

**LIBRO DE DATOS**

**10: LA PRESA DE SAN ESTEBAN**

## **Libro de Datos 10**

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## **LIBRO DE DATOS 10: LA PRESA DE SAN ESTEBAN**

### **1. DATOS DEL CAUDAL**

Los Cuadros 10.1 - 10.11, muestran los datos del caudal en Villerías y Moscoso entre 1970 y 1980.

Los Cuadros 10.12 - 10.22, muestran los datos del flujo convertido en la Presa de San Esteban.

La Fig. 10.1 a la Fig. 10.10, muestran el régimen del caudal de la Presa de San Esteban.

### **2. LINEA DE EXCAVACION DE LA PRESA**

La Fig. 10.11 muestra la línea proyectada de excavación para la presa. Se estimó que la profundidad de la roca débil es de 5 metros.

### **3. ANALISIS DE ESTABILIDAD DE LAPRESA**

Los Cuadros 10.23 y 10.24 muestran el análisis de estabilidad de la sección de la gravedad del concreto y la sección de escollera para la presa.

### **4. ESTIMACION DEL COSTO DE LA PRESA**

El Cuadro 10.25 muestra el cálculo del volumen y el costo de la Presa "15 de Septiembre" y el Cuadro 10.26 muestra el volumen de cálculo y la estimación del costo de la Presa de San Esteban.

### **5. CONCEPTO DE DISTRIBUCION DE COSTOS DE LA PRESA MULTI-PROPOSITO**

Para la distribución de los costos de la Presa de San Esteban, se adoptó el Método de Costo del Proyecto Alternativo. En este método, el costo del proyecto alternativo se define como "el supuesto costo que se requerirá para instalar independientemente las instalaciones o estructuras con un beneficio igual al de instalaciones en conjunto".

El concepto de la distribución se muestra en la Fig. 10.12.

Cuadro 10.1 DESCARGA DIARIA EN VILLERIAS (1970)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1					2.19	4.83	8.48	96.2	43.4	64.8	20.2	5.78
2					2.4	14.3	6.68	176	38.9	169	23.8	5.78
3					4.51	14.4	7.99	74.9	54.8	209	16	5.75
4					3.91	36.6	14.6	32.8	198	97.9	14.2	5.64
5					3.09	8.8	11.4	39.7	145	58.2	13.2	5.61
6					2.93	4.61	10.8	48.2	56.9	69.6	12.5	5.53
7					2.76	3.5	8.08	79	35.1	42.9	11.8	5.56
8					2.6	2.67	5.82	33	60.7	48.8	11.6	5.31
9					2.4	2.82	4.83	23.1	42	50.3	11.6	5.18
10					2.62	2.85	4.67	20.4	44.8	71.3	10.1	5.4
11					2.58	38.6	9.44	16.8	43.6	71.6	8.97	5.72
12					2.54	88.6	36.6	35.2	33.5	209	8.93	5.67
13					2.75	17.7	32	35.6	53.1	66.2	9.73	5.53
14					3.77	34.4	32.5	26	32.4	45.9	8.65	5.61
15					3.07	62.7	28.5	16.9	38.3	66.4	11.6	5.42
16					9.29	90.9	25.6	13.8	49.2	31.5	8.52	5.65
17					10.2	59.1	15	15.4	25.2	24.6	8.03	8.74
18					5.15	29.8	13.4	12.8	20.5	23.9	7.9	5.53
19					3.98	72.7	8.72	16.4	39.1	34	7.56	4.8
20					3.43	24.1	33.7	11	19.8	29	7.36	4.6
21					3.15	188	36	9.84	139	21.2	7.22	4.57
22					3.14	91.1	22.3	8.64	43.9	25.2	7.42	4.35
23					3.06	81	15	7.49	57.4	20.6	6.93	4.27
24					3.14	22	29.6	9.92	137	24.3	6.76	4.2
25					7.23	22	32.7	30.6	38.6	17.7	6.67	4
26					40.4	14.7	52.6	72.3	56	17.7	6.53	4.05
27					85	11	74.6	26.1	51.4	20.5	6.34	3.95
28					66.9	9.36	48.6	50.7	63.7	17.4	6.35	3.81
29					42.1	11.2	46.6	35.4	146	15.7	6.26	3.93
30					44.3	16.4	117	24.3	189	24.9	5.83	3.93
31					10.8		97.2	28.1		38.1		3.81
Total					385.39	1080.74	891.01	1126.59	1976.3	1727.2	298.56	157.68
Average					12.43	36.02	28.74	36.34	65.88	55.72	9.95	5.09

Cuadro 10.2 DESCARGA DIARIA EN VILLERIAS (1971)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3.91	2.42	2.46	2.11	2.21	6.70	6.03	91.20	166.00	97.50	16.90	5.39
2	4.12	2.54	2.42	2.52	2.22	9.09	4.86	15.00	64.70	26.80	15.50	6.20
3	4.08	2.44	2.30	2.54	2.23	6.77	2.93	14.90	129.00	24.80	14.40	6.25
4	4.08	2.30	2.46	3.90	1.74	13.00	2.81	23.70	51.50	132.00	13.70	6.33
5	3.81	2.27	2.36	3.43	2.18	42.10	2.85	9.61	32.70	38.00	13.30	4.89
6	3.84	2.31	2.28	3.24	1.97	23.90	2.94	7.74	28.90	116.00	14.90	4.82
7	3.70	2.42	2.38	2.90	1.97	8.03	3.55	7.81	32.30	98.70	11.60	4.64
8	3.69	2.34	2.28	1.98	1.97	36.20	3.03	12.40	45.40	42.70	10.70	4.64
9	3.62	2.41	2.19	1.62	2.05	21.50	3.30	17.60	49.40	53.40	10.40	4.64
10	3.50	2.40	2.10	1.54	2.10	7.90	3.17	7.46	46.80	26.20	9.78	4.42
11	3.62	2.24	2.11	1.46	2.11	24.10	3.11	6.65	59.30	29.20	8.98	4.13
12	3.61	2.32	2.08	1.34	2.07	160.00	5.84	7.29	34.60	62.10	8.76	4.03
13	3.33	2.64	2.15	1.35	2.43	47.40	4.76	103.00	24.40	54.70	8.47	3.79
14	3.37	2.42	2.16	1.66	3.28	21.70	5.43	10.90	20.20	102.00	8.10	4.54
15	3.39	2.62	2.15	2.29	2.63	14.20	6.90	8.38	17.30	62.50	7.77	4.26
16	3.48	2.70	2.08	2.31	6.31	16.80	6.19	38.20	13.10	84.10	7.58	3.35
17	3.37	2.80	2.20	2.35	6.80	17.40	29.40	121.00	11.60	76.70	7.50	3.39
18	3.46	2.80	2.15	2.41	73.70	8.65	15.60	51.50	10.20	66.20	7.58	4.17
19	3.46	2.62	2.12	2.37	8.87	7.23	7.27	62.70	13.10	58.90	7.55	3.23
20	3.33	2.54	2.14	2.34	5.43	10.20	5.68	56.20	12.20	50.60	7.34	3.23
21	3.29	2.64	1.63	2.44	4.13	6.64	4.86	58.80	67.90	120.00	7.81	4.03
22	3.05	2.82	2.16	2.20	4.14	5.68	3.90	71.00	23.60	62.20	10.70	3.96
23	3.12	2.72	2.11	1.99	4.16	5.03	3.63	65.70	18.80	56.70	8.38	4.03
24	3.26	2.58	2.07	1.99	7.36	4.83	4.05	44.90	64.60	63.30	8.01	4.14
25	3.22	2.66	2.03	2.07	6.31	4.81	9.48	62.80	49.60	40.10	6.87	4.03
26	3.01	2.62	2.06	1.96	4.54	4.38	16.40	59.50	46.20	27.70	6.54	4.03
27	2.90	2.50	1.98	1.99	4.47	4.07	8.57	106.00	34.10	26.70	6.37	4.03
28	2.86	2.58	2.06	2.06	4.66	5.09	9.05	105.00	41.10	23.60	6.34	3.94
29	2.70		2.06	2.17	12.00	8.12	15.60	86.60	25.30	38.90	5.93	3.74
30	2.74		2.14	2.16	9.27	7.64	6.29	133.00	70.70	27.40	5.74	3.78
31	2.82		2.03		7.01		30.90	106.00		18.90		3.74
Total	105.74	70.67	66.90	66.69	202.32	559.16	238.38	1572.54	1304.40	1808.60	283.50	133.79
Average	3.41	2.52	2.16	2.22	6.53	18.64	7.69	50.73	43.48	58.34	9.45	4.52

Cuadro 10.3 DESCARGA DIARIA EN VILLERIAS (1972)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	
1	3.66	2.64	2.26	1.54	2.58	7.53	4.58	4.68	6.32	66.80	7.44	3.56
2	3.62	2.71	2.23	1.43	2.55	7.85	4.07	4.38	10.30	63.00	12.90	3.48
3	3.66	2.83	2.35	1.26	2.43	5.86	3.76	3.91	10.50	27.50	7.54	3.44
4	3.58	2.74	1.74	1.18	3.56	4.92	3.65	3.54	11.60	28.80	9.14	3.22
5	3.44	1.99	1.55	0.99	4.57	12.00	3.48	3.26	9.33	55.80	7.79	3.18
6	3.42	2.64	1.58	0.90	6.00	26.40	3.52	3.10	13.10	93.90	6.75	3.20
7	3.37	2.69	1.50	1.31	3.40	34.00	3.14	2.96	23.80	49.60	6.10	3.18
8	3.53	2.72	1.57	1.65	5.58	31.70	3.40	2.96	11.10	108.00	12.40	3.03
9	2.84	2.76	1.46	1.66	6.25	20.00	2.94	3.08	7.79	35.50	6.35	2.93
10	3.51	2.07	1.29	1.22	7.95	72.60	2.75	3.81	6.41	26.60	5.76	2.89
11	2.87	2.13	1.18	1.14	16.10	16.40	2.79	5.95	5.73	18.60	5.70	2.93
12	3.54	2.57	1.10	1.31	6.38	25.00	2.75	4.33	5.09	17.10	6.42	2.79
13	3.40	1.93	1.49	1.84	5.06	19.40	2.62	4.11	5.34	19.60	8.10	2.87
14	2.63	2.44	1.58	1.96	10.20	11.10	2.58	7.51	4.77	19.20	10.30	2.85
15	2.51	2.34	1.61	1.93	5.96	8.55	2.51	5.08	4.09	13.50	6.72	2.56
16	2.37	2.64	1.58	2.00	10.10	8.44	2.51	4.00	3.77	13.10	7.67	2.56
17	2.14	2.59	1.64	7.71	18.00	8.10	2.51	3.66	9.41	12.80	7.64	2.47
18	2.48	1.62	1.58	12.60	8.21	6.78	2.13	3.66	5.53	13.50	6.18	2.47
19	2.38	1.29	1.94	4.76	5.85	6.02	3.74	4.08	27.60	47.90	5.54	2.47
20	2.48	1.33	1.69	4.00	20.70	5.51	7.25	3.44	14.50	77.50	4.99	2.45
21	3.20	1.37	1.54	3.39	18.00	43.40	10.50	3.32	9.47	27.00	4.63	2.58
22	3.14	1.33	1.51	2.38	7.68	63.70	14.90	3.32	8.39	13.70	4.56	2.73
23	3.18	1.38	1.59	3.35	5.91	16.90	9.84	3.46	10.10	11.10	4.46	2.79
24	3.06	1.77	1.54	3.45	4.99	11.70	6.96	6.79	28.80	9.74	4.56	2.81
25	3.00	1.76	1.57	2.98	4.61	11.90	8.11	4.71	69.80	9.50	4.36	2.83
26	2.91	1.64	1.54	2.79	7.53	8.60	13.20	9.25	44.60	9.05	4.29	2.72
27	2.89	1.70	1.49	2.79	11.30	7.33	26.60	26.80	49.40	8.50	4.13	2.55
28	2.93	1.76	1.62	2.67	12.00	6.30	13.80	20.40	45.80	7.87	3.88	2.60
29	2.79		1.57	2.89	58.50	5.56	8.10	40.30	32.00	13.80	3.79	2.60
30	2.76		1.62	2.83	11.20	4.92	6.40	11.00	34.10	8.18	3.52	2.77
31	2.76		1.64		8.33		5.50	8.07		7.56		2.93
Total	94.10	59.38	50.15	81.91	301.48	518.27	190.59	218.92	528.54	933.90	193.61	88.44
Average	3.04	2.12	1.62	2.73	9.73	17.28	6.15	7.06	17.62	30.13	6.45	2.85



Cuadro 10.4 DESCARGA DIARIA EN VILLERIAS (1973)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	2.93	1.85	2.03	2.38	3.26	6.05	14.20	18.90	64.60	55.60	23.10	6.90
2	2.93	1.83	1.83	2.30	2.93	4.89	30.70	21.40	61.30	57.90	22.10	6.79
3	2.93	1.95	1.69	1.90	2.80	4.33	22.60	20.60	48.00	31.10	21.00	6.85
4	2.71	1.83	1.60	2.00	2.66	25.10	11.80	19.00	99.40	29.00	19.00	6.66
5	2.66	1.81	1.55	2.11	2.15	65.40	9.69	13.00	66.90	46.60	18.20	6.52
6	2.69	2.06	1.53	1.81	1.96	35.20	9.00	21.50	37.00	112.00	17.30	6.63
7	2.53	1.81	1.45	1.94	1.87	8.56	8.40	38.10	29.20	69.10	15.90	6.60
8	2.44	1.79	1.46	1.92	2.08	6.28	7.73	13.60	22.30	191.00	14.80	6.66
9	2.17	1.67	1.53	2.00	2.04	45.40	7.30	11.30	19.80	101.00	14.10	6.44
10	2.15	1.67	1.53	1.82	2.27	76.80	6.66	42.60	17.20	122.00	13.80	6.15
11	1.92	1.67	1.56	1.97	2.96	44.20	6.30	50.70	35.20	78.60	13.70	5.86
12	2.07	1.50	1.54	1.90	2.52	82.70	8.58	31.80	27.30	137.00	13.10	5.94
13	1.93	1.54	1.39	1.88	2.57	72.10	13.00	17.60	42.60	123.00	11.90	5.84
14	1.96	1.53	1.36	1.62	2.46	96.80	7.61	13.70	33.70	94.60	11.60	5.81
15	2.16	1.63	1.64	1.41	2.45	101.00	6.87	15.10	70.10	52.90	11.10	5.97
16	2.00	1.63	1.63	1.74	2.72	83.20	8.68	18.00	243.00	37.80	10.90	5.94
17	2.09	1.56	1.76	1.73	2.62	239.00	6.57	13.20	137.00	51.90	10.70	5.66
18	2.00	1.63	1.72	1.75	5.60	89.60	6.14	12.10	136.00	175.00	10.00	5.48
19	1.93	1.63	1.50	2.01	11.00	163.00	9.45	12.10	125.00	80.90	9.83	5.44
20	2.00	1.57	1.52	2.02	8.00	56.50	36.30	15.90	131.00	52.40	9.54	5.48
21	2.00	1.56	2.07	2.29	20.60	172.00	29.60	16.20	179.00	88.40	9.36	5.46
22	2.00	1.60	2.05	2.70	10.60	50.90	32.80	12.40	70.50	141.00	11.80	5.15
23	1.97	1.60	2.03	4.74	14.30	14.90	53.50	23.80	54.50	140.00	10.50	5.25
24	2.00	1.66	2.10	5.36	14.20	11.10	56.70	35.20	35.80	207.00	9.26	5.44
25	1.84	1.73	2.20	3.97	7.97	10.90	20.00	56.20	73.40	129.00	8.58	5.41
26	1.83	1.80	2.16	3.40	6.63	51.40	47.70	37.40	38.00	109.00	8.39	5.20
27	1.91	1.90	2.14	3.13	5.45	49.70	76.20	59.80	67.90	74.00	8.07	4.95
28	1.96	1.95	2.03	12.60	23.70	56.80	17.20	81.00	111.00	51.80	7.84	4.70
29	1.91		1.96	7.27	28.30	28.80	38.10	68.60	87.30	52.30	7.54	4.65
30	1.84		2.15	4.17	12.80	15.90	63.80	115.00	71.00	34.50	7.21	4.65
31	1.92		2.41		8.63	19.20	169.00			25.40		4.65
Total	67.38	47.96	55.12	87.84	220.10	1768.31	692.38	1092.80	2235.00	2731.80	380.22	179.13
Average	2.17	1.71	1.78	2.93	7.10	58.94	22.33	35.25	74.50	88.12	12.67	5.78

Cuadro 10.5 DESCARGA DIARIA EN VILLERIAS (1974)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	4.45	2.75	1.73	2.38	1.44	2.44	24.90	5.36	31.50	25.90	5.64	2.48
2	4.49	2.70	1.62	2.36	1.44	15.30	24.50	4.12	20.40	61.50	5.39	2.57
3	4.40	2.79	1.66	2.19	1.75	21.40	26.20	3.62	18.30	200.00	4.95	2.39
4	4.45	2.88	1.60	2.20	1.70	13.60	11.60	3.60	10.50	88.60	4.93	2.44
5	4.40	2.87	1.51	2.28	1.73	5.58	8.05	5.23	25.40	48.10	4.70	2.38
6	4.05	2.62	1.48	2.23	1.92	4.23	6.62	3.89	17.60	32.70	4.63	2.47
7	4.05	2.24	1.70	2.15	2.25	3.48	5.77	3.27	18.20	25.20	4.68	2.47
8	4.07	2.23	1.87	2.00	2.39	3.17	5.21	3.26	60.70	21.20	4.78	2.41
9	4.12	2.21	2.02	2.01	2.54	2.80	4.84	2.99	24.20	21.80	4.70	2.27
10	3.97	2.21	1.93	2.06	2.29	2.80	5.02	2.73	32.20	16.90	4.70	2.27
11	3.99	2.26	2.10	2.08	2.17	3.37	7.75	2.97	21.70	13.40	4.63	2.33
12	4.14	2.13	1.91	2.10	2.09	7.11	6.86	4.50	19.10	16.90	4.70	2.63
13	4.03	2.06	1.92	2.18	2.12	28.70	8.06	3.78	21.10	46.10	4.39	2.64
14	3.78	2.09	1.86	2.14	2.06	13.70	12.30	5.27	23.20	26.10	4.31	2.50
15	3.58	1.99	2.06	2.10	2.82	5.02	5.79	9.41	13.20	43.20	3.99	2.53
16	3.46	1.94	2.58	1.94	7.16	4.37	4.47	4.26	11.60	21.60	3.94	2.48
17	3.48	2.11	2.75	1.94	8.06	7.02	7.31	3.42	11.40	24.30	3.92	2.35
18	3.45	2.08	2.44	1.99	2.95	5.45	5.35	2.87	11.10	14.80	3.70	2.25
19	3.59	1.97	2.12	2.00	12.60	5.07	4.84	2.83	103.00	12.70	3.57	2.18
20	3.54	2.04	1.88	1.93	3.93	11.70	6.55	2.73	434.00	11.60	3.40	2.09
21	3.76	2.04	1.85	2.00	16.60	24.90	4.73	2.52	166.00	11.30	3.31	2.02
22	3.48	2.02	1.92	2.09	20.10	17.80	4.29	2.66	51.50	10.30	3.22	1.99
23	3.46	2.00	1.84	2.15	5.17	19.20	5.03	2.72	55.00	9.53	3.12	2.02
24	3.44	1.94	1.88	2.19	4.81	9.09	4.51	7.35	31.20	9.22	3.09	1.71
25	3.13	1.88	1.78	2.31	3.60	22.90	4.05	23.00	22.20	8.88	2.95	1.84
26	3.14	1.62	1.83	2.26	3.01	19.80	3.62	19.90	29.30	8.26	2.80	1.99
27	3.07	1.78	1.61	2.19	3.49	11.90	3.40	12.50	23.20	8.23	2.62	1.86
28	3.18	1.73	1.54	2.34	2.90	9.82	3.12	19.40	17.10	7.99	2.57	1.73
29	2.78		1.44	2.32	2.60	7.79	3.02	27.90	23.60	6.72	2.57	1.62
30	2.94		2.53	2.44	3.21	36.50	2.94	17.90	35.70	6.52	2.54	1.59
31	2.78		2.36		2.63		10.50	12.30		6.19		1.73
Total	114.65	61.18	59.32	64.55	133.53	346.01	241.20	228.26	1383.20	865.74	118.44	68.23
Average	3.70	2.19	1.91	2.15	4.31	11.53	7.78	7.36	46.11	27.93	3.95	2.20

Cuadro 10.6 DESCARGA DIARIA EN VILLERIAS (1975)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.75	1.41	1.44	1.11	2.52	14.24	2.32	33.86	39.93	145.75	27.90	6.56
2	1.77	1.51	1.59	1.10	2.64	27.27	2.10	13.91	58.67	75.51	87.11	6.06
3	1.74	1.58	1.59	0.98	3.52	13.62	2.23	11.41	45.05	53.67	64.16	5.89
4	1.66	1.51	1.54	1.07	3.28	21.05	2.68	42.72	44.65	45.55	34.93	5.60
5	1.69	1.42	1.54	0.98	3.26	8.74	2.76	55.44	99.89	43.35	26.47	5.35
6	1.69	1.46	1.49	1.02	3.28	6.74	3.56	13.23	118.42	63.77	25.88	5.12
7	1.53	1.42	1.39	1.18	3.25	8.49	20.93	10.48	39.61	75.61	47.35	4.90
8	1.50	1.37	1.57	1.17	3.08	8.16	25.05	34.05	74.80	40.70	37.71	4.86
9	1.58	1.38	1.58	1.19	3.23	6.49	6.84	25.74	65.20	61.17	39.67	4.75
10	2.03	1.32	1.52	1.23	3.09	5.49	4.75	15.63	128.09	34.53	38.95	4.45
11	1.99	1.45	1.57	1.30	2.93	4.63	3.95	11.52	204.38	29.91	42.17	4.25
12	2.02	1.40	1.52	1.35	2.86	5.02	3.46	34.28	61.99	25.12	32.18	4.13
13	2.07	1.46	1.61	1.45	2.79	4.56	3.00	11.64	33.62	34.83	28.06	3.97
14	1.87	1.39	1.49	1.52	2.90	3.77	2.67	8.63	34.05	79.85	19.38	3.84
15	1.89	1.48	1.54	1.07	2.75	3.63	2.45	7.12	46.08	31.22	16.10	3.91
16	1.88	1.53	1.40	1.25	3.90	3.63	2.39	32.26	22.92	27.55	14.76	3.43
17	1.83	1.53	1.45	1.30	2.68	3.44	9.58	63.63	44.81	24.85	13.76	3.40
18	1.77	1.59	1.52	1.04	4.48	3.29	5.10	85.84	29.22	50.10	13.06	3.35
19	1.83	1.51	1.08	1.50	3.10	3.39	3.27	81.42	28.57	76.76	12.18	3.39
20	1.85	1.45	1.19	1.65	2.73	4.41	2.84	72.69	28.61	46.85	11.72	3.07
21	1.75	1.54	1.13	1.67	2.48	9.32	6.15	26.68	44.43	25.58	11.72	3.19
22	1.60	1.49	1.20	1.63	7.10	6.92	21.32	13.75	39.81	24.06	12.89	3.12
23	1.51	1.49	1.02	1.55	4.59	15.22	92.66	30.09	107.78	19.32	9.21	3.24
24	1.63	1.47	0.95	1.58	4.06	6.32	27.89	27.98	365.00	16.93	8.97	2.94
25	1.58	1.31	0.73	1.66	5.39	4.61	43.40	18.29	65.84	16.13	8.45	2.96
26	1.59	1.29	1.01	1.69	9.20	3.61	45.98	11.23	43.10	31.97	7.71	3.06
27	1.54	1.46	1.05	1.60	21.64	2.78	10.81	10.26	36.96	43.81	7.33	2.85
28	1.50	1.41	1.17	1.90	23.56	2.68	15.32	27.36	32.43	29.27	7.39	3.06
29	1.41		1.07	2.39	39.97	4.14	7.11	19.95	36.54	19.34	7.15	2.85
30	1.54		1.13	2.54	43.52	2.74	5.44	28.58	72.45	24.03	6.84	2.94
31	1.56		1.17		27.46		4.56	45.47		21.83		2.66
Total	53.15	40.63	41.05	42.67	251.21	218.38	392.57	924.90	2092.90	1338.90	721.13	123.12
Average	1.71	1.45	1.32	1.42	8.10	7.28	12.66	29.84	69.76	43.19	24.04	3.97

Cuadro 10.7 DESCARGA DIARIA EN VILLERIAS (1976)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	2.62	3.94	2.28	2.08	8.29	2.98	18.43	3.61	5.24	14.90	5.46	2.60
2	2.76	4.12	2.03	1.80	26.95	33.48	16.47	3.61	5.10	13.99	5.22	2.51
3	2.41	3.59	1.85	1.87	8.98	20.48	18.36	3.83	7.19	22.42	4.95	2.17
4	2.13	3.84	1.79	2.10	6.65	76.46	14.15	4.33	23.69	17.62	4.61	2.20
5	3.12	3.92	1.88	2.30	4.73	265.67	24.34	3.90	21.94	13.54	4.24	2.59
6	3.99	3.39	2.02	2.23	3.27	131.50	34.28	3.40	9.65	19.07	4.21	2.52
7	4.31	3.41	2.15	2.42	2.51	49.37	40.94	3.18	8.48	26.14	3.98	2.47
8	4.93	2.93	2.18	2.55	1.95	25.79	18.39	2.78	6.01	36.20	3.74	2.09
9	4.74	2.90	1.93	2.83	1.43	24.97	27.58	2.44	5.24	19.13	3.74	2.02
10	4.55	3.17	1.99	8.02	1.07	32.04	15.28	2.16	6.15	17.20	3.40	1.95
11	4.95	3.23	1.94	3.35	0.83	44.83	12.84	2.37	10.64	15.92	3.40	2.00
12	5.04	2.57	1.96	2.33	0.71	48.00	11.56	2.70	8.01	15.49	3.19	1.90
13	4.63	2.26	1.86	2.46	0.61	51.00	10.43	5.72	7.72	14.09	3.44	2.05
14	4.90	2.27	1.92	2.35	0.65	54.52	29.73	11.69	5.70	13.74	3.59	1.72
15	4.81	2.30	2.00	2.53	0.96	43.76	22.19	4.89	10.91	13.22	3.48	1.75
16	4.60	2.17	1.73	2.87	1.69	36.71	9.30	4.27	5.52	37.66	3.65	1.96
17	4.60	1.90	1.77	2.99	2.25	27.89	8.75	4.40	16.13	64.80	4.37	2.24
18	5.30	2.01	1.67	4.70	9.54	50.26	8.58	6.65	6.82	26.49	4.81	1.91
19	5.35	1.93	1.49	4.07	6.89	40.74	8.08	4.78	5.20	15.28	4.26	1.97
20	5.26	1.79	1.74	7.28	5.49	28.06	7.63	5.02	4.63	25.70	4.00	1.94
21	5.12	1.81	1.57	4.32	4.14	44.79	6.90	10.09	5.54	18.06	3.77	2.00
22	5.36	2.06	1.77	4.33	3.58	102.00	6.32	5.22	8.21	11.16	3.62	1.95
23	5.22	2.06	1.65	3.94	3.45	86.82	5.58	5.34	39.61	11.01	3.23	1.98
24	4.89	2.01	1.63	3.26	3.45	83.49	5.22	8.62	33.16	10.01	3.02	1.91
25	4.97	1.92	1.63	2.87	3.49	97.57	5.08	17.04	18.10	8.88	2.89	1.98
26	4.77	2.00	1.97	4.84	13.37	33.60	4.90	18.58	75.06	8.35	3.05	1.98
27	4.67	1.97	1.98	3.59	12.02	63.19	4.54	6.63	45.84	7.73	2.83	1.84
28	4.55	2.10	2.09	6.23	7.51	53.80	4.06	6.83	20.46	7.41	2.57	2.00
29	4.12		2.28	14.19	4.92	23.87	3.84	16.24	21.93	6.75	2.59	1.86
30	4.35		1.82	33.56	3.74	22.28	4.00	11.84	18.62	6.12	2.52	1.78
31	3.97		1.98		3.36		3.67	6.39		5.78		1.80
Total	137.04	73.59	58.54	144.27	158.45	1679.92	411.43	198.54	466.48	543.89	111.82	63.62
Average	4.42	2.63	1.89	4.81	5.11	56.00	13.27	6.40	15.55	17.54	3.73	2.05

Cuadro 10.8 DESCARGA DIARIA EN VILLERIAS (1977)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.58	1.40	1.26	1.12	4.72	64.35	4.05	6.91	9.31	13.24	9.27	2.41
2	1.57	1.40	1.25	1.11	3.46	16.56	3.68	10.32	14.75	13.46	5.10	2.57
3	1.57	1.39	1.25	1.11	8.12	19.18	3.46	4.54	6.84	11.84	14.72	2.99
4	1.56	1.38	1.24	1.10	10.33	50.17	3.29	3.46	12.57	14.82	16.20	3.02
5	1.56	1.38	1.24	1.10	10.11	74.35	3.14	2.89	5.53	7.28	11.35	2.85
6	1.55	1.37	1.23	1.09	4.40	57.04	2.97	3.19	4.19	5.80	7.73	2.67
7	1.54	1.37	1.23	1.09	4.11	31.88	2.80	22.03	3.71	5.75	6.07	2.65
8	1.54	1.36	1.22	1.09	2.67	48.20	2.65	13.37	3.51	4.50	5.05	2.58
9	1.53	1.36	1.22	1.08	2.42	35.32	2.49	5.37	3.37	10.99	4.39	2.45
10	1.53	1.35	1.21	1.08	5.12	19.21	2.33	4.06	3.10	7.37	3.93	2.42
11	1.52	1.35	1.21	1.07	4.90	17.29	2.20	9.60	2.82	6.38	3.68	2.42
12	1.51	1.34	1.21	1.07	3.43	10.03	2.20	15.51	2.65	5.99	3.49	2.37
13	1.51	1.34	1.20	1.07	3.24	6.66	2.18	6.19	3.09	6.14	3.18	2.29
14	1.50	1.33	1.20	1.06	4.52	7.44	2.18	4.48	10.74	8.14	3.12	2.31
15	1.50	1.33	1.19	1.06	5.06	23.47	2.28	4.02	22.81	3.81	2.94	2.21
16	1.49	1.32	1.19	1.05	4.79	81.29	2.25	4.10	32.00	3.26	2.84	2.30
17	1.48	1.32	1.18	1.05	6.87	10.41	2.38	8.68	22.06	3.06	2.80	2.23
18	1.48	1.31	1.18	1.04	3.89	8.69	2.55	15.13	11.47	2.96	2.96	2.25
19	1.47	1.31	1.17	1.04	2.84	9.36	2.37	5.16	7.27	2.82	5.26	3.32
20	1.47	1.30	1.17	1.04	2.92	8.03	2.17	3.92	5.74	3.02	6.45	2.46
21	1.46	1.30	1.16	1.03	2.41	10.40	2.07	7.96	5.45	2.86	3.91	2.42
22	1.46	1.29	1.16	1.03	2.78	11.09	2.07	13.80	11.50	3.02	3.53	2.40
23	1.45	1.29	1.16	1.02	5.44	5.98	2.09	20.67	5.64	7.24	3.25	2.29
24	1.45	1.28	1.15	1.02	3.01	5.52	2.13	19.95	35.61	6.37	3.06	2.31
25	1.44	1.28	1.15	1.02	2.12	5.18	2.40	14.83	49.32	6.68	2.96	2.25
26	1.43	1.27	1.14	1.01	2.05	4.98	2.21	8.65	17.76	5.44	2.71	2.33
27	1.43	1.27	1.14	1.01	2.46	6.49	2.14	11.33	15.08	6.04	2.48	2.24
28	1.42	1.26	1.13	1.01	2.13	5.51	1.99	20.04	23.95	4.92	2.55	2.20
29	1.42		1.13	1.00	6.87	5.48	1.93	7.16	14.58	19.00	2.29	2.14
30	1.41		1.12	1.00	3.68	6.29	1.92	5.89	12.72	8.27	2.27	2.18
31	1.41		1.12		34.90		2.72	6.88		5.36		2.14
Total	46.22	37.24	36.79	31.65	165.76	665.84	77.26	290.07	378.76	215.78	149.49	75.62
Average	1.49	1.33	1.19	1.05	5.35	22.19	2.49	9.56	12.63	6.96	4.98	2.44

Quadro 10.9 DESCARGA DIARIA EN VILLERIAS (1978)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.41	1.29	1.19	1.09	1.83	11.36	18.01	8.48	72.54	41.86	6.52	2.72
2	1.40	1.28	1.18	1.08	1.71	9.23	20.09	5.92	59.09	72.95	9.75	2.83
3	1.40	1.28	1.18	1.08	1.57	11.72	28.01	4.88	37.33	64.27	11.46	2.72
4	1.39	1.28	1.18	1.08	1.27	20.43	7.16	10.09	57.73	39.86	6.96	2.87
5	1.39	1.27	1.17	1.07	2.94	15.40	43.36	22.28	54.09	31.42	6.67	2.67
6	1.39	1.27	1.17	1.07	2.64	8.60	9.17	5.74	123.20	52.40	6.50	2.58
7	1.38	1.26	1.17	1.07	2.11	23.01	9.22	18.11	153.30	46.84	6.18	2.72
8	1.38	1.26	1.16	1.06	3.63	9.40	6.58	26.40	55.27	23.26	6.83	3.01
9	1.37	1.26	1.16	1.06	2.05	10.82	6.20	15.51	38.49	22.70	14.10	3.28
10	1.37	1.25	1.16	1.06	1.69	4.71	4.61	6.18	24.35	16.69	7.79	4.37
11	1.37	1.25	1.15	1.05	1.69	4.06	4.79	4.30	20.33	20.85	8.72	3.90
12	1.36	1.25	1.15	1.05	1.50	3.66	14.71	4.58	21.80	40.48	6.15	3.26
13	1.36	1.24	1.15	1.05	1.43	2.69	93.04	6.66	29.53	16.63	5.14	3.06
14	1.35	1.24	1.14	1.05	1.32	2.98	33.82	3.90	47.31	110.58	4.65	2.90
15	1.35	1.24	1.14	1.04	1.35	5.59	16.43	2.94	17.04	82.59	4.95	2.77
16	1.35	1.23	1.14	1.04	1.32	3.03	20.30	2.58	13.72	106.17	4.89	2.57
17	1.34	1.23	1.13	1.04	1.23	1.90	55.57	2.39	16.09	138.68	4.29	2.55
18	1.34	1.22	1.13	1.03	1.25	1.54	18.59	27.73	17.29	59.16	3.68	2.50
19	1.34	1.22	1.13	1.03	2.63	1.68	20.37	20.02	101.12	56.76	3.43	2.43
20	1.33	1.22	1.12	1.03	50.67	8.10	11.93	6.71	118.37	28.51	5.56	2.37
21	1.33	1.21	1.12	1.42	8.40	7.79	49.29	17.88	170.09	22.84	3.68	2.45
22	1.32	1.21	1.12	1.30	5.25	10.80	33.90	9.75	54.19	19.67	3.74	2.38
23	1.32	1.21	1.11	1.46	3.88	5.25	26.87	13.61	88.99	17.37	3.63	2.47
24	1.32	1.20	1.11	1.31	3.98	3.57	12.21	39.42	117.86	17.75	3.76	2.42
25	1.31	1.20	1.11	2.62	3.37	2.60	8.47	32.20	109.81	13.87	3.68	2.42
26	1.31	1.20	1.10	5.35	6.08	2.07	6.06	15.14	75.80	13.27	3.35	2.44
27	1.30	1.19	1.10	6.51	8.59	4.69	6.19	20.17	102.31	14.72	3.42	2.33
28	1.30	1.19	1.10	3.18	10.59	2.46	26.09	39.52	82.66	16.59	3.05	2.54
29	1.30		1.09	2.19	13.64	1.94	8.60	43.46	131.33	11.05	2.99	2.66
30	1.29		1.09	1.79	6.40	6.82	9.43	119.68	78.96	9.21	2.95	2.46
31	1.29		1.09		7.49	27.66	125.86			8.48		2.47
Total	41.75	34.64	35.23	48.23	163.52	207.88	656.74	681.87	2089.99	1267.49	166.45	85.09
Average	1.35	1.24	1.14	1.61	5.27	6.93	21.19	22.00	69.67	40.89	5.55	2.74

Cuadro 10.10 DESCARGA DIARIA EN VILLERIAS (1979)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	2.56	1.79	1.64	1.50	4.51	30.58	35.50	11.83	61.01	19.46	19.46	6.29
2	2.59	1.75	1.38	1.42	3.39	18.17	55.18	62.16	18.52	35.82	37.64	6.27
3	2.43	1.76	1.42	1.42	3.51	12.80	61.63	30.35	107.54	47.24	72.98	6.35
4	2.20	1.73	1.53	1.36	12.84	117.52	107.48	67.10	71.46	43.49	28.18	6.17
5	2.13	1.71	1.57	1.38	6.39	65.16	35.97	20.10	45.91	27.60	21.89	5.72
6	2.06	1.63	1.57	1.29	5.93	23.71	103.48	13.07	46.62	25.59	19.30	5.60
7	2.10	1.63	1.51	1.47	5.78	14.85	35.98	10.93	75.23	21.23	17.62	5.57
8	2.16	1.59	1.46	1.60	4.62	43.03	22.84	9.66	52.54	106.05	16.25	5.48
9	2.02	1.54	1.51	1.57	4.08	22.07	21.86	9.02	41.01	93.94	15.10	5.36
10	1.89	1.53	1.42	1.57	3.75	20.27	18.36	8.19	77.82	75.61	14.23	5.61
11	1.87	1.69	1.48	1.46	3.59	14.17	65.05	6.84	57.93	65.38	13.40	5.38
12	1.80	1.73	1.51	1.42	4.39	12.70	44.30	6.24	139.23	61.22	12.49	5.26
13	1.81	1.68	1.42	1.42	3.76	12.01	24.47	5.74	118.08	42.44	12.17	4.94
14	1.80	1.63	1.45	1.48	15.19	74.55	23.49	6.68	80.60	40.63	11.26	4.72
15	1.73	1.68	1.42	1.51	6.24	54.71	14.43	5.90	48.81	47.77	10.09	4.69
16	1.75	1.75	1.42	1.51	4.68	56.37	12.26	6.61	40.21	70.04	9.45	4.56
17	1.58	1.79	1.38	1.46	3.87	17.82	10.73	12.87	70.02	50.09	9.19	4.47
18	1.53	1.74	1.27	1.42	3.25	11.71	12.63	15.35	62.70	84.67	8.65	4.37
19	1.61	1.79	1.27	1.53	2.94	9.40	22.76	29.43	40.63	68.95	8.38	4.29
20	1.41	1.67	1.27	4.27	2.80	8.91	11.23	57.21	31.50	85.85	8.15	4.10
21	1.61	1.65	1.27	5.68	2.78	7.67	10.49	80.85	38.33	90.85	7.94	4.23
22	1.53	1.63	1.27	3.14	2.64	11.98	26.49	69.30	28.30	51.80	7.77	4.41
23	1.48	1.75	1.27	7.02	2.38	8.11	14.97	26.93	22.30	61.01	7.24	4.60
24	1.67	1.76	1.38	14.69	2.16	23.15	10.90	25.26	19.78	48.39	6.75	4.54
25	1.93	1.83	1.42	5.45	4.16	9.44	9.19	27.16	20.14	31.23	6.62	4.44
26	1.97	1.69	1.42	6.15	2.59	6.21	37.03	16.46	74.65	24.88	6.52	4.28
27	1.91	1.61	1.42	3.99	4.35	5.28	49.65	13.74	58.24	24.22	6.46	4.16
28	2.02	1.70	1.43	10.68	7.09	4.59	15.06	13.64	33.20	20.66	6.46	4.06
29	2.01		1.68	38.59	4.45	21.43	28.40	21.23	38.16	24.81	6.57	4.03
30	1.91		1.69	6.74	11.13	25.34	15.76	47.78	38.67	32.27	6.36	4.07
31	1.87		1.55		6.32		11.10	149.24		28.22		3.98
Total	58.93	47.42	44.73	134.18	155.53	763.68	968.64	986.87	1653.97	1551.39	434.03	151.97
Average	1.90	1.69	1.44	4.47	5.02	25.46	31.25	28.61	55.13	50.04	14.47	4.90

Cuadro 10.11 DESCARGA DIARIA EN VILLERIAS (1980)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3.91	2.70	2.60	2.36	3.25	34.99	11.33	26.51	14.79	42.42	17.50	7.32
2	3.79	2.64	2.77	2.36	3.19	21.79	10.27	61.11	15.31	48.20	16.50	7.15
3	3.86	2.53	2.71	2.36	3.27	12.64	9.56	31.47	12.50	132.72	15.50	6.85
4	3.99	2.69	2.51	2.43	4.08	23.02	8.89	18.66	14.30	150.77	15.00	6.57
5	4.12	2.85	2.48	2.48	4.12	46.90	8.67	15.64	12.19	55.01	17.50	6.51
6	1.77	2.73	2.53	2.36	6.66	12.41	10.68	18.31	13.15	72.23	15.00	6.33
7	4.16	2.74	2.73	2.36	4.44	10.01	8.72	69.93	10.79	134.11	14.00	6.31
8	3.82	2.58	2.75	2.36	4.74	13.96	8.03	19.89	25.67	74.53	13.50	6.23
9	3.61	2.71	2.81	2.36	4.17	72.36	13.40	21.87	42.70	74.34	13.50	6.10
10	3.41	2.80	2.78	2.36	3.77	30.52	8.81	19.82	122.38	93.04	14.00	5.99
11	3.38	3.00	2.70	2.36	3.69	95.18	8.43	26.25	52.02	153.75	13.00	5.83
12	3.41	2.90	2.73	2.36	3.77	125.09	9.03	20.02	81.57	84.28	12.00	5.88
13	3.42	2.75	2.75	2.36	13.45	231.91	13.85	14.24	135.57	62.19	12.50	5.83
14	3.45	2.55	2.66	2.36	8.14	49.15	8.55	34.21	87.18	44.14	12.00	5.83
15	3.30	2.55	2.68	2.36	20.84	113.01	7.41	251.98	42.40	75.75	11.30	5.83
16	3.25	2.60	2.78	2.36	9.91	43.40	6.83	57.34	42.61	98.94	12.10	5.73
17	3.28	2.68	2.72	2.29	6.43	23.78	6.44	44.78	40.49	56.02	12.00	5.57
18	3.42	2.75	2.57	2.22	5.08	16.36	6.11	35.43	37.34	46.45	12.00	5.53
19	3.46	2.67	2.46	2.17	4.61	14.14	8.26	75.25	49.18	70.04	10.00	5.30
20	3.58	2.60	2.36	2.17	4.25	71.71	23.86	81.18	81.31	50.53	10.55	5.30
21	3.57	2.55	2.36	2.17	5.16	199.18	30.85	84.53	68.33	57.22	10.02	5.30
22	3.46	2.78	2.36	2.17	10.03	168.33	21.44	51.56	73.91	40.34	9.62	5.21
23	3.40	2.75	2.36	2.17	13.44	96.49	15.50	32.02	77.01	49.43	9.10	5.05
24	3.37	2.86	2.41	2.17	35.70	95.82	101.33	25.68	50.36	32.15	9.07	5.05
25	3.15	2.81	2.47	2.17	9.63	38.96	28.74	20.46	45.31	26.33	8.84	4.95
26	3.12	2.65	2.43	2.13	6.51	21.42	33.29	17.98	39.26	23.65	8.68	4.79
27	3.06	2.68	2.36	2.13	39.02	18.29	21.41	16.31	217.75	21.83	8.28	4.79
28	3.09	2.60	2.36	3.65	138.77	15.90	44.12	14.94	88.66	25.50	7.98	4.70
29	2.79		2.36	2.68	64.89	13.89	20.30	14.30	52.83	24.00	7.56	4.55
30	2.19			2.38	77.35	12.55	15.90	19.19	45.86	21.40	7.37	4.55
31	2.40		2.36		39.18		35.58	23.98		19.95		4.55
Total	103.98	75.71	79.25	70.61	561.55	1743.13	565.59	1264.85	1692.72	1961.24	355.96	175.61
Average	3.35	2.70	2.56	2.35	18.11	58.10	18.24	40.80	56.42	63.27	11.87	5.66



Cuadro 10.12 DESCARGA DIARIA EN EL SITIO DE LA PRESA SAN ESTEBAN (1970)

UNIT: m<sup>3</sup>/s

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1					2.05	4.51	7.92	89.86	40.54	60.53	18.87	5.40
2					2.24	13.36	6.24	184.40	36.34	157.86	22.23	5.40
3					4.21	13.45	7.46	69.96	51.19	195.22	14.95	5.37
4					3.65	34.19	13.64	30.64	184.95	91.45	13.26	5.27
5					2.89	8.22	10.65	37.08	135.44	54.36	12.33	5.24
6					2.74	4.31	10.09	45.02	53.15	65.01	11.68	5.17
7					2.58	3.27	7.55	73.79	32.79	40.07	11.02	5.19
8					2.43	2.49	5.44	30.82	56.70	45.58	10.84	4.96
9					2.24	2.63	4.51	21.58	39.23	46.98	10.84	4.84
10					2.45	2.66	4.36	19.05	41.85	66.50	9.43	5.04
11					2.41	36.05	8.82	15.69	40.73	66.83	8.38	5.34
12					2.37	82.76	34.19	32.88	31.29	195.22	8.34	5.30
13					2.57	16.53	29.89	33.25	49.60	61.84	9.09	5.17
14					3.52	32.13	30.36	24.29	30.26	42.87	8.03	5.24
15					2.87	58.57	26.62	15.79	35.77	62.02	10.84	5.06
16					8.68	84.91	23.91	12.89	45.96	29.42	7.96	5.28
17					9.53	55.20	14.01	14.38	23.54	22.98	7.50	8.16
18					4.81	27.84	12.52	11.96	19.15	22.32	7.38	5.17
19					3.72	67.91	8.15	15.32	36.52	31.76	7.06	4.48
20					3.20	22.51	31.48	10.27	18.49	27.09	6.87	4.30
21					2.94	175.60	33.63	9.19	129.84	19.80	6.74	4.27
22					2.93	85.09	20.83	8.07	41.01	23.54	6.93	4.06
23					2.86	75.66	14.01	7.00	53.62	19.24	6.47	3.99
24					2.93	20.55	27.65	9.27	127.97	22.70	6.31	3.92
25					6.75	20.55	30.54	28.58	36.05	16.53	6.23	3.74
26					37.74	13.73	49.13	67.53	33.63	16.53	6.10	3.78
27					79.40	10.27	69.68	24.38	48.01	19.15	5.92	3.69
28					62.49	8.74	45.40	47.36	59.50	16.25	5.93	3.56
29					39.32	10.46	43.53	33.07	136.37	14.66	5.85	3.67
30					41.38	15.32	109.29	22.70	176.54	23.26	5.45	3.67
31					10.09		90.79	26.25		35.59		3.56
Total					359.98	1009.48	832.26	1052.31	1845.99	1613.32	278.87	147.28
Average					11.61	33.65	26.85	33.95	61.53	52.04	9.30	4.75

Cuadro 10.13 DESCARGA DIARIA EN EL SITIO DE LA PRESA SAN ESTEBAN (1971)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3.54	2.19	2.23	1.91	2.00	6.07	5.47	82.68	150.49	88.39	15.32	4.89
2	3.74	2.30	2.19	2.28	2.01	8.24	4.41	13.60	58.66	24.30	14.05	5.62
3	3.70	2.21	2.09	2.30	2.02	6.14	2.66	13.51	116.95	22.48	13.05	5.67
4	3.70	2.09	2.23	3.54	1.58	11.79	2.55	21.49	46.51	119.67	12.42	5.74
5	3.45	2.06	2.14	3.11	1.98	38.17	2.58	8.71	29.65	34.45	12.06	4.43
6	3.48	2.09	2.07	2.94	1.79	21.67	2.67	7.02	26.20	105.16	13.51	4.37
7	3.35	2.19	2.16	2.63	1.79	7.28	3.22	7.08	29.28	89.48	10.52	4.21
8	3.35	2.12	2.07	1.80	1.79	32.82	2.75	11.24	41.16	38.71	9.70	4.21
9	3.28	2.18	1.99	1.47	1.86	19.49	2.99	15.96	44.79	48.41	9.43	4.21
10	3.17	2.18	1.90	1.40	1.90	7.16	2.87	6.76	42.43	23.75	8.87	4.01
11	3.28	2.03	1.91	1.32	1.91	21.85	2.82	6.03	53.76	26.47	8.14	3.74
12	3.27	2.10	1.89	1.21	1.88	145.05	5.29	6.61	31.37	56.30	7.94	3.65
13	3.02	2.39	1.95	1.22	2.20	42.97	4.32	93.38	22.12	49.59	7.68	3.44
14	3.06	2.19	1.96	1.50	2.97	19.67	4.92	9.88	18.31	92.47	7.34	4.12
15	3.07	2.38	1.95	2.08	2.38	12.87	6.26	7.60	15.68	56.66	7.04	3.86
16	3.15	2.45	1.89	2.09	5.72	15.23	5.61	34.63	11.88	76.24	6.87	3.04
17	3.06	2.54	1.99	2.13	6.16	15.77	26.65	109.70	10.52	69.54	6.80	3.07
18	3.14	2.54	1.95	2.18	66.82	7.84	14.14	46.69	9.25	60.02	6.87	3.78
19	3.14	2.38	1.92	2.15	8.04	6.55	6.59	56.84	11.88	53.40	6.84	2.93
20	3.02	2.30	1.94	2.12	4.92	9.25	5.15	50.95	11.06	45.87	6.65	2.93
21	2.98	2.39	1.48	2.21	3.74	6.02	4.41	53.31	61.56	108.79	7.08	3.65
22	2.77	2.56	1.96	1.99	3.75	5.15	3.54	64.37	21.40	56.39	9.70	3.59
23	2.83	2.47	1.91	1.80	3.77	4.56	3.29	59.56	17.04	51.40	7.60	3.65
24	2.96	2.34	1.88	1.80	6.67	4.38	3.67	40.71	58.57	57.39	7.26	3.75
25	2.92	2.41	1.84	1.88	5.72	4.36	8.59	56.93	44.97	36.35	6.23	3.55
26	2.73	2.38	1.87	1.78	4.12	3.97	14.87	53.94	41.88	25.11	5.93	3.65
27	2.63	2.27	1.80	1.80	4.05	3.69	7.77	96.10	30.91	24.21	5.78	3.65
28	2.59	2.34	1.87	1.87	4.22	4.61	8.20	95.19	27.26	21.40	5.75	3.57
29	2.45	0.00	1.87	1.97	10.88	7.36	14.14	78.51	22.94	35.27	5.38	3.39
30	2.48	0.00	1.94	1.96	8.40	6.93	5.70	120.58	64.10	24.84	5.20	3.43
31	2.56	0.00	1.84	0.00	6.36	0.00	28.01	96.10	0.00	17.13	0.00	3.39
TOTAL	95.86	64.07	60.65	60.46	183.42	506.93	216.11	1,425.65	1,182.56	1,639.66	257.02	121.29
AVERAGE	3.09	2.29	1.96	2.02	5.92	16.90	6.97	45.99	39.42	52.89	8.57	3.91
TOTAL (MCM)												502.30
AVERAGE (m3)												15.93

UNIT: m3/s

Cuadro 10.14 DESCARGA DIARIA EN EL SITIO DE LA PRESA SAN ESTEBAN (1972)

UNIT: m<sup>3</sup>/s

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3.32	2.39	2.05	1.40	2.34	6.83	4.15	4.24	5.73	60.56	6.75	3.23
2	3.28	2.46	2.02	1.30	2.31	7.12	3.69	3.97	9.34	57.12	11.70	3.15
3	3.32	2.57	2.13	1.14	2.20	5.31	3.41	3.54	9.52	24.93	6.84	3.12
4	3.25	2.48	1.58	1.07	3.23	4.46	3.31	3.21	10.52	26.11	8.29	2.92
5	3.12	1.80	1.41	0.90	4.14	10.88	3.15	2.96	8.46	50.59	7.06	2.88
6	3.10	2.39	1.43	0.81	5.44	23.93	3.19	2.81	11.88	85.13	6.12	2.90
7	3.06	2.44	1.36	1.19	3.08	30.82	2.85	2.68	21.58	44.97	5.53	2.88
8	3.20	2.47	1.42	1.50	5.06	28.74	3.08	2.68	10.06	97.91	11.24	2.75
9	2.57	2.50	1.32	1.50	5.67	18.13	2.67	2.79	7.06	32.00	5.76	2.66
10	3.18	1.88	1.17	1.11	7.21	65.82	2.49	3.45	5.81	24.12	5.22	2.62
11	2.60	1.93	1.07	1.03	14.60	14.87	2.53	5.39	5.19	16.86	5.17	2.66
12	3.21	2.33	1.00	1.19	5.78	22.66	2.49	3.93	4.61	15.50	5.82	2.53
13	3.08	1.75	1.35	1.67	4.59	17.59	2.38	3.73	4.84	17.77	7.34	2.60
14	2.43	2.21	1.43	1.78	9.25	10.06	2.34	6.81	4.32	17.41	9.34	2.58
15	2.28	2.12	1.46	1.75	5.40	7.57	2.28	4.61	3.71	12.24	6.09	2.32
16	2.15	2.39	1.43	1.81	9.16	7.65	2.28	3.63	3.42	11.88	6.95	2.32
17	1.94	2.35	1.49	6.99	16.32	7.34	2.28	3.32	8.53	11.60	6.93	2.24
18	2.25	1.47	1.43	11.42	7.44	6.15	1.93	3.32	5.01	12.24	5.60	2.24
19	2.16	1.17	1.76	4.32	5.30	5.46	3.39	3.70	25.02	43.43	5.02	2.24
20	2.25	1.21	1.53	3.63	18.77	5.00	6.57	3.12	13.15	70.26	4.52	2.22
21	2.90	1.24	1.40	3.07	16.32	39.35	9.52	3.01	8.59	24.48	4.20	2.34
22	2.85	1.21	1.37	2.16	6.96	57.75	13.51	3.01	7.61	12.42	4.13	2.48
23	2.88	1.25	1.44	3.04	5.36	15.32	8.92	3.14	9.16	10.06	4.04	2.53
24	2.77	1.60	1.40	3.13	4.52	10.61	6.31	6.16	26.11	9.83	4.13	2.55
25	2.72	1.60	1.42	2.70	4.18	10.79	7.35	4.27	63.28	8.61	3.95	2.57
26	2.64	1.49	1.40	2.53	6.83	7.80	11.97	8.39	40.43	8.20	3.89	2.47
27	2.62	1.54	1.35	2.53	10.24	6.65	24.12	24.30	44.79	7.71	3.74	2.31
28	2.66	1.60	1.47	2.42	10.88	5.71	12.51	18.49	41.52	7.13	3.52	2.36
29	2.53		1.42	2.62	53.04	5.04	7.34	36.54	29.01	12.51	3.44	2.36
30	2.50		1.47	2.57	10.15	4.46	5.80	9.97	30.91	7.42	3.19	2.51
31	2.50		1.49		7.55		4.99	7.32		6.67		2.66
TOTAL	85.31	53.83	45.47	74.26	273.32	469.86	172.79	198.47	479.17	846.67	175.53	80.18
VERAG	2.75	1.92	1.47	2.48	8.82	15.66	5.57	6.40	15.97	27.31	5.85	2.59
TOTAL(MCM)												255.30
AVERAGE(m <sup>3</sup> )												8.10

Cuadro 10.15 DESCARGA DIARIA EN EL SITIO DE LA PRESA SAN ESTEBAN (1973)

UNIT: m<sup>3</sup>/s

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	2.66	1.68	1.84	2.16	2.96	5.48	12.87	17.13	58.57	50.41	20.94	6.26
2	2.66	1.66	1.66	2.09	2.66	4.43	27.83	19.40	55.57	34.36	20.04	6.16
3	2.66	1.77	1.53	1.72	2.54	3.93	20.49	18.68	43.52	28.20	19.04	6.21
4	2.46	1.66	1.45	1.81	2.41	22.76	10.70	17.23	90.12	26.29	17.23	6.04
5	2.41	1.64	1.41	1.91	1.95	59.29	8.78	11.79	60.65	42.25	16.50	5.91
6	2.44	1.87	1.39	1.64	1.78	31.91	8.16	19.49	33.54	101.54	15.68	6.01
7	2.29	1.64	1.31	1.76	1.70	7.76	7.62	34.54	26.47	62.65	14.41	5.98
8	2.21	1.62	1.32	1.74	1.89	5.69	7.01	12.33	20.22	173.16	13.42	6.04
9	1.97	1.51	1.39	1.81	1.85	41.16	6.62	10.24	17.95	91.57	12.78	5.84
10	1.95	1.51	1.39	1.65	2.06	69.63	6.04	38.62	15.59	110.60	12.51	5.58
11	1.74	1.51	1.41	1.79	2.68	40.07	5.71	45.96	31.91	71.26	12.42	5.31
12	1.88	1.36	1.40	1.72	2.28	74.98	7.78	28.83	24.75	124.20	11.88	5.39
13	1.75	1.40	1.26	1.70	2.33	65.37	11.79	15.96	38.62	111.51	10.79	5.29
14	1.78	1.39	1.23	1.47	2.23	87.76	6.90	12.42	30.55	85.76	10.52	5.27
15	1.96	1.48	1.49	1.28	2.22	91.57	6.23	13.69	63.55	47.96	10.06	5.41
16	1.81	1.48	1.48	1.58	2.47	75.43	7.87	16.32	220.30	34.27	9.88	5.39
17	1.89	1.41	1.60	1.57	2.38	216.68	5.96	11.97	124.20	47.05	9.70	5.13
18	1.81	1.48	1.56	1.59	5.08	81.23	5.57	10.97	123.30	158.65	9.07	4.97
19	1.75	1.48	1.36	1.82	9.97	147.77	8.57	10.97	113.32	73.34	8.91	4.93
20	1.81	1.42	1.38	1.83	7.25	51.04	32.91	14.41	118.76	47.51	8.65	4.97
21	1.81	1.41	1.88	2.08	18.68	155.93	26.84	14.69	162.28	80.14	8.49	4.95
22	1.81	1.45	1.86	2.45	9.61	46.15	29.74	11.24	63.91	127.83	10.70	4.67
23	1.79	1.45	1.84	4.30	12.96	13.51	48.50	21.58	49.41	126.92	9.52	4.76
24	1.81	1.50	1.90	4.86	12.87	10.06	51.40	31.91	32.46	187.66	8.40	4.93
25	1.67	1.57	1.99	3.60	7.23	9.88	18.13	50.95	66.54	116.95	7.78	4.90
26	1.66	1.63	1.96	3.08	6.01	46.60	43.24	33.91	34.45	98.82	7.61	4.71
27	1.73	1.72	1.94	2.84	4.94	45.06	69.08	54.21	61.56	67.09	7.32	4.49
28	1.78	1.77	1.84	11.42	21.49	51.49	15.59	73.43	100.63	46.96	7.11	4.26
29	1.73		1.78	6.59	25.66	26.11	34.54	62.19	79.15	47.41	6.84	4.22
30	1.67		1.95	3.78	11.60	14.41	57.84	102.45	64.37	31.28	6.54	4.22
31	1.74		2.18		7.82		17.41	153.21		23.03		4.22
TOTAL	61.09	43.48	49.97	79.64	199.54	1603.14	627.71	990.73	2026.24	2476.63	344.70	162.40
VERAG	1.97	1.55	1.61	2.65	6.44	53.44	20.25	31.96	67.54	79.89	11.49	5.24
TOTAL(MCM) 748.68												
AVERAGE(m <sup>3</sup> /s) 23.74												

Cuadro 10.16 DESCARGA DIARIA EN EL SITIO DE LA PRESA SAN ESTEBAN (1974)

UNIT: m<sup>3</sup>/s

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	4.03	2.49	1.57	2.16	1.31	2.21	22.57	4.86	28.56	23.48	5.11	2.25
2	4.07	2.45	1.47	2.14	1.31	13.87	22.21	3.74	18.49	55.76	4.89	2.33
3	3.99	2.53	1.50	1.99	1.59	19.40	23.75	3.28	16.59	181.32	4.49	2.17
4	4.03	2.61	1.45	1.99	1.54	12.33	10.52	3.26	9.52	80.32	4.47	2.21
5	3.99	2.60	1.37	2.07	1.57	5.06	7.30	4.74	23.03	43.61	4.26	2.16
6	3.67	2.38	1.34	2.02	1.74	3.83	6.00	3.53	15.96	29.65	4.20	2.24
7	3.67	2.03	1.54	1.95	2.04	3.15	5.23	2.96	16.50	22.85	4.24	2.24
8	3.69	2.02	1.70	1.81	2.17	2.87	4.72	2.96	55.03	19.22	4.33	2.18
9	3.74	2.00	1.83	1.82	2.30	2.54	4.39	2.71	21.94	19.76	4.26	2.06
10	3.60	2.00	1.75	1.87	2.08	2.54	4.55	2.48	29.19	15.32	4.26	2.06
11	3.62	2.05	1.90	1.89	1.97	3.06	7.03	2.69	19.67	12.15	4.20	2.11
12	3.75	1.93	1.73	1.90	1.89	6.45	6.22	4.08	17.32	15.32	4.26	2.38
13	3.65	1.87	1.74	1.98	1.92	26.02	7.31	3.43	19.13	41.79	3.98	2.39
14	3.43	1.89	1.69	1.94	1.87	12.42	11.15	4.78	21.03	23.66	3.91	2.27
15	3.25	1.80	1.87	1.90	2.56	4.55	5.25	8.53	11.97	39.16	3.62	2.29
16	3.14	1.76	2.34	1.76	6.49	3.96	4.05	3.86	10.52	19.58	3.57	2.25
17	3.15	1.91	2.49	1.76	7.31	6.36	6.63	3.10	10.34	22.03	3.55	2.13
18	3.13	1.89	2.21	1.80	2.67	4.94	4.85	2.60	10.06	13.42	3.35	2.04
19	3.25	1.79	1.92	1.81	11.42	4.60	4.39	2.57	93.38	11.51	3.24	1.98
20	3.21	1.85	1.70	1.75	3.56	10.61	5.94	2.48	393.46	10.52	3.08	1.89
21	3.41	1.85	1.68	1.81	15.05	22.57	4.29	2.28	150.49	10.24	3.00	1.83
22	3.15	1.83	1.74	1.89	18.22	16.14	3.89	2.41	46.69	9.34	2.92	1.80
23	3.14	1.81	1.67	1.95	4.69	17.41	4.56	2.47	49.86	8.64	2.83	1.83
24	3.12	1.76	1.70	1.99	4.36	8.24	4.09	6.66	28.29	8.36	2.80	1.55
25	2.84	1.70	1.61	2.09	3.26	20.76	3.67	20.85	20.13	8.05	2.67	1.67
26	2.85	1.47	1.66	2.05	2.73	17.95	3.28	18.04	26.56	7.49	2.54	1.80
27	2.78	1.61	1.46	1.99	3.16	10.79	3.08	11.33	21.03	7.46	2.38	1.69
28	2.88	1.57	1.40	2.12	2.63	8.90	2.83	17.59	15.50	7.24	2.33	1.57
29	2.52		1.31	2.10	2.36	7.06	2.74	25.29	21.40	6.09	2.33	1.47
30	2.67		2.29	2.21	2.91	33.09	2.67	16.23	32.37	5.91	2.30	1.44
31	2.52		2.14		2.38		9.52	11.15		5.61		1.57
TOTAL	103.94	55.47	53.78	58.52	121.06	313.69	218.67	206.94	1254.00	784.87	107.38	61.86
VERAG	3.35	1.98	1.73	1.95	3.91	10.46	7.05	6.68	41.80	25.32	3.58	2.00
TOTAL(MCM) 288.59												
AVERAGE(m <sup>3</sup> /s) 9.15												

Quadro 10.17 DESCARGA DIARIA EN EL SITIO DE LA PRESA SAN ESTEBAN (1975)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.59	1.28	1.31	1.01	2.29	12.91	2.10	30.69	36.20	132.14	25.29	5.94
2	1.60	1.37	1.44	1.00	2.39	24.73	1.91	12.61	53.19	68.46	78.97	5.49
3	1.58	1.43	1.44	0.89	3.19	12.35	2.02	10.34	40.84	48.65	58.16	5.34
4	1.50	1.37	1.40	0.97	2.97	19.09	2.43	38.73	40.48	41.29	31.67	5.08
5	1.53	1.29	1.40	0.89	2.96	7.92	2.50	50.26	90.56	39.30	24.00	4.85
6	1.53	1.32	1.35	0.92	2.97	6.11	3.23	11.99	107.36	57.82	23.46	4.64
7	1.39	1.29	1.26	1.07	2.95	7.70	13.97	9.50	35.91	68.55	42.93	4.44
8	1.36	1.24	1.42	1.06	2.79	7.40	22.71	30.87	67.81	36.89	34.19	4.40
9	1.43	1.25	1.43	1.08	2.92	5.88	6.20	23.34	59.11	55.46	35.97	4.30
10	1.84	1.20	1.38	1.12	2.80	4.98	4.31	14.17	116.13	31.31	35.31	4.03
11	1.80	1.31	1.42	1.18	2.65	4.20	3.58	10.27	185.29	27.11	38.23	3.86
12	1.83	1.27	1.38	1.22	2.59	4.55	3.14	31.07	56.20	22.78	29.17	3.74
13	1.88	1.32	1.46	1.31	2.53	4.13	2.72	10.55	30.48	31.57	25.43	3.60
14	1.70	1.26	1.35	1.38	2.63	3.41	2.42	7.83	30.87	72.39	17.57	3.48
15	1.71	1.34	1.40	0.97	2.49	3.29	2.22	6.45	41.77	28.30	14.59	3.54
16	1.70	1.39	1.27	1.13	3.53	3.29	2.17	29.24	20.78	24.98	13.38	3.11
17	1.66	1.39	1.31	1.18	2.43	3.12	8.68	57.68	40.63	22.52	12.47	3.09
18	1.60	1.44	1.20	0.94	4.06	2.98	4.62	77.82	26.49	45.42	11.84	3.04
19	1.66	1.37	0.98	1.36	2.81	3.07	2.97	73.81	25.90	69.59	11.05	3.07
20	1.68	1.31	1.08	1.50	2.48	4.00	2.57	65.90	25.93	42.48	10.62	2.79
21	1.59	1.40	1.02	1.51	2.25	8.45	5.58	24.19	40.28	23.19	10.62	2.90
22	1.45	1.35	1.09	1.48	6.43	6.27	19.33	12.46	36.09	21.81	11.69	2.82
23	1.37	1.35	0.92	1.41	4.16	13.80	84.00	27.28	97.72	17.52	8.35	2.93
24	1.48	1.33	0.86	1.43	3.68	5.73	25.29	25.37	330.91	15.35	8.13	2.67
25	1.43	1.19	0.66	1.50	4.88	4.18	39.35	16.58	59.69	14.62	7.64	2.62
26	1.44	1.17	0.92	1.53	8.34	3.27	41.68	10.18	39.07	28.98	6.99	2.78
27	1.40	1.32	0.95	1.45	19.62	2.52	9.80	9.30	33.51	39.72	6.65	2.58
28	1.36	1.28	1.06	1.72	21.36	2.43	13.89	24.80	29.40	26.54	6.70	2.78
29	1.28		0.97	2.17	36.24	3.75	6.45	18.08	33.13	17.53	6.48	2.59
30	1.40		1.02	2.30	39.46	2.49	4.93	25.91	65.68	21.78	6.20	2.67
31	1.41		1.06		24.89		4.13	41.22		19.79		2.41
TOTAL	48.19	36.83	37.21	38.68	227.74	197.98	355.90	838.51	1897.41	1213.84	653.77	111.62
AVERAG	1.55	1.32	1.20	1.29	7.35	6.60	11.48	27.05	63.25	39.16	21.79	3.60

UNIT: m<sup>3</sup>/s  
 TOTAL(MCM): 488.82  
 AVERAGE(m<sup>3</sup>/s): 15.50

Cuadro 10.18 DESCARGA DIARIA EN EL SITIO DE LA PRESA SAN ESTEBAN (1976)

UNIT: m<sup>3</sup>/s

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	2.38	3.57	2.07	1.88	7.52	2.70	16.71	3.27	4.75	13.51	4.95	2.35
2	2.51	3.74	1.84	1.63	24.43	30.35	14.93	3.27	4.63	12.68	4.73	2.28
3	2.19	3.26	1.68	1.70	8.14	18.56	16.65	3.47	6.52	20.32	4.49	1.97
4	1.93	3.48	1.63	1.91	6.03	69.32	12.83	3.92	21.48	15.97	4.18	1.99
5	2.83	3.55	1.71	2.09	4.29	240.85	22.07	3.54	19.89	12.28	3.84	2.35
6	3.62	3.07	1.83	2.02	2.96	119.22	31.08	3.08	8.75	17.29	3.82	2.28
7	3.91	3.09	1.95	2.19	2.27	44.76	37.12	2.88	7.69	23.70	3.60	2.24
8	4.47	2.66	1.98	2.31	1.77	23.38	16.67	2.52	5.45	32.81	3.39	1.89
9	4.30	2.63	1.75	2.57	1.29	22.64	25.01	2.22	4.75	17.39	3.39	1.83
10	4.13	2.87	1.80	2.27	0.97	29.05	13.86	1.96	5.58	15.59	3.09	1.77
11	4.49	2.93	1.76	3.04	0.75	40.64	11.64	2.15	9.64	14.43	3.08	1.81
12	4.57	2.33	1.78	2.11	0.64	43.52	10.48	2.45	7.26	14.04	2.89	1.72
13	4.24	2.05	1.68	2.23	0.55	46.24	9.46	5.18	7.00	12.77	3.12	1.86
14	4.44	2.05	1.74	2.13	0.59	49.43	26.95	10.60	5.17	12.46	3.25	1.56
15	4.36	2.09	1.81	2.29	0.87	39.67	20.12	4.43	9.89	11.98	3.16	1.59
16	4.17	1.97	1.57	2.61	1.53	33.28	8.43	3.87	5.00	34.14	3.31	1.77
17	4.17	1.73	1.61	2.71	2.04	25.28	7.93	3.99	14.62	58.75	3.96	2.03
18	4.81	1.83	1.51	4.26	8.65	45.57	7.78	6.03	6.19	24.01	4.36	1.73
19	4.85	1.75	1.35	3.69	6.25	36.93	7.33	4.33	4.71	13.85	3.86	1.79
20	4.77	1.63	1.58	6.60	4.98	25.44	6.92	4.55	4.19	23.30	3.62	1.76
21	4.65	1.64	1.43	3.92	3.75	40.61	6.25	9.15	5.02	16.38	3.42	1.81
22	4.86	1.87	1.60	3.93	3.25	92.47	5.73	4.73	7.45	10.12	3.28	1.77
23	4.73	1.87	1.50	3.58	3.13	78.71	5.06	4.84	35.91	9.98	2.93	1.79
24	4.43	1.82	1.47	2.95	3.13	75.69	4.73	7.82	30.06	9.07	2.74	1.73
25	4.50	1.74	1.48	2.61	3.16	88.46	4.61	15.45	16.41	8.05	2.62	1.79
26	4.33	1.82	1.79	4.39	12.12	30.46	4.45	16.85	68.05	7.57	2.77	1.79
27	4.23	1.79	1.79	3.25	10.89	57.29	4.11	6.01	41.56	7.01	2.57	1.67
28	4.13	1.91	1.89	5.65	6.81	30.64	3.68	6.19	18.54	6.72	2.33	1.81
29	3.74		2.06	12.86	4.46	21.64	3.48	14.72	19.88	6.12	2.35	1.69
30	3.94		1.65	30.43	3.39	20.20	2.63	10.74	16.88	5.55	2.28	1.61
31	3.60		1.79		3.05		3.32	5.80		5.24		1.63
TOTAL	124.24	66.71	53.07	130.79	143.65	1523.00	373.00	180.00	422.91	493.08	101.38	57.67
VERAG	4.01	2.38	1.71	4.36	4.63	50.77	12.03	5.81	14.10	15.91	3.38	1.86

TOTAL(MCM): 317.05  
 AVERAGE(m<sup>3</sup>/s): 10.05

Cuadro 10.19 DESCARGA DIARIA EN EL SITIO DE LA PRESA SAN ESTEBAN (1977)

DAY	UNIT: m <sup>3</sup> /s											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.47	1.31	1.17	1.04	4.41	60.10	3.79	6.45	8.69	12.36	8.66	2.25
2	1.47	1.30	1.17	1.04	3.23	15.47	3.43	9.64	13.78	12.57	4.76	2.40
3	1.46	1.30	1.16	1.03	7.58	17.91	3.23	4.24	6.39	11.06	13.75	2.79
4	1.46	1.29	1.16	1.03	9.65	46.86	3.07	3.23	11.74	13.84	15.13	2.82
5	1.45	1.29	1.16	1.02	9.44	69.44	2.93	2.70	4.98	6.80	10.60	2.65
6	1.45	1.28	1.15	1.02	4.11	53.28	2.77	2.98	3.91	5.42	7.22	2.49
7	1.44	1.28	1.15	1.02	3.84	29.78	2.62	20.58	3.47	5.37	5.67	2.48
8	1.44	1.27	1.14	1.01	2.49	45.02	2.47	12.49	3.28	4.20	4.71	2.41
9	1.43	1.27	1.14	1.01	2.26	32.99	2.33	5.02	3.15	10.27	4.10	2.27
10	1.42	1.26	1.13	1.01	4.78	17.94	2.17	3.79	2.90	6.89	3.67	2.26
11	1.42	1.26	1.13	1.00	4.58	16.15	2.06	8.96	2.64	5.95	3.44	2.26
12	1.41	1.25	1.13	1.00	3.20	9.37	2.06	14.48	2.47	5.59	3.26	2.21
13	1.41	1.25	1.12	0.99	3.03	6.22	2.03	5.78	2.88	5.73	2.97	2.14
14	1.40	1.24	1.12	0.99	4.22	6.95	2.04	4.18	10.03	7.60	2.91	2.16
15	1.40	1.24	1.11	0.99	4.72	21.92	2.13	3.76	21.31	3.56	2.75	2.07
16	1.39	1.23	1.11	0.98	4.48	75.93	2.10	3.83	29.89	3.04	2.65	2.15
17	1.39	1.23	1.10	0.98	6.42	9.72	2.22	8.10	20.60	2.86	2.61	2.08
18	1.38	1.23	1.10	0.98	3.64	8.12	2.38	14.13	10.71	2.77	2.76	2.10
19	1.38	1.22	1.09	0.97	2.66	8.74	2.21	4.82	6.79	2.63	4.91	3.10
20	1.37	1.22	1.09	0.97	2.73	7.50	2.03	3.66	5.36	2.82	6.02	2.30
21	1.36	1.21	1.09	0.96	2.25	9.71	1.93	7.43	5.09	2.67	3.65	2.26
22	1.36	1.21	1.08	0.96	2.60	10.36	1.93	12.89	10.56	2.82	3.29	2.24
23	1.35	1.20	1.08	0.96	5.08	5.58	1.95	19.31	5.27	6.76	3.04	2.14
24	1.35	1.20	1.07	0.95	2.81	5.15	1.99	18.63	33.27	5.95	2.86	2.16
25	1.34	1.19	1.07	0.95	1.98	4.84	2.24	13.85	46.07	6.23	2.77	2.10
26	1.34	1.19	1.07	0.95	1.91	4.65	2.06	8.08	16.59	5.08	2.53	2.17
27	1.33	1.18	1.06	0.94	2.30	6.06	2.00	10.59	14.09	5.64	2.31	2.10
28	1.33	1.18	1.06	0.94	1.99	5.15	1.86	18.72	22.37	4.59	2.36	2.05
29	1.32		1.05	0.94	6.41	5.12	1.80	6.69	13.62	17.75	2.14	2.00
30	1.32		1.05	0.93	3.44	5.88	1.80	5.50	11.89	7.72	2.12	2.04
31	1.31		1.05		32.60		2.54	6.42		5.01		2.00
TOTAL	43.17	34.78	34.37	29.56	154.83	621.94	72.17	270.95	353.78	201.56	139.63	70.64
VERAG	1.39	1.24	1.11	0.99	4.99	20.06	2.33	8.74	11.79	6.50	4.65	2.28

TOTAL(MCM): 175.17  
 AVERAGE(m<sup>3</sup>/s): 5.55



Cuadro 10.20 DESCARGA DIARIA EN EL SITIO DE LA PRESA SAN ESTEBAN (1978)

UNIT: m<sup>3</sup>/s

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.27	1.17	1.08	0.98	1.66	10.29	16.33	7.69	65.76	37.95	5.91	2.46
2	1.27	1.16	1.07	0.98	1.55	8.36	18.22	5.36	53.57	66.14	8.84	2.57
3	1.27	1.16	1.07	0.98	1.42	10.63	25.40	4.42	33.85	58.26	10.39	2.46
4	1.26	1.16	1.07	0.97	1.16	18.52	6.49	9.15	52.33	81.46	6.31	2.60
5	1.26	1.15	1.06	0.97	2.67	13.96	39.31	20.20	49.04	28.49	6.05	2.42
6	1.26	1.15	1.06	0.97	2.39	7.80	8.32	5.20	111.69	47.51	5.90	2.34
7	1.25	1.15	1.06	0.97	1.91	20.86	8.36	16.42	138.98	42.47	5.60	2.47
8	1.25	1.14	1.05	0.96	3.29	8.53	5.97	23.93	50.11	21.08	6.19	2.73
9	1.25	1.14	1.05	0.96	1.86	9.80	5.62	14.06	34.89	20.58	12.79	2.98
10	1.24	1.14	1.05	0.96	1.53	4.27	4.18	5.60	22.08	15.13	7.06	3.96
11	1.24	1.13	1.04	0.96	1.53	3.68	4.34	3.90	18.43	18.90	7.91	3.53
12	1.23	1.13	1.04	0.95	1.36	3.32	13.34	3.97	19.76	36.70	5.58	2.95
13	1.23	1.13	1.04	0.95	1.30	2.44	84.35	6.04	26.77	15.08	4.66	2.78
14	1.23	1.12	1.04	0.95	1.20	2.70	30.66	3.54	42.89	100.25	4.22	2.63
15	1.22	1.12	1.03	0.94	1.22	5.07	14.90	2.66	15.45	74.88	4.49	2.51
16	1.22	1.12	1.03	0.94	1.20	2.75	18.40	2.34	12.44	96.25	4.43	2.33
17	1.22	1.11	1.03	0.94	1.11	1.72	50.38	2.16	14.59	125.73	3.89	2.31
18	1.21	1.11	1.02	0.94	1.14	1.40	16.85	25.14	15.68	53.63	3.33	2.27
19	1.21	1.11	1.02	0.93	2.39	1.53	18.47	18.15	91.67	33.33	3.11	2.20
20	1.21	1.10	1.02	0.93	45.94	7.34	10.81	6.09	107.32	25.85	3.22	2.15
21	1.20	1.10	1.02	1.28	7.62	7.06	44.69	16.21	154.20	20.70	3.34	2.22
22	1.20	1.10	1.01	1.17	4.76	9.79	30.73	8.84	49.13	17.84	3.39	2.16
23	1.20	1.09	1.01	1.33	3.52	4.76	24.36	12.34	80.68	15.75	3.29	2.23
24	1.19	1.09	1.01	1.18	3.61	3.23	11.07	35.74	106.85	16.10	3.41	2.19
25	1.19	1.09	1.00	2.38	3.05	2.35	7.68	29.19	99.55	12.58	3.33	2.19
26	1.19	1.08	1.00	4.85	5.51	1.88	5.50	13.73	68.72	12.03	3.03	2.21
27	1.18	1.08	1.00	5.90	7.79	4.25	5.61	18.28	92.76	13.34	3.10	2.11
28	1.18	1.08	0.99	2.88	9.60	2.23	23.66	35.82	74.94	15.04	2.76	2.30
29	1.18	1.08	0.99	1.99	12.36	1.76	7.80	39.40	119.06	10.02	2.71	2.41
30	1.17	1.07	0.99	1.62	5.80	6.18	8.55	108.50	71.58	8.35	2.67	2.23
31	1.17	1.07	0.99	6.79	6.79	25.08	114.10	7.68	7.68	7.68	2.23	2.23
TOTAL	37.85	31.40	31.94	43.73	148.24	188.47	595.40	618.18	1894.77	1149.10	150.90	77.14
VERAG	1.22	1.01	1.03	1.41	4.78	6.08	19.21	19.94	61.12	37.07	4.87	2.49

TOTAL(MCM): 429.16  
 AVERAGE(m<sup>3</sup>/s): 13.61

Cuadro 10.21 DESCARGA DIARIA EN EL SITIO DE LA PRESA SAN ESTEBAN (1979)

UNIT: m<sup>3</sup>/s

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.97	1.38	1.26	1.15	3.46	23.49	27.27	9.09	46.86	14.95	14.53	4.83
2	1.99	1.34	1.06	1.09	2.60	13.96	42.39	47.75	10.39	27.52	28.91	4.81
3	1.87	1.35	1.09	1.09	2.69	9.83	47.34	23.31	82.46	36.29	56.06	4.87
4	1.69	1.33	1.18	1.04	9.86	90.27	82.56	51.55	54.89	33.41	21.55	4.74
5	1.64	1.31	1.21	1.06	4.91	50.05	27.63	15.44	35.26	21.20	16.81	4.40
6	1.58	1.25	1.21	0.99	4.56	18.21	79.49	10.04	35.81	19.66	14.82	4.30
7	1.61	1.25	1.16	1.13	4.44	11.40	27.64	8.39	57.82	16.31	13.54	4.28
8	1.66	1.22	1.12	1.23	3.55	33.05	17.54	7.42	40.36	81.46	12.48	4.21
9	1.55	1.18	1.16	1.21	3.14	16.95	16.79	6.93	31.50	72.16	11.60	4.12
10	1.45	1.17	1.09	1.21	2.88	15.57	14.10	6.29	59.78	58.08	10.93	4.31
11	1.44	1.30	1.14	1.12	2.75	10.89	49.97	5.25	44.50	50.22	10.30	4.13
12	1.38	1.33	1.16	1.09	3.37	9.76	34.03	4.80	106.95	47.03	9.60	4.04
13	1.39	1.29	1.09	1.09	2.88	9.22	18.79	4.41	90.70	32.60	9.35	3.79
14	1.38	1.25	1.11	1.14	11.67	57.27	18.04	5.12	61.91	31.21	8.65	3.62
15	1.33	1.29	1.09	1.16	4.80	42.03	11.09	4.53	37.49	36.70	7.75	3.60
16	1.34	1.34	1.09	1.16	3.59	43.30	9.41	5.08	30.89	53.80	7.26	3.50
17	1.22	1.37	1.06	1.12	2.98	13.69	8.24	9.89	53.78	38.47	7.06	3.43
18	1.18	1.34	0.98	1.09	2.50	9.00	9.70	11.79	48.16	65.04	6.64	3.36
19	1.24	1.37	0.98	1.18	2.26	7.22	17.48	22.60	31.21	52.97	6.44	3.30
20	1.08	1.28	0.98	3.28	2.15	6.84	8.62	43.94	24.19	65.94	6.26	3.15
21	1.24	1.27	0.98	4.36	2.14	5.89	8.06	62.11	29.44	69.79	6.10	3.25
22	1.18	1.25	0.98	2.41	2.02	9.21	20.35	53.23	21.74	39.79	5.97	3.38
23	1.13	1.35	0.98	5.39	1.83	6.23	11.50	20.69	17.13	46.86	5.56	3.53
24	1.28	1.35	1.06	11.29	1.66	17.78	8.37	19.41	15.19	37.17	5.19	3.49
25	1.48	1.41	1.09	4.18	3.19	7.25	7.06	20.86	15.47	23.99	5.09	3.41
26	1.51	1.30	1.09	4.73	1.99	4.77	28.44	12.64	57.34	19.11	5.01	3.29
27	1.47	1.24	1.09	3.06	3.34	4.06	38.14	10.55	44.74	18.60	4.96	3.19
28	1.55	1.31	1.10	8.20	5.44	3.52	11.57	10.48	25.50	15.87	4.96	3.12
29	1.54		1.29	29.65	3.42	16.46	21.81	16.31	29.31	19.06	5.05	3.09
30	1.47		1.30	5.18	8.55	19.46	12.11	36.70	29.71	24.79	4.89	3.12
31	1.43		1.19		4.85		8.52	114.64		21.67		3.06
TOTAL	45.26	36.42	34.36	103.07	119.47	586.62	744.07	681.25	1270.51	1191.71	333.40	116.74
VERAG	1.46	1.30	1.11	3.44	3.85	19.55	24.00	21.98	42.35	38.44	11.11	3.77

TOTAL(MCM): 454.71

AVERAGE(m<sup>3</sup>/s): 14.42

Cuadro 10.22 DESCARGA DIARIA EN EL SITIO DE LA PRESA SAN ESTEBAN (1980)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3.01	2.08	2.00	1.81	2.50	26.87	8.70	20.37	11.36	32.58	13.44	5.62
2	2.91	2.03	2.13	1.81	2.45	16.74	7.89	46.94	11.76	37.03	12.67	5.49
3	2.96	1.94	2.08	1.81	2.51	9.71	7.34	24.18	9.60	101.95	11.91	5.26
4	3.06	2.06	1.93	1.87	3.14	17.68	6.83	14.34	10.98	115.81	11.52	5.05
5	3.17	2.19	1.91	1.91	3.17	36.03	6.66	12.01	9.36	42.25	13.44	5.00
6	1.36	2.10	1.94	1.81	5.12	9.54	8.21	14.07	10.10	55.48	11.52	4.90
7	3.19	2.10	2.09	1.81	3.41	7.69	6.70	53.72	8.29	103.01	10.75	4.84
8	2.94	1.98	2.11	1.81	3.64	10.72	6.16	15.28	19.72	57.25	10.37	4.83
9	2.77	2.08	2.16	1.81	3.20	55.58	10.29	16.80	32.80	57.10	10.37	4.69
10	2.62	2.15	2.14	1.81	2.90	23.45	6.77	15.23	94.01	71.47	10.75	4.60
11	2.60	2.31	2.07	1.81	2.83	73.11	6.48	20.16	39.96	118.10	9.99	4.51
12	2.62	2.23	2.09	1.81	2.89	96.08	6.94	15.38	62.66	64.74	9.22	4.51
13	2.63	2.11	2.11	1.81	10.33	178.14	10.64	10.94	104.14	47.77	9.60	4.48
14	2.65	1.96	2.05	1.81	6.26	37.75	6.57	26.28	66.96	33.90	9.22	4.48
15	2.53	1.96	2.06	1.81	16.01	86.81	5.69	193.56	32.57	58.19	8.68	4.48
16	2.50	2.00	2.13	1.81	7.61	33.34	5.25	44.04	32.73	76.00	9.29	4.40
17	2.52	2.05	2.09	1.76	4.94	18.27	4.95	34.40	31.10	43.03	9.22	4.27
18	2.62	2.11	1.97	1.70	3.90	12.57	4.70	27.21	28.68	35.68	9.22	4.25
19	2.66	2.05	1.89	1.67	3.54	10.86	6.35	57.80	37.78	53.80	7.68	4.07
20	2.75	2.00	1.81	1.67	3.26	55.08	18.33	62.36	62.46	38.81	8.10	4.07
21	2.74	1.96	1.81	1.67	3.96	153.00	23.69	64.93	52.49	43.95	7.70	4.07
22	2.66	2.13	1.81	1.67	7.70	129.30	16.47	39.61	56.78	30.99	7.39	4.00
23	2.61	2.11	1.81	1.67	10.32	74.12	11.91	24.60	59.15	37.97	6.99	3.88
24	2.59	2.20	1.85	1.67	27.43	73.60	77.84	19.73	38.68	24.70	6.97	3.88
25	2.42	2.16	1.90	1.67	7.40	29.93	22.08	15.71	34.81	20.22	6.79	3.80
26	2.39	2.04	1.87	1.63	5.00	16.46	25.57	13.81	30.16	18.17	6.67	3.68
27	2.35	2.06	1.81	1.64	29.98	14.05	16.44	12.53	167.26	16.77	6.36	3.68
28	2.38	2.00	1.81	2.80	106.59	12.21	33.89	11.48	68.11	19.59	6.13	3.61
29	2.14		1.81	2.06	49.85	10.67	15.59	10.98	40.58	18.44	5.81	3.49
30	1.68		1.81	1.83	59.42	9.64	12.22	14.74	35.23	16.44	5.66	3.49
31	1.84		1.81		30.09		27.33	18.42		15.32		3.49
TOTAL	79.87	58.16	60.88	54.24	431.36	1339.00	434.46	971.60	1300.27	1506.54	273.43	134.90
VERAG	2.58	2.03	1.96	1.81	13.91	43.19	14.01	31.34	43.34	48.60	9.11	4.35

UNIT: m<sup>3</sup>/s  
 TOTAL(MCM): 574.1  
 AVERAGE(m<sup>3</sup>/s): 18.20

Cuadro 10.23 ANALISIS DE ESTABILIDAD PARA LA PRESA DE GRAVEDAD  
(ALTURA DE PRESA 43 M)

**DAM CONFIGURATION**

HEIGHT 43 m  
 D/S SLOPE 0.8  
 FILET HEIGHT 20 m  
 SLOPE 0.5

WATER DEPTH 37

**PROPERTY OF MATERIAL**

UNIT WIGHT CONCRETE 2.3 t/m<sup>3</sup>  
 SEDIMENT 1 t/m<sup>3</sup>

**LOAD**

SEISMIC COEFFICIENT 0.12

**STRENGTH OF FOUNDATION ROCK**

Phai 40 degree  
 Tau 80 t/m<sup>2</sup>

**CALCULATION OF SELF WEIGHT OF DAM**

PART	AREA (m <sup>2</sup> )	WEIGHT (t/m)
MAIN TRIANG	740	1,701
FILET	100	100
TOTAL	840	1,801

**STABILITY ANALYSIS**

LOAD	VERTICAL	HORIZONTAL
SELF WEIGHT	1,801	
WATER WEIG	270	
SEDIMENT W	150	
SEISMIC FORCE		216.1296
HYDROSTATIC F.		684.5
HYDRODYNAMIC F.		82.14
SEDIMENT FORCE		312.5
UPLIFT	-273.8	
TOTAL	1,947	1,295

**SAFETY FACTOR**

$$= (V \cdot \tan(\text{phai}) + L \cdot \tau) / H$$

$$= 4.00$$

Cuadro 10.24 ANALISIS DE ESTABILIDAD PARA LA PRESA DE ESCOLLERA

<b>PROPERTY OF MATERIALS</b>			
ROCK MATERIAL	Wsat/Wsub=		1.90
	U/S	phai=	40.00 degree
	D/S	phai=	35.00 degree
<b>SEISMIC COEFFICIENT</b>			
HORIZONTAL	k=		0.15
<b>SLOPE GRADIENT</b>			
U/S	Tan(theta)=		0.3333
D/S	Tan(theta)=		0.40
<b>SAFETY FACTOR UPSTREAM</b>			
	$FS = \frac{(1 - k \cdot W_{sat}/W_{sub} \cdot \tan(\theta))}{(\tan(\theta) + k \cdot (W_{sat}/W_{sub})) \cdot \tan(\phi)}$		
	=	1.23	
<b>SAFETY FACTOR DOWNSTREAM</b>			
	$FS = \frac{(1 - k \cdot \tan(\theta))}{(\tan(\theta) + k) \cdot \tan(\phi)}$		
	=	1.20	

Cuadro 10.25 COSTO DE LA PRESA 15 DE SEPTIEMBRE

FEATURES OF DAM		
RESERVOIR AREA	km2	35.75
RESERVOIR VOLUME	m3	380,000,000
ROCK FILL VOLUME	m3	2,848,000
impervious fill	m3	395,000
unprocessed filter	m3	557,000
processed filter	m3	125,700
grizzled rock	m3	123,700
randaom rockfill	m3	1,220,000
oversized rockfill	m3	76,600
random fill	m3	350,000
CONCRETE VOLUME	m3	333,700
spillway concrete	m3	170,000
powerhouse concrete	m3	144,000
gravity wall concrete	m3	15,000
spillway bridge concrete	m3	700
miscellaneous concrete	m3	4,000
NUMBER OF RESETTLEMENT	person	2,000

PROJECT COST	COLON	US \$(8.72C)	M.YEN(110Y=1D)	UNIT COST
LAND ACQUISITION	36,996,223	4,242,686	467	118,677 US\$/km2
HOUSING AND DEVELOPMENT(POWER HOUSE ETC)	364,925,826	41,849,292	4,603	31.63 US\$/m3
CIVIL WORKS	1,023,410,864	117,363,631	12,910	207.17 US\$/m3
TURBINMOTERS,GENERATORS	178,841,978	20,509,401	2,256	212.728 US\$/MW
ELECTRIC CONTROL UNIT	19,884,701	2,280,356	251	
EQUIPMENT	29,386,894	3,370,057	371	
SUBSTATIONS	87,234,443	10,003,950	1,100	
TOTAL	1,740,680,929	199,619,373	21,958	
COST OF LANDACQUISITION	US\$ 4,242,686	unit	35.75	
COST OF DAM AND POWERHOUSE	US\$ 159,212,923	RESERVOIR AREA km2	2,848,000	
(ROCKFILL AND CONCRETE)		ROCK FILL m3	333,700	
COST OF POWER GENERATION RELATED	US\$ 36,163,763	CONCRETE m3	170	
TOTAL	US\$ 199,619,373	MAX CAPACITY MW		

Cuadro 10.26 COSTO DE LA PRESA SAN ESTEBAN (COMBINACION CON ALVIADERO)

1. ROCK FILL DAM (WITH SPILLWAY)		COST(US\$)		32 UNIT COST		44.5		43		39		44.5		44		43.5		39		32	
DAM HEIGHT	50	40	30	44.5	44	43.5	43	39	32	UNIT COST	30	30	44.5	44	43.5	43	39	32	39	32	
DAM HEIGHT	50	40	30	44.5	44	43.5	43	39	32	UNIT COST	30	30	44.5	44	43.5	43	39	32	39	32	
DAM VOLUME	3,138,680	1,656,468	706,530	2,323,454	2,249,345	2,175,235	2,101,128	1,561,374	895,717	69,703,633	67,400,344	65,257,654	63,003,765	46,841,216	29,871,518						
FILTER VOLUME	327,378	207,316	117,155	261,344	255,341	249,338	243,335	195,310	135,187	7,840,328	7,660,235	7,490,143	7,300,050	5,859,309	4,055,614						
CORE VOLUME	785,076	482,304	261,861	603,413	589,274	573,135	573,135	460,259	305,949	18,556,540	18,102,381	17,648,222	17,194,042	13,807,777	9,176,460						
TOTAL VOLUME	4,251,115	2,346,088	1,084,545	3,203,350	3,108,099	3,012,647	2,917,596	2,216,943	1,336,854	96,100,501	93,242,960	90,385,419	87,527,877	66,506,302	40,105,611						

2. DIVERSION TUNNEL INCLUDED IN SPILLWAY		COST(US\$)		32 UNIT COST		44.5		44		43.5					
DAM HEIGHT	50	40	30	44.5	44	43.5	43	39	32	UNIT COST	30	30	44.5	44	43.5
DAM HEIGHT	50	40	30	44.5	44	43.5	43	39	32	UNIT COST	30	30	44.5	44	43.5
DAM VOLUME	59,400	39,960	19,440	48,708	47,738	46,764	45,792	37,908	23,544	10,228,660	10,024,560	9,830,440	9,616,320	7,990,680	4,944,240
WALL VOLUME	164,583	85,867	37,350	121,289	117,353	113,418	109,482	81,015	47,053	210	25,470,725	24,644,200	23,817,875	22,991,150	17,013,150
ENERGY DISIPA	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	210	2,205,000	2,205,000	2,205,000	2,205,000	2,205,000
TOTAL VOLUME	234,483	136,327	67,290	180,497	175,589	170,682	165,774	129,423	81,097	37,904,405	36,873,760	35,843,115	34,812,470	27,178,830	17,030,440

4. LAND ACQUISITION		COST(US\$)		32 UNIT COST		44.5		44		43.5	
DAM HEIGHT	m	120	125	130	135	140	142	129	133	134	134.5
AREA	km <sup>2</sup>	17.16	23.81	30.99	38.31	45.38	48.82	29,554	35,382	36,199	36,886
PEOPLE	person	3,400	5,672	1,281	1,107	1,107	3,850	5,445	7,300	7,574	7,846
HOUSEHOLD	family	818	1,281	1,281	2,479	2,479	905	1,233	1,847	1,714	1,770
ROAD	km	1.716	2.381	3.099	3.831	4.539	30.73	43.88	53.60	53.60	53.60
CROP LAND	km <sup>2</sup>	135	215	26	26	26	1,982	2,854	3,5382	3,6189	3,685
NUMBER OF DOT		25	26								
NO. PERSON PER DOT											

4. TOTAL COST		SUB TOTAL - COMPENSATI SOLO TOT		MULTI RATIO		ALOCATIO		ALLOCATED		PURPOSE		FLOOD	
PURPOSE	HEIGHT	DAM	SPILLWAY	GATE	SUB TOTAL	COMPENSATI	SOLO TOT	MULTI RATIO	ALOCATIO	ALLOCATED	PURPOSE	FLOOD	
MULTI-1	44.5	96,100,501	37,904,405	336,779	134,241,685	19,060,800	153,402,405					32,521,327	
MULTI-2	44	93,242,960	36,873,760	284,123	130,400,843	18,951,543	149,352,386					31,662,708	
MULTI-3	43.5	90,385,419	35,843,115	219,400	126,447,834	18,710,400	145,158,334					30,773,567	
MULTI-4	43	90,385,419	35,843,115	197,460	126,425,994	18,710,400	145,136,394					30,768,915	
POWER	43	87,527,877	34,812,470	0	122,340,347	18,402,085	140,802,432	1	44.4%	62,524,217	POWER		
IRRIGATION	39	66,506,302	27,178,830	0	93,685,132	15,003,207	108,690,339	0.771935097	34.3%	48,264,637	IRRIGATION		
FLOOD ONLY	32	40,105,611	17,030,440	274,250	57,410,301	10,179,207	67,589,508	0.480031257	21.3%	30,013,578	FLOOD ONLY		
							2,25198635	100%	140,802,432				

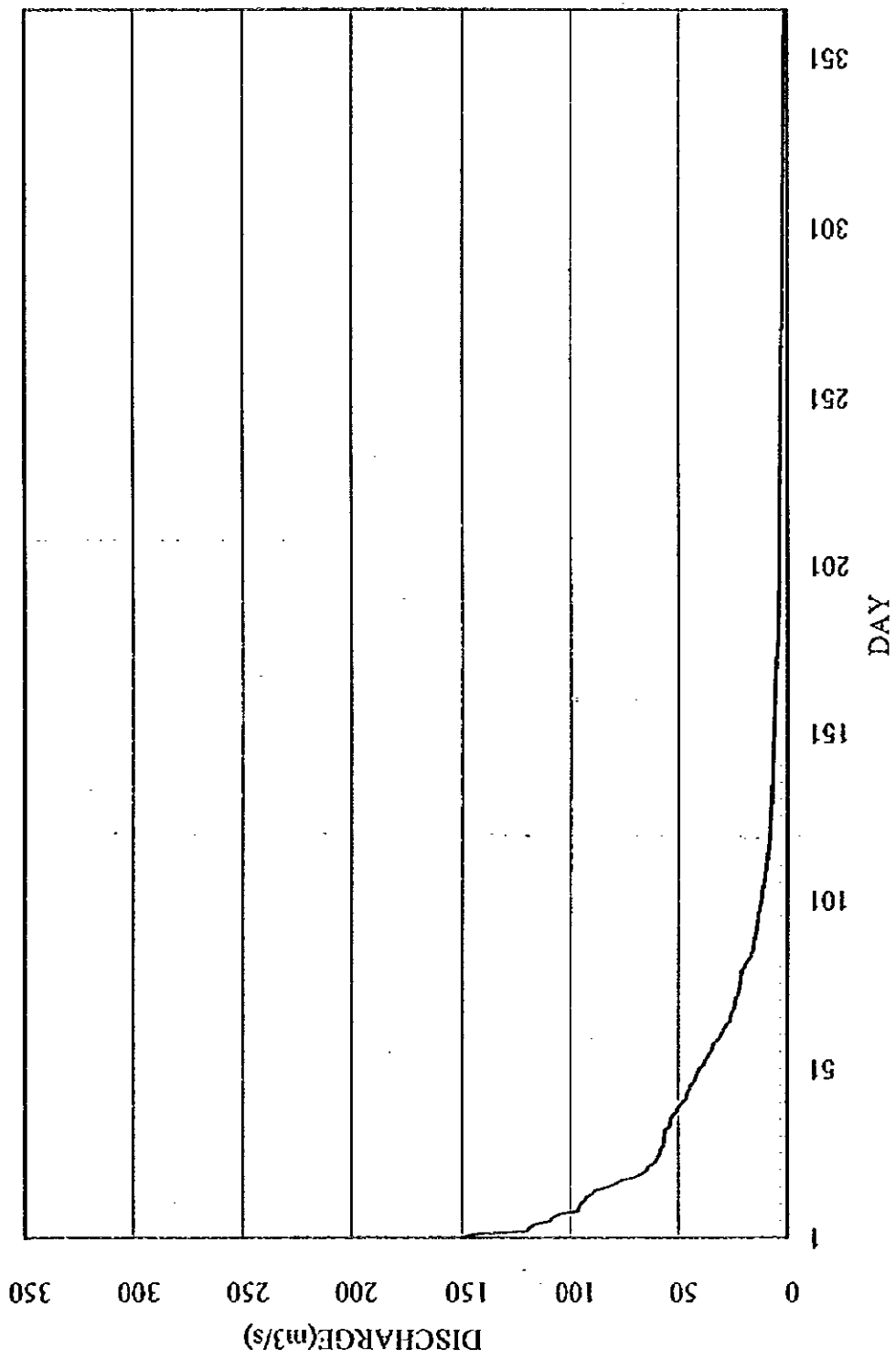


Figura 10.1 REGIMEN DE CAUDAL EN EL SITIO DE LA PRESA DE SAN ESTEBAN (1971)



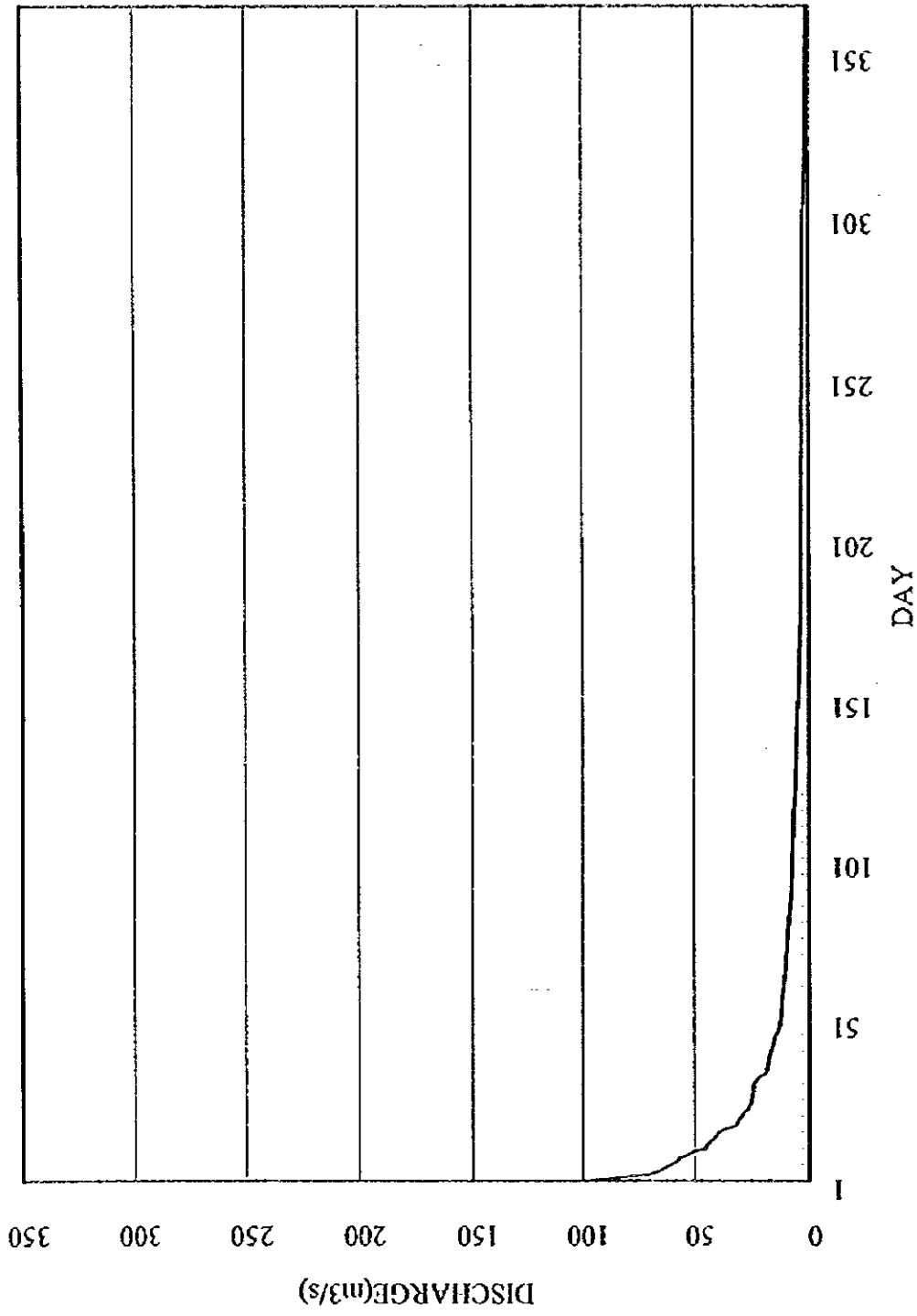


Figura 10.2 REGIMEN DE CAUDAL EN EL SITIO DE LA PRESA DE SAN ESTEBAN (1972)

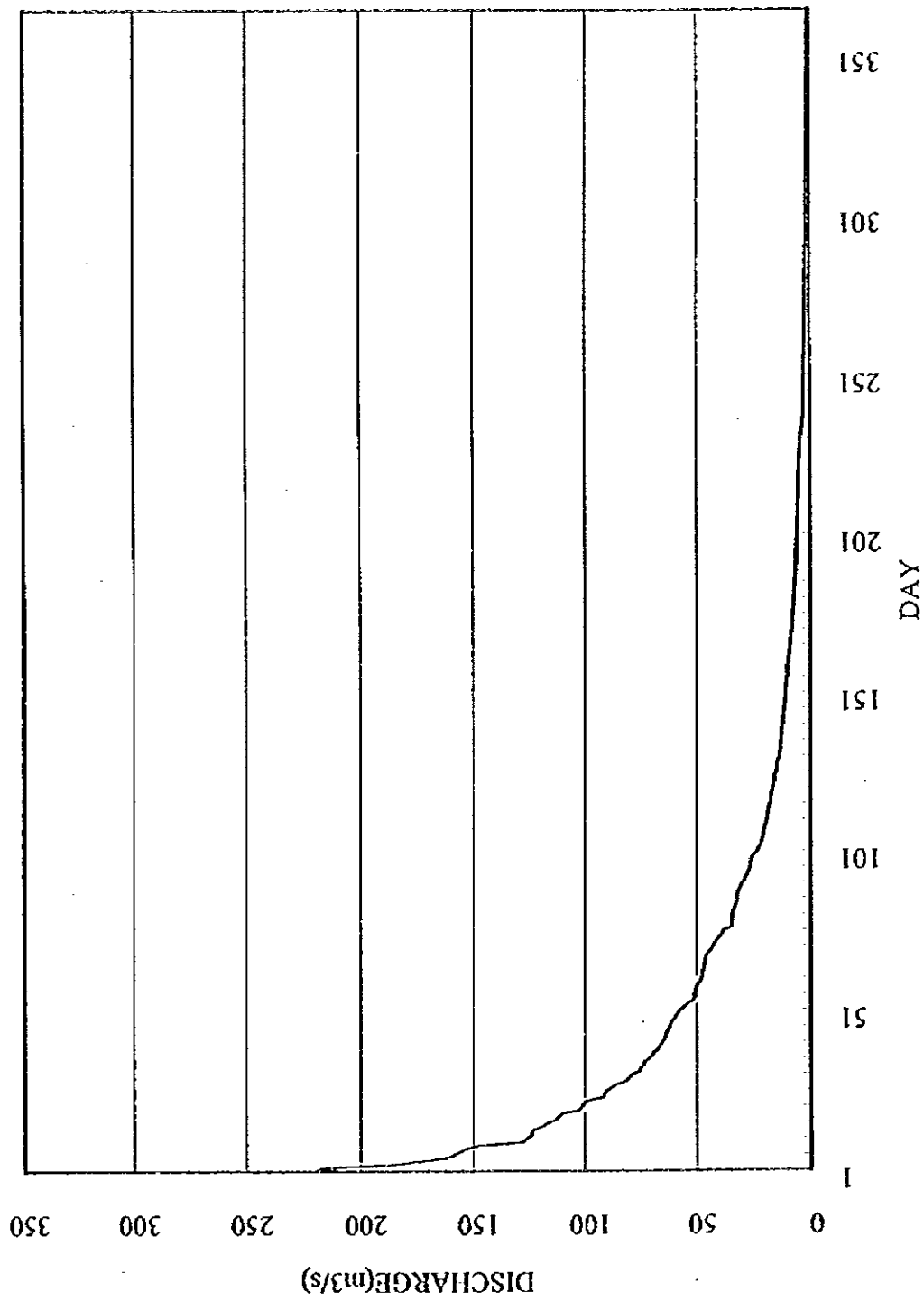


Figura 10.3 REGIMEN DE CAUDAL EN EL SITIO DE LA PRESA DE SAN ESTEBAN (1973)

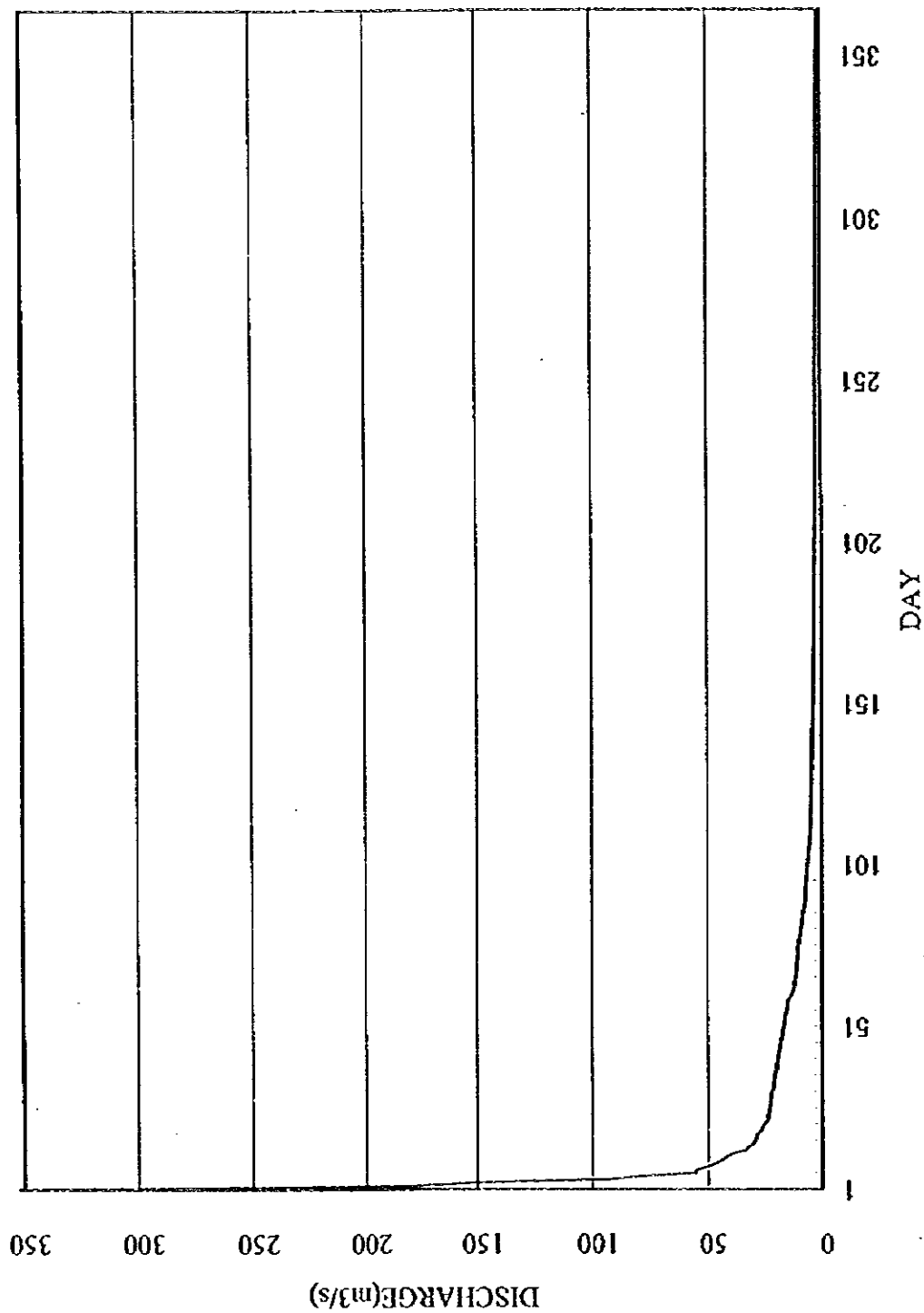


Figura 10.4 REGIMEN DE CAUDAL EN EL SITIO DE LA PRESA DE SAN ESTEBAN (1974)

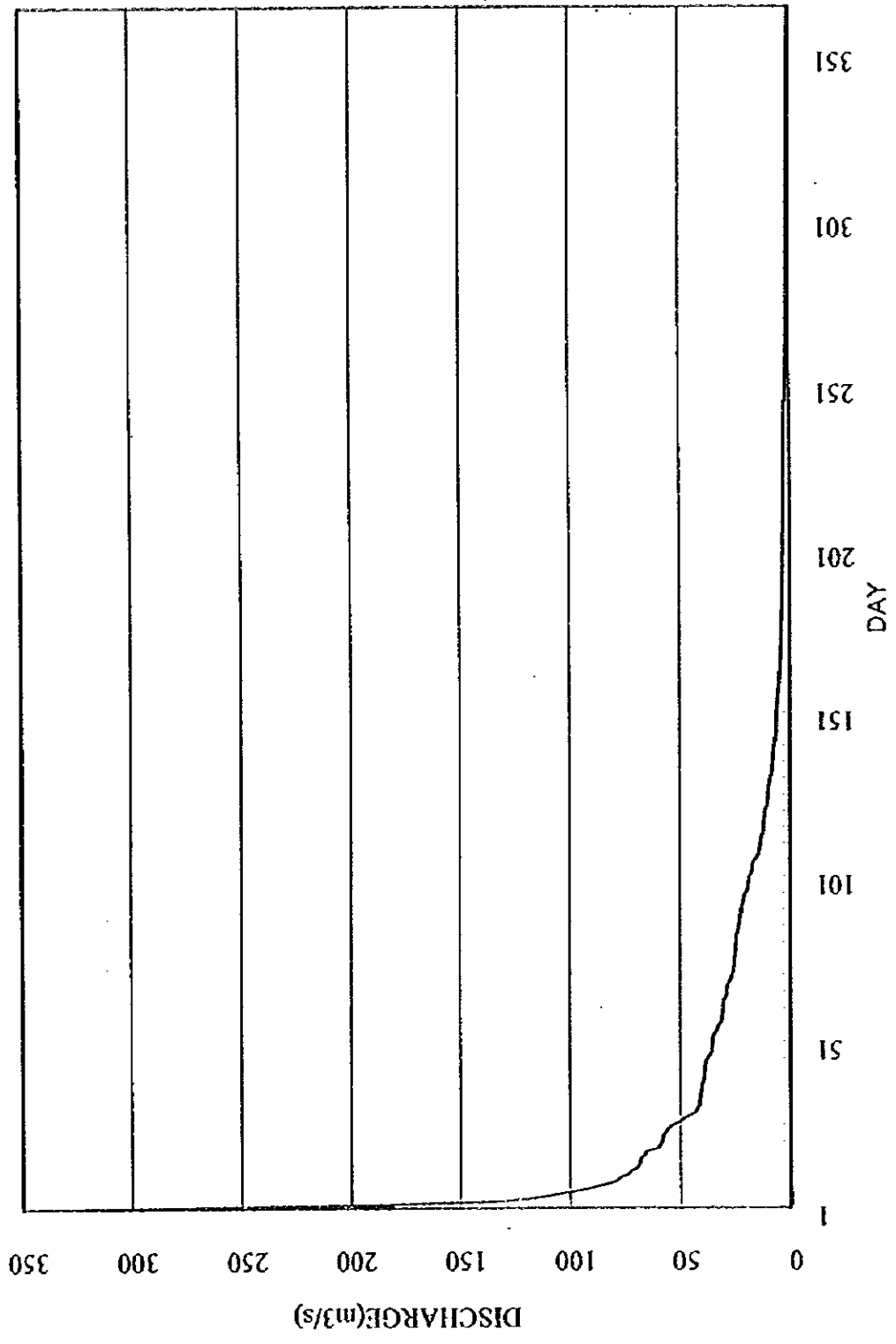


Figura 10.5 REGIMEN DE CAUDAL EN EL SITIO DE LA PRESA DE SAN ESTEBAN (1975)

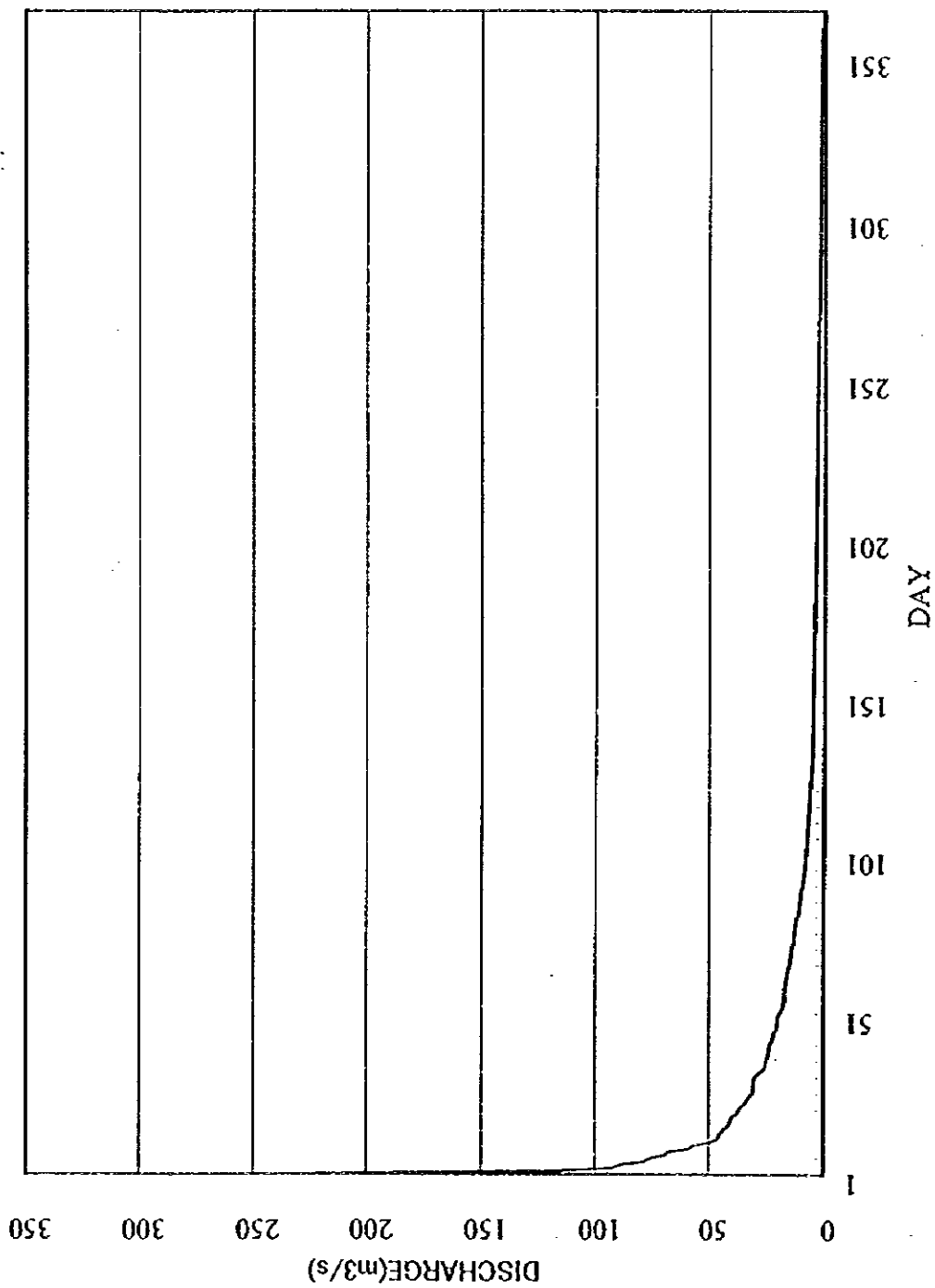


Figura 10.6 REGIMEN DE CAUDAL EN EL SITIO DE LA PRESA DE SAN ESTEBAN (1976)

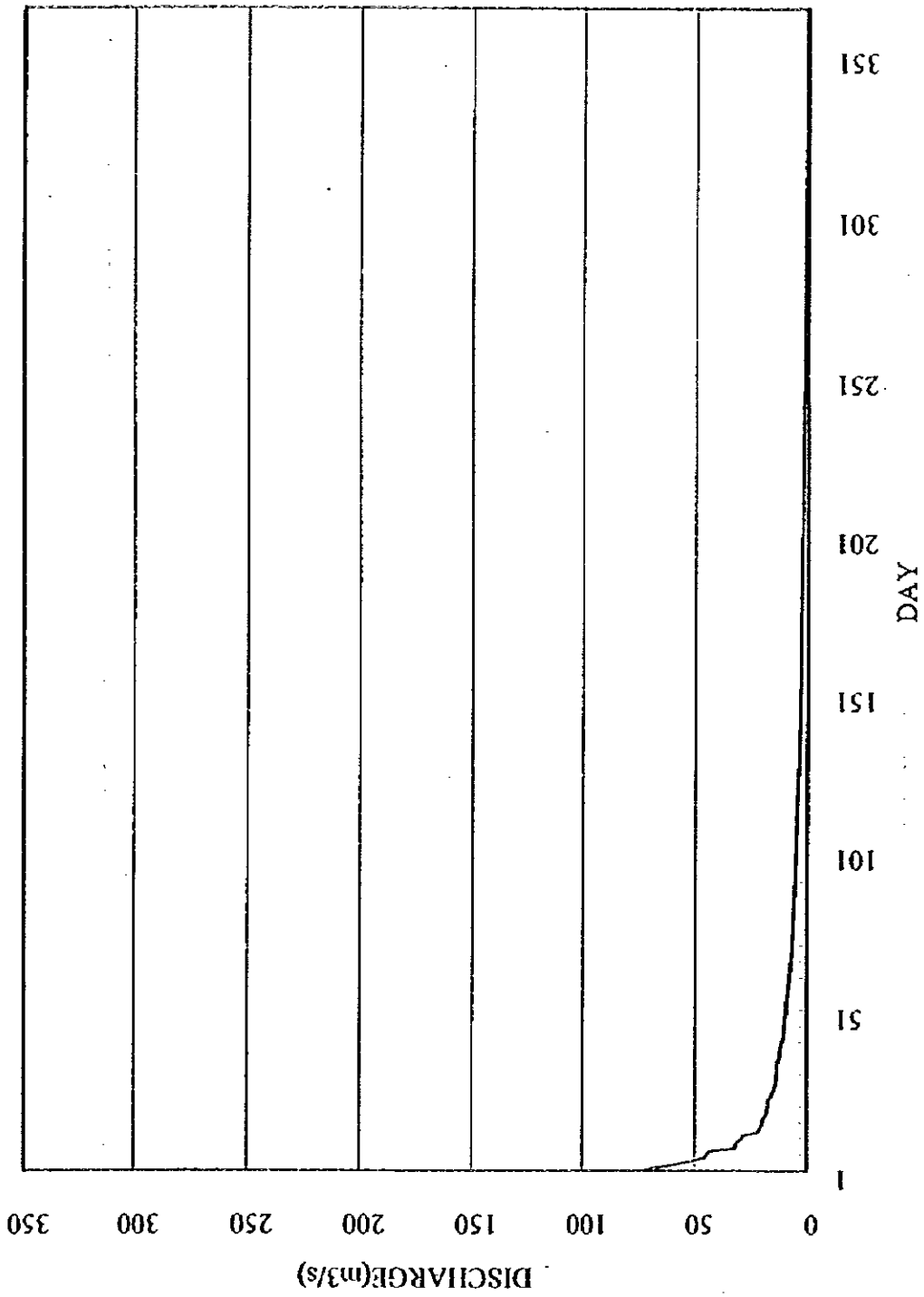


Figura 10.7 REGIMEN DE CAUDAL EN EL SITIO DE LA PRESA DE SAN ESTEBAN (1977)

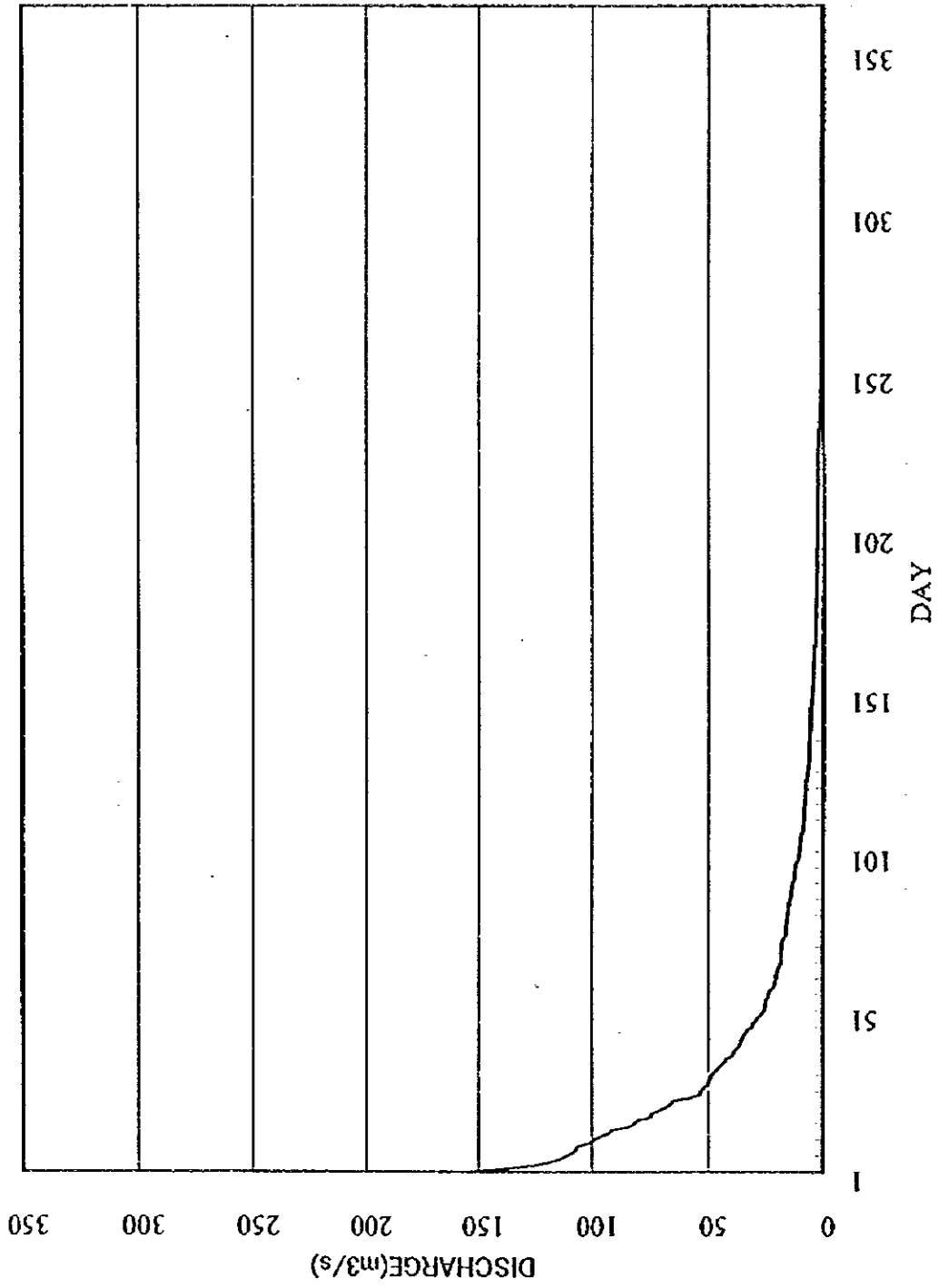


Figura 10.8 REGIMEN DE CAUDAL EN EL SITIO DE LA PRESA DE SAN ESTEBAN (1978)

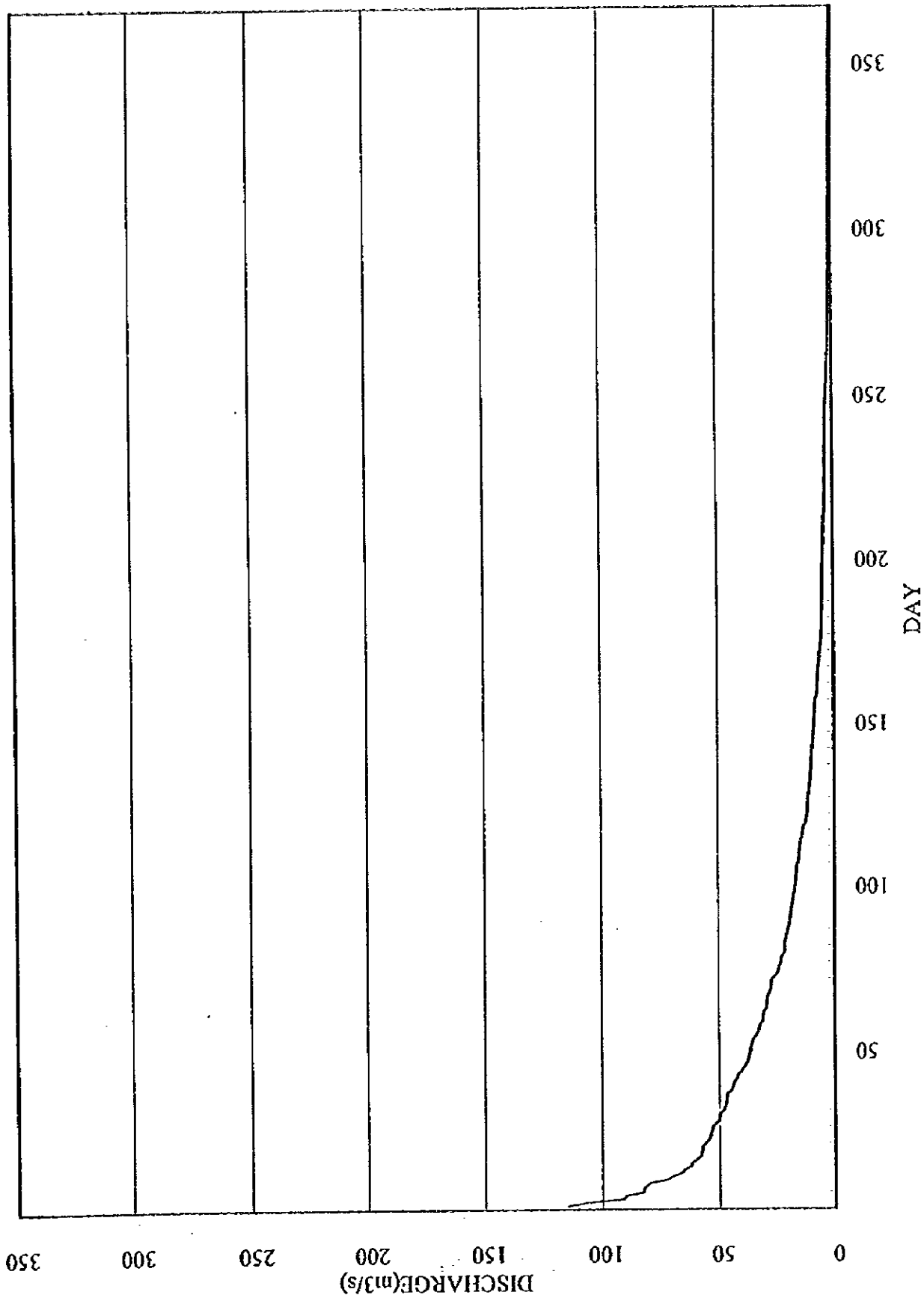


Figura 10.9 REGIMEN DE CAUDAL EN EL SITIO DE LA PRESA DE SAN ESTEBAN (1979)



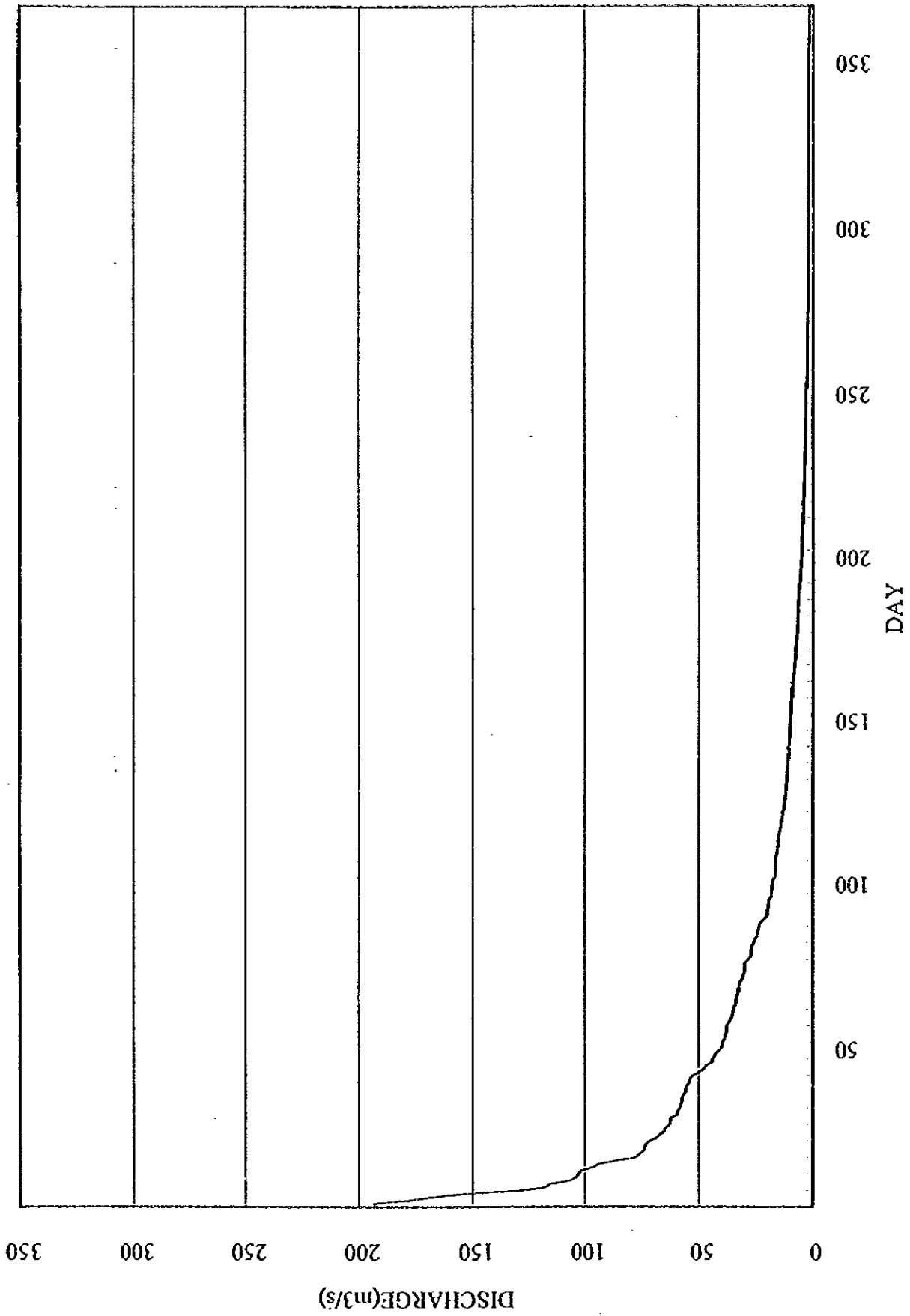
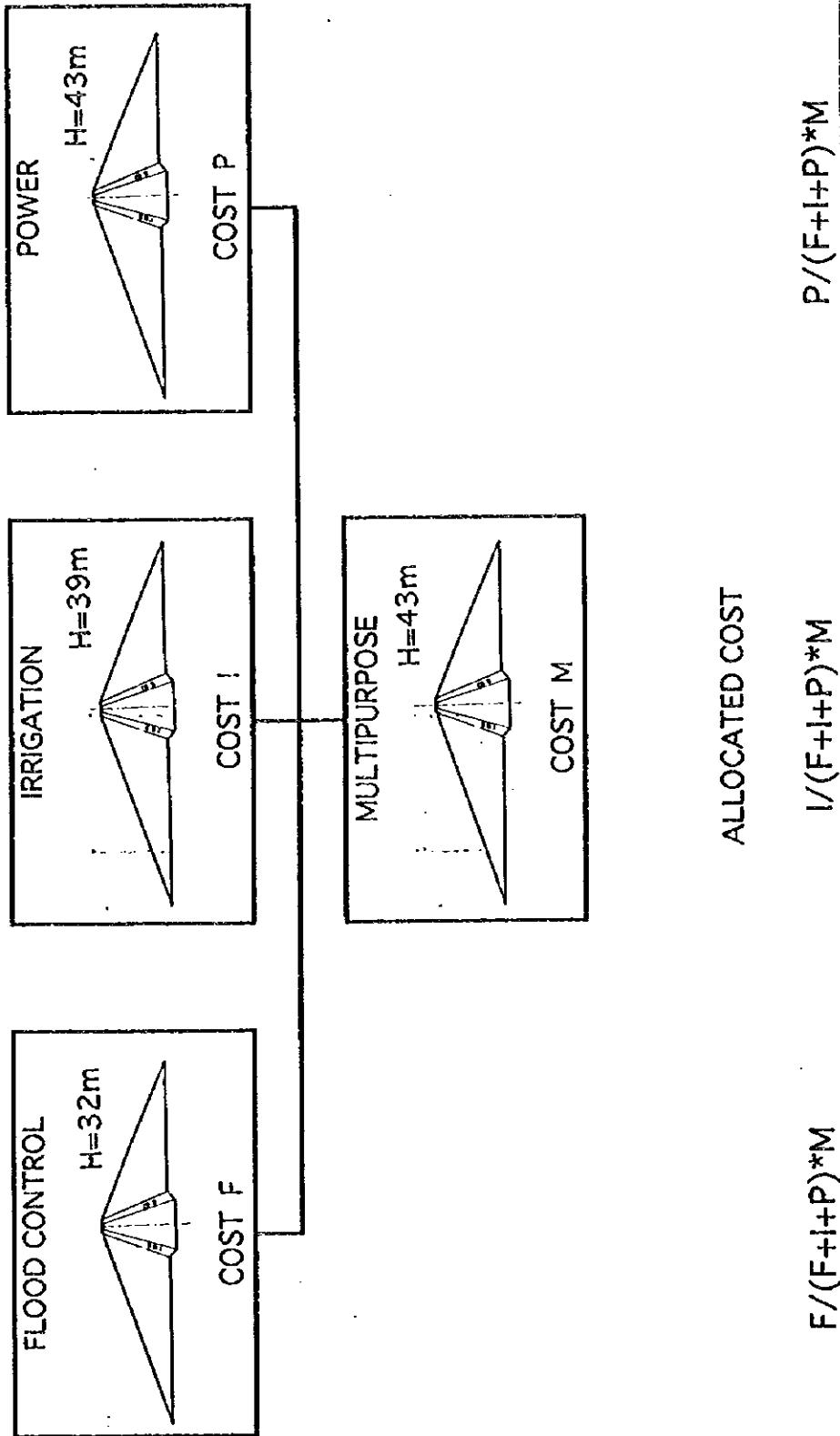
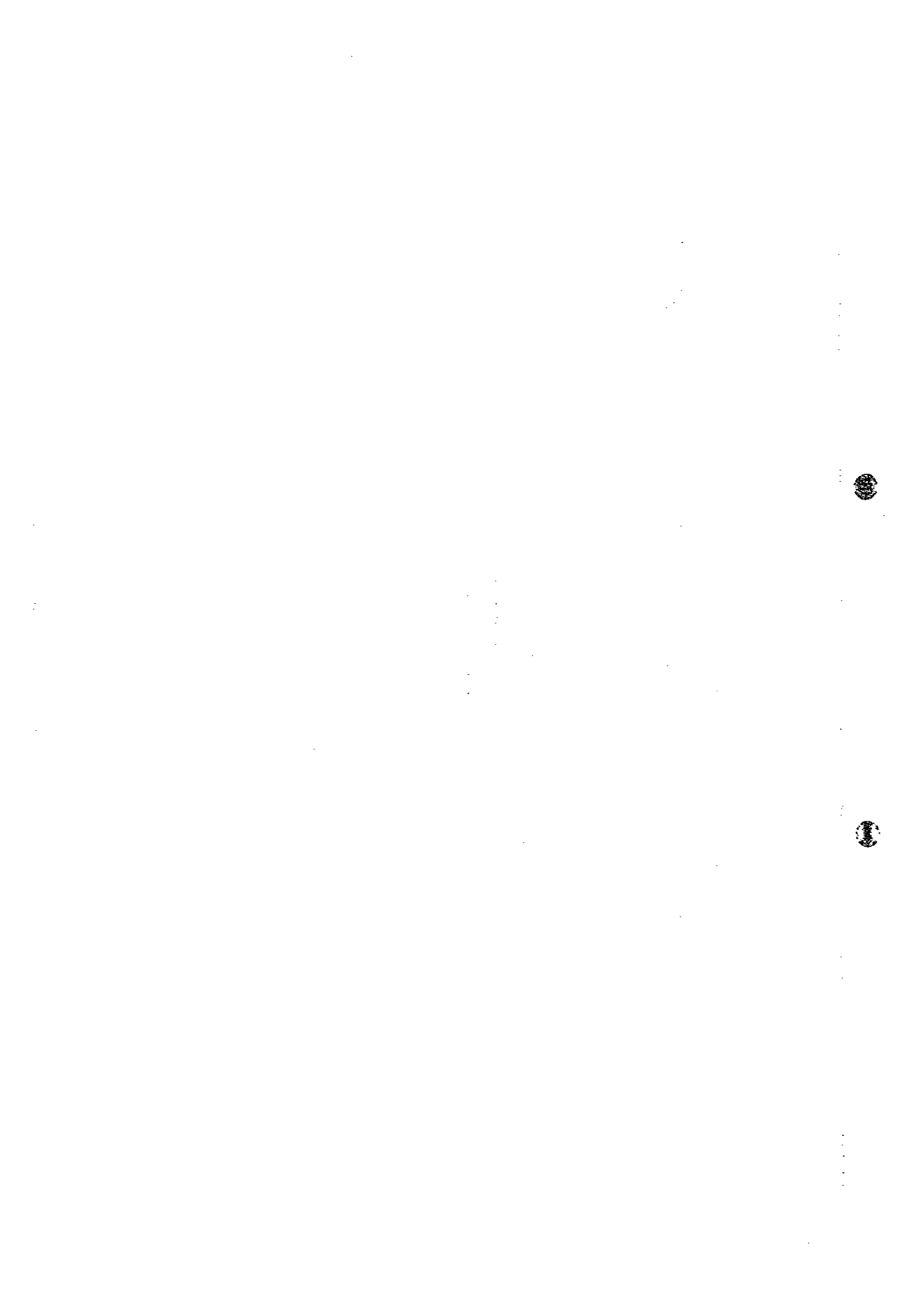


Figura 10.10 REGIMEN DE CAUDAL EN EL SITIO DE LA PRESA DE SAN ESTEBAN (1980)

CONCEPT OF COST ALLOCATION OF MULTI-PURPOSE DAM



CONCEPTO DE LA DISTRIBUCION DE COSTO EN LA PRESA MULTI-PROPOSITO







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JICA