

APPENDIX

APPENDIX

A-1	調査団とICEとの間の打合せ議事録	A-1
A-2	Angostura および Dos Montanas 測水所地点における流量資料	A-13
A-3	L5 流量の説明資料	A-33
A-4	ICE 電力系統既設水力発電所の L5 流量	A-35
A-5	ICE 電力系統日負荷曲線 (1995 年)	A-37
A-6	ICE 電力系統解析	A-39
A-7	ボーリング柱状図	A-57
A-8	顕微鏡写真および岩石記載	A-125
A-9	X線解析 (岩石)	A-135

A—1 調査団とICEとの間の打合せ議事録

MEMORANDUM
OF
NECESSARY DATA OR DOCUMENTS
FOR
GUAYABO PROJECT AND SIQUIRRES PROJECT

1. REQUIRED LEVEL OF STUDY

Guayabo Project Feasibility Level
Siquirres Project Pre-feasibility Level

2. HYDROLOGICAL AND METEOROLOGICAL DATA

<u>Description of Items</u>	<u>Data or Documents</u>	<u>Note</u>
2.1 River Flows	<u>Guayabo:</u>	
	Informe Hidrológico Preliminar Proyecto Hidroeléctrico Amistad, ICE 1974	Obtained
	<u>Siquirres:</u>	
	Informe Hidrológico Preliminar Proyecto Hidroeléctrico Siquirres, ICE 1975	Obtained
2.2 Supplemental		
River Flow Data up-to-date Since May 1973	Guayabo Siquirres	Obtained
2.3 Flood Hydrograph and flood damages	Data for Design Flood and for Calculation of Benefit by flood control Avenida Maxima probable Río Pacuare Sitio de Presa Proyecto Hidroeléctrico Siquirres. U. C. 1976	Guayabo site not obtained yet Siquirres site Obtained

<u>Description of Items</u>	<u>Data or Documents</u>	<u>Note</u>
2.4 Sedimentation	Data for Assumed Amount of Deposit in Reservoir and for Design of Diversion Works	Obtained
2.5 Other Items		
2.5.1 Histogram of Typical Daily Rainfall in wet and dry Seasons	Data for construction Method and Period	
2.5.2 Precipitation Evaporation Humidity Temperature Duration of Sunshine Hours Solar Radiation		Under Preparation
2.5.3 Description System of Gaging Stations		
3. MAPS		
<u>Description of Items</u>	<u>Data or Documents</u>	<u>Note</u>
3.1 Guayabo Project		
. Dam Site	1/1,000, 1/10,000, 1/25,000 (UN Standard 1/5,000)	
. Reservoir	1/10,000, 1/25,000 (UN Standard 1/10,000)	
. Tunnel	1/10,000 (UN Standard 1/10,000)	
. Penstock	1/10,000 (UN Standard 1/2,000)	1/1,000 Under Preparation
. Surge Tank		
. Power House		
3.2 Siquirres Project		
. Dam Site	1/500, 1/1,000, 1/10,000 1/25,000 *UN Standard is 1/50,000 but you had better to prepare more detailed maps)	Need for Maps of 1/1,000 and 1/2,000 Which Cover (Continued)

<u>Description of Items</u>	<u>Data or Documents</u>	<u>Note</u>
		<u>Extended Area, Under Preparation</u>
. Reservoir	1/25,000 (UN Standard is 1/50,000 ditto)	1/10,000 Under Preparation
. Tunnel	1/10,000 (UN Standard is 1/50,000 ditto)	
. Penstock	1/10,000 (UN Standard is 1/50,000 ditto)	1/2,000 Under Preparation
. Surge Tank		
. Power House		

4. GEOLOGY AND EXPLORATION

<u>Description of Items</u>	<u>Data or Documents</u>	<u>Note</u>
4.1 Guayabo	. Proyecto Amistad - Siquirres Sitio de Presa de Guayabo "Informe Geológico de Reconocimiento" Junio 1975 I.C.E.	Obtained Obtained
	. Proyecto Amistad Línea de Túnel y Casa de Máquinas "Informe de Reconocimiento- Geológico" Mayo 1975 I. C. E.	Obtained
	. Plans Originally Prepared by Dr. Setsumi Miyamura for I. C. E. July 1975	Obtained
	. Aerial Photograph	Obtained
4.2 Siquirres	. Projector Siquirres Sitio de Presa "Informe de Reconocimiento Geológico" Enero 1975 I. C. E.	Obtained
	. Proyecto Siquirres Línea de Túnel "Informe de Reconocimiento Geológico" Octubre 1975 I. C. E.	Obtained
	. Aerial Photograph	Obtained

<u>Description of Items</u>	<u>Data or Documents</u>	<u>Note</u>
4.3 Additional Investigation Required for Guayabo Project:	(Time limit ----- Beginning of November in this year)	
a) At Dam Site		
. Core Boring (PAM - 11)	. Data for Permeability Coefficient of Alluvium and Mudrock foundation Safety Analysis	Method As Indicated
. Test Pit (DP-1 -2)	. Data for gradation or quantity of Aggregates in Alluvium (Rock-fill material + Concrete aggregate)	Method of USBR
	. Data for Density of Alluvium in Layers (Safety Analysis)	Method of USBR
. Seismic Survey for foundation Rock (SP-1, -2, -3)	. Data for Rock qualities and finding - out of Faults (Safety Analysis)	As indicated
. Test Pit (CP-1 -2)	. Data for quantity and quality of impervious core such as gradation and content of water in soils (Alternative--Concrete Core) (Safety Analysis)	Method of USBR
b) Tunnel		
. Core Boring (PA-4)	. Data for sound Coverage of rock	As indicated

5. OTHER ENGINEERING DATA OR DOCUMENTS

<u>Description of Items</u>	<u>Data or Documents</u>	<u>Note</u>
5.1 References		

Published on Earth-quake or Volcanic Activities in Costa Rica

<u>Description of Items</u>	<u>Data or Documents</u>	<u>Note</u>
5.2 Design Criteria of structures against earthquake	.Codigo Sismico de Costa Rica C.F.C. 1974	Obtained
5.3 Ecological Map, Isohyetal map, soil classification map		Obtained
5.4 Reports on Project Implemented	. Data for local conditions including construction cost . Arenal . Informe del Estudio de Estabilidad de la Presa de Arenal ICE. 1977 . Design Report for Arenal Dam N° 1,2 W.A 1975 . Board of Consultants - Arenal N° 1,2 I.C.E. 1976/1977	Obtained
5.5 Construction Cost Estimates	(Agreement)	
5.5.1 Form of Cost Estimates	. Follows as International Standard such as UN's with Minor changes	
5.5.2 Pay Items		
	. Contingencies	
	Land 10%	
	Civil works 15%	
	Tunnel works 20%	
	Penstocks, gates 15%	
	Turbines, Ene-rators Switchyard equipment 15%	

<u>Description of Items</u>	<u>Data or Documents</u>	<u>Note</u>
Others		
Investigation	As given by ICE,	
Engineering	5% of total C. Cost	
Administration	5% of total C. Cost	
Other costs	5% of total C. Cost	
5.5.3 Unit Price	Determined with reference to ICE price and Arenal of Cachi Projects's price	
	Indice de Costos de la Dirección Construcción Energía en el año ICE 1977	Obtained
5.5.4 Partition of Unit Price for domestic and foreign currencies	Followed as ICE Standard	

6. ECONOMIC EVALUATION

<u>Description of Items</u>	<u>Data or Documents</u>	<u>Note</u>
6.1 Principle	Benefit-Cost Comparison (B/C, B - C)	
6.2 Period of Analysis	Determined from useful life of facilities, e. g. Dam 50 years Transmission Line 30 years Steam Plant 30 years Gas Turbine Plant 20 years Diesel Plant 25 years Geothermal Plant 30 years	
6.3 Interest Rate	Domestic 12% Foreign 8% (For Sensibility Analysis 6%, 4%, if possible) (Interest during construction is the same above) (Discount Rate determined by Survey Team) (Internal Rate of Return will be calculated)	

<u>Description of Items</u>	<u>Data or Documents</u>	<u>Note</u>
	(Effect of Inflation will be calculated, if possible)	
6.4 Conversion Rate	1 U.S.\$ = 8.6 ¢	
6.5 Alternative Thermal (steam) Plant for Calculation of Benefit	<p>Location : Moin Installed Capacity same as Hydro-power Unit capacity Less than or equal to 10% of Max. Power Demand</p> <p>Annual Plant Factor same as Hydro-Power Percent of Power House Service ; 5% Construction cost Determined by Survey Team Operation & Maintenance Ditto Administration ; Ditto Tax ; 5,44/kw-year Insurance ; 0.5% of Initial Investment cost Fuel ; 0.6746 (heavy oil at Moin in 1976) KW Adjustment factor Determined by Survey Team Route of Transmission Line ; Ditto</p>	
6.6 Annual operation and Maintenance costs	From "Multiple Purpose River Basin Development", UN	
Dam and reservoirs	0.1% of Capital cost	
Intake and outlet works	1.0% of Capital cost	
Hydro plants	1.0% of Capital cost	
Steam plants (excluding fuel)	2.5% of Capital cost	
Transmission lines	1.0% of Capital cost	

<u>Description of Items</u>	<u>Data or Documents</u>	<u>Note</u>
Penstocks	1.5% of Capital cost	
Gates, hoists, miscellaneous	1.5% of Capital cost	
Metal work		
Bridges, concrete and steel	3.0% where,	
	i) (Capital cost)= (Direct Items) + (Indirect Items)	
	ii) (Indirect Items)= (Contingencies) + (Engineering Fee) + (Interest During Construction)	
6.7 Annual Cost	= (Interest) + (O & M Cost) + (Depreciation)	
6.8 Depreciation	By Sinking Fund Depreciation	
7. <u>LOAD FORECAST</u>		
7.1 Existing demand forecast	. Capítulo de mercado eléctrico 1976 - 1990 SNI	
Basic data	. Mercado eléctrico 1976-1990 SNI	
	. Proyección del mercado eléctrico	
	. Zonas de distribución las (Planos) principales empresas eléctricas de Costa Rica 1985	
	. Costos de operación y balances de situación de varias empresas eléctricas año 1986	

<u>Description of Items</u>	<u>Data or Documents</u>	<u>Note</u>
	<ul style="list-style-type: none"> Informe de operación de las principales empresas productoras y distribuidoras de energía eléctrica año 1976 Poblacion: Total, urbana y rural Grado de electrificación 	
7.2 Reference	<ul style="list-style-type: none"> Plan Nacional de desarrollo 1978-1982 (OFIPLAN) 	
7.3 Demand and supply balance	<ul style="list-style-type: none"> Reunión anual #20 1976 Total length of distribution lines O.C.P. Sepias cuadro #4 Commissioning dates of new power plants Document de trabajo 008-77 "Appendice" Loss rates of the power system Programa preliminar de obras (Plans) generación del SNI 1978-2000 	Not obtained yet
7.4 Interconnection	<ul style="list-style-type: none"> Interconexión Costa Rica-Nicaragua-Línea de 230 KV Contrato de interconexión entre el ICE y la ENALUF Sistema Nacional Interconectado 	
7.5 Others	<ul style="list-style-type: none"> Tarifas y reglamento para suministro de energía eléctrica 	
8. <u>OTHER DOCUMENTS RECEIVED</u>		
8.1 Proyecto Pacuare	<ul style="list-style-type: none"> Informe Geológico de Reconocimiento-Sitios de Presa 	

<u>Description of Items</u>	<u>Data or Documents</u>	<u>Note</u>
8.2 ICE	<ul style="list-style-type: none"> Universidad de Costa Rica Facultad de Ingeniería Escuela de Ingeniería Civil Definición Preliminar del Proyecto Hidroeléctrico de Siquirres - 1975 	
8.3 ICE	<ul style="list-style-type: none"> Informe Geológico Preliminar del Proyecto Hidroeléctrico de Angostura en el rio Reventazón 1969 	
8.4 ICE	Informe de Reconocimiento Geologico a los Sitios de Presa #1 y #2 de la Alternative de Murcia en la Cuenca Media del Río Reventazón Julio 1972	
8.5 ICE	<ul style="list-style-type: none"> Bolétín Hidrológico #9 - Diciembre 1974 	
8.6 ICE	Oficina de Proyectos -Seccion Geología -Ampliacion No. 1 - Rio Macho	
8.7 ICE	Sección de Geología -Informe Geológico Final al Proyecto Hidroeléctrico de Cachí - 1963	
8.8 ICE	Desarrollo Hidroelectrico del Rio Arenal	
8.9 ICE	Proyecto Nacional de Servicio Meteorológico e Hidrológico OMM/PNUD/Gobierno de Costa Rica -Bolétín Hidrológico - Junio 1975	

<u>Description of Items</u>	<u>Data or Documents</u>	<u>Note</u>
8.10 ICE:	Documento de trabajo	002-77
ICE:	Ditto	003-77
ICE:	Ditto	004-77
ICE:	Ditto	004-77 (Apendix)
ICE:	Ditto	005-77
ICE:	Ditto	006-77
ICE:	Ditto	00 -77
8.11 CEPAL:	Naciones Unidas Consejo Económico y Social 1976	

Above-mentioned data, document, and agreements are obtained and reached between the persons below.

Mitsuharu Sato
LEADER OF JAPANESE MISSION

Carlos Ml. Obregón Q.
JEFE SECCION PROYECTOS HIDRO-ELECTRICOS, I. C. E.

**A—2 Angostura および Dos Montanas
測水所地点における流量資料**

A—2—1 Angostura 測水所流量

A—2—2 Dos Montanas 測水所流量

A-2-1 Angostura G.S.

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN M³/SEG.
 RIO REVENIAZON EN ANGOSTURA 71-01-03

AREA DE DRENAJE:		1337RM2		ELEVACION:		1325M						
AÑO HIDROLOGICO		1953 - 1954		DATOS DESDE SET. 6, 1953								
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1					77.2	101	64.5	77.4	50.1	43.0	43.5	
2					81.7	88.6	62.7	101	48.1	44.4	45.3	
3					93.4	74.2	60.5	92.4	49.4	42.3	45.1	
4					96.3	69.3	59.9	93.3	48.1	57.5	49.2	
5					112	65.1	58.9	90.8	45.8	50.5	48.3	
6					90.1	124	61.1	55.0	87.1	47.7	47.4	
7					83.7	109	76.6	54.6	77.1	51.6	46.7	
8					84.5	112	141	59.2	72.3	54.9	51.4	
9					78.5	84.4	97.9	67.3	66.0	74.5	44.7	
10					90.0	78.1	86.0	59.2	62.1	71.4	45.2	
11					101	95.9	90.7	55.2	91.8	58.8	47.2	
12					91.1	82.2	74.2	51.9	87.1	51.7	43.1	
13					90.9	82.3	137	49.8	78.8	75.5	67.0	
14					105	124	144	92.1	68.6	62.0	53.0	
15					99.4	94.7	97.3	94.4	69.9	54.6	46.6	
16					87.5	103	103	77.3	61.3	52.7	43.8	
17					87.5	126	103	72.1	52.8	54.4	53.8	
18					71.4	125	93.7	67.9	60.6	64.3	51.2	
19					74.4	101	95.2	119	59.7	54.4	46.9	
20					75.1	80.5	79.0	210	62.6	55.0	44.0	
21					74.0	85.8	79.3	117	61.1	58.7	42.8	
22					87.0	86.8	70.2	95.6	61.3	56.9	40.5	
23					88.6	76.8	66.9	86.7	56.7	51.2	39.0	
24					99.9	75.8	66.1	79.2	54.1	62.6	38.5	
25					107	94.3	103	71.5	52.5	49.8	36.0	
26					108	89.9	84.2	109	50.7	46.8	37.7	
27					144	76.1	92.1	81.9	71.3	45.3	37.7	
28					178	74.8	74.5	71.8	80.7	43.7	30.2	
29					105	73.1	72.5	67.1	57.9	40.0	66.7	
30					85.1	72.9	67.0	65.8	53.9	40.9	66.3	
31						87.1		111	50.9	41.2		

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO			CAUDAL PROMEDIO MENSUAL		VOLUMEN			
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEG	MINIMO DIA	ESC.	MC/SEG	DE ESTE AÑO MC/SEG	L/S/K	DE TODO EL REGISTRO MC/SEG	L/S/K	M ³	MM
OCT	18	2.46	257	30	0.91	72.4	92.3	69	92.9	69	248.75	186
NOV	13	2.58	276	5	0.76	61.3	87.5	65	87.5	65	276.88	170
DIC	20	3.35	435	13	0.61	49.8	80.0	60	80.0	60	214.21	160
ENE	23	1.74	158	26	0.62	50.7	70.9	53	70.9	53	189.75	142
FEB	10	1.39	116	29	0.51	43.7	55.2	41	55.2	41	133.42	100
MAR	13	1.14	92.0	27	0.42	37.7	45.2	34	45.2	34	120.96	90
APR	19	2.16	214	1	0.51	43.5	66.6	50	66.6	50	172.65	129
TOT												

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN M³/SEG.
 RIO REVENIAZON EN ANGOSTURA 73-05-03

AREA DE DRENAJE:		1337RM2		ELEVACION:		1325M						
AÑO HIDROLOGICO		1954 - 1955		DATOS DESDE SET. 6, 1953								
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	104	83.3	102	148	125	115	192	133	104	85.3	53.0	57.1
2	111	78.9	154	102	140	141	150	118	99.3	75.5	49.4	64.2
3	122	114	118	93.5	173	129	130	111	92.7	96.4	46.1	51.3
4	129	90.2	97.8	98.3	103	107	118	110	98.9	61.8	43.8	42.3
5	155	132	92.0	125	109	101	126	108	91.9	61.8	42.2	39.1
6	130	182	142	179	115	143	115	98.1	87.6	59.9	41.4	37.3
7	103	89.3	103	135	114	94.5	106	103	84.9	55.3	40.4	36.4
8	115	81.1	190	178	86.0	192	101	95.2	82.1	67.4	46.9	38.2
9	115	96.3	223	130	84.8	164	100	89.2	79.6	68.1	45.4	37.7
10	123	95.6	228	107	74.3	358	98.7	124	78.6	91.8	43.1	45.0
11	98.7	100	167	99.9	77.2	179	94.2	104	79.6	58.7	67.9	62.0
12	115	102	149	99.4	88.7	144	90.2	98.4	77.9	146	72.4	65.6
13	109	214	168	122	80.2	135	90.4	99.6	76.5	90.1	41.6	58.7
14	97.8	186	153	105	97.4	115	82.8	95.8	80.0	69.3	43.3	54.4
15	114	132	104	92.5	94.8	112	79.6	93.1	80.0	61.6	38.5	52.1
16	101	126	120	85.6	106	93.7	81.3	107	76.8	59.0	36.3	49.1
17	91.4	115	103	87.2	106	156	95.1	321	84.2	56.3	37.2	45.4
18	94.0	125	117	91.3	117	147	99.9	284	47.5	52.8	38.2	43.9
19	96.1	118	140	99.4	134	450	116	184	80.7	124	36.4	52.4
20	158	109	117	86.7	110	531	341	399	74.4	61.1	35.5	53.6
21	136	219	99.1	141	100	267	163	507	71.0	54.2	35.2	53.8
22	97.8	121	101	107	141	167	191	472	69.0	50.3	36.0	47.1
23	119	105	100	95.7	127	154	304	399	67.4	65.3	38.3	42.4
24	109	99.6	96.2	175	190	605	378	342	68.1	59.4	36.1	38.6
25	109	92.4	100	153	147	386	204	233	73.2	57.0	45.8	40.4
26	104	141	98.0	134	129	303	172	166	84.0	52.9	54.6	47.2
27	112	167	121	103	228	194	145	164	74.2	53.0	89.9	37.7
28	158	131	112	134	176	226	145	126	69.7	56.9	55.5	32.6
29	111	110	169	112	154	149	130	178	74.5	53.4	53.4	30.6
30	96.8	96.8	121	131	129	168	176	118	79.4	46.1	46.1	28.4
31	87.5		137	135		225		112	91.2	46.6		

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO			CAUDAL PROMEDIO MENSUAL		VOLUMEN			
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEG	MINIMO DIA	ESC.	MC/SEG	DE ESTE AÑO MC/SEG	L/S/K	DE TODO EL REGISTRO MC/SEG	L/S/K	M ³	MM
MAY	20	2.78	311	31	1.09	87.5	114	85	114	85	304.27	228
JUN	13	1.97	609	2	0.99	78.9	122	91	122	91	315.38	236
JUL	18	2.98	348	5	1.14	92.0	132	98	132	94	352.35	264
AGO	25	2.89	330	16	1.07	85.6	119	89	119	89	316.34	238
SET	27	3.54	487	10	0.93	74.3	122	91	122	91	315.91	236
OCT	25	5.00	948	16	1.15	93.7	208	156	151	113	557.38	417
NOV	24	4.74	855	15	1.00	79.6	147	110	117	88	381.82	288
DIC	20	4.08	636	9	1.10	89.2	184	137	132	99	491.82	368
ENE	1	1.67	149	23	0.85	67.4	81.3	61	76.1	57	217.63	163
FEB	12	2.14	211	22	0.61	50.3	69.7	52	62.4	47	168.58	126
MAR	1	0.84	75.0	21	0.79	39.2	46.4	35	45.8	34	124.30	93
ABR	14	0.58	49.0	30	0.28	28.4	46.2	35	56.4	42	119.62	89
TOT	25	5.00	948	30	0.28	28.4	116	87	104	78	3667.57	2743

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
REGISTRO DE CAUDALES MEDIO DIARIOS EN MC./SEG.
RIO REVENTAZON EN ANCOSTURA 73-09-03

AREA DE DRENAJE: 1337KM2		ELEVACION: 532MSNM										
AÑO HIDROLOGICO		DATOS DESDE: MAY. 6, 1953										
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	27.0	109	95.2	150	125	92.3	154	103	272	60.4	61.8	35.0
2	26.6	127	107	113	154	94.2	170	99.0	176	91.8	73.1	51.1
3	26.4	175	130	104	145	81.7	160	104	264	106	73.2	50.9
4	43.8	187	114	117	125	101	172	93.4	437	87.9	71.4	50.7
5	25.7	82.2	89.0	107	138	121	142	89.2	103	69.5	71.7	50.4
6	26.8	77.5	152	104	153	90.4	161	98.2	111	61.8	78.8	50.3
7	24.9	85.4	235	110	209	102	166	237	97.0	60.8	68.0	50.1
8	24.5	97.0	152	113	132	97.4	130	256	88.1	66.0	82.1	50.0
9	31.1	139	110	92.0	102	155	138	198	98.2	88.2	66.3	50.0
10	36.6	126	108	127	175	235	123	200	88.7	59.3	89.9	100
11	35.3	106	109	179	234	99.9	112	164	80.8	57.9	71.8	77.9
12	31.3	96.1	106	109	89.4	92.8	112	111	83.8	46.7	86.8	72.6
13	36.2	92.0	94.3	106	150	414	125	114	78.2	43.5	67.7	64.5
14	30.3	95.0	92.8	114	141	1200	92.6	117	65.4	43.0	59.2	55.2
15	27.8	95.0	91.3	104	96.1	752	127	146	61.2	42.1	57.9	48.6
16	33.1	76.5	89.4	82.0	89.0	591	127	118	59.5	51.6	62.5	55.7
17	37.1	72.7	124	94.0	178	528	122	109	71.5	57.3	61.4	91.6
18	71.0	62.7	204	84.0	156	394	119	123	95.3	53.0	57.9	138
19	95.1	66.0	185	113	126	249	94.5	231	89.3	103	56.2	93.2
20	170	64.7	132	91.1	100	180	102	164	78.4	104	81.5	91.4
21	52.2	76.0	122	78.5	91.1	183	183	144	73.0	97.1	53.7	78.0
22	40.3	64.3	107	64.7	87.2	171	93.7	140	65.2	94.0	74.0	79.0
23	56.8	74.2	113	74.1	104	176	92.2	127	61.4	88.1	72.9	63.0
24	79.3	62.6	107	74.7	132	257	84.2	123	61.3	76.5	62.8	64.8
25	68.4	59.6	119	77.1	124	243	40.9	127	60.3	69.2	39.6	102
26	46.5	83.5	109	71.0	88.1	259	108	132	60.4	66.1	147	124
27	75.5	104	104	70.2	94.0	238	134	123	58.7	68.0	88.4	78.1
28	260	74.4	102	60.3	81.9	225	130	125	68.8	72.5	62.0	68.4
29	234	69.4	88.4	102	111	194	110	146	82.8	67.7	59.9	67.8
30	157	91.9	94.5	107	86.7	180	102	233	69.4	61.1	61.1	56.5
31	106		116	86.5		224		327	61.1		58.9	

MES	CAUDALES EXTREMOS			MINIMO PROMEDIO DIARIO		CAUDAL PROMEDIO MENSUAL		VOLUMEN				
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEG	DIA	ESC.	MC/SEG	DE ESTE AÑO MC/SEG	L/S/Y	DE TODO EL REGISTRO MC/SEG	L/S/Y	M.M.C	M ³
MAY	28	3.38	415	8	0.21	24.5	44.7	48	89.4	67	173.39	130
JUN	9	2.32	204	25	0.74	59.6	93.8	70	108	81	243.16	182
JUL	7	3.59	457	14	1.04	82.8	119	89	126	94	329.95	239
AGO	1	3.87	304	28	0.75	40.3	98.6	74	109	81	284.20	199
SET	7	3.11	365	29	1.05	83.9	128	94	125	94	339.00	248
OCT	14	6.78	1670	4	1.02	81.7	259	193	187	140	499.40	318
NOV	3	2.76	304	24	1.05	84.2	123	92	119	89	117.70	218
DIC	31	3.80	499	5	1.11	89.2	150	112	138	103	401.05	300
ENE	4	3.90	519	27	0.73	58.7	104	78	85.4	64	278.52	208
FEB	12	1.57	134	15	0.49	42.1	71.4	53	65.4	49	179.03	134
MAR	26	1.40	140	21	0.69	35.7	48.2	51	53.3	40	182.62	137
APR	18	2.14	234	15	0.59	48.6	71.0	53	61.3	46	184.11	139
TOT	14	6.78	1670	8	0.21	24.5	113	84	105	79	3568.13	2649

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
REGISTRO DE CAUDALES MEDIO DIARIOS EN MC./SEG.
RIO REVENTAZON EN ANCOSTURA 73-09-03

AREA DE DRENAJE: 1337KM2		ELEVACION: 532MSNM										
AÑO HIDROLOGICO		DATOS DESDE: SET. 8, 1953										
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	37.2	113	149	212	138	185	165	81.0	200	44.9	34.4	21.6
2	55.1	173	247	189	117	139	187	83.6	155	42.3	33.7	88.3
3	32.4	173	225	160	111	129	140	91.5	125	58.9	33.1	51.0
4	49.3	104	208	149	207	155	122	113	113	58.6	32.0	38.1
5	101	533	187	136	157	185	110	132	101	57.2	31.7	31.4
6	123	159	193	132	149	210	100	114	95.2	54.9	31.2	29.1
7	130	124	140	123	147	211	99.8	114	90.3	55.3	30.5	30.4
8	423	130	154	116	146	240	103	200	84.6	58.0	30.5	30.2
9	152	109	190	112	140	240	113	157	120	61.9	30.2	31.5
10	126	114	184	111	120	172	110	165	96.6	56.4	29.4	46.7
11	134	135	201	107	120	161	98.1	114	85.3	54.2	31.0	49.3
12	108	185	242	106	138	146	95.2	118	79.6	64.1	31.8	50.3
13	110	116	198	109	170	176	94.0	102	90.1	67.7	29.3	62.5
14	236	132	201	113	180	336	95.2	93.9	79.8	64.8	28.6	37.9
15	212	106	222	122	145	313	92.4	207	75.5	64.8	28.9	35.3
16	133	98.2	242	133	151	234	99.2	188	72.6	63.5	28.5	38.7
17	292	104	208	170	182	218	115	160	75.7	58.9	28.1	46.8
18	136	152	193	146	152	175	113	134	88.9	58.7	28.4	49.8
19	232	149	189	135	197	140	105	131	88.9	55.6	27.9	43.4
20	179	118	173	115	205	140	140	124	80.5	53.1	27.5	45.4
21	244	143	167	118	194	142	137	158	77.6	51.4	27.0	34.2
22	411	114	169	109	118	141	107	134	76.2	51.9	26.7	33.0
23	297	118	162	119	143	125	100	114	69.8	54.8	33.7	39.7
24	297	143	172	126	170	125	90.5	103	66.8	43.3	32.4	38.6
25	262	110	192	145	150	114	92.9	97.4	64.4	37.3	34.6	37.5
26	150	138	172	159	140	118	84.0	99.4	70.9	36.1	46.6	29.3
27	216	132	178	162	128	118	84.0	96.2	99.1	35.3	87.1	30.3
28	211	147	173	170	133	125	112	99.1	82.5	37.5	55.0	27.5
29	142	123	167	163	142	118	92.4	98.1	77.2	39.1	39.1	26.7
30	130	140	171	169	187	154	94.0	178	72.5	34.7	34.7	27.3
31	107		224	142		132		398	48.1		32.3	

MES	CAUDALES EXTREMOS			MINIMO PROMEDIO DIARIO		CAUDAL PROMEDIO MENSUAL		VOLUMEN				
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEG	DIA	ESC.	MC/SEG	DE ESTE AÑO MC/SEG	L/S/Y	DE TODO EL REGISTRO MC/SEG	L/S/Y	M.M.C	M ³
MAY				3	0.34	32.4	183	137	121	80	489.89	364
JUN				14	1.20	98.3	145	188	120	98	378.20	281
JUL	2	2.51	479	29	1.85	147	194	145	149	111	519.53	389
AGO	17	3.30	422	12	1.28	106	137	103	118	88	367.20	275
SET	30	3.05	363	3	1.34	111	153	114	134	100	394.32	296
OCT	14	5.03	936	25	1.37	114	172	129	183	137	461.98	344
NOV	1	2.77	304	26	1.03	84.0	110	82	117	87	288.46	213
DIC	31	3.94	604	1	1.01	81.0	143	107	139	104	388.41	288
ENE	1	2.48	260	25	0.80	44.4	81.1	68	86.8	63	243.88	182
FEB	12	0.91	72.5	27	0.39	35.3	55.1	41	62.8	47	133.25	100
MAR				22	0.25	26.7	42.2	32	30.5	18	113.09	85
APR				29	0.25	26.7	44.7	33	57.3	43	115.97	87
TOT				22	0.25	26.7	133	92	213	83	3886.40	2905

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEC.
 RIO REVENTAZON EN ANGOSTURA 73-09-03

AREA DE DRENAJE: 1337KM2 ELEVACION: 532MSM
 AÑO HIDROLOGICO 1957 - 1958 DATOS DESDE: 6.1953

DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	75.3	102	63.4	116	108	239	99.6	124	68.6	64.3	52.1	34.1
2	48.9	120	128	81.9	109	265	104	120	69.1	71.8	48.1	32.1
3	34.1	129	158	76.0	128	263	93.1	152	72.5	151	47.7	32.9
4	29.7	188	114	223	89.4	206	79.0	127	147	200	46.5	32.6
5	37.8	146	84.7	169	324	127	92.6	111	91.1	133	46.8	31.9
6	39.0	121	83.3	173	107	134	120	103	76.6	67.7	51.2	31.1
7	39.4	107	115	354	97.0	149	127	86.6	71.7	70.8	52.0	30.5
8	41.6	90.1	177	121	155	101	160	98.9	79.6	90.9	60.7	31.5
9	41.9	99.0	258	95.9	120	171	160	152	129	79.4	48.0	52.3
10	36.4	88.1	168	96.5	90.1	219	289	209	114	80.5	45.1	73.5
11	42.6	103	150	86.3	78.2	219	168	252	90.9	70.5	41.0	52.8
12	55.9	120	171	126	155	462	239	649	91.3	60.0	43.3	45.7
13	47.9	103	150	86.3	78.2	219	168	252	90.9	70.5	41.0	52.8
14	77.6	96.2	144	92.0	118	209	115	193	85.6	57.3	41.4	44.3
15	88.2	148	115	106	233	238	143	143	82.4	56.6	38.1	41.4
16	94.8	92.1	105	88.9	107	179	251	146	76.5	59.5	37.3	39.7
17	97.6	93.1	126	128	146	182	243	137	72.8	61.6	38.8	38.1
18	76.6	92.1	108	91.7	103	134	126	142	148	101	40.2	40.5
19	90.1	83.9	97.5	120	133	147	104	157	145	129	35.5	36.7
20	100	74.7	93.6	315	173	145	107	125	111	126	39.3	39.5
21	103	83.6	91.7	103	214	117	88.7	110	87.0	162	46.6	36.9
22	124	73.2	97.9	95.0	243	143	84.7	96.5	68.9	126	63.2	37.4
23	94.9	86.4	96.1	81.5	315	209	136	98.2	63.7	105	53.2	43.9
24	113	150	82.7	122	462	139	249	120	61.0	82.1	42.0	39.0
25	103	408	81.3	75.7	358	377	140	15.8	59.5	70.0	40.2	40.5
26	118	163	115	82.3	292	186	122	78.7	58.4	62.9	88.9	34.6
27	133	110	122	103	222	152	118	75.4	56.1	56.9	43.3	39.4
28	121	85.3	177	94.4	244	123	95.4	73.5	58.6	55.0	38.5	38.7
29	95.7	76.3	140	88.7	124	112	137	71.5	73.1	73.1	37.0	40.5
30	123	68.4	101	83.1	139	102	105	70.9	108	108	36.1	38.5
31	121	124	124	94.1	139	102	105	70.9	108	108	36.1	38.5

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO		CAUDAL PROMEDIO MENSUAL		VOLUMEN EN				
	MAXIMO INSTANTANEO DIA	ESC. MC/SEG	MINIMO MC/SEG	DIA	ESC. MC/SEG	DE ESTE AÑO MC/SEG	L/S/K	DE TODO EL REGISTRO MC/SEG	L/S/K	M.M.C	MH	
MAY	21	2.16	214	5	0.30	29.3	78.5	59	110	83	210.17	157
JUN				30	0.86	68.4	120	89	120	90	309.87	232
JUL				1	0.79	63.4	122	91	142	106	325.78	244
AGO				3	0.95	75.7	130	97	121	91	248.88	261
SET				4	0.98	78.2	175	131	144	108	454.87	340
OCT				31	1.15	93.3	189	141	184	138	506.42	379
NOV				4	0.99	79.0	140	105	122	91	363.76	272
DIC				31	0.87	69.4	147	110	141	105	393.56	294
ENE				27	0.70	56.1	96.9	65	86.8	65	232.64	174
FEB				28	0.68	55.0	90.0	67	68.2	51	217.78	163
MAR				19	0.39	35.5	45.7	34	49.5	37	122.27	91
ABR	10	1.57	136	7	0.32	30.5	39.7	30	53.7	40	102.89	77
TOT				5	0.30	29.3	114	85	112	84	3588.86	2684

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEC.
 RIO REVENTAZON EN ANGOSTURA 73-09-03

AREA DE DRENAJE: 1337KM2 ELEVACION: 532MSM
 AÑO HIDROLOGICO 1958 - 1959 DATOS DESDE: 7.1953

DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	38.6	70.9	134	84.7	77.9	106	101	81.6	48.9	39.4	27.7	24.9
2	28.0	94.4	117	83.0	72.3	80.8	105	102	45.9	41.0	40.6	24.5
3	35.9	176	153	79.4	82.4	85.4	83.6	65.6	44.0	37.3	49.4	24.7
4	34.8	228	146	114	71.4	91.3	76.5	58.8	42.1	34.7	35.5	24.9
5	36.7	162	120	108	67.7	102	71.0	55.5	40.1	32.8	31.6	24.0
6	52.4	118	118	88.2	84.7	75.1	68.0	52.1	40.0	33.9	30.3	24.5
7	82.9	129	104	87.9	121	81.2	75.7	50.1	40.7	65.1	28.9	23.4
8	242	94.5	125	94.4	110	79.1	87.7	46.6	42.2	44.3	29.5	23.4
9	97.9	81.4	147	83.2	77.8	89.4	99.4	45.3	37.3	40.4	30.0	24.1
10	84.5	116	146	76.9	80.9	77.0	125	43.4	35.4	35.9	31.1	23.4
11	57.3	89.7	102	135	80.9	84.2	146	45.9	47.2	35.4	30.5	22.9
12	109	102	86.7	140	109	81.2	127	72.5	61.5	33.5	27.8	27.8
13	174	78.8	129	156	176	89.5	88.7	71.6	48.1	31.3	26.8	35.3
14	194	71.9	122	134	156	90.1	78.1	55.8	42.1	34.8	26.4	50.3
15	272	100	91.8	99.1	148	100	74.6	53.1	39.4	35.7	26.2	43.7
16	113	77.8	80.6	84.6	285	110	71.1	59.0	36.7	31.5	35.6	36.9
17	129	67.8	137	112	177	113	67.9	52.8	37.4	30.6	25.9	41.4
18	153	257	145	545	351	107	66.3	56.1	37.3	29.4	26.3	59.0
19	168	101	139	202	100	133	72.0	65.1	40.5	28.4	27.9	68.6
20	114	96.7	118	102	85.6	141	69.5	80.1	39.2	37.3	26.7	50.6
21	316	72.7	108	84.5	77.0	101	71.6	70.6	36.7	33.2	25.4	40.6
22	121	116	95.2	113	86.7	102	68.5	65.6	35.6	29.7	24.5	36.6
23	108	139	87.2	111	73.3	115	85.8	63.7	39.6	30.5	29.5	33.6
24	177	160	97.8	108	99.1	88.1	73.5	51.1	35.7	32.3	27.7	73.1
25	119	114	122	93.1	113	103	89.8	49.3	34.1	29.0	25.8	51.9
26	101	102	136	107	85.6	84.7	80.2	51.7	33.9	29.7	25.1	36.4
27	231	92.4	110	85.6	94.2	76.2	74.1	52.1	37.4	29.0	24.9	33.5
28	139	141	98.2	94.2	111	92.7	85.4	70.6	36.9	28.4	24.5	34.3
29	128	134	92.3	99.7	106	130	63.1	70.9	36.1	36.1	24.9	38.3
30	178	156	91.1	85.1	99.5	121	58.1	55.1	36.1	36.1	26.7	36.4
31	110		89.1	89.2		120		51.2	35.2		25.5	

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO		CAUDAL PROMEDIO MENSUAL		VOLUMEN EN				
	MAXIMO INSTANTANEO DIA	ESC. MC/SEG	MINIMO MC/SEG	DIA	ESC. MC/SEG	DE ESTE AÑO MC/SEG	L/S/K	DE TODO EL REGISTRO MC/SEG	L/S/K	M.M.C	MH	
MAY				2	0.27	28.0	127	95	111	85	340.16	254
JUN				17	0.85	67.8	118	88	120	89	205.84	229
JUL				16	1.01	80.6	116	87	137	102	310.00	232
AGO	4	2.57	274	10	0.94	74.9	119	89	121	90	318.73	238
SET				5	0.85	67.7	115	86	138	103	298.08	223
OCT	29	2.37	243	6	0.94	75.1	98.4	74	170	127	263.52	197
NOV	11	2.93	337	30	0.72	58.1	83.5	62	116	86	216.40	162
DIC	2	1.55	133	10	0.51	43.4	60.9	46	128	95	163.03	122
ENE	12	0.82	68.2	26	0.37	33.9	40.1	30	79.0	59	107.42	80
FEB	7	0.98	78.2	19	0.28	28.4	34.8	28	62.6	47	84.21	63
MAR	2	0.84	67.0	28	0.21	24.5	28.7	21	46.0	34	76.83	57
ABR	19	1.36	123	11	0.18	22.9	36.5	27	50.8	38	94.61	71
TOT				11	0.18	22.9	81.5	61	107	80	2578.79	1929

C. SOLIDO = 4.09268E-06 *C. LIQUIDO = 4.04759 PARA 0 <= C <= 407
 C. SOLIDO = 368.23 *C. LIQUIDO = 1 PARA 407 <= C <= 4000

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO REVENTAZON EN AMOCTURA 73-09-03

AREA DE DRENAJE: 1337KM² ELEVACION: 537MNSM

DIA	DATOS DEBO: SET. 6, 1953											
	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	29.4	132	114	112	93.9	163	89.8	65.5	68.8	101	36.7	46.3
2	53.5	111	96.5	103	80.1	137	111	62.6	65.8	107	35.8	42.4
3	53.9	110	92.3	103	80.1	126	124	59.6	74.6	90.1	34.4	40.0
4	41.4	187	109	95.7	93.0	123	132	59.4	75.6	77.4	35.2	38.3
5	37.6	215	119	94.1	68.9	97.3	102	68.4	57.0	66.0	35.5	38.7
6	38.3	217	112	145	67.0	182	119	88.5	52.3	58.9	33.8	39.7
7	37.2	114	90.0	166	67.3	188	140	148	60.0	55.5	32.8	44.0
8	40.4	105	83.1	127	62.1	123	118	757	60.1	53.2	33.7	40.5
9	25.5	92.8	82.3	98.6	67.0	155	103	217	53.8	55.4	34.6	36.7
10	32.1	99.8	78.6	84.1	77.7	146	107	131	51.4	48.8	36.9	36.0
11	37.5	298	90.0	83.3	70.6	200	104	106	52.3	49.1	34.4	39.4
12	52.0	139	97.6	92.2	96.7	204	93.2	86.7	48.1	48.3	32.6	60.7
13	47.9	102	125	92.1	177	133	94.6	77.7	52.0	42.9	37.3	54.5
14	74.1	103	129	101	149	292	55.0	74.6	75.1	42.6	39.1	59.8
15	111	215	112	86.3	142	230	89.8	80.8	57.5	49.5	36.7	47.1
16	62.8	131	97.3	79.9	125	175	84.1	75.9	52.9	55.2	34.8	47.3
17	40.8	141	84.7	86.6	198	193	104	71.4	65.2	47.7	35.7	43.8
18	42.8	110	92.0	80.6	127	221	133	69.8	67.2	50.6	35.0	47.4
19	36.1	116	88.9	80.2	222	156	99.4	102	71.7	56.9	37.1	40.5
20	31.9	110	72.7	112	110	143	144	85.9	94.2	56.0	35.5	40.9
21	43.6	112	76.0	122	120	143	167	75.2	85.2	58.4	37.9	42.9
22	36.0	208	92.3	126	413	117	158	71.5	42.7	55.7	32.1	45.0
23	32.6	232	132	92.5	138	113	126	66.6	74.0	49.2	34.5	44.6
24	31.0	150	136	97.2	129	183	187	61.2	148	52.3	35.1	49.6
25	39.6	114	100	105	139	103	100	50.4	337	47.8	32.9	48.2
26	46.8	110	138	132	125	112	93.1	62.3	457	41.6	30.5	46.5
27	69.0	104	181	123	97.8	86.3	79.9	61.5	187	39.6	38.3	46.5
28	82.2	90.8	143	92.1	107	111	75.7	69.1	113	39.7	62.1	54.6
29	79.0	113	140	108	119	93.8	73.3	70.1	90.1	38.7	55.1	52.8
30	101	164	105	113	169	96.6	67.0	63.8	85.2	48.6	48.6	51.2
31	81.4	116	108	108	107	107	62.3	77.3	77.3	46.8	46.8	51.2

MES	CAUDALES EXTREMOS				CAUDAL PROMEDIO MENSUAL		VOLUMEN EN					
	MAXIMO INSTANTANEO DIA	ESC.	MINIMO	PROMEDIO DIARIO	DE ESTE AÑO MC/SEG	L/S/R	DE TODO EL REGISTRO MC/SEG	L/S/R	M.H.C	MM		
MAY	16	2.21	220	1	0.30	29.4	52.5	39	103	77	140.72	105
JUN	22	3.08	370	28	1.13	90.8	143	106	144	92	315.74	274
JUL	29	2.44	253	20	0.91	72.7	107	80	132	89	287.30	215
AGO	7	2.97	340	16	1.00	79.9	105	78	118	88	280.24	210
SET				8	0.77	62.1	104	93	136	102	322.19	243
OCT				27	1.08	86.3	148	110	167	125	395.11	295
NOV	20	2.69	292	30	0.84	67.0	107	80	115	86	278.20	208
DIC				25	0.72	58.4	103	77	124	93	277.15	207
ENE				12	0.58	49.1	95.9	72	81.4	61	256.79	192
FEB	1	1.36	113	29	0.46	38.7	56.3	42	61.8	46	141.08	106
MAR	22	2.37	243	12	0.35	32.6	50.3	38	46.6	35	134.78	101
ABR	29	1.21	99.2	10	0.40	36.0	44.4	34	47.9	37	114.23	87
TOT				1	0.30	29.4	94.6	71	105	78	2995.50	2240

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO REVENTAZON EN AMOCTURA 73-09-03

AREA DE DRENAJE: 1337KM² ELEVACION: 537MNSM

DIA	DATOS DEBO: SET. 6, 1953											
	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	49.8	103	93.6	95.7	101	230	206	113	55.0	70.8	36.1	37.5
2	45.6	88.1	110	84.8	119	172	185	135	53.5	80.8	36.3	31.5
3	44.9	97.0	85.7	79.8	109	133	202	207	52.1	85.3	30.9	29.9
4	52.8	126	150	86.6	106	172	235	183	52.8	64.6	49.3	30.3
5	48.9	132	135	77.2	89.6	176	181	349	56.3	40.8	44.8	28.4
6	47.1	124	138	78.3	85.7	144	165	303	56.3	53.5	42.8	27.2
7	41.1	99.2	111	69.6	81.0	151	138	312	56.4	51.0	41.4	26.3
8	40.3	83.1	105	67.4	83.1	231	124	154	53.9	52.2	40.0	26.3
9	37.2	83.3	111	96.5	82.9	200	113	143	52.1	52.6	43.7	44.9
10	37.5	96.8	131	108	110	225	103	126	40.2	47.2	54.0	54.1
11	39.1	98.0	87.3	89.4	93.3	221	102	109	62.6	48.9	48.0	34.3
12	48.7	82.8	97.6	85.4	107	218	94.1	99.0	56.5	47.2	41.4	35.1
13	107	68.8	95.2	73.1	95.1	173	94.4	114	54.3	44.0	38.7	30.3
14	69.6	80.4	144	74.8	85.9	140	92.4	115	53.8	43.1	36.7	28.1
15	92.5	108	270	95.6	75.1	116	93.1	104	53.4	42.1	38.2	27.7
16	78.5	112	148	97.7	82.5	104	87.6	106	63.1	40.8	36.0	28.3
17	67.5	134	146	131	108	283	74.4	92.4	58.7	41.8	34.8	29.7
18	64.7	104	105	89.7	98.5	173	74.4	90.0	53.2	43.5	34.0	27.7
19	48.4	115	93.9	76.5	74.1	119	79.7	116	53.3	40.0	32.8	27.7
20	56.3	143	102	97.6	89.2	101	105	131	50.4	39.5	31.5	27.2
21	49.0	111	108	139	157	137	113	92.3	140	38.5	30.8	25.8
22	45.0	85.0	129	137	144	173	90.8	82.8	120	42.3	30.2	32.9
23	46.7	133	214	151	147	134	78.6	77.7	73.2	46.8	38.0	16.6
24	53.5	149	127	103	139	150	87.7	76.7	63.9	44.5	36.2	44.4
25	66.9	149	114	90.5	140	142	84.6	74.2	58.7	46.4	30.8	47.0
26	98.3	176	214	80.2	94.3	131	83.7	69.6	58.4	46.0	29.6	52.1
27	82.1	121	127	78.4	83.9	147	94.8	64.2	52.8	39.4	29.0	49.6
28	108	110	237	113	133	211	86.1	63.3	50.0	40.0	28.4	42.7
29	100	108	154	88.4	125	283	88.1	60.7	49.2	49.2	27.7	42.8
30	94.0	91.7	176	111	125	195	81.8	58.5	48.6	48.6	29.0	42.5
31	80.5	112	100	100	107	210	210	56.5	47.2	47.2	27.7	27.7

MES	CAUDALES EXTREMOS				CAUDAL PROMEDIO MENSUAL		VOLUMEN EN					
	MAXIMO INSTANTANEO DIA	ESC.	MINIMO	PROMEDIO DIARIO	DE ESTE AÑO MC/SEG	L/S/R	DE TODO EL REGISTRO MC/SEG	L/S/R	M.H.C	MM		
MAY	28	1.51	129	9	0.61	37.2	62.9	67	97.3	73	168.47	126
JUN	26	2.59	277	13	0.86	48.8	110	83	122	91	286.17	214
JUL	28	3.60	503	3	1.07	85.7	130	97	132	98	347.35	260
AGO	23	2.32	335	8	0.82	67.4	98.0	71	115	86	234.54	190
SET	21	2.67	289	15	0.94	75.1	106	79	132	98	272.55	205
OCT	8	3.43	511	20	1.23	101	171	128	148	125	458.35	343
NOV	6	3.12	378	18	0.96	74.4	115	86	115	86	299.16	224
DIC	5	3.67	508	31	0.70	56.5	122	91	124	93	328.75	246
ENE	21	2.04	197	10	0.56	46.6	60.1	45	78.7	59	161.06	120
FEB	1	3.70	153	21	0.44	38.5	49.1	37	60.3	45	118.77	89
MAR	10	0.84	47.0	31	0.27	27.7	37.0	28	45.4	34	95.32	74
ABR	10	1.20	98.2	21	0.34	25.8	34.9	26	48.0	36	90.45	68
TOT	8	3.43	511	21	0.74	25.8	91.1	68	103	77	2883.81	2157

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO REVENTAZON EN ANGOSTURA 73-09-03

AREA DE DRENAJE:		ELEVACION:										
1337KM2		532HSM										
ANO HIDROLOGICO		DATOS DESDE: SET. 6, 1953										
1961 ~ 1962												
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	45.8	73.8	85.5	112	96.0	152	180	301	84.9	55.0	40.0	31.5
2	42.1	64.6	88.9	138	111	123	191	197	81.7	52.8	38.7	32.5
3	36.4	70.1	92.0	106	113	173	178	168	157	51.4	40.8	14.4
4	34.0	107	88.7	101	90.0	135	188	147	124	49.2	39.4	34.0
5	34.0	107	99.2	103	179	129	122	131	103	48.6	38.1	31.5
6	34.0	110	131	106	273	122	110	117	90.5	48.0	37.4	30.2
7	34.4	117	148	99.3	193	129	107	111	87.0	46.6	36.7	30.2
8	37.4	119	228	106	123	125	151	107	79.0	46.6	39.4	31.5
9	34.5	180	163	98.5	119	105	226	99.2	75.7	46.0	38.1	36.0
10	43.8	185	163	94.3	164	99.0	201	93.2	71.6	44.6	36.7	35.4
11	51.5	168	123	100	172	96.0	137	91.9	68.5	44.6	35.4	32.2
12	80.6	102	121	87.4	148	91.0	149	106	67.6	42.8	34.8	65.4
13	72.9	85.9	111	78.4	137	199	148	131	71.7	42.8	34.0	49.2
14	113	101	108	80.4	136	164	125	125	72.1	43.1	34.8	40.8
15	99.6	99.2	110	113	158	176	111	103	67.7	44.7	35.4	38.1
16	94.4	82.7	122	121	168	173	111	91.3	67.0	45.6	36.7	36.7
17	74.3	124	118	129	177	169	108	84.9	62.6	46.0	34.0	37.9
18	58.8	102	103	91.0	142	154	99.6	82.6	64.0	44.0	41.4	40.3
19	53.3	87.6	97.0	83.1	134	150	99.8	94.0	61.8	42.1	40.0	44.0
20	49.5	77.1	106	75.9	123	170	133	103	62.8	42.1	36.7	34.1
21	47.6	103	108	96.1	109	165	145	107	73.5	42.1	33.4	30.8
22	61.0	104	114	90.3	125	181	111	94.2	70.5	41.4	32.2	41.9
23	68.3	85.1	92.5	89.6	151	177	91.3	92.7	70.1	41.4	32.8	50.7
24	107	107	93.8	90.1	151	155	118	110	80.3	40.0	33.1	61.6
25	128	112	87.3	110	120	170	133	139	74.5	40.0	34.0	58.6
26	82.5	124	8	89.0	164	123	133	544	61.0	39.4	34.8	72.2
27	73.4	88.8	88.5	96.0	140	116	108	233	58.8	40.8	35.4	74.6
28	71.1	76.8	78.7	102	139	103	102	148	62.1	42.1	33.4	61.1
29	65.0	88.3	138	79.7	173	142	152	119	67.6	40.0	30.8	47.0
30	59.1	105	150	81.0	156	181	265	104	61.8	29.6	29.6	42.1
31	55.7		111	108		166		92.3	60.3		30.2	

MES	CAUDALES EXTREMOS			PROMEDIO DIARIO		CAUDAL PROMEDIO MENSUAL DE ESTE AÑO		PROMEDIO MENSUAL DE TODO EL REGISTRO		VOLUMEN EN		
	MAXIMO DIA	INSTANTANEO ESC.	MINIMO MC/SEC	DIA	PROMEDIO ESC.	MC/SEC	L/S/K	MC/SEC	L/S/K	M.H.C	MM	
MAY	25	2.33	210	4	0.37	34.0	62.7	47	93.0	70	167.87	126
JUN	10	2.67	289	2	0.81	64.6	105	78	120	90	271.47	203
JUL	8	3.15	385	28	0.99	78.7	115	86	130	97	309.22	231
AGO	15	2.55	271	20	0.95	75.9	98.6	74	113	84	263.96	197
SET	6	3.09	372	4	1.12	90.0	148	111	134	100	383.10	287
OCT	13	3.21	400	12	1.11	91.0	144	108	165	124	386.73	289
NOV	30	3.09	372	23	1.13	91.3	141	106	118	88	366.31	274
DIC	26	4.06	636	18	1.03	82.6	145	108	126	94	388.57	291
ENE	3	1.89	178	27	0.73	58.8	76.2	57	78.4	59	204.14	153
FEB	14	0.83	66.2	26	0.45	39.4	44.8	33	58.5	44	108.33	81
MAR	3	0.50	42.8	30	0.30	29.6	35.6	27	44.3	33	95.46	71
ABR	27	1.49	127	6	0.31	30.2	42.8	32	47.4	35	110.98	83
TOT	26	4.06	636	30	0.30	29.6	96.6	72	102	77	3056.06	2286

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO REVENTAZON EN ANGOSTURA 73-09-03

AREA DE DRENAJE:		ELEVACION:										
1337KM2		532HSM										
ANO HIDROLOGICO		DATOS DESDE: SET. 6, 1953										
1962 ~ 1963												
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	40.0	102	177	117	119	125	108	77.0	74.0	93.6	45.2	48.6
2	51.9	84.7	202	103	112	161	152	69.0	75.0	80.4	46.6	46.0
3	83.6	86.3	182	110	96.2	174	190	72.0	85.0	70.0	46.6	44.0
4	58.7	131	178	111	98.8	278	626	70.0	82.0	61.8	58.5	43.4
5	47.2	143	210	96.0	103	246	980	67.8	83.0	58.5	75.6	54.9
6	42.1	113	227	110	93.6	192	766	100	85.1	42.2	74.9	47.3
7	47.2	152	161	107	120	226	600	86.7	98.3	75.6	69.6	42.1
8	42.8	138	141	136	150	190	315	97.0	80.1	95.4	58.3	39.4
9	40.0	230	118	137	126	148	232	272	75.7	95.1	78.0	47.5
10	39.4	170	106	106	108	138	231	150	73.2	78.3	63.4	66.2
11	56.7	125	96.2	105	103	125	189	165	71.0	67.0	62.6	62.5
12	54.2	112	117	100	129	152	177	125	68.5	69.3	60.3	88.2
13	52.3	101	145	86.4	106	170	232	301	65.5	66.7	61.0	73.2
14	59.6	93.9	167	73.0	104	167	416	360	63.4	58.7	56.5	60.3
15	56.0	88.2	115	73.2	159	156	478	490	63.3	56.5	55.7	51.4
16	60.3	123	154	119	229	174	232	272	62.2	53.5	57.4	54.7
17	68.9	148	123	107	219	142	157	205	62.2	54.2	58.1	67.0
18	65.2	141	103	118	171	126	127	172	60.9	51.4	53.5	101
19	86.7	122	95.2	155	141	122	255	230	55.5	60.7	51.4	130
20	130	120	88.4	124	145	128	232	195	53.4	52.9	50.7	95.2
21	108	94.6	84.1	115	127	123	140	207	56.4	62.5	52.1	138
22	84.8	84.0	96.3	103	167	264	137	160	57.7	58.8	48.6	134
23	102	81.4	88.5	93.1	275	176	107	117	58.9	60.3	52.0	107
24	122	78.2	86.4	107	192	155	91.0	158	69.2	53.5	60.4	96.0
25	145	142	145	124	178	232	110	144	70.1	50.7	48.6	80.7
26	210	134	98.3	98.0	158	166	66.3	118	59.2	49.2	47.2	85.4
27	187	102	132	109	123	128	81.5	96.0	55.5	47.2	50.0	89.7
28	125	101	200	122	150	127	77.0	84.0	52.7	46.0	50.7	90.3
29	129	95.1	124	120	166	141	78.0	82.0	55.3		49.2	123
30	133	125	157	154	125	124	91.6	79.0	52.8		50.7	116
31	141		145	126		111		74.0	106		48.6	

MES	CAUDALES EXTREMOS			PROMEDIO DIARIO		CAUDAL PROMEDIO MENSUAL DE ESTE AÑO		PROMEDIO MENSUAL DE TODO EL REGISTRO		VOLUMEN EN		
	MAXIMO DIA	INSTANTANEO ESC.	MINIMO MC/SEC	DIA	PROMEDIO ESC.	MC/SEC	L/S/K	MC/SEC	L/S/K	M.H.C	MM	
MAY	26	2.79	309	10	0.45	39.4	85.5	64	92.2	69	228.93	171
JUN	9	3.21	400	24	0.98	78.2	119	88	120	90	309.43	231
JUL	5	3.10	374	21	1.03	84.1	137	102	131	98	366.54	274
AGO	19	2.38	244	14	0.92	73.0	112	84	113	84	299.35	224
SET	22	3.95	602	6	1.13	91.6	143	107	135	101	370.79	277
OCT	3	3.68	524	31	1.34	113	164	123	165	123	439.60	329
NOV	4	3.31	1060	28	0.97	77.0	253	190	132	98	656.85	491
DIC	13	3.44	460	5	0.85	67.8	159	119	129	97	424.70	318
ENE	31	1.76	161	28	0.55	52.7	68.7	51	77.4	58	103.95	138
FEB	1	1.54	132	28	0.55	46.0	63.9	48	59.0	44	154.66	116
MAR	4	1.16	942	1	0.34	45.3	56.2	42	45.5	34	150.51	113
ABR	21	2.10	205	8	0.45	39.4	77.4	58	50.4	38	200.53	150
TOT	4	3.31	1060	8	0.45	39.4	120	90	104	78	3785.79	2831

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO REVENTAZON EN ANGOSTURA 73-09-03

AREA DE DRENAJE: 1337KM ²		ELEVACION: 532MSNM										
ANO HIDROLOGICO 1963 - 1964		DATOS DESDE: SET. 6, 1953										
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	93.0	94.0	139	106	98.9	107	154	95.1	259	51.5	32.0	23.9
2	82.0	78.0	138	129	82.6	97.2	153	108	246	47.5	31.0	21.7
3	73.2	84.0	124	124	85.3	95.0	133	101	155	45.0	30.0	23.9
4	62.0	160	115	112	94.8	101	258	95.5	122	48.8	31.0	23.9
5	57.0	152	113	105	106	106	280	89.0	111	47.0	30.5	23.4
6	53.0	93.0	110	88.2	131	96.2	197	137	107	44.5	29.5	23.4
7	78.0	86.3	110	87.4	238	123	241	129	99.0	44.0	28.6	13.9
8	65.4	123	105	171	190	173	200	100	88.0	43.5	29.6	24.6
9	56.0	142	148	105	177	156	184	167	340	42.0	31.0	24.4
10	53.0	103	145	101	220	208	213	376	81.0	41.0	28.6	25.0
11	83.0	136	128	181	234	187	157	186	85.0	40.6	28.6	24.4
12	121	130	109	157	234	163	136	127	75.0	40.6	28.4	26.2
13	86.2	113	140	187	162	149	141	104	73.0	40.0	28.0	28.6
14	100	101	120	181	162	184	199	97.0	71.0	40.4	28.6	27.6
15	130	95.7	112	121	188	171	305	78.0	99.0	42.0	29.7	25.0
16	120	100	102	100	211	149	263	84.0	85.5	41.0	34.0	26.8
17	98.0	86.2	130	153	147	131	204	79.0	77.0	40.6	29.0	29.7
18	82.4	84.0	124	122	126	166	187	75.0	74.0	40.0	28.6	28.0
19	120	81.5	144	113	151	159	177	76.0	65.3	36.0	28.0	27.6
20	310	89.2	125	147	171	161	171	75.0	68.3	34.2	29.5	25.5
21	175	85.8	113	159	155	171	148	69.1	63.0	33.5	27.6	25.8
22	144	72.5	130	144	122	121	130	67.8	42.9	33.0	27.6	29.6
23	122	93.2	119	115	133	116	133	67.0	61.0	32.8	28.0	33.0
24	103	102	106	94.5	158	178	129	67.4	41.7	33.5	28.6	47.1
25	98.0	121	95.0	84.5	180	125	113	134	58.0	33.0	25.8	40.0
26	125	101	85.1	80.0	178	114	101	140	54.0	34.5	25.8	55.2
27	143	92.5	78.5	78.2	149	97.0	93.4	108	54.2	35.5	25.0	43.3
28	137	99.0	116	76.5	132	95.7	88.5	98.5	48.3	33.2	25.0	41.5
29	130	151	90.5	74.9	116	95.2	88.0	82.0	50.4	32.5	25.0	36.2
30	105	172	87.9	83.0	107	96.0	92.5	104	48.8	33.9	23.9	33.1
31	115		92.3	89.3		122		98.5	49.5		23.8	

MES	CAUDALES EXTREMOS			MINIMO PROMEDIO DIARIO		CAUDAL PROMEDIO MENSUAL		DE TODO EL REGISTRO		VOLUMEN EN		
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEG	DIA	ESC.	MC/SEG	DE ESTE AÑO MC/SEG	L/9/K	DE TODO EL REGISTRO MC/SEG	L/9/K	M.M.C	MM
MAY	20	2.85	322	10	0.65	53.0	107	80	93.7	70	284.21	414
JUN	4	3.08	369	22	0.91	72.5	107	80	119	89	278.37	208
JUL	19	2.91	333	27	0.98	78.5	116	87	130	97	310.75	332
AGO	11	4.02	624	29	0.54	74.9	118	89	114	85	174.30	237
SET	15	3.42	454	2	1.03	82.6	155	116	137	102	404.03	308
OCT	10	3.70	529	7	1.17	93.0	134	102	182	121	364.72	273
NOV	4	3.78	551	29	1.02	89.0	169	126	133	101	438.17	398
DIC	9	4.18	671	23	0.78	47.0	110	82	110	82	295.45	221
ENE	1	3.06	379	28	0.55	48.3	96.5	72	127	95	258.59	193
FEB	1	0.58	58.5	29	0.31	32.5	39.2	30	57.3	43	99.78	75
MAR	2	0.39	37.2	31	0.11	21.8	28.4	21	43.9	33	75.97	57
ABR	25	1.10	97.3	5	0.10	23.4	30.4	23	48.6	36	78.81	59
TOT	9	4.18	671	5	0.10	23.4	101	76	104	78	3205.11	3397

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO REVENTAZON EN ANGOSTURA 73-09-03

AREA DE DRENAJE: 1337KM ²		ELEVACION: 532MSNM										
ANO HIDROLOGICO 1964 - 1965		DATOS DESDE: SET. 6, 1953										
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	38.4	80.8	189	209	136	153	159	87.0	48.6	71.4	77.0	48.3
2	39.5	96.5	157	168	138	143	157	79.0	47.0	47.9	63.6	48.6
3	37.4	81.8	145	153	143	148	226	76.0	55.4	77.9	61.0	47.2
4	33.7	132	130	138	137	171	194	70.0	66.2	74.6	58.5	53.0
5	30.3	104	114	133	108	125	142	75.0	81.0	64.4	53.9	65.5
6	34.7	77.0	99.6	120	97.0	131	136	86.4	209	63.4	50.4	42.2
7	33.4	89.2	103	111	117	113	130	81.2	258	60.0	79.0	42.1
8	39.1	113	144	109	126	100	130	88.4	197	63.0	174	41.0
9	46.1	88.4	114	112	133	101	159	73.2	133	58.5	151	40.5
10	53.4	121	127	123	162	100	145	67.0	116	56.0	120	34.2
11	51.9	150	112	100	146	114	116	64.5	107	55.9	89.5	34.0
12	43.5	125	131	103	143	181	120	66.1	94.3	54.4	77.0	33.5
13	44.3	103	137	137	162	188	113	63.6	87.4	51.4	71.0	40.0
14	49.5	88.8	190	134	182	156	119	68.5	82.7	49.6	65.0	35.1
15	56.4	134	134	200	234	132	129	78.8	90.4	48.6	61.0	32.0
16	57.8	193	174	165	208	193	125	42.8	88.9	48.0	37.0	37.8
17	62.1	110	179	189	192	188	104	55.3	119	47.0	56.4	31.0
18	71.5	142	250	212	160	147	105	56.0	277	48.0	56.0	33.1
19	76.0	139	118	194	250	152	101	59.6	377	55.4	54.4	33.0
20	72.0	135	131	163	202	228	96.3	61.0	247	86.4	51.2	36.9
21	57.0	110	162	167	163	212	92.0	79.3	175	71.4	68.1	40.2
22	67.0	143	239	164	243	174	88.0	63.6	143	61.6	34.4	51.0
23	62.3	258	317	123	187	180	101	64.1	123	58.0	31.9	46.0
24	61.2	120	213	128	149	185	111	63.0	106	52.8	52.4	61.5
25	68.0	117	188	135	152	129	302	56.0	101	55.7	53.4	37.3
26	109	137	164	230	151	146	91.0	65.0	94.0	143	49.4	35.8
27	117	108	146	143	152	141	85.0	63.0	109	141	47.5	35.8
28	84.3	96.3	140	123	140	135	87.0	55.4	95.0	96.3	46.0	34.2
29	89.5	86.4	201	116	165	150	79.0	56.6	87.0	47.0	46.0	36.6
30	86.1	137	264	101	160	144	85.0	51.2	83.4	50.4	50.4	35.4
31	80.5		272	114		154		49.6	75.8		58.0	

MES	CAUDALES EXTREMOS			MINIMO PROMEDIO DIARIO		CAUDAL PROMEDIO MENSUAL		DE TODO EL REGISTRO		VOLUMEN EN		
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEG	DIA	ESC.	MC/SEG	DE ESTE AÑO MC/SEG	L/9/K	DE TODO EL REGISTRO MC/SEG	L/9/K	M.M.C	MM
MAY	26	2.48	279	5	0.27	30.2	58.9	44	90.5	68	157.77	118
JUN	30	2.51	284	6	0.89	77.0	113	86	119	89	297.58	221
JUL	22	3.77	549	6	1.12	89.6	165	124	123	100	442.59	331
AGO	17	2.81	333	11	1.13	100	183	107	127	87	341.40	286
SET	19	6.25	693	6	1.10	97.0	161	121	138	104	418.00	313
OCT	16	3.51	479	9	1.14	301	154	115	161	121	412.39	308
NOV	3	2.81	331	29	0.81	79.0	121	90	136	100	312.71	234
DIC	8	1.17	105	31	0.57	89.6	67.2	50	122	91	179.68	135
ENE	19	3.67	521	2	0.53	47.0	129	96	83.2	63	346.17	257
FEB	26	1.91	198	17	0.53	47.0	67.4	50	58.1	43	162.93	122
MAR	8	1.91	198	28	0.52	46.0	67.9	51	45.9	34	181.94	136
ABR	22	0.75	64.5	17	0.78	31.0	39.3	29	47.8	36	101.77	74
TOT	19	4.25	693	5	0.27	30.2	107	80	106	78	3393.41	2534

C.SOLIDO= 6.09268E-06 *C.LIQUIDO* 1 PARA 407 <= C <= 407
 C.SOLIDO= 368.21 *C.LIQUIDO* 1 PARA 407 <= C <= 4006

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO REVENTAZON EN ANCOSTURA 73-09-03

AREA DE DRENAJE: 1337KM2		ELEVACION: 532MGNH										
ANO HIDROLOGICO 1965 - 1966		DATOS DESDE: SET. 6, 1953										
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	36.0	161	112	159	114	127	177	106	106	171	95.0	66.0
2	33.2	127	94.5	183	108	147	240	104	96.0	144	97.0	64.0
3	35.0	121	95.3	181	97.1	160	233	99.0	93.0	121	133	56.0
4	37.8	122	120	160	109	141	194	99.5	89.0	119	100	51.0
5	42.5	102	114	187	117	156	152	95.3	82.0	107	91.0	50.0
6	56.8	112	113	167	121	123	132	95.0	76.0	106	66.0	49.0
7	54.5	130	107	135	137	124	129	98.0	76.0	124	64.0	48.0
8	55.2	181	98.0	128	188	120	127	105	93.0	103	60.0	46.0
9	53.5	179	105	182	146	106	147	85.0	124	93.0	57.0	45.0
10	113	163	100	155	144	201	144	78.0	137	87.0	55.0	42.0
11	172	127	107	150	134	112	142	75.0	97.0	104	64.0	42.0
12	116	125	104	118	108	202	130	75.0	93.0	99.0	66.0	41.0
13	81.0	220	90.0	117	113	180	180	71.3	109	92.0	60.0	40.0
14	66.5	117	87.5	118	127	147	159	69.0	102	84.0	58.0	39.0
15	77.9	104	100	151	131	148	152	69.2	117	77.0	57.0	38.0
16	91.5	94.0	108	134	132	139	139	76.0	91.0	72.0	57.0	37.0
17	76.0	82.0	95.0	120	121	117	124	81.0	81.0	72.0	55.0	38.0
18	66.5	89.4	142	150	122	132	111	97.0	88.0	76.0	54.0	36.0
19	82.8	97.3	129	179	117	113	106	98.0	87.8	72.0	62.0	36.0
20	95.0	123	103	201	114	164	99.5	203	74.0	88.0	56.0	36.0
21	109	124	121	152	126	165	102	98.0	71.0	83.0	75.0	43.0
22	135	135	134	167	137	169	99.5	89.0	74.0	74.0	92.0	55.0
23	155	197	108	150	160	191	93.0	86.0	93.0	67.0	76.0	44.0
24	104	184	117	140	153	235	113	87.0	99.0	139	65.0	66.0
25	117	183	125	154	137	283	260	87.0	76.0	569	65.0	107
26	106	155	137	159	122	199	201	89.0	72.0	225	65.0	66.0
27	86.0	135	148	172	147	153	131	95.0	262	140	60.0	70.0
28	117	129	148	142	225	142	111	127	323	113	60.0	165
29	149	124	131	122	211	144	108	102	166		55.0	95.0
30	225	113	166	119	144	147	110	108	146		60.0	111
31	230		170	125		179		132	230		70.0	

MES	CAUDALES EXTREMOS			PROMEDIO DIARIO		CAUDAL DE ESTE AÑO		PROMEDIO MENSUAL		VOLUMEN EN		
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEG	MINIMO DIA	ESC.	MC/SEG	MC/SEG	L/S/K	DE TODO EL REGISTRO MC/SEG	L/S/K	M.M.C	M.M.
MAY	30	3.36	443	2	0.32	33.0	96.5	72	91.0	66	258.57	193
JUN	13	3.94	599	17	0.95	82.0	135	101	120	90	350.41	262
JUL	30	2.80	331	14	1.00	87.0	118	88	132	99	315.30	236
AGO	19	2.80	331	13	1.28	117	150	112	120	90	401.93	301
SET	28	3.22	412	3	1.10	97.0	135	101	139	104	350.98	264
OCT	23	3.62	508	10	1.13	101	153	115	160	120	410.94	307
NOV	2	3.22	412	23	1.06	93.0	145	108	135	101	375.49	281
DIC	20	3.30	476	14	0.80	69.0	96.2	72	120	90	257.58	193
ENE	28	3.70	529	21	0.83	71.0	114	85	85.5	64	304.45	229
FEB	25	4.66	827	23	0.79	67.0	122	91	63.0	47	295.57	221
MAR	3	1.54	150	18	0.62	54.0	69.4	52	47.7	36	185.76	139
ABR	28	2.06	217	18	0.37	36.0	55.9	42	48.4	36	144.96	108
TOT	25	4.66	827	2	0.32	33.0	116	87	105	79	3651.91	2731

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO REVENTAZON EN ANCOSTURA 73-09-03

AREA DE DRENAJE: 1337KM2		ELEVACION: 532MGNH										
ANO HIDROLOGICO 1966 - 1967		DATOS DESDE: SET. 6, 1953										
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	102	169	95.0	104	124	232	119	137	174	84.3	51.0	41.0
2	128	378	93.0	95.0	112	182	107	260	164	78.4	54.0	40.0
3	121	245	93.2	95.0	120	138	181	361	142	73.3	53.8	43.0
4	121	175	93.0	86.0	113	219	216	251	114	94.0	63.0	41.0
5	105	139	96.0	94.0	140	139	239	179	117	89.6	58.0	42.0
6	84.8	154	93.0	151	155	148	211	155	125	84.0	57.0	51.0
7	103	200	89.0	209	122	129	204	137	117	74.0	56.0	67.5
8	115	172	107	172	128	140	178	124	96.0	67.1	59.0	61.1
9	156	133	139	124	161	112	165	113	96.5	65.5	63.1	98.0
10	117	118	94.0	122	200	115	137	124	105	63.3	48.0	102
11	121	108	85.0	102	189	126	119	294	134	62.0	87.0	78.0
12	187	124	142	109	152	140	112	214	104	62.0	65.1	102
13	181	141	263	141	138	130	117	179	104	63.0	74.0	77.0
14	136	193	242	130	119	167	105	154	95.0	59.0	65.0	67.0
15	163	122	150	106	145	183	96.0	163	89.2	61.0	59.0	82.0
16	166	107	121	95.0	166	170	103	132	91.4	62.0	53.0	111
17	137	98.0	110	152	157	149	89.0	115	99.0	54.0	50.0	109
18	145	119	108	207	126	250	85.0	108	86.3	62.0	50.0	85.5
19	203	123	102	250	111	199	82.0	104	93.0	65.0	48.0	68.1
20	145	137	137	193	112	177	78.0	103	162	65.0	47.0	69.3
21	155	141	186	158	106	158	74.0	124	142	79.0	47.0	117
22	141	138	194	155	127	215	78.0	123	115	65.0	48.0	139
23	137	136	132	131	106	187	152	138	108	69.1	44.0	187
24	111	118	114	120	134	161	114	105	108	55.0	53.0	110
25	124	146	132	128	130	157	150	268	100	59.6	48.0	148
26	147	140	119	174	130	137	119	597	99.5	54.0	44.0	132
27	132	137	115	198	126	134	104	512	93.0	55.0	44.0	96.0
28	126	121	141	202	138	126	134	272	95.0	54.2	44.0	104
29	115	113	126	175	161	117	157	233	100		42.0	115
30	103	103	109	159	215	113	111	200	92.0		39.0	98.0
31	140		120	152		114		179	94.0		38.0	

MES	CAUDALES EXTREMOS			PROMEDIO DIARIO		CAUDAL DE ESTE AÑO		PROMEDIO MENSUAL		VOLUMEN EN		
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEG	MINIMO DIA	ESC.	MC/SEG	MC/SEG	L/S/K	DE TODO EL REGISTRO MC/SEG	L/S/K	M.M.C	M.M.
MAY	2	3.16	399	6	0.97	85.0	134	101	94.3	71	360.10	269
JUN	2	4.58	799	17	1.11	98.0	148	111	122	91	384.31	287
JUL	13	3.62	508	11	0.98	89.0	128	96	132	98	342.16	256
AGO	19	3.54	487	4	0.99	86.0	145	108	122	91	387.50	290
SET	30	4.22	683	23	1.18	106	139	104	139	104	359.66	269
OCT	18	3.44	462	30	1.24	113	154	115	160	119	411.52	308
NOV	24	3.54	487	21	0.86	74.0	138	103	135	101	357.35	267
DIC	26	4.94	926	20	1.15	103	199	148	126	94	531.71	398
ENE	2	2.50	283	18	0.99	86.0	111	83	87.4	65	298.50	223
FEB	5	1.90	197	17	0.62	54.0	67.1	50	63.3	47	262.39	193
MAR	9	1.78	181	31	0.40	38.0	53.3	40	48.1	36	142.73	107
ABR	21	2.66	308	2	0.43	40.0	89.5	67	51.3	38	231.87	173
TOT	26	4.94	926	31	0.40	38.0	123	94	107	80	3969.95	2969

C. SOLIDO = 4.09288E-06 * C. LIQUIDO = 4.04759 PARA 0 C = C (- 40)
 C. SOLIDO = 168.23 * C. LIQUIDO = 1 PARA 107 C = C (- 4000)

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO REVENTAZON EN ANCASTURA 73-09-03

AREA DE DRENAJE: 1337872 ELEVACION: 532100

DIA	ANO HIDROLOGICO		DATOS DESDE: OCT. 6, 1953									
	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	44.3	91.0	201	137	185	227	105	168	93.7	107	37.7	112
2	89.5	157	150	128	230	196	109	148	51.5	84.4	84.1	113
3	76.0	260	129	225	199	199	127	150	54.6	71.6	82.1	101
4	81.0	190	132	229	214	178	148	138	57.3	62.6	76.4	71.5
5	68.4	298	136	173	158	158	127	120	56.0	56.8	71.4	102
6	64.3	192	118	151	198	137	125	110	51.7	43.8	64.1	94.1
7	77.8	147	119	160	153	115	133	105	48.0	57.6	61.9	93.3
8	90.4	142	122	162	131	131	111	112	50.4	90.0	51.0	126
9	78.2	157	135	185	159	122	152	111	52.9	179	52.0	161
10	75.3	205	141	146	207	134	138	96.0	53.0	161	42.0	137
11	77.8	205	121	145	204	124	137	90.0	45.4	108	45.0	105
12	43.0	137	106	130	160	115	124	100	53.7	79.8	49.0	97.4
13	80.7	116	192	128	141	132	119	95.3	53.3	76.6	49.0	88.1
14	78.3	121	127	113	134	121	113	84.0	50.0	67.6	55.4	82.7
15	85.5	139	123	109	127	207	119	83.0	61.6	74.0	81.0	96.5
16	96.4	184	143	127	142	202	132	85.4	67.1	62.6	46.4	84.0
17	90.7	173	116	141	138	140	296	79.5	64.1	57.9	47.4	65.5
18	114	193	93.0	151	141	184	206	79.0	59.4	75.4	57.5	57.5
19	124	164	100	125	145	192	163	93.4	44.2	67.9	58.0	46.4
20	106	155	131	102	149	200	160	40.0	61.9	52.3	58.4	61.3
21	85.0	136	110	131	151	257	161	90.9	65.0	47.5	47.0	55.4
22	41.6	141	149	118	145	288	134	84.6	52.8	55.0	47.4	57.4
23	76.0	156	178	137	154	294	141	79.8	50.1	96.4	137	56.8
24	85.1	143	126	195	164	228	134	121	52.9	70.0	230	56.3
25	95.2	147	132	206	156	180	109	106	57.3	326	132	54.5
26	77.8	149	140	236	136	185	34.0	92.1	55.3	240	110	33.1
27	77.4	231	207	211	152	161	119	96.5	50.5	168	86.4	52.6
28	116	234	125	178	171	152	232	55.2	33.9	146	161	42.8
29	103	200	110	159	207	140	162	55.2	47.0	110	181	50.0
30	85.0	170	134	152	215	141	145	59.5	141	120	120	57.3
31	88.0		134	184		141		53.0	177		96.1	

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO		CAUDAL PROMEDIO MENSUAL		VOLUMEN				
	MAXIMO INSTANTANEO	MINIMO	PROMEDIO DIARIO	DE ESTE AÑO	PROMEDIO MENSUAL	DE TODO EL REGISTRO	M.M.C	M3				
MAY	11	2.40	266	6	0.75	54.3	87.8	66	93.8	70	235.19	176
JUN	5	3.84	369	1	1.03	90.8	170	127	125	84	440.90	330
JUL	26	2.44	338	18	1.11	99.0	134	101	132	99	359.94	289
AGO	3	3.58	499	20	1.15	102	157	118	125	93	421.03	315
SET	30	3.12	412	15	1.37	127	165	124	141	105	424.20	320
OCT	18	3.60	503	12	1.26	115	173	130	161	120	463.79	347
NOV	17	3.30	430	26	1.09	96.0	142	107	135	101	369.19	276
DIC	19	2.40	266	31	0.61	53.0	97.5	73	124	93	261.07	195
ENE	31	2.44	273	28	0.33	33.9	62.6	47	85.7	64	167.77	125
FEB	25	3.80	557	21	0.54	47.5	100	75	65.9	49	250.49	193
MAR	24	2.86	342	10	0.46	42.0	83.7	63	50.5	38	224.90	169
ABR	9	2.40	266	28	0.47	42.8	82.4	62	53.4	40	213.50	160
TOT	5	3.84	569	28	0.33	34.0	121	91	108	81	3836.23	2869

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO REVENTAZON EN ANCASTURA 73-09-03

AREA DE DRENAJE: 1337872 ELEVACION: 532854M

DIA	ANO HIDROLOGICO		DATOS DESDE: OCT. 6, 1953									
	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	54.6	139	174	153	137	94.0	185	109	81.4	55.5	38.0	60.0
2	58.7	150	178	142	143	141	170	100	63.0	50.9	30.6	50.5
3	40.0	159	224	178	145	147	160	97.0	58.0	41.3	34.3	43.5
4	68.0	157	244	171	139	136	146	110	53.3	49.3	39.0	34.8
5	75.8	195	178	142	156	146	162	109	64.2	101	38.0	37.6
6	62.3	158	145	144	213	129	140	103	57.5	47.0	35.4	32.7
7	113	140	159	127	259	117	128	93.3	66.3	55.0	34.1	44.0
8	90.1	145	158	140	236	170	158	75.0	51.0	52.6	31.0	45.4
9	74.7	134	136	170	211	141	139	81.0	48.0	44.2	34.7	47.7
10	84.0	157	126	204	201	115	112	79.0	48.2	52.0	32.0	52.0
11	118	174	161	216	232	129	107	80.5	43.7	44.0	28.5	47.0
12	121	159	125	162	224	189	112	80.7	45.3	47.0	28.0	44.5
13	119	163	139	137	187	142	230	80.0	51.0	43.4	27.8	40.1
14	107	183	123	124	145	111	172	78.0	40.7	40.5	36.4	42.0
15	121	151	110	136	170	129	134	181	41.4	39.0	31.0	41.6
16	104	125	99.3	130	267	158	140	468	47.2	32.4	30.3	40.0
17	94.7	187	135	115	211	145	148	358	57.4	36.3	30.7	34.0
18	108	188	165	164	306	152	152	236	59.2	38.3	33.7	38.2
19	163	192	185	226	367	150	125	155	59.8	40.2	34.2	42.7
20	128	155	193	227	275	110	129	127	59.5	42.2	35.0	34.4
21	120	178	201	159	219	98.0	109	113	63.0	41.4	40.1	46.6
22	136	146	189	146	182	125	99.3	106	54.6	40.0	45.4	60.4
23	125	150	157	144	246	116	97.2	117	51.6	38.0	32.5	52.2
24	112	142	167	136	257	135	134	94.6	56.0	38.3	35.4	50.4
25	140	132	174	143	192	285	242	103	55.3	39.0	36.2	52.3
26	134	109	160	130	200	195	133	104	68.0	39.0	39.4	59.2
27	119	171	189	113	140	181	169	97.0	61.7	38.3	40.8	42.3
28	130	188	160	134	120	241	139	82.5	69.2	35.0	41.7	46.3
29	137	129	216	144	100	195	119	84.7	62.0		41.0	47.0
30	167	169	191	148	82.9	165	108	89.6	70.3		37.1	66.2
31	186		173	138		156		67.0	68.0		55.1	

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO		CAUDAL PROMEDIO MENSUAL		VOLUMEN				
	MAXIMO INSTANTANEO	MINIMO	PROMEDIO DIARIO	DE ESTE AÑO	PROMEDIO MENSUAL	DE TODO EL REGISTRO	M.M.C	M3				
MAY	31	2.78	324	3	0.43	40.0	110	82	94.9	71	284.70	220
JUN	18	3.26	421	2	1.21	109	158	110	127	85	410.48	307
JUL	3	3.72	535	16	1.12	99.4	166	124	134	100	445.50	333
AGO	19	3.54	487	27	1.25	133	158	115	127	99	432.98	309
SET	19	4.80	876	30	0.95	82.9	200	149	146	108	517.35	387
OCT	35	1.48	472	1	1.07	94.0	150	112	160	120	405.31	301
NOV	28	4.05	633	21	1.10	97.3	150	113	134	102	488.33	391
DIC	16	3.72	535	28	0.95	83.5	124	93	124	93	331.85	248
ENE	7	1.74	176	14	0.44	40.7	54.6	42	61.9	63	151.45	113
FEB	5	1.85	190	16	0.31	32.4	46.3	35	64.6	48	111.68	84
MAR	22	0.94	82.0	13	0.22	27.8	35.8	27	49.6	37	95.80	72
ABR	25	2.16	232	4	0.31	32.7	50.1	37	53.3	40	129.88	87
TOT	19	4.40	876	13	0.22	27.8	117	87	108	81	3682.45	2762

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO REVENTAZON EN ANGOSTURA 73-09-01

AREA DE DRENAJE: 1337KM² ELEVACION: 5323M

ANO HIDROLOGICO 1969 - 1970 DATOS DESDE: SET. 6, 1953

DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	17.6	106	138	96.0	163	185	129	260	97.0	64.0	50.0	100
2	45.0	137	136	130	155	135	106	213	90.0	62.0	35.0	41.7
3	41.6	122	116	126	166	165	115	210	87.0	60.0	67.6	67.0
4	33.5	129	101	205	171	147	87.4	201	61.3	100	63.0	59.0
5	39.4	102	94.2	236	151	124	138	168	80.3	211	60.0	55.9
6	42.7	82.3	99.0	169	113	145	128	129	79.0	222	58.2	58.0
7	45.1	86.4	100	141	109	187	102	159	90.0	207	55.0	55.3
8	45.1	108	90.0	167	114	251	114	114	240	216	53.6	44.3
9	50.5	100	94.5	187	95.0	253	114	95.3	240	216	53.0	263.0
10	47.0	91.3	78.0	185	101	206	122	97.6	538	217	35.0	111.0
11	35.0	92.7	85.0	162	104	261	136	97.6	258	235	53.3	645
12	40.6	98.0	70.2	137	126	279	129	75.7	178	210	55.1	250
13	45.4	90.6	64.4	128	93.4	208	107	101	153	230	55.1	195
14	46.0	118	82.7	138	93.3	189	127	111	127	176	68.3	233
15	50.2	119	79.6	144	199	211	131	111	112	237	70.0	213
16	55.6	101	78.0	149	178	231	155	167	103	193	59.1	175
17	49.6	97.2	86.0	173	159	172	159	427	94.5	170	59.7	155
18	36.3	94.1	72.5	141	291	144	123	197	91.0	167	55.0	148
19	45.2	88.6	61.0	152	213	152	181	161	94.0	141	58.5	133
20	50.0	71.0	77.0	135	159	88.0	230	147	81.0	153	54.5	106
21	50.7	79.0	60.0	170	233	217	176	150	75.0	144	53.0	38.0
22	46.2	85.0	59.1	187	255	117	364	169	64.0	151	49.0	30.0
23	44.1	99.0	56.4	168	195	170	498	147	61.8	149	46.0	91.0
24	41.3	110	54.3	175	190	110	742	135	70.4	145	52.1	75.0
25	63.6	113	80.0	157	157	120	359	115	70.0	102	49.6	73.0
26	90.5	120	70.4	151	162	113	394	108	65.0	95.0	55.5	74.0
27	83.0	103	70.0	130	178	112	363	99.0	68.0	86.5	85.9	74.0
28	103	130	79.0	174	203	107	224	90.0	87.0	79.0	84.5	213
29	125	163	71.6	142	259	122	204	38.0	74.0	74.0	88.6	110
30	134	155	66.0	155	261	133	234	119	71.0	71.0	83.9	120
31	127		81.0	153		122		105	68.0			

CAUDALES EXTREMOS

MES	MAXIMO INSTANTANEO DIA	ESC.	MC/SEG	MINIMO DIA	ESC.	PROMEDIO DIARIO MC/SEG	CAUDAL DE ESTE ANO MC/SEG	PROMEDIO MENSUAL DE TODO EL REGISTRO MC/SEG	VOLUMEN EN M.H.C	M ³		
MAY	29	2.58	295	4	0.32	33.5	57.4	43	92.6	69	153.79	115
JUN	29	3.06	379	20	0.83	71.0	106	80	126	94	275.89	206
JUL	1	2.40	266	24	0.62	54.2	81.9	61	131	98	219.45	164
AGO	4	3.44	462	1	1.08	95.5	157	118	129	96	421.20	315
SET	28	3.50	476	14	1.36	93.4	165	123	146	109	427.39	320
OCT	11	4.04	630	20	1.80	87.7	164	127	160	120	439.00	329
NOV	24	6.76	1660	4	1.00	87.4	204	152	140	105	528.28	395
DIC	17	4.92	919	29	1.02	88.0	154	115	126	94	412.42	308
ENE	9	4.30	708	23	0.76	61.8	130	97	86.6	65	348.04	260
FEB	14	3.66	519	3	0.70	60.0	176	132	71.2	53	426.60	319
MAR	29	2.62	301	22	0.52	46.0	61.1	45	50.3	38	153.36	122
ABR	9	10.60	3800	5	0.64	55.9	282	211	66.6	50	729.57	546
TOT	9	10.60	3800	4	0.32	33.5	145	108	110	83	4545.46	3399

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO REVENTAZON EN ANGOSTURA 73-09-03

AREA DE DRENAJE: 1337KM² ELEVACION: 5323M

ANO HIDROLOGICO 1970 - 1971 DATOS DESDE: SET. 6, 1953

DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	128	189	139	181	183	242	177	133	172	62.4	83.2	53.1
2	132	160	136	125	150	214	143	135	174	90.7	93.0	54.4
3	103	187	131	129	162	156	149	759	163	79.6	72.2	51.7
4	93.1	164	132	129	190	164	135	1660	145	79.6	73.4	56.5
5	98.0	142	128	71.0	192	156	128	959	127	73.1	67.4	54.6
6	109	150	125	103	156	194	128	462	156	68.3	98.0	54.4
7	150	131	135	90.0	164	144	144	397	194	160	76.5	50.6
8	91.3	126	135	68.5	132	107	310	144	132	68.6	84.0	56.7
9	102	120	196	84.3	136	139	217	419	164	65.5	98.4	123
10	97.1	116	170	124	110	182	214	764	120	65.6	83.6	154
11	121	164	213	119	114	183	131	624	94.4	67.1	73.5	180
12	97.3	208	232	101	91.6	123	128	366	127	59.2	75.6	331
13	98.3	159	192	138	136	117	121	303	127	55.4	73.0	137
14	134	135	154	100	118	178	146	268	148	49.1	73.0	135
15	216	137	149	98.6	170	138	167	279	121	62.6	57.4	117
16	223	153	153	116	120	144	464	226	153	65.4	76.3	128
17	217	144	188	89.5	126	144	734	239	108	65.7	106	75.4
18	148	182	190	94.0	179	140	356	371	81.0	63.0	74.0	68.1
19	155	177	161	79.6	168	119	348	918	83.6	107	71.0	76.4
20	149	214	172	76.0	145	97.4	170	156	103	60.1	86.0	75.4
21	193	187	179	90.5	85.2	140	177	393	97.0	69.4	59.2	69.2
22	190	141	118	87.1	162	110	153	413	171	47.0	79.3	89.3
23	175	150	100	74.4	179	124	150	253	304	57.3	84.5	78.1
24	149	158	134	108	167	136	130	212	146	59.6	81.2	64.1
25	147	202	108	127	176	116	115	200	131	64.0	48.2	59.2
26	188	164	130	130	206	79.8	122	193	112	66.0	73.6	62.3
27	174	207	271	208	205	140	82.3	208	110	81.1	63.0	62.4
28	202	173	246	263	205	166	106	193	91.6	72.1	60.5	60.6
29	172	156	180	201	232	226	124	163	91.0		64.5	57.0
30	151	140	170	276	184	285	156	165	117		61.3	55.4
31	175		142	246		234		163	90.0			

CAUDALES EXTREMOS

MES	MAXIMO INSTANTANEO DIA	ESC.	MC/SEG	MINIMO DIA	ESC.	PROMEDIO DIARIO MC/SEG	CAUDAL DE ESTE ANO MC/SEG	PROMEDIO MENSUAL DE TODO EL REGISTRO MC/SEG	VOLUMEN EN M.H.C	M ³		
MAY	15	3.08	370	8	1.30	91.3	148	110	95.8	72	395.72	296
JUN	27	4.00	618	10	1.49	116	161	121	128	96	417.74	312
JUL	27	1.84	389	23	2.37	100	182	121	133	99	434.50	325
AGO	27	1.84	569	8	1.05	68.5	127	85	128	96	338.25	254
SET	4	3.36	438	21	1.24	85.2	158	110	147	110	409.88	307
OCT	29	5.00	948	26	1.18	79.8	157	117	160	120	420.61	315
NOV	16	8.20	1410	27	1.07	82.3	209	156	144	108	541.41	405
DIC	4	9.10	2280	1	1.53	133	404	302	141	106	1082.93	810
ENE	23	3.44	460	18	1.05	81.0	133	99	89.2	67	356.10	266
FEB	19	2.32	292	22	0.63	47.0	67.5	51	71.0	53	163.38	122
MAR	17	2.27	244	15	0.77	57.4	75.6	57	51.7	39	202.40	151
ABR	12	3.12	378	7	0.67	50.6	89.5	67	67.9	51	232.10	174
TOT	4	8.10	2280	22	0.63	47.0	158	118	113	85	4999.98	3736

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO REVENTAZON EN ANGOSTURA 73-09-03

AREA DE DRENAJE: 1337KM2 ELEVACION: 5324M

DIA	DATOS DESDE: SET. 4, 1953											
	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	59.5	84.0	340	127	130	172	161	113	59.7	54.1	60.9	28.9
2	60.9	81.3	261	142	131	153	150	79.1	71.0	51.6	55.7	31.4
3	63.4	92.7	190	158	122	197	157	70.6	105	48.8	50.0	42.9
4	63.8	223	176	174	178	189	189	75.8	86.0	53.7	47.8	86.1
5	61.5	96.4	87.0	184	170	180	186	83.4	93.0	47.7	49.3	70.6
6	43.2	92.0	100	170	251	186	139	62.8	80.0	59.2	50.0	72.9
7	69.9	78.0	83.0	156	203	186	137	78.8	109	64.4	51.1	66.7
8	74.5	75.0	118	149	161	120	130	67.9	116	61.2	52.4	66.1
9	83.2	109	109	151	158	91.2	149	70.9	87.8	52.2	55.0	73.2
10	94.7	258	150	129	140	131	131	44.0	42.4	50.9	54.4	73.8
11	89.1	101	72.0	153	143	176	128	62.6	79.9	49.8	54.1	74.7
12	101	99.8	118	154	117	179	118	60.2	89.6	42.9	42.7	77.9
13	161	99.5	89.0	124	70.6	219	100	51.6	111	34.6	58.9	80.5
14	110	140	121	121	77.3	136	108	58.8	109	47.3	62.5	74.4
15	161	213	185	100	104	153	109	62.3	106	45.0	62.6	80.2
16	115	84.2	275	123	117	198	91.8	54.6	93.1	45.0	57.2	80.7
17	123	95.4	240	121	123	213	105	59.5	80.8	43.1	56.3	148
18	239	82.1	170	132	128	191	127	62.0	76.5	41.9	51.3	72.1
19	254	149	430	182	156	258	104	58.5	68.0	37.9	36.9	87.8
20	178	176	115	166	158	241	110	65.5	65.7	37.9	48.2	84.0
21	204	201	109	122	177	153	91.0	59.0	63.2	132	55.1	88.7
22	98.5	115	202	159	125	178	95.3	59.2	81.6	137	56.1	89.4
23	218	110	215	139	178	239	94.1	58.7	54.7	133	52.8	83.5
24	133	108	113	161	251	298	82.2	64.0	56.6	79.5	49.7	79.6
25	121	101	120	155	253	221	101	58.9	58.1	70.9	47.5	77.4
26	98.9	104	108	215	161	164	88.4	57.1	55.3	66.3	42.0	71.0
27	85.2	93.0	96.6	162	216	157	79.8	53.2	55.1	55.4	44.5	66.9
28	80.0	99.0	103	160	195	184	83.2	51.7	55.2	62.3	44.8	64.9
29	175	140	127	195	144	168	83.8	53.2	59.2	60.9	39.8	67.2
30	78.0	160	116	149	151	221	73.4	56.0	52.6	49.2	32.1	57.5
31	76.0		119	149		240		60.0			30.4	

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO			CAUDAL PROMEDIO MENSUAL		VOLUMEN EN			
	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
MAY	20	3.03	372	1	0.80	59.5	116	87	96.9	72	310.67	232
JUN	30	4.00	618	8	0.99	75.0	122	91	128	95	315.44	236
JUL				7	1.08	83.0	158	118	134	101	423.15	316
AGO	25	2.98	363	15	1.25	100	153	114	130	97	408.84	306
SET	23	4.22	683	13	0.82	70.6	154	117	148	110	405.12	303
OCT	23	4.00	618	9	1.17	91.2	185	139	161	121	496.64	371
NOV	4	2.32	254	10	0.85	71.4	116	87	143	107	300.24	225
DIC	1	2.16	231	13	0.59	51.6	64.0	48	137	102	171.31	128
ENE	12	2.08	220	31	0.57	49.2	77.2	58	88.6	66	208.88	155
FEB	21	2.07	219	13	0.36	34.6	60.9	46	70.5	53	152.56	114
MAR	1	0.90	77.9	31	0.27	30.4	50.1	37	51.6	39	134.10	100
ABR	17	1.84	189	1	0.24	28.9	74.8	56	68.3	51	193.45	145
TOT	23	4.22	683	1	0.24	28.9	111	83	113	85	3518.75	2632

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO REVENTAZON EN ANGOSTURA 73-09-03

AREA DE DRENAJE: 1337KM2 ELEVACION: 5324M

DIA	DATOS DESDE: SET. 4, 1953											
	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	61.4	112	83.5	85.2	107	148	137	67.8	53.2	57.7	50.7	42.8
2	68.5	93.6	88.1	75.9	130	168	146	64.6	55.5	56.3	54.9	43.3
3	62.4	97.9	102	108	156	204	134	63.2	49.7	63.4	48.2	46.3
4	46.7	86.3	89.4	83.4	287	162	137	63.8	57.8	49.0	43.0	45.1
5	54.8	97.0	108	72.2	238	142	114	64.4	49.3	65.8	49.4	36.0
6	61.2	108	99.8	59.7	175	135	102	67.8	44.6	63.8	51.3	33.9
7	52.3	110	84.6	69.8	138	118	120	147	45.6	66.4	51.4	34.2
8	44.5	108	84.8	67.9	125	120	247	94.0	42.9	66.0	52.6	32.9
9	63.8	108	76.8	98.8	118	185	206	88.7	45.1	62.1	58.4	31.3
10	71.1	129	96.8	75.0	127	103	162	80.0	45.5	64.5	47.0	28.8
11	77.4	123	87.6	74.0	119	118	150	72.0	43.8	75.3	35.4	24.6
12	76.2	105	75.4	61.9	103	92.1	151	63.0	44.7	104	45.1	20.9
13	85.3	112	73.6	53.3	103	89.3	147	65.6	122	87.8	47.6	25.3
14	65.8	96.1	70.3	80.0	103	108	208	70.9	295	74.4	48.6	27.2
15	59.5	45.4	66.5	95.9	118	184	203	74.1	227	47.9	48.0	32.1
16	64.5	77.1	55.6	107	130	257	206	72.7	130	84.3	48.2	24.5
17	80.4	75.9	70.5	105	105	234	186	68.4	108	64.1	45.4	26.0
18	91.4	82.4	78.6	103	149	242	133	84.8	92.3	54.5	34.7	24.7
19	91.1	98.0	82.3	168	120	256	119	83.8	81.0	58.2	39.6	26.7
20	95.5	83.4	111	220	104	213	108	74.3	67.8	58.1	46.5	28.8
21	101	74.8	105	179	93.8	164	105	89.7	59.0	57.3	47.8	31.6
22	87.6	73.9	93.6	160	90.3	159	82.2	111	58.3	54.4	42.8	25.7
23	141	72.2	97.8	170	101	150	87.4	150	59.9	54.5	46.9	27.8
24	130	93.3	92.0	171	149	154	89.9	497	58.9	46.3	44.8	27.2
25	118	103	85.6	211	161	130	80.8	145	57.4	37.7	36.5	30.5
26	159	87.6	75.1	218	143	132	88.3	103	37.3	48.8	43.7	30.4
27	188	68.4	65.2	179	141	163	93.1	99.9	55.4	47.7	48.0	29.7
28	187	54.8	68.1	157	138	171	75.2	102	49.4	48.4	48.0	25.8
29	190	92.4	75.7	136	123	200	75.8	82.1	51.4		46.9	23.2
30	145	106	71.9	122	123	160	73.2	73.5	64.5		47.4	32.3
31	128		89.6	120		126		61.8	62.8		45.6	

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO			CAUDAL PROMEDIO MENSUAL		VOLUMEN EN			
	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
MAY	28	3.12	389	5	0.82	61.2	97.4	73	96.9	72	260.96	195
JUN	10	2.62	301	28	0.83	54.8	83.4	70	124	84	342.19	181
JUL	20	2.83	302	16	0.86	55.6	86.2	83	131	88	323.40	168
AGO	20	3.28	424	13	0.71	53.3	119	89	128	97	318.11	238
SET	4	4.08	642	23	1.18	80.2	134	100	167	110	347.46	240
OCT	16	2.94	605	13	1.14	89.3	158	114	161	120	424.06	317
NOV	14	3.40	500	30	0.85	73.2	133	99	142	107	348.43	258
DIC	24	4.48	974	31	0.95	61.8	97.3	73	135	101	280.73	195
ENE	14	3.24	419	8	0.68	42.9	75.3	56	87.9	66	201.75	151
FEB	12	2.00	200	25	0.40	37.7	62.9	47	70.1	52	152.07	114
MAR	7	0.90	66.4	18	0.41	34.7	46.3	35	51.3	38	124.13	93
ABR	9	0.87	66.2	12	0.12	20.9	30.1	22	66.4	50	77.92	58
TOT	24	4.98	934	13	0.11	20.9	94.2	70	112	84	3879.22	2328

C. SÓLIDO = 4.092878-06 * C. LÍQUIDO = 4.04759 PARA 0 <= C <= 407
 C. SÓLIDO = 366.23 * C. LÍQUIDO = 1 PARA 407 <= C <= 4000

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO REVENTAZON EN ANGOSTURA 73-09-03

AREA DE DRENAJE: 1337KM2 ELEVACION: 532MSNM

ANO HIDROLOGICO 1973 - 1974 DATOS DESDE: SET. 6, 1953

DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	27.6	174	119	145	143	165	111	146	91.1	67.3	59.1	47.8
2	34.7	225	110	133	185	139	94.8	128	91.9	66.5	58.0	41.8
3	35.6	195	99.0	117	207	112	92.2	112	106	59.8	58.5	40.8
4	35.6	177	94.0	130	175	125	92.8	96.0	95.9	61.2	57.6	48.8
5	34.4	160	84.4	118	137	162	116	86.0	88.6	67.1	56.2	51.2
6	34.6	152	73.8	120	111	156	102	79.6	83.5	76.3	56.9	58.1
7	41.2	148	67.4	98.5	117	159	187	81.1	95.0	69.1	59.7	55.2
8	47.1	117	69.8	109	126	125	187	83.5	92.0	64.6	56.8	51.9
9	59.1	114	97.0	86.2	105	197	151	89.4	186	61.3	50.8	49.1
10	42.5	113	106	86.1	120	206	116	426	184	59.4	46.6	38.4
11	46.5	94.8	84.4	91.0	125	166	96.6	523	143	61.3	53.3	25.0
12	48.6	83.8	84.3	73.0	122	141	106	509	113	60.6	54.5	22.0
13	26.4	103	70.5	66.4	154	138	99.5	432	197	70.9	53.2	29.0
14	28.7	142	67.3	63.1	146	118	119	270	149	68.3	53.9	38.5
15	33.9	117	72.6	60.8	141	111	169	214	122	65.0	52.4	47.0
16	42.0	120	86.5	61.1	106	101	218	178	113	62.0	52.7	48.3
17	48.0	156	94.5	70.4	96.8	88.3	177	220	102	58.4	52.9	46.2
18	60.1	162	124	71.9	109	83.6	162	361	97.2	64.6	57.8	47.1
19	106	257	112	74.4	99.3	81.7	192	313	91.1	63.8	61.1	58.8
20	97.4	289	132	119	121	104	165	212	88.0	62.5	53.4	58.6
21	79.1	231	238	178	112	149	129	184	81.6	60.3	51.6	57.2
22	85.3	180	171	191	36.2	140	121	230	87.4	58.1	55.1	89.5
23	78.0	214	174	200	103	295	122	193	79.5	50.9	54.5	66.5
24	86.2	247	139	229	106	275	130	150	94.1	46.6	47.4	66.8
25	92.7	269	138	184	107	236	122	130	83.2	46.8	49.3	60.0
26	76.5	205	161	243	95.1	198	147	127	74.6	51.7	54.8	65.9
27	81.7	201	188	355	88.3	174	150	142	71.7	66.1	53.1	81.4
28	113	180	175	229	111	148	206	111	78.0	63.8	54.1	63.2
29	109	153	140	374	136	150	264	107	69.9	54.9	55.5	62.9
30	135	134	134	276	138	133	215	113	76.2	55.5	55.5	74.8
31	132		131	237		111		97.8	75.5		53.0	

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO		CAUDAL DE ESTE AÑO		PROMEDIO MENSUAL DE TODO EL REGISTRO		VOLUMEN EN		
	MAXIMO DIA	INSTANTANEO ESC.	MC/SEG	MINIMO DIA	PROMEDIO ESC.	MC/SEG	MC/SEG	L/S/K	MC/SEG	L/S/K	M ³	M ³
MAY	19	2.54	286	13	0.41	26.4	64.5	48	95.3	71	172.74	129
JUN	20	3.76	547	12	1.14	83.8	170	127	128	96	441.82	330
JUL	20	2.84	341	14	0.95	67.3	118	89	130	97	315.96	236
AGO	27	4.52	779	15	0.87	60.8	148	111	130	97	396.76	297
SET	1	3.16	404	27	1.18	88.3	127	95	146	109	328.30	246
OCT	23	4.00	616	19	1.11	81.7	151	113	161	120	404.97	303
NOV	8	2.96	364	2	0.92	65.8	142	106	142	106	367.31	275
DIC	10	5.16	1000	6	1.10	79.8	198	148	138	103	530.81	397
ENE	9	2.68	320	29	0.92	69.9	103	77	88.6	66	276.67	207
FEB	6	1.19	94.8	24	0.61	46.6	61.9	46	69.7	52	149.82	112
MAR				10	0.61	46.6	54.5	41	51.5	38	145.87	109
ABR	10	4.00	616	12	0.14	22.0	53.1	40	65.8	49	137.57	103
TOT	10	5.16	1000	12	0.14	22.0	116	87	112	84	3669.04	2744

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO REVENTAZON EN ANGOSTURA 73-09-03

AREA DE DRENAJE: 1337KM2 ELEVACION: 532MSNM

ANO HIDROLOGICO 1974 - 1975 DATOS DESDE: SET. 6, 1953

DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	71.8	214	156	118	164	132	156	110	53.5	99.6	42.0	39.9
2	67.1	155	178	137	125	129	173	103	53.7	77.1	39.5	39.7
3	65.1	110	128	133	106	117	95.3	258	44.6	67.8	37.9	37.0
4	65.7	137	111	110	98.0	114	143	873	49.6	63.8	37.6	38.5
5	59.0	113	120	106	101	115	76.4	722	50.5	62.5	41.0	39.1
6	57.7	100	108	102	86.2	120	124	339	52.4	57.9	36.6	40.8
7	56.5	87.4	105	98.7	79.7	124	72.6	220	55.7	57.1	36.8	40.5
8	64.9	94.1	121	82.5	102	129	81.6	172	48.4	55.5	38.3	45.0
9	86.5	115	92.6	87.8	138	126	124	150	52.8	44.2	36.7	43.9
10	78.9	168	160	93.8	112	78.8	66.3	138	54.3	46.9	37.4	42.6
11	83.5	178	135	119	125	80.3	111	108	51.8	44.2	38.2	42.3
12	74.2	107	182	170	166	104	63.8	101	48.0	43.0	40.4	41.0
13	82.9	276	199	174.	109	102	61.5	104	49.5	40.9	41.7	38.6
14	99.8	151	141	170	97.3	92.8	60.2	89.7	52.6	39.8	38.6	38.1
15	118	125	153	171	103	92.8	62.3	86.9	52.2	38.0	33.9	32.6
16	151	129	159	131	100	82.4	62.7	82.4	52.6	38.8	38.6	34.7
17	159	153	116	165	108	121	74.8	76.6	56.6	35.4	38.4	35.0
18	174	148	120	97.5	102	149	83.5	71.6	55.3	36.6	39.1	38.6
19	178	130	134	83.6	80.9	212	83.2	65.8	38.7	35.0	36.7	37.2
20	149	136	143	96.4	97.1	186	79.0	60.9	53.8	35.6	40.1	36.4
21	120	130	117	188	86.4	132	69.1	56.8	54.6	34.3	38.0	47.2
22	122	125	106	165	74.1	130	70.6	57.4	57.9	30.8	34.7	52.7
23	123	137	113	175	83.5	80.1	79.6	59.6	51.2	29.2	36.3	53.5
24	119	144	118	226	80.5	147	69.7	67.7	60.5	33.5	36.7	50.7
25	93.8	123	140	173	143	179	85.8	55.5	51.8	37.3	31.8	40.0
26	87.2	182	128	166	91.6	260	98.0	55.8	43.9	32.5	29.4	36.7
27	85.8	179	110	186	89.9	192	176	55.7	49.1	37.6	24.2	41.0
28	85.6	136	145	158	98.9	175	102	46.0	52.3	41.4	26.0	41.9
29	81.9	111	119	178	125	163	203	54.1	52.9		28.4	39.5
30	76.8	134	102	138	139	150	128	51.1	51.8		28.9	39.1
31	134		116	144		194		50.1	65.4		34.9	

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO		CAUDAL DE ESTE AÑO		PROMEDIO MENSUAL DE TODO EL REGISTRO		VOLUMEN EN		
	MAXIMO DIA	INSTANTANEO ESC.	MC/SEG	MINIMO DIA	PROMEDIO ESC.	MC/SEG	MC/SEG	L/S/K	MC/SEG	L/S/K	M ³	M ³
MAY	31	3.69	527	7	0.76	56.5	99.2	74	95.5	71	265.57	199
JUN	12	4.81	876	7	1.12	87.4	149	111	129	96	385.21	288
JUL	12	3.36	468	9	1.17	92.6	132	99	130	97	352.91	264
AGO	17	3.44	487	8	1.04	82.5	140	103	130	98	375.09	281
SET	12	4.40	740	22	0.98	74.1	106	80	144	108	275.80	206
OCT	18	3.77	550	10	1.03	78.8	116	102	160	120	363.67	272
NOV	28	3.03	394	14	0.81	60.2	105	78	140	105	270.95	203
DIC	4	5.77	1230	28	0.61	46.6	146	108	128	107	391.11	293
ENE	7	1.20	95.9	26	0.57	46.6	52.2	39	64.9	65	139.77	105
FEB	1	1.80	172	23	0.31	29.2	46.3	33	68.6	51	112.00	84
MAR	2	0.66	49.7	27	0.19	24.2	36.1	27	50.8	38	96.75	72
ABR	22	0.86	64.5	15	0.38	32.6	40.8	31	64.7	48	105.74	79
TOT	4	5.77	1230	27	0.19	24.2	99.0	74	112	83	3134.50	2344

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
RIO REVENTAZON EN ANGOSTURA 73-09-03

AREA DE DRENAJE: 1337KM² ELEVACION: 532MSNM
 DATOS DESDE: SET. 6, 1953

DIA	DATOS DESDE: SET. 6, 1953											
	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	40.5	91.8	214	121	116	188	97.7	246	93.4	61.9	40.4	44.5
2	46.5	81.3	277	147	108	196	88.1	177	81.5	48.0	49.3	45.0
3	48.1	85.6	264	188	119	242	95.0	139	79.1	68.4	45.6	37.0
4	38.3	82.3	271	261	136	208	142	132	83.5	68.4	41.6	31.2
5	46.3	76.6	178	240	133	194	219	142	72.7	64.9	48.3	28.2
6	36.9	82.4	135	176	204	202	215	171	75.5	63.7	48.6	36.5
7	37.3	106	182	176	198	181	199	218	75.6	66.0	43.2	34.2
8	30.5	107	142	121	162	186	156	264	74.4	42.4	41.8	31.5
9	35.3	96.1	176	157	142	218	129	254	80.9	56.1	40.8	36.2
10	31.1	72.9	120	117	171	196	120	187	75.6	63.0	46.9	51.5
11	38.7	79.5	83.3	115	168	156	146	217	75.3	69.6	43.0	46.6
12	37.0	95.5	120	118	280	168	179	421	69.4	71.3	39.6	39.1
13	38.8	81.2	115	132	307	127	217	599	68.2	65.5	42.2	33.1
14	41.3	83.1	115	146	207	144	161	907	64.7	64.5	31.6	40.1
15	42.8	100	118	166	177	154	237	494	59.6	60.8	45.5	33.8
16	34.3	102	140	199	155	225	299	322	84.0	72.2	46.5	33.0
17	39.7	108	116	178	180	241	202	261	86.4	57.7	47.0	36.3
18	42.8	95.7	114	211	183	191	180	216	334	60.9	47.0	37.9
19	42.5	81.2	97.2	189	187	183	144	187	405	60.1	44.0	50.0
20	45.1	109	97.2	226	204	165	142	161	188	62.1	44.2	67.9
21	54.9	117	101	287	191	152	146	146	128	58.2	43.0	53.4
22	57.9	90.8	104	180	281	140	128	128	109	45.8	49.6	50.6
23	58.1	130	124	188	392	126	247	131	102	48.9	55.8	46.5
24	60.5	194	110	255	274	81.9	208	129	89.0	49.8	52.5	39.8
25	56.3	110	115	184	232	86.7	170	120	67.7	43.1	52.0	39.8
26	59.8	101	153	137	243	109	182	130	74.7	38.1	46.0	50.2
27	80.9	117	91.2	172	254	107	146	143	75.1	31.8	42.0	55.1
28	97.4	209	126	150	206	78.4	126	117	72.5	30.5	26.8	67.3
29	90.4	260	101	183	205	84.8	120	109	75.0	24.9	33.0	67.6
30	86.4	213	110	170	218	88.9	119	96.4	67.8	42.0	42.0	92.6
31	111	108	115	115	115	86.1		90.6	66.9		44.5	

MES	CAUDALES EXTREMOS						CAUDAL PROMEDIO MENSUAL		VOLUMEN EN			
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEG	MINIMO DIA	ESC.	PROMEDIO DIARIO MC/SEG	DE ESTE AÑO MC/SEG	L/S/K	DE TODO EL REGISTRO MC/SEG	L/S/K	M.M.C	M ³
MAY	28	2.59	303	8	0.32	30.5	51.8	39	93.5	70	138.70	134
JUN	28	3.74	541	10	0.96	72.9	112	84	128	96	290.16	217
JUL	26	3.56	492	11	1.20	83.3	139	104	130	98	173.03	279
AGO	20	3.08	405	11	1.48	115	174	130	132	99	466.99	349
SET	22	3.98	610	2	1.35	108	198	148	146	110	513.48	384
OCT	16	3.66	519	28	1.15	78.4	158	118	160	120	423.66	317
NOV	16	3.57	494	2	1.25	88.1	165	124	141	106	428.70	321
DIC	14	5.84	1260	31	1.27	90.6	228	170	142	106	609.55	456
ENE	18	4.17	667	15	0.94	59.6	101	76	87.5	65	270.65	202
FEB	15	1.52	120	29	0.42	24.9	56.5	42	68.1	51	141.54	106
MAR				28	0.76	26.9	44.0	33	50.5	38	117.88	88
ABR				5	0.80	28.2	44.9	34	63.8	48	116.37	87
TOT	14	5.84	1260	29	0.42	24.9	123	92	112	84	3890.67	2910

A-2 Monthly Run-off at Dos Montanas Gauging Station

C.A = 652 km²

(Unit : m³/sec)

Year	Jan.	Fed.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1959	16.4	10.8	10.5	11.7	41.9	59.4	51.5	50.2	44.9	100.	59.8	48.2
1960	39.5	34.2	27.5	25.9	50.1	68.4	65.3	62.4	62.8	101.	69.7	96.7
1961	29.3	18.7	15.4	11.4	37.9	61.8	58.6	45.8	79.9	97.0	93.3	90.4
1962	50.3	24.3	15.5	26.7	66.1	74.2	72.7	57.3	50.6	128.	203.	89.1
1963	38.5	35.3	26.5	45.3	60.0	67.2						

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRICIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO VAGUARE EN SIQUIRES 75-RR-02

AREA DE DRENAJE:		ELEVACION: 533m										
ANO HIDROLOGICO		DATOS CESDE: JUNIO 6, 1963										
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1			65.0	53.2	39.8	65.3	114	67.3	338	29.0	17.3	12.5
2			65.3	80.9	55.6	60.8	128	30.4	233	27.7	17.5	12.4
3			66.5	106	46.2	59.4	118	61.5	112	26.5	17.5	12.4
4			66.5	68.0	59.4	64.8	163	54.0	96.7	25.9	14.3	12.1
5			108	59.4	55.6	67.4	180	52.2	22.2	25.1	16.3	12.2
6			75.7	55.6	58.0	65.3	150	73.0	75.8	24.2	17.3	12.2
7			68.0	50.8	110	70.2	134	64.7	66.5	24.0	17.1	12.1
8			60.8	58.0	108	95.3	121	54.0	61.5	23.7	16.4	12.1
9		94.8	63.6	60.8	68.0	91.2	104	176	56.1	22.3	10.7	12.1
10		78.8	98.4	56.4	144	100	102	223	52.7	22.7	10.1	12.1
11		92.8	76.7	52.0	119	126	96.5	111	42.7	22.0	15.1	12.1
12		120	75.7	75.7	106	131	85.6	72.4	47.5	21.9	14.7	12.1
13		119	66.5	66.7	80.4	103	104	61.1	45.4	21.6	15.1	12.1
14		92.8	63.6	132	77.3	131	153	54.4	47.5	21.1	16.0	12.1
15		78.8	66.5	69.6	75.7	117	219	50.3	82.2	21.4	21.0	12.1
16		72.6	59.0	59.4	108	118	265	47.5	60.8	21.1	21.3	11.2
17		74.2	63.6	54.4	76.3	92.8	201	45.1	51.0	20.3	17.0	11.1
18		65.0	66.5	57.1	89.4	150	163	43.4	46.3	20.1	15.4	12.0
19		60.8	68.0	55.6	111	116	134	42.6	43.0	20.1	15.1	11.7
20		60.0	63.6	63.1	102	120	115	40.3	40.8	14.8	15.3	11.7
21		58.0	63.2	74.1	125	132	102	39.9	38.9	19.4	14.0	11.7
22		55.6	68.0	79.1	98.7	100	92.8	38.1	37.3	19.1	20.5	11.5
23		66.5	69.6	59.7	91.2	102	88.2	37.0	36.1	18.7	17.7	11.2
24		103	61.6	57.1	92.5	167	80.4	48.6	35.4	18.7	16.1	10.7
25		91.1	71.0	54.2	100	109	71.1	116	33.6	18.5	14.5	11.5
26		166	60.8	49.3	102	90.9	68.5	92.9	32.6	18.6	13.0	11.4
27		143	54.4	46.1	95.0	47.9	67.7	82.1	31.4	18.1	11.4	11.8
28		65.0	69.0	43.6	120	86.6	61.0	65.0	30.7	17.9	14.2	11.3
29		64.8	60.9	41.9	83.8	79.0	57.3	55.0	27.9	17.6	11.1	11.5
30		89.0	54.4	37.7	72.8	127	65.0	99.2	29.5	17.0	11.0	11.0
31			54.3	43.0		139		81.8	28.0		12.0	

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO			CAUDAL PROMEDIO MENSUAL		VOLUMEN EN			
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEG	MINIMO DIA	PROMEDIO ESC.	MC/SEG	DE ESTE AÑO MC/SEG	DE TODO EL REGISTRO MC/SEG	M.M.C	MM		
JUL	10	1.42	198	31	0.67	54.3	68.3	104	68.3	104	182.81	278
AGO	13	1.82	313	30	0.52	37.7	62.0	94	62.0	94	165.97	252
SET	18	1.86	325	1	0.54	39.8	83.4	135	83.4	135	211.66	352
OCT	30	1.90	338	3	0.71	59.4	102	153	102	153	271.52	415
NOV	15	2.16	426	19	0.70	57.3	123	188	123	188	312.69	480
DIC	9	2.87	724	23	0.51	37.0	72.1	110	72.1	110	193.23	294
ENE	1	2.35	500	11	0.42	28.0	66.8	102	66.8	102	179.02	272
FEB	1	0.46	31.4	29	0.30	17.6	21.7	33	21.7	33	54.41	83
MAR	15	0.49	34.6	11	0.24	12.9	16.1	25	16.1	25	33.14	56
ABR	25	0.50	35.6	22	0.22	11.5	13.0	21	14.0	21	36.14	59
TOT	9	2.97	724	22	0.22	11.5						

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRICIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
 RIO VAGUARE EN SIQUIRES 75-RR-02

AREA DE DRENAJE:		ELEVACION: 533m										
ANO HIDROLOGICO		DATOS CESDE: JUNIO 4, 1963										
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	12.5	35.5	89.5	74.0	80.8	59.4	94.9	44.0	21.0	41.7	37.6	24.5
2	12.7	37.1	71.5	59.5	77.3	54.1	105	36.7	20.8	39.6	32.2	24.3
3	12.4	31.9	57.4	62.0	68.4	53.1	124	32.5	26.8	44.8	29.0	26.6
4	13.0	48.6	48.5	61.0	57.2	65.0	114	30.7	22.2	37.8	35.1	24.7
5	11.6	44.0	41.4	55.6	50.4	50.9	83.2	31.1	33.6	33.9	28.0	21.7
6	11.0	33.4	63.8	50.9	46.2	48.5	71.6	45.1	32.7	32.7	45.1	21.0
7	12.0	30.4	47.2	46.6	44.1	57.7	75.7	37.8	137	31.4	178	30.2
8	11.4	42.5	70.6	43.0	45.4	49.8	66.9	34.1	89.0	31.1	163	19.4
9	11.5	41.9	56.8	50.0	58.0	46.4	59.4	30.3	63.6	28.8	102	18.9
10	13.1	39.6	58.7	41.0	62.2	46.6	55.6	28.5	52.6	27.9	66.5	16.6
11	12.9	76.7	52.6	39.7	55.5	64.2	54.1	27.8	50.8	27.1	52.0	18.2
12	13.3	58.0	43.4	38.7	50.9	77.6	55.1	27.6	42.3	26.2	44.8	18.3
13	13.0	42.9	51.6	45.1	48.6	111	52.3	28.0	38.6	25.4	40.0	18.4
14	18.3	35.0	71.0	82.1	50.5	85.0	55.4	29.7	38.7	24.5	37.2	17.6
15	24.6	82.2	50.0	87.3	60.5	84.8	52.1	30.0	53.6	23.9	35.1	17.8
16	22.8	48.5	63.3	75.0	57.8	114	49.8	26.8	61.1	23.4	35.6	17.8
17	22.6	43.0	46.3	83.7	44.2	110	45.1	25.6	79.8	22.8	31.4	17.9
18	26.3	39.3	47.3	78.7	38.7	82.1	42.0	25.1	220	22.9	30.0	17.8
19	32.4	59.6	43.0	61.0	83.8	163	40.3	24.4	318	36.0	28.7	17.3
20	31.4	58.1	42.9	63.5	127	149	39.9	29.5	248	49.7	26.5	17.6
21	28.8	55.1	65.4	58.5	85.8	119	43.4	29.5	136	31.4	32.2	17.6
22	32.4	63.5	116	63.7	68.6	90.7	39.7	30.0	108	26.8	28.8	17.6
23	38.3	74.5	129	48.7	89.6	115	45.1	27.6	83.8	25.2	27.0	16.5
24	27.9	85.8	107	50.8	62.2	96.8	50.7	26.8	71.1	23.9	26.2	16.0
25	38.0	50.8	80.4	59.4	65.0	116	40.8	25.0	59.3	25.6	25.0	14.9
26	72.8	42.0	62.3	48.6	63.5	100	37.0	24.7	58.6	21.5	25.0	14.5
27	76.8	42.6	61.5	82.2	59.4	80.4	35.1	34.7	61.0	20.8	25.0	14.5
28	41.9	45.3	51.0	53.0	55.4	69.7	33.4	25.9	55.9	48.5	27.5	14.5
29	49.7	34.7	53.2	51.0	86.3	66.1	37.4	23.3	50.1		26.5	16.7
30	39.0	42.1	71.4	49.7	74.6	69.4	40.6	22.5	47.0		12.4	16.1
31	36.1		105	80.0		79.2		21.7	44.0		27.3	

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO			CAUDAL PROMEDIO MENSUAL		VOLUMEN EN			
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEG	MINIMO DIA	PROMEDIO ESC.	MC/SEG	DE ESTE AÑO MC/SEG	DE TODO EL REGISTRO MC/SEG	M.M.C	MM		
MAY	27	1.25	162	6	0.21	11.8	26.5	40	26.5	40	70.89	108
JUN	15	1.43	200	7	0.45	30.4	48.8	74	48.8	74	126.54	193
JUL	22	1.56	235	5	0.36	41.4	65.7	99	66.8	102	174.76	266
AGO	31	1.52	224	12	0.53	38.7	59.5	91	60.8	92	159.49	243
SET	20	1.35	232	18	0.60	46.4	63.9	97	76.6	117	165.74	252
OCT	19	2.05	187	9	0.48	33.4	83.0	126	82.5	141	222.44	336
NOV	6	0.71	59.4	28	0.35	21.7	38.6	45	30.5	38	150.40	228
DIC	2	0.71	59.4	31	0.35	21.7	38.6	45	30.5	38	150.40	228
ENE	19	2.24	457	3	0.34	20.6	81.1	123	74.0	113	217.30	331
FEB	26	1.27	166	17	0.36	22.8	35.2	54	28.5	43	85.18	130
MAR	7	1.59	243	26	0.39	25.0	44.6	68	30.4	46	119.57	182
ABR	3	0.47	32.3	28	0.26	14.5	18.7	28	16.4	25	48.52	74
TOT	19	2.24	457	6	0.21	11.0	31.2	78	55.2	86	1620.03	2463

AREA DE DRENAJE:		RIO PACUARE EN SIQUIRES										75-08-02	
657KM2		ELEVACION: 53MSNM											
AÑO HIDROLOGICO		DATOS DESDE:											
1965 - 1966		JUNIO											
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR	
1	13.8	89.1	55.3	68.2	44.0	94.0	93.5	60.8	46.0	109	41.5	37.2	
2	13.8	60.8	47.0	106	42.0	95.0	102	56.9	38.7	85.0	40.0	28.8	
3	13.8	52.0	42.9	104	58.0	97.0	104	58.0	35.4	81.4	53.2	25.0	
4	16.8	48.5	45.1	65.0	38.0	77.0	91.0	52.0	33.5	77.0	63.8	26.0	
5	16.8	46.2	49.0	60.6	42.0	70.0	76.0	52.0	30.4	62.2	54.4	23.5	
6	55.9	46.2	53.2	55.6	51.0	55.0	66.5	52.0	29.5	57.2	48.5	24.3	
7	26.9	75.0	49.5	50.8	88.0	58.0	63.1	50.5	28.6	50.8	45.0	32.5	
8	26.9	49.7	44.0	52.2	99.0	58.0	66.4	58.0	28.6	50.8	41.9	24.3	
9	39.0	50.7	40.2	111	67.0	56.0	82.1	48.5	61.7	44.5	39.0	21.6	
10	82.1	106	40.3	51.0	70.0	54.5	75.7	45.0	62.2	41.8	37.8	21.0	
11	86.9	65.0	43.1	51.5	65.5	51.5	66.5	42.6	42.9	42.5	35.6	20.3	
12	60.5	67.9	46.0	50.6	53.5	86.0	59.0	41.5	43.2	38.2	34.6	20.0	
13	33.0	77.4	42.9	48.5	48.5	94.0	96.0	39.2	63.8	37.5	32.5	18.6	
14	28.6	52.0	42.2	65.5	51.5	70.0	99.0	35.8	55.6	53.5	31.5	18.0	
15	24.3	46.2	43.4	70.1	58.0	87.0	78.9	33.8	60.8	31.4	41.2	17.6	
16	30.0	43.0	56.4	86.3	65.0	85.0	69.6	31.4	45.1	30.0	29.3	17.6	
17	30.4	38.7	48.5	30.0	63.0	67.5	58.0	47.8	39.5	30.5	28.2	24.3	
18	27.8	38.7	59.9	51.0	64.5	68.0	52.5	93.5	43.0	27.8	28.2	17.5	
19	66.9	38.7	89.6	50.8	77.0	51.0	30.6	98.4	40.7	27.2	31.5	17.0	
20	50.8	37.7	46.8	94.3	101	101	50.2	103	34.5	37.7	27.8	18.4	
21	44.0	58.9	102	74.0	104	112	43.5	58.5	33.5	33.8	34.6	17.5	
22	59.4	60.8	144	68.0	96.5	91.4	48.5	45.0	34.5	29.5	34.6	27.8	
23	106	74.0	71.0	70.0	117	90.5	44.0	42.2	67.7	28.2	29.5	22.6	
24	85.0	105	55.6	64.0	122	115	68.5	41.5	53.0	22.2	27.8	99.4	
25	68.3	83.0	50.0	58.0	175	232	168	37.0	38.5	59.0	26.6	105	
26	58.0	86.4	43.0	53.0	123	139	173	34.7	34.5	82.0	29.5	52.0	
27	62.0	72.8	76.4	50.0	105	120	96.6	37.5	18.0	53.0	29.5	51.0	
28	60.8	75.1	315	49.0	99.0	112	75.7	50.2	300	45.5	26.0	92.4	
29	104	70.7	76.0	46.0	118	112	65.0	42.9	113		24.6	62.2	
30	62.6	58.0	65.0	49.0	95.0	94.7	63.2	55.5	94.4		24.0	109	
31	84.5		58.0	49.0		77.5		66.8	177		26.2		

MES	CAUDALES EXTREMOS			CAUDAL		PROMEDIO MENSUAL		VOLUMEN				
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEG	MINIMO DIA	PROMEDIO DIARIO ESC. MC/SEG	DE ESTE AÑO MC/SEG	L/S/K	DE TODO EL REGISTRO MC/SEG	L/S/K	M.M.C	MM	
MAY	23	1.37	187	1	0.25	13.8	49.8	76	38.2	58	133.45	203
JUN	25	1.38	189	20	0.52	37.7	62.5	95	55.7	85	162.10	247
JUL	28	3.00	790	9	0.54	40.2	65.8	100	66.5	101	176.37	266
AGO	15	1.52	224	29	0.60	46.0	63.6	97	61.7	94	170.47	259
SET	7	1.95	355	3	0.52	38.0	80.0	122	77.7	118	207.45	316
OCT	25	2.23	453	19	0.64	51.0	89.7	137	91.6	139	240.33	366
NOV	25	1.85	122	21	0.57	43.5	52.1	119	86.4	131	202.75	308
DIC	19	1.37	187	16	0.46	31.4	52.1	79	51.2	76	139.60	212
ENE	28	2.51	564	7	0.42	27.8	61.6	97	70.5	107	170.29	259
FEB	25	3.98	1290	19	0.41	27.2	75.4	115	44.1	67	182.41	274
MAR	3	0.80	72.6	30	0.38	24.0	35.4	54	32.1	49	94.89	144
ABR	24	1.49	215	19	0.29	17.0	36.9	56	23.2	35	95.61	145
TOT	25	3.98	1290	1	0.25	13.8	62.8	95	58.2	89	1975.69	3006

AREA DE DRENAJE:		RIO PACUARE EN SIQUIRES										75-08-02	
657KM2		ELEVACION: 53MSNM											
AÑO HIDROLOGICO		DATOS DESDE:											
1966 - 1967		JUNIO 9, 1963											
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR	
1	87.2	117	48.5	44.0	56.2	92.6	61.0	106	74.3	35.1	21.3	15.3	
2	90.3	131	47.0	39.7	55.5	97.6	60.8	178	68.5	32.3	20.8	15.8	
3	104	123	44.0	38.2	54.6	79.0	149	214	62.5	32.0	21.0	15.4	
4	89.0	102	41.5	35.7	47.5	63.6	155	188	57.8	44.8	36.1	15.2	
5	94.6	82.3	40.2	36.6	44.0	56.5	176	234	55.1	26.4	23.7	18.1	
6	62.2	107	39.2	34.5	50.8	56.7	165	109	67.3	32.3	23.5	16.7	
7	58.0	146	38.0	56.7	49.6	71.4	168	96.2	51.5	30.2	22.8	20.5	
8	61.0	118	46.9	59.8	42.7	59.5	121	88.8	47.5	28.8	22.9	39.0	
9	80.6	92.8	62.0	45.0	48.5	65.2	94.8	89.8	46.8	27.8	21.5	75.0	
10	62.5	75.7	41.5	40.1	65.7	55.6	80.0	96.4	49.0	26.8	20.5	63.2	
11	52.0	66.6	38.7	36.6	77.7	55.5	70.5	111	50.7	28.2	42.2	37.1	
12	76.0	63.3	82.2	44.6	52.0	56.0	63.9	120	48.0	26.3	28.8	32.5	
13	90.5	118	124	41.5	45.5	54.4	66.4	105	46.0	27.4	31.4	34.6	
14	74.1	101	124	54.5	44.0	47.4	57.5	95.5	44.0	25.5	25.5	51.1	
15	106	88.8	83.8	32.0	52.2	45.1	54.1	94.1	42.6	24.4	22.7	96.8	
16	125	66.7	65.2	35.6	52.4	71.5	55.6	78.2	41.5	23.7	21.0	121	
17	113	59.3	64.3	43.2	62.2	65.0	49.5	70.3	40.5	23.6	20.4	70.0	
18	96.3	71.4	63.2	69.7	45.0	87.8	45.1	76.0	59.7	24.7	21.2	62.5	
19	81.1	74.0	80.3	66.0	53.0	80.5	42.5	76.3	45.5	24.4	20.2	43.8	
20	86.4	76.4	63.8	101	40.8	95.1	40.8	108	87.0	23.6	18.9	36.2	
21	100	113	63.1	91.4	40.8	68.4	43.0	102	61.0	22.9	18.5	44.8	
22	96.8	89.0	55.6	66.3	42.2	80.2	58.0	82.5	53.9	23.6	18.8	67.5	
23	100	80.5	49.6	62.0	46.1	70.0	115	76.9	46.2	23.5	18.1	86.5	
24	83.8	78.8	46.0	49.7	68.5	56.8	223	83.2	41.7	22.1	18.3	64.3	
25	83.9	75.6	63.5	44.0	54.4	56.3	110	255	37.9	25.2	20.4	68.5	
26	82.9	72.5	55.5	73.5	52.0	52.0	94.3	471	35.1	24.8	18.1	67.6	
27	90.6	77.7	49.3	110	40.3	56.5	77.5	251	34.0	23.5	18.8	48.5	
28	82.9	68.0	66.9	112	48.4	60.3	123	148	33.5	21.6	18.2	54.5	
29	74.7	59.4	55.6	82.1	50.5	58.0	132	114	58.7		18.1	61.0	
30	72.2	53.3	52.0	66.1	66.3	59.4	93.2	95.6	42.6		17.0	52.0	
31	77.9		47.0	79.3		55.6		82.5	40.0		15.3		

MES	CAUDALES EXTREMOS			CAUDAL		PROMEDIO MENSUAL		VOLUMEN				
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEG	MINIMO DIA	PROMEDIO DIARIO ESC. MC/SEG	DE ESTE AÑO MC/SEG	L/S/K	DE TODO EL REGISTRO MC/SEG	L/S/K	M.M.C	MM	
MAY	19	1.53	224	11	0.65	52.0	86.1	131	54.2	82	230.59	351
JUN	13	2.11	408	30	0.66	53.3	88.2	134	66.5	101	228.73	348
JUL	13	1.59	243	7	0.52	38.0	59.5	91	64.8	99	159.37	242
AGO	27	1.60	244	6	0.49	34.5	57.8	88	60.7	92	154.78	235
SET	24	1.11	130	20	0.55	40.8	51.6	79	71.2	109	133.87	206
OCT	1	1.51	221	10	0.59	45.1	65.5	100	85.1	129	175.32	247
NOV	24	2.43	532	20	0.53	40.8	94.8	144	88.5	135	245.76	374
DIC	26	2.96	770	17	0.69	70.3	129	196	70.6	107	345.30	525
ENE	20	1.05	130	28	0.37	33.5	50.7	77	65.5	100	135.48	206
FEB	4	0.56	53.9	28	0.23	21.6	27.3	41	38.9	61	65.97	100
MAR	11	0.67	67.5	31	0.15	15.3	21.8	33	29.5	45	58.61	89
ABR	15	1.77	298	4	0.15	15.2	49.8	76	29.8	45	129.01	196
TOT	12	2.96	770	4	0.15	15.2	65.2	99	60.5	92	2062.74	3138

AREA DE DRENAJE:		RIO PACUARE EN SIQUIRRAS						75-08-02		ELEVACION:		53MSNM	
ANO HIDROLOGICO		1967 - 1968						DATOS DESDE JUNIO 9, 1963					
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR	
1	43.2	64.1	116	59.6	123	77.4	61.0	130	29.7	72.2	61.7	69.4	
2	40.0	87.8	82.3	58.8	174	69.3	56.7	98.7	29.5	51.2	54.6	79.2	
3	35.3	167	71.5	233	125	76.6	52.0	91.5	35.4	43.5	51.2	67.5	
4	34.2	103	72.5	173	96.4	74.2	49.6	104	52.8	39.2	45.5	79.2	
5	31.3	139	71.2	92.2	80.8	79.4	49.7	80.7	34.4	35.7	42.2	67.0	
6	30.4	103	59.5	104	72.2	63.5	46.7	73.4	30.7	33.8	39.0	59.1	
7	28.7	101	53.8	112	68.0	56.2	55.6	79.5	28.9	32.2	36.6	57.0	
8	27.4	86.0	62.8	87.2	81.1	61.7	53.2	72.1	27.9	71.7	34.7	75.2	
9	30.6	93.9	50.4	72.8	92.3	61.0	44.6	73.5	27.5	115	33.2	96.7	
10	40.3	89.3	51.0	81.6	72.2	69.4	85.3	60.4	27.0	88.9	31.6	114	
11	63.4	157	47.2	79.4	66.3	65.5	62.9	55.6	26.5	61.8	30.6	85.2	
12	44.7	93.9	52.5	74.8	68.1	50.7	56.9	58.0	25.8	49.7	29.4	65.4	
13	41.0	72.8	176	63.5	66.8	48.8	54.4	54.4	25.6	41.4	28.8	56.9	
14	36.8	62.3	68.8	58.6	61.8	46.8	55.5	52.0	26.0	36.4	41.1	50.7	
15	32.4	73.6	61.0	54.5	95.9	91.2	75.3	47.6	34.7	33.2	81.9	45.7	
16	40.0	91.7	59.1	52.3	71.7	102	107	43.8	45.3	33.1	38.5	42.5	
17	59.3	112	60.7	56.3	69.9	81.4	247	42.3	35.7	31.1	33.0	40.2	
18	91.7	113	57.6	55.1	61.7	145	148	40.5	29.2	29.2	31.3	37.8	
19	96.5	80.5	51.5	50.4	59.4	128	108	38.5	27.0	28.9	29.8	37.6	
20	68.2	76.8	61.0	46.8	61.3	138	109	17.4	45.8	27.3	28.1	15.6	
21	49.3	72.4	60.5	45.8	65.1	158	100	36.6	25.5	26.8	27.2	33.8	
22	41.7	62.2	59.3	44.2	61.8	187	81.5	15.2	29.0	28.1	27.1	32.3	
23	41.5	62.4	73.2	52.5	54.5	167	74.8	17.5	25.5	50.1	153	31.3	
24	57.6	73.3	59.8	102	77.0	141	64.3	58.0	90.0	37.8	160	30.4	
25	48.1	70.2	73.7	145	76.2	114	59.0	50.7	50.7	23.9	97.8	30.2	
26	73.6	70.7	67.2	126	68.5	99.8	55.7	39.4	42.0	186	68.0	28.6	
27	57.4	91.2	116	104	62.9	91.5	71.3	35.7	38.4	125	60.9	27.9	
28	70.9	135	78.2	88.8	64.9	80.7	87.9	14.2	14.2	100	144	27.3	
29	80.5	119	68.7	71.5	100	70.6	77.8	33.0	32.1	73.5	128	26.6	
30	59.0	99.5	81.0	64.3	80.2	67.0	86.0	31.5	128		85.1	27.2	
31	49.3		56.1	76.6		69.3		31.0	125		62.2		

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO		CAUDAL DE ESTE AÑO		PROMEDIO MENSUAL DE TODO EL REGISTRO		VOLUMEN EN		
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEG	MINIMO DIA	PROMEDIO ESC. MC/SEG	MC/SEG	L/S/K	MC/SEG	L/S/K	M.H.C	MM	
HAY	18	1.24	169	8	0.30	27.4	49.8	76	53.1	81	133.43	203
JUN	3	2.27	468	22	0.43	62.2	94.1	143	73.4	112	243.96	371
JUL	13	2.04	384	11	0.50	47.2	70.3	107	65.9	100	188.36	287
AGO	3	3.02	799	22	0.47	44.2	83.4	127	65.2	99	221.48	340
SET	1	2.15	423	23	0.52	54.5	79.4	121	72.8	111	205.89	313
OCT	22	1.68	269	14	0.45	46.8	91.4	139	86.4	131	244.68	372
NOV	17	2.19	437	6	0.45	46.7	79.6	121	86.7	132	206.21	314
DIC	1	1.35	199	11	0.29	31.0	56.7	86	67.8	103	151.78	231
ENE	30	1.75	293	21	0.22	25.5	40.2	61	60.4	92	107.65	164
FEB	25	1.97	362	21	0.24	26.8	62.8	96	44.5	68	157.40	239
MAR	23	1.74	290	22	0.24	27.1	58.6	89	35.3	54	156.90	239
ABR	10	1.20	168	29	0.23	26.6	51.9	79	34.2	52	134.59	205
TOT	3	3.02	799	21	0.22	25.5	68.2	104	62.2	95	2154.31	3278

AREA DE DRENAJE:		RIO PACUARE EN SIQUIRRAS						75-08-02		ELEVACION:		53MSNM	
ANO HIDROLOGICO		1968 - 1969						DATOS DESDE JUNIO 9, 1963					
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR	
1	36.7	106	72.1	97.7	88.6	63.7	126	59.2	36.0	26.5	16.5	34.1	
2	34.3	124	75.8	86.2	78.1	67.8	123	56.8	35.2	23.7	15.9	23.4	
3	33.8	107	93.9	111	79.9	80.9	127	53.0	34.1	22.2	15.9	19.0	
4	30.4	108	106	105	65.5	83.9	97.0	49.8	33.0	23.7	15.7	18.7	
5	52.0	125	87.7	85.1	64.9	98.4	86.2	49.6	31.5	47.8	15.3	17.2	
6	69.0	111	73.9	74.9	113	76.1	76.1	46.1	30.8	31.7	15.0	16.6	
7	103	88.1	67.3	70.7	176	65.4	71.1	44.4	30.3	25.6	16.5	16.6	
8	92.9	72.9	66.7	72.1	162	77.6	70.5	43.5	29.2	21.4	15.8	15.3	
9	72.1	72.2	62.5	79.2	117	67.6	73.5	44.5	28.3	22.6	15.3	14.6	
10	77.4	72.3	56.8	91.9	95.2	64.2	63.7	44.2	27.5	22.0	15.0	14.3	
11	67.9	79.2	52.1	74.6	91.4	62.1	72.1	48.5	27.1	21.6	15.0	15.0	
12	60.3	89.2	50.2	80.6	103	77.8	70.0	49.7	26.7	20.9	14.9	15.6	
13	58.6	116	61.5	70.0	96.6	68.2	166	43.4	25.9	20.0	14.2	14.3	
14	49.2	99.9	51.4	65.3	82.8	63.9	104	40.4	25.6	19.2	15.9	14.3	
15	68.9	78.9	46.6	63.1	83.3	69.2	80.5	84.4	27.3	19.0	14.6	14.3	
16	70.2	66.7	45.5	56.9	128	96.1	69.3	324	33.0	19.6	15.7	14.0	
17	84.9	94.5	48.5	59.2	123	81.7	62.9	259	28.3	20.4	14.2	15.3	
18	91.0	122	62.3	85.5	131	74.1	59.4	151	27.2	19.4	14.2	16.9	
19	81.4	137	79.0	91.0	144	64.2	56.8	99.7	25.7	20.1	14.0	18.8	
20	69.5	94.6	70.8	106	136	61.0	58.8	82.3	26.1	23.0	13.8	14.9	
21	102	92.3	66.5	85.8	119	58.1	57.5	70.6	31.6	21.7	15.0	14.9	
22	91.9	86.5	88.1	107	125	56.1	51.1	61.9	25.5	20.2	23.6	34.3	
23	75.9	72.6	75.3	96.9	144	63.2	51.9	56.8	25.0	19.4	18.8	65.4	
24	62.7	65.5	75.1	74.9	125	69.1	59.4	53.5	24.7	18.3	14.9	53.6	
25	70.4	44.3	70.8	72.4	105	103	162	49.2	24.2	17.9	13.1	32.1	
26	63.8	56.8	57.5	65.4	89.8	120	164	46.7	23.8	17.5	15.0	27.1	
27	57.2	61.7	114	83.9	77.8	93.7	103	46.0	27.1	17.2	17.9	22.4	
28	69.1	91.9	102	81.9	73.3	100	82.6	42.2	25.2	17.7	18.7	19.7	
29	75.9	96.3	316	99.1	55.8	122	70.6	40.4	24.3		18.0	18.6	
30	76.9	76.4	159	95.4	61.1	97.4	63.2	38.7	46.8		20.1	17.4	
31	93.7		117	86.6		97.0		37.2	32.1		26.0		

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO		CAUDAL DE ESTE AÑO		PROMEDIO MENSUAL DE TODO EL REGISTRO		VOLUMEN EN		
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEG	MINIMO DIA	PROMEDIO ESC. MC/SEG	MC/SEG	L/S/K	MC/SEG	L/S/K	M.H.C	MM	
HAY	21	1.52	235	4	0.28	30.4	69.1	105	56.3	86	185.16	282
JUN	18	2.20	441	26	0.54	56.8	91.1	139	76.9	117	236.03	359
JUL	29	3.03	804	16	0.44	45.5	83.6	127	68.9	105	223.94	341
AGO	10	1.40	211	16	0.54	56.9	83.1	126	68.2	104	222.64	339
SET	7	1.94	352	30	0.58	61.1	105	159	78.1	119	271.64	413
OCT	27	1.44	219	22	0.53	56.1	78.8	129	89.1	139	215.04	331
NOV	25	1.93	348	22	0.49	53.1	86.0	131	86.6	132	222.84	339
DIC	16	2.12	412	31	0.36	37.2	71.4	109	68.4	104	191.35	291
ENE	30	0.90	110	26	0.20	23.8	29.0	44	55.2	84	77.68	118
FEB	5	0.58	61.7	27	0.11	17.2	22.3	34	40.8	63	53.85	82
MAR	31	0.28	30.5	25	0.06	13.2	16.3	25	32.1	49	43.60	66
ABR	23	1.14	156	16	0.07	14.0	21.6	33	32.1	49	56.05	85
TOT	29	3.03	804	25	0.06	13.2	63.1	96	62.4	95	1995.78	3036

ARFA DE DRENAJE:		RIO PACUARE EN SIQUIRRES										
657KM2		75-08-02										
ELEVACION:		53MSNM										
ANO HIDROLOGICO		DATOS DESDE JUNIO 9, 1963										
1969 - 1970												
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	16.5	75.5	83.4	55.9	91.3	107	70.3	171	58.0	54.0	33.0	75.0
2	16.0	86.0	85.0	81.1	90.4	101	80.7	157	54.4	48.2	31.3	43.0
3	16.5	77.5	66.2	66.9	95.4	90.0	61.5	181	49.7	43.0	29.6	34.0
4	15.0	92.2	62.2	105	86.7	72.0	54.9	177	47.6	67.0	28.8	25.3
5	14.9	70.6	54.4	122	72.8	66.6	63.5	136	45.6	136	27.1	23.5
6	14.3	53.1	50.6	86.9	61.7	75.6	64.9	117	43.5	139	27.1	25.3
7	14.3	78.9	56.6	64.7	56.4	200	54.4	103	45.6	86.0	26.3	39.5
8	12.8	102	49.9	57.8	72.4	159	67.3	93.0	123	120	21.2	685
9	12.8	92.8	56.7	73.0	64.4	149	63.0	85.2	565	146	22.5	1620
10	18.5	60.7	48.7	63.9	56.1	128	61.9	77.8	558	136	21.7	860
11	15.6	59.2	45.1	89.3	52.0	218	64.3	72.0	221	183	21.7	860
12	15.0	63.0	42.7	58.7	65.2	123	74.9	76.0	145	200	21.0	145
13	15.0	54.2	40.4	50.4	59.8	117	59.2	86.5	117	349	23.0	275
14	15.0	52.6	50.2	63.2	58.6	111	60.4	104	96.5	263	24.3	340
15	14.6	54.1	45.6	65.9	98.0	120	66.5	80.6	82.2	133	25.5	262
16	26.3	64.0	42.1	64.2	179	132	87.6	336	77.0	99.3	21.7	255
17	30.0	64.0	73.3	79.8	108	104	97.4	196	65.5	134	22.5	92.0
18	27.4	56.2	49.6	79.6	116	96.6	70.0	150	60.5	92.9	22.1	71.0
19	18.7	45.8	42.4	67.9	129	80.8	147	128	56.8	72.1	26.3	62.0
20	23.2	43.4	16.5	63.3	96.5	70.6	150	109	53.2	64.2	23.2	52.0
21	18.7	37.5	13.9	76.2	132	68.0	241	161	49.7	58.0	19.5	43.0
22	19.7	16.5	33.5	81.9	131	63.0	465	153	47.6	52.3	18.0	40.3
23	19.1	56.0	31.3	66.2	110	58.6	567	135	44.5	48.7	17.2	35.5
24	34.6	66.9	29.6	78.3	97.1	57.0	500	110	57.0	45.6	16.5	34.0
25	30.9	63.7	29.8	79.3	84.4	55.2	450	93.2	56.0	42.4	15.7	43.0
26	43.9	56.4	45.6	74.4	75.7	56.6	345	81.7	58.0	46.4	15.7	27.0
27	52.4	77.5	42.4	67.9	74.6	55.6	235	74.0	57.0	38.5	10.6	99.0
28	50.1	74.6	41.9	70.1	110	51.5	187	68.0	86.5	35.6	35.4	202
29	64.3	115	33.4	71.2	124	100	160	75.3	67.0	41.6	99.0	83.0
30	73.6	109	36.8	65.4	122	80.9	161	73.0	56.0	25.7	33.7	
31	65.2		49.5	77.4		79.8		64.2				

MES	CAUDALES EXTREMOS				CAUDAL DE ESTE AÑO		PROMEDIO MENSUAL DE TODO EL REGISTRO		VOLUMEN EN			
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEC	MINIMO DIA	PROMEDIO DIARIO ESC.	MC/SEC	L/S/K	MC/SEC	L/S/K	M.H.C	MM	
MAY	28	1.26	181	8	0.05	12.8	26.6	41	51.4	78	71.37	109
JUN	8	1.46	223	22	0.35	26.5	68.0	103	75.4	115	175.16	268
JUL	17	1.09	145	24	0.27	30.0	48.7	74	66.0	100	130.40	198
AGO	5	1.31	191	13	0.49	50.4	73.2	111	68.9	105	195.94	298
SET	16	1.84	319	11	0.50	52.0	92.0	140	80.1	122	238.51	363
OCT	7	1.49	229	28	0.50	51.5	91.9	140	86.1	121	246.02	374
NOV	24	5.70	2340	7	0.52	54.4	161	245	97.2	148	416.85	634
DIC	16	2.40	520	31	0.60	64.2	120	183	75.8	115	321.97	490
ENE	10	3.12	866	6	0.42	43.5	103	157	62.0	94	276.25	420
FEB	13	3.78	1180	28	0.34	35.6	105	159	49.9	76	253.57	386
MAR	27	0.91	112	36	0.08	15.0	25.2	38	31.1	47	67.46	103
ABR	9	6.50	2920	5	0.19	23.5	211	321	57.7	88	547.65	833
TOT	9	6.50	2920	8	0.05	12.8	93.8	143	66.8	102	2342.14	4476

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEG.
RIO PACUARE EN DOS MONTANAS 75-08-03

AREA DE DRENAJE:		RIO PACUARE EN DOS MONTANAS										
652KM2		75MSNM										
ELEVACION:												
ANO HIDROLOGICO		DATOS DESDE JUNIO 9, 1963										
1970 - 1971												
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	63.4	64.2	50.1	77.8	157	131	61.5	58.0	40.0	38.4	39.2	17.3
2	64.2	78.0	89.9	68.0	71.2	111	47.7	60.5	56.0	38.4	43.4	17.3
3	50.1	59.8	75.6	96.7	62.1	101	41.8	326	54.0	36.1	32.3	17.3
4	46.3	62.2	69.6	61.6	55.2	72.8	34.8	815	53.0	29.2	30.9	31.3
5	48.3	59.5	66.3	51.1	87.8	59.8	76.2	781	51.5	29.2	26.1	18.2
6	43.3	82.5	53.7	45.5	125	53.7	284	516	51.0	29.2	25.1	17.3
7	41.0	52.7	52.2	52.3	193	60.4	294	348	50.0	24.0	22.0	17.3
8	41.2	46.2	51.7	51.2	58.3	43.4	267	285	48.9	25.0	26.5	21.1
9	41.2	41.3	70.3	50.3	55.8	46.8	172	380	48.0	27.5	41.1	145
10	41.0	39.0	95.7	37.4	58.9	81.3	157	990	46.0	25.0	26.1	183
11	41.4	47.1	102	55.0	60.4	67.8	145	720	44.5	25.1	24.0	170
12	41.2	86.4	124	32.9	46.2	58.4	117	322	43.9	25.1	21.0	194
13	41.7	55.7	102	33.8	51.5	41.8	102	270	42.5	25.1	23.0	100
14	63.2	50.7	79.4	59.1	53.0	40.4	98.0	210	42.0	25.1	20.0	74.8
15	82.0	58.5	69.5	27.6	44.9	42.0	99.9	220	38.0	25.1	20.0	61.4
16	109	108	66.3	34.3	55.2	54.4	321	160	36.5	32.2	24.0	52.2
17	136	85.0	81.6	44.9	51.8	47.7	930	149	37.0	26.1	52.8	44.7
18	225	62.6	224	42.9	61.5	34.8	299	325	38.0	25.1	29.5	39.0
19	81.5	50.7	95.9	40.0	57.1	29.2	285	1350	36.5	22.0	25.1	34.8
20	100	56.3	79.8	37.0	68.7	38.3	85.0	295	38.0	21.0	25.1	33.4
21	116	71.1	90.8	40.0	52.3	58.3	275	350	33.5	20.0	22.0	44.2
22	148	43.3	64.7	37.0	73.1	36.7	245	370	66.0	26.0	31.4	34.8
23	132	83.3	53.7	77.0	87.3	60.5	65.0	163	70.0	32.9	48.9	34.1
24	123	54.3	52.2	46.0	79.7	45.9	57.0	117	72.8	22.0	37.6	28.1
25	103	77.9	44.8	68.0	68.5	37.7	50.0	114	58.8	25.1	36.2	25.1
26	114	72.0	84.3	112	101	34.7	52.0	105	52.2	24.0	34.1	25.1
27	125	53.7	120	115	97.3	72.1	34.5	118	46.2	20.0	28.1	25.1
28	123	47.4	120	215	93.8	90.7	44.5	105	44.7	24.1	24.0	25.1
29	109	55.3	100	250	96.6	130	54.0	79.9	40.4		23.0	22.0
30	81.2	37.8	104	215	92.5	72.7	53.0	80.0	40.4		23.0	21.0
31	66.3		88.2	245		82.6		79.9	38.9		20.0	

MES	CAUDALES EXTREMOS				CAUDAL DE ESTE AÑO		PROMEDIO MENSUAL DE TODO EL REGISTRO		VOLUMEN EN			
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEC	MINIMO DIA	PROMEDIO DIARIO ESC.	MC/SEC	L/S/K	MC/SEC	L/S/K	M.H.C	MM	
MAY	12	2.32	152	7	1.00	41.0	82.0	126	55.8	86	219.59	337
JUN	12	2.56	206	25	1.67	39.0	61.0	94	73.3	113	158.20	243
JUL	12	2.56	206	25	1.71	44.8	81.1	124	67.9	104	217.24	333
AGO				15	1.58	27.6	78.1	120	70.0	107	209.12	321
SET	8	2.56	206	15	1.71	44.9	74.2	114	79.4	122	192.37	295
OCT	1	2.64	224	19	1.60	29.2	61.3	94	83.0	127	164.15	252
NOV	16	5.52	1880	27	1.63	34.5	162	248	105	161	418.69	642
DIC	4	5.48	1870	1	1.80	58.0	331	508	108	165	887.70	1362
ENE	23	2.80	215	21	1.43	33.5	47.1	72	60.1	92	126.16	194
FEB	23	1.78	52.2	21	1.51	20.0	26.7	41	47.0	72	64.61	99
MAR	17	1.90	74.4	14	1.51	20.0	29.1	45	30.9	47	78.06	120
ABR	12	2.90	286	1	1.48	17.3	52.4	80	57.0	88	135.82	208
TOT	16	5.52	1880	1	1.48	17.3	90.5	139	69.8	107	2871.69	4406

AREA DE DRENAJE:		RIO PACUARE EN DOS MONTANAS 75-09-03										ELEVACION:	
652KH2												7515M	
ANO HIDROLOGICO		1971 - 1972										DATOS DESDE JUNIO 9, 1963	
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR	
1	45.0	57.3	74.5	55.7	56.1	92.0	108	61.0	51.0	11.0	27.4	20.2	
2	39.0	49.3	64.0	61.3	56.2	84.0	104	43.0	34.0	31.0	25.5	21.0	
3	37.3	61.2	54.0	50.8	78.0	83.9	99.0	40.5	37.0	11.0	23.6	17.5	
4	35.0	84.0	52.5	50.8	91.9	95.0	105	38.2	37.5	31.0	23.6	41.1	
5	34.0	83.5	47.0	54.8	71.3	92.0	91.0	35.0	40.0	28.5	23.6	46.5	
6	33.5	78.0	46.2	68.3	79.7	83.0	79.0	35.8	38.9	25.2	23.6	37.1	
7	33.5	79.9	43.8	52.2	74.0	94.0	75.9	35.8	74.0	25.2	22.3	30.5	
8	34.0	116	46.0	48.1	68.2	84.0	73.0	35.8	73.9	23.4	21.4	28.5	
9	36.5	88.0	43.9	50.2	60.4	71.9	72.0	35.8	60.0	23.4	21.0	25.5	
10	83.0	80.0	108	46.8	64.6	74.0	74.0	35.0	56.3	23.4	21.9	59.6	
11	52.0	72.0	74.1	54.4	62.3	94.0	81.0	33.7	54.0	24.5	28.0	43.6	
12	44.3	69.0	69.1	59.7	53.2	113	68.5	33.7	82.0	21.6	25.5	28.9	
13	65.0	84.0	64.2	49.7	47.8	103	65.0	33.7	60.0	21.6	32.1	29.2	
14	64.0	68.0	75.5	45.5	47.8	140	64.2	31.5	58.0	20.8	29.4	29.0	
15	70.3	67.9	126	49.5	50.6	104	62.5	31.5	61.0	19.9	34.2	31.8	
16	81.0	58.0	105	65.7	52.0	103	61.0	31.5	55.3	19.9	29.4	31.8	
17	94.0	58.0	104	62.0	49.1	109	71.0	31.5	48.0	19.9	25.5	30.5	
18	120	57.5	84.4	70.5	47.8	100	78.0	31.5	45.0	19.9	23.6	44.6	
19	158	58.0	139	65.7	51.4	102	69.9	31.5	41.0	19.9	23.6	45.7	
20	130	71.9	81.9	65.7	62.0	125	59.9	31.5	37.5	31.7	23.6	43.9	
21	142	88.0	79.7	53.6	59.9	103	54.0	31.5	35.5	103	23.6	40.3	
22	116	64.0	73.4	57.4	50.4	102	51.0	31.5	34.9	90.2	27.4	52.2	
23	97.0	55.5	129	64.5	55.2	108	53.0	31.5	33.0	48.0	25.5	40.7	
24	92.0	52.5	84.2	52.2	84.0	130	51.0	39.2	33.5	35.6	23.6	57.0	
25	84.0	50.0	78.4	56.0	88.0	100	51.0	38.2	32.0	30.1	23.6	50.0	
26	71.5	46.0	76.8	72.5	84.0	92.0	48.3	33.7	32.0	29.1	23.6	49.9	
27	63.5	44.5	68.4	60.6	72.0	34.5	45.5	31.5	32.0	29.1	22.6	44.3	
28	61.0	51.9	70.3	62.4	74.0	80.0	45.5	31.5	32.0	27.1	21.9	38.0	
29	93.1	69.0	79.6	79.8	72.2	125	45.5	31.5	31.2	27.1	21.9	36.5	
30	90.8	58.9	56.4	86.3	86.0	160	49.4	36.5	31.0	27.1	21.0	35.0	
31	75.7		53.6	73.0		142		40.5	31.0		19.3		

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO		CAUDAL DE ESTE AÑO		PROMEDIO MENSUAL		VOLUMEN		
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEC	MINIMO DIA	PROMEDIO ESC. MC/SEC	MC/SEC	L/D/R	MC/SEC	L/S/R	M.M.C	M3	
MAY				6	1.63	33.5	73.4	113	58.0	89	196.60	302
JUN				27	1.71	44.5	67.4	103	72.0	111	174.60	280
JUL	19	2.76	253	7	1.70	43.8	76.1	117	68.9	106	203.72	313
AGO	29	2.56	195	14	1.85	45.5	59.5	91	68.0	106	159.49	245
SET	3	2.48	173	14	1.86	47.8	65.0	100	77.8	119	160.49	258
OCT				9	1.96	71.9	100	154	84.9	130	269.07	413
NOV	30	2.12	100	29	1.79	45.5	68.5	105	101	155	177.65	273
DIC	24	2.06	77.2	17	1.73	31.5	35.4	54	99.9	153	94.71	145
ENE	1	2.08	80.6	30	1.72	31.0	44.5	68	58.4	96	119.25	183
FEB	22	2.32	129	18	1.60	19.9	31.3	48	45.3	69	73.55	121
MAR	15	1.84	44.8	31	1.59	19.3	24.6	38	30.2	46	65.91	101
ABR	4	2.36	140	1	1.61	20.2	40.4	62	55.2	85	104.75	161
TOT				31	1.59	19.3	57.2	88	66.4	105	1812.80	2781

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC/SEC.
RIO PACUARE EN DOS MONTANAS 75-08-03

AREA DE DRENAJE:		RIO PACUARE EN DOS MONTANAS 75-08-03										ELEVACION:	
652KH2												7515M	
ANO HIDROLOGICO		1972 - 1973										DATOS DESDE JUNIO 9, 1963	
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR	
1	43.0	81.5	45.0	20.1	44.2	182	68.5	38.9	68.5	27.6	23.5	10.9	
2	48.0	74.5	51.9	21.5	64.7	199	65.4	36.8	65.4	25.6	20.0	10.9	
3	35.2	78.0	51.0	26.0	79.1	157	59.3	34.9	59.3	45.0	19.3	10.9	
4	33.3	79.0	51.0	24.0	91.6	103	66.0	34.3	56.4	60.6	18.1	11.2	
5	32.5	71.0	60.0	20.5	93.0	90.5	63.5	35.0	56.4	37.3	17.8	12.1	
6	27.1	72.0	51.5	21.0	58.4	88.9	60.0	34.9	50.9	29.5	17.2	11.2	
7	26.9	85.0	45.0	20.5	52.3	88.0	115	63.0	43.0	27.5	20.6	11.5	
8	39.5	103	41.0	20.1	52.3	78.5	195	50.3	40.5	25.6	20.6	11.5	
9	42.0	115	38.5	20.1	52.3	77.9	121	38.5	36.0	23.7	19.9	11.2	
10	36.8	122	43.0	20.5	58.7	65.4	97.0	37.2	29.4	23.7	18.4	11.7	
11	42.1	108	39.0	22.5	55.7	62.2	91.0	30.0	27.4	47.2	17.7	12.1	
12	42.6	84.0	35.0	31.1	49.5	63.8	79.9	32.7	82.4	74.6	15.6	11.7	
13	42.0	101	32.0	30.0	49.5	63.8	85.0	32.9	140	51.2	15.6	11.7	
14	47.4	94.0	32.0	38.0	46.7	62.2	106	39.3	166	38.3	15.6	11.1	
15	41.6	76.5	30.5	53.6	74.6	96.4	103	34.9	107	33.8	15.6	17.0	
16	43.8	66.0	29.1	52.1	77.4	162	132	30.8	70.2	31.6	15.6	15.8	
17	47.0	66.0	26.3	41.5	69.9	159	108	30.8	56.5	29.5	15.6	13.8	
18	85.0	65.0	25.2	45.2	66.4	127	83.0	41.1	48.1	25.6	15.6	12.6	
19	90.0	65.0	25.8	98.0	64.8	124	73.0	48.2	43.0	23.7	15.6	13.0	
20	87.0	58.5	35.5	108	56.7	113	64.5	42.1	40.5	26.0	15.5	14.0	
21	111	53.0	31.1	110	52.3	109	65.0	47.2	38.2	25.5	15.0	14.6	
22	115	50.5	26.8	95.0	56.5	100	63.0	52.5	35.8	24.4	12.6	10.5	
23	112	45.0	29.5	86.0	71.4	89.1	58.3	117	35.8	23.0	12.6	15.3	
24	85.0	62.0	28.8	145	118	81.8	54.0	312	33.7	23.0	12.6	13.1	
25	99.0	85.0	27.0	143	105	95.9	51.0	134	29.4	23.0	12.6	13.1	
26	115	65.5	27.8	118	90.2	85.5	51.0	115	28.4	23.0	12.6	13.1	
27	126	55.0	24.1	92.0	120	99.9	55.5	100	29.4	23.7	12.1	19.9	
28	143	55.0	23.5	84.0	168	94.4	47.0	106	26.5	23.9	12.0	15.7	
29	135	59.5	23.0	68.0	159	122	43.0	96.5	23.6		11.8	13.1	
30	103	55.0	22.1	65.0	139	78.7	40.5	82.0	34.7		11.5	18.2	
31	98.0		20.6	50.8		68.5		71.7	35.9		11.2		

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO		CAUDAL DE ESTE AÑO		PROMEDIO MENSUAL		VOLUMEN		
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEC	MINIMO DIA	PROMEDIO ESC. MC/SEC	MC/SEC	L/S/R	MC/SEC	L/S/R	M.M.C	M3	
MAY				7	1.73	26.9	70.2	108	59.4	91	187.90	280
JUN				23	1.90	45.0	75.0	115	72.9	112	194.36	298
JUL				31	1.85	20.6	34.6	53	65.4	100	92.59	142
AGO				8	1.64	20.1	57.8	89	67.7	104	154.75	237
SET	27	2.78	257	1	1.90	44.2	78.0	120	77.8	119	202.19	310
OCT	16	3.12	341	11	1.97	62.2	103	157	86.7	133	274.69	421
NOV				30	1.86	40.5	78.8	121	98.8	152	204.28	313
DIC	24	3.50	441	16	1.77	30.8	64.7	99	96.4	148	173.36	266
ENE	13	2.88	227	29	1.64	23.6	52.8	81	57.8	89	141.55	217
FEB	12	2.08	80.6	24	1.60	23.0	32.0	49	44.0	67	77.51	119
MAR				31	1.42	11.2	15.8	24	28.8	44	42.34	65
ABR				1	1.41	30.9	13.4	21	51.0	76	34.78	53
TOT				1	1.41	10.9	56.3	86	67.2	103	1780.25	2731

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEC.
 RIO PACUAHE EN DOS MONTANAS 75-08-03

AREA DE DRENAJE: 652KM2

ELEVACION: 6915NM

ANOS HIDROLOGICOS 1973 - 1974

DATOS DESDE JUNIO 9, 1963

DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	17.9	38.8	61.6	97.2	81.8	54.7	45.8	196	67.7	33.1	36.9	16.5
2	12.1	33.7	56.4	54.9	74.7	55.2	42.6	174	73.5	31.4	31.7	16.4
3	11.3	63.9	30.9	53.8	74.0	49.6	41.7	160	68.2	30.3	27.5	19.7
4	11.8	57.3	45.5	57.4	75.0	50.6	39.9	153	56.3	30.3	26.5	17.7
5	11.8	63.2	44.3	64.6	67.1	63.1	47.3	143	51.1	30.3	24.7	17.0
6	11.6	70.0	39.4	51.0	70.4	90.7	43.5	139	51.7	31.1	22.5	17.7
7	12.6	67.5	41.9	46.7	65.5	66.8	38.2	137	48.7	30.3	22.1	17.0
8	12.6	50.9	46.8	42.9	59.3	66.1	71.7	130	51.8	28.4	21.1	16.0
9	12.6	54.9	71.8	44.4	54.1	75.9	66.1	139	151	26.5	22.6	16.3
10	35.4	60.4	61.1	37.0	52.2	106	48.1	253	137	28.4	22.1	16.2
11	28.8	43.7	46.8	36.4	63.7	91.6	42.6	478	73.3	28.9	22.7	16.1
12	15.7	40.5	43.0	34.8	67.3	84.1	50.9	414	126	42.1	20.7	16.0
13	14.4	58.1	45.3	31.2	76.3	112	48.1	414	126	28.9	22.7	16.1
14	12.6	76.9	48.3	32.7	82.0	91.1	51.7	299	84.2	34.1	19.4	15.9
15	24.7	61.8	51.7	31.7	83.2	88.7	100	200	66.2	29.4	19.8	15.8
16	39.5	60.1	53.8	30.3	69.4	72.6	134	107	61.1	26.1	19.8	15.7
17	25.0	64.6	45.6	29.3	72.6	71.0	113	130	56.3	23.7	19.8	15.7
18	24.3	75.1	71.8	32.6	80.2	67.6	91.2	254	51.7	25.4	21.1	15.7
19	66.4	77.0	82.7	32.3	84.6	67.1	121	206	46.0	26.2	19.6	28.0
20	52.5	79.7	80.7	30.9	87.9	65.5	101	152	41.9	26.6	19.1	22.9
21	51.3	77.7	145	61.4	80.9	74.8	88.1	124	39.9	23.7	18.9	40.2
22	41.9	67.8	98.1	64.4	67.6	94.7	75.4	194	39.9	22.9	18.8	50.1
23	33.4	64.0	85.6	62.0	61.4	107	77.4	132	37.9	22.1	20.4	25.9
24	32.3	73.6	81.3	72.0	59.9	104	61.1	102	37.9	21.7	17.9	20.6
25	42.0	109	68.2	85.0	48.1	94.1	71.9	93.3	37.9	21.3	17.7	18.5
26	26.9	93.5	61.6	103	45.4	75.5	60.6	85.0	37.9	22.1	17.5	30.4
27	43.2	94.3	57.6	130	45.4	89.9	60.3	118	36.9	42.9	16.5	50.1
28	51.8	88.1	53.0	162	41.2	58.4	210	91.4	36.0	63.3	16.4	28.7
29	44.7	82.1	49.5	196	52.7	52.3	301	83.0	36.9	36.9	16.9	25.2
30	74.5	71.1	46.8	132	53.0	50.3	242	81.1	36.9	36.9	16.8	44.1
31	62.4		72.5	100		46.7		71.5	33.0		16.6	

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO			CAUDAL PROMEDIO MENSUAL			VOLUMEN		
	MAXIMO INSTANTANEO	MINIMO	PROMEDIO	DE ESTE AÑO	DE ESTE AÑO	PROMEDIO MENSUAL	DE TODO EL REGISTRO	DE TODO EL REGISTRO	M.M.C.	M3		
	DIA	ESC.	MC/SEC	DIA	ESC.	MC/SEC	MC/SEC	L/S/R	MC/SEC	L/S/R		
MAY	30	2.46	168	3	1.42	11.3	32.2	49	56.7	87	86.17	134
JUN	25	2.48	173	12	1.80	40.5	68.7	105	72.5	111	177.94	273
JUL	21	2.68	227	6	1.79	39.4	61.6	94	65.1	100	164.90	253
AGO	1	2.31	127	17	1.75	29.3	65.9	101	67.5	104	176.44	271
SET				28	1.87	41.2	66.6	102	76.8	118	172.53	265
OCT	10	2.52	184	31	1.92	46.7	74.8	115	65.6	131	200.30	307
NOV	28	3.43	422	7	1.84	38.2	87.0	133	97.7	150	245.43	346
DIC	14	3.64	480	31	2.32	71.5	180	276	104	160	481.10	734
ENE	9	2.81	201	31	2.05	35.0	60.4	93	58.0	89	161.77	248
FEB	28	2.43	97.6	25	2.01	21.3	29.7	46	42.7	66	71.69	110
MAR	1	2.08	37.9	29	1.91	16.4	21.1	32	28.1	43	50.45	87
ABR	21	2.62	149	17	1.93	15.7	22.8	35	48.4	74	58.38	90
TOT	14	3.64	480	3	1.42	11.3	64.2	98	66.9	103	2033.85	3120

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS EN MC./SEC.
 RIO PACUAHE EN DOS MONTANAS 75-08-03

AREA DE DRENAJE: 652KM2

ELEVACION: 6915NM

ANOS HIDROLOGICOS 1974 - 1975

DATOS DESDE:

DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	26.3	142	83.0	62.8	57.4	84.6	90.0	103	33.3	30.8	14.9	12.6
2	27.5	100	100	85.7	84.9	83.7	85.0	100	30.5	27.5	14.8	12.6
3	30.3	69.4	64.5	68.3	56.4	92.0	79.0	428	25.4	25.5	16.3	12.5
4	41.2	59.6	67.6	67.0	46.4	69.8	73.0	549	23.9	29.0	15.6	14.5
5	32.7	64.0	79.7	141	48.0	55.1	48.0	443	23.9	31.0	14.8	12.4
6	30.3	50.2	65.4	75.9	57.7	49.2	63.0	266	23.9	25.0	14.8	12.4
7	43.4	43.9	68.8	54.4	47.0	63.0	52.7	176	23.1	23.6	16.6	12.3
8	45.2	44.3	102	59.1	41.4	104	55.2	130	23.9	22.0	15.4	12.3
9	57.2	56.2	69.7	58.6	41.4	74.2	56.3	168	23.9	21.8	14.8	11.8
10	47.5	81.5	97.6	60.5	41.3	57.7	51.0	92.6	23.9	21.8	14.8	11.7
11	49.0	127	77.4	134	41.5	51.8	46.4	82.1	22.4	20.9	15.4	11.6
12	50.0	123	104	134	74.8	50.0	40.6	76.8	22.4	20.4	15.4	11.5
13	46.5	164	110	158	67.1	60.0	39.3	70.2	22.0	19.2	14.2	11.4
14	59.0	119	79.1	144	55.2	46.4	38.0	65.4	22.0	19.2	14.8	11.4
15	96.0	83.1	77.7	101	65.3	46.2	36.7	66.0	22.2	18.5	14.3	11.4
16	98.0	87.6	83.5	80.6	83.3	63.7	35.5	55.2	22.0	17.9	13.8	11.4
17	104	83.5	67.1	97.6	59.2	71.6	34.3	54.5	24.0	17.9	12.8	11.4
18	102	83.5	67.8	96.9	51.2	68.6	34.5	53.2	26.0	19.0	12.7	11.8
19	82.0	65.4	70.4	78.7	50.0	70.3	36.8	47.5	25.0	18.3	12.6	11.8
20	68.0	60.2	59.4	88.9	53.7	70.5	35.2	45.0	25.0	17.7	12.5	11.8
21	56.0	60.2	62.4	88.2	59.4	57.5	33.1	42.7	27.6	17.1	12.4	12.3
22	48.0	69.9	67.9	87.4	43.7	57.4	32.0	41.6	30.5	16.5	12.4	13.6
23	51.0	71.3	59.4	68.9	41.0	55.3	37.1	40.5	29.5	16.5	12.3	16.2
24	49.0	77.0	57.8	101	57.5	83.5	33.1	39.4	36.0	15.9	12.2	14.1
25	42.0	71.4	57.8	108	54.1	90.4	46.1	39.4	33.0	15.4	12.1	12.0
26	42.0	74.8	82.1	74.0	45.3	130	121	38.3	26.0	15.3	12.1	11.4
27	48.0	74.0	60.2	65.4	44.3	97.0	499	36.3	23.5	15.2	14.4	13.2
28	49.3	66.2	88.9	64.9	40.7	80.0	396	36.3	22.0	15.0	15.4	13.6
29	43.2	57.8	61.2	82.3	61.0	77.0	35.2	24.2	24.2	13.8	12.8	11.4
30	44.5	59.6	64.9	56.1	61.0	80.0	128	34.3	23.9	12.8	12.8	11.4
31	73.7		56.2	58.8		91.0		33.3	42.2		12.7	

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO			CAUDAL PROMEDIO MENSUAL			VOLUMEN		
	MAXIMO INSTANTANEO	MINIMO	PROMEDIO	DE ESTE AÑO	DE ESTE AÑO	PROMEDIO MENSUAL	DE TODO EL REGISTRO	DE TODO EL REGISTRO	M.M.C.	M3		
	DIA	ESC.	MC/SEC	DIA	ESC.	MC/SEC	MC/SEC	L/S/R	MC/SEC	L/S/R		
MAY				2	1.97	27.5	54.7	84	56.5	87	146.57	225
JUN	1	3.04	276	8	2.14	44.3	79.7	122	73.2	112	206.80	317
JUL	1	2.74	181	31	2.22	56.2	74.6	114	65.9	101	199.89	307
AGO	1	2.95	247	30	2.27	56.1	87.1	134	69.1	106	233.24	350
SET	24	2.78	192	28	2.17	40.7	57.7	82	74.9	115	139.22	214
OCT				15	2.21	46.2	72.0	110	84.5	130	192.81	296
NOV	27	4.23	654	22	2.10	32.0	85.4	131	96.7	148	221.27	339
DIC	4	4.50	739	31	1.97	33.3	111	170	105	160	396.42	455
ENE				13	1.88	22.4	76.0	40	55.3	85	69.73	107
FEB				28	1.32	15.0	20.5	31	40.9	63	49.58	76
MAR	27	1.79	19.0	25	1.67	12.1	14.0	21	26.9	41	37.53	58
ABR	23	1.76	17.1	13	1.65	11.4	12.3	19	45.4	70	31.90	49
TOT				33	1.65	11.4	57.6	88	66.1	101	1824.71	2800

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS LN MC./SEG.
 RIO PACUARE EN DOS MONTANAS 75-08-03

AREA DE DRENAJE:		652KM ²		ELEVACION: 8615M								
AÑO HIDROLOGICO		1975 -		1976		DATOS DESDE:						
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	11.4	50.0	58.0	73.6	53.9	99.5	95.5	93.1	48.5	44.4	22.9	14.0
2	16.4	43.4	48.1	70.2	48.7	93.8	91.6	77.5	47.2	46.0	22.1	11.8
3	17.9	35.2	56.6	69.2	54.1	105	110	67.9	46.0	44.8	22.1	11.6
4	16.0	40.8	80.3	108	62.4	87.7	137	66.4	44.8	40.1	19.8	11.3
5	21.8	38.3	80.3	89.6	58.5	88.3	127	74.2	43.6	37.9	19.4	16.7
6	17.1	36.3	65.4	92.9	86.4	87.7	144	89.7	42.4	37.6	21.3	17.0
7	16.5	34.3	63.9	90.8	99.5	82.1	182	95.2	39.0	37.4	20.9	17.1
8	14.8	46.1	58.0	80.3	97.5	71.8	138	115	37.9	37.1	20.6	17.7
9	12.8	46.2	68.5	67.0	109	103	144	119	39.0	36.9	20.3	17.9
10	12.3	36.3	68.7	56.6	110	117	134	111	42.4	39.0	20.0	21.1
11	12.3	49.1	50.2	50.0	114	108	120	119	40.1	37.5	19.7	17.0
12	15.5	31.4	56.1	69.0	153	89.6	129	192	36.9	53.6	19.4	15.7
13	17.8	43.6	54.0	98.3	153	73.4	134	372	32.8	43.6	19.1	15.5
14	18.3	46.2	54.9	82.3	115	70.2	149	587	32.0	37.9	18.8	15.3
15	13.8	47.5	65.2	96.2	99.5	85.6	223	322	32.8	31.8	18.5	15.1
16	18.9	36.3	87.4	103	84.3	102	237	200	34.8	31.8	18.2	15.0
17	22.0	51.7	68.7	80.3	92.6	117	161	162	30.0	29.9	17.8	14.8
18	17.1	36.3	60.1	106	99.4	108	129	261	111	27.1	17.5	14.6
19	14.3	34.3	57.7	98.2	87.8	106	113	112	139	27.1	17.2	14.5
20	13.8	34.3	61.4	104	92.9	85.8	99.5	99.0	66.4	27.5	16.9	13.6
21	18.3	42.7	65.9	99.5	87.2	78.6	129	91.5	75.9	26.7	16.6	13.8
22	24.6	42.7	74.2	80.3	100	68.5	93.5	87.9	67.9	26.0	16.3	13.5
23	20.3	35.2	70.2	67.2	124	67.0	139	79.2	59.1	25.2	16.0	14.5
24	26.4	40.5	67.0	79.0	137	70.2	149	82.6	55.0	24.4	15.7	12.7
25	46.1	40.5	62.4	82.1	119	76.8	159	74.2	50.4	23.6	15.4	12.4
26	50.0	36.3	60.2	82.1	98.1	87.5	152	71.1	47.2	22.8	15.1	12.1
27	35.2	57.0	78.9	60.9	124	79.0	115	67.8	46.0	22.1	14.9	15.3
28	38.3	59.6	71.8	57.7	95.6	72.8	95.2	64.9	45.8	22.9	14.7	12.1
29	38.9	113	58.0	67.9	110	82.8	87.9	59.1	45.5	23.7	14.5	13.3
30	31.6	99.5	80.4	78.6	108	96.8	74.2	53.6	45.3		14.3	46.0
31	34.1		77.4	59.5		100		51.0	45.1		14.2	

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO			CAUDAL DE ESTE AÑO		PROMEDIO MENSUAL		VOLUMEN EN	
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEC	MINIMO DIA	ESC.	MC/SEC	MC/SEC	L/S/K	DE TODO EL REGISTRO MC/SEC	L/S/K	M.M.C	M ³
MAY	25	2.44	104	1	1.65	11.4	22.1	34	53.6	82	59.15	91
JUN	29	2.89	231	12	1.95	31.4	46.1	71	70.9	109	119.61	184
JUL				2	2.11	48.1	55.1	100	65.8	101	174.36	168
AGO	18	2.75	186	11	2.12	50.0	80.8	124	70.0	107	216.53	332
SET	11	2.84	215	2	2.11	48.7	98.9	152	76.7	118	256.24	393
OCT	10	2.72	176	23	2.24	67.0	89.1	137	84.3	130	238.57	366
NOV	15	3.12	306	30	2.26	74.2	134	206	99.6	153	348.56	535
DIC	14	4.09	736	31	2.20	51.0	133	204	107	164	355.80	546
ENE				25	2.04	31.8	50.7	78	54.9	84	135.70	208
FEB	11	2.40	80.9	25	1.92	22.1	34.8	53	40.4	62	87.16	134
MAR	1	1.94	23.7	25	1.84	16.4	18.1	28	26.2	40	48.44	74
ABR	29	2.48	95.2	25	1.77	12.1	17.9	27	43.3	66	46.34	71
TOT	14	4.09	736	1	1.65	11.4	65.9	101	66.1	101	2086.44	3201

INSTITUTO COSTARRICENSE DE ELECTRICIDAD - DIRECCION DE ELECTRIFICACION
 DEPARTAMENTO DE ESTUDIOS BASICOS - OFICINA DE HIDROLOGIA
 REGISTRO DE CAUDALES MEDIOS DIARIOS LN MC./SEG.
 RIO PACUARE EN DOS MONTANAS 75-08-03

AREA DE DRENAJE:		652KM ²		ELEVACION: 8615M								
AÑO HIDROLOGICO		1976 -		1977		DATOS DESDE JUNIO 9, 1972						
DIA	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR
1	43.2	69.4	64.8	52.8	55.7	53.5	39.6	35.5	26.8	(17.4)	11.0	14.1
2	93.3	75.6	53.5	24.9	67.9	74.4	83.4	36.2	25.6	(17.3)	22.8	12.7
3	87.6	145	51.0	260	65.4	89.1	59.4	37.9	24.5	(17.2)	25.2	12.1
4	119	156	76.5	173	51.0	65.4	335	29.6	23.3	(17.1)	21.3	12.7
5	74.4	112	104	135	72.8	52.9	231	(26.3)	27.2	(17.1)	25.6	12.7
6	43.1	104	83.9	112	49.9	79.5	315	(33.1)	21.4	(17.1)	21.2	14.7
7	92.4	98.5	77.1	112	60.2	72.5	214	(32.2)	(26.8)	(16.4)	29.6	14.6
8	37.7	92.9	63.6	85.2	37.0	59.7	284	(31.8)	(26.5)	(16.7)	31.4	13.6
9	54.1	80.9	52.7	64.1	192	55.4	198	(41.9)	(30.2)	(16.6)	34.3	15.6
10	41.3	84.4	52.7	59.7	102	76.2	135	349	(39.9)	(16.4)	24.4	12.5
11	39.8	83.6	51.0	66.7	75.0	59.7	109	125	(39.7)	(16.4)	24.4	12.5
12	17.9	72.4	49.4	66.8	63.5	61.4	102	168	(38.3)	(16.4)	20.6	12.6
13	35.0	68.8	40.6	71.2	62.7	69.2	105	151	(38.1)	(16.3)	20.6	12.6
14	34.8	54.9	38.0	73.7	83.0	56.2	86.1	99.0	(20.8)	(15.2)	19.8	12.5
15	46.2	60.8	35.6	61.6	158	64.2	79.6	79.2	(19.1)	(16.1)	19.8	12.4
16	41.2	86.5	59.5	54.4	126	67.4	75.7	85.4	(19.0)	(16.0)	15.1	12.4
17	37.9	97.5	167	54.5	35.4	101	80.5	77.7	(18.4)	(15.9)	15.7	14.1
18	44.3	85.9	148	59.7	69.9	71.3	71.7	64.7	(19.3)	(15.6)	15.5	12.7
19	34.8	106	101	51.0	69.6	73.7	68.8	44.2	(19.8)	(15.7)	13.5	12.7
20	32.4	138	186	44.9	51.0	75.4	64.0	40.1	(28.8)	(17.7)	13.4	12.7
21	44.2	107	329	44.1	52.6	69.9	59.1	39.3	(25.7)	(17.4)	13.4	13.3
22	46.8	83.9	117	44.9	59.7	59.7	54.3	38.7	(30.6)	(18.8)	13.8	13.1
23	49.3	73.4	83.0	64.6	43.4	56.2	49.4	37.0	(39.9)	(16.6)	11.3	16.5
24	57.7	71.0	99.1	61.6	47.0	52.6	53.2	35.9	(37.7)	(16.4)	11.3	16.6
25	61.1	99.0	145	46.6	58.2	49.1	85.2	34.7	(25.0)	(16.3)	13.2	16.7
26	76.9	146	99.4	47.9	60.3	45.8	58.1	33.6	(25.0)	(16.3)	13.2	16.6
27	108	119	97.2	38.0	46.0	43.0	38.8	32.5	(22.2)	(17.0)	13.1	16.6
28	78.3	78.2	76.2	36.7	40.1	41.2	49.5	31.3	(18.5)	(19.1)	13.1	16.4
29	118	84.4	85.1	42.0	100	40.4	46.2	30.2	(18.4)		13.0	16.7
30	86.2	81.4	153	72.9	61.6	39.6	42.8	29.0	(17.6)		13.0	15.1
31	87.5		202	47.9		38.8		27.9	(17.5)		12.9	

MES	CAUDALES EXTREMOS			CAUDAL PROMEDIO DIARIO			CAUDAL DE ESTE AÑO		PROMEDIO MENSUAL		VOLUMEN EN	
	MAXIMO INSTANTANEO DIA	ESC.	MC/SEC	MINIMO DIA	ESC.	MC/SEC	MC/SEC	L/S/K	DE TODO EL REGISTRO MC/SEC	L/S/K	M.M.C	M ³
MAY	29	2.97	215	20	2.04	32.4	61.0	94	52.8	81	163.32	251
JUN	26	3.41	347	15	2.27	40.8	94.2	145	73.9	112	244.23	375
JUL	21	3.96	538	15	2.33	34.6	98.4	151	68.8	104	263.44	404
AGO	1	4.54	805	28	2.14	35.7	92.2	141	71.8	110	241.90	372
SET	8	4.14	606	23	2.19	43.4	78.7	121	76.9	118	203.77	313
OCT	11	2.85	180	31	2.16	38.8	65.6	101	93.1	129	179.81	276
NOV	8	3.46	383	1	2.15	38.0	108	154	101	155	236.88	368
DIC	10	3.65	427	21	2.08	27.9	49.8	91	107	184	156.05	244
ENE	NO	NO	NO	31	1.86	17.5	33.0	35	51.0	78	61.66	95
FEB	28	1.86	23.9	19	1.83	15.7	16.7	26	38.6	59	40.48	72
MAR	8	2.10	39.0	17	1.83	15.7	18.4	24	25.6	39	40.17	72
ABR	1	2.04	32.8	19	1.78	8.97	13.9	21	41.2	63	50.11	82
TOT	1	4.44	808	17	2.00	15.7	60.1	92	69.9	101	1997.82	2981

(*) Valores estimados, mediante correlacion de caudales promedio diarios con los obtenidos en 7 febrero en Pacuare

A—3 L5 流量の説明資料

L₅ 流量の説明

L₅ 流量とは各月流況曲線の最小から5個の流量を平均したものである。

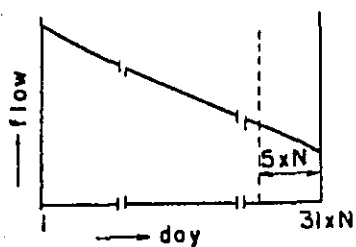
流況曲線には、Series 流況曲線、Parallel 流況曲線があり作成方法と主な特徴を下表のとおりである。

Series 流況曲線と Parallel 流況曲線の作成方法と特徴

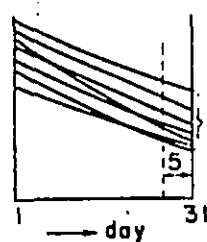
項 目	Series 流 況 曲 線	Parallel 流 況 曲 線
作成方法	N年間毎日の流量を、発生した年や日に無関係に、大きさの順に並べ、上位から順にN個ずつ平均し、これを連ね、1年に圧縮する。	N年間各年の流況曲線における同一順位の流量を平均し、これを連ねて作成する。
特 徴	豊満水が極端に表現される傾向になる。	平均的な流況曲線となり、豊満水がならされて表現される傾向になる。

流況曲線から求まる L₅ 流量

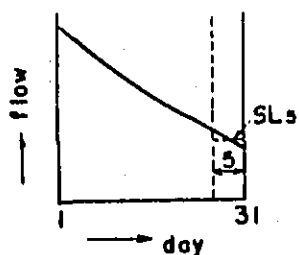
Monthly Flow Duration Curve of "Series"



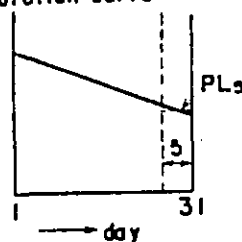
Monthly Flow Duration Curve of "Parallel"



31xN records be reduced into 31 records



Average and make it into a monthly flow duration curve



L₅ 流量平均值

$$\text{Mean} = \frac{PL_5 + SL_5}{2}$$

L-5 Discharge at Angostura Gauging Station

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1959	34.8	28.8	24.8	23.4	31.8	97.7	78.5	81.6	66.4	95.4	76.0	60.0
1960	51.2	40.4	33.3	37.9	39.0	79.7	91.1	72.3	79.5	114.2	78.6	61.0
1961	48.7	39.5	28.4	26.6	34.2	72.5	85.7	79.1	103.8	98.8	99.9	88.6
1962	60.7	40.3	31.1	30.8	40.9	82.9	88.5	84.3	98.5	121.2	82.8	70.6
1963	53.9	48.9	46.8	43.0	56.2	80.0	86.9	78.5	93.5	95.6	93.1	69.4
1964	50.2	32.9	24.5	23.6	33.9	82.9	108.5	104.8	116.2	108.2	84.8	53.2
1965	58.6	48.2	48.1	32.2	36.9	92.9	92.5	118.4	107.1	109.8	100.0	71.9
1966	73.4	71.4	55.0	37.0	99.6	105.8	90.6	93.0	109.8	114.2	79.4	106.6
1967	90.4	54.4	41.4	41.4	72.0	120.2	105.0	113.4	135.2	120.4	106.0	60.2
1968	45.8	53.8	45.6	50.6	56.7	125.8	116.7	122.2	115.8	105.6	104.1	78.5
1969	43.7	36.1	29.0	35.5	36.4	80.7	58.2	120.0	97.3	106.8	103.3	90.3
1970	65.4	70.3	50.0	64.8	95.4	125.6	115.8	73.7	103.8	102.0	109.3	151.8
1971	87.4	53.6	59.9	52.8	62.2	80.1	89.5	117.4	97.2	126.2	80.5	52.9
1972	53.4	39.0	36.2	45.1	62.2	68.4	65.1	61.5	98.1	99.5	77.4	63.2
1973	44.2	45.7	37.8	22.4	30.2	101.7	69.5	64.4	95.1	91.7	92.3	83.9
1974	73.6	50.8	49.1	30.6	60.6	100.9	102.7	88.8	77.0	82.9	62.1	50.8
1975	44.7	32.1	27.4	35.1	33.6	78.3	94.0	117.2	122.4	83.6	104.0	106.6
1976	64.6	33.5	34.3	31.4	53.9	85.4	91.8	77.3	100.6	87.7	86.7	58.8
① Average (parallel)	58.0	45.5	39.0	36.9	52.0	92.3	90.6	92.7	101.0	103.6	90.0	76.6
② Average (Series)	45.1	35.8	28.4	27.1	37.4	82.1	79.2	79.2	90.7	98.6	82.0	59.5
Average $(\frac{1}{2} \textcircled{1} + \textcircled{2})$	51.6	40.7	33.7	32.0	44.7	87.2	84.9	86.0	95.9	101.1	86.0	68.1

A-4 ICE電力系統既設水力発電所のL5流量

Monthly Discharge and L5 Discharge of Power Stations

(Unit : m³/sec)

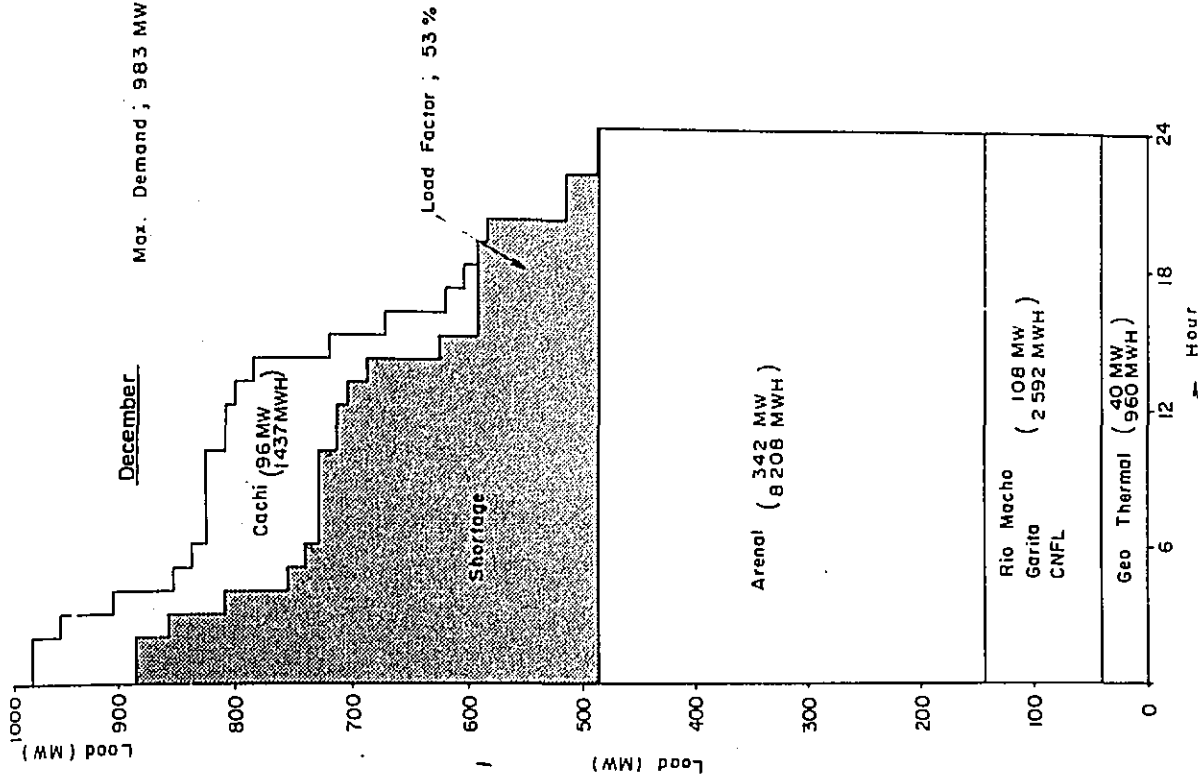
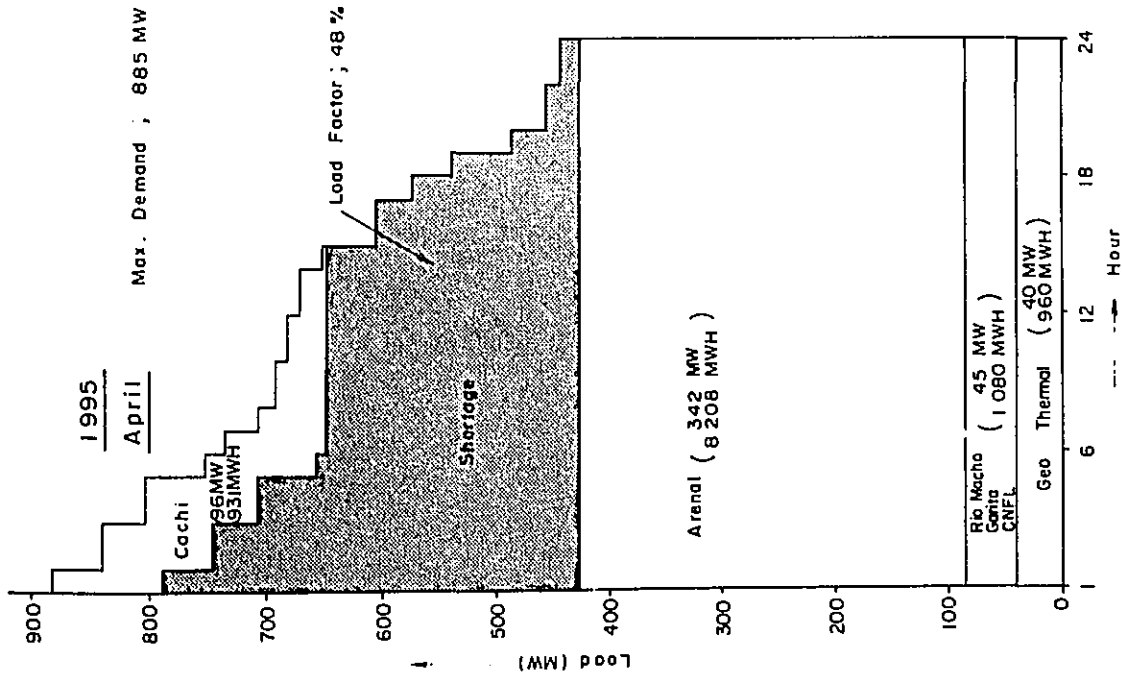
Item	Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Remarks
(Angostura G.S. C.A.=1337km²)														
①	Monthly Average Discharge	87.9	68.0	50.8	66.6	87.2	131	130	134	148	154	151	144	From Jan. 1959 to Dec. 1976
②	L5 Average Discharge	51.6	40.7	33.7	32.0	44.7	87.2	84.9	86.0	95.9	101	86.0	68.1	
③	= ② ÷ ①	0.59	0.60	0.66	0.48	0.51	0.67	0.65	0.64	0.65	0.66	0.57	0.47	
④	Cachi G.S. (C.A.=692km ²)	39.2	28.1	20.9	24.6	38.2	53.4	59.4	60.9	71.6	76.8	72.0	63.2	From May 1955 to Apr. 1974
⑤	Garita P.S. (C.A.=739km ²)	17.5	16.5	15.3	14.7	16.1	17.7	17.7	17.9	17.9	17.9	18.0	18.0	From Jan. 1957 to Dec. 1973
⑥	San Miguel G.S. (C.A.=832km ²)	22.4	17.5	15.3	16.1	22.9	37.8	34.8	39.1	66.5	81.6	56.7	34.8	From May 1956 to Apr. 1973
Monthly Average														
⑦	Rio Macho and Macho No. 1 P.S. (C.A.=283km ²)	18.0	11.5	8.55	10.1	15.6	21.8	24.3	24.9	29.3	31.4	29.4	25.8	④ × ²⁸³ / ₆₉₂ : Run-off (*2) Qmax.: 34m ³ /sec
⑧	Cachi P.S. (C.A.=785km ²)	44.5	31.9	23.7	27.9	43.3	60.6	67.4	69.1	81.2	87.1	81.7	71.7	④ × ⁷⁸⁵ / ₆₉₂ : Run-off Qmax.: 54m ³ /sec
⑨	Garita P.S. (C.A.=639km ²)	17.5	16.5	15.3	14.7	16.1	17.7	17.7	17.9	17.9	17.9	18.0	18.0	Power Discharge
⑩	CNFL and Others P.S.	20.2	17.1	13.8	14.5	20.6	34.0	31.3	35.2	59.9	73.4	51.0	31.3	⑤ × 90% : Run-off Qmax.: 17m ² /sec
⑪	Arenal and Corobici P.S.	38.7	56.1	56.1	56.1	56.1	56.1	38.7	38.7	38.7	38.7	38.7	38.7	
⑫	Guayabo P.S. (C.A.=1518km ²)	99.8	77.2	57.7	75.6	99.0	149.	148	152	168	175	171	163	① × ¹⁵¹⁸ / ₁₃₃₇ : Run-off Qmax.: 140m ³ /sec
Monthly Average Discharge of Power Station														
⑬	Rio Macho and Macho No. 1 P.S.	9.44	6.90	5.64	4.85	7.96	14.6	15.8	15.9	19.0	20.7	16.8	12.1	③ × ⑦
⑭	Cachi P.S.	26.3	22.0 (19.1)	22.3 (15.6)	22.1 (13.4)	22.1	40.6	43.8	44.2	52.8	57.5	46.6	33.7	③ × ⑧ : Before Regulation () of Cachi Reservoir
⑮	Garita P.S.	14.9	9.90 (*1)	10.1 (*1)	7.06 (*1)	8.21 (*1)	16.2	16.1	17.4	17.4	17.4	18.0	18.0	(*) × ⑨
⑯	CNFL and Others P.S.	11.9	9.66	9.11	6.96	10.5	22.8	20.3	22.5	38.9	48.4	29.1	14.7	③ × ⑩
⑰	Arenal and Corobici P.S.	38.7	56.1	56.1	56.1	56.1	56.1	38.7	38.7	38.7	38.7	38.7	38.7	
⑱	Guayabo. P.S.	58.6	49.1 (46.2)	45.0 (38.3)	45.0 (36.3)	50.8	99.0	96.4	97.6	109.	115.	97.6	77.3	② × ¹⁵¹⁸ / ₁₃₃₇

(Note) Monthly Average Run-off are quoted from "Boletin Hidrologico 1975" and "Document de Trabajo 003-77"

(*2) Qmax.; Max. Power discharge

A—5 ICE電力系統日負荷曲線（1995年）

Appendix A-5



A—6 ICE電力系統解析

- 6.1 前提条件
- 6.2 電力の流れおよび電圧調整対策
- 6.3 短絡容量
- 6.4 安定度
- 6.5 検討の結果

6.1 前提条件

- (1) 1990年まで、SIQUIRRES 発電所の投入はないものとした。
- (2) ニカラグア国との国際連系線はないものとして扱った。
- (3) 各変電所での需要伸び率は一率6%/year, 1981年12月をベース^{*1}に求めた。
- (4) 対象年度はそれぞれ1987年および1990年の4月/12月とし、同じ年の需要は12月の方が4月よりも約10%多いものとした。
- (5) 火力は予備力として使用されるものとし、新設される火力発電所は、PAILAS(地熱1990年)のみとした。
- (6) 既設の連系トランスのタップ比は1.0, また既設の調相設備容量と設置場所は不明のため、ないものとして計算した。

6.2 電力夕流および電圧調整対策

1987年及び1990年の4月と12月ピークにおける計4ケースと1990年12月時点で、COROBICI ↔ COLIMA間^{*2}に230kV 1回線の送電線があるものと仮定した場合につき電圧・夕流計算を行なった。

計算にあたり以下の条件を設定した。

- (1) 負荷力率は0.85で年度、季節による変化はない。
- (2) 主要変電所の高圧側母線電圧は約98%とした。
- (3) 各変圧器は100 ± 5%のタップ(固定^{LRT})を有するものとした。

6.2.1 送電線/変電所の増強計画

(1) 送電線

平常時では1990年まで現状で問題ないが、都市北部の主要変電所に給電しているLA CAJA ↔ COLIMA間の138kV 2回線送電線がなんらかの理由で1回線で運用される場合にはTable A-6-1に示すように1990年12月ピークで130%^{*3}程度の過負荷となる。参考までに、同年12月時点においてCOROBICI ↔ COLIMA間を230kV 410[□]ACSR 1回線で連系すれば、この過負荷は85%までに軽減される。(Fig. A-6-6)。

このような過負荷問題の回避や、後述する北部変電所の電圧調整対策などから、ICEにおいて、すでに計画しているように、1989年頃までにCOROBICI ↔ SAN JOSE^{*4}北変電所間に、230kV送電線(当面1回線)を新設することが望ましい。

註 *1) ICE 資料 Aug.1977 頁36-6-281より

*2) 実際の計画ではCorobici ↔ San Jose 北変電所間の連系であるが便宜上Colimaと連系した。

*3) 138kV ACSR330[□]1条の連続熱容量定格162MWを100%とした。

*4) San JOSE 北変電所の建設予定地はColima S.S.の北部である。

また、他の過負荷対策の一つとして、単に LA CAJA ↔ COLIMA 間 138 kV 8.7 km 2 回線を 4 回線としたときに、この区間に流れる汐流値も Fig. A-6-5 に併記しておいたが、将来のニカラグア国との国際連系や PAILAS 地熱発電所の出力増加なども考慮すれば、COROBICI SAN JOSE 北変電所 230kV 連系統線新設の方が、経済性はともかく、信頼度面で、はるかに有利となる。

(2) 変圧器

(a) 需要端変圧器

需要に応じて、増容量化を計る。

(b) 連系用変圧器

当初計画設備のままでゆくと、Table A-6-2 に示す 3ヶ所の変電所のトランスが過負荷となるので増容量化が必要となる。

Table A-6-1 LA CAJA ↔ COLIMA 予想電力汐流

年・月	回線数	1回線当りの有効汐流 (MW)	過負荷率 (%)
1987年	2	88	54 ($\frac{88}{162} \times 100$)
4月	1	158	98
1987年	2	97	60
12月	1	173	107
1990年	4	62	38
12月	2	117	72
	1	210	130
1990年12月 COROBICI COLIMA 230kV 連系時	2	79	49
	1	137	85

註) 無効電力分を考慮すれば過負荷率はもう少し大きくなる。

Table A-6-2 変電所の増設容量

地点	当初計画容量 (MVA)	予想汐流ピーク時 (MW)	必要容量 (MVA) とその時期
LA CAJA 230/138kV	3 × 60	195 (Apr.'87) 244 (Dec.'90)	4 × 60 Apr.'87頃までに
CANAS 230/138kV	30	33 (Dec.'87) 39 (Dec.'90)	40 Apr.'88 (又は 2 × 30)
COLIMA 138/34.5	4 × 30	121 (Apr.'90) 134 (Dec.'90)	5 × 30 Dec.'90

6.2.2 電圧調整対策

検討の結果、都市北部の変電所 HEREDIA, COLIMA, SABANILLA等は COROBICI, ARENAL および GUAYABOなどの主要電源から離れているため、ピーク時に変電所電圧を100%に維持するためには、スタコン等の調相設備が必要となる。(Table A-6-3)

なお計算上、変電所一次側にスタコンを入れたため必要調相容量は大きな値となっている*。また、1990年12月断面で、COROBICI ↔ COLIMA間に230kV 1回線の連系線があると仮定すれば(Fig. A-6-7, A-6-8) Table A-6-3の下欄に示すように、同じ時点で比較してこの調相容量を1割程度減らすことができる。さらに、この間の連系トランスをLRTとしてタップ比を加減できれば電圧調整面でより効果的となる。

このLRTタップの調整巾は、計算では5%としたが実際の系統運用上では電源脱落や2回線送電線の1回線運用等を考えて、100±10%程度とすることが望ましい。

Table A-6-3 変電所における所要スタコン(例)

年 月	HEREDIA 一次側	COLIMA 二次側	SABANILLA 一次側	ESTE 一次側
1987年 4月	84MVA	0	77	5
12月	94	0	93	32
1990年 4月	82	50	82	24
12月	91	60	90	21
1990年12月	LRT Tap 1.0	Tap 1.0	Tap 1.0	Tap 1.0
COLIMA	79	58	80	18
COROBICI	(88)*	(60)	(87)	(20)
230kV 連系時	LRT Tap 0.95	Tap 0.95	Tap 0.95	Tap 0.95
	74	57	75	17
	(81)	(58)	(80)	(18)

註*) カッコ内は COLIMA ↔ LA CAJA 1回線のとき
138kV

この他GARITA, CONCAVAS S.Sなども需要が地域内での発電々力量を大きく上廻るため電圧対策上、スタコンが必要となる。

なお、日負荷曲線が不明のため深夜の電圧汐流計算は行なっていないが、線路亘長や線種からみて、夜間の電圧上昇は特に問題ないと思われる。

註*) 参考までに、変圧器二次側にスタコンを設置すれば、計算上、同じ2次電圧を得るのに、1次側に投入する量の $\frac{1}{4}$ 程度で済むが、逆に1次側系統電圧の低下を招くので、うまく協調を計る必要がある。

6.3 短絡容量

1990年の系統構成における短絡容量は Fig. A-6-8および Fig. A-6-9 に示すとおりである。

計算にあたって、発電機リアクタンスは $X'd$ を用い、すべての発電機が系統に入っているものとして計算した。また負荷からの流れ込みも無視した。

Table A-6-4 最大短絡容量

電圧 (kV)	地点名	短絡容量	
		MVA	KA
230	ARENAL	1,912	4.8
138	LA CAJA	1,903	8.0
34.5	LA CAJA 2次側	832	13.9
13.8	COLIMA 負荷端2次側	505	21.1
	ARENAL* 発電端子	1,663	69.6*

註*)

ARENAL P.S.の
発電機電圧を13.8kV
と仮定

$$\left[\begin{array}{l} \text{なお、短絡容量 } C \text{ (MVA) と短絡電流 } I \text{ (kA) 線路電圧 } E \text{ (kV) の間には次の関係がある。} \\ C \text{ (MVA)} = \sqrt{3} \frac{I \text{ (kA)} \cdot E \text{ (kV)}}{E} \end{array} \right]$$

Table A-6-5 JECのしゃ断器規格 (1970年)

電圧 (kV)	しゃ断容量 (最大)	
	MVA	kA
240	16,600	40
120	8,310	40
36	1,560	25
12	1,660	80

各電圧階級における最大短絡容量を Table A-6-4 に示しておくが各値とも日本の JEC の定めるしゃ断器のしゃ断定格範囲内であり、特に問題はない。

6.4 安定度

6.4.1 定態安定度

1990年12月ピークにおける潮流計算結果 (Fig. A-6-5)によれば、主な需要地である COLIMA の負荷母線と各発電機間での電圧位相角差は最大で25度程度であるので定態安定度上の問題はほとんどないと云える。

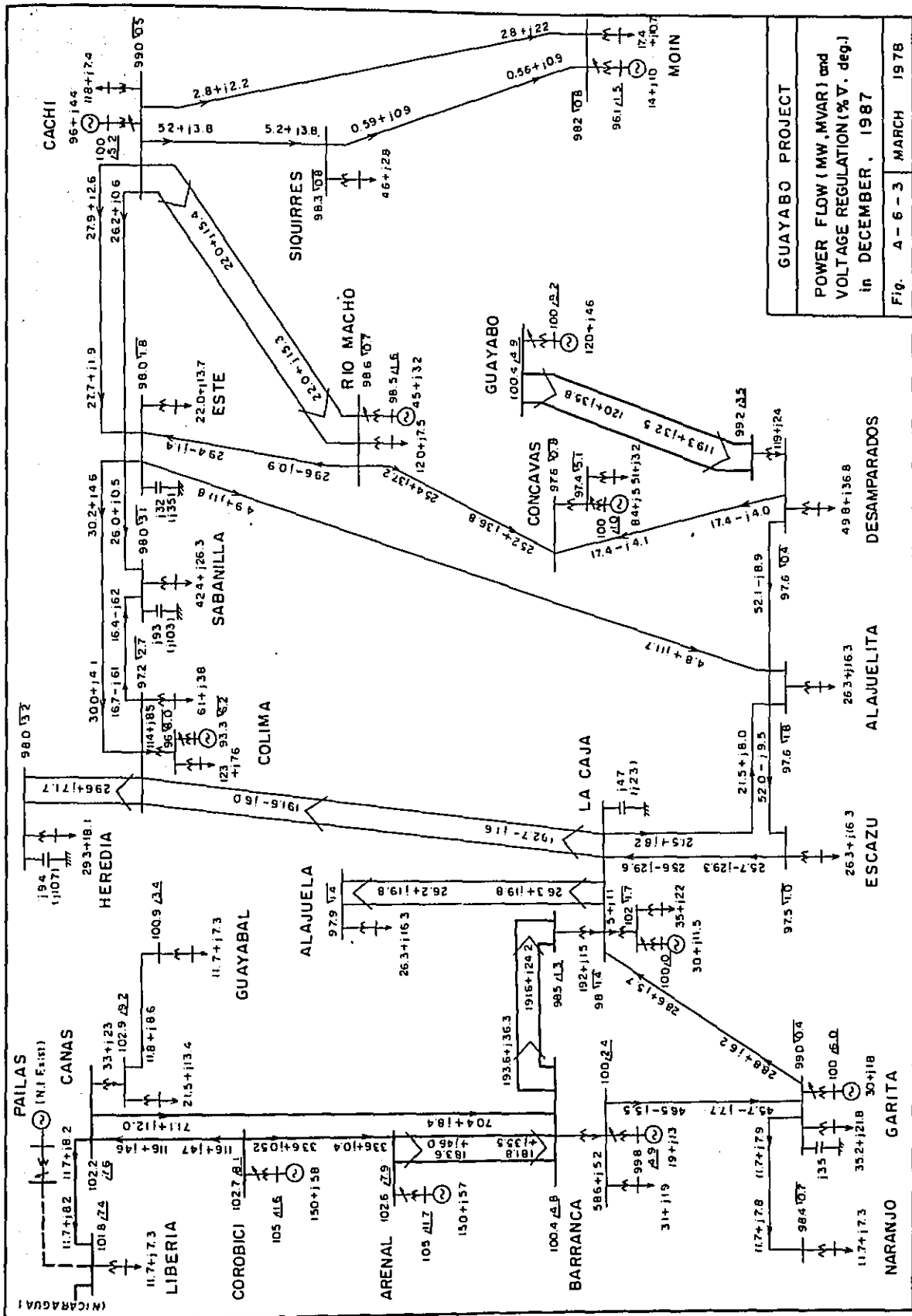
Table A-6-6 発電機定数表

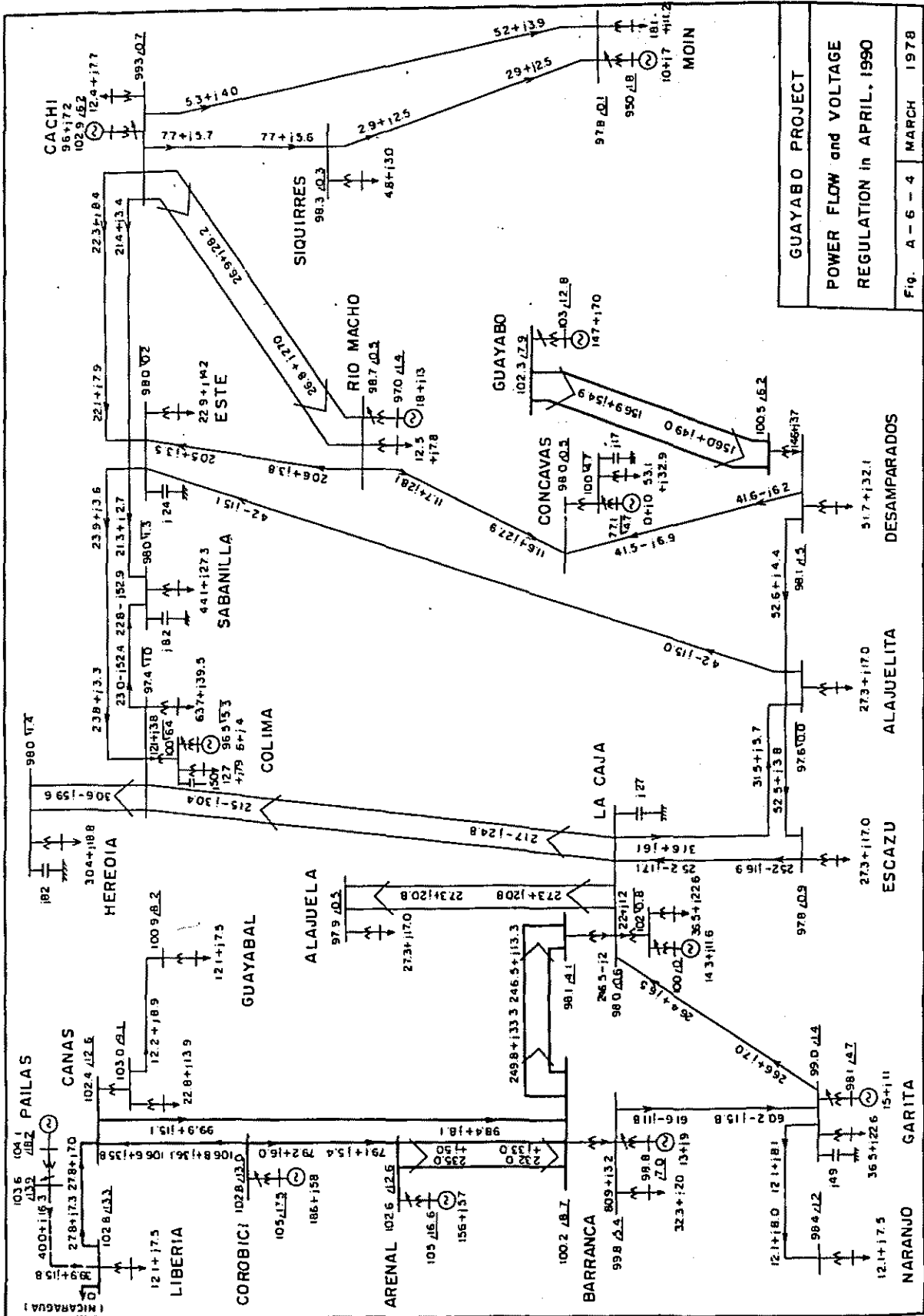
発電所(タイプ)	定格出力(MW)	力率%	マシンベース% Xd(%)	慣性定数 H(sec)
GUAYABO (H)	180	80	30.1	4.5
CONCAVAS (T)	8.4	80	31.5	1.6
RIO MACHO (H)	121	80	22.7	4.0
MOIN (T)	32	80	18.0	2.6
CACHI (H)	96	80	27.1	3.7
LA CAJA * (T/H)	79.2	80	18.0	3.5
GARITA (H)	30	80	31.8	2.6
BARRANCA (T)	41.6	80	18.0	2.9
ARENAL (H)	156	90	18.0	4.4
COROBICI (H)	186	80	27.0	5.0
COLIMA (T)	20	80	18.4	2.3
PAILAS (E)	40	80	24.0	2.9

註) H:水力 T:火力 E:地熱

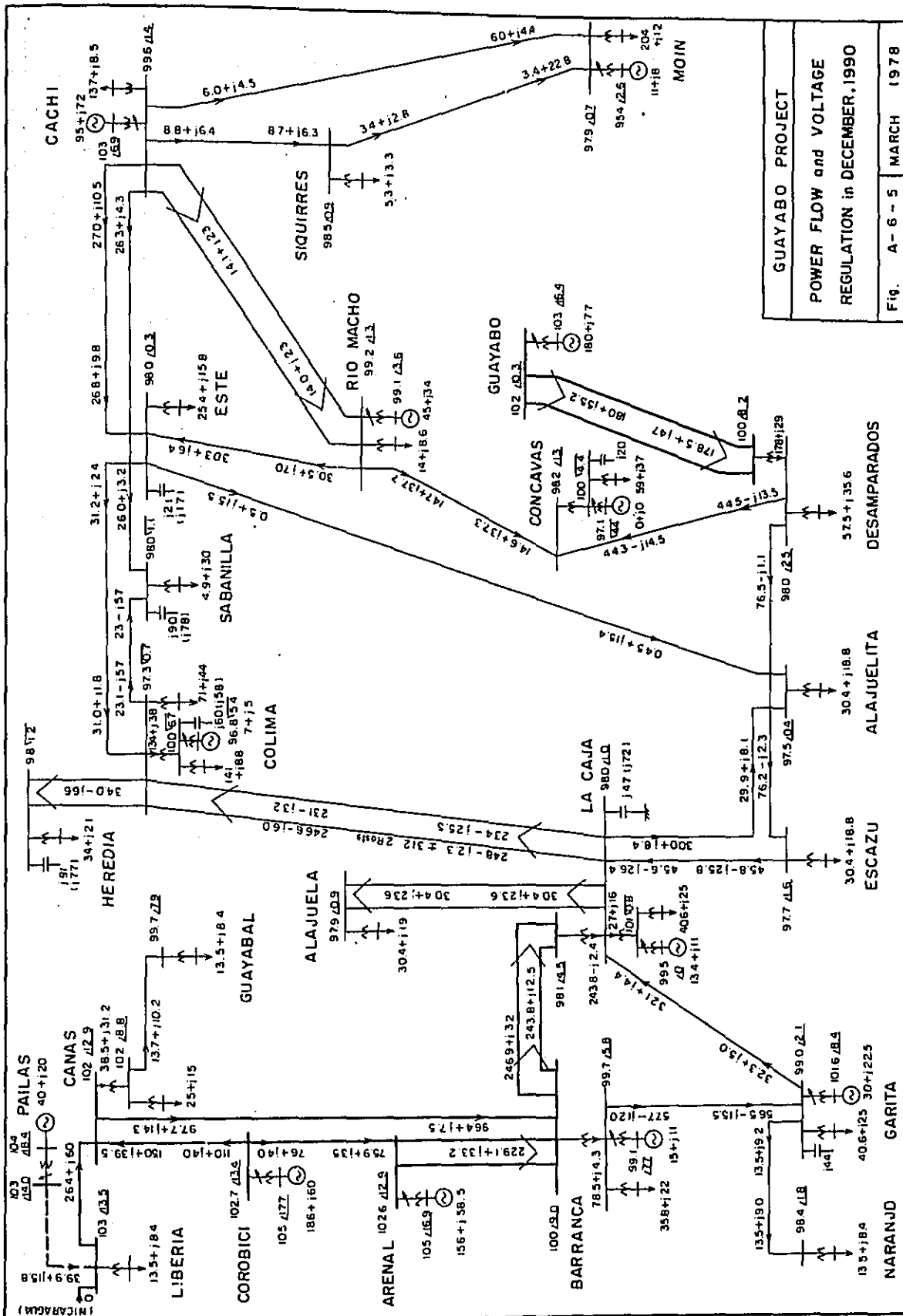
* LA CAJAでは水力機と火力機数台を一台にまとめて扱った。

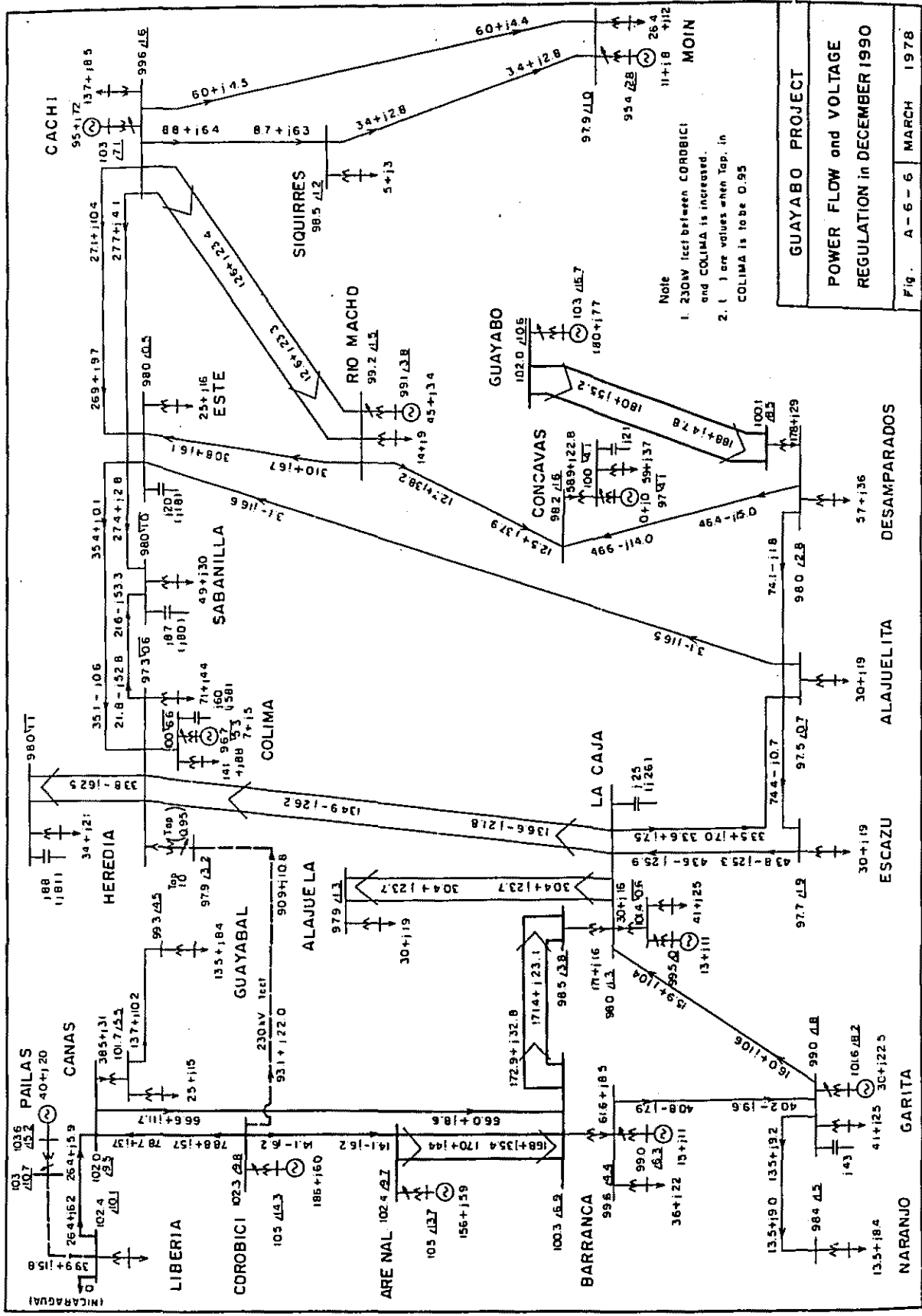
発電機慣性定数Hはタイプ容量比から求めた概略値を使用した。

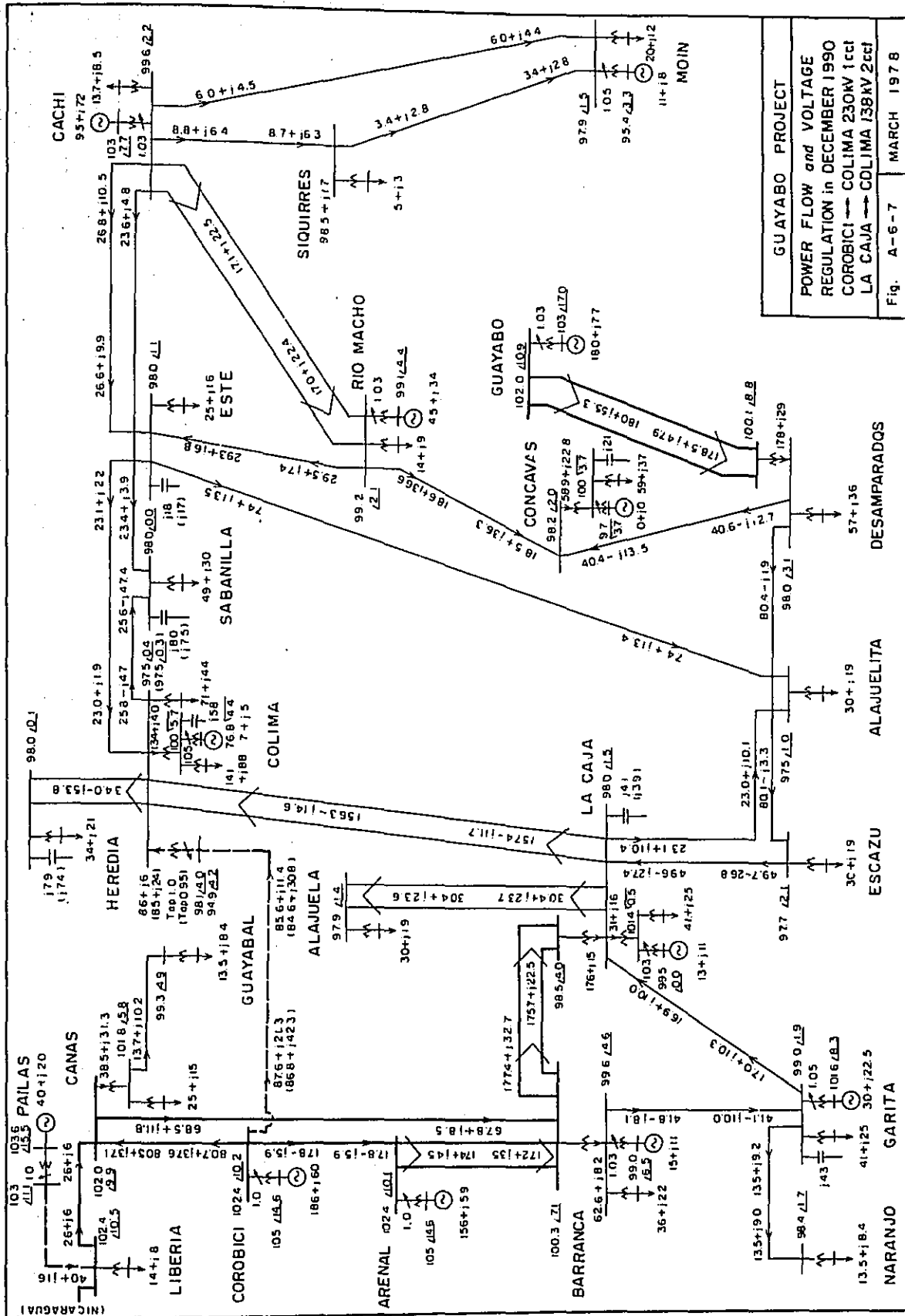




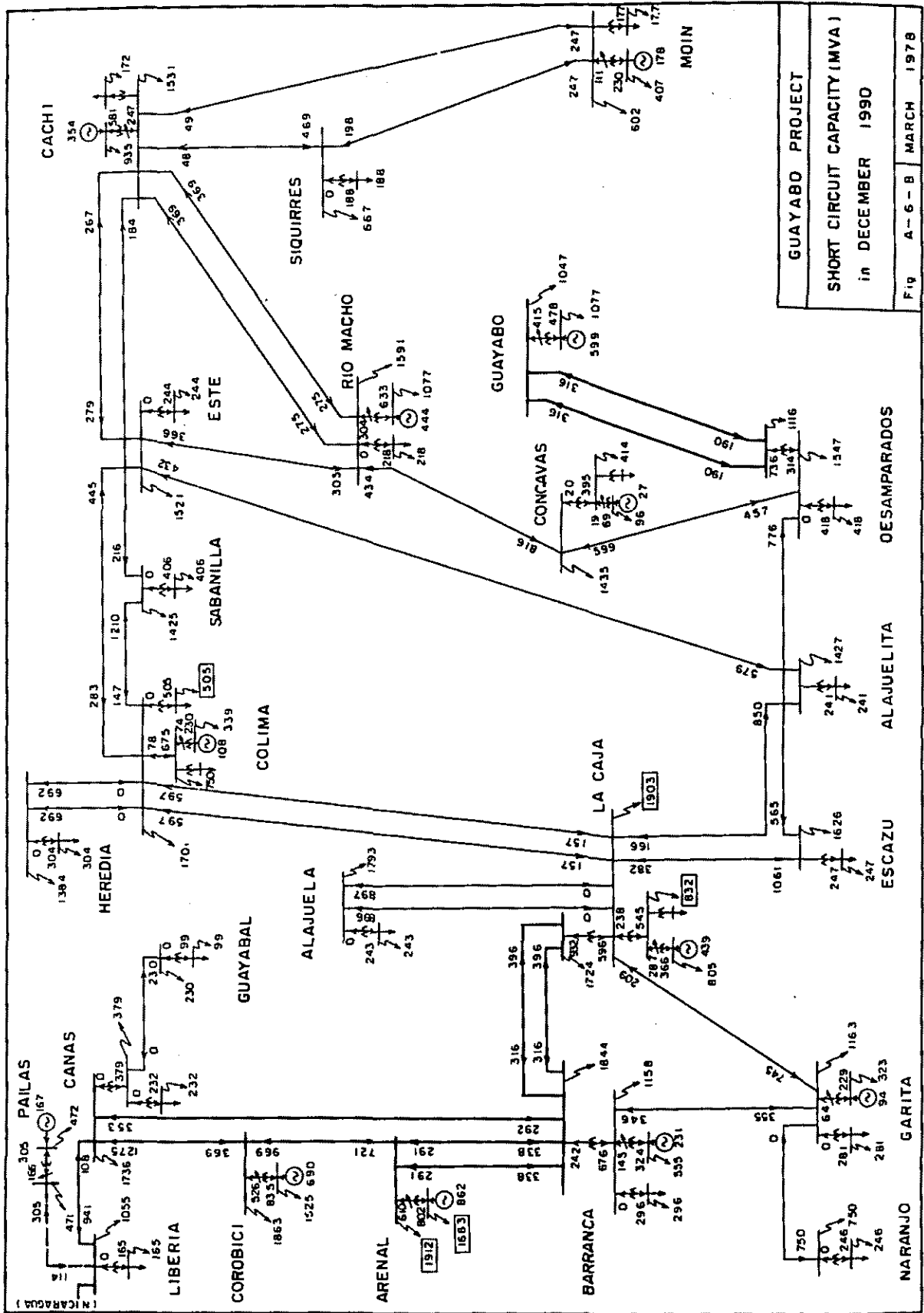
GUAYABO PROJECT
POWER FLOW and VOLTAGE
REGULATION in APRIL, 1990
 FIG. A-6-4 MARCH 1978







GUAYABO PROJECT
 POWER FLOW and VOLTAGE
 REGULATION in DECEMBER 1990
 COLIMBI → COLIMA 230kV 1cct
 LA CAJA → COLIMA 138kV 2cct
 Fig. A-6-7 MARCH 1978



GUAYABO PROJECT
SHORT CIRCUIT CAPACITY (MVA)
in DECEMBER 1990
 Fig A-6-B MARCH 1978

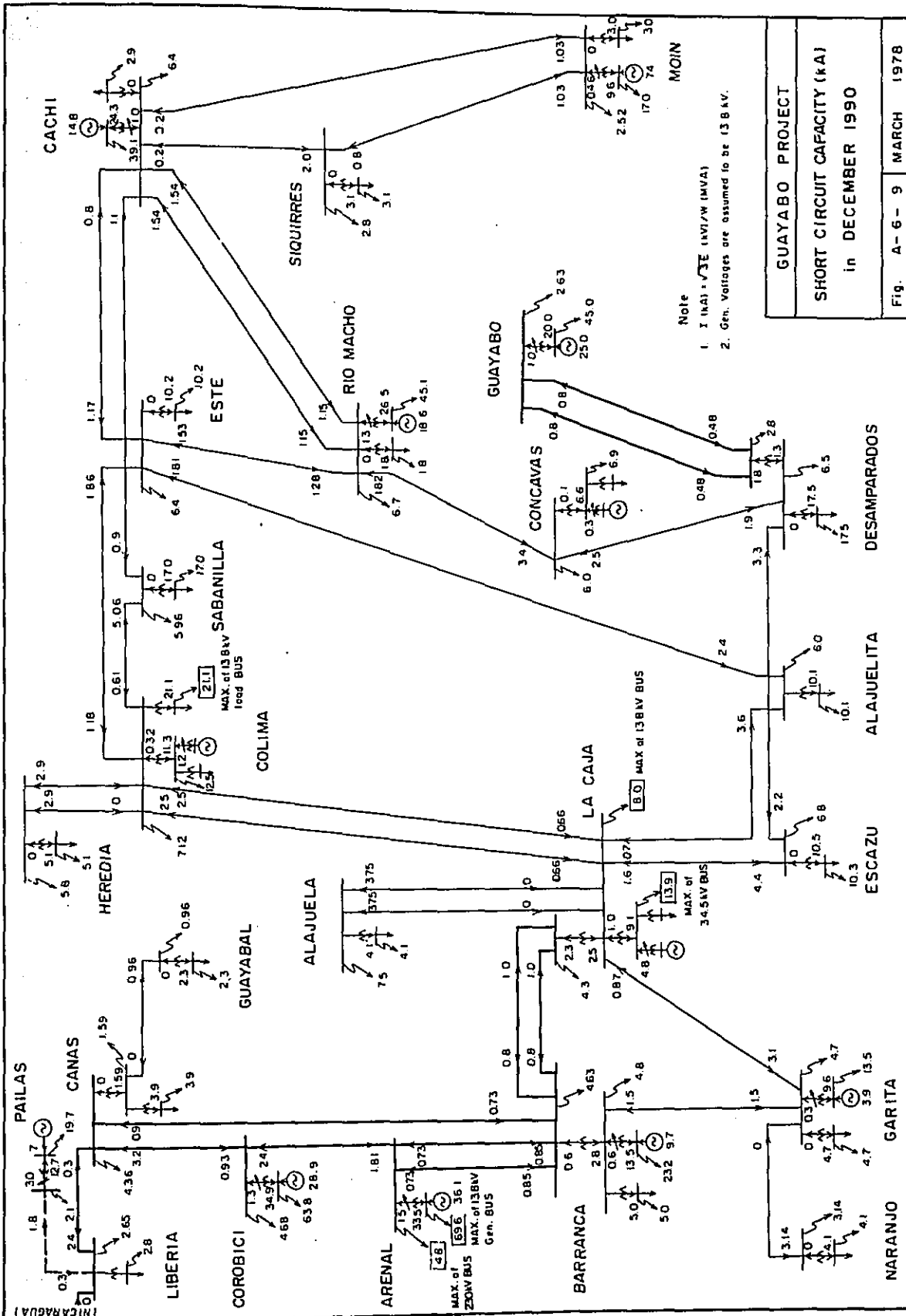
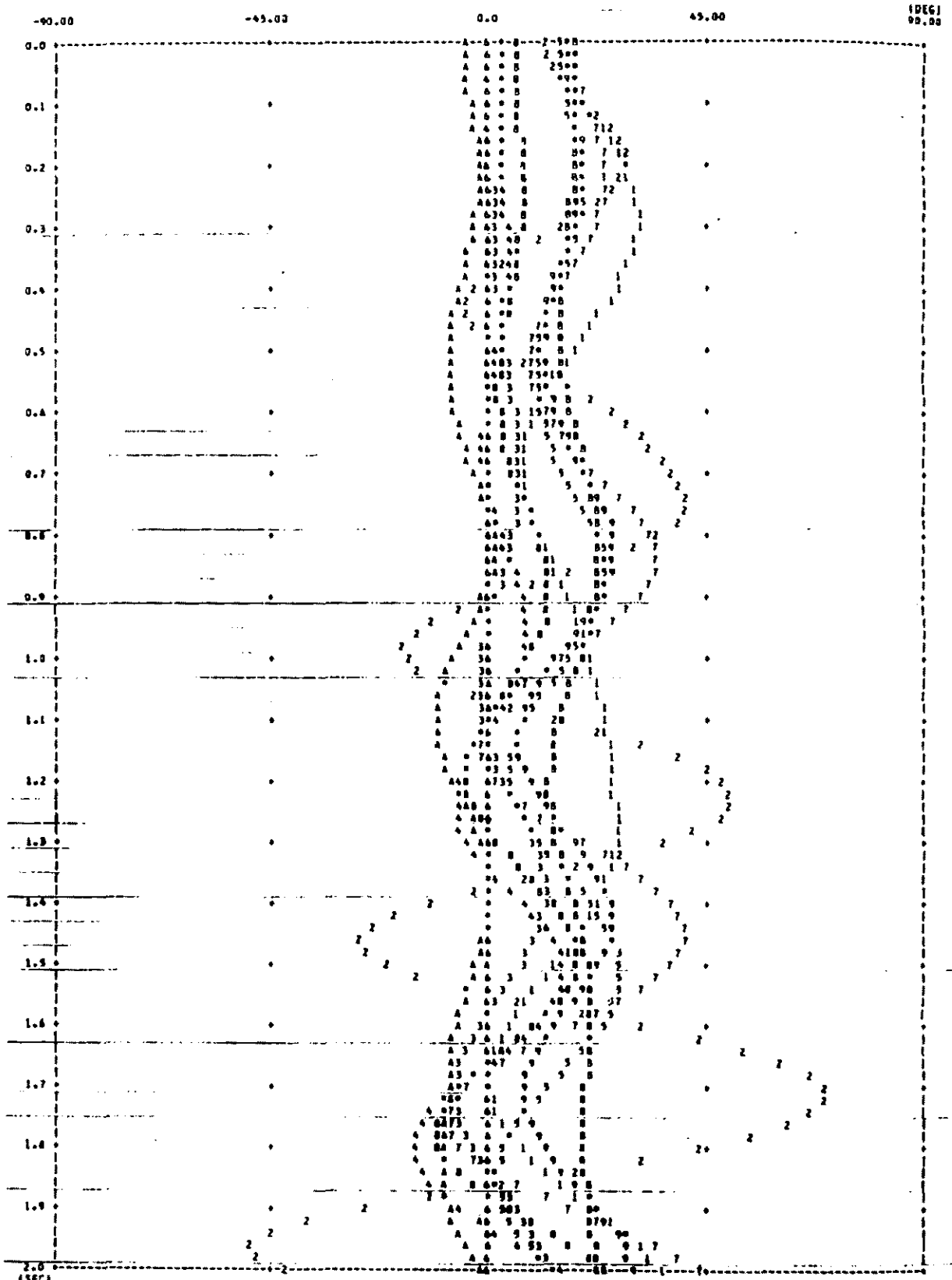


Fig. A-6-10

DECEMBER 1987.

GUAYABO I-CCT D-C-D AT 43.98 BUS BASE GENERATOR- & LA CAJA



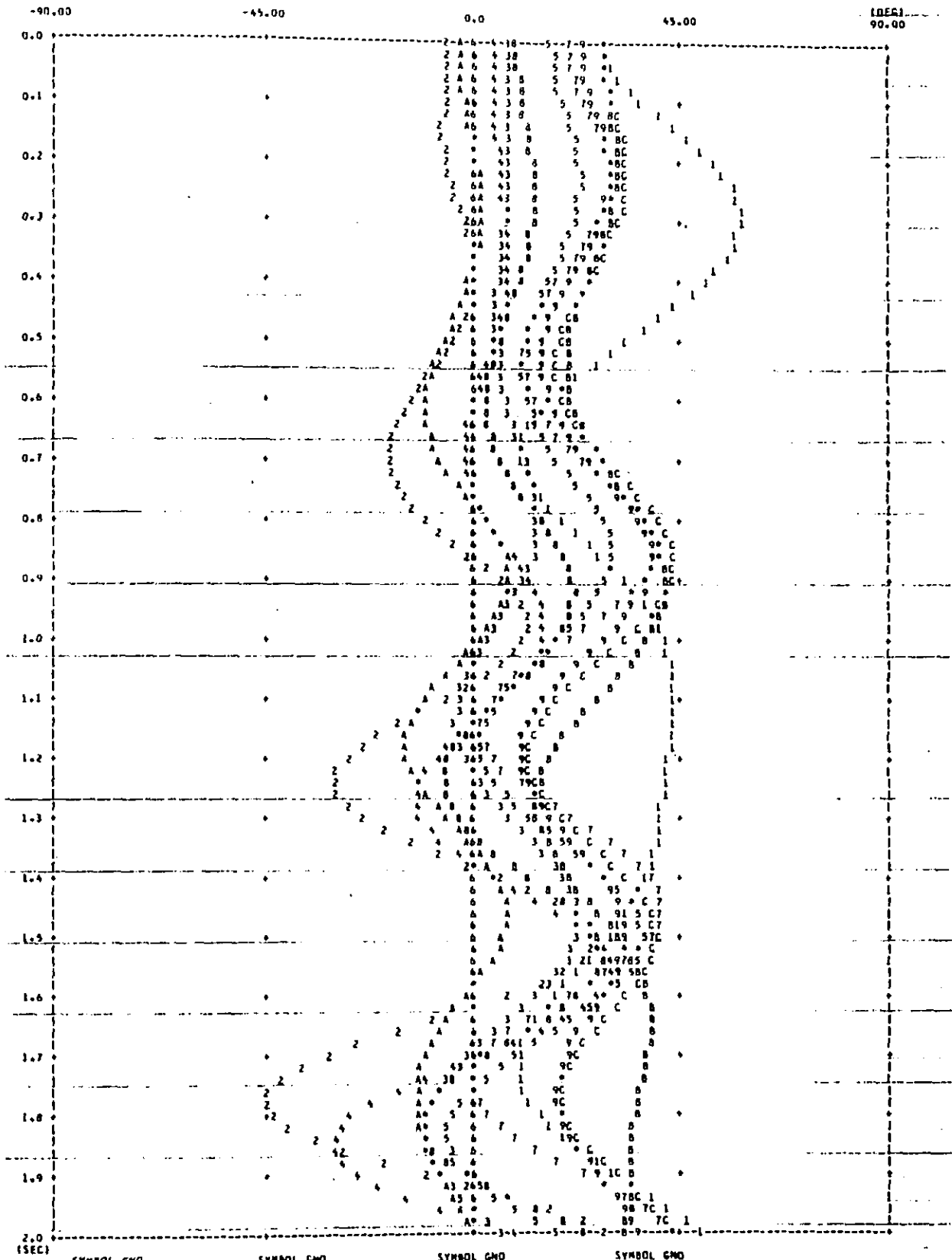
SYMBOL	GND	SYMBOL	GND	SYMBOL	GND	SYMBOL	GND
1*	1 GUAYABO PS	2*	2 CONCAVAS	3*	3 RIO RACHO	4*	4 MIEN PS
5*	5 CACHE	6*	6 LA CAJA	7*	7 GARITA	8*	8 BARRANCA
9*	9 ARENAL	A*	10 COLINA	8*	11 CONDIC		

Fig.A - 6-11

DECEMBER 1990.

GUAYABO I-CCT 0-C-Q AT MU.58 BJS

BASE GENERATOR- 6 LA CAJA



SYMBOL GND		SYMBOL GND		SYMBOL GND		SYMBOL GND	
1=	1 GUAYABO PS	2=	2 CONCAVAS	3=	3 RIO MACHO	4=	4 MOIN PS
5=	5 CACHI	6=	6 LA CAJA	7=	7 CARITA	8=	8 BARRANCA
9=	9 ARENAL	10=	10 COLINA	11=	11 COROBICI	12=	12 PALLAS

A-7 ボーリング柱状図

Geologic Log of Drill Hole

	Name of Hole	Location	Length of Hole (m)	Sheet	Remarks
Guayabo project	DB-3	Dam, Left bank	30.0	1-2	Water Pressure Test
	DB-4	Dam, Left bank	30.0	3-4	Water Pressure Test
	DB-5	Dam, Left bank	30.0	5-6	
	DB-6	Dam, Left bank	50.0	7-9	
	DB-7	Dam, Left bank	30.0	10-11	Water Pressure Test
	DB-9	Dam, Left bank	30.0	12-13	Water Pressure Test
	DB-10	Dam, Left bank	163.25	14-22	Water Pressure Test
	HB-1	Headrace tunnel	180.0	23-31	
	SB-1	Surge tank	116.5	32-37	
	PHB-1	Power House	25.35	38-39	
Siquirres Project	DB-1	Dam, Left bank	265.15	40-53	
	DB-2	Dam, Right bank	231.16	54-65	

Classification of Core Character in Drill Hole

WEATHERING		HARDNESS		CRACK INTERVAL	
5	The rock forming minerals and grains are completely deteriorated and discolored, and rock is remarkably weathered and loosened	E	The rock can be easily excavated with a hammer tip and easily broken with fingers and can be scratched by fingernail.	V	Cracks and joints are spaced less than 1 cm apart
4	Almost rock forming minerals and grains excluding quartz are slightly softend and altered. Somewhere, unweathered parts are remained as block or gravelin weathered parts	D	The rock is easily broken by blow of hammer. Sometimes snapped off by hands or can be whittled with a knife.	IV	Cracks and joints are spaced 1 to 5 cm apart
3	The rock forming minerals and grains are slightly softend and altered. Most of cracks, sometimes rock itself are stained by limonites etc. and some cracks are filled by clay materials.	C	The rock is broken by blow of hammer into small pieces to fragment with some amount of rock dust and powder.	III	Cracks and joints are spaced 5 to 10 cm apart
2	The rock forming minerals and grains are partially sustained with slight weathering and deterioration. Some of cracks are slightly stained but lacked clayey materials.	B	The rock is broken by strong blow of hammer into pieces to fragments with some amount of rock powder.	II	Cracks and joints are spaced 10 to 30 cm apart
1	The rock is very fresh, and the rock forming minerals and grains are neither weathered nor deteriorated.	A	The rock is broken by strong blow of hammer into sharp edged pieces or fragments with sharp fractures.	I	Cracks and joints spaced more than 30 cm apart

GEOLOGIC LOG OF DRILL HOLE

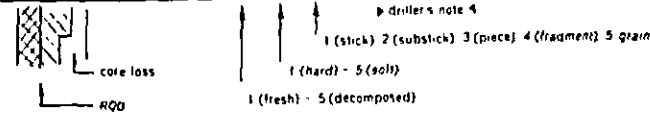
Sheet No. 1

GUAYABO PROJECT

HOLE No. DB-3 (SHEET 1 OF 2)

LOCATION <u>Left Bank, Damsite</u>	DEPTH OF HOLE <u>3000 m</u>	COMMENCED <u>8 Mar. '75</u>
ELEVATION <u>411.67 m</u>	DEPTH OF OVERBURDEN <u>8.90 m</u>	COMPLETED <u>1 Apr. '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>21.10 m</u>	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90 °</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE				DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING		WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	LUCEON	DEPTH		
0m			0-100											411.67	
1-8.9	Mud flow deposit			N.C.P.					Mainly andesitic fragments (max. 33cm) partially sandy cores. cores 4.3m long in total						
8.9														407.97	
8.9-11.6				N.B.					Brittle and very cracky, generally bearing fossil fragments.						
11.6-13.9									Brittle.						
13.9-14.07	Mudstone								Dip of bedding plane is about 20 degree.						
14.07-15.85															
15.85-19.6									Low grade of solidification, but generally sound.						
19.6-20														391.67	



GEOLOGIC LOG OF DRILL HOLE

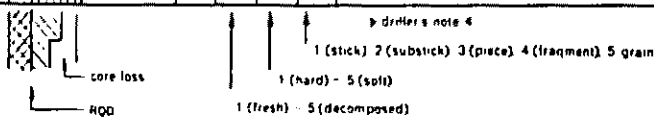
Sheet No. 2

GUAYABO PROJECT

HOLE No. DB-3 (SHEET 2 OF 2)

LOCATION <u>Left Bank, Damsite</u>	DEPTH OF HOLE <u>30.00</u> m	COMMENCED <u>8 - Mar. - '75</u>
ELEVATION <u>411.67</u> m	DEPTH OF OVERBURDEN <u>8.90</u> m	COMPLETED <u>1 - Apr. - '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>21.10</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION						
20m			0 - 100										20m	391.67	
1	Mudstone	NB	BST	NB	brownish gray	3	3	4 - 3	Generally bearing fossil fragments.	Lu = 18.6 (Max. P = 10.0 kg/cm ²)	Lu = 28.9 (Max. P = 10.0 kg/cm ²)	Lu = 21.7 (Max. P = 10.0 kg/cm ²)	1	22.0	
2								3					22.5		
3								3							
4								2							
5								3							
6								3							
7								3							
8								3							
9								3							
10								3							
25.17															
25													25		
1								4	Mostly cracky cores. partially granular cores.				1		
2														2	
3														3	
4														4	
5														5	
6														6	
7														7	
8														8	
9														9	
10														10	
25.32 - 25.37m															
25													25		
1													1		
2													2		
3													3		
4													4		
5													5		
6													6		
7													7		
8													8		
9													9		
10													10		
29.0															
29													29		
1													1		
2													2		
3													3		
4													4		
5													5		
6													6		
7													7		
8													8		
9													9		
10													10		
30													30	381.67	
1													1		
2													2		
3													3		
4													4		
5													5		
6													6		
7													7		
8													8		
9													9		
10													10		
30.00													30		



GEOLOGIC LOG OF DRILL HOLE

Sheet No. 3

GUAYABO PROJECT

HOLE No. DB-4 (SHEET 1 OF 2)

LOCATION <u>Left Bank, Damsite</u>	DEPTH OF HOLE <u>30.00</u> m	COMMENCED <u>6 -Apr- '75</u>
ELEVATION <u>416.94</u> m	DEPTH OF OVERBURDEN <u>6.10</u> m	COMPLETED <u>25 -Apr- '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>23.90</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION			
0m			0 → 100									416.94
1-6	Mud flow deposit	◇		N C.P					Mainly consists of hard andesitic fragments (Ø 2 ~ 45cm), matrix loss, partially sandy cores. Cores 4.0m long			413.24
6-7	Mudstone				greyish brown	3	3	3	Soft and brittle, generally bearing minute fossil fragments. 8.2 Dip of bed is 16°			410.84
7-9	Mudstone				greyish brown	3	3	4	Fragmental cores (Ø 1-2cm)			407.47
9-10	Sandstone				light gray	4	4	5	Granular cores. Soft rock but generally sound.			405.94
10-12	Mudstone			NB	light greyish brown	3	3	3	Low grade of solidification, but generally sound.			
12-15	Mudstone				light greyish brown	3	3	4	Granular cores.			
15-16						3	4	5	15.45			
16-18						4	5	5	16.15			
18-20						3	3	3	Bearing minute fossil fragments.			396.94

driller's note 4

1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain

1 (hard) - 5 (soft)

1 (fresh) - 5 (decomposed)

core loss

RQD

GEOLOGIC LOG OF DRILL HOLE

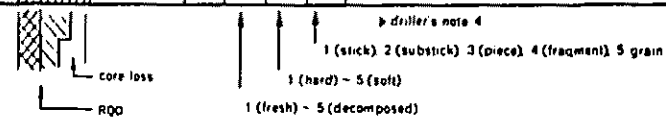
Sheet No. 4

GUAYABO PROJECT

HOLE No. DB-4 (SHEET 2 of 2)

LOCATION <u>Left Bank, Damsite</u>	DEPTH OF HOLE <u>30.00</u> m	COMMENCED <u>6 Apr. '75</u>
ELEVATION <u>416.94</u> m	DEPTH OF OVERBURDEN <u>6.10</u> m	COMPLETED <u>25 Apr. '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>23.90</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					DESCRIPTION	WATER TABLE			DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	WATER PRESSURE TEST		LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION		
20m			0 → 100 %										0	396.94 ^m	
1	Sandstone				gray	3	3	3		Partly break up to powder by hand.				1	
2										21.5				2	394.94
3														3	
4														4	
25	Mudstone			NB	light grayish brown	3	1	3		Somewhat brittle but generally sound.				25	
6										Dip of bed is 14°				6	
7										Gray sandstone at 25.05 - 25.17				7	
8										27.1				8	
9										Dip of bed is 20°				9	
30														30	386.94
1										Bottom of hole.				1	
2														2	
3														3	
4														4	
5														5	
6														6	
7														7	
8														8	
9														9	
10														10	



GEOLOGIC LOG OF DRILL HOLE

Sheet No. 5

GUAYABO PROJECT

HOLE No. DB-5 (SHEET 1 OF 2)

LOCATION	<u>Left Bank, Damsite</u>	DEPTH OF HOLE	30.00 m	COMMENCED	<u>10 Apr. '75</u>
ELEVATION	421.31 m	DEPTH OF OVERBURDEN	14.60 m	COMPLETED	<u>24 Apr. '75</u>
COORDINATE		LENGTH OF ROCK DRILLING	15.40 m	DRILLED BY	<u>I. C. E</u>
ANGLE FROM HORIZONTAL	90°	TOTAL LENGTH OF CORE	_____ m	LOGGED BY	_____
BEARING OF ANGLE HOLE	_____	CORE RECOVERY	_____ %		

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION					
0m			0 → 100%									0	421.31 m	
1		◇							Fine grained sand. cores 35cm long.				1	
2		◇							2.5				2	
3		◇											3	
4		◇											4	
5		◇											5	
6		◇							Mainly consists of hard andesitic fragments. (Ø max. 50cm), matrix loss.				6	
7		◇							Rock fragments consist of porous material and compact one.				7	
8		◇											8	
9		◇											9	
10		◇							Total core length is 9.3 m.				10	410.96
										10.35				
										Ground water level				
11		◇											11	
12		◇											12	
13		◇											13	
14		◇											14	
15		◇											15	
16		◇											16	
17		◇											17	
18		◇											18	
19		◇											19	
20		◇											20	401.31

driller's note 4

1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 (grain)

1 (hard) - 5 (soft)

1 (fresh) - 5 (decomposed)

core loss

RQD

GEOLOGIC LOG OF DRILL HOLE

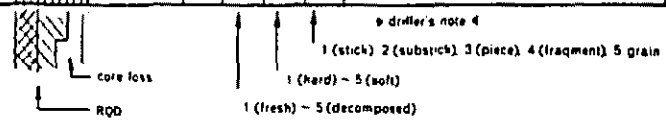
Sheet No. 6

GUAYABO PROJECT

HOLE No. DB-5 (SHEET 2 OF 2)

LOCATION <u>Left Bank, Dam site</u>	DEPTH OF HOLE <u>30.00</u> m	COMMENCED <u>10 Apr. '75</u>
ELEVATION <u>421.31</u> m	DEPTH OF OVERBURDEN <u>14.60</u> m	COMPLETED <u>24 Apr. '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>15.40</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION			
20.0			0-100%							LUGEON 0 10 20 30 40	20.0	401.31
1	Mudstone				light brownish gray		3	4	Fragmental and granular cores, brittle.		1	
2							3	4	Gray sandstone, brittle.		2	406.71
3	Mudstone				dark gray		3	4			3	
4							4	5	Soft, slickenside.		4	396.35
25							4	5	Light gray, fine grained sandstone		25	
6											6	
7	Sandstone				dark brownish gray		3	3	Somewhat brittle but generally sound.		7	
8							2	3			8	
9									Interbedded with dark brownish gray mudstone at 25.24 - 25.84 m.		9	
30									Bottom of hole		30	381.38



GEOLOGIC LOG OF DRILL HOLE

Sheet No. 7

GUAYABO PROJECT

HOLE No. DB-6 (SHEET 1 OF 3)

LOCATION	<u>Left Bank, Damsite</u>	DEPTH OF HOLE	<u>50.00</u> m	COMMENCED	<u>26 Apr. '75</u>
ELEVATION	<u>410.98</u> m	DEPTH OF OVERBURDEN	<u>10.00</u> m	COMPLETED	<u>28 May. '75</u>
COORDINATE		LENGTH OF ROCK DRILLING	<u>40.00</u> m	DRILLED BY	<u>I. C. E</u>
ANGLE FROM HORIZONTAL	<u>90°</u>	TOTAL LENGTH OF CORE	<u> </u> m	LOGGED BY	<u> </u>
BEARING OF ANGLE HOLE	<u> </u>	CORE RECOVERY	<u> </u> %		

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION			
0.5		△	0 = 100								0	410.98 ^m
0.5		△							Topsoil		0.5	410.48
1	Mud flow deposit	◇		NX, C.P.					Mainly consists of hard andesitic fragments. matrix no core. Total core length is 4.1 m.			
2		◇										
3		◇										
4		◇										
5		◇										
6		◇										
7		◇										
8		◇										
9		◇										
10		◇										
10.0											10.0	400.98
10.5	Mudstone				4	4-3-4-3			Strongly weathered, clayey.		10.5	400.48
11									Brittle, mostly 1-3cm fragments, generally bearing minute fossil fragments.			
12					4	1-4						
13					3	3						
13.5					3	3						397.48
13.8									Light gray fine grained sandstone		13.8	397.18
15	Mudstone				3	4-1-1			Fault breccia at 13.95 ~ 14.13 m.			
16					4	4-3						
16.18												394.80
16.5					3-2	2			Light brownish gray, fine grained sandstone		16.5	394.48
17	Mudstone				3	3			Somewhat brittle but generally sound.			
18					1	4						
19.16					2	3-4-4-5			Dip of bed is 15°		19.16	
19.5					3	3			Gray sandstone		19.5	391.82
20	M ₃				3	3-4-4-5			Brownish gray mudstone		20	391.48
20												390.98

* driller's note *

1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain

1 (hard) - 5 (soft)

1 (fresh) - 5 (decomposed)

core loss

H₂O

GEOLOGIC LOG OF DRILL HOLE

Sheet No. 8

GUAYABO PROJECT

HOLE No. DB-6 (SHEET 2 OF 3)

LOCATION <u>Left Bank, Damsite</u>	DEPTH OF HOLE <u>50.00</u> m	COMMENCED <u>26 - Apr. - '75</u>
ELEVATION <u>410.98</u> m	DEPTH OF OVERBURDEN <u>10.00</u> m	COMPLETED <u>28 - May - '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>40.00</u> m	DRILLED BY _____
ANGLE FROM HORIZONTAL <u>90 °</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
20m			0-100								0	20m	390.98
1	Mudstone				brownish gray		3	4		Brittle, mostly cracky cores, partially interbedded with thin sandstone		1	
2					brownish gray		3	4	21.6			2	389.18
3					brownish gray		4	5	22.4	Brittle		3	
4					brownish gray		3	3	23.1			4	
25	Conglomerate				light brownish gray		2	2	3	Generally hard, bearing fossil fragments (Ø 0.2 ~ 2.5cm)		25	
26					light brownish gray		3	3	2			26	
25.35									25.35				
25.96									4-34-5	Brittle		25.96	385.02
26.7	Sandstone						3	3-4	26.7	Light brownish gray, fine grained sandstone		26.7	383.96
27.02							4		27.02			27.02	
28.5	Mudstone				light brownish gray		4	4	5	Brittle, fragments and grains.		28.5	382.48
28.5							3	5					
30.0	Conglomerate								30.0			30	380.98
30													
35	Mudstone				dark gray		3	4	5	Very brittle, mostly granular to fragmental cores.		35	
35									35.0				
37							3	4		Fragment Ø 0.5 ~ 2cm, brittle.		37	
37							4						
40												40	370.98

↓ driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

GEOLOGIC LOG OF DRILL HOLE

Sheet No. 9

GUAYABO PROJECT

HOLE No. **DB-6** (SHEET 3 OF 3)

LOCATION <u>Left Bank, Damsite</u>	DEPTH OF HOLE <u>50.00</u> m	COMMENCED <u>26 Apr. '75</u>
ELEVATION <u>410.98</u> m	DEPTH OF OVERBURDEN <u>10.00</u> m	COMPLETED <u>28 May. '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>40.00</u> m	DRILLED BY _____
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE				DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER				
40m			0-100%												470.98m
1	Mudstone				dark gray		3	4	Dip of bed is 17°						
2							4								
3															
4	Cgl				light gray		3	3	Somewhat hard, bearing fossil fragments.	43.35					367.63
5	Ss			N			3		Light brownish gray sandstone.	44.45					366.53
6										45.75					365.23
7	Mudstone				dark gray		3	4	Fragments \varnothing 0.5~1.5 cm as a result of mudcrack which is produced after coring						
8							4								
9															
50										50.0					360.98
1									Bottom of hole						
2															
3															
4															
5															
6															
7															
8															
9															
0															

core loss log

> driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

GEOLOGIC LOG OF DRILL HOLE

Sheet No. 10

GUAYABO PROJECT

HOLE No. DB-7 (SHEET 1 OF 2)

LOCATION <u>Left Bank, Damsite</u>	DEPTH OF HOLE <u>30.00</u> m	COMMENCED <u>20 May '75</u>
ELEVATION <u>415.06</u> m	DEPTH OF OVERBURDEN <u>12.00</u> m	COMPLETED <u>7 Jun. '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>18.00</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION			
0m			0-100							0	415.06	
1	Mud flow deposit	[Hatched pattern]	[Dotted pattern]	N	C.P.	light brownish gray	3	5	Mainly consists of hard andesitic fragments (Ø max. 36cm), matrix no core. Cores 7.7m long in total.	LUGEON	40	0m
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												395.06

> driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

GEOLOGIC LOG OF DRILL HOLE

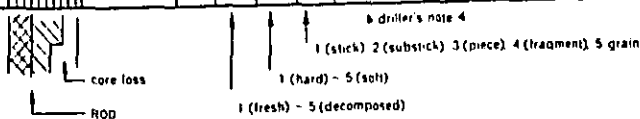
GUAYABO PROJECT

Sheet No. 11

HOLE No. DB-7 (SHEET 2 OF 2)

LOCATION Left Bank, Damsite DEPTH OF HOLE 30.00 m COMMENCED 20 May, '75
 ELEVATION 415.06 m DEPTH OF OVERBURDEN 12.00 m COMPLETED 7 Jun., '75
 COORDINATE _____ LENGTH OF ROCK DRILLING 18.00 m DRILLED BY I. C. E.
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE _____ m LOGGED BY _____
 BEARING OF ANGLE HOLE _____ CORE RECOVERY _____ %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT, CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION					
20m			0 - 100										20m	395.06
1	Mudstone				light brownish gray	3 4	4	5 4	Dip of bed is 18° 21.6					
2									Generally brittle, granular to fragmental cores.	Lu = 22.9 (Max. P = 100 kg/cm ²)				
3							3	4						
4							4	5						
25	Cgl.			80	gray			4	Conglomerate, bearing fossil fragment 25.7				25	390.26
6	Mudstone				whitish brown gray	3		4	Fragment # 0.5 ~ 3 cm Dip of bed is 15°	Lu = 30.2 (Max. P = 100 kg/cm ²)			6	389.36
7								4						
8							3	4						
8	Cgl.				gray			3	Conglomerate, bearing fossil fragment 27.95	Lu = 25.4 (Max. P = 100 kg/cm ²)			8	387.11
9								5						
9	Cgl.							5	Conglomerate, bearing fossil fragment 29.2				9	385.86
30	Ms.							3	Mudstone 30.0				30	385.06
								4	Bottom of hole					



GEOLOGIC LOG OF DRILL HOLE

Sheet No. 12

GUAYABO PROJECT

HOLE No. DB-9 (SHEET 1 of 2)

LOCATION <u>Left Bank, Damsite</u>	DEPTH OF HOLE <u>30.00</u> m	COMMENCED <u>18-Jun-'75</u>
ELEVATION <u>420.63</u> m	DEPTH OF OVERBURDEN <u>13.85</u> m	COMPLETED <u>27-Jun-'75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>16.15</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION						
0m			0 → 100									0	420.63		
1	Mud flow deposit	[Hatched pattern]	[Hatched pattern]	C.P.					Mainly consists of hard andesitic fragments. ϕ max. 22cm, partially gravels of sandstone.						
2															
3															
4															
5															
6															
7															
8															
9															
10															
11	Mudstone	[Cross-hatched pattern]	[Cross-hatched pattern]	B0	light greyish brown	3	1	5	13.0	Fine to medium grained sand	13.85				406.78
12															
13															
14	Mudstone	[Cross-hatched pattern]	[Cross-hatched pattern]		light greyish brown	3	4	4	17.8	Generally brittle, bearing minute fossil fragments					401.83
15															
16	Cgl	[Dotted pattern]	[Dotted pattern]		Light gray	3	4	5	18.8	Very brittle.	18.8				401.83
17															
18	Cgl	[Dotted pattern]	[Dotted pattern]		Light gray	3	3	3		Conglomerate, generally sound.					400.63
19															
20															

> driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

GEOLOGIC LOG OF DRILL HOLE

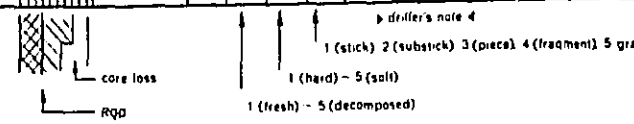
GUAYABO PROJECT

Sheet. No. 13

HOLE No. DB-9 (SHEET 2 OF 2)

LOCATION	<u>Left Bank, Dam site</u>	DEPTH OF HOLE	<u>30.00</u> m	COMMENCED	<u>18 Jun. '75</u>
ELEVATION	<u>420.63</u> m	DEPTH OF OVERBURDEN	<u>13.85</u> m	COMPLETED	<u>27 Jun. '75</u>
COORDINATE		LENGTH OF ROCK DRILLING	<u>16.15</u> m	DRILLED BY	<u>I. C. E</u>
ANGLE FROM HORIZONTAL	<u>90°</u>	TOTAL LENGTH OF CORE	<u> </u> m	LOGGED BY	<u> </u>
BEARING OF ANGLE HOLE	<u> </u>	CORE RECOVERY	<u> </u> %		

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT OR CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION						
20m			0-100%											400.63m	
1	Conglomerate	O O O O O	[Diagram]		whitish gray			3	3	Generally sound, pebble to granule.					
2															21.8 - 22.0 Mudstone
3															
4	Sandstone	•••••	[Diagram]				4	4	24.07				396.56		
25	Mudstone	[Diagram]	[Diagram]		light greyish brown		3	4	5	Generally brittle, granular to fragmental cores. Most cracks are produced after boring.				390.63	
6															
7															
8															
9															
30									30.0	Bottom of hole					



GEOLOGIC LOG OF DRILL HOLE

Sheet No. 14

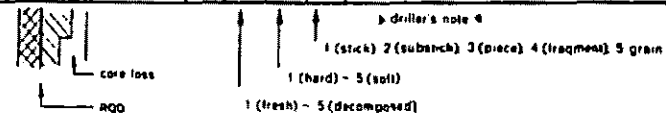
GUAYABO PROJECT

HOLE No. DB-10 (SHEET 1 OF 9)

LOCATION <u>Left Bank, Damsite</u>	DEPTH OF HOLE <u>163.25</u> m	COMMENCED <u>19-Jun-'75</u>
ELEVATION <u>410.98</u> m	DEPTH OF OVERBURDEN <u>17.25</u> m	COMPLETED <u>10-Sep-'75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>146.00</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>42°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE <u>S72°E</u>	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTA. TION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE				DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING		WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER				
9.5			0 - 100 %										0	410.98	
1		◇		NX					Mainly consists of hard andesitic fragments Ø 10-20cm. matrix no-core.						
2		◇		NX.C.P.											
3		◇													
4		◇													
5		◇													
6		◇													
7		◇													
8		◇													
9		◇													
10		◇													
11		◇													
12		◇													
13		◇													
14		◇													
15		◇						15.0							
16		◇							No core						
17		◇													
18		◇													
19		◇													
20	Mudstone			NB	Light brownish gray	3	3	4	18.0	Low grade of solidification, but somewhat good condition.				399.44	
20						2	3							397.60	

Mud flow deposit.



Lu = 32.6
(Max P = 100 kg/cm²)

GEOLOGIC LOG OF DRILL HOLE

GUAYA BO PROJECT

Sheet No. 15

HOLE No. **DB-10** (SHEET 2 OF 9)

LOCATION Left Bank, Dam site DEPTH OF HOLE 163.25 m COMMENCED 19 Jun. '75
 ELEVATION 410.98 m DEPTH OF OVERBURDEN 17.25 m COMPLETED 10 Sep. '75
 COORDINATE _____ LENGTH OF ROCK DRILLING 146.00 m DRILLED BY I. C. E.
 ANGLE FROM HORIZONTAL 42° TOTAL LENGTH OF CORE _____ m LOGGED BY _____
 BEARING OF ANGLE HOLE S 72° E CORE RECOVERY _____ %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE				DEPTH	ELEVATION										
					COLOR	WEATHERING	HARDNESS	CORE CUTTING		WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	LUCEON	LU			P	MAX. P								
20m			0-100												397.6										
1	Mudstone	NB	3	3	light brownish gray	3	3	4	Generally soft and brittle but somewhat good condition.	Lu = 27.5 (Max. P = 10.0 kg/cm ²)	Lu = 38.1 (Max. P = 10.0 kg/cm ²)	3	1	2	3										
2																3	1	4	Lu = 32.3 (Max. P = 10.0 kg/cm ²)	3	2	3			
3																4	4	Lu = 26.5 (Max. P = 10.0 kg/cm ²)					3	3	3
4																3	3								
25	2	2	Fragments, brittle.	3	3	3																			
6	2	2					35.1	3	3	3															
7	3	3									37.4	3	3	3											
8	3	3													Generally sound.	3	3	3							
9	3	3	Partially interbedded with thin conglomerate	3	3	3																			
30	3	3					385.95	3	3	3															
1	3	3									384.21	3	3	3											
2	3	3													3	3	3	3							
3	3	3	3	3	3	3																			
4	3	3					3	3	3	3															
25	3	3									3	3	3	3											
6	3	3													3	3	3	3							
7	3	3	3	3	3	3																			
8	3	3					3	3	3	3															
9	3	3									3	3	3	3											
40	3	3													3	3	3	3							

driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

core loss
 RQB

GEOLOGIC LOG OF DRILL HOLE

Sheet No. 16

GUAYABO PROJECT

HOLE No. DB-10 (SHEET 3 OF 9)

LOCATION <u>Left Bank Damsite</u>	DEPTH OF HOLE <u>163.25</u> m	COMMENCED <u>19 Jun. '75</u>
ELEVATION <u>410.98</u> m	DEPTH OF OVERBURDEN <u>17.25</u> m	COMPLETED <u>10 Sep. '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>146.00</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>42°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE <u>S72°E</u>	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
40m			0 - 100									384.21	
1	Sandstone	[Pattern]	[Pattern]	NB	whitish brown.	3	3	2	42.6	Brittle, slickenside	[Pattern]	[Pattern]	
2								3					
3								3-4					43.15
4								2					
5								4					
6								3					
7								2					
8								3					
9								2					
10								2					50.9
11								51.1				376.79	
12	Alternation of Sandstone and Mudstone	[Pattern]	[Pattern]	NB	stripes of gray and black	3	3	4	58.3	Sandstone is very fine grained, laminated. Mudstone core is deteriorated after coring	[Pattern]	[Pattern]	
13								3					
14								4					
15								3					
16								4					
17								3					
18								4					
19								3					
20								4					
21								3					58.3
22												370.83	

driller's note 4

1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain

1 (hard) - 5 (soft)

1 (fresh) - 5 (decomposed)

core loss

RQD

GEOLOGIC LOG OF DRILL HOLE

Sheet No. 17

GUAYABO PROJECT

HOLE No. DB-10 (SHEET 4 OF 9)

LOCATION	<u>Left Bank, Damsite</u>	DEPTH OF HOLE	<u>163.25 m</u>	COMMENCED	<u>19-Jun-'75</u>
ELEVATION	<u>410.98 m</u>	DEPTH OF OVERBURDEN	<u>17.25 m</u>	COMPLETED	<u>10-Sep-'75</u>
COORDINATE		LENGTH OF ROCK DRILLING	<u>146.00 m</u>	DRILLED BY	<u>I. C. E</u>
ANGLE FROM HORIZONTAL	<u>42°</u>	TOTAL LENGTH OF CORE	<u> m</u>	LOGGED BY	<u> </u>
BEARING OF ANGLE HOLE	<u>S72°E</u>	CORE RECOVERY	<u> %</u>		

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE				DEPTH	ELEVATION								
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER												
60.0			0 - 100										0	10	20	30	40	60m	370.83m				
1	Alternation of Sandstone and Mudstone	[Hatched Pattern]	[Hatched Pattern]	NB	grey	3	1	3	3	61.4	Slickenside along cracks								1				
2						3	3-4	4	62.0													2	
3						4			62.5	Sheared zone, no core													3
4						3																	4
65	Alternation of Ss/Ms	[Vertical Lines]	[Vertical Lines]	NB	grey	3-4				Very fine grained sandstone, laminated.									65				
6						3	4	4														6	
7						1	3																7
8						3																	8
9						3	1	2	3									9					
70						3	1	2	3									70					
71						3	4	4										71					
72						3	1	2										72					
73						3	1	2										73					
74						4-3	4		73.6									74					
75										Fossil bed, light brown								75					
76						3	1	2										76					
77						3-4	4		76.1									77					
78						2	1	3										78					
79						3												79					
80																		80	357.45				

Driller's note 4

1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain

1 (hard) - 5 (soft)

1 (fresh) - 5 (decomposed)

core loss

RQD

GEOLOGIC LOG OF DRILL HOLE

GUAYABO PROJECT

Sheet No. 19

LOCATION	<u>Left Bank, Damsite</u>	DEPTH OF HOLE	<u>163.25</u> m	COMMENCED	<u>19 Jun. '75</u>
ELEVATION	<u>410.98</u> m	DEPTH OF OVERBURDEN	<u>17.25</u> m	COMPLETED	<u>10 Sep. '75</u>
COORDINATE		LENGTH OF ROCK DRILLING	<u>146.00</u> m	DRILLED BY	<u>I. C. E</u>
ANGLE FROM HORIZONTAL	<u>42°</u>	TOTAL LENGTH OF CORE	_____ m	LOGGED BY	_____
BEARING OF ANGLE HOLE	<u>S 72° E</u>	CORE RECOVERY	_____ %		

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION			
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION						
10.0m			0-100%									344.07			
1-2	Alternation Ss/Ms	[Pattern]	[Pattern]		stripes of gray and black			3	Very fine grained sandstone, laminated						
2-3													3	102.9	342.13
3-4													2		
4-5													3		
5-6	Conglomerate	[Pattern]	[Pattern]		gray		3	3	Pebble conglomerate						
6-7													3	106.5	339.72
7-8	Sandstone and Mudstone	[Pattern]	[Pattern]		stripes of gray and black			2	Generally sound, somewhat hard, mostly 15 - 40cm cores.						
8-9													2		
9-10													1		
10-11													3		
11-12	Alternation of Sandstone and Mudstone	[Pattern]	[Pattern]		stripes of gray and black		2	3							
12-13													2		
13-14	Fossil bed	[Pattern]	[Pattern]		light gray		2	2	Containing shell-lime						
14-15													3	116.8	332.83
15-16	Fossil bed	[Pattern]	[Pattern]		light gray		4	5-4	118.1 Sheared zone						
16-17													3-2	118.7	331.5
17-18	Cgl	[Pattern]	[Pattern]		light gray		3	4-5	119.3 Sheared zone, granular or fragmental cores.						
18-19													4-5	119.3	330.68

↓ driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

GEOLOGIC LOG OF DRILL HOLE

Sheet No. 21

GUAYABO PROJECT

HOLE No. DB-10 (SHEET 8 OF 9)

LOCATION <u>Left Bank, Damsile</u>	DEPTH OF HOLE <u>163.25 m</u>	COMMENCED <u>19-Jun-'75</u>
ELEVATION <u>410.98 m</u>	DEPTH OF OVERBURDEN <u>17.25 m</u>	COMPLETED <u>10-Sep-'75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>146.00 m</u>	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>42°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE <u>S72°E</u>	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE				DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING		WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION			
140.3			0 = 100									0 10 20 30 40 14.0m	317.3			
1	Alternation of Sandstone and Mudstone	NB	stripes of grey and black.	2	3	2	1	3	Somewhat hard, generally sound. Sandstone is very fine grain, laminated	Partially clayey	LUGEON	DEPTH	ELEVATION			
2					3	2	1	3						141.85	1	317.3
3					2	1	3	142.1						2	317.2	
4					3	2	1	3						3	317.1	
5					3	2	1	3						4	317.0	
6					2	1	3	2						3	316.9	
7					3	2	1	3						3	316.8	
8					2	1	3	1						3	316.7	
9					3	2	1	3						3	316.6	
10					3	2	1	3						3	316.5	
11					3	2	1	3						3	316.4	
12					3	2	1	3						3	316.3	
13					3	2	1	3						3	316.2	
14					3	2	1	3						3	316.1	
15					3	2	1	3						3	316.0	
160													303.92			

↓ Driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

GEOLOGIC LOG OF DRILL HOLE

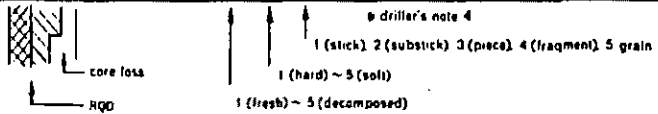
Sheet No. 22

GUA YABO PROJECT

HOLE No. DB-10 (SHEET 9 OF 9)

LOCATION <u>Left Bank, Damsite</u>	DEPTH OF HOLE <u>163.25</u> m	COMMENCED <u>19-Jun-'75</u>
ELEVATION <u>410.98</u> m	DEPTH OF OVERBURDEN <u>17.25</u> m	COMPLETED <u>10-Sep-'75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>146.00</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>42°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE <u>S72°E</u>	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					DESCRIPTION	WATER TABLE				DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	WATER PRESSURE TEST		LEAKAGE OF DRILLING WATER					
160m			D = 100								LUGEON					303.92
1	Alternation Ms/Ss	[Hatched Pattern]	[Hatched Pattern]	NB	stripes of grey and black	2	3	3 1 2	Somewhat brittle, but generally sound.	163.25	[Water Table Graph]				1	
2											2					
3											3					
4								Bottom of hole					4			
165													165			
6													6			
7													7			
8													8			
9													9			
0													0			
1													1			
2													2			
3													3			
4													4			
5													5			
6													6			
7													7			
8													8			
9													9			
0													0			



GEOLOGIC LOG OF DRILL HOLE

Sheet No. 23

GUAYABO PROJECT

HOLE No. HB-1 (SHEET 1 OF 9)

LOCATION <u>Headrace Tunnel</u>	DEPTH OF HOLE <u>180</u> m	COMMENCED <u> </u>
ELEVATION <u> </u> m	DEPTH OF OVERBURDEN <u>37.65</u> m	COMPLETED <u> </u>
COORDINATE <u> </u>	LENGTH OF ROCK DRILLING <u>142.35</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE <u> </u> m	LOGGED BY <u> </u>
BEARING OF ANGLE HOLE <u> </u>	CORE RECOVERY <u> </u> %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING			
0m			0-100%							0	4.3
1										1	
2										2	
3										3	
4										4	
5										5	
6										6	
7										7	
8										8	
9										9	
10										10	
11										11	
12										12	
13										13	
14										14	
15										15	
16										16	
17										17	
18										18	
19										19	
20										20	

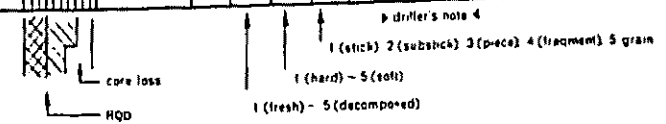
Agglomerate

No core

5.0

Low grade of solidification, mainly andesitic fragments (Ø 1-3 cm), matrix no core.

15.85
Greyish brown, silt and clay.
17.05



GEOLOGIC LOG OF DRILL HOLE

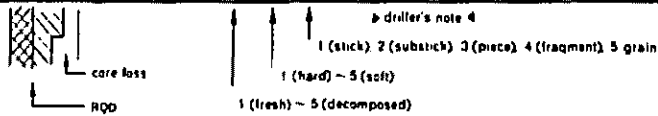
Sheet No. 24

GUAYABO PROJECT

HOLE No. HB-1 (SHEET 2 OF 9)

LOCATION <u>Headrace Tunnel</u>	DEPTH OF HOLE <u>180</u> m	COMMENCED <u>- -</u>
ELEVATION <u> </u> m	DEPTH OF OVERBURDEN <u>37.65</u> m	COMPLETED <u>- -</u>
COORDINATE <u> </u>	LENGTH OF ROCK DRILLING <u>142.35</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE <u> </u> m	LOGGED BY <u> </u>
BEARING OF ANGLE HOLE <u> </u>	CORE RECOVERY <u> </u> %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	LUCEON					
20m			0 → 100%								0 10 20 30 40	20m	47	
1	Agglomerate	◇								23.0		1		
2		◇										2		
3		◇										3		
4		◇										4		
25		◇										25		
6		◇										6		
7		◇										7		
8		◇									Low grade of solidification, mainly andesitic fragments (Ø 5 - 10cm), matrix no core.		8	
9		◇											9	
30		◇											30	
1	Mudstone	◇										1		
2		◇										2		
3		◇										3		
4		◇										4		
35		◇										35		
6		◇										6		
7		◇										7		
8		◇									37.65		8	
9		◇									Mostly soft and brittle. Core is decomposed after lifted.		9	
40		◇											40	



GEOLOGIC LOG OF DRILL HOLE

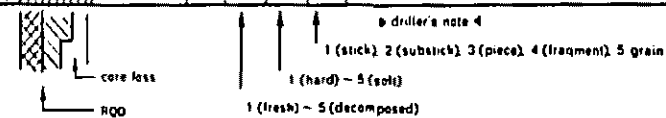
Sheet No. 26

GUAYABO PROJECT

HOLE No. HB-1 (SHEET 4 OF 9)

LOCATION <u>Headrace Tunnel</u>	DEPTH OF HOLE <u>180</u> m	COMMENCED <u>- - -</u>
ELEVATION <u> </u> m	DEPTH OF OVERBURDEN <u>37.65</u> m	COMPLETED <u>- - -</u>
COORDINATE <u> </u>	LENGTH OF ROCK DRILLING <u>42.35</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90 °</u>	TOTAL LENGTH OF CORE <u> </u> m	LOGGED BY <u> </u>
BEARING OF ANGLE HOLE <u> </u>	CORE RECOVERY <u> </u> %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE			DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING		WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER			
60m			0 - 100 %							LUGEON 0 10 20 30 40 50m				
1	Mudstone				light brownish gray			4	Fragments, poorly recovered.					1
2								62.3						2
3														3
4														4
65														65
6														6
7														7
8														8
9														9
70						gray	3	1	3	Poorly solidified, generally soft and brittle. Core is decomposed after drilling.				
1								4						1
2														2
3														3
4														4
75														75
6														6
7														7
8														8
9														9
80														80



GEOLOGIC LOG OF DRILL HOLE

Sheet No. 27

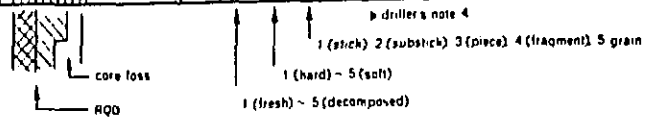
GUAYABO PROJECT

HOLE No. HB-1 (SHEET 5 of 9)

LOCATION Headrace Tunnel DEPTH OF HOLE 180 m COMMENCED - -
 ELEVATION - - m DEPTH OF OVERBURDEN 37.65 m COMPLETED - -
 COORDINATE - - - - LENGTH OF ROCK DRILLING 142.35 m DRILLED BY I. C. E.
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE - - m LOGGED BY - - - -
 BEARING OF ANGLE HOLE - - - - CORE RECOVERY - - %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE				DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING		WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER				
80m			0 → 100												
1															
2															
3															
4															
85															
6															
7															
8															
9															
90	Mudstone				gray	3	3	3	80.7						
1															
2															
3															
4															
95															
6															
7															
8															
9															
100									98.5						

Poorly solidified,
generally brittle, easily
breakable to fragment.
Mostly bearing minute
fossil fragments.



GEOLOGIC LOG OF DRILL HOLE

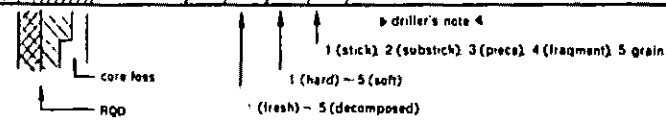
Sheet No. 28

GUAYABO PROJECT

HOLE No. HB-1 (SHEET 6 OF 9)

LOCATION <u>Headrace Tunnel</u>	DEPTH OF HOLE <u>180</u> m	COMMENCED <u>- -</u>
ELEVATION _____ m	DEPTH OF OVERBURDEN <u>37.65</u> m	COMPLETED <u>- -</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>142.35</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE				DEPTH	ELEVATION					
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER									
100m			0-100%										0	10	20	30	40	100m	43	
1	Mudstone	gray							Poorly solidified, brittle, Mostly flaky cores.											
2																				
3																				
4																				
5																				
6																				
7																				3 3
8																				1 1 4
9																				2 4
10																				114.4
11	Poorly solidified, but generally sound.																			
12																				
13																				
14																				
15																				
16																				
17																				3 2
18																				Surface of core is decomposed after boring.
19																				
20																				



GEOLOGIC LOG OF DRILL HOLE

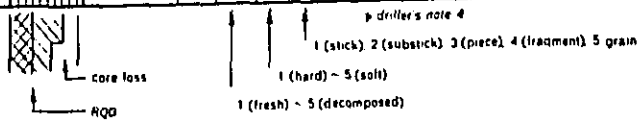
GUAYABO PROJECT

Sheet No. 29

HOLE No. HB-1 (SHEET 7 OF 9)

LOCATION	Headrace Tunnel	DEPTH OF HOLE	180 m	COMMENCED	-
ELEVATION	_____ m	DEPTH OF OVERBURDEN	37.65 m	COMPLETED	-
COORDINATE	_____	LENGTH OF ROCK DRILLING	142.35 m	DRILLED BY	I. C. E
ANGLE FROM HORIZONTAL	90°	TOTAL LENGTH OF CORE	_____ m	LOGGED BY	_____
BEARING OF ANGLE HOLE	_____	CORE RECOVERY	_____ %		

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION										
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION															
120.0			100									0	10	20	30	40	120m							
1	Mudstone				gray	3	1	2	3	2	Poorly solidified, generally brittle, mostly 15 cm cores. Surface of core is decomposed.	0	10	20	30	40	125	E						
2																								
3																								
4																								
5																								
6																								
7																								
8																			127.9					
9																			3	1	4	3	4	Soft and brittle, flaky cores.
10																								
11																								
12																								
13	132.85																							
14	3	4	3	4	Brittle, flaky cores.																			
15																								
16																								
17																								
18	137.85																							
19	4	4	4	4	Unconsolidated, soft, easily breakable to grain by hand.																			
20																								



GEOLOGIC LOG OF DRILL HOLE

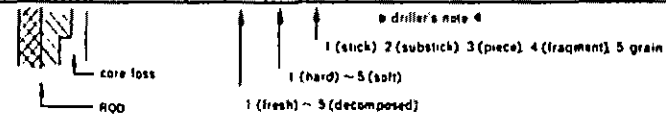
Sheet No. 30

GUAYABO PROJECT

HOLE No. HB-1 (SHEET 8 OF 9)

LOCATION <u>Headrace Tunnel</u>	DEPTH OF HOLE <u>180</u> m	COMMENCED <u> </u>
ELEVATION <u> </u> m	DEPTH OF OVERBURDEN <u>37.65</u> m	COMPLETED <u> </u>
COORDINATE <u> </u>	LENGTH OF ROCK DRILLING <u>142.35</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90 °</u>	TOTAL LENGTH OF CORE <u> </u> m	LOGGED BY <u> </u>
BEARING OF ANGLE HOLE <u> </u>	CORE RECOVERY <u> </u> %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
140			0-100									140	
1	Mudstone	•••••			gray	3		4				1	
2	Sandstone	•••••			whitish brown	3	4	4		Very brittle, granular or fragmental cores.		2	
3								5				3	
4												4	
145												145	
6												6	
7												7	
8												8	
9						3	3	3		Poorly solidified, mostly 1-10cm cores.		9	
150	Mudstone	•••••			gray	1		2		Surface of core is decomposed.		150	
1												1	
2												2	
3												3	
4												4	
155												155	
6												6	
7												7	
8												8	
9												9	
160												160	



GEOLOGIC LOG OF DRILL HOLE

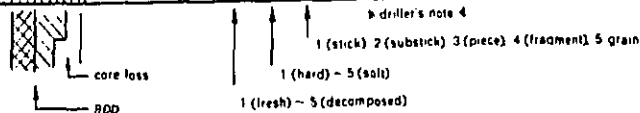
GUAYABO PROJECT

Sheet No. 31

HOLE No. HB-1 (SHEET 9 OF 9)

LOCATION <u>Headrace Tunnel</u>	DEPTH OF HOLE <u>180</u> m	COMMENCED <u> </u> - <u> </u> - <u> </u>
ELEVATION <u> </u> m	DEPTH OF OVERBURDEN <u>37.65</u> m	COMPLETED <u> </u> - <u> </u> - <u> </u>
COORDINATE <u> </u>	LENGTH OF ROCK DRILLING <u>142.35</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90</u> °	TOTAL LENGTH OF CORE <u> </u> m	LOGGED BY <u> </u>
BEARING OF ANGLE HOLE <u> </u>	CORE RECOVERY <u> </u> %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING				
160m	Mudstone		0 - 100%		gray				Poorly solidified, brittle, mostly 5-25cm cores, generally bearing minute fossil fragments. Surface of core is decomposed.		0	160m
1												
2												
3												
4												
6												
7												
8												
9												
169.9												
170	Cgl	O	O	2	3	170.8	170					
1	Mudstone				gray			Same condition as 160 - 169.0 m.		0	170	
2												
3												
4												
6												
7												
8												
9												
180												



GEOLOGIC LOG OF DRILL HOLE

Sheet No. 32

GUAYABO PROJECT

HOLE No. SB-1 (SHEET 1 OF 6)

LOCATION <u>Surge Tank</u>	DEPTH OF HOLE <u>116.50</u> m	COMMENCED <u>14 Dec. '74</u>
ELEVATION <u>456.64</u> m	DEPTH OF OVERBURDEN <u>11.60</u> m	COMPLETED <u>16 Jan. '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>104.90</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE			DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER				
0			0 → 100										0	456.64	
0.5	Topsoil	△							Reddish brown.				0.5		
1	Residual soil	△							Strongly weathered, very soft, granular or fragmental cores.				1	455.64	
2		△												2	
3		△												3	
4		△												4	
5		△												5	
6		△												6	
7		△												7	
8		△												8	
9		△												9	
10		△												10	
11													11		
11.6													11.6	445.04	
12	Sandstone	△							Poorly solidified, fine grained tuffaceous sandstone, mostly bearing minute fossil fragments, strongly weathered, very brittle.				12		
13		△												13	
14		△												14	
15		△												15	
16		△												16	
17		△												17	
18		△												18	
19		△												19	
20												20	436.64		

driller's note 4

1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain

1 (hard) - 5 (soft)

1 (fresh) - 5 (decomposed)

core loss

RQD

GEOLOGIC LOG OF DRILL HOLE

Sheet No. 34

GUAYABO PROJECT

HOLE No. SB-1 (SHEET 3 OF 6)

LOCATION	Surge Tank	DEPTH OF HOLE	116.50 m	COMMENCED	14 Dec. '74
ELEVATION	456.64 m	DEPTH OF OVERBURDEN	11.60 m	COMPLETED	16 Jan. '75
COORDINATE		LENGTH OF ROCK DRILLING	104.90 m	DRILLED BY	I. C. E
ANGLE FROM HORIZONTAL	90°	TOTAL LENGTH OF CORE		LOGGED BY	
BEARING OF ANGLE HOLE		CORE RECOVERY			

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE			DESCRIPTION	WATER TABLE				DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS		WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER				
40m			0-100									40m	416.64m	
1					4-3	4-3	4	40.2						
2					3	3		Slightly fractured zone at 30.4 - 48.35, 42.2 mostly brittle.						
3					3	3	3							
4					4	4								
45					4	4	5	450 Fault breccia clayey.					411.64	
6					3	3	4	Soft and brittle.						
7					4	4	3							
8					4	4	4-5	479 48.35 Altered, clayey					408.74	
9					3	3	3							
50	Sandstone	NB			greenish gray	3-4	4		Poorly solidified, brittle and cracky					
1						3	4	3						
2						3	4	3						
3						3	4	3						
4						3	4	3						
5						3	4	3						
6						3	4	3						
7						3	4	3						
8						3	4	3						
9						3	4	3						
55								53.7 - 54.0m Very soft						
6					3-4	3-4	4							
7							3							
8					3	3	3							
9							3							
60							2						396.64	

↓ driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

GEOLOGIC LOG OF DRILL HOLE

GUAYABO PROJECT

Sheet No. 35

LOCATION	Surge Tank	DEPTH OF HOLE	116.50 m	COMMENCED	14 Dec. '74
ELEVATION	456.64 m	DEPTH OF OVERBURDEN	11.60 m	COMPLETED	16 Jan. '75
COORDINATE		LENGTH OF ROCK DRILLING	104.90 m	DRILLED BY	I. C. E
ANGLE FROM HORIZONTAL	90°	TOTAL LENGTH OF CORE		LOGGED BY	
BEARING OF ANGLE HOLE		CORE RECOVERY			

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION			
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION						
60m			0-100%									396.64 m			
1	Sandstone	X	[Pattern]	NB	greenish gray					LUGEN 0 10 20 30 40 60m	1				
2									Very fine grained, and partially silty, laminated, tuffaceous.		2				
3												3			
4												3	63.5		
65												4	Generally containing microfossils and minute fossil fragments	4	
6												3		6	
7												4	Altered zone. clayey	7	
8												3		8	
9												2		9	
70												2	69.1	70	
1	Sandstone	X	[Pattern]	BST	greenish gray					LUGEN 0 10 20 30 40 60m	1				
2									Slightly well solidified, generally sound.		2				
3												3		3	
4												3		4	
75												1		75	
6												2		6	
7												4	78.2-78.43 m altered, clayey.	7	
8												3		8	
9												1		9	
80												2	78.5	80	376.64

driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

core loss
AQD

GEOLOGIC LOG OF DRILL HOLE

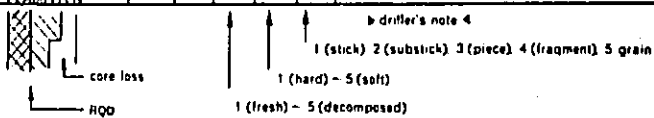
Sheet No. 36

GUAYABO PROJECT

HOLE No. SB-1 (SHEET 5 OF 6)

LOCATION	Surge Tank	DEPTH OF HOLE	116.50 m	COMMENCED	14 Dec '74
ELEVATION	456.64 m	DEPTH OF OVERBURDEN	11.60 m	COMPLETED	16 Jan '75
COORDINATE		LENGTH OF ROCK DRILLING	104.90 m	DRILLED BY	I. C. E
ANGLE FROM HORIZONTAL	90°	TOTAL LENGTH OF CORE		LOGGED BY	
BEARING OF ANGLE HOLE		CORE RECOVERY			

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE				DEPTH	ELEVATION										
					COLOR	WEATHERING	HARDNESS	CORE CUTTING		WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION												
80m			0 - 100%											376.64											
1	Sandstone	[Pattern]	[Pattern]		greenish gray				Generally sand, mostly 10-15cm cores.	LUGEON				[Scale]											
2																									
3																									
4																									
85																									
86.2																									
7	Ms	[Pattern]	[Pattern]		greenish gray			Gray mudstone	86.9					370.44											
8	Sandstone	[Pattern]	[Pattern]		greenish gray			Gray mudstone	87.9					368.74											
9	Ms	[Pattern]	[Pattern]		greenish gray	3	3-4	4	Gray mudstone	88.35															
90																									
1	Sandstone	[Pattern]	[Pattern]		greenish gray				Medium to coarse grained, tuffaceous and generally contained minute fossil fragments. Cracks are stained with limonite. partially interbedded with thin mudstone.	LUGEON				[Scale]											
2																									
3																									
4																									
95																									
98.9 - 99.1m																									
										Altered clayey															
100																									356.64



GEOLOGIC LOG OF DRILL HOLE

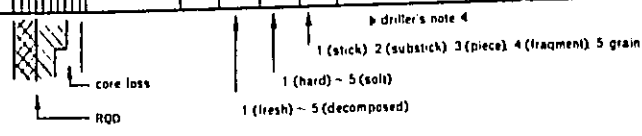
Sheet No. 37

GUAYABO PROJECT

HOLE No. SB-1 (SHEET 6 OF 6)

LOCATION	Surge Tank	DEPTH OF HOLE	116.50 m	COMMENCED	14 Dec. '74
ELEVATION	456.64 m	DEPTH OF OVERBURDEN	11.60 m	COMPLETED	16 Jan. '75
COORDINATE		LENGTH OF ROCK DRILLING	104.90 m	DRILLED BY	I. C. E
ANGLE FROM HORIZONTAL	90°	TOTAL LENGTH OF CORE	_____ m	LOGGED BY	_____
BEARING OF ANGLE HOLE	_____	CORE RECOVERY	_____ %		

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE			DESCRIPTION	WATER TABLE				DEPTH	ELEVATION			
					COLOR	WEATHERING	HARDNESS		WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	LUGEON	DEPTH			ELEVATION		
100.0			0 - 100										356.64				
1-4	Sandstone	[Pattern]			greenish. gray			Same condition as 88.35 - 100.0 m	LUGEON								
5-6									3	3	3	10			20	30	40
7-8									2	2	2						
9-10									3	3	3						
105								102.7 - 102.8 clayey									
109.5				BST									347.14				
110-115	Conglomerate	[Pattern]			various colores			Generally sound, well cemented, hard. 1130 Tuffaceous granule conglomerate, bearing fossil fragments.	LUGEON								
116									2	2	2						
117									3	3	3						
118									2	2	2						
119									3	3	3						
116.5													340.14				
120								Bottom of hole									



GEOLOGIC LOG OF DRILL HOLE

Sheet No. 38

GUAYABO PROJECT

HOLE No. PHB-1 (SHEET 1 of 2)

LOCATION <u>Powerhouse</u>	DEPTH OF HOLE <u>25.35</u> m	COMMENCED <u>6 -Feb- '75</u>
ELEVATION _____ m	DEPTH OF OVERBURDEN <u>5.00</u> m	COMPLETED <u>13 -Feb- '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>20.35</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION			
0.0			0 - 100							0	4.3	
1	River deposit		100	C.P.	dark gray	2	3	4	3	Mainly andesitic and basaltic gravel (Ø 5-20cm, max. 30cm)	3.9	Ground water level.
2												
3												
4												
5												
6	Dolerite		100	N.B.	dark gray	2	3	4	3	Generally fresh and hard, mostly 5-15cm cores.	7.85	
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

driller's note 4

1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain

1 (hard) - 5 (soft)

1 (fresh) - 5 (decomposed)

core loss

ROD

GEOLOGIC LOG OF DRILL HOLE

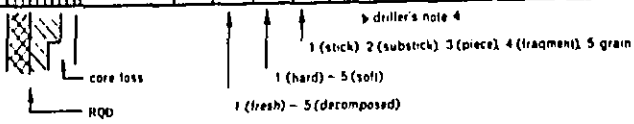
GUAYABO PROJECT

Sheet No. 39

HOLE No. PHB-1 (SHEET 2 OF 2)

LOCATION Powerhouse DEPTH OF HOLE 25.35 m COMMENCED 6 Feb. '75
 ELEVATION _____ m DEPTH OF OVERBURDEN 5.00 m COMPLETED 13 Feb. '75
 COORDINATE _____ LENGTH OF ROCK DRILLING 20.35 m DRILLED BY I. C. E
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE _____ m LOGGED BY _____
 BEARING OF ANGLE HOLE _____ CORE RECOVERY _____ %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE				DEPTH	ELEVATION				
					COLOR	WEATHERING	HARDNESS	CORE CUTTING		WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	LUGEN							
20m			0 - 100										0	20m	43				
1	Dolerite	L	L	NB	dark gray.	2	2	3	Intergranular texture, fresh and hard.					1					
2		L	L											2		2	3	2	2
3		L	L											3		3	2		3
4		L	L																4
25		L	L																25
6								Bottom of hole.					6						
7													7						
8													8						
9													9						
30													30						
1													1						
2													2						
3													3						
4													4						
5													5						
6													6						
7													7						
8													8						
9													9						
0													0						



GEOLOGIC LOG OF DRILL HOLE

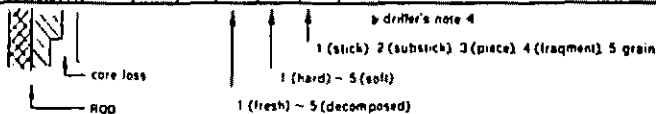
Sheet No. 40

SIQUIRRAS PROJECT

HOLE No. DB-1 (SHEET 1 OF 14)

LOCATION <u>Left Bank, Damsite</u>	DEPTH OF HOLE <u>265.15</u> m	COMMENCED <u>11 - Nov - '74</u>
ELEVATION <u>256</u> m	DEPTH OF OVERBURDEN <u>25.65</u> m	COMPLETED <u>27 - Feb - '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>239.50</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING				
0m			0 → 100 %								0m	256
1	Topsoil	△							light brown.		1	
2		△						1.5	greyish brown		2	
3		△							3.0		3	253.0
4	Residual soil	△							Basalt, completely weathered, clayey		4	
5		△						4			5	
6		△						5	5.5		6	250.5
7	Basalt	V									7	
8		V						2			8	
9		V						3	6.4		9	
10	Basalt	V									10	
11		V						3			11	
12		V						2	7.9	Weathered basalt lava.	12	
13	Basalt	V									13	
14		V						2			14	
15		V						3			15	
16	Weathered basalt	◇									16	
17		◇									17	
18		◇									18	
19	Weathered basalt	V									19	
20		V									20	
21		V									21	243.0
22	Weathered basalt	◇									22	
23		◇									23	
24		◇									24	
25	Weathered basalt	V									25	
26		V									26	
27		V									27	
28	Weathered basalt	◇									28	
29		◇									29	
30		◇									30	
31	Weathered basalt	V									31	
32		V									32	
33		V									33	
34	Weathered basalt	◇									34	
35		◇									35	
36		◇									36	
37	Weathered basalt	V									37	
38		V									38	
39		V									39	
40	Weathered basalt	◇									40	
41		◇									41	
42		◇									42	
43	Weathered basalt	V									43	
44		V									44	
45		V									45	
46	Weathered basalt	◇									46	
47		◇									47	
48		◇									48	
49	Weathered basalt	V									49	
50		V									50	
51		V									51	
52	Weathered basalt	◇									52	
53		◇									53	
54		◇									54	
55	Weathered basalt	V									55	
56		V									56	
57		V									57	
58	Weathered basalt	◇									58	
59		◇									59	
60		◇									60	
61	Weathered basalt	V									61	
62		V									62	
63		V									63	
64	Weathered basalt	◇									64	
65		◇									65	
66		◇									66	
67	Weathered basalt	V									67	
68		V									68	
69		V									69	
70	Weathered basalt	◇									70	
71		◇									71	
72		◇									72	
73	Weathered basalt	V									73	
74		V									74	
75		V									75	
76	Weathered basalt	◇									76	
77		◇									77	
78		◇									78	
79	Weathered basalt	V									79	
80		V									80	
81		V									81	
82	Weathered basalt	◇									82	
83		◇									83	
84		◇									84	
85	Weathered basalt	V									85	
86		V									86	
87		V									87	
88	Weathered basalt	◇									88	
89		◇									89	
90		◇									90	
91	Weathered basalt	V									91	
92		V									92	
93		V									93	
94	Weathered basalt	◇									94	
95		◇									95	
96		◇									96	
97	Weathered basalt	V									97	
98		V									98	
99		V									99	
100	Weathered basalt	◇									100	236
101		◇									101	
102		◇									102	



GEOLOGIC LOG OF DRILL HOLE

SQUIRRES. PROJECT

Sheet No. 41
HOLE No. DB-1 (SHEET 2 OF 14)

LOCATION <u>Left Bank, Damsite</u>	DEPTH OF HOLE <u>265.15 m</u>	COMMENCED <u>11 Nov. '74</u>
ELEVATION <u>256 m</u>	DEPTH OF OVERBURDEN <u>25.65 m</u>	COMPLETED <u>27 Feb. '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>239.50 m</u>	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT OR CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING				
20.0			0 - 100								20.0	236
1	Weathered basalt	◇			light grayish brown	4	4	5	Autobrecciated lava, strongly weathered, very soft.		1	
2		◇								2		
3		◇								3		
4		◇							24.0		4	
25	Basalt	◇			dark gray	2	2	3	Lava, amygdaloidal, generally hard.		25	
25.3		◇				3	2	2	25.3		25.3	
25.65						4	4		25.65		25.65	230.35
6	Weathered basalt	◇				3	3	4	Weathered lava, slightly brittle Many small gas cavities.		6	
7		◇				4				7		
8		◇							28.32		8	
9	Basalt	◇				2	2	3	Fresh, hard.		9	
30		◇								30		
30.8		◇							30.8		30.8	
1	Weathered basalt	◇				3	3	4	Autobrecciated lava, fragmental cores.		1	
2		◇				2	2	3	32.55		2	
3		◇									3	
4	Basalt	◇				3	3	4	Autobrecciated lava, many small gas cavities, slightly brittle.		4	
35		◇				2	2	3	35.9		35	
35.9									35.9		35.9	220.1
6	Basalt	◇				2	2	1	Lava, fresh, hard and compact, mostly 10-30 cm cores (max. 35 cm)		6	
7		◇								7		
8		◇								8		
9		◇								9		
40										40	216	

driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

core loss
RQD

GEOLOGIC LOG OF DRILL HOLE

Sheet No. 42

SQUIRRES. PROJECT

HOLE No. DB-1 (SHEET 3 OF 14)

LOCATION <u>Left Bank, Dam site</u>	DEPTH OF HOLE <u>265.15</u> m	COMMENCED <u>11 Nov. '74</u>
ELEVATION <u>256</u> m	DEPTH OF OVERBURDEN <u>25.65</u> m	COMPLETED <u>27 Feb. '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>239.50</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE			DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING		WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH		
40m			0 - 100%									40m	212.3	
1		V					2	1				1		
2		V				dark gray	2	2				2		
3		V				dark gray						3		
4		V				dark gray			43.7			4		
5		V				purplish gray	2	3	4	Many small gas cavities partially amygdaloidal, slightly brittle.		5		
6		V				purplish gray	1	1	1			6		
7		V				purplish gray	3	2	3	45.67		7	208.7	
8		V				dark gray			3			8		
9		V				dark gray	2	2	1	Massive lava, fresh and hard.		9		
10	Basalt	V		NB		dark gray			1	Dip of flow structure is 32 degree.		10		
11		V				dark gray			2			11		
12		V				dark gray			3			12		
13		V				dark gray			3			13	202.8	
14		V				purplish gray	2	1	4	Autobrecciated lava, generally sound		14		
15		V				purplish gray	1	3	3	54.55		15		
16		V				purplish gray			2			16	199.55	
17		V				blueish black	2	2				17		
18		V				blueish black			3	Fresh and hard, mostly 5-10cm cores.		18		
19		V				blueish black						19		
20		V				blueish black						20	196	

↓ driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

GEOLOGIC LOG OF DRILL HOLE

SIQUIRRES PROJECT

Sheet No. 43

LOCATION	<u>Left Bank, Damsite</u>	DEPTH OF HOLE	<u>265.15</u> m	COMMENCED	<u>11-Nov-'74</u>
ELEVATION	<u>256</u> m	DEPTH OF OVERBURDEN	<u>25.65</u> m	COMPLETED	<u>27-Feb-'75</u>
COORDINATE		LENGTH OF ROCK DRILLING	<u>239.50</u> m	DRILLED BY	<u>I. C. E</u>
ANGLE FROM HORIZONTAL	<u>90°</u>	TOTAL LENGTH OF CORE	<u> </u> m	LOGGED BY	<u> </u>
BEARING OF ANGLE HOLE	<u> </u>	CORE RECOVERY	<u> </u> %		

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHER- ING	HARD- NESS	CORE CUTTING	DESCRIPTION			
60m			0-100								60m	196.4
1		V					3	61.0			1	195.0
2		V									2	
3		V									3	
4		V					2	2	Autobrecciated lava, fresh and hard, Mostly small gas cavi- ties (Ø 1 - 3mm)		4	
65		V									65	
6		V									6	
7		V									7	
8		V						68.1			8	187.9
9		V					2				9	
70	basalt	V		NB					Massive lava, many gas cavities (Ø 1-7mm) generally sound.		70	
1		V					2	3			1	
2		V					1	1			2	
3		V					3	4			3	
4		V									4	
75		V						74.55			75	181.55
6		V					2	1	Autobrecciated lava, fresh and hard.		6	180.1
7		V						75.9			7	
8		V					2	2	Massive lava.		8	
9		V									9	
80		V									80	176

driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

GEOLOGIC LOG OF DRILL HOLE

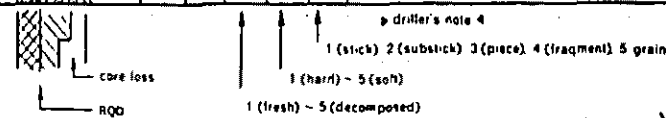
Sheet No. 44

SQUIRRES PROJECT

HOLE No. DB - 1 (SHEET 5 OF 14)

LOCATION <u>Left Bank, Dam site</u>	DEPTH OF HOLE <u>265.15</u> m	COMMENCED <u>11 - Nov - '74</u>
ELEVATION <u>256</u> m	DEPTH OF OVERBURDEN <u>25.65</u> m	COMPLETED <u>27 - Feb - '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>239.50</u> m	DRILLED BY <u>L.C.E.</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION				
80m			0 - 100								40	80m	176
1		V					2	2	Massive lava, fresh and hard			1	
2		V					4	81.75				2	
3		V					3		Mostly many little gas cavities and a few amygdaloids			3	
4		V				2						4	
5		V				1	4					5	
6		V				3	3	85.9				6	
7		V					3		Massive lava, mostly 5 - 10cm cores.			7	
8		V					3	87.8				8	
9		V					2					9	
10		V				2	2	89.3				10	
11	Basalt	V		NB			3	90.6				11	165.4
12		V					2-3		Autobrecciated lava, quartz veins produced along cracks.			12	
13		V					4					13	162.6
14		V						93.4				14	
15		V							Massive lava, fresh, hard and compact. slightly weathered along cracks.			15	
16		V				2	2					16	
17		V					1					17	
18		V					3					18	
19		V						99.5				19	156.5
100		V				2-3	3		Autobrecciated lava			100	156



GEOLOGIC LOG OF DRILL HOLE

Sheet No. 45

SIQUIRRES. PROJECT

HOLE No. DB - 1 (SHEET 6 OF 14)

LOCATION	Left Bank, Damsite	DEPTH OF HOLE	265.15 m	COMMENCED	11 - Nov - '74
ELEVATION	256 m	DEPTH OF OVERBURDEN	25.65 m	COMPLETED	27 - Feb - '75
COORDINATE		LENGTH OF ROCK DRILLING	239.50 m	DRILLED BY	I. C. E
ANGLE FROM HORIZONTAL	90°	TOTAL LENGTH OF CORE		LOGGED BY	
BEARING OF ANGLE HOLE		CORE RECOVERY			

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION				
10.0m			0-100%								100m	156.0	
1		V			purplish gray	2-3	3	4	Autobrecciated lava, slightly brittle		1	154.8	
2		V			purplish gray	2	2		Lava, mostly hard, generally produced many small gas cavities. Partially cracky — Slickenside		2		
3		V				2	2					3	
4		V				2-3	4					4	
5		V				2	2					5	
6		V				2-3	4				6		
7		V				2	2				7	149.0	
8		V			dark gray	2-3	4		Autobrecciated lava, slightly brittle.		8		
9		V				2	2					9	147.0
10	Basalt	V		NB	dark gray	2	1		Lava, fresh, hard and compact. 111.1 - 114.0m, Mostly produced many small gas cavities (Ø 2-10mm) and a few amygdaloids.		10		
11		V				2	1					11	
12		V				2	3					12	
13		V				2	3					13	
14		V			purplish gray	2	2		Slightly autobrecciated lava, hard.		14		
15		V				2	1					15	
16		V				2	1		Autobrecciated lava.		16	139.2	
17		V			2	4					17		
18		V			purplish gray	2	1		Slightly autobrecciated lava, hard.		18		
19		V				2	1					19	
20		V				2	2		Autobrecciated lava.		20	136	

driller's note 4
1 (stick) 2 (substick) 3 (piece) 4 (hammer) 5 grain

1 (hard) - 5 (soft)

1 (fresh) - 5 (decomposed)

core loss

900

GEOLOGIC LOG OF DRILL HOLE

Sheet No. 46

SQUIRRES. PROJECT :

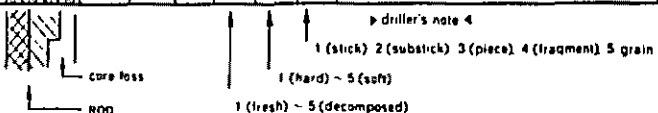
PROJECT :

HOLE No. DB-1

(SHEET 7 OF 14)

LOCATION Left Bank, Damsite DEPTH OF HOLE 265.15 m COMMENCED 11 - Nov. - '74
 ELEVATION 256 m DEPTH OF OVERBURDEN 25.65 m COMPLETED 27 - Feb. - '75
 COORDINATE _____ LENGTH OF ROCK DRILLING 239.50 m DRILLED BY I. C. E
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE _____ m LOGGED BY _____
 BEARING OF ANGLE HOLE _____ CORE RECOVERY _____ %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING			
120m			0 - 100							120m	136.4
120.4							2 2				135.6
1	V									1	
2	V									2	
3	V									3	
4	V									4	
125	V				dark gray	2 1 1	2 1 1			125	
6	V									6	
7	V									7	
8	V									8	
9	V									9	
130	V	Basalt		NB						130	
1	V						3			1	
2	V									2	123.8
3	V						2			3	
4	V				purplish gray	2	3			4	
135	V									135	
6	V									6	
7	V									7	118.9
8	V				bluish black	2 1 1	2 1 1			8	
9	V									9	
140	V									140	116



GEOLOGIC LOG OF DRILL HOLE

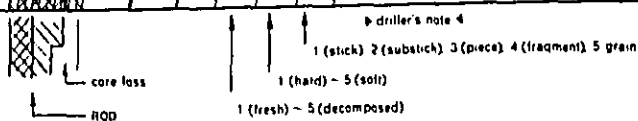
SIQUIRRES PROJECT

Sheet No. 47

HOLE No. DB - 1 (SHEET B OF 14)

LOCATION	<u>Left Bank, Dam site</u>	DEPTH OF HOLE	<u>265.15 m</u>	COMMENCED	<u>11 - Nov. - '74</u>
ELEVATION	<u>256 m</u>	DEPTH OF OVERBURDEN	<u>25.65 m</u>	COMPLETED	<u>27 - Feb. - '75</u>
COORDINATE		LENGTH OF ROCK DRILLING	<u>239.50 m</u>	DRILLED BY	<u>J. C. E</u>
ANGLE FROM HORIZONTAL	<u>90°</u>	TOTAL LENGTH OF CORE	<u> m</u>	LOGGED BY	<u> </u>
BEARING OF ANGLE HOLE	<u> </u>	CORE RECOVERY	<u> %</u>		

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING				
14.0m			0 = 100%								14.0m	116 m
1		V							Massive lava, fresh, hard and compact.		1	
2		V									2	
3		V			2	2					3	
4		V			1	1	2		Fragmental cores at 144.2 - 144.32m		4	
145		V									145	
6		V							146.25		6	109.75
7		◇					2		Purplish autobrecciated lava, amygdaloidal		7	108.85
8		V					1				8	
9		V					3-4		Lava, fresh and hard.		9	
150		V					2-1				150	
1	Basalt	V		N B	2	2	4		Partially produced small gas cavities (Ø max. 2 cm)		1	
2		V					2		152.2		2	103.8
3		◇					1		Purplish autobrecciated lava.		3	
4		V					1		153.6		4	102.4
155		V							155.25		155	
6		V							Massive lava, fresh and hard,	156.0	6	100.0
7		V									7	
8		V			2	2	2				8	
9		V			1	1			159.0		9	97.0
160		◇							Autobrecciated lava.		160	96



GEOLOGIC LOG OF DRILL HOLE

Sheet No. 48

SQUIRRES. PROJECT

HOLE No. DB-1 (SHEET 9 OF 14)

LOCATION <u>Left Bank, Damsite</u>	DEPTH OF HOLE <u>265.15</u> m	COMMENCED <u>11 Nov. '74</u>
ELEVATION <u>256</u> m	DEPTH OF OVERBURDEN <u>25.65</u> m	COMPLETED <u>27 Feb. '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>239.50</u> m	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE		DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING		WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER			
16.0m			0-100								0	16.0m	98.6	
1		◇				2-1	2-1	2	Autobrecciated lava.					
1		V				2	2	4						94.6
2		V						3	161.4					
3		V							Massive lava, fresh, hard and compact.					
4		V							Partially produced a few small gas cavities.					
165		V							165.8					
6		V							166.9					89.1
7		◇							Autobrecciated lava, fresh and hard.					
8		V												
9		◇												
170	Basalt	V		N B		2	1							
1		◇												
2		V												
3		V							172.7					83.3
4		V												
175		V							Massive lava, fresh, hard and compact					
6		V												
7		V												
8		V												
9		V												
180		V												76

Driller's note 4

1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain

1 (hard) ~ 5 (soft)

1 (fresh) ~ 5 (decomposed)

core loss

aqo

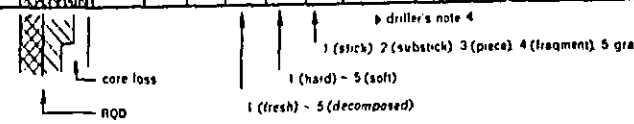
GEOLOGIC LOG OF DRILL HOLE

SQUIRRES PROJECT

Sheet No. 49

LOCATION: Left Bank, Dam site HOLE No. DB - 1 (SHEET 10 OF 14)
 ELEVATION: 256 m DEPTH OF HOLE: 265.15 m COMMENCED: 11 - Nov. - '74
 COORDINATE: _____ DEPTH OF OVERBURDEN: 25.65 m COMPLETED: 27 - Feb. - '75
 ANGLE FROM HORIZONTAL: 90° LENGTH OF ROCK DRILLING: 239.50 m DRILLED BY: I.C.E
 BEARING OF ANGLE HOLE: _____ TOTAL LENGTH OF CORE: _____ m LOGGED BY: _____
 CORE RECOVERY: _____ %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT Casing	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION			
18.0m			0 - 100								18.0m	76.3
1		V							Massive lava.		1	
2		V				2					2	
3		V				1					3	
4		V				1					4	
185											185	
6		◇			blueish black				Autobrecciated lava		6	70.4
7		V				2	2	2	Many little gas cavities (Ø 1-2mm)		7	
8		V				1					8	
9		V				1			Autobrecciated lava		9	
190	Basalt	◇		N B							190	65.35
1		V				2	1	1	Lava, generally produced many gas cavities (Ø 1-10mm)		1	
2		V				2					2	
3		V									3	63.0
4		◇							Autobrecciated lava, hard.		4	
195		V			greyish black	2	2	1	Lava, hard		195	61.3
6		V				1		3			6	
7		V				2	4-3	4	Soft, clayey.		7	59.3
8		V			blueish black	2	2	2	Lava, fresh, hard and compact.		8	
9		V				1					9	
200		V									200	56



GEOLOGIC LOG OF DRILL HOLE

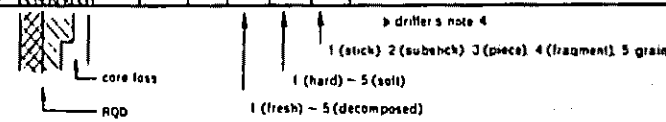
Sheet No. 50

SIQUIRRAS. PROJECT

HOLE No. DB - 1 (SHEET 11 OF 14)

LOCATION	Left Bank, Dam site	DEPTH OF HOLE	265.15 m	COMMENCED	11 - Nov. - '74
ELEVATION	256 m	DEPTH OF OVERBURDEN	25.65 m	COMPLETED	27 - Feb. - '75
COORDINATE		LENGTH OF ROCK DRILLING	239.50 m	DRILLED BY	I. C. E
ANGLE FROM HORIZONTAL	90°	TOTAL LENGTH OF CORE		LOGGED BY	
BEARING OF ANGLE HOLE		CORE RECOVERY			

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION			
200m			0 - 100								402.00m	58 m
1		V										
2		V					2		Massive lava, fresh hard and compact, mostly 15-40 cm cores.			
3		V					1					
4		V					1					
5		V					4		Slickensides along cracks.			
6		V										
7		V				2	2					
8		V				1	1					
9		V				1	1					
10		V						2				
11	Basalt	V		NB	blueish black			1				
12		V										
13		V										
14		V										
15		V										
16		V										
17		V										
18		V										
19		V										
20		V										
21		V										
22		V										
23		V										
24		V										
25		V										
26		V										
27		V										
28		V										
29		V										
30		V										
31		V										
32		V										
33		V										
34		V										
35		V										
36		V										
37		V										
38		V										
39		V										
40		V										
41		V										
42		V										
43		V										
44		V										
45		V										
46		V										
47		V										
48		V										
49		V										
50		V										
51		V										
52		V										
53		V										
54		V										
55		V										
56		V										
57		V										
58		V										
59		V										
60		V										
61		V										
62		V										
63		V										
64		V										
65		V										
66		V										
67		V										
68		V										
69		V										
70		V										
71		V										
72		V										
73		V										
74		V										
75		V										
76		V										
77		V										
78		V										
79		V										
80		V										
81		V										
82		V										
83		V										
84		V										
85		V										
86		V										
87		V										
88		V										
89		V										
90		V										
91		V										
92		V										
93		V										
94		V										
95		V										
96		V										
97		V										
98		V										
99		V										
100		V										
101		V										
102		V										
103		V										
104		V										
105		V										
106		V										
107		V										
108		V										
109		V										
110		V										
111		V										
112		V										
113		V										
114		V										
115		V										
116		V										
117		V										
118		V										
119		V										
120		V										



GEOLOGIC LOG OF DRILL HOLE

SQUIRRES. PROJECT

Sheet No. 51

HOLE No. DB-1 (SHEET 12 OF 14)

LOCATION Left Bank, Dam site DEPTH OF HOLE 265.15 m COMMENCED 11 Nov. '74
 ELEVATION 256 m DEPTH OF OVERBURDEN 25.65 m COMPLETED 17 Feb. '75
 COORDINATE _____ LENGTH OF ROCK DRILLING 239.50 m DRILLED BY I. C. E
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE _____ m LOGGED BY _____
 BEARING OF ANGLE HOLE _____ CORE RECOVERY _____ %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION			
220m			0 → 100								220m	56
1	Basalt	V			blueish black	2	2	2	221.9	Massive lava, generally sound		
2		V										
3		V										
4		V										
5		V										
6		V										
7		V										
8		V										
9		V							229.16			
10		V										
11	Mudstone				raddish brown	4	4	4	230.16	Soft and brittle, looks like fine grained tuff		25.84
12						2	3	3	231.85			24.15
13		◇				3	2	2		Autobrecciated lava, slightly brittle		
14		V				2	1	3	233.2			22.8
15		V										
16	Basalt	V			blueish brown	2	2	3		Massive lava, hard and compact.		
17		V				1	1	1				
18		V				1	1	2				
19		V										
20		V										
21		V										
22		V										
23		V										
24		V										
25		V										
26		V										
27		V										
28		V										
29		V										
30		V										
31		V										
32		V										
33		V										
34		V										
35		V										
36		V										
37		V										
38		V										
39		V										
40		V										
41		V										
42		V										
43		V										
44		V										
45		V										
46		V										
47		V										
48		V										
49		V										
50		V										
51		V										
52		V										
53		V										
54		V										
55		V										
56		V										
57		V										
58		V										
59		V										
60		V										
61		V										
62		V										
63		V										
64		V										
65		V										
66		V										
67		V										
68		V										
69		V										
70		V										
71		V										
72		V										
73		V										
74		V										
75		V										
76		V										
77		V										
78		V										
79		V										
80		V										
81		V										
82		V										
83		V										
84		V										
85		V										
86		V										
87		V										
88		V										
89		V										
90		V										
91		V										
92		V										
93		V										
94		V										
95		V										
96		V										
97		V										
98		V										
99		V										
100		V										

↓ core loss
 ↓ RQD
 ↑ 1 (fresh) - 5 (decomposed)
 ↑ 1 (hard) - 5 (soft)
 ↑ 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 ↑ driller's note 4

GEOLOGIC LOG OF DRILL HOLE

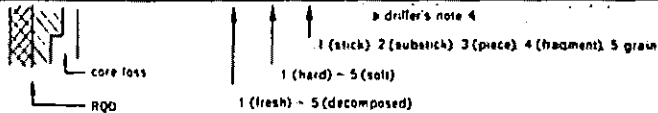
Sheet No. 52

SQUIRRES. PROJECT

HOLE No. DB - 1 (SHEET 13 OF 14)

LOCATION	Left Bank, Damsite	DEPTH OF HOLE	265.15 m	COMMENCED	11 Nov. '74
ELEVATION	256 m	DEPTH OF OVERBURDEN	25.65 m	COMPLETED	27 Feb. '75
COORDINATE		LENGTH OF ROCK DRILLING	239.50 m	DRILLED BY	I. C. E
ANGLE FROM HORIZONTAL	90°	TOTAL LENGTH OF CORE	_____ m	LOGGED BY	_____
BEARING OF ANGLE HOLE	_____	CORE RECOVERY	_____ %		

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION			
24.0m			0-100								24.0m	16 m
1		V			bluish black	2	2	3	Massive lava			
2		V			bluish black	1	1	1				
3		V			bluish black	1	1	2				
4		V			bluish black				244.5			11.5
245		◇			reddish brown	3	3	2	Autobrecciated lava, generally slickenside produced, brittle			245
6		V			reddish brown	2	1	3				6
7		V			reddish brown				246.8			9.2
8		V			reddish brown							8
9		V			reddish brown							9
250	Basalt	V		NB	bluish black	2	2	2	fresh and hard			250
1		V			bluish black	1	1	1				1
2		V			bluish black	1	1	1				2
3		V			bluish black							3
4		V			bluish black				253.8			2.2
255		◇			dark gray			3	Autobrecciated lava			255
6		V			dark gray	3	1	3	Lava, slightly brittle			6
7		V			dark gray	2	2	4	256.6			7
8		V			dark gray			3	Slightly sheared, slickenside			8
260	Mudstone	V			reddish brown	3	1	3	Poorly solidified, generally soft and brittle, slickenside			260
		V			reddish brown	4			258.0			- 2.0
		V			reddish brown	3	1	3				9
		V			reddish brown	4						- 4.0



GEOLOGIC LOG OF DRILL HOLE

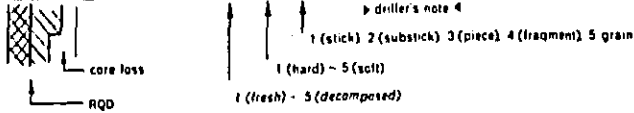
SIQUIRRES PROJECT

Sheet No. 53

HOLE No. DB-1 (SHEET 14 OF 14)

LOCATION Left Bank, Dam site DEPTH OF HOLE 265.15 m COMMENCED 11 Nov. '74
 ELEVATION 256 m DEPTH OF OVERBURDEN 25.65 m COMPLETED 27 Feb. '75
 COORDINATE _____ LENGTH OF ROCK DRILLING 239.50 m DRILLED BY _____
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE _____ m LOGGED BY _____
 BEARING OF ANGLE HOLE _____ CORE RECOVERY _____ %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION				
26.0m			0 - 100%								26.0m	-4.0 m	
1	Mudstone	[Hatched pattern]	NB	reddish brown	greenish gray	2	3	1	3	Generally soft and brittle, no calcareous.	262.0	1	
2													
3													
4													
265											265	-9.5	
6									Bottom of hole		6		
7											7		
8											8		
9											9		
0											0		
1											1		
2											2		
3											3		
4											4		
5											5		
6											6		
7											7		
8											8		
9											9		
0											0		



GEOLOGIC LOG OF DRILL HOLE

Sheet No. 54

SIQUIRRES. PROJECT

HOLE No. DB-2 (SHEET 1 OF 12)

LOCATION <u>Right Bank, Damsite</u>	DEPTH OF HOLE <u>231.16</u> m	COMMENCED <u>23 May. '75</u>
ELEVATION <u>207.5</u> m	DEPTH OF OVERBURDEN <u>3.10</u> m	COMPLETED <u>26 Jul. '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>228.06</u> m	DRILLED BY <u>I. C. E.</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING				
0			0 → 100							0	207.5	
0.3	Tapsoil	△										
1		△										
2		△										
3.1											204.4	
4	Basalt	V										
5.25		V									202.55	
6		◇										
7.88		V										199.62
8		◇										
9		V										
10		V										
11		V										
12		V										
13		V										
14.5												
16.23												
17												
18												
19												
20											187.5	

Driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

GEOLOGIC LOG OF DRILL HOLE

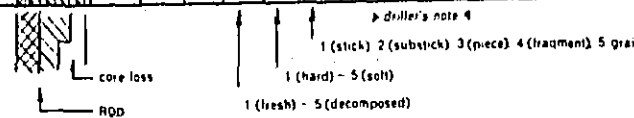
SIQUIRES. PROJECT

Sheet No. 55

HOLE No. DB-2 (SHEET 2 OF 12)

LOCATION Right Bank, Damsite DEPTH OF HOLE 231.16 m COMMENCED 23 May '75
 ELEVATION 207.5 m DEPTH OF OVERBURDEN 3.10 m COMPLETED 26 Jul. '75
 COORDINATE _____ LENGTH OF ROCK DRILLING 228.06 m DRILLED BY I.C.E.
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE _____ m LOGGED BY _____
 BEARING OF ANGLE HOLE _____ CORE RECOVERY _____ %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
20m			0 - 100									20m	187.5
1	Basalt	V								Lava, compact and hard, cracks weathered to brown.			
2		V											
3		V				2	2			23.6			
4		V											
25		V										25	
6		V								26.4		6	
7		V			dark gray	2	2	4	1	Many gas cavities, slightly brittle.		7	
8		V								27.5		8	
9		V										9	
30		V										30	
1		V										1	
2		V										2	
3		V										3	
4		V								33.55		4	
35		V										35	
6		V			purplish black	2	3	1	4	Many gas cavities, slightly brittle.		6	
7		V								35.7		7	
8		V										8	
9		V			dark gray	2	2	2	1	Lava, generally sound.		9	
40		V										40	167.5



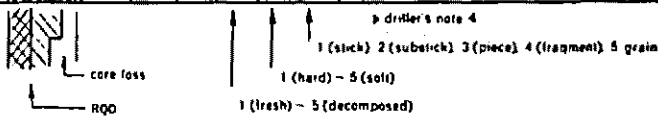
GEOLOGIC LOG OF DRILL HOLE

SIQUIRRES. PROJECT

Sheet No. 56
HOLE No. DB-2 (SHEET 3 OF 12)

LOCATION Right Bank, Dam site DEPTH OF HOLE 231.16 m COMMENCED 23 - May - '75
 ELEVATION 207.5 m DEPTH OF OVERBURDEN 3.10 m COMPLETED 26 - Jul. - '75
 COORDINATE _____ LENGTH OF ROCK DRILLING 228.06 m DRILLED BY I. C. E
 ANGLE FROM HORIZONTAL _____ TOTAL LENGTH OF CORE _____ m LOGGED BY _____
 BEARING OF ANGLE HOLE _____ CORE RECOVERY _____ %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE			DEPTH	ELEVATION
					COLOR	WEATHER- ING	HARD- NESS	CORE CUTTING		WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	LUGEON		
40			0 - 100									40	167.5	
1		V				2	2	2	4	41.38		1		
2		V			dark gray	2	2	3	4	Lava, slightly brittle, generally many gas cavities (Ø max 4 cm)		2		
3		V				1	1	1	1	43.4		3		
4		V				3	3	2	2			4		
45		V				2	2	2	1	Fragmental cores and many gas cavities at 45.5 - 46.0m.		45		
6		V				2	2	3	3	46.2		6	161.3	
7		◇										7		
8		V								Autobrecciated lava, a few amygdales. slightly brittle.		8		
9		◇			blueish black	2	3	1	1			9		
50	Basalt	V		N B		3	1	1	3			50		
1		◇										1		
2		V				2	2	2	3	52.4		2	155.1	
3		V										3		
4		V				2	2	3	4	Lava, fresh and hard, somewhat cracky cores.		4		
55		V			dark gray	2	2	3	1	55.6		55	151.9	
6		V										6		
7		◇										7		
8		V				2	1	2	1	Autobrecciated lava, fresh and hard, mostly 15 - 40 cm cores.		8		
9		◇			blueish black	2	3	1	1			9		
60		V										60	147.5	



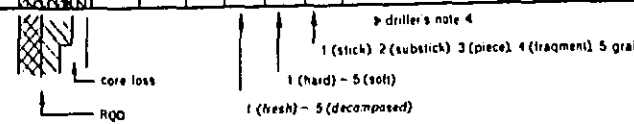
GEOLOGIC LOG OF DRILL HOLE

SQUIRRES PROJECT

Sheet No. 57

LOCATION Right Bank, Damalta HOLE No. _____ (SHEET 4 OF 12)
 ELEVATION 207.5 m DEPTH OF HOLE 231.16 m COMMENCED 23 May '75
 COORDINATE _____ DEPTH OF OVERBURDEN 3.10 m COMPLETED 26 Jul '75
 ANGLE FROM HORIZONTAL 90 ° LENGTH OF ROCK DRILLING 228.06 m DRILLED BY I. C. E
 BEARING OF ANGLE HOLE _____ TOTAL LENGTH OF CORE _____ m LOGGED BY _____
 CORE RECOVERY _____ %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION					
60m			0 → 100										60m	147.5 m
1		◇											1	
2		V											2	
3		◇					2	2	Autobrecciated lava, fresh and generally hard,				3	
4		V					1	1					4	
5		◇					3	1					5	
6		V											6	
7		◇											7	
8		V											8	
9		◇											9	
10		V											10	
11	Basalt	◇		NB	blueish black	2							11	
12		V											12	
13		◇											13	
14		V											14	
15		◇											15	
16		V											16	
17		◇											17	
18		V											18	
19		◇											19	
20		V											20	
21		◇											21	
22		V											22	
23		◇											23	
24		V											24	
25		◇											25	
26		V											26	
27		◇											27	
28		V											28	
29		◇											29	
30		V											30	
31		◇											31	
32		V											32	
33		◇											33	
34		V											34	
35		◇											35	
36		V											36	
37		◇											37	
38		V											38	
39		◇											39	
40		V											40	
41		◇											41	
42		V											42	
43		◇											43	
44		V											44	
45		◇											45	
46		V											46	
47		◇											47	
48		V											48	
49		◇											49	
50		V											50	
51		◇											51	
52		V											52	
53		◇											53	
54		V											54	
55		◇											55	
56		V											56	
57		◇											57	
58		V											58	
59		◇											59	
60		V											60	127.5



GEOLOGIC LOG OF DRILL HOLE

Sheet No. 58

SQUIRRES. PROJECT

HOLE No. DB-2 (SHEET 5 of 12)

LOCATION <u>Right Bank, Dam site</u>	DEPTH OF HOLE <u>231.16 m</u>	COMMENCED <u>23 May '75</u>
ELEVATION <u>207.5 m</u>	DEPTH OF OVERBURDEN <u>3.10 m</u>	COMPLETED <u>26 Jul. '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>228.06 m</u>	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING				DESCRIPTION
80m			0-100						0	40	80m	127.3 m
1	V						2	2 1 1	81.23			
2	V											
3	V											
4	V											
5	V											
6	V						2	3 1 4				
7	V						3	3 4				
8	V											
8.5									88.48			
9	◇						2					
9.5	V											
10	◇								90.35			
11	V											
12	V											
13	V											
14	V											
15	V											
16	V											
17	V											
18	V											
19	V											
20	V											
21	V											
22	V											
23	V											
24	V											
25	V											
26	V											
27	V											
28	V											
29	V											
30	V											
31	V											
32	V											
33	V											
34	V											
35	V											
36	V											
37	V											
38	V											
39	V											
40	V											
41	V											
42	V											
43	V											
44	V											
45	V											
46	V											
47	V											
48	V											
49	V											
50	V											
51	V											
52	V											
53	V											
54	V											
55	V											
56	V											
57	V											
58	V											
59	V											
60	V											
61	V											
62	V											
63	V											
64	V											
65	V											
66	V											
67	V											
68	V											
69	V											
70	V											
71	V											
72	V											
73	V											
74	V											
75	V											
76	V											
77	V											
78	V											
79	V											
80	V											
81	V											
82	V											
83	V											
84	V											
85	V											
86	V											
87	V											
88	V											
89	V											
90	V											
91	V											
92	V											
93	V											
94	V											
95	V											
96	V											
97	V											
98	V											
99	V											
100	V											

driller's note 4

1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain

1 (hard) ~ 5 (soft)

1 (fresh) ~ 5 (decomposed)

core loss

RQD

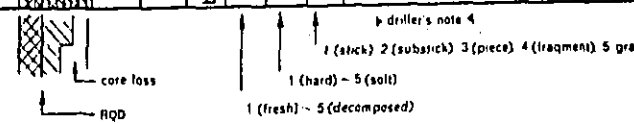
GEOLOGIC LOG OF DRILL HOLE

SQUIRRES. PROJECT

HOLE No. DB - 2 (Sheet No. 59 of 12)

LOCATION Right Bank, Damsite DEPTH OF HOLE 231.16 m COMMENCED 23 - May - '75
 ELEVATION 207.5 m DEPTH OF OVERBURDEN 3.10 m COMPLETED 26 - Jul. - '75
 COORDINATE _____ LENGTH OF ROCK DRILLING 228.06 m DRILLED BY I. C. E.
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE _____ m LOGGED BY _____
 BEARING OF ANGLE HOLE _____ CORE RECOVERY _____ %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT Casing	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION			
0.0m			0 → 100%								0	107.5 m
1		V										
2		V										
3		V										
4		V										
105		◇										103.1
6		V										
7		◇										101.02
8		V										
9		V										
110	Basalt	V		NB								97.5
1		V										
2		V										
3		V										
4		V										
115		V										
6		V										90.9
7		◇										
8		V										
9		◇										
120												87.5



GEOLOGIC LOG OF DRILL HOLE

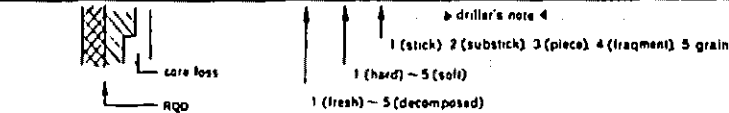
Sheet No. 60

SQUIRRES PROJECT

HOLE No. DB-2 (SHEET 7 OF 12)

LOCATION	Right Bank, Dam site	DEPTH OF HOLE	231.16 m	COMMENCED	23 May '75
ELEVATION	207.5 m	DEPTH OF OVERBURDEN	3.10 m	COMPLETED	26 Jul '75
COORDINATE		LENGTH OF ROCK DRILLING	228.06 m	DRILLED BY	I. C. E
ANGLE FROM HORIZONTAL	90 °	TOTAL LENGTH OF CORE	_____ m	LOGGED BY	_____
BEARING OF ANGLE HOLE	_____	CORE RECOVERY	_____ %		

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE		DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING		WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER		
120m			0-100%									120m	87.5 m
1		◇			brownish dark gray			2	1	Same condition as 116.6 - 120.0 m			
2		V						2	1				
3		◇											
4		V								123.55			83.95
5		V											
6		V						2	1	Massive lava, fresh, hard and compact. Cracks are not weathered.			
7		V											
8		V											
9		V											
10		V						1	1				
11		V						2	2	130.9			
12		V			dark gray					Many amygdalites (Ø max. 20mm)			75.15
13		◇								Autobrecciated lava.			
14		V						2		134.3			73.2
15		V								Many amygdalites (Ø 0.5 - max. 20mm)			
16		V								136.4			
17		V						2	1				
18		V								138.55			
19		V						2	2				
20		V											
140												140	67.5



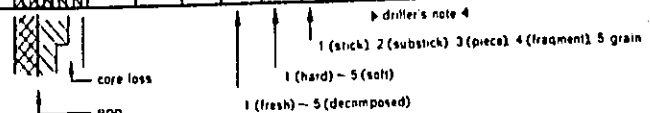
GEOLOGIC LOG OF DRILL HOLE

SQUIRRES. PROJECT

Sheet No. 61
HOLE No. DB-2 (SHEET 8 OF 12)

LOCATION	<u>Right Bank, Damsite</u>	DEPTH OF HOLE	<u>231.16 m</u>	COMMENCED	<u>23 May '75</u>
ELEVATION	<u>207.5 m</u>	DEPTH OF OVERBURDEN	<u>3.10 m</u>	COMPLETED	<u>26 Jul. '75</u>
COORDINATE		LENGTH OF ROCK DRILLING	<u>228.06 m</u>	DRILLED BY	<u>I. C. E</u>
ANGLE FROM HORIZONTAL	<u>90°</u>	TOTAL LENGTH OF CORE	<u> m</u>	LOGGED BY	<u> </u>
BEARING OF ANGLE HOLE	<u> </u>	CORE RECOVERY	<u> %</u>		

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION				
14.0m			0 - 100								0	14.0m	67.5 m
1		V					2	1	141.7	Massive Lava, fresh, hard and compact, mostly 10-30cm cores.		1	
2		V			dark gray		2	1				2	
3		V					2	1				3	
4		V					1	2				4	
145		V										145	
6		V							146	Autobrecciated lava,		6	61.5
7		◇										7	
8		V										8	
9		◇					2	1				9	
150	Basalt	V		NB	brownish black		2	1				150	
1		◇										1	
2		V										2	
3		◇					2	1	153			3	54.5
4		V										4	
155		V										155	
6		V					2	1		Massive lava,		6	
7		V			dark gray		2	1				7	
8		V										8	
9		V										9	
160		V										160	47.5



GEOLOGIC LOG OF DRILL HOLE

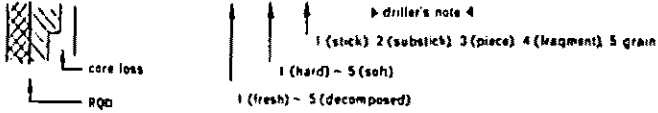
Sheet No. 62

SQUIRRES. PROJECT

HOLE No. DB-2 (SHEET 9 OF 12)

LOCATION <u>Right Bank, Damsite</u>	DEPTH OF HOLE <u>231.16 m</u>	COMMENCED <u>23 -May- '75</u>
ELEVATION <u>207.5 m</u>	DEPTH OF OVERBURDEN <u>3.10 m</u>	COMPLETED <u>26 -Jul- '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>228.06 m</u>	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING			
160.3			0 → 100							0	47.5
1		V			dark gray		2 1	2 1	Massive lava		
161.3		V									46.2
2		◇									
3		V									
4		◇									
165		V			brownish black		2	1 1 2	Autobrecciated lava, fresh and hard, mostly 15 - 50 cm cores.		165
6		◇									
7		V									
8		◇									
168.7		V									38.8
170	Basalt	V		NB			2 1 1				170
1		V									
2		V									
3		V									
4		V							Massive lava, fresh hard and compact.		
175		V			dark gray		2 1 1				175
6		V									
7		V									
8		V									
9		V									
180		V									27.5



GEOLOGIC LOG OF DRILL HOLE

SQUIRRES PROJECT

Sheet No. 63

HOLE No. DB-2 (SHEET 10 OF 12)

LOCATION Right Bank, Damsite DEPTH OF HOLE 231.16 m COMMENCED 23 May '75
 ELEVATION 207.5 m DEPTH OF OVERBURDEN 3.10 m COMPLETED 26 Jul '75
 COORDINATE _____ LENGTH OF ROCK DRILLING 228.06 m DRILLED BY I. C. E
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE _____ LOGGED BY _____
 BEARING OF ANGLE HOLE _____ CORE RECOVERY _____ %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING				
180m			0-100								180m	
1		V									1	
2		V									2	
3		V									3	
4		V									4	
5		V									5	
6		V									6	
7		V			dark gray	2	2	1			7	
8		V			dark gray	1	1	1			8	
9		V									9	
10		V									10	
11	basalt	V		NB							11	
12		V									12	
13		V									13	
14		V									14	
15		V									15	
16		V									16	
17		V									17	
18		V									18	
19		V									19	
20		V									20	
21		V									21	
22		V									22	
23		V									23	
24		V									24	
25		V									25	
26		V									26	
27		V									27	
28		V									28	
29		V									29	
30		V									30	
31		V									31	
32		V									32	
33		V									33	
34		V									34	
35		V									35	
36		V									36	
37		V									37	
38		V									38	
39		V									39	
40		V									40	
41		V									41	
42		V									42	
43		V									43	
44		V									44	
45		V									45	
46		V									46	
47		V									47	
48		V									48	
49		V									49	
50		V									50	
51		V									51	
52		V									52	
53		V									53	
54		V									54	
55		V									55	
56		V									56	
57		V									57	
58		V									58	
59		V									59	
60		V									60	
61		V									61	
62		V									62	
63		V									63	
64		V									64	
65		V									65	
66		V									66	
67		V									67	
68		V									68	
69		V									69	
70		V									70	
71		V									71	
72		V									72	
73		V									73	
74		V									74	
75		V									75	
76		V									76	
77		V									77	
78		V									78	
79		V									79	
80		V									80	
81		V									81	
82		V									82	
83		V									83	
84		V									84	
85		V									85	
86		V									86	
87		V									87	
88		V									88	
89		V									89	
90		V									90	
91		V									91	
92		V									92	
93		V									93	
94		V									94	
95		V									95	
96		V									96	
97		V									97	
98		V									98	
99		V									99	
100		V									100	
101		V									101	
102		V									102	
103		V									103	
104		V									104	
105		V									105	
106		V									106	
107		V									107	
108		V									108	
109		V									109	
110		V									110	
111		V									111	
112		V									112	
113		V									113	
114		V									114	
115		V									115	
116		V									116	
117		V									117	
118		V									118	
119		V									119	
120		V									120	
121		V									121	
122		V									122	
123		V									123	
124		V									124	
125		V									125	
126		V									126	
127		V									127	
128		V									128	
129		V									129	
130		V									130	
131		V									131	
132		V									132	
133		V									133	
134		V									134	
135		V									135	
136		V									136	
137		V									137	
138		V									138	
139		V									139	
140		V									140	
141		V									141	
142		V									142	
143		V									143	
144		V									144	
145		V									145	
146		V									146	

GEOLOGIC LOG OF DRILL HOLE

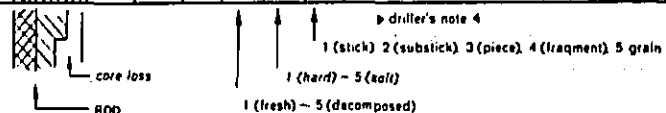
Sheet No. 64

SQUIRRES PROJECT

HOLE No. DB-2 (SHEET 11 OF 12)

LOCATION <u>Right Bank, Dam site</u>	DEPTH OF HOLE <u>231.16 m</u>	COMMENCED <u>23 May - '75</u>
ELEVATION <u>207.5 m</u>	DEPTH OF OVERBURDEN <u>3.10 m</u>	COMPLETED <u>26 Jul - '75</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>228.06 m</u>	DRILLED BY <u>I. C. E</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE _____ m	LOGGED BY _____
BEARING OF ANGLE HOLE _____	CORE RECOVERY _____ %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE			DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING		WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	LUGEON		
200m			0 - 100%									200m	7.5 m	
1	Basalt	V	[Hatched Pattern]		dark gray	2	2	2	Slightly brittle due to many gas cavities.					
2							201.5							
3														
4														
205														
6	Mudstone	V	[Horizontal Lines]		light brownish gray	3	3	4	Looks like fine grained tuff. Poorly solidified, generally soft, slightly sheared, slickenside					
7														
8														
209.4														
210	Basalt	V	[Hatched Pattern]		dark gray	2			Lava, fresh and hard, somewhat cracky.					
1														
2														
3														
4							214.08							
215														
6														
7							216.65							
8							217.6							
220														



GEOLOGIC LOG OF DRILL HOLE

SQUIRRES. PROJECT

Sheet No. 65

HOLE No. DB-2 (SHEET 12 OF 12)

LOCATION	Right Bank, Damsife	DEPTH OF HOLE	231.16 m	COMMENCED	23 May. '75
ELEVATION	207.5 m	DEPTH OF OVERBURDEN	3.10 m	COMPLETED	26 Jul. '75
COORDINATE		LENGTH OF ROCK DRILLING	228.06 m	DRILLED BY	I. C. E
ANGLE FROM HORIZONTAL	90 °	TOTAL LENGTH OF CORE		LOGGED BY	
BEARING OF ANGLE HOLE		CORE RECOVERY			

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION			
220m			0 - 100%								0	
1		V					4	220.55				
2		V					2					
3		V					1					
4		V					3	222.8				
5		V					3-4					
6		V										
7		V										
8		V										
9		V										
10		V										
11		V										
12		V										
13		V										
14		V										
15		V										
16		V										
17		V										
18		V										
19		V										
20		V										
21		V										
22		V										
23		V										
24		V										
25		V										
26		V										
27		V										
28		V										
29		V										
30		V										
31		V										
32		V										
33		V										
34		V										
35		V										
36		V										
37		V										
38		V										
39		V										
40		V										
41		V										
42		V										
43		V										
44		V										
45		V										
46		V										
47		V										
48		V										
49		V										
50		V										
51		V										
52		V										
53		V										
54		V										
55		V										
56		V										
57		V										
58		V										
59		V										
60		V										
61		V										
62		V										
63		V										
64		V										
65		V										
66		V										
67		V										
68		V										
69		V										
70		V										
71		V										
72		V										
73		V										
74		V										
75		V										
76		V										
77		V										
78		V										
79		V										
80		V										
81		V										
82		V										
83		V										
84		V										
85		V										
86		V										
87		V										
88		V										
89		V										
90		V										
91		V										
92		V										
93		V										
94		V										
95		V										
96		V										
97		V										
98		V										
99		V										
100		V										
101		V										
102		V										
103		V										
104		V										
105		V										
106		V										
107		V										
108		V										
109		V										
110		V										
111		V										
112		V										
113		V										
114		V										
115		V										
116		V										
117		V										
118		V										
119		V										
120		V										
121		V										
122		V										
123		V										
124		V										
125		V										
126		V										
127		V										
128		V										
129		V										
130		V										
131		V										
132		V										
133		V										
134		V										
135		V										
136		V										
137		V										
138		V										
139		V										
140		V										
141		V										
142		V										
143		V										
144		V										
145		V										
146		V										
147		V										
148		V										
149		V										

A—8 顕微鏡写真および岩石記載

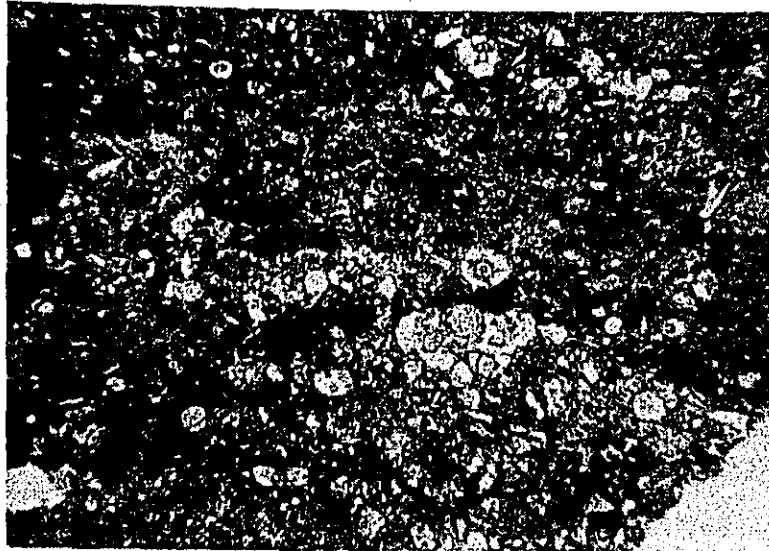
Photomicrograph and Petrographic Description of Rock (Plate 1 of 9)

Locality:

Guayabo Project
Drill hole SB-1
at 20.3 m deep
(Surge tank)

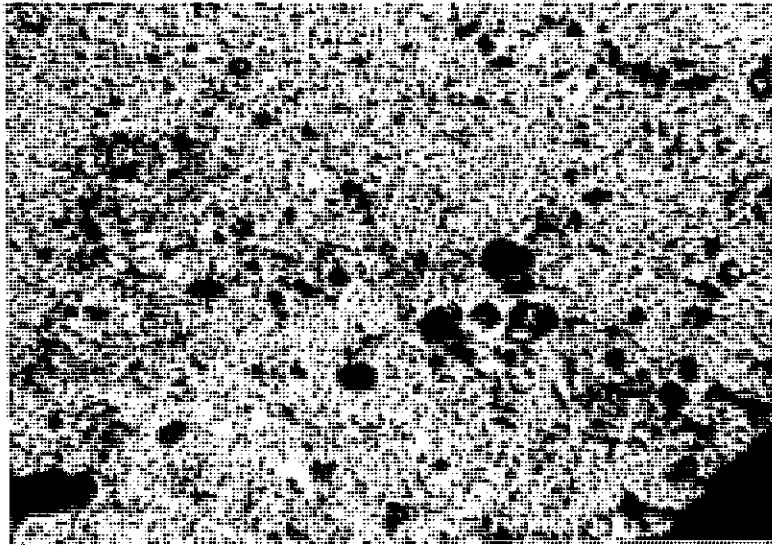
Rock name:

Tufferous
sandstone



0 0.5mm

(Open nicols)



Petrographic
description:

(crossed nicols)

Granular texture.

Bearing micro-fossil fragments. Dotted with xenomorphic amphibole and minute magnetite.

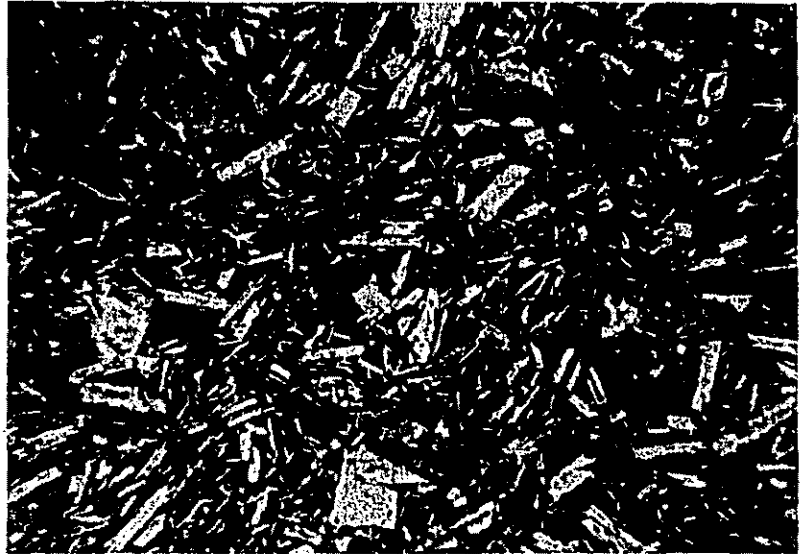
Photomicrograph and Petrographic Description of Rock (Plate 2 of 9)

Locality:

Guayabo Project
Drill hole PHB-1
at 15.0 m deep
(Powerhouse)

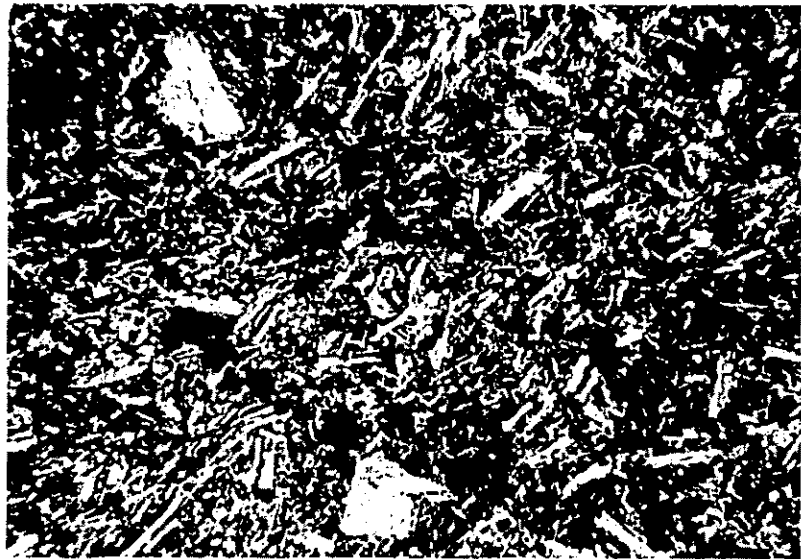
Rock name:

Dolerite



0 0.5mm

(open nicols)



Petrographic
description:

(crossed nicols)

Intergranular texture.

Consisting of plagioclase and amphibole phenocrysts. Plagioclase presents idiomorphic and albite twin, fresh. Amphibole presents hypidiomorphic and light green color, somewhat altered into chlorite.

Groundmass shows flow structure, and include many plagioclases and minute pyroxenes, dotted with magnetites (small than 0.1 mm). Gas cavities are filled with nepheline.

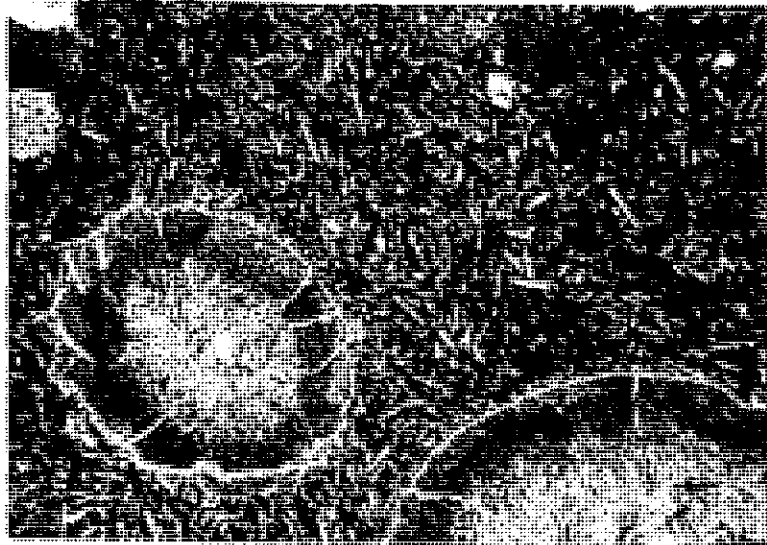
Photomicrograph and Petrographic Description of Rock (Plate 3 of 9)

Locality:

Guayabo Project
80 m up stream from
powerhouse, left bank

Rock name:

Basalt



0 0.5mm

(open nicols)



Petrographic
description:

Intergranular texture.

(crossed nicols)

Consisting of phenocrysts of plagioclase and amphibole. Plagioclase presents idiomorphic (0.5 - 2.7 mm) and is somewhat altered. Amphibole presents light green color and hypidiomorphic shape (0.5 - 1.0 mm), it is altered into chlorite.

Groundmass shows flow structure, including plagioclase and minute pyroxene, dotted with magnetite (smaller than 0.2 mm). Glass of groundmass is altered into chlorite and presents light green. Dotted gas cavities (2 - 4 mm) are filled with chlorite and zeolite.

Photomicrograph and Petrographic Description of Rock (Plate 4 of 9)

Locality:

Guayabo Project
Powerhouse
Left bank of R.
Pacuare

Rock name:

Andesitic lapilli tuff
(Matrix of agglomerate)



0 0.5mm

(open nicols)



Petrographic
description:

(crossed nicols)

Andesitic and basaltic grains of smaller than 2 mm in size are filled with glass. Phroxene and plagioclase are altered into chlorite.

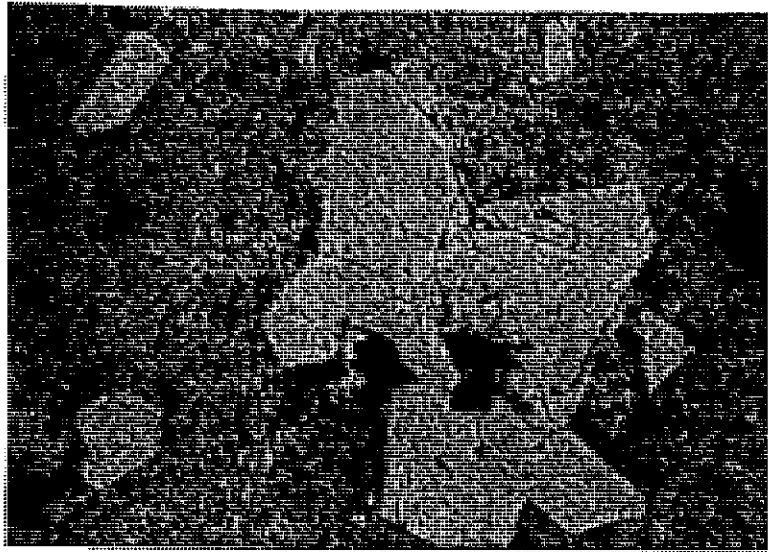
Photomicrograph and Petrographic Description of Rock (Plate 5 of 9)

Locality:

Guayabo Project
Powerhouse
Left bank of R.
Paucuare

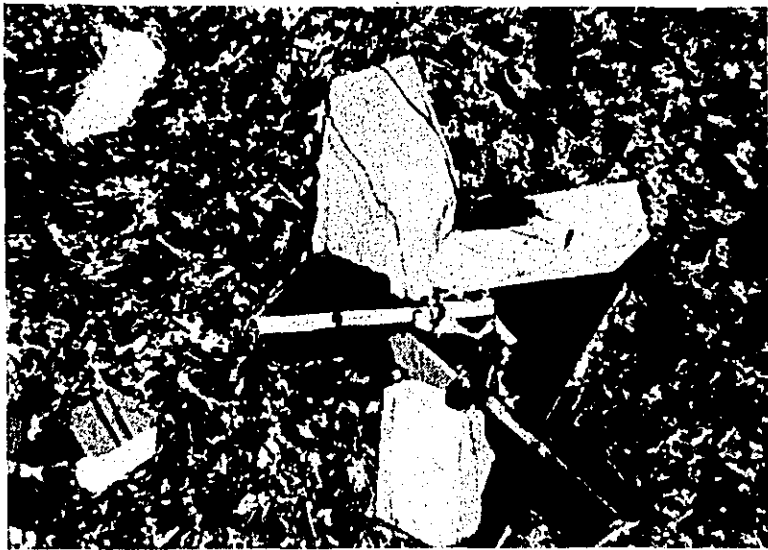
Rock name:

Andesite (Breccia
of agglomerate)



0 0.5mm

(open nicols)



Petrographic
description:

(crossed nicols)

Porphyritic texture with flow structure of intersertal groundmass.

Consisting of phenocryst of plagioclase, pyroxene, amphibole and small amount of quartz. Plagioclase shows idiomorphic and albite twin in part, fresh. Pyroxene and amphibole are somewhat altered.

Groundmass is composed of plagioclase and dotted magnetite.

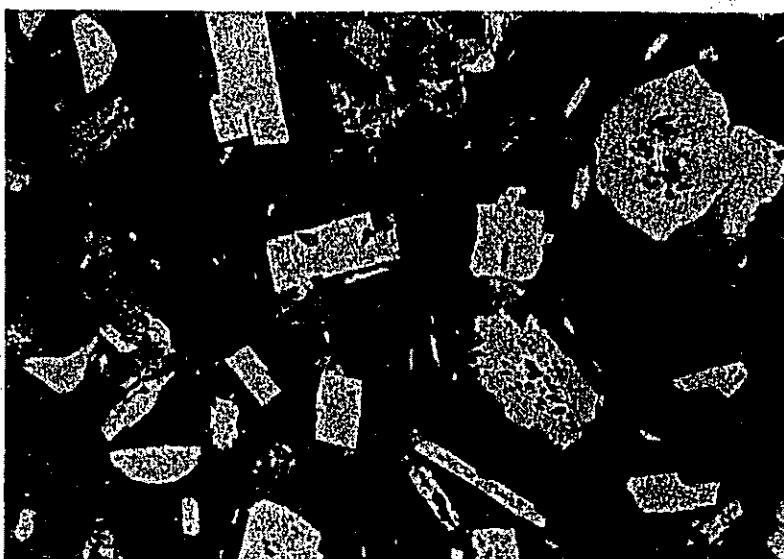
Photomicrograph and Petrographic Description of Rock (Plate 6 of 9)

Locality:

Guayabo Project
Test pit DB-1
at 1.3 m deep

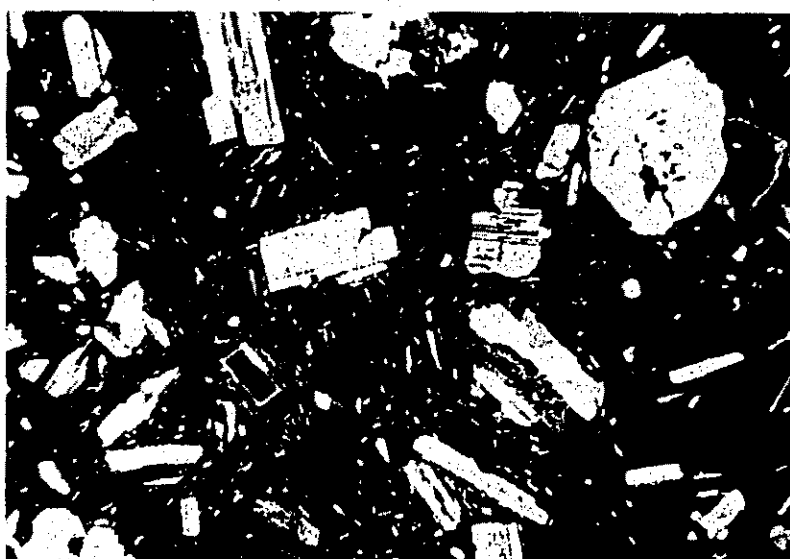
Rock name:

Pyroxene andesite
(Breccia of mud
flow deposit)



0 0.5mm

(open nicols)



Petrographic
description:

Prophyritic texture with intersertal groundmass.

(crossed nicols)

Phenocryst consists of plagioclase, amphibole and pyroxene. Plagioclase presents idiomorphic or hypidiomorphic, and has albite twin and zonal texture, fresh. Amphibole and pyroxene present idiomorphic or hypidiomorphic. They are almost fresh and present light yellow.

Groundmass has flow-structure consisting of microphenocryst of plagioclase and pyroxene, and slightly altered into chlorite. Small amount of magnetite and quartz (0.1 - 0.2 mm) are contained.

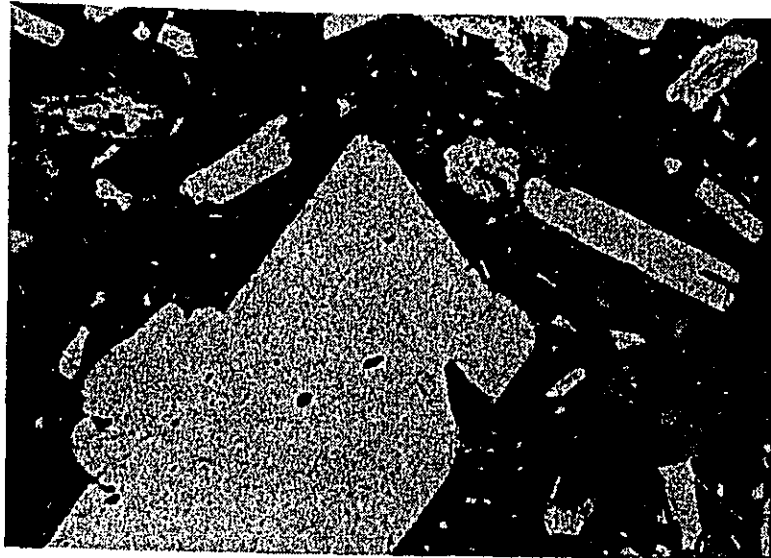
Photomicrograph and Petrographic Description of Rock (Plate 7 of 9)

Locality:

Guayabo Project
River bed of
Damsite

Rock name:

Tow-pyroxene
andesite
(Gravel of river
deposit)



0 0.5mm

(open nicols)



Petrographic
description:

(crossed nicols)

Porphyritic texture with intersertal groundmass.

Phenocryst consists of plagioclase, amphibole, orthopyroxene and angite. Plagioclase, 0.2 - 5.5 mm in size, shows albite twin and it is slightly altered in part. Pyroxene presents idiomorphic or hypidiomorphic, and is fresh. Amphibole presents hypidiomorphic and is somewhat altered.

Groundmass is glassy including microphenocryst of plagioclase and pyroxene, and slightly chloritized. Tiny magnetite and zircon are spotted. Fresh as a whole.

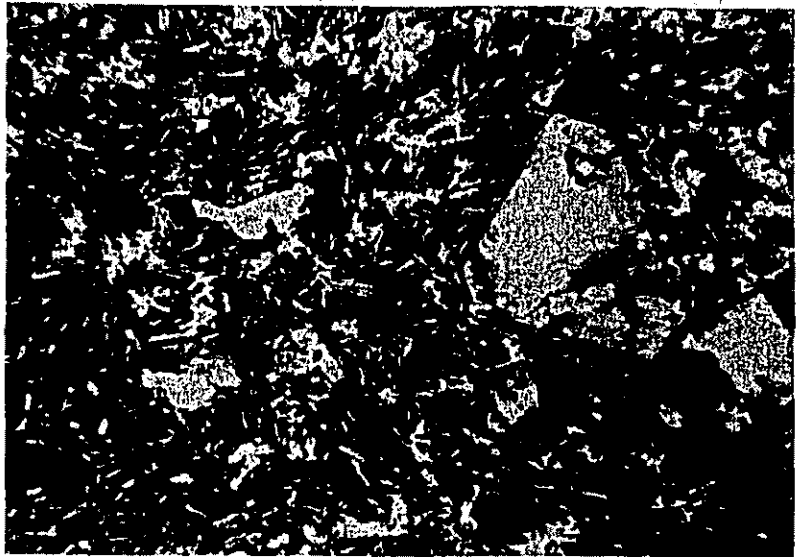
Photomicrograph and Petrographic Description of Rock (Plate 8 of 9)

Locality:

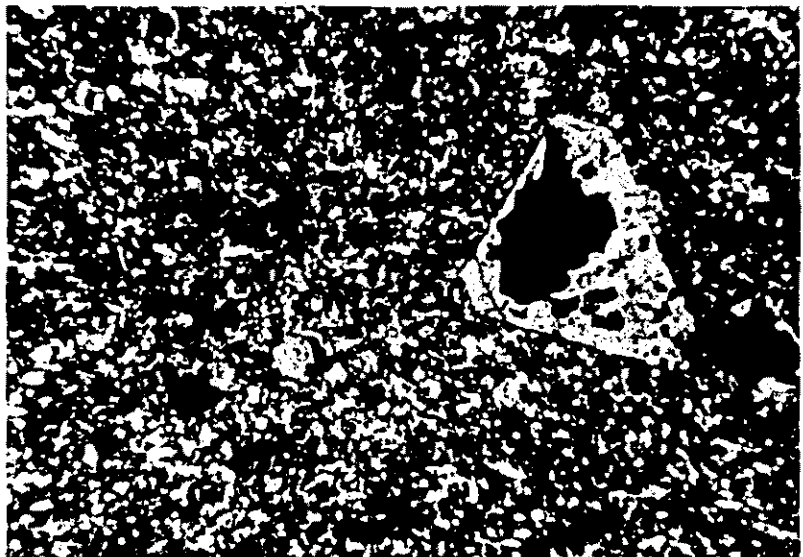
Siquirres Project
Drill hole DB-2
at 107.34 m deep

Rock name:

Olivine basalt



0 0.5mm 0.5 mm (open nicols)



Petrographic

description:

(crossed nicols)

Intergranular texture.

Phenocryst consists of olivine which has 0.2 - 1.2 mm in size and presents idiomorphic or hypidiomorphic with light brown color, and is strongly altered.

Groundmass consists of columnar plagioclase and granular pyroxene spotting with few of magnetite and amygdaloidal minerals.

Considerably altered in general.

Photomicrograph and Petrographic Description of Rock (Plate 9 of 9)

Locality:

Siquirres Project
Drill hole DB-2
at 154.9 m deep

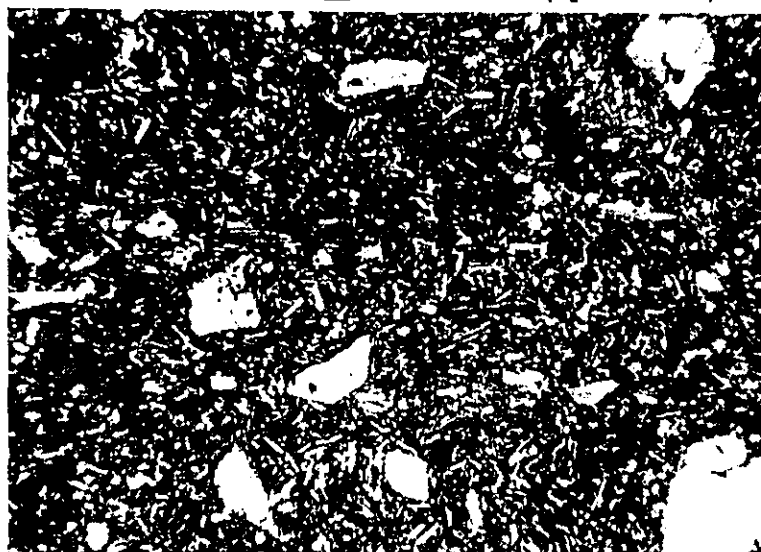
Rock name:

Olivine basalt



0 0.5 mm

(open nicols)



Petrographic
description:

(crossed nicols)

Intergranular texture.

Phenocryst consists of idiomorphic or hypidiomorphic olivine showing yellowish brown color.

Columnar plagioclase and granular pyroxene are predominantly seen in groundmass presenting flow structure. Chloritization has been progressed.

A—9 X線解析(岩石)

X-RAY DIFFRACTION ANALYSIS (GUAYABO Project)

