGATION SCHEDULE							(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	
CALCULATION OF WEIGHTED CROP WATER REQUIREMENT							$WR = 19P_2 / 40$	$WR = (20P_2 + 9P_1 + 3P) / 40$	$WR = (20P_2 + 10P_1 + 10P + 5W_2) / 40$	$WR = (20P_2 + 10P_1 + 10P + 20W_2) / 40$	$WR = (P_2 + 10P_1 + 10P + 20W_2 + 10W_3) / 40$	$WR = (P_1 + 7P + 20W_3 + 20W_2) / 40$	$WR = (15W_2 + 30W_3) / 40$	$WR = (30W_3 + 10W_4) / 40$	$WR = (20W_3 + 20W_4) / 40$	$WR = (10W_3 + 30W_4) / 40$	$WR = (30W_4 + 10W_5) / 40$	$WR = (20W_4 + 20W_5) / 40$	$WR = (10W_4 + 20W_5) / 40$	$WR = 20W_5 / 40$	$WR = 10W_5 / 40$	

Figure A-5-7 Geology and Site Investigation Map at Dam Site and reservoir Area

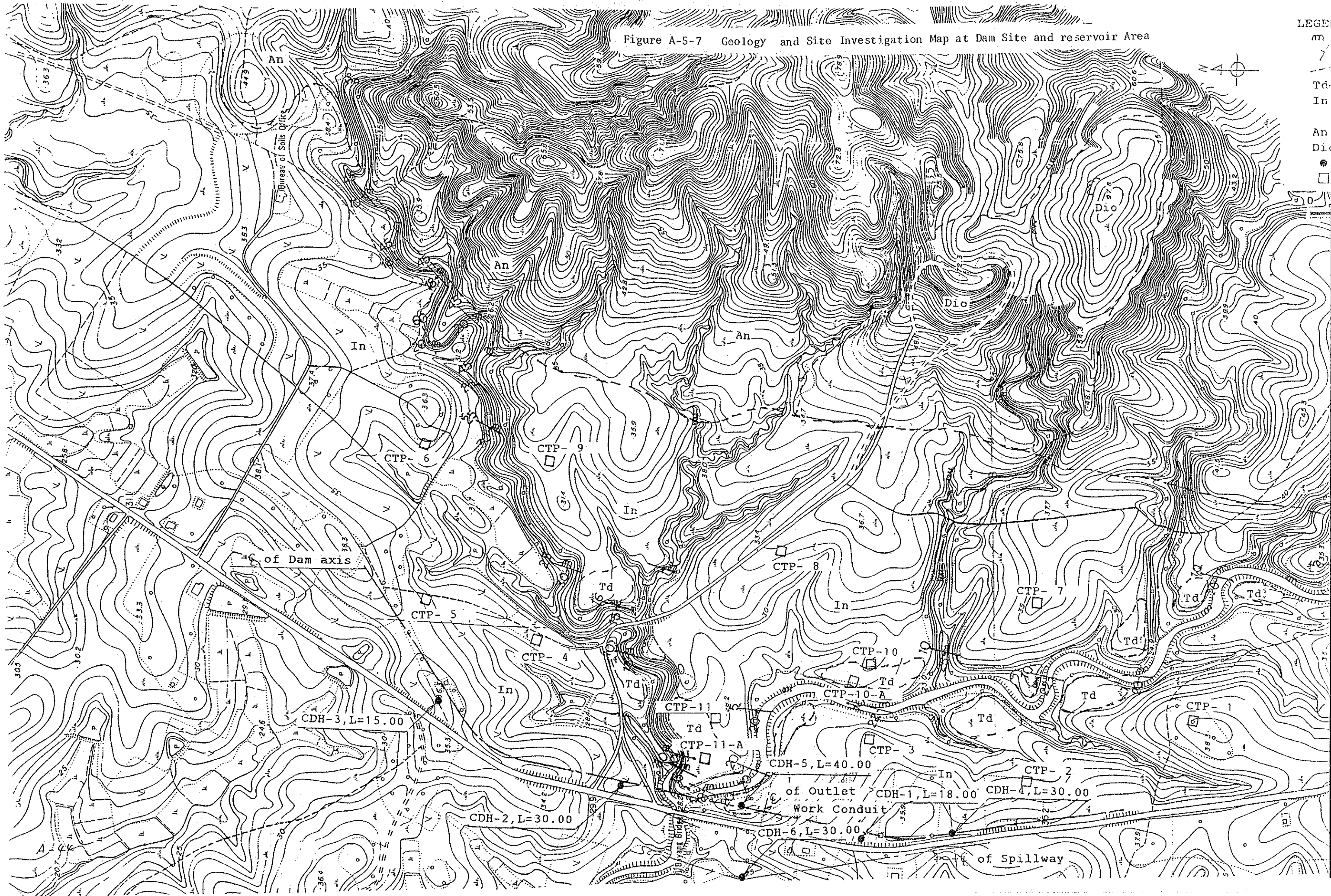
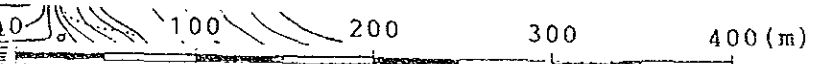


Figure A-5-7 Geology and Site Investigation Map at Dam Site and reservoir Area

LEGEND

- m Outcrop
- / Strike and Dip of Strate
- - - Geological Contact line
- Td Terrace Deposit
- In Interbedded Conglomerate, Sandstone
Siltstone and Limestone
- An Andsite
- Dio (Quartz) Diorite
- Bore Holl
- Test Pit



Scale 1: 4000

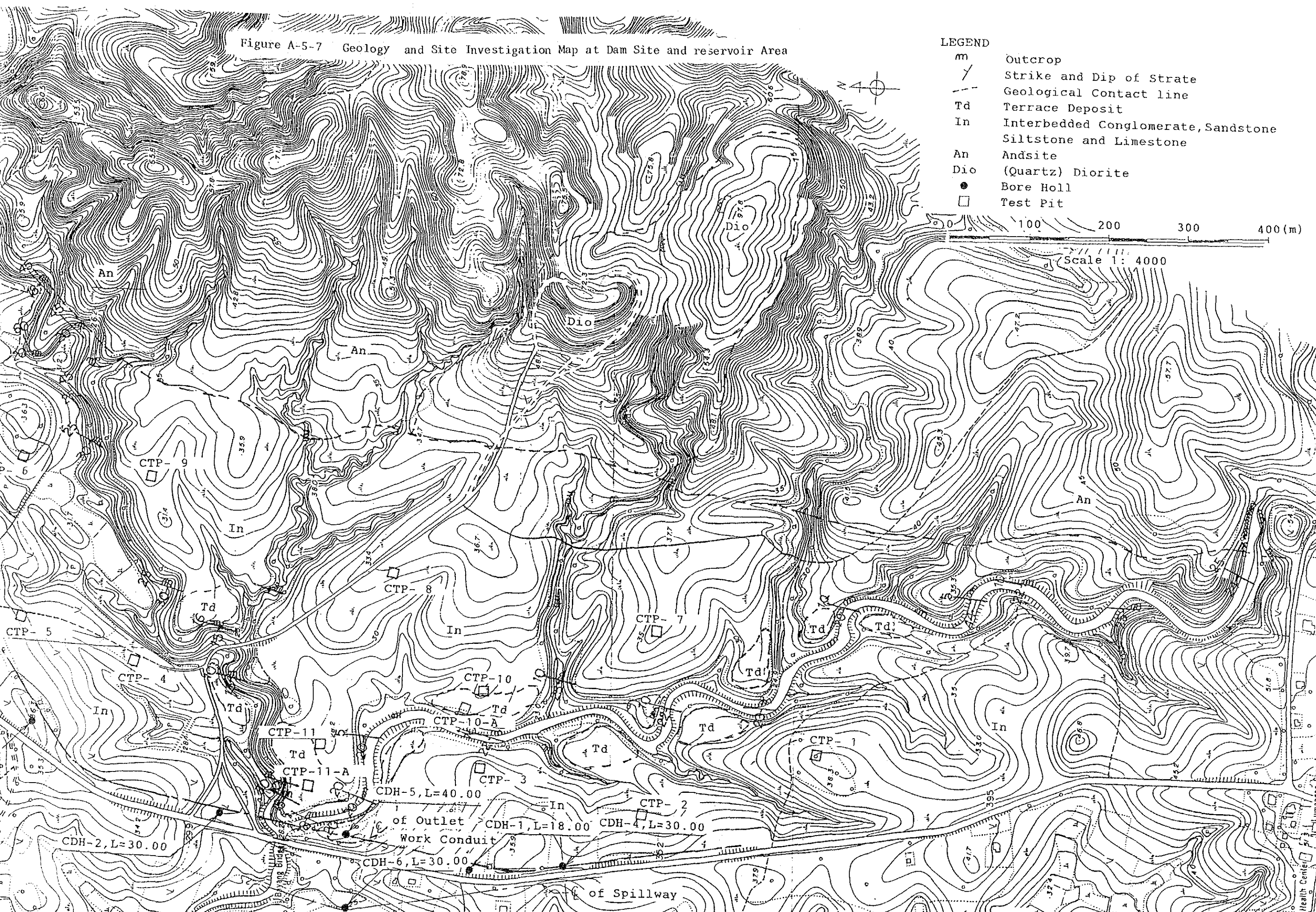


Figure A-5-8 Borehole Log Book at Capayas Dam Site

BOREHOLE: CDH-1
EL 33.07

BOREHOLE: CDH-3
EL 34.98

BOREHOLE: CDH-5
EL 25.80

1985

DEPTH (m)	GEOLOGY	CLASS	RQD (%)	SPT (N)	LUGEON
10	GC				
227	EW	D			
307	MW				
	MW	CL			35.2
5.28	SS/SLS		12		
6.1	SS/SLS		35		
6.48	SS/SLS		10		26.9
		CL	23		
		CM	0		
10	SLS/SS	Fr	17		41.8
			17		
		CM	85		
			54		12.4
15			44		
			70		
			55		13.8
			46		

1985

DEPTH (m)	GEOLOGY	CLASS	RQD (%)	SPT (N)	LUGEON
1.6	SLC				
	SC				
2.8	EW	D			
	SM	CL	16		76.1
5.0			27		
			60		
			0		
			60		70.2
			29		
10	SLT/ST/Con	Fr	44		49.6
		CM	23		
			57		
12.75			37		
	ST/Con		0		12.8
15			0		

1989

DEPTH (m)	GEOLOGY	CLASS	RQD (%)	SPT (N)	LUGEON
1.0	GC				
	SLC				
3.0					
3.8	EW	D			
	MM	CL			(8.0)
5.5	SW		0		P=0.3
	Fr	CL	0		
7.0		CM	0		
7.6	EW	D	0		
			40		2.2
10			0		
			62		
		CL	42		
12		CL	26		1.4
	Fr	I	37		
		CM	76		
15			37		
	CS/SS		67		2.5
			25		
			24		
19					
20	EW	D	0		
	MW	CL	0		
22			0		
	EW	D	0		1.7
23.9			0		
25	Fr	CM	30		
26	EW	D	0		
	Fr	CL	0		
		CM	47		22.7
28			0		
	EW	D	0		
30			0		
31	Fr	CM	68		
	EW	D	0		
32.5			0		
33	SS	CL	48		20.9
	EW	D	0		
35			0		
	Fr	CM	50		
			0		
37	SS/SLS/CS		0		
	EW	D	0		16.5
38.3			55		
	Fr	CM	50		

BOREHOLE: CDH-2
EL 28.00

BOREHOLE: CDH-4
EL 33.50

1985

DEPTH (m)	GEOLOGY	CLASS	RQD (%)	SPT (N)	LUGEON
0.3	GC				
1.2	GC				
	EW	D			
3.4	SM	CL	25		
4.86		CL	13		
		CM	12		42.3
			17		
7.5	SLS/SS		21		
			44		
10			28		7.2
			45		
		CM	11		
			28		2.7
15	SS		37		
			76		
			0		1.2
18			0		
	Con		0		
20			18		1.0
			0		
		CL	0		1.1
			34		
		CM	72		0.3
			20		
			0		
			0		
			0		1.5
			19		

1989

DEPTH (m)	GEOLOGY	CLASS	RQD (%)	SPT (N)	LUGEON
0.5	TS				
	SC				
3.0					
	EW	D			
4.5	SM	CL	32		
5.0	EW	D	0		
5.8			0		
	Fr	CM	23		
7.0			0		
7.8	EW	D	0		
			49		9.5
			30		
10		CM	22		
			0		
			0		5.6
13		D	14		
13.85			0		
15	SS/SLS/CS/Con	CM	80		
16			27		
16.85		D	0		
	Fr		77		25.2
			29		
20			52		
			11		
		CM	68		5.5
			49		
			68		
25			49		
			56		
			73		5.8
			66		
			22		
30	CS		73		

LEGEND:

- TS - Top Soil
- GC - Gravely Clay
- SC - Sandy Clay
- SLC - Silty Clay
- Con - Conglomerate
- SS - Sandstone
- SLS - Siltstone
- CS - Claystone
- EW - Extremely Weathered
- MW - Moderately Weathered
- SW - Slightly Weathered
- Fr - Fresh Rock
- / : interbedded

BOREHOLE LOGGINGS
AT CAPAYAS DAMSITE

BOREHOLE: CDH-6
EL 25.00

1989

DEPTH (m)	GEOLOGY	CLASS	RQD (%)	SPT (N)	LUGEON
0.5	SC				
2.0	EW	D			
3.3	SW	CL	38		
5.0	Fr	CM	0		
7.3	Fr	CM	68		
7.3	Fr	CM	68		
7.3	Fr	CM	27		
7.3	Fr	CM	52		13.9
10	EW	D	38		
10.3	SS		0		
10.3	SS		72		
10.3	Fr	CM	48		7.8
10.3	Fr	CM	36		
15	Fr	D	0		
15.7	Fr	CM	0		
18	Fr	CM	53		5.8
18	Fr	D	32		
20	Fr	CL	16		
21	Fr	CM	57		
21	Fr	CM	66		5.0
21	Fr	CM	52		
21	Fr	CM	0		
21	Fr	CM	35		
21	Fr	CM	53		
21	Fr	CM	0		
21	Fr	CM	95		4.9
21	Fr	CM	84		

TEST PIT NO. CTP- 1

(1985)

DEPTH (m)	GEOLOGY	WEATHER-ING	CLAS-SIFICATION	SAMPLING	REMARKS
0.6	SLC		ML		
1	GC		GC		
1.25	SLS	FW	BEDROCK	NO SAMPLE	
1.85	SLS	FW	BEDROCK	NO SAMPLE	
2	SS	MW	BEDROCK	NO SAMPLE	1.8
2.45					MATERIAL INVESTIGATION

TEST PIT NO. CTP- 2

(1985)

DEPTH (m)	GEOLOGY	WEATHER-ING	CLAS-SIFICATION	SAMPLING	REMARKS
0.6	GC		GC		
1	SLC		ML	SAMPLE TAKEN 35kg	
1.65	SLS	FW	BEDROCK	SAMPLE TAKEN 35kg	1.25
2	SLS/SS	FW	BEDROCK	SAMPLE TAKEN 35kg	
2.40					

TEST PIT NO. CTP- 3

(1985)

DEPTH (m)	GEOLOGY	WEATHER-ING	CLAS-SIFICATION	SAMPLING	REMARKS
0.7	C		CM		
1	SLC		ML	SAMPLE TAKEN 35kg	
1.2	SS	EW	BEDROCK	SAMPLE TAKEN 35kg	MATERIAL INVESTIGATION
1.95					

TEST PIT NO. CTP- 4

(1985)

DEPTH (m)	GEOLOGY	WEATHER-ING	CLAS-SIFICATION	SAMPLING	REMARKS
0.3	TS				
1	SLC		ML	SAMPLE TAKEN 35kg	
1.2					MATERIAL INVESTIGATION
2		EW	BEDROCK	SAMPLE TAKEN 35kg	
2.5	SLC/SS		BEDROCK	SAMPLE TAKEN 35kg	2.50
3		SW			
3.7		Fr			

TEST PIT NO. CTP- 5

(1985)

DEPTH (m)	GEOLOGY	WEATHER-ING	CLAS-SIFICATION	SAMPLING	REMARKS
0.3	TS				
1	GC		GC	40kg	
1.25					1.35
2	SLS	FW	BEDROCK	SAMPLE TAKEN 40kg	
2.4		MW			
2.9	SS	Fr			

TEST PIT NO. CTP- 6

(1985)

DEPTH (m)	GEOLOGY	WEATHER-ING	CLAS-SIFICATION	SAMPLING	REMARKS
0.3	TS				
1	C		CL		
1.2					MATERIAL INVESTIGATION
1.8	SLC		ML		
2		EW	BEDROCK	NO SAMPLE	
2.4	SLS/SS	FW	BEDROCK	NO SAMPLE	
3		MW			2.60
3.30					

TEST PIT LOGGINGS AT CAPAYAS DAMSITE

TEST PIT NO. CTP- 7

(1989)

DEPTH (m)	GEOLOGY	WEATHER- ING	CLAS- SIFICATION	SAMPLING	REMARKS
0.3	TS				MATERIAL INVESTIGATION
	GC		GC		
1.1		EW	SM	SAMPLE TAKEN 55kg	
1.8	SLS /SS /CS				
2		EW			
3		MW	BEDROCK		
4					
5	SW				

TEST PIT NO. CTP- 8

(1989)

DEPTH (m)	GEOLOGY	WEATHER- ING	CLAS- SIFICATION	SAMPLING	REMARKS
0.5	TS				MATERIAL INVESTIGATION
0.7	GC		GC		
1	SC		SC	SAMPLE TAKEN 70kg	
1.4			GC		
1.7	GC		GC		
1.9		EW			
3	SLS /SS /Con	MW	BEDROCK		
3.9					
4	SS	SN			
5					

TEST PIT NO. CTP- 9

(1989)

DEPTH (m)	GEOLOGY	WEATHER- ING	CLAS- SIFICATION	SAMPLING	REMARKS
0.2	TS				MATERIAL INVESTIGATION
0.5	GC		GC		
1	SLS /SS	EW	SM	SAMPLE TAKEN 47kg	
2					
2.9		MW	BEDROCK		
3	SS				
3.4					
4	SLS /SS /CS	SW			
5					

TEST PIT NO. CTP-10

(1989)

DEPTH (m)	GEOLOGY	WEATHER- ING	CLAS- SIFICATION	SAMPLING	REMARKS
0.5	TS				MATERIAL INVESTIGATION
	GC		GC		
0.95	SIS		SM	SAMPLE TAKEN 60kg	
1.4					
2	GSL		GM		
2.4					
3	GS	MW	GW		

TEST PIT NO. CTP-10-A

(1989)

DEPTH (m)	GEOLOGY	WEATHER- ING	CLAS- SIFICATION	SAMPLING	REMARKS
0.4	TS				NO SAMPLE MATERIAL INVESTIGATION
1	SC (G)		ML		
1.45					
	C		CL		

TEST PIT NO. CTP-11

(1989)

DEPTH (m)	GEOLOGY	WEATHER- ING	CLAS- SIFICATION	SAMPLING	REMARKS
0.2	TS				NO SAMPLE MATERIAL INVESTIGATION
	SIS		SM		
1.1					
	SLS		ML		
1.95		EW			
	SS		SW		
2.7					
3	SLT	MW			

TEST PIT NO. CTP-11-A

(1989)

DEPTH (m)	GEOLOGY	WEATHER- ING	CLAS- SIFICATION	SAMPLING	REMARKS
1.1	TS				MATERIAL INVESTIGATION
	GC		GC	SAMPLE TAKEN 60kg	
2					

LEGEND:

- TS - Top Soil
- G - Gravel
- GS - Sandy Gravel
- GSL - Silty Gravel
- GC - Clayey Gravel
- SIS - Silty Sand
- SC - Clayey Sand
- SLC - Silty Clay
- Com - Conglomerate
- SS - Sandstone
- SLS - Siltstone
- CS - Claystone

- EW - Extremely Weathered
- MW - Moderately Weathered
- SW - Slightly Weathered
- Fr - Fresh Rock
- / : Interbedded

Figure A-5-10 Flood Water Balance

FLOOD ROUTING (CAPAYAS DAM)

Spillway weir length $L = 60\text{ m}$

$Q_{\text{max}} = 417\text{ cu. m/sec}$

- ($L \dot{=} 80, Q_p = 256$)
- ($L \dot{=} 70, Q_p = 242$)
- $Q_{\text{peak}} 226\text{ cu. m/sec}$
- ($L \dot{=} 50, Q_p = 206$)
- ($L \dot{=} 40, Q_p = 183$)

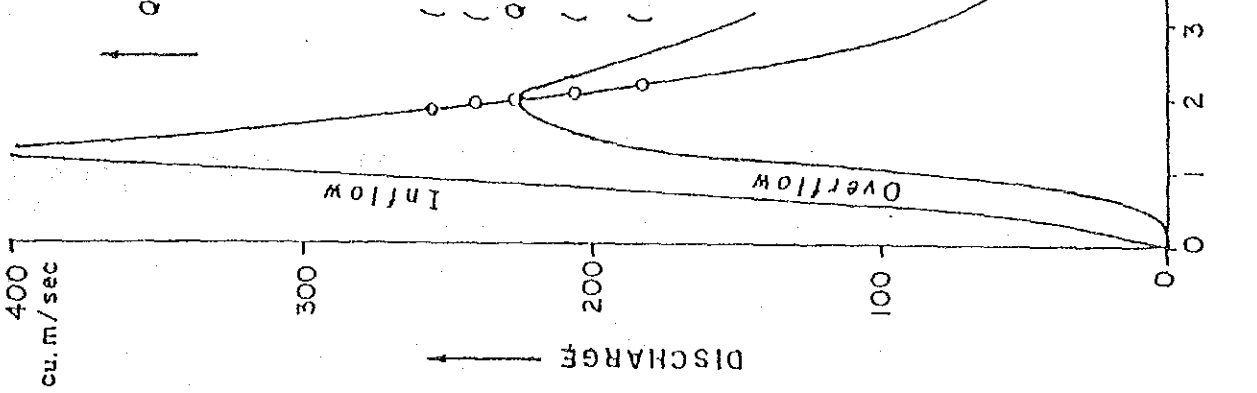


Figure A-5-11 Projected Flood Conditions (Capayas Dam)

Station (m)	Bottom (m)	Width (m)	Flow Depth (m)	Velocity (m/s)	Froude Number	Remarks
CHUTE						
0 + 0.00	El. 34.00	60	1.13	3.33	1.00	Crest
0 + 3.79	31.33	60	0.43	8.68	4.21	} Chute Entered
0 + 13.00	31.23	60	0.46	8.25	3.90	
SIDE CHANNEL						
0 - 60.00	30.00	6.5	-	-	-	} Flip Bucket
0 + 0.00	27.50	8	4.33	6.52	1.00	
0 + 125.00	26.25	8	3.33	8.48	1.48	
0 + 200.00	(22.50)	8	2.35	12.0	2.51	

Figure A-5-12. DISCHARGE CAPACITY OF INTAKE CONDUIT

