ANNEX 10
ENVIRONMENTAL FLOW AND ENVIRONMENTAL REQUIREMENTS ANALYSIS

I INTRODUCTION

This report presents a proposal for the validation of the Environmental Authority for the environmental flows (Qe) that the PHAM will keep in all events.

For this, the calculation methodology which has been applied in response to the singularities of each waterway in relation to their current extent of intervention, morphologic characteristics and environmental sensitivity has been presented.

For the hydrologic analysis of the Qe, the Owner has used broad statistical data, with over 50 years of waterway data logs, and adjustments based on the conventional statistical analysis.

The proposed Qe have been validated assuming criteria different from the hydrologic type, related to the preservation of natural habitats and the environmental functions of the water resource, especially since the PHAM is inserted in an area that shows notorious singularities from the environmental and the anthropic intervention point of view. In that respect, it is worth highlighting the following:

i) Presence of waterways with a regulated flow: the Yeso reservoir is a drinking water reservoir for the Metropolitan Region, due to which, the waters discharged from this reservoir are regulated by Aguas Andinas, according to requirements or for the safety of the supply. The supply volume of the El Yeso reservoir is of approximately 250 mill m3. The historical delivery statistics of the reservoir indicate that the river's flow is 0 (zero) during some months. Yeso river registers an increase in its flow from November to March, and a decrease during the winter months, with an annual average flow flowing into the reservoir of 8.1 (m3/s). The presence in the area of the Alfalfal and Maitenes run-of-river plants that use the waters of Colorado river from 1991 and 1923 respectively stands out; and of the Volcán and Queltehue power plants both in the sub-basin of Volcán river, that operate since the 1940's.

ii) Presence of interest areas from the landscape and recreational point of view: The area where the project is inserted is of a landscape interest, with the waterways being an attribute that provides value to the mountain scenery, due to the presence of surface runoff, mirrors and waterfalls, these being abundant in the thawing season. In general, in the area there is sightseeing, camping, hiking, and mountaineering tourism along with other ecotourism activities, where there is a marked seasonality, with some recreational activities related to the waterways and that consist of: beach resorts, fishing and sailing.

iii) Low environmental valuation of the limnologic system: The high extent of intervention of the hydric system in the area, along with the natural conditions of altitude, runoff rate and variability of the physical-chemical characteristics establish that, in general, in the area of the Project there is a low level of richness and abundance of aquatic life. The ictic fauna present in the waterways is mainly comprised by a swarm of allochthonous species, which has been accentuated by the incorporation of attractive species for fishing, and the predation effects that these have on the native fauna.

iv) Scarce vegetation development in the banks: In a natural way, the conditions of the slope and the seasonal variation of the waterways, along with other abiotic variables establish that in mid elevation mountain areas there is not a significant development of bank vegetation, being mainly represented by colonizing herbaceous plants that are within certain areas of waterway stretches with a lower slope.

II. DETERMINATION OF ENVIRONMENTAL FLOWS RELATED TO THE SYSTEM'S LIMNOLOGIC REQUIREMENTS.

1. OVERVIEW

The operation and construction of the power plants require a study of the Qe, since the water intakes will alter the natural conditions of the rivers. Therefore, it is necessary to identify the biological communities present in the river, as well as the environmental conditions in which they are, and the minimum hydrodynamic requirements to preserve their habitats.

The environmental flow is the minimum value that should pass through a stretch of the river, in order to preserve the aquatic ecosystems. In turn, the environmental flow analysis of a river is the application of a series of methodologies that have been set by the DGA and by foreign legislation, so as to obtain a figure of the minimum flow that can run off the rivers. The application of these methodologies takes place in areas defined as environmental flow areas, which for this study are defined as the area of biological importance of the river that will be mostly influenced by the construction and/or operation of the power plants. The definition of this Qe area in the intervened rivers is done through the systematic characterization of the watercourses, focusing on their hydrologic, biologic, morphologic and hydraulic classification and characterization.

Since each one of the applied methodologies for the calculation of the Qe provide a different value, the discrimination of which will be defined as the Qe is done from the analysis between the variations in the runoff of the waterway in a project situation and the minimum requirements of the biological species, mainly fish.

The project gathers the hydric resources from three sub-sub-basins that belong to the Maipo river basin, Maipo Alto River's sub-sub-basin, which according to the National Water Commission of the National Waters Authority are:

- Volcán river's sub-sub-basin
  Direct effects: Colina, Engorda, Las Placas and Morado streams
  Indirect effects: Volcán River

- Río Yeso river's sub-sub basin
  Direct effects: Yeso River

- Colorado river's sub-sub-basin between Olivares and Maipo river
  Direct effects: Colorado River

In each one of them, the project collects resources of some of its sources, creating indirect effects on Maipo River in the stretch between El Volcán River and the waters return point of Las Lajas power plant. The methodology used for determining the environmental flow is applied to all of them.

The statistical period used for all of the project's calculations, and of this report for all of the waterways is 55 years, from hydrologic year 1950/51 to the period of 2004/05. The hydrologic information used is included in the Appendix of this Annex.

2 OBJETIVES

The objective of this study is to determine the Qe in Volcán, Yeso, and Colorado rivers, as well as in the Cajón La Engorda, Estero Colina, Quebrada Las Placas and Cajón El Morado tributaries. For this purpose, the specific objectives are:

- To biologically characterize Volcán, Yeso, Colorado, and Maipo rivers, as well as the Cajón La Engorda, Estero Colina, Quebrada Las Placas and Cajón El Morado tributaries.
- To hydrologically characterize Volcán, Yeso, Colorado, and Maipo rivers, as well as the Cajón La Engorda, Estero Colina, Quebrada Las Placas and Cajón El Morado tributaries.

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- To morphologically and hydraulically characterize Volcán, Yeso, Colorado, and Maipo rivers, as well as the Cajón La Engorda, Estero Colina, Quebrada Las Placas and Cajón El Morado tributaries.
- To define environmental flow areas of Volcán, Yeso, Colorado, and Maipo rivers, as well as the Cajón La Engorda, Estero Colina, Quebrada Las Placas and Cajón El Morado tributaries.
- To calculate the environmental flow of the sensitive areas of Volcán, Yeso, Colorado, and Maipo rivers, as well as the Cajón La Engorda, Estero Colina, Quebrada Las Placas and Cajón El Morado tributaries.

3 SCOPE

The following relevant concepts are interpreted for this study:

- **Sensitive area or environmental flow area:** Area of the river with biological importance that will be mainly influenced by the construction and/or operation of power plants.
- **Environmental flow (Qe):** According to the definition of the DGA, it is the minimum flow that a river should have in order to preserve its ecosystems, preserving the environmental quality. This definition is applied to the area of the environmental flow or sensitive area.
- **Flow in control point:** Minimum flow that must pass through the collections, in order to satisfy the Qe in the sensitive area. It is calculated as the Qe minus the minimum flow of the historical series contributed by the intermediate basin.

These concepts have been set due to the singularities that the area presents in terms of the anthropic intervention on its waterways, and since the PHAM uses the existing infrastructure (Aucayes, Maitenes, etc water intakes).

4 METHODOLOGY

The calculation methodology for the environmental flow of the power plants is based on the requirements set by the DGA for the calculation of the environmental flow and the environmental hydric demand. The requirements established by the state organization are summarized in the following items:

- Hydrologic assessment.
- Identification of the environmental components directly related to the hydric resource.
- Level variation analysis, due to the extraction and/or exercise of the exploitation right.
- Forecast and assessment of the direct, indirect, and related effects on all and each of the items identified by the Owner as per the previous point, which can be verified as a consequence of the exercise of the exploitation right.
- Current and expected water regime.
- Consequence of the exercise of the exploitation rights, particularly, the effect of the regulations on the hydric system, if applicable.

Based on these requirements, the present report is itemized in the two following relevant points: the characterization of the area under study, and the calculation of the environmental flow.

The characterization of the study area consists of conducting a hydrologic condition, habitat quality and biologic analysis, in order to determine the most affected areas by the reduction of flows in the rivers.

In this way, the calculation of the environmental flow is done for the sensitive area identified in the characterization of the river. In this report, the environmental flow calculation is done considering different regulations, both local and international, and from the estimated values and the characterization of the area under study, the environmental flow for Volcán, Yeso, and Colorado rivers, as well as the Cajón La Engorda, Estero Colina, Quebrada Las Placas and Cajón El Morado tributaries is established.

4.1 Characterization of the Area under Study

Biological Characteristics

For the biological characterization of the area under study there is summary of the characteristics of the area in a study presented in the base line, document “Aquatic Flora and Fauna Base Line,” (Chapter 5.4.3 of the EIA).

This summary focuses on the qualification of the biological quality of the area under study so as to identify the areas of greater biological importance.

Hydrologic Characteristics

The hydrologic characterization of the rivers was done based on a time series of average monthly flows obtained in the Hydrologic Study of the PHAM.

The statistical period used for all of the project's calculations, and of this report for all of the waterways is 55 years, from hydrologic year 1950/51 to the period of 2004/05. The hydrologic information used is included in Appendix 1.

For the hydrologic characterization of the rivers there was a 55 years statistics series and its average seasonal variation, focusing on the variability analysis of the historical series and its influence in the aquatic ecosystem.

Hydraulic Characteristics

The hydraulic characterization refers to defining the hydraulic behavior of the rivers and the morphology of the river's waterway, which is described in in chapter 3 of the "Sedimentological Study of Maipo River" (2007), carried out by the Civil Engineering Department of Universidad de Chile included in Annex 20 of this EIA.

Figure 1
Identification of the Hydraulic Modeling Areas in Yeso, Maipo and Volcán Rivers (Upper Area)

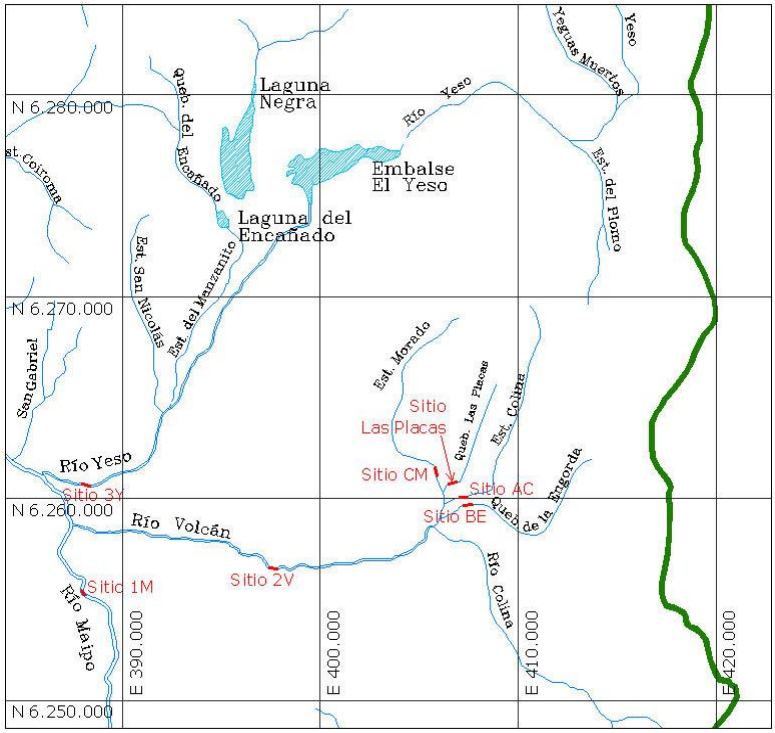
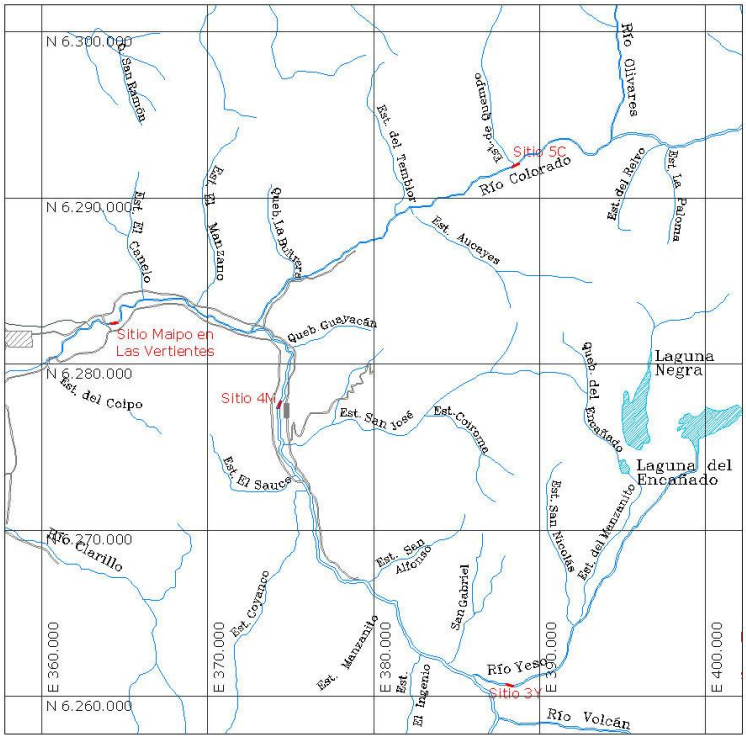


Figure 2
Identification of the Hydraulic Modeling Areas in Colorado, Maipo and Yeso Rivers (Lower Area)



4.2 Environmental Flow Calculation

As it was mentioned in the scope of the work, the definition of the environmental flow focuses on estimating the minimum flow that must pass through the sensitive areas or the environmental flow areas, according to the criteria of the DGA and the international experience.

Considering the result of the environmental flow for the sensitive area and the intermediate contributions between this area and the water intakes of the flow that must pass through the collections, in order to comply with the requirements of such sensitive area is calculated.

The description of each one of the methodologies used for the estimation of the environmental flow calculation is described as follows. This description is based on the research of Ángela Haro “Methodologies for assessing the impact of water extractions on the biodiversity in natural waterways” (Haro, 2003).

Hydrologic Method

The DGA recommends a hydrologic criterion for the estimation of environmental flows, for the resolution of water exploitation requests, which are mentioned in the document “Resource Management Standards and Procedures” (DGA, 2002). This criterion corresponds to a minimum flow of 10% of the annual average flow.

Habitat Simulation Method

1. Overview of the habitat's conditions

From the results obtained from the calculation of the hydraulic axis for different flows, the impact on the conditions of the habitat given the reduction of the flow on the ecosystem will be estimated, analyzing the runoff heights and rate.

The runoff heights that allow quantifying the impacts associated to the flow decrease have to do with the longitudinal migratory processes in the rivers. The criteria accepted by the DGA, and which is explicit in Swiss legislation, are that the runoff height cannot be lower than 20 cm. In this way, it is estimated that if the minimum runoff height is lower than that limit, the longitudinal migratory processes will be affected by the decrease in the flow.

The runoff rate has a direct influence on the conditions of the benthic flora and fauna habitat, where these benthic microorganisms are adapted to local rate conditions. In this way, flow reductions are translated into a rate variation, which would indicate the possibility of a species change from those adapted to certain rate conditions in ritroic environments (e.g. Plecoptera of the Gripopterygiidae family, the Blephariceridae of the Diptera, and Trichoptera of the Hydrobiosidae family), to others adapted to lower rates in lentic environments (e.g. groups of Cnidaria, Annelida, Platyhelminthes, mollusks of the Physidae, Sphaeridae families).

2. Fish habitat simulation

3.

The habitat simulation consists on matching the runoff conditions, given the rate, depth and type of substratum, with the specific requirements of the biological species under study. This quantification is done from the calculation of an index for the different analyzed flows. In this way, it is possible to obtain the value of this index for the different flows and quantify the decrease in the quality of the habitat for the effects of decreasing the flow.

To quantify the index, the PHABSIM software is used (http://www.fort.usgs.gov/Products/Software/PHABSIM/), which incorporates the habitability curves used in the PHABSIM software, as well as those shown in Figure 3, for the analysis.

The relationship between the physical conditions of the runoff and the biological component is done by gathering the habitat characterization model, with the results of the hydraulic axis for the different mentioned scenarios, and for this, the PHABSIM model is used to quantify the impact on the change of the runoff conditions on the ictic component.

From the information available in the literature, the critical variables for the preservation of the aquatic species in the rivers where defined – using fish as the indicators of the environmental requirements of aquatic species (a similar criteria to the one used by the DGA and CONAMA for establishing the Environmental Flows) - the following variables: runoff height and runoff rate.

F**igure 3** shows the habitability curve of aquatic species presented by the EULA (2000) according to the runoff depth, while **Figure 4** shows the same curves for the runoff rate.

Figure 3
Habitat Depth Requirements for Different Species (EULA, 2000).
(A) and (J) refer to Adult and Young states of ictic species

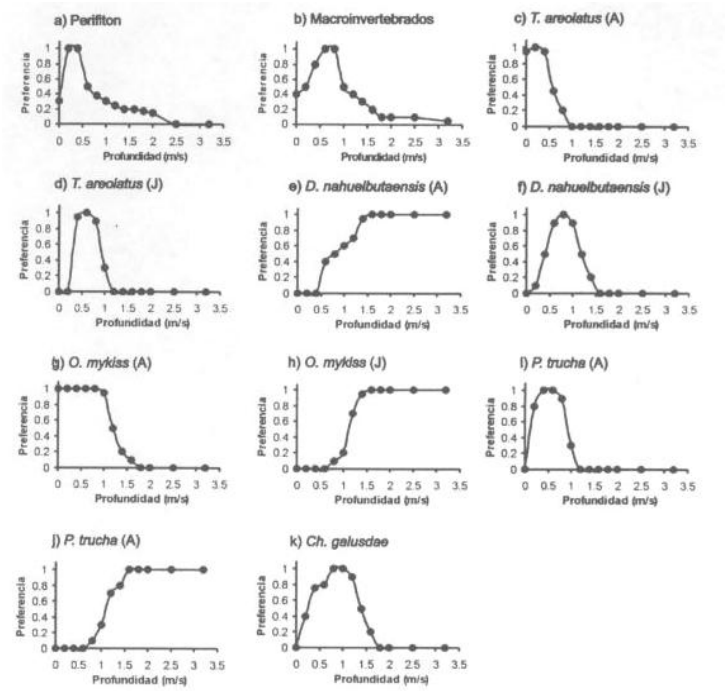


Figure 4
Habitat Rate Requirements for Different Species (EULA, 2000).
(A) and (J) refer to Adult and Young states of ictic species

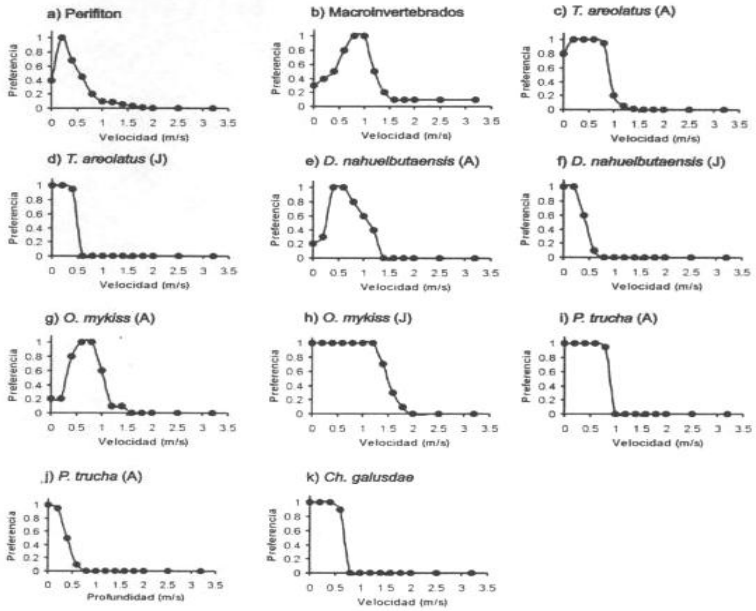


FIGURA 13. Curvas de preferencia de hábitat para la variable velocidad de la corriente (m/s) de las especies estudiadas con PHABSIM. a) perifiton, b) macroinvertebrados bentónicos, c) *Trichomycterus areolatus* adultos, d) *T. areolatus* juveniles, e) *Diplomystes nahuelbutaensis* adultos, f) *D. nahuelbutaensis* juveniles, g) *Oncorhynchus mykiss* adultos, h) *O. mykiss* juveniles, i) *Percichthys trucha* adultos, j) *P. trucha* juveniles, k) *Ch. galusdae* adultos y juveniles.

Fish are frequently used as bioindicators for establishing the requirements of flows in rivers, due to their relevance for sports fishing and also for being the components that are in the highest trophic stretches ("higher predators"). The aforementioned, establishes the need for identifying the environmental requirements of fish, such as runoff height and rate. This information is practically absent for native ictic fauna, where it is necessary to consult studies carried out in exotic species. As an example, Figure 5 presents details of the habitat requirements for trout (Garcia de Jalón et al., 1993)[1]. The minimum depth requirements are between 10 and 30 cm for 50% of the cases.

Figure 5
Habitat Requirements for Trouts
(Habitability Index Versus Depth and Temperature)

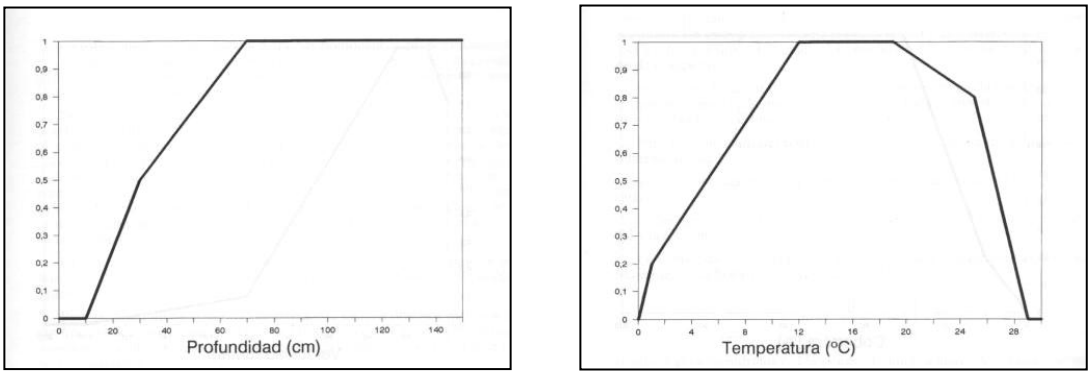


Table 1 describes the tolerance ranges of fish that live in rivers, considering different development stages. In general terms, we can establish that the maximum rates do not exceed 2 m/s and those optimum rates do not exceed 1 m/s.

In this way, we propose using the following parameters as environmental thresholds for the preserving aquatic ecosystems: runoff height (Z > 20 cm) and runoff rate (V < 1 m/s).

[1] GARCIA DE JALON, D., M. MAYO, F. HERVELLA, E. BARCELO & T. FERNANDEZ. (1993). Principios y Técnicas de Gestión de la Pesca en Aguas Continentales (Management Principles and Techniques for Fishing in Continental Waters). Ediciones Mundi-Prensa, Madrid. 247 pp.

Table 1
Rates as Upper Limits for Salmonides (m/s)

Species	Spawning	Alevins	Young	Adults
Atlantic Salmon[1]	1.00	1.00	1.00	-
Brown Trout[2]	1.19	0.88	1.07	1.83
Rainbow Trout[3]	0.94	0.90	1.06	1.06
Chinook Salmon[4]	1.31	76	91	1.52

Preferred Flow Rate for Salmonides (m/s)

Species	Spawning	Alevins	Young	Adults
Atlantic Salmon[1]	0.60-0.80	0.10-0.30	0.10-0.40	-
Brown Trout[2]	0.21-0.52	0.09	0.15	0.15
Rainbow Trout[3]	0.49-0.91	0.00	0.00-0.15	0.15-0.61
Chinook Salmon[4]	0.46-0.73	0.06-0.09	0.12-0.21	0.83

Stanley and Trial, 1995[2]
Raleigh et al., 1986a[3]
Raleigh et al., 1984[4]
Raleigh et al., 1986b[5]

Chosen Method

According to the aforementioned, and to the objectives described in this document, the Habitat Simulation Method has been considered as the most appropriate one for determining environmental flows.

Therefore, the main objective of this section will be the determination of the necessary flows to meet the runoff height and rate conditions that were previously established, in each one of the environmental flow areas identified in the waterways influenced by the PHAM. In this way, it will be possible to verify if the flows running off through those areas - in a project situation- meet the referred habitat conditions, which will allow, finally assessing the impact of the impact of the PHAM in the aquatic ecosystems.

[2] Stanley, J.G. and J.G. Trial. 1995. Habitat Suitability Index Models: Nonmigratory Freshwater Life Stages of Atlantic Salmon. Biological Science Report 3. U.S. Department of the Interior, National Biological Service. Washington, D.C.
[3] Raleigh, R.F., W.J. Miller and P.C. Nelson. 1986a. Habitat Suitability Index Models and In stream Flow Suitability Curves: Chinook Salmon. U.S. Fish Wildl. Serv. Biol. Rep. 82(10.122). 64 pages.
[4] Raleigh, R.F., L.D. Zuckerman and P.C. Nelson. 1986b. Habitat Suitability Index Models and In stream Flow Suitability Curves: Brown Trout, Revised. U.S. Fish Wildl. Serv. Biol. Rep. 82(10.124). 65 pp. [Initially edited with N°: FWS/OBS-82/10.71, September, 1984]
[5] Raleigh, R.F., T. Hickman, R.C. Solomon and P.C. Nelson. 1984. Habitat Suitability Information: Rainbow Trout. U.S. Fish Wildl. Serv. FWS/OBS-82/10.60. 64 pages.

5 RESULTS

5.1 RESULTS IN RIVERS AND STREAMS DIRECTLY AFFECTED BY THE CONSTRUCTION AND OPERATION OF THE PHAM PROJECT

5.1.1 Yeso river

5.1.1.1 Biological Characteristics

In Yeso river, the presence of the introduced salmoniform species *Salmo trutta* (brown trout) and 4 taxa of benthic macroinvertebrates were detected. There was a predominance of the *Simulium* sp. (Diptera), taxa establishing a condition of moderate organic contamination.

5.1.1.2 Hydrologic Characteristics

The sub-sub-basin of Yeso river has a 637 Km^2 contributing watershed which is made up by the homonymic main waterway and the secondary waterways corresponding to ravines and streams that are originated in the upper summits (Figure 6). The basin has significant bodies such as Laguna Negra and Laguna Lo Encañado lagoons. Also, in 1967 the El Yeso reservoir went into operation, with a storage capacity of approximately 250 million m^3, and it is regulated by Aguas Andinas according to the needs of the Metropolitan Region.

The annual average flow in the natural regime of the sub-sub-basin of the Yeso river is 10.99 m^3/s. From these, the 353 Km^2 watershed flowing into the reservoir, contributes with an 8.1 m^3/s annual average flow.

Figure 7 shows the discharge curve of Yeso river in the hydraulic modeling area selected for this river.

Figure 6
Contributing Basin to El Yeso Reservoir

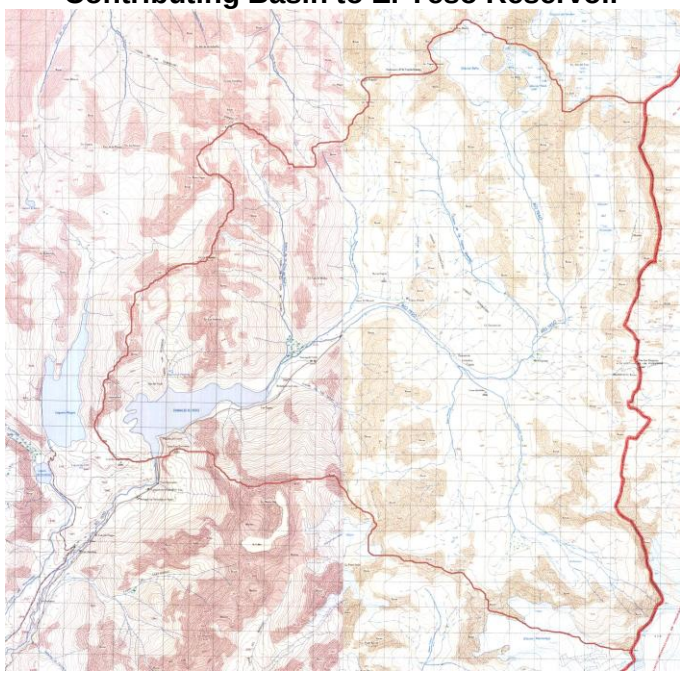
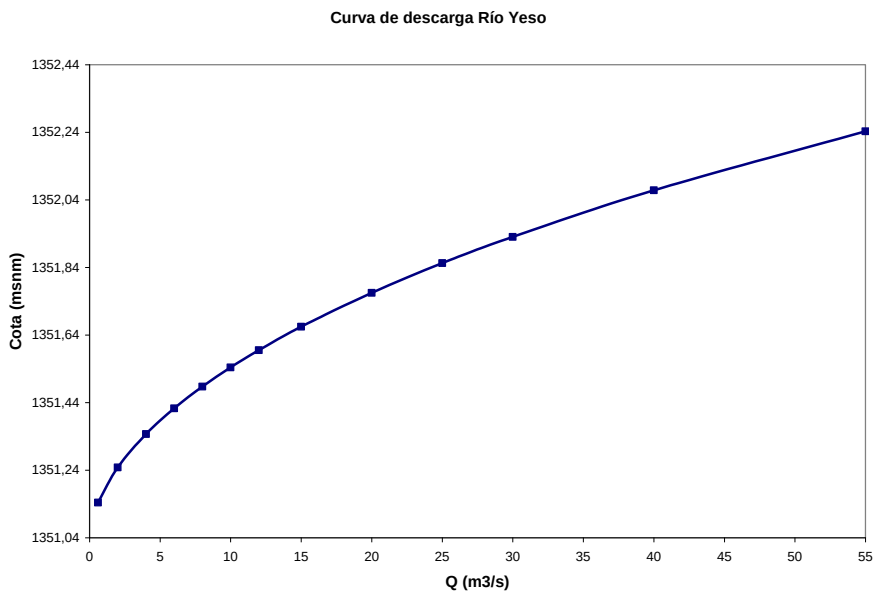


Figure 7
Discharge Curve of Yeso River



5.1.1.3 Hydraulic Characteristics of Yeso River

Figure 8 describes a granulometric curve obtained for Yeso river in the area being studied. The characteristic size of the particles present in the river bed is described in Table 2, with which the Manning roughness coefficient was estimated (Table 3).

Figure 8
Granulometric Curve of Yeso River

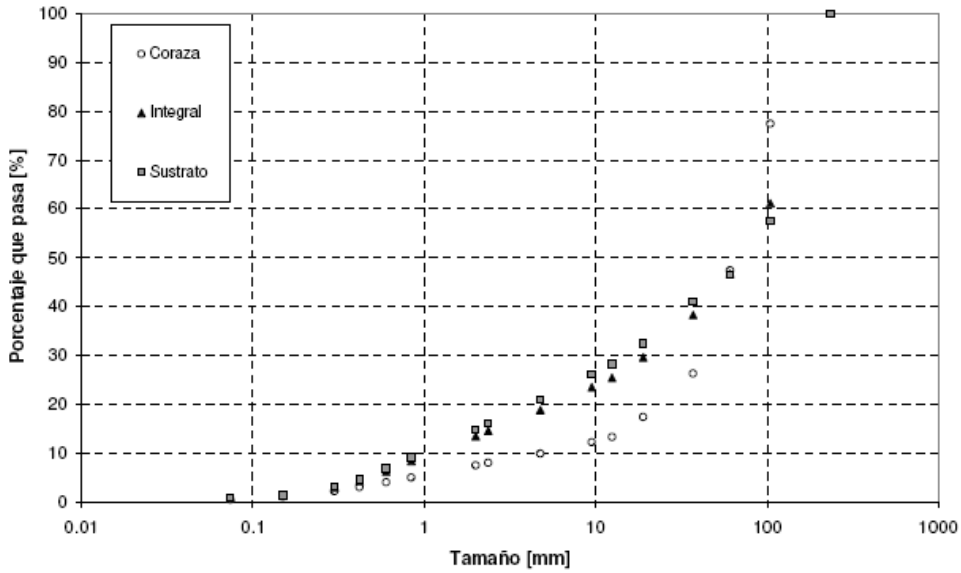


Table 2
Characteristic sizes of Yeso River (mm)

	Shield	Integral	Substrate
D_{90}	177,5	201,6	204,5
D_{84}	143,0	181,5	186,2
sD_{50}	64,8	71,0	74,9
D_{16}	16,8	3,2	2,4

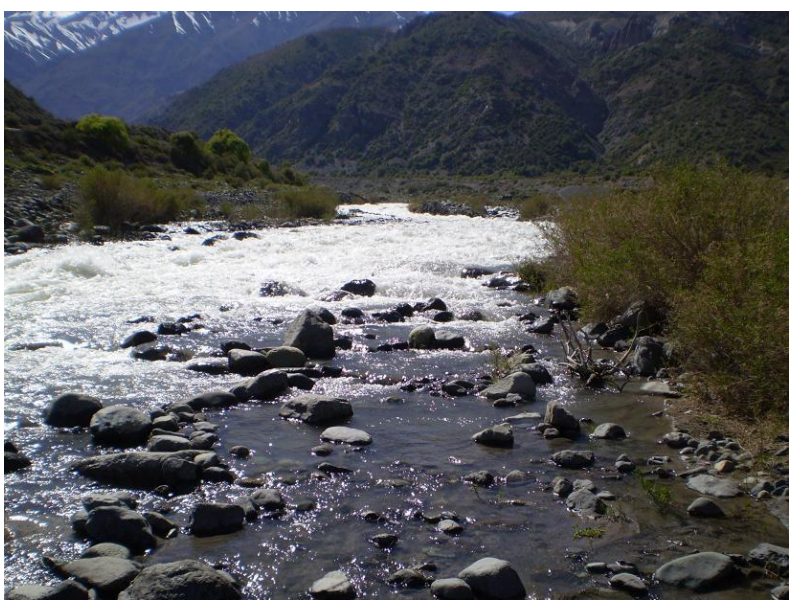
Table 3
Determination of the Manning Roughness Coefficient

Area	d (mm)	n_o	n_1	n_2	n_3	n_4	m	n
Yeso river	202	0,029	0,010	0,005	0,010	0	1	0,054

5.1.1.4 Definition of Yeso River's Environmental Flow Areas

The environmental flow area in Yeso river corresponded to the stretch between the confluence of San Nicolás stream and Maipo river. The area under study corresponded to the stretch of a lower slope, where we have the most favorable conditions for preserving aquatic fauna (Figure 9).

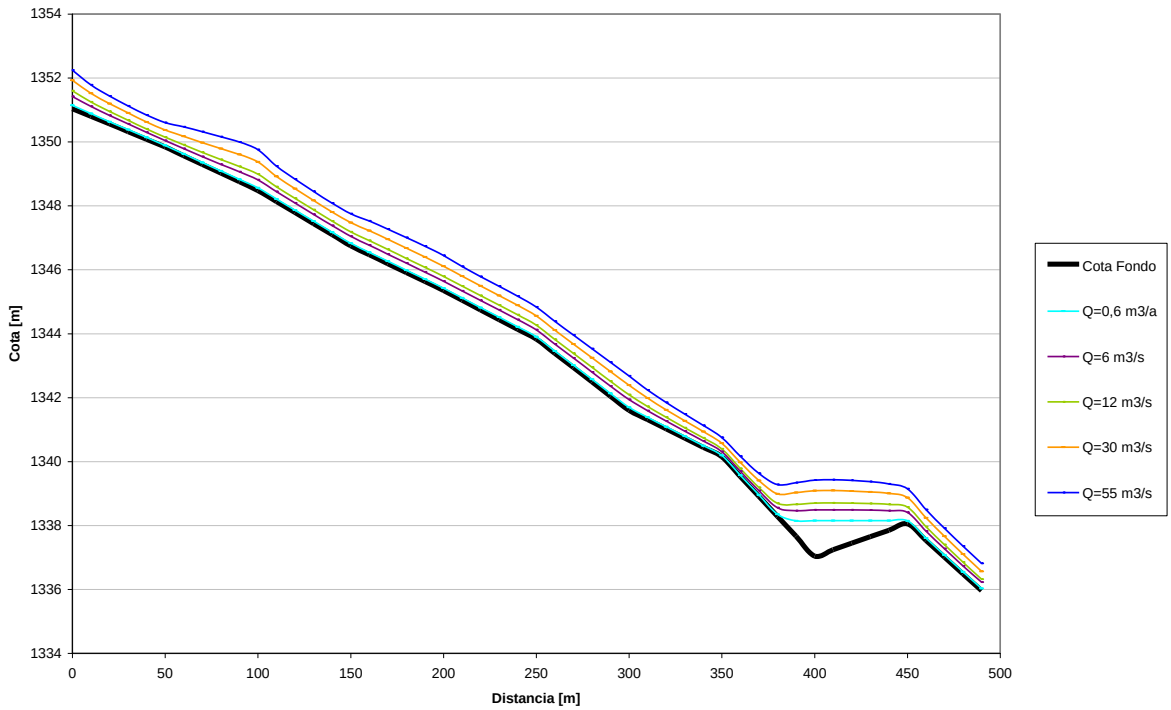
Figure 9
General Characteristics of the Area Defined as the Environmental Flow of El Yeso River



5.1.1.5 Hydraulic Axis of the Environmental Flow Area of Yeso River

Figure 10 shows the calculated hydraulic axis for Yeso river, in the stretch considered as the environmental flow.

Figure 10
Hydraulic axis of Yeso river in the Area under Study



5.1.1.6 Environmental Flow Calculation of Yeso River

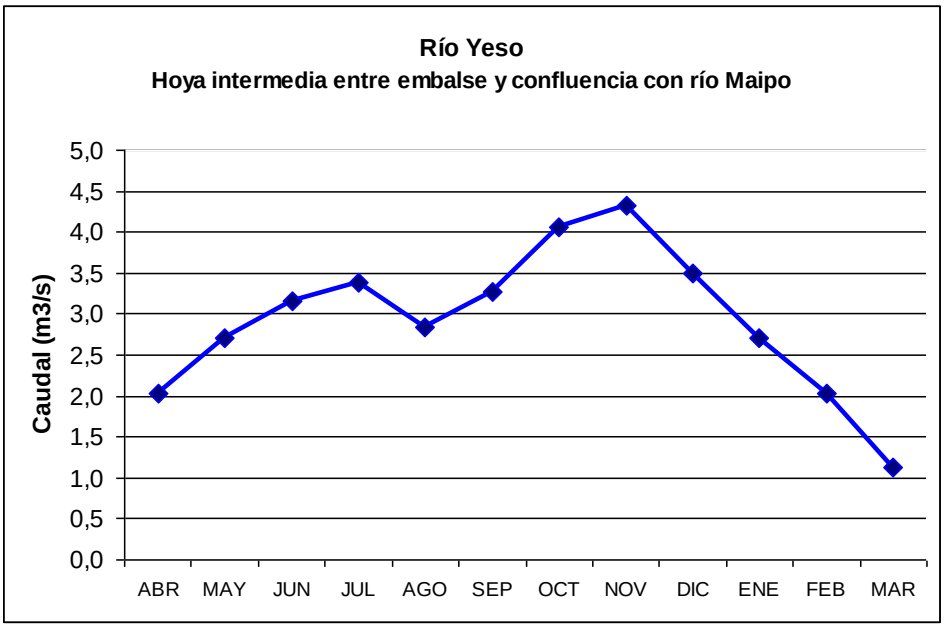
i) Hydrologic Information

The operation of the reservoir modified the natural regime of Yeso river, whose condition is now subject to water deliveries from the reservoir, a condition that may be observed in the historical statistics shown in Appendix 1. In it can be observed that the flow deliveries vary from 0 to a maximum of 40 m^3/s. In its historical condition, the average flow downstream from the reservoir for a year with 50% probability of surplus is 7,0 m^3/s and for the year it is 85% probability of surplus is 4,7 m^3/s. From the point of view of the life of the habitat, as well as for the scenery and tourism, we are facing a historical situation that has modified the nature of the waterway.

The most important streams that feed the intermediate watershed between the reservoir and Yeso river in the outlet are Manzanito, Cortaderas and San Nicolás streams. Manzanito and San Nicolás streams are collected by Aguas Andinas in the exercise of its rights constituted in both streams, in such a way that none of these intermediate basins fully contributes with resources to the river in the stretch under analysis.

A theoretical analysis on the contributions of the intermediate watershed between the reservoir and the outlet of Yeso to Maipo river, shows that there would be recoveries in the river that would go up, in the outlet, at an average annual flow of 2.93 m^3/s (Figure 11) subtracting the contributions of the watershed flowing into Laguna Negra and Lo Encañado, since those resources have been conducted by the Laguna Negra aqueduct to Santiago, from the startup of those works at the beginning of the century.

Figure 11
Contribution of the Intermediate Basin between the Reservoir and the Outlet of Yeso to Maipo River



Gener has water exploitation rights for non-consumption use, for a permanent and continuous exercise in Yeso river, for a flow of up to 15 m^3/s, that are collected at a point located downstream from the reservoir and that are subject to the operation of Aguas Andinas S.A. These water rights were granted without environmental flow requirements.

The project considers to collect, approximately 700 m downstream from the reservoir, a maximum flow of 15 m^3/s subject to the water availability in the river given by the operation of the reservoir, according to DGA Resolution N°107 of 04.25.83 that constituted the mentioned water rights.

To analyze the intermediate contributions of Yeso river in more detail, that intermediate watershed has been divided into two stretches:

- **Between the reservoir's dam and the Cortaderas stream**

In this stretch, of approximately 9 Km, there are not any relevant contributions from the ravines flowing into the river. However, it presents recoveries coming from the leakages of the reservoir and Laguna Negra, the latter are in part collected by Aguas Andinas before they get to the river, in the “Drenes Azulillos” to be later conducted to the Laguna Negra aqueduct.

The contribution from this stretch was calculated based on the information available in Yeso river in the confluence with Cortaderas stream and through relationships between the second section of the Yeso river and intermediate watersheds of similar areas of the basin under analysis[6]. The results show that the contribution of this stretch reaches an average value of 0.9 m^3/s.

To confirm the volume of the contributions of this part of the river, there were gaugings conducted indicated the river's flow in four areas of Yeso river (Appendix 2):

a) Yeso river downstream from the reservoir in the area of the water intake of the project,
b) Section located at 1,500 m downstream from a),
c) Section located at 2,500 m from the previous,
d) Section located in front of Cortaderas ravine (approximately 6 Km downstream from the reservoir.)

The result of the gauging is shown in Table 4, and the detailed information of the calculation is included in Appendix 2.

Table 4
Stream gauging of Yeso river in the Intermediate Basin

Section	Date	Time	Flow (lt/s)
a)	12.22.2007	09:30 AM	126
b)	12.22.2007	01:00 PM	380
c)	12.22.2007	02:00 PM	498
d)	12.22.2007	03:00 PM	650

These results, obtained in a date when the El Yeso reservoir **was not delivering water**, confirm the contributions to the river, that are of 650 lt/s, around 3 km before the confluence of Yeso river with Cortaderas stream.

- **Between Cortaderas stream and the outlet**

In this stretch of the river, of approximately 12 Km measured by the waterway, the calculated contribution (without considering Las Cortaderas stream) goes up to an average of 1.57 m^3/s.

The previous allows confirming that the intermediate watershed of the Yeso river, subtracting the flows collected by Aguas Andinas, and subtracting the contribution of Las Cortaderas stream, represents an average flow of 2.56 m^3/s in the outlet.

[6] Source: “Balance Hídrico de la Hoya del Río Maipo” (Hydric Balance of the Maipo River Watershed) CONIC-BF Ingenieros Consultores Ltda, December 2007

ii) Habitat Simulation Method

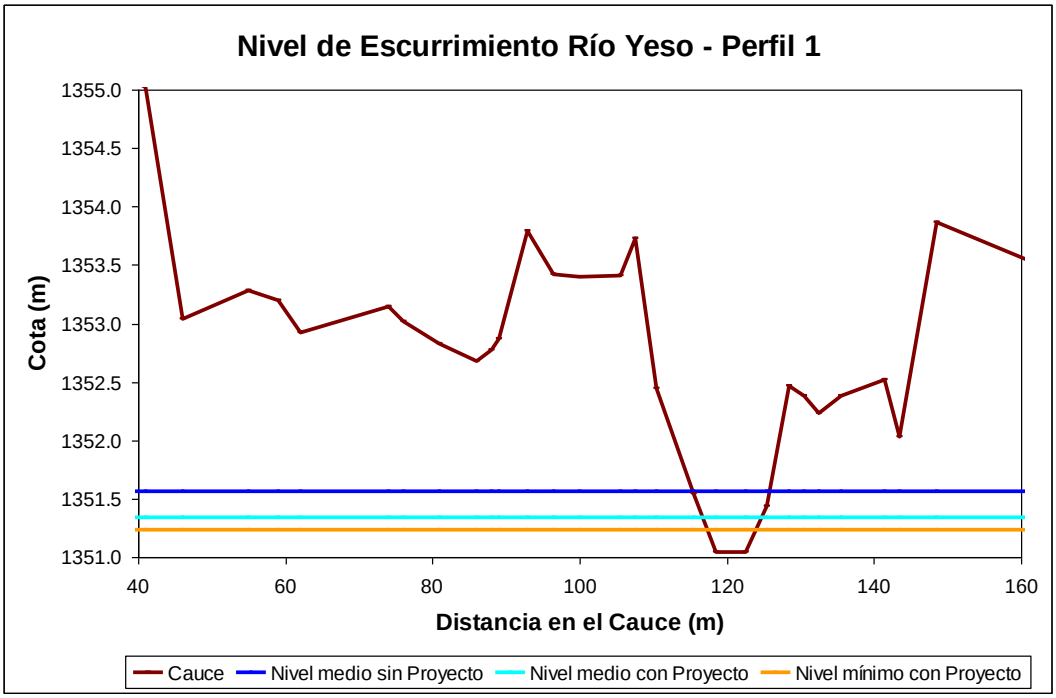
From the results of the hydraulic axis, a simulation of the aquatic habitat quality of the fish took place, using as a descriptive species the *Salmo trutta* (brown trout), and using depth (Figures 12, 13 and 14) and the local rate (Figure 15) as the descriptive variables of the aquatic habitat.

Both hydraulic axes as well as the runoff rate in the waterway were obtained from the MOSSEM model[7], by solving the equation of energy balance. That information provides the depth variation curves (Figures 13, 14 and 15) and the runoff rate (Figure 16).

From the hydraulic axes values under study, it is concluded that, on average, flows of the order of 2.6 m^3/s verify runoff heights of over 20 cm. However, the condition of a rate lower than 1 m/s is not met with this level of flows, in fact, such condition is met for flows lower than 2.2 m^3/s.

The prior means that, in terms of annual average flow, the condition of runoff height greater than 20 cm, can be met only with the contribution of the intermediate watershed of Yeso river, whose value rises up to, as it was mentioned previously, to 2.93 m^3/s. In turn, the rate condition practically does not take place naturally, considering the fact that the annual average flow of Yeso river rises up to 10 m^3/s.

Figure 12
Runoff Height of Yeso River in Profile 1



[7] Reference: "Estudio Sedimentológico en el Río Maipo" (Sedimentologic Study at Maipo River) (2007), conducted by the Civil Engineering Department of Universidad de Chile included in Annex 20 of this Sedimentologic Study EIA

Figure 13
Runoff Height of Yeso River in Profile 7

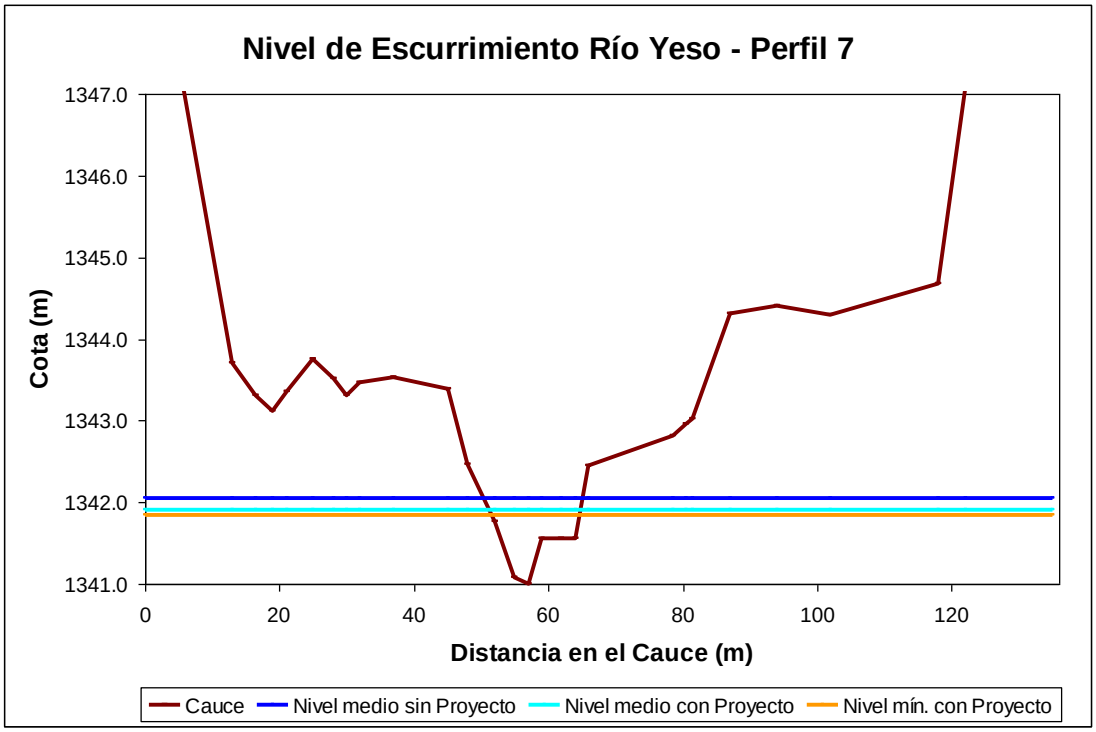


Figure 14
Runoff Height of Yeso River in Profile 11

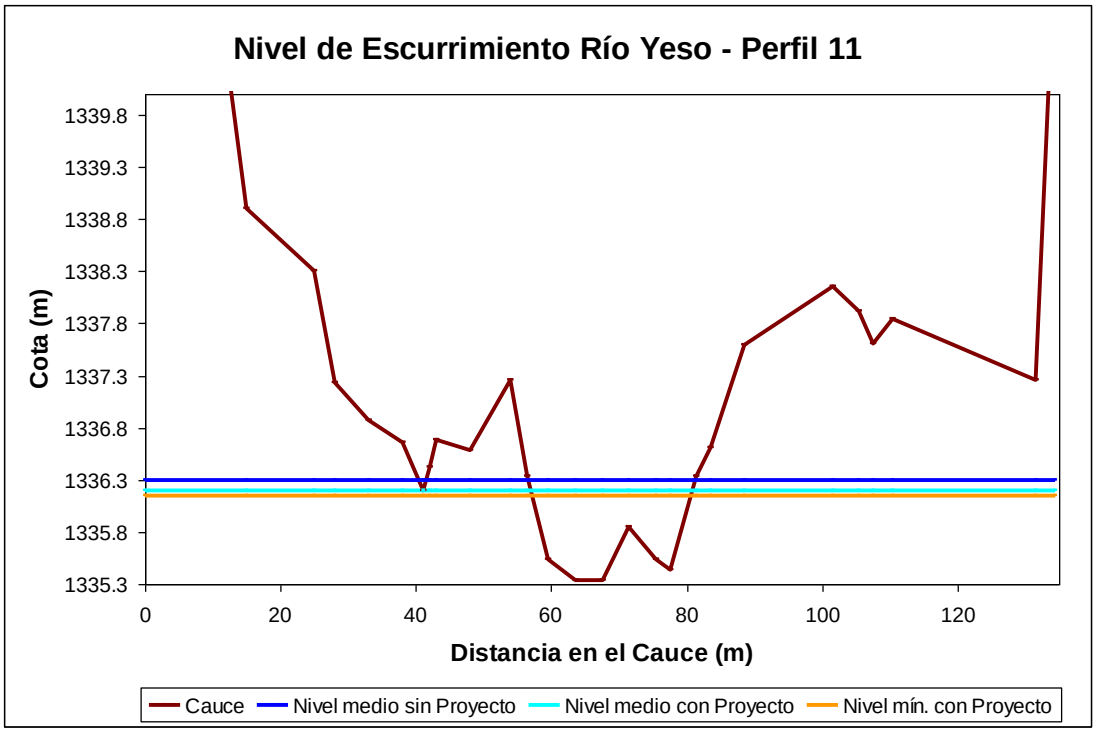
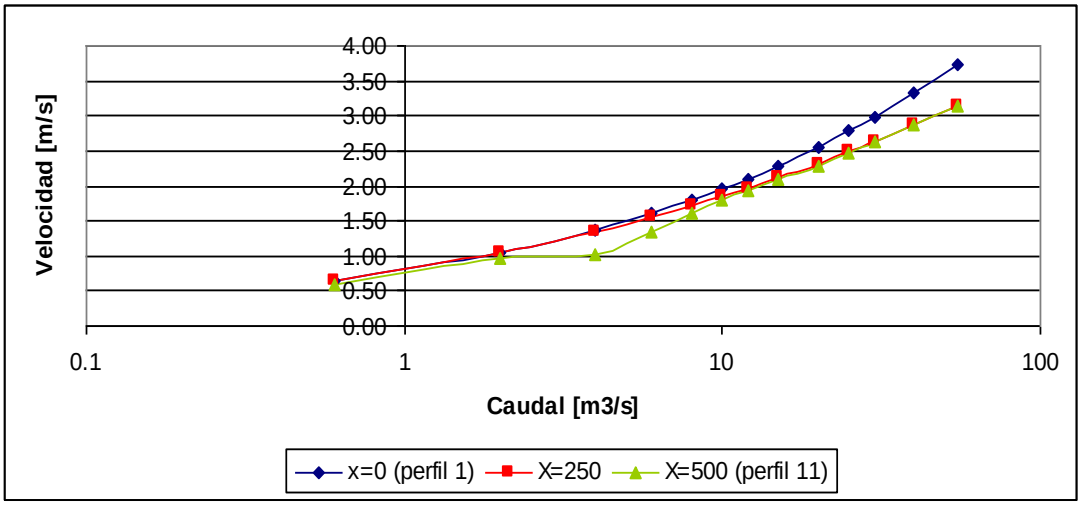


Figure 15
Runoff Rate of Yeso River



iii) Conclusions

a) The environmental flow required in the sensitive area, that maintains the 20 cm height condition in the waterway, turns up to be 2.6 m^3/s.

b) The rates that correspond to that flow are in general, higher than 1 m/s.

c) The contribution of the intermediate watershed downstream from the intake of the project is of 2.93 m^3/s.

d) The average flow in the intake with the project is 4.2 m^3/s.

It must be considered that, both the aquatic flora and fauna in Yeso river have been subject, since 1968, to flow variations, due to the operation of the El Yeso reservoir carried out by its owners, which implies variations that are in ranges between 0.6 m^3/s to 40 m^3/s.

Additionally, statistics show that the intermediate watershed by itself contributes abundantly with the environmental flow required by the sensitive area, which would make it unnecessary to let an environmental flow pass through the intake from the habitat point of view.

Nevertheless, to ensure that the waterway will not dry out in the stretch located immediately downstream from the collection works, the PHAM proposes to let 200 lt/s pass continuously in the intake of the project when the reservoir delivers water.

To verify the conditions of the waterway in the analyzed stretch, defined as sensitive area, the Owner proposes to run a monthly stream gauge for a year, before and after the operation of the project.

5.1.2 Colorado River

5.1.2.1 Biological Characteristics

In Colorado river the presence of *Trichomycterus aerolatus* (native species), was detected, specifically in the confluence of Quempo stream with Colorado river, corresponding approximately to the area where the outlet duct of the Las Lajas Forebay crosses Colorado river's siphon. Also, there were 2 taxa of benthic macroinvertebrates detected, the taxa were Chironomida of the *Simulium* and *Edwardsina genus*, which were found in a very low abundance.

5.1.2.2 Hydrologic Characteristics

In this sub-sub-basin, the area under study is located between the intake of Maitenes Power Plant, some 5 Km downstream below the confluence of rivers Colorado and Olivares, and the outlet of Maipo river. In this stretch, the most important contributions correspond to Quempo, Aucayes and El Durazno streams, and secondarily to El Sauce and El Temblor streams (or Los Tollos).

In this area of Colorado river, located between the intake of Maitenes Power Plant and its discharge, of approximately 10 Km long, the natural regime of the river is modified by the operation of Alfalfal and Maitenes Power Plants, both being run-of-river plants. Currently, between the intake of Maitenes Power Plant -in operation since 1923- and the discharge of this power plant, the operation is not subject to environmental flow requirements, which represents a historical condition of practically non-existing flows in low water level periods until before the contribution of Quempo stream. This is since the discharge of the Alfalfal Power Plant is connected with the head tunnel of Maitenes Power Plant. Downstream from this point, the river runs, in extreme situations, only the flow equivalent to the contribution of this stream. In such conditions, the described stretch could be compared to the condition present in Yeso river.

In Figures 16 and 17 the discharge curve of Colorado river is shown, in the area of the outlet of Quempo stream.

Figure 16
Discharge Curve of Colorado River

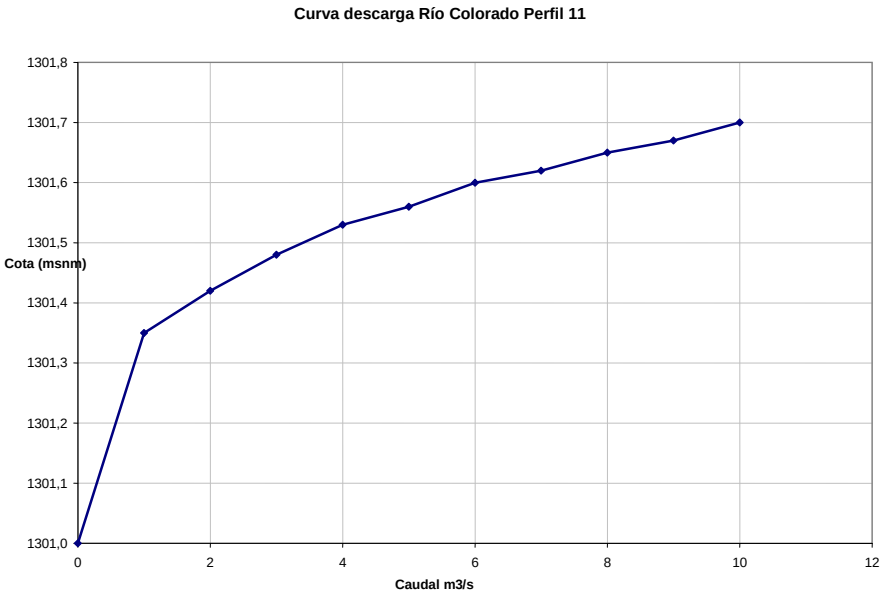
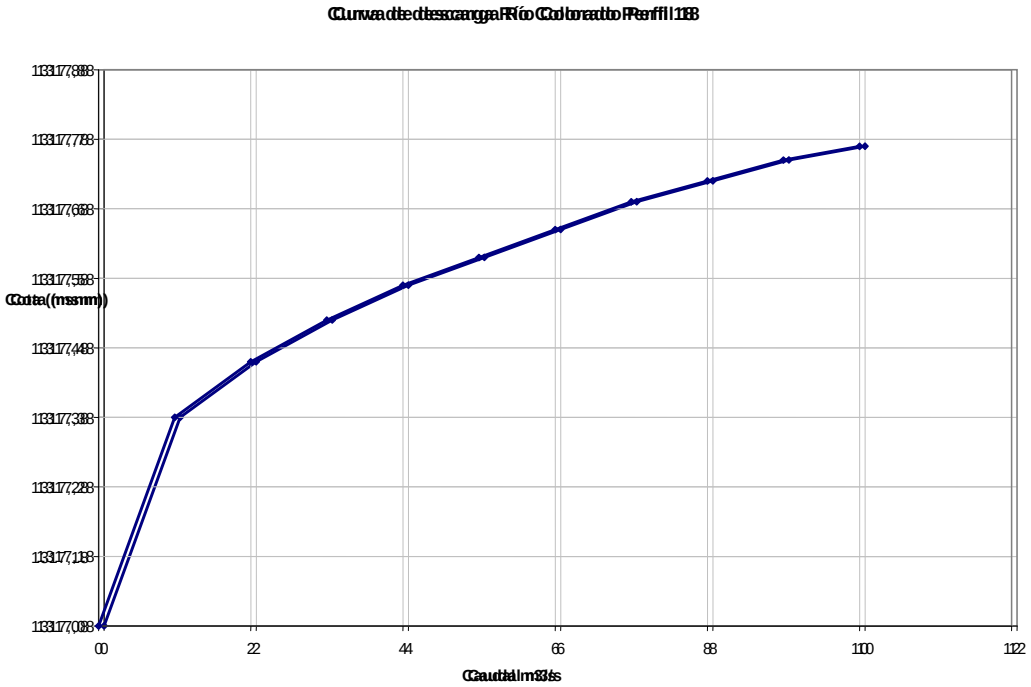


Figure 17
Discharge Curve of Colorado River



5.1.2.3 Hydraulic Characteristics of Colorado River

Figure 18 describes the granulometric curve obtained for Colorado river in the area being studied. The characteristic size of the particles present in the river bed is described in Table 5, with which the Manning roughness coefficient was determined (Table 6).

Figure 18
Granulometric Curve of Colorado River

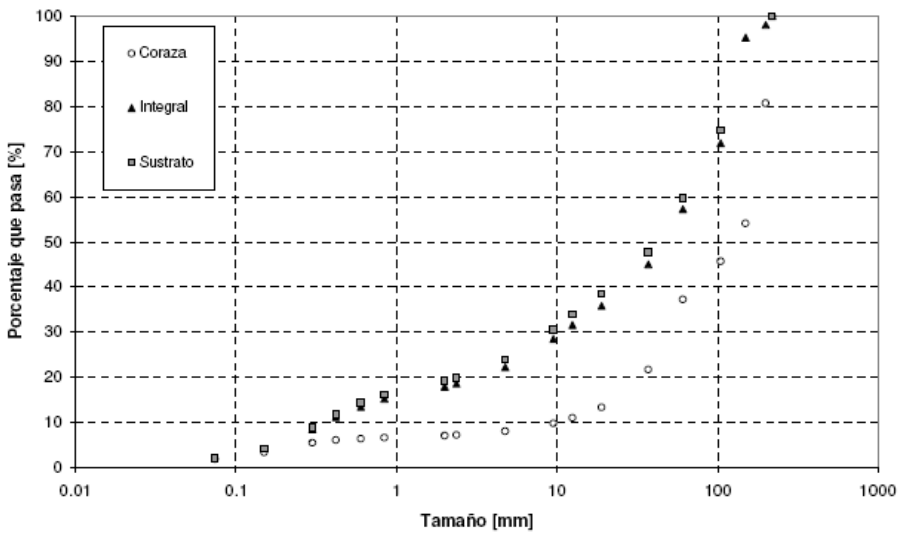


Table 5
Characteristic sizes of Colorado River (mm)

	Shield	Integral	Substrate
D_{90}	209.6	139.9	174.3
D_{84}	203.4	128.4	146.9
sD_{50}	128.1	46.9	41.8
D_{16}	24.8	1.2	0.8

Table 6
Determination of the Manning Roughness Coefficient

Area	d (mm)	n_o	n_1	n_2	n_3	n_4	m	n
Colorado River	172	0,028	0,010	0,010	0	0	1	0,048

5.1.2.4 Definition of Environmental Flow Areas of Colorado River

The environmental flow area in Colorado river was the stretch between the intake of Maitenes Power Plant and the confluence of El Sauce stream with Colorado river. The area under study was the stretch of a lower slope, where we have the most favorable conditions for preserving aquatic fauna (Figures 19 and 20).

Figure 19
Area Defined as the Environmental Flow Area in Colorado River

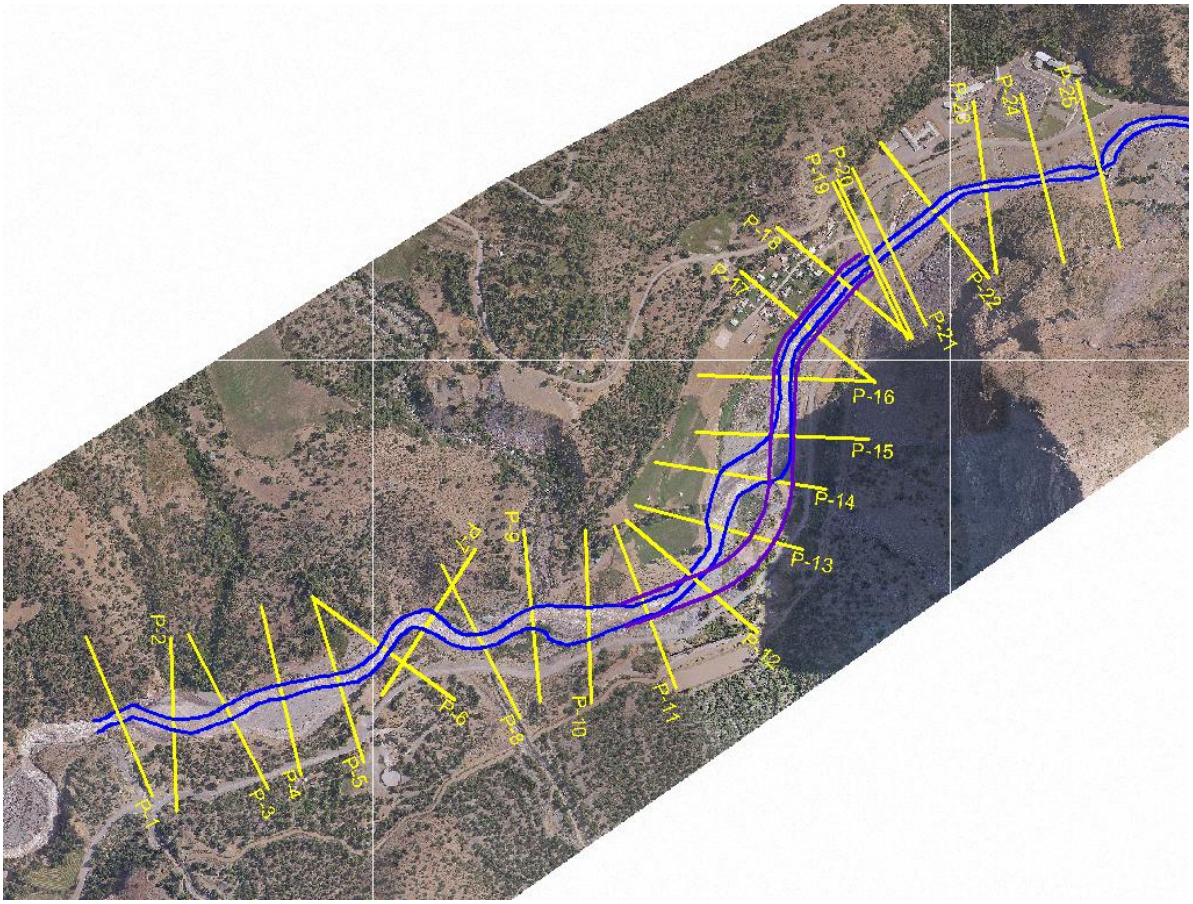
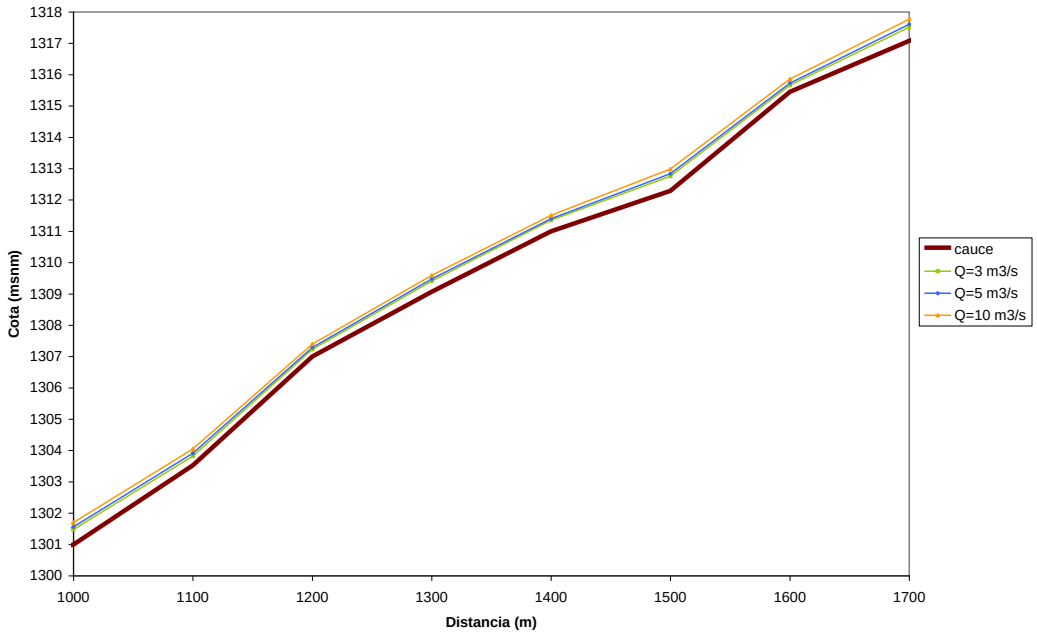


Figure 20
General Characteristics of the Area Defined as the Environmental Flow Area in Colorado River

5.1.2.5 Hydraulic Axis of the Environmental Flow Area of Colorado River

Figure 21 shows the calculated hydraulic axis for Yeso river, in the stretch considered as the environmental flow.

Figure 21
Hydraulic axis of Colorado river in the Area under Study



5.1.2.6 Environmental Flow Calculation of Colorado River

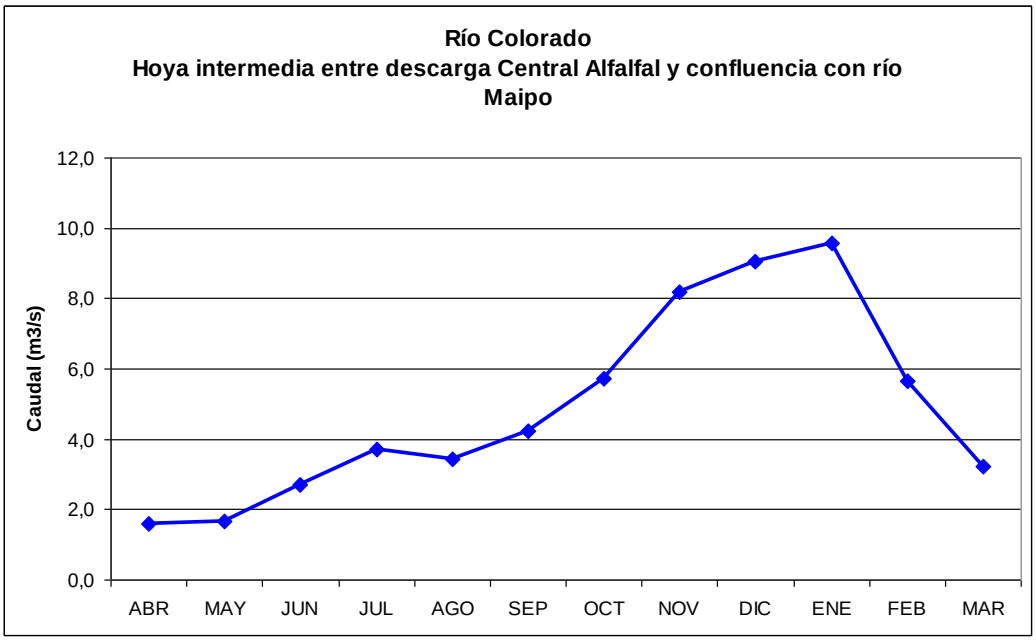
i) Hydrologic Information

The hydrologic studies conducted by the PHAM[8]show that the availability of flows in the discharge of Alfalfal Power Plant, located at approximately 200 m downstream from the intake of Maitenes Power Plant, rises to an annual average value of 26 m^3/s. Moreover, the flow regime determined from the Colorado stream flow gauging station in the outlet indicates that the annual average flow in that section of the river is of around 31 m^3/s. The difference between both statistics allows calculating the contribution of the intermediate watershed of Colorado river, which would be of 4.9 m^3/s (Figure 22).

The entire watershed of Colorado river is 1,713 km^2 long, from which 1,413 km^2 is part of the basin in the area of the intake of Maitenes Power Plant, which represents 82% of the Colorado river basin.

[8] Source: "Balance Hidrológico Hoya del Río Maipo" (Hydrologic Balance of Maipo River's Watershed) CONIC-BF Ingenieros Civiles Consultores Ltda. December 2007

Figure 22
Flow Contribution of Colorado River's Intermediate Basin



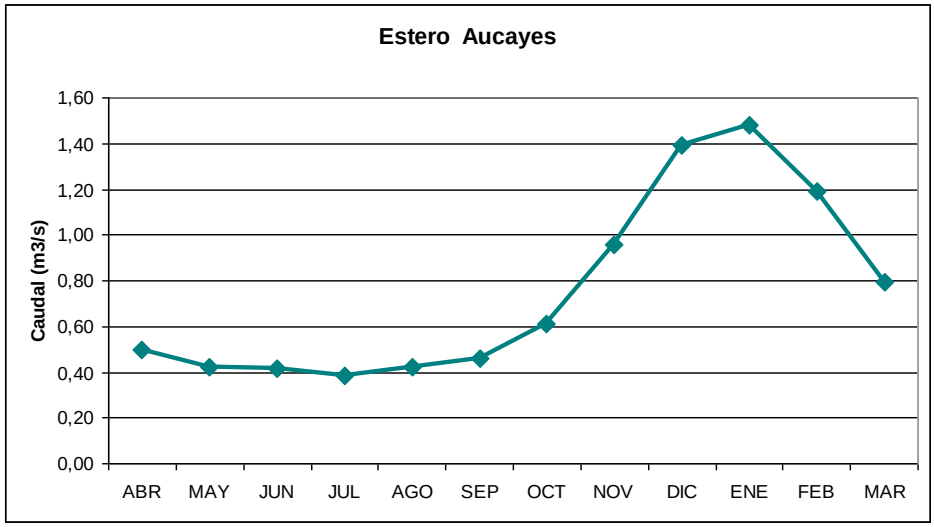
In this sub-basin, the PHAM uses the available resources of Maitenes Power Plant's intake and those available in the discharge of Alfalfal Power Plant, with a maximum of 40 m^3/s, collected from the discharge of Alfalfal Power Plant and from Maitenes tailrace, apart from the resources of Aucayes stream.

<u>Aucayes Stream</u>

Currently, the waters of Aucayes stream are collected for the generation of Maitenes Power Plant, limited to the rights that Gener has on this stream, of 2 m^3/s, which do not have environmental flow requirements. The contributing watershed in the intake of the tunnel that runs the waters to the referred Power Plant is of approximately 49 km^2.

The Alto Maipo project will use all of the resources currently generated by Maitenes Power Plant, leaving this plant out of service most of the time. However, being there excesses in the river, once the requirements that will be finally adopted regarding the remaining flows in the river are met, the Maitenes plant would be able to operate during the summer. This situation has motivated the decision of not intervening the current intake of the Aucayes stream, though those resources are leveraged by the new project, which will be materialized by altering the flows of the streams that currently run through the tunnel, to the head tunnel of Las Lajas Power Plant, through a sounding that will connect both aqueducts. By not intervening the intake, there aren't any environmental flows considered in this stream.

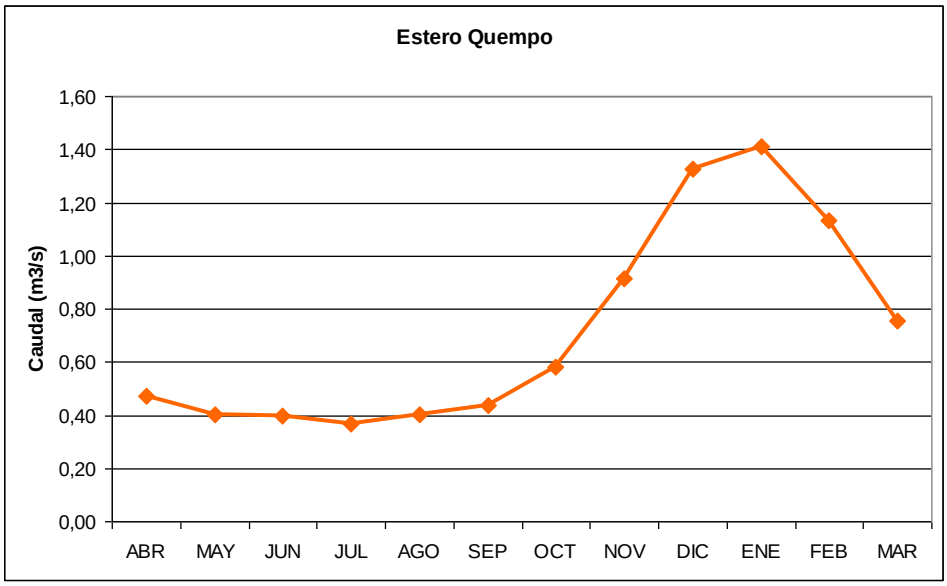
Figure 23
Aucayes Stream Flow



Quempo Stream

Quempo stream, an affluent of the Colorado river, presents a flow regime similar to all of the waterways of the area, with a flow increase from November to March. The recent hydrologic analyses that have consisted basically in the extension of the available statistics indicate for this stream an annual average flow of 0.72 m^3/s, which represents an affluent watershed of 50 km^2. Gener has water exploitation rights on this stream for 1 m^3/s, out of these, 150 lt/s are used as refrigeration water for Alfalfal power plant, and are then returned to Colorado river through the discharge of this plant.

Figure 24
Quempo Stream's Flow



ii) Habitat Simulation Method

From the results of the hydraulic axis, the aquatic habitat quality simulation for fish was done using the *Trichomycterus aerolatus* as a descriptive species, and using as depth and rates as descriptive variables of the aquatic habitat (Figures 25, 26, 27 and 28).

Both hydraulic axes as well as the runoff rate in the waterway were obtained from the Hec-Ras model, by solving the equation of energy balance. In this way, the runoff depth and rate variation curves are obtained (Figures 25, 26, 27 and 28). The average values of runoff depth and rate are shown in Figures 29, 30 and 31.

Figure 25
Colorado River Flow v/s Altitude (m.a.s.l) and Rate (m/s) in Profile 11 (Current Situation)

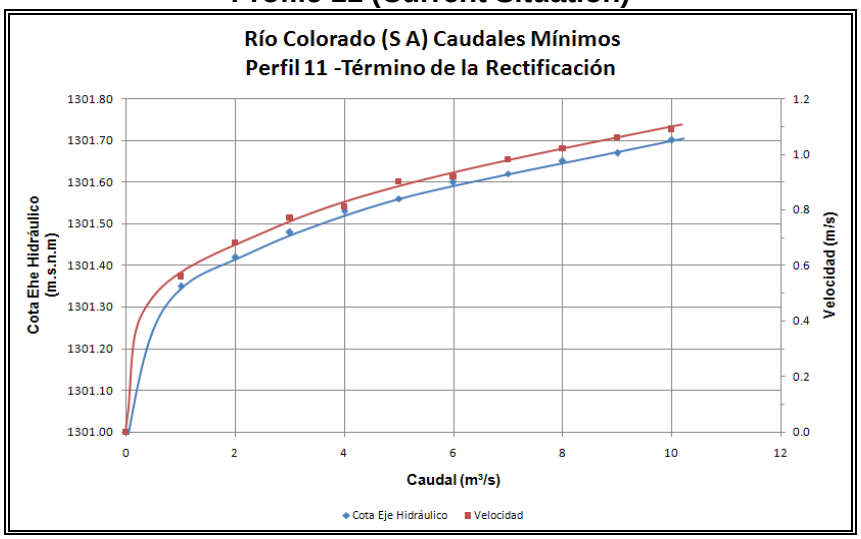


Figure 26
Colorado River Flow v/s Altitude (m.a.s.l) and Rate (m/s) in Profile 11 (Project Situation)

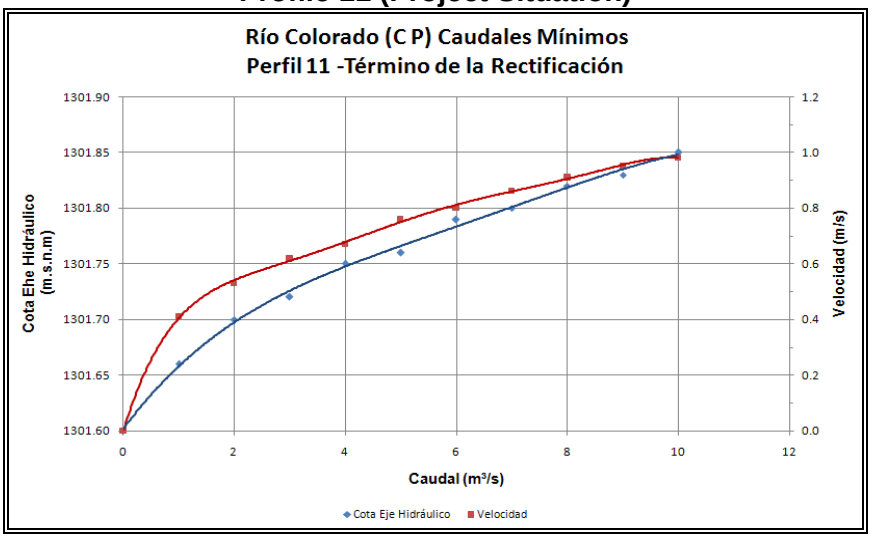


Figure 27
Colorado River Flow v/s Altitude (m.a.s.l.) and Rate (m/s) in Profile 18 (Current Situation)

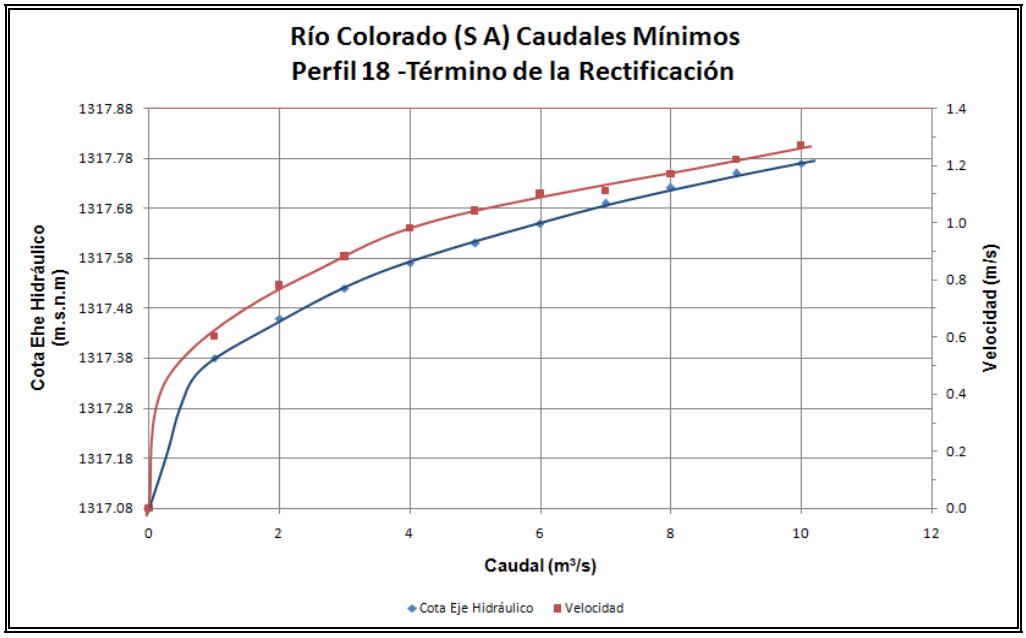


Figure 28
Colorado River Flow v/s Altitude (m.a.s.l.) and Rate (m/s) in Profile 18 (Project Situation)

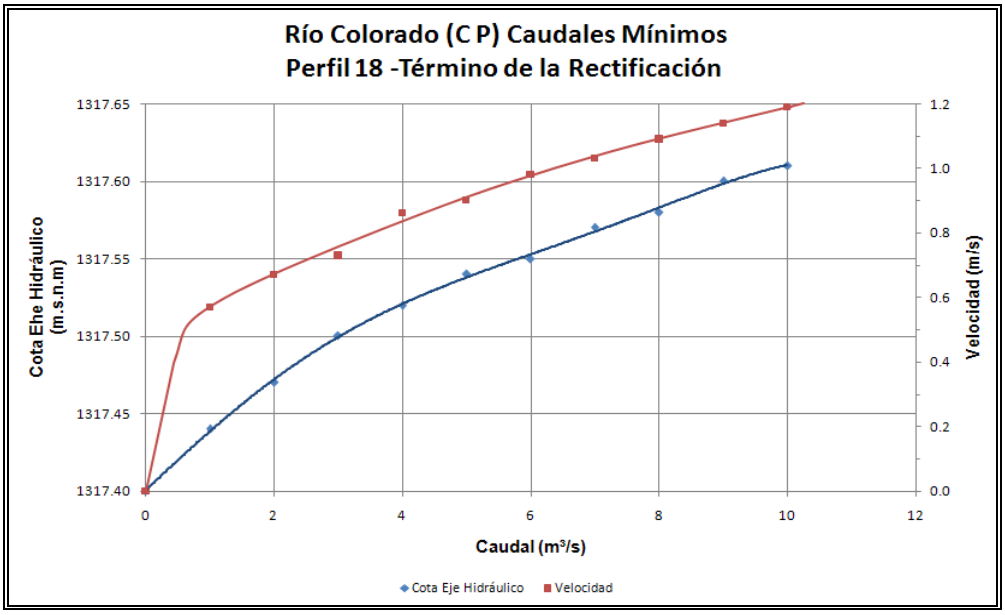


Figure 29
Runoff Height of Colorado River

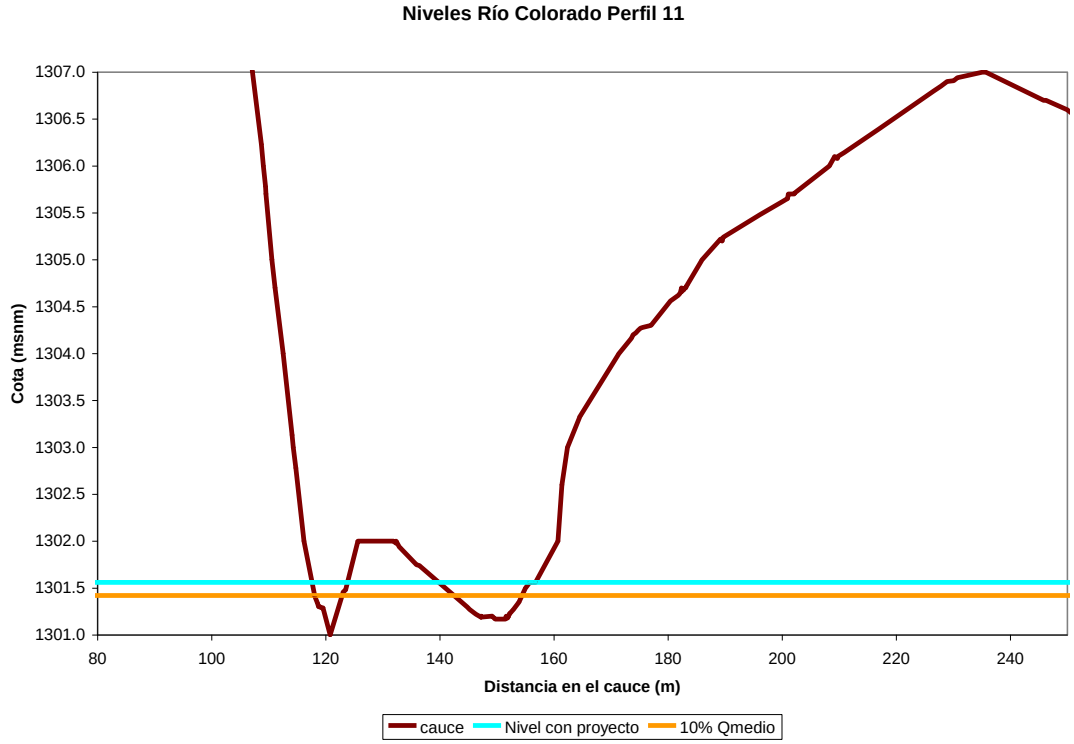


Figure 30
Runoff Height of Colorado River

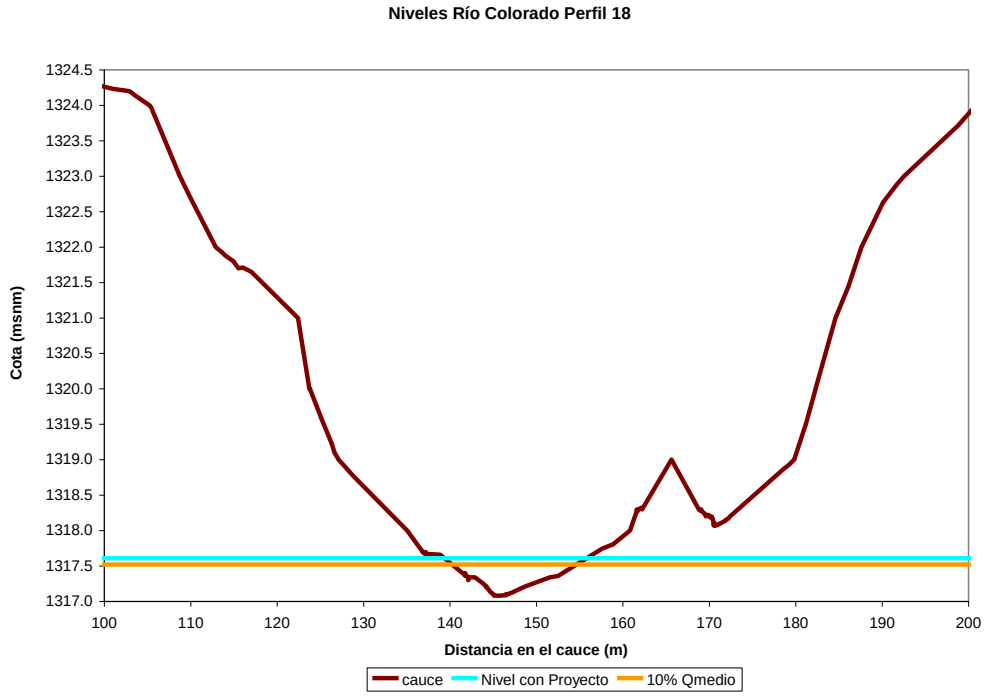
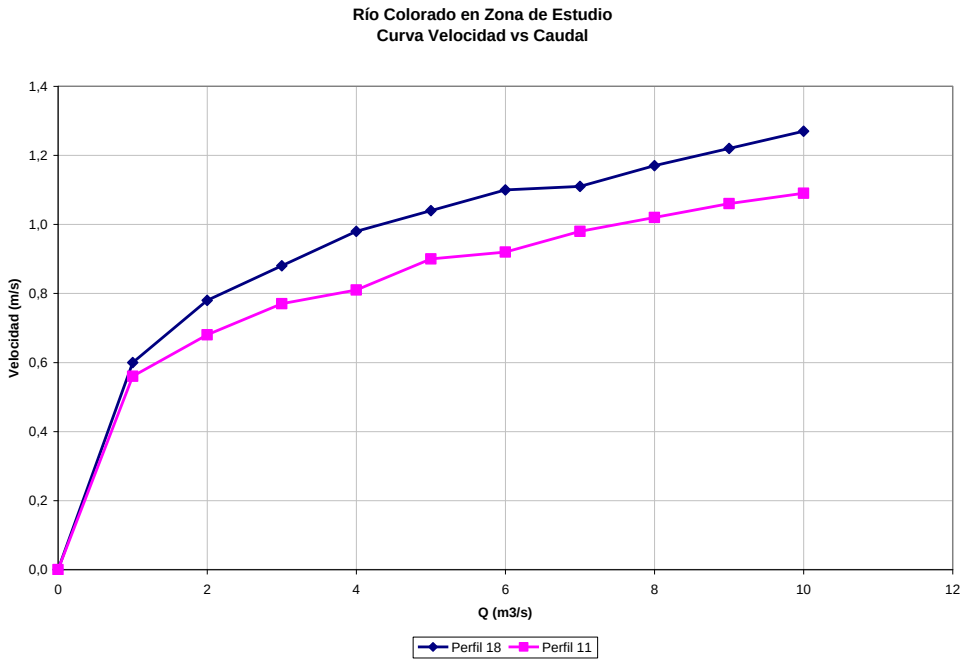


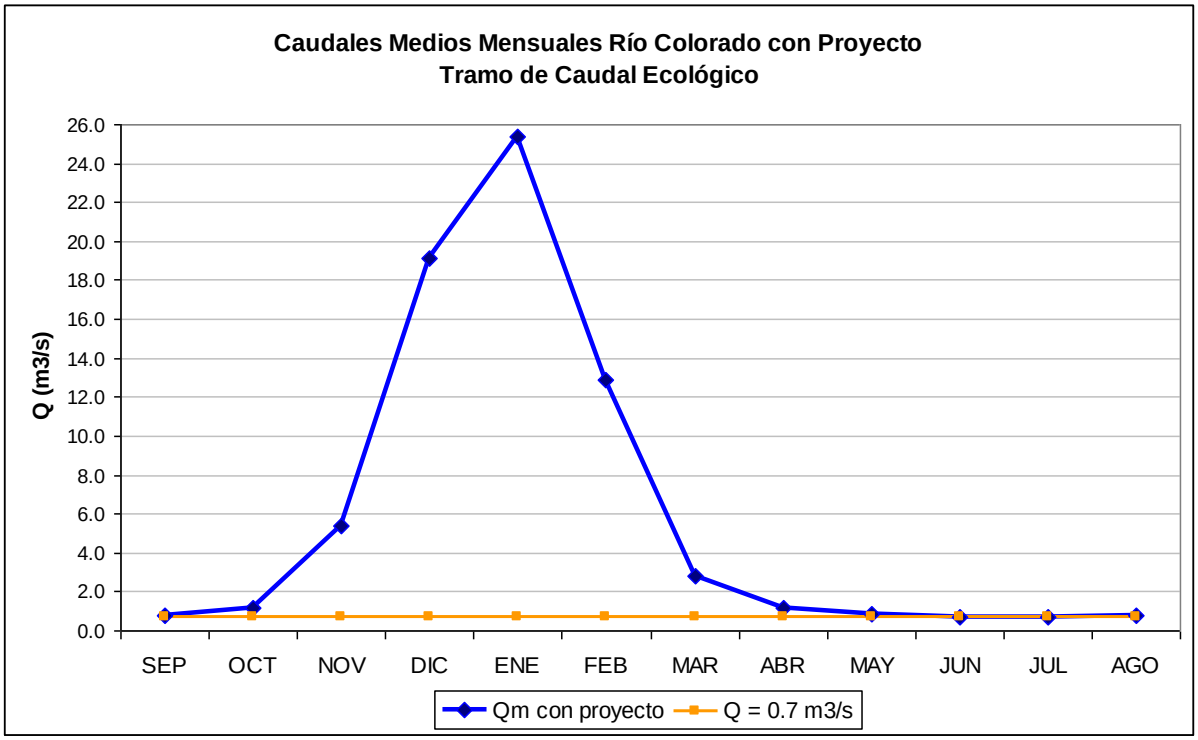
Figure 31
Runoff Rate of Colorado River



From the hydraulic axes values under study, it is concluded that, on average, flows of the order of 0.6 m3/s verify runoff heights of over 20 cm. Moreover, rates lower than 1 m/s are associated to flows lower than 6 m^3/s.

Therefore, in order to meet the quality requirements of the aquatic habitat, the PHAM proposes to assure a minimum flow of 0.7 m^3/s in the area defined as the environmental flow area. To meet this, the PHAM considers on one hand, not collecting the resources of Quempo stream that were originally considered within the works of the project, and whose annual average flow is of 0.72 m^3/s, and, if necessary, to let a flow of 0.3 m^3/s pass in the intake of Maitenes Power Plant. The prior, would allow a monthly distribution of flows such as the one shown in Figure 32.

Figure 32
Colorado River Flow with the Project in a Sensitive Area



iii) *Conclusion*

e) The environmental flow required in the sensitive area, that maintains the 20 cm height condition in the waterway, turns up to be 0.6 m3/s.

f) The rates for that flow are in general, lower than 1 m/s. For flows over 6 m^3/s, the rate increases at over 1 m/s.

g) The average flow in this area, with the project, is of 6 m^3/s, with a variability that would fluctuate between 0.5 m^3/s and 25 m^3/s.

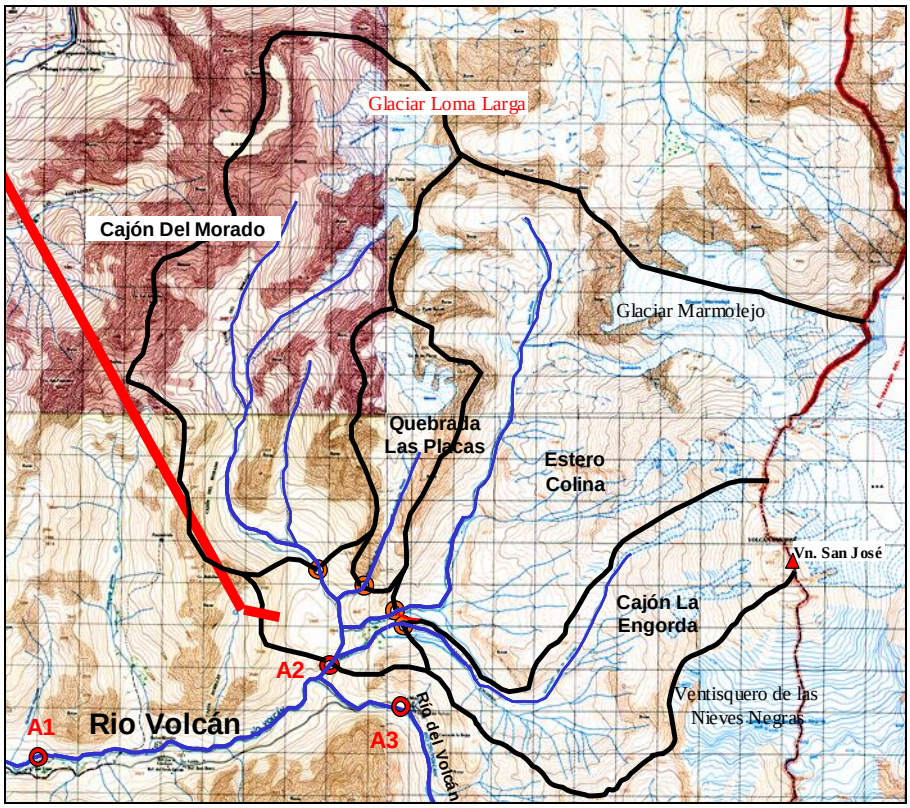
Under these conditions, and as a way of guaranteeing the minimum flows required for the habitat requirement, the PHAM has decided to cease the collection of its legally constituted rights on Quempo stream, which will contribute to keep at a minimum, the current situation of such stretch of the river, which, by the way, has allowed for the existence of the native species *Trichomycterus aerolatus*.

Finally, if necessary, the PHAM would allow passing 0.3 m^3/s in the intake of Maitenes Power Plant.

5.1.3 Streams: La Engorda, Colina, Las Placas and Cajón El Morado

In this sub-sub-basin, the project collects resources from La Engorda, Colina, Las Placas and El Morado streams (Figure 33). This high area of El Volcán river presents a hydrologic regime of nival and glacial origin, covering approximately 36 km^2 of glaciers of a total of 169 Km^2 corresponding to the sum of the watersheds of each one of the streams. The largest flows arise between the months of November and March due to the increase of temperatures, strongly decreasing during the months of winter. The interest area of the project is located at an altitude of approximately 2500 m.a.s.l. At this altitude, the streams arise in plains that fall abruptly at 2300 of altitude in the area where the four streams converge forming the Engorda stream, according to the denomination of the maps of the IGM.

Figure 33
Hydrographic watersheds of La Engorda, Colina, Las Placas and Cajón El Morado streams



5.1.3.1 Biological Characteristics

In La Engorda, Colina, Las Placas and Cajón El Morado streams **the presence of fish** was not detected, being this an expected situation due to the elevation and hydraulic conditions (large slopes) of the streams. The richness and abundance of benthic macroinvertebrates was low.

5.1.3.2 Hydrologic Characteristics

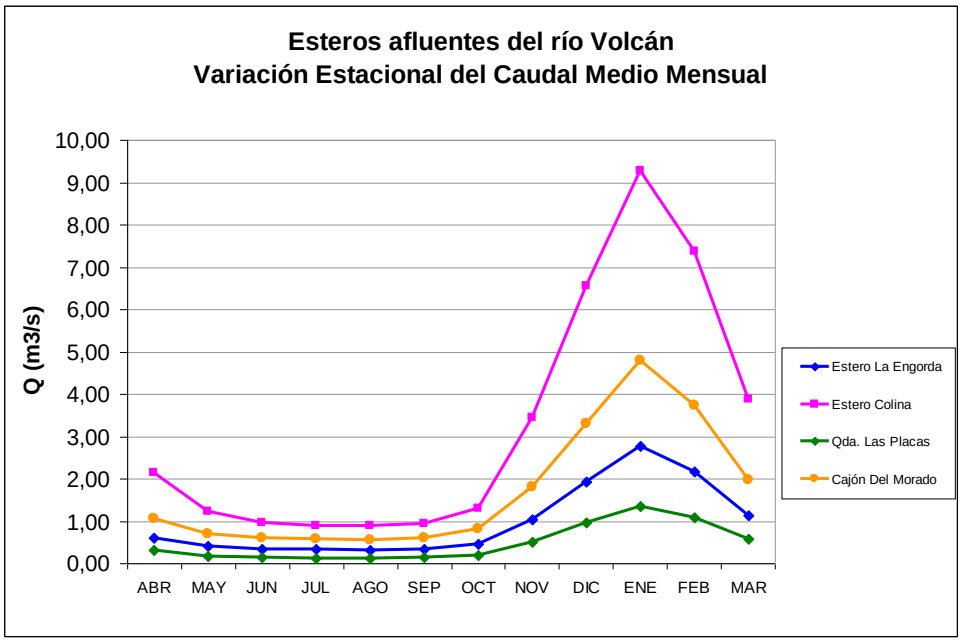
La Engorda stream, after it has received the contribution of the rest of the streams, joins "Río del Volcán" river that corresponds to the southern branch of Volcán river, made up by Colina and Cajón de Carreño rivers whose sources are located in the watersheds located at the south of the mountainside of San José volcano towards the south of the basin. The contributions of both branches of Volcán river are similar, with La Engorda being approximately 25% larger, due to the contribution of glaciers.

The available resources in the streams of interest for the PHAM represent an annual average of 6.41 m^3/s and a monthly variation shown in Table 7 and Figure 34.

Table 7
Flow Provided by Cajón La Engorda, Colina, Las Placas and Cajón El Morado streams to the PHAM

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
PROM	4,13	2,50	2,05	1,93	1,88	2,01	2,76	6,80	12,72	18,21	14,35	7,56	6,41
MAX	6,53	3,92	3,92	3,20	3,12	3,32	3,87	9,01	18,69	33,80	28,04	13,11	10,09
MIN	3,00	1,33	1,33	1,33	1,30	1,26	1,56	4,41	8,04	9,53	8,89	5,75	4,49

Figure 34
Monthly Flow Provided by Cajón La Engorda, Colina, Las Placas and Cajón El Morado streams to the PHAM



Figures 35, 36, 37, 38, 39, 40, 41 and 42 show the discharge and rate vs. flow of the streams.

Figure 35
Discharge Curve of La Engorda Stream

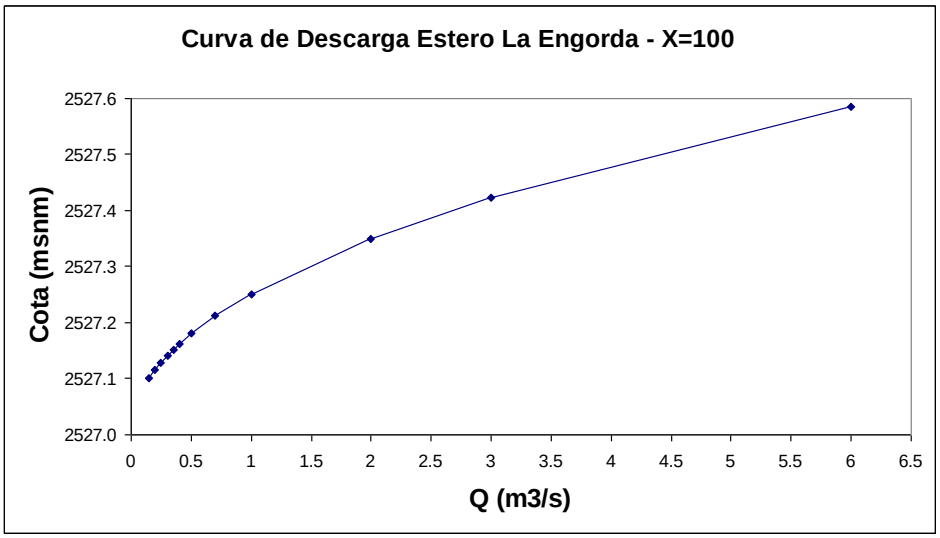


Figure 36
Discharge Curve of Colina Stream

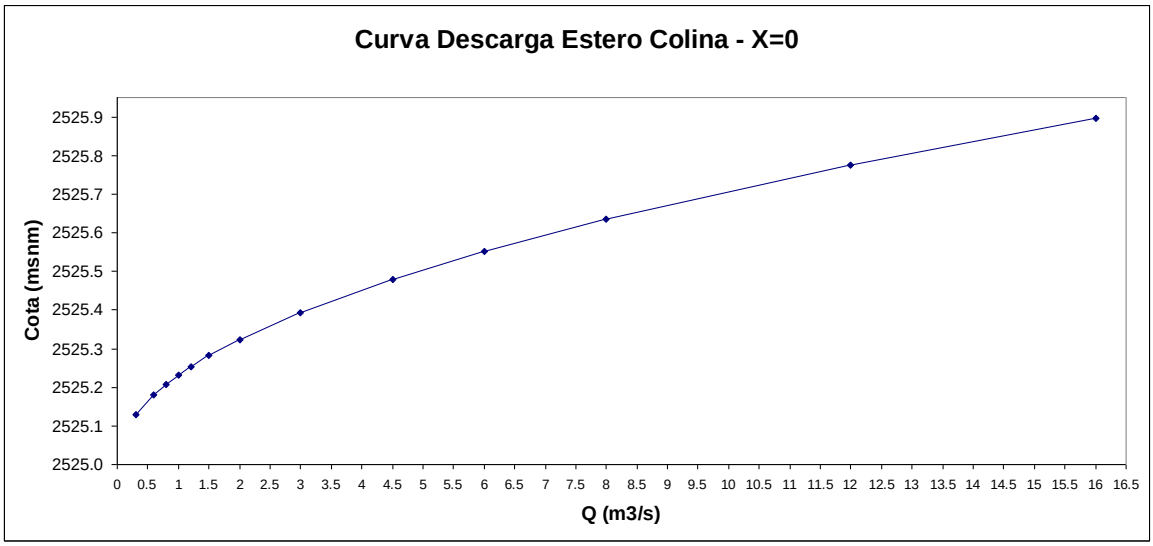


Figure 37
Discharge Curve of Las Placas Stream

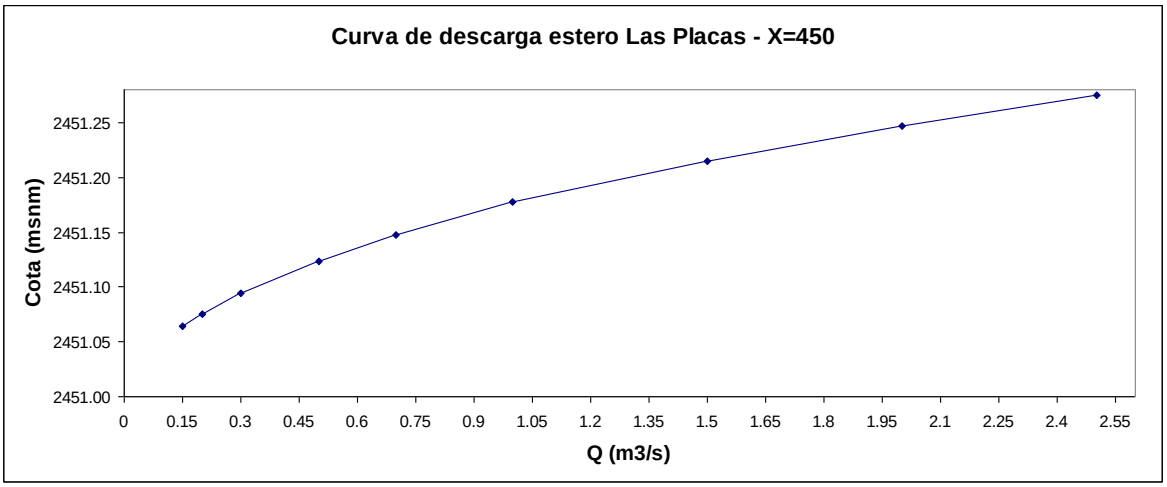


Figure 38
Discharge Curve of Cajón El Morado Stream

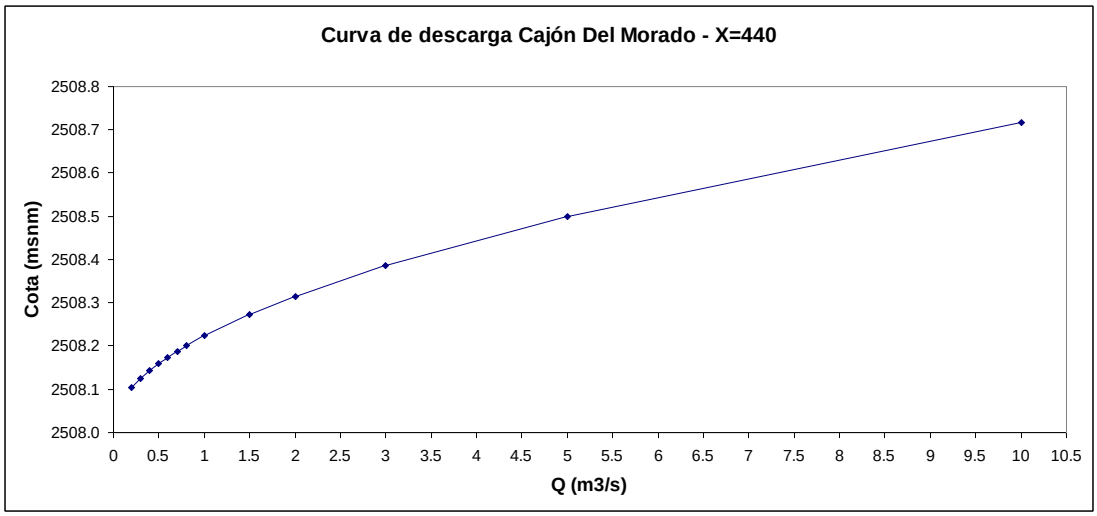


Figure 39
Runoff Rate of La Engorda Stream

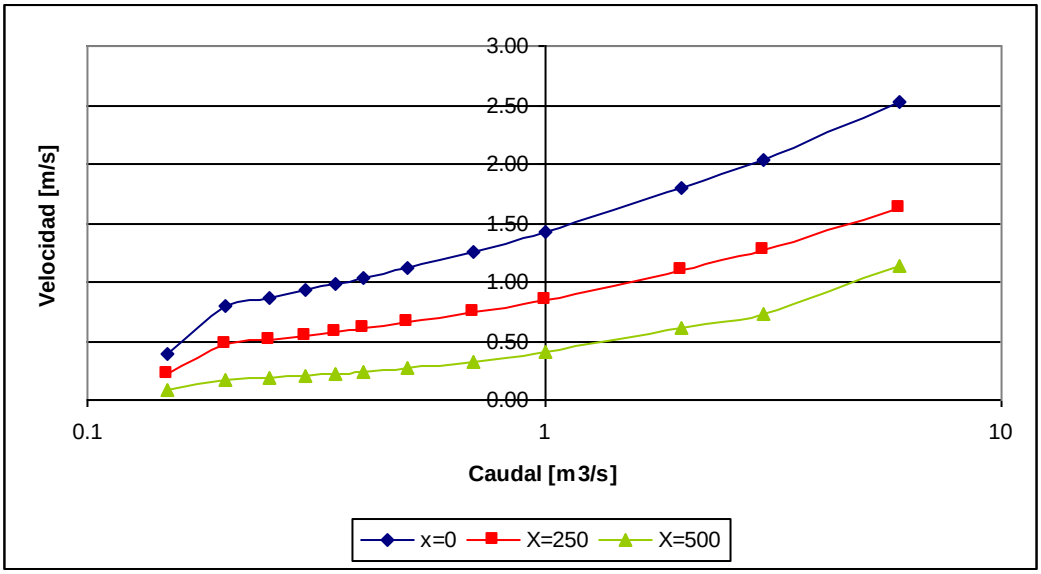


Figure 40
Runoff Rate of Colina Stream

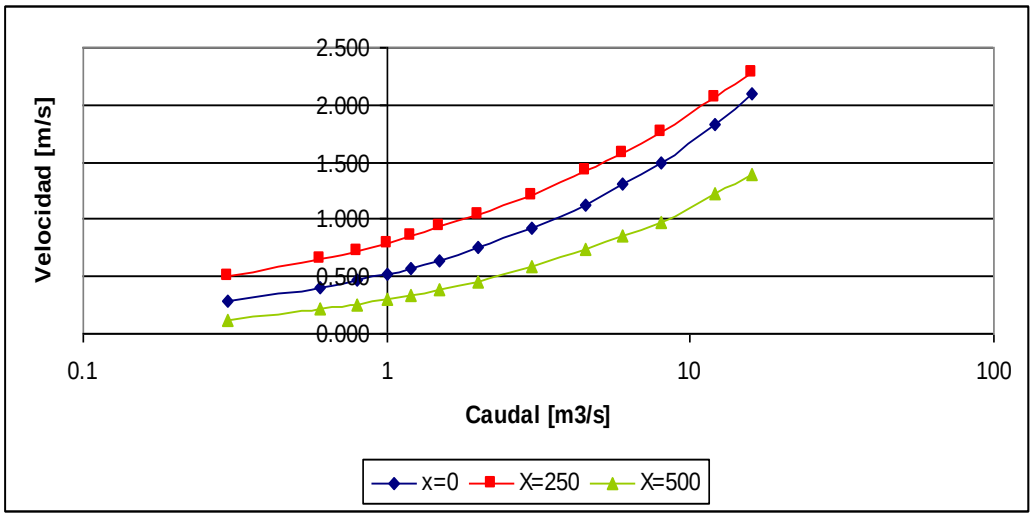


Figure 41
Runoff Rate of Las Placas Stream

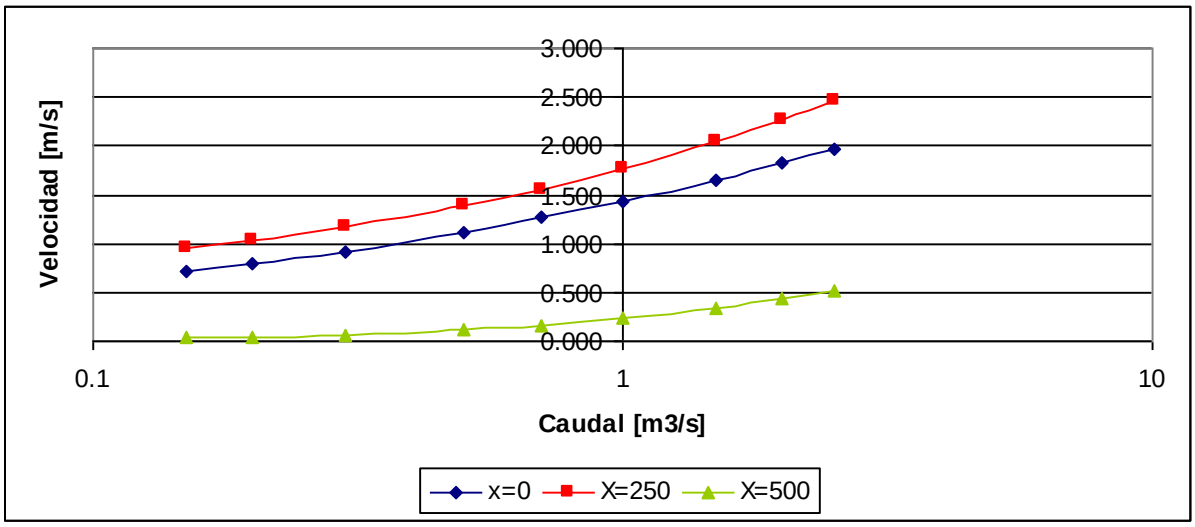
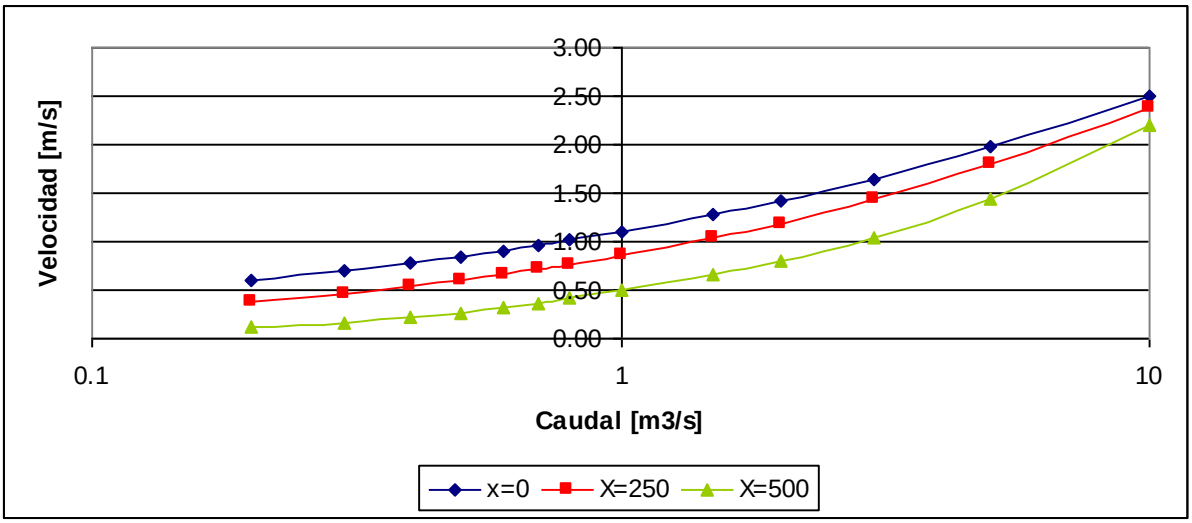


Figure 42
Runoff Rate of El Morado Stream



5.1.3.3 Definition of Environmental Flow Areas of La Engorda, Colina, Las Placas and Cajón El Morado Streams

The environmental flow area of La Engorda, Colina, Las Placas and Cajón El Morado streams, corresponds to the stretch located between the intake works with the confluence with Volcán river (Figure 33). The area under study was the stretch of a lower slope, where there are the most favorable conditions for preserving aquatic fauna (Figures 43,44, 45 and 46).

Figure 43
General Characteristics of the Area Defined as the Environmental Flow Area in La Engorda Stream

Figure 44
General Characteristics of the Area Defined as the Environmental Flow Area in Colina Stream

Figure 45
General Characteristics of the Area Defined as the Environmental Flow Area in Las Placas Stream

Figure 46
General Characteristics of the Area Defined as the Environmental Flow Area in Cajón El Morado Stream

5.1.3.4 Hydraulic Axis of the Environmental Flow Area of La Engorda, Colina, Las Placas and Cajón El Morado Streams

Figures 47, 48, 49 and 50 show the hydraulic axes calculated for La Engorda, Colina, Las Placas and Cajón El Morado streams in the stretch considered as environmental flow.

Figure 47
Hydraulic Axis of La Engorda Stream in the Area under Study

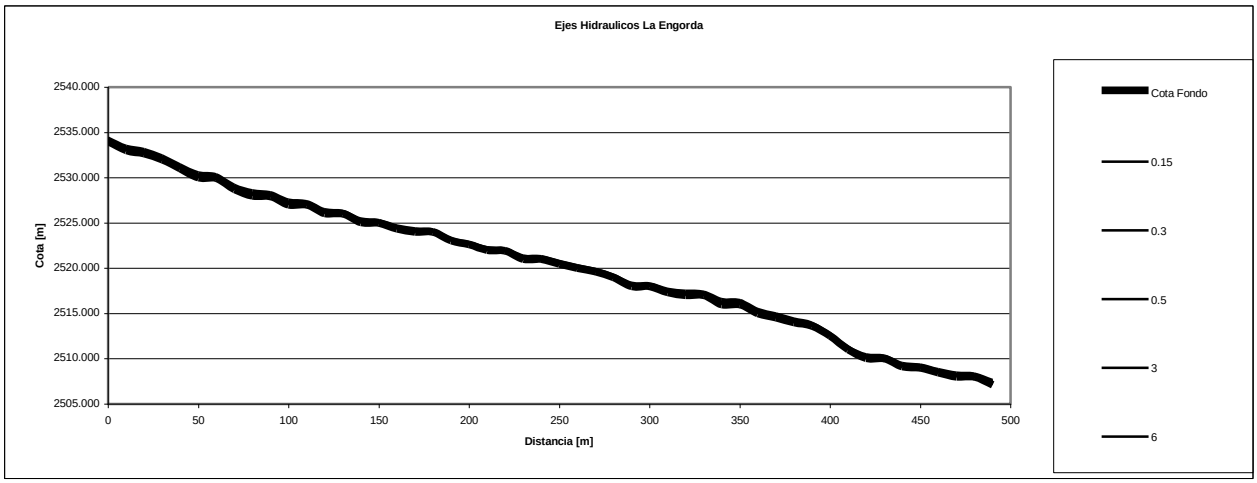


Figure 48
Hydraulic Axis of Colina Stream in the Area under Study

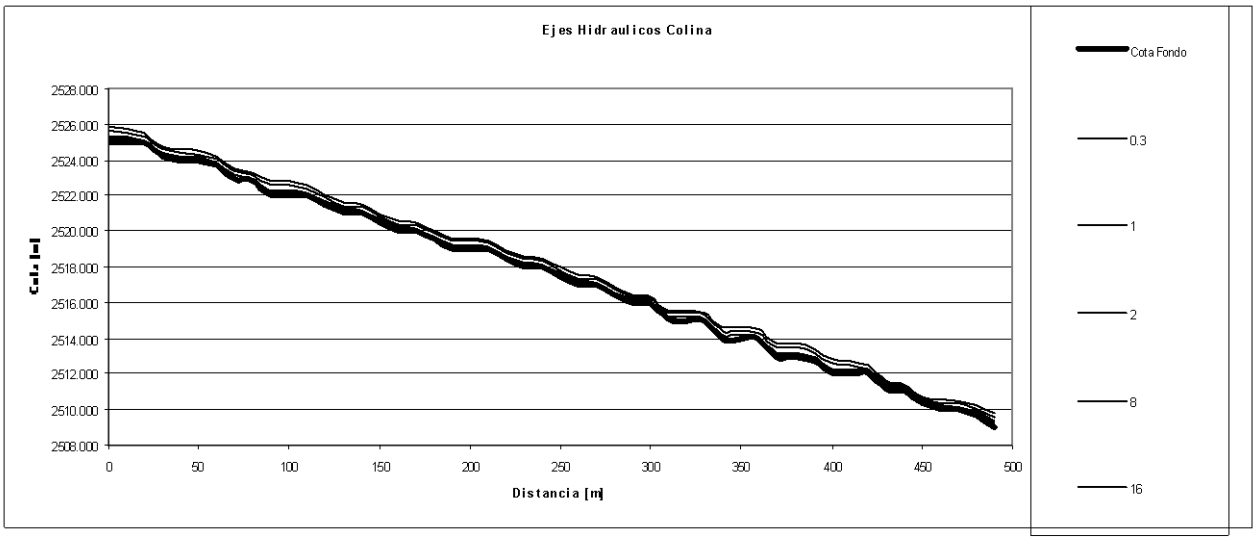


Figure 49
Hydraulic Axis of Las Placas Stream in the Area under Study

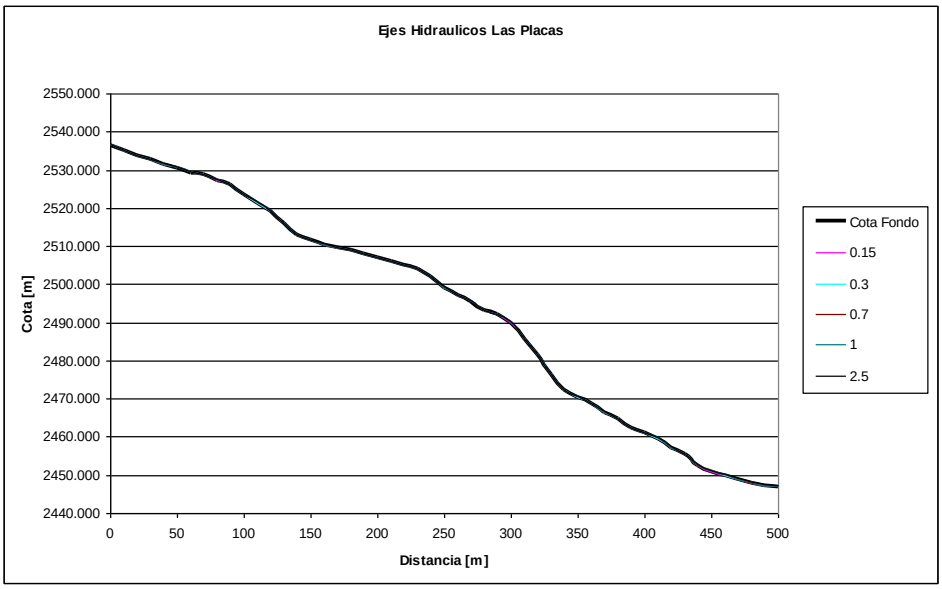
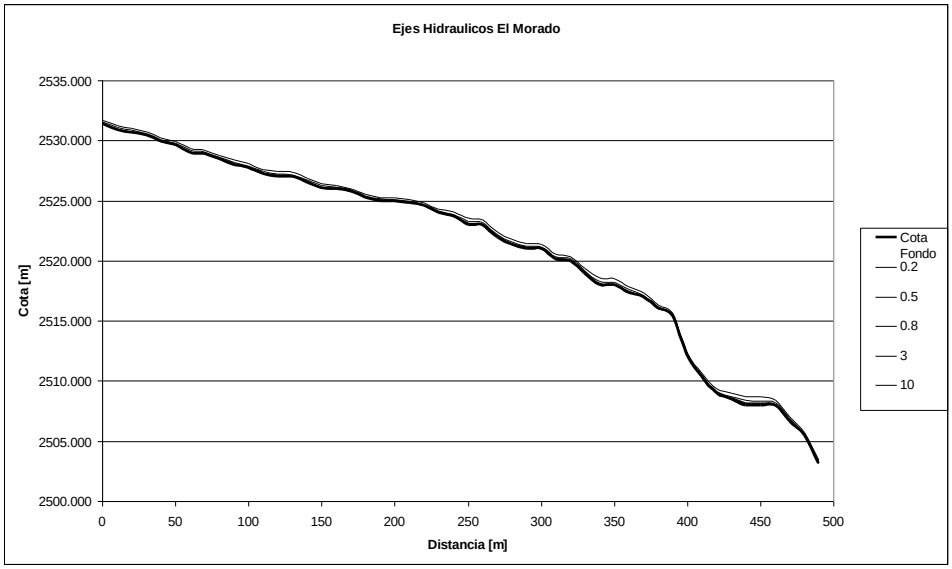


Figure 50
Hydraulic Axis of Cajón El Morado Stream in the Area under Study



The average slope for each waterway in this stretch, is shown in table 8:

Table 8
Average slope in the Area under Study

Waterway	Slope i (%)
La Engorda	5.4
Colina	3.2
Las Placas	17.9
El Morado	5.7

5.1.3.5 Environmental Flow Calculation of La Engorda, Colina, Las Placas and Cajón El Morado Streams

i) Environmental flow information established by the DGA in the Water Exploitation Rights of AES Gener S.A.

Gener holds water exploitation rights in each one of the mentioned streams, which add up to a maximum of 12.8 m^3/s and that were granted by the DGA fixing a continuous environmental flow during the entire year (Table 9).

Table 9
Water Exploitation Rights Granted and Environmental Flows Established by the DGA

Cauce	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA	Q eco
Cajón del Morado	1.40	1.07	0.97	1.02	0.87	0.99	1.49	2.76	3.70	3.70	3.45	2.31	1.98	0.24
Estero La Engorda	1.18	0.91	0.81	0.87	0.73	0.83	1.26	2.10	2.10	2.10	2.10	1.96	1.41	0.2
Estero Colina	1.71	1.31	1.17	1.24	1.06	1.20	1.82	3.36	5.54	6.00	4.21	2.82	2.62	0.3
Quebrada Las Placas	0.84	0.64	0.57	0.57	0.46	0.59	0.90	1.00	1.00	1.00	1.00	1.00	0.80	0.14

The PHAM considers collecting all of the water exploitation rights constituted in these streams to then return them to Maipo river in the discharge of Las Lajas power plant. For that, Gener is processing, with the DGA, the necessary modifications for such effect.

According to the arrangement of the works of the project, the stretch that would decrease its flow to the environmental flow has an extension of approximately 2500 m between the intakes planned and the confluence of the streams with Volcán river.

Table 10 shows the average monthly flows of the streams collected in the 2500 m mentioned stretch, with or without a project. The details of the statistics for the flows in natural regime, collected by the project and the remaining flows are attached in Appendix 1.

Table 10
Monthly Average Flows of the Streams Collected in the 2500 m Stretch, with or without the Project

Cauce	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
Régimen natural (sin proyecto)													
Cajón del Morado	1.06	0.69	0.61	0.57	0.56	0.60	0.82	1.80	3.30	4.81	3.74	1.96	1.71
Estero La Engorda	0.61	0.40	0.34	0.33	0.32	0.34	0.47	1.04	1.92	2.78	2.17	1.14	0.99
Estero Colina	2.14	1.23	0.96	0.90	0.88	0.93	1.29	3.46	6.55	9.27	7.37	3.89	3.24
Quebrada Las Placas	0.31	0.18	0.14	0.13	0.13	0.13	0.18	0.50	0.96	1.35	1.07	0.57	0.47
Régimen con proyecto													
Cajón del Morado	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.34	1.33	0.70	0.27	0.38
Estero La Engorda	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.25	0.81	0.39	0.20	0.27
Estero Colina	0.48	0.31	0.31	0.30	0.30	0.30	0.30	0.40	1.13	3.29	3.16	1.07	0.94
Quebrada Las Placas	0.14	0.14	0.13	0.12	0.12	0.13	0.14	0.14	0.15	0.38	0.20	0.14	0.16

Please notice that in the previous table, the environmental flow imposed in Las Placas stream (0.14 m^3/s) is, during some months, higher than the monthly average flow.

i.) Habitat Simulation Method

From the analysis of the hydraulic axes and rates obtained with the MOSSEM model, that solves the energy balance equation, the average flows were determined for which the aquatic habitat quality conditions were met, this is, a runoff height greater than 20 cm and a rate lower than 1 m/s. The results are shown in the following table:

Table 11
Flows (m^3/s) for Habitat Quality Conditions

Waterway	Q_h (h > 20 cm)	Q_v (r < 1 m/s)
La Engorda	2.0	0.97
Colina	3.0	2.71
Las Placas	5.2	0.28
El Morado	4.1	1.12

From the data of the previous table, it can be observed, in general, that:

a) The flows that meet the depth requirements in these streams, by far exceed the annual average flows in a natural regime present in them, with the exception of Colina (see table 10). This indicates that the depth requirement, in general, is not even met naturally.

b) The maximum flows that meet the rate requirements in the streams are, in all cases, lower than those corresponding to annual average flows in a natural regime present in them. This indicates that the rate requirement, in general, is not even met naturally.

The particular analysis of each waterway is presented as follows:

<u>La Engorda Stream:</u>

- The depth requirement is met only in January and February.
- The rate requirement is only met between April and October.

Colina Stream:

- The depth requirement is only met between November and March.
- The rate requirement is only met between April and October.

Las Placas Stream:

- The depth requirement is not met at a monthly level.
- The rate requirement is only met between May and October.

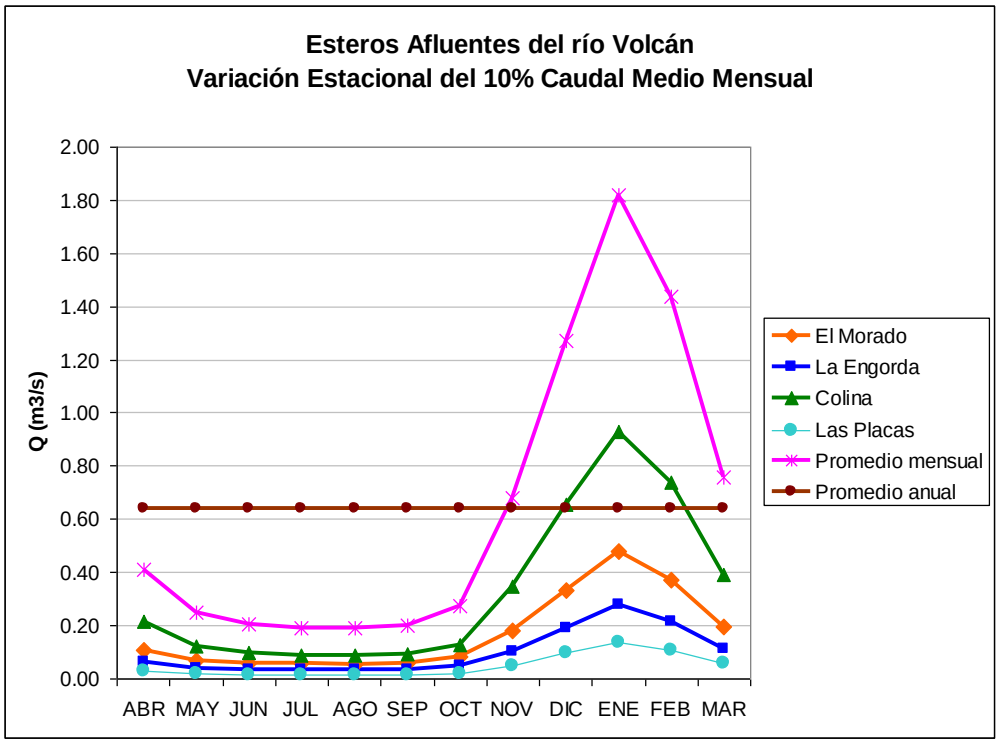
El Morado Stream:

- The depth condition is met only in January.
- The rate requirement is only met between April and October.

The prior, is an evidence of the need for establishing on one hand, environmental flows that consider the large seasonal variation that these resources experience along the year and, on the other hand, of changing the simulation method of the aquatic habitat in this area, since in all waterways, the conditions of a quality habitat are not met naturally, a proof of this is that, as the Base Line states, there were not any fish found in this area.

Therefore, other considerations, that have to do with the landscape or tourism, should be taken into account for the establishment of the environmental flows in these streams. Based on this, it has been considered appropriate to conduct the exercise considering the hydrologic method with the criteria of 10% of the average flow, but at a monthly level, with the aim of visualizing a possible environmental flow that varies per season and that responds to the actual flow of the streams (Figure 49). In this way, it is assured that the waterways will not dry out when the PHAM's intakes go into operation, preserving in this way, the landscape attributes of the area.

Figure 51
Environmental Flow of 10 % of La Engorda, Colina, Las Placas and Cajón El Morado streams



Based on the prior, the PHAM proposes the installation of a flow gauging station in the confluence area of the streams, in order to ensure permanently the 10% flow of the streams with the indicated season variability.

iii) Conclusion

The hydraulic axes calculated for La Engorda, Colina, Las Placas and Cajón El Morado streams, allow pointing out that the flow variations do not significantly alter the runoff conditions, mainly due to its high slope (torrent type runoff). These conditions strongly limit the development of aquatic organisms, due to the great cutting effort that such runoff creates and that avoids the settlement of aquatic flora and fauna. Additionally, the high sediment load creates a low quality environment for aquatic biota.

Similarly, due to the morphologic characteristics of these waterways, it was proven that the aquatic habitat quality conditions for the ictic fauna were not met naturally, and also proving, what was set forth in the Base Line regarding the fact that the presence of fish was not detected.

Based on the prior, it is proposed to establish environmental flows that incorporate the large seasonal variation that the flows in these waterways show, and therefore it was considered to keep a flow of 10% of the monthly average flow, controlling this flow in an integrated way in their confluence.

5.2 RESULTS IN RIVERS AND STREAMS INDIRECTLY AFFECTED BY THE CONSTRUCTION AND OPERATION OF THE PHAM PROJECT

5.2.1 Volcán River

The resources collected in the sub-sub-basin of Volcán river indirectly affect Volcán river since the extraction of the flow takes place in the streams that flow into La Engorda stream, which joins the "Río del Volcán", forming the Volcán river. The contributions of both branches of the Volcán river are similar.

The sub-sub-basin of the Volcán river has a total surface of 520.5 km^2. In terms of the contributing surface, the collected resources, whose total affluent watershed is of 169 km^2, represent 32% of the total area.

5.2.1.1 Biological Characteristics

In the Volcán river the presence of fish was not detected, being this a frequent result during the spring season in altitude fluvial systems due to the high sediment load that watercourses carry and the runoff conditions, which creates a transitory shift towards fluvial bodies with greater transparency in the water column. This result is confirmed by specialized literature. In the same way, the presence of benthic macroinvertebrates was not detected.

The prior allows establishing that the richness and abundance of the aquatic fauna in Volcán river is low, which could decrease even more during low water level periods. The ictic fauna should be restricted to introduced species, since the river does not present favorable physical conditions for preserving native species (Figures 3, 4 and 5).

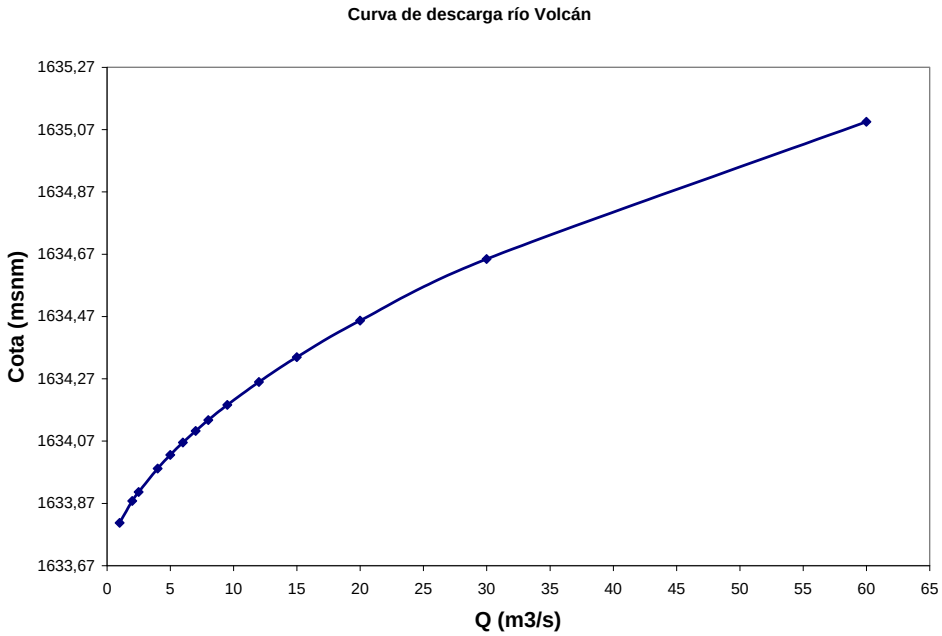
5.2.1.2 Hydrologic Characteristics

The average flow in the natural regime of Volcán river, in the Volcán power plant in Queltehues, is of approximately 14 m^3/s, with a winter average close to 7 m^3/s, that is entirely collected in the intake of Volcán power plant since its startup in 1944.

The analysis on the indirect effects of the project on the Volcán river is done, thus, upstream from the intake of Volcán power plant, located at approximately 12 Km from the confluence of Volcán river with Maipo river, since downstream, the natural regime of the river is altered by the operation of the power plant.

Figure 52 shows the discharge curve of Volcán river.

Figure 52
Discharge Curve of Volcán River



5.2.1.3 Hydraulic Characteristics of Volcán River

Figure 53 describes the granulometric curve obtained for Volcán river in the area being studied. The characteristic size of the particles present in the river bed is described in Table 12, with which the Manning roughness coefficient was determined (Table 13).

Figure 53
Granulometric Curve of Volcán River

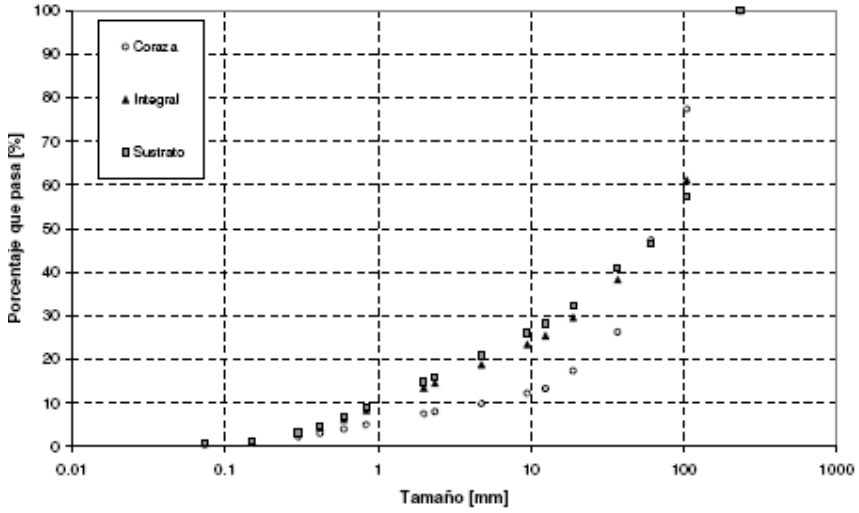


Table 12
Characteristic Sizes of the Volcán River (mm)

	Shield	Integral	Substrate
D_{90}	453,1	323,8	287,7
D_{84}	390,0	243,2	232,3
sD_{50}	216,4	90,1	40,1
D_{16}	57,5	2,7	1,3

Table 13
Determination of the Manning Roughness Coefficient

Area	d (mm)	n_o	n_1	n_2	n_3	n_4	m	n
Volcán River	274	0,032	0,010	0,05	0	0	1	0,047

5.2.1.4 Definition of the Environmental Flow Area of Volcán River

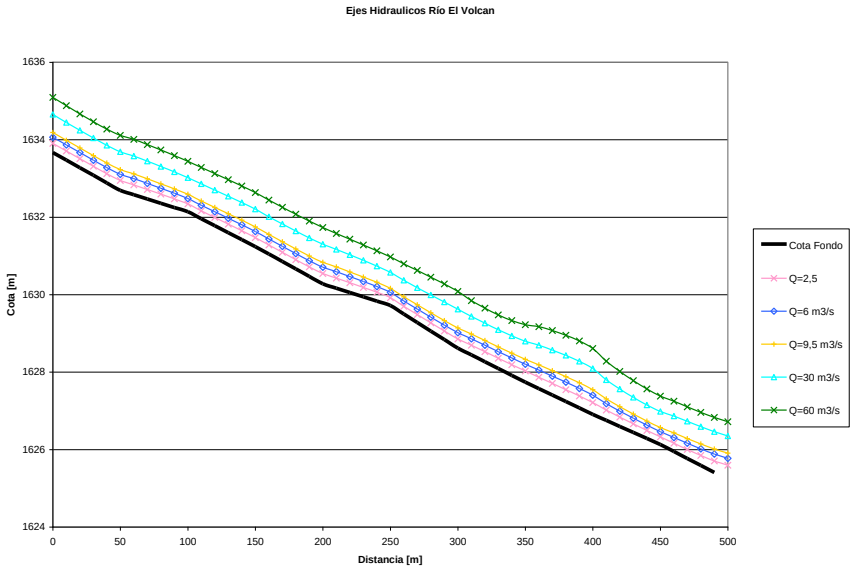
The environmental flow area of the Volcán river was set as the stretch between the confluence of the Morado, Las Placas, Colina and La Engorda streams and the intake of Volcán Power Plant. The area under study was the stretch of a lower slope, where there are the most favorable conditions for preserving aquatic fauna (Figure 54).

Figure 54
General Characteristics of the Area Defined as the Environmental Flow Area in Volcán River

5.2.1.5 Hydraulic Axis of the Environmental Flow Area of Volcán River

Figure 55 shows the hydraulic axis calculated for the Volcán river, in the stretch considered as the environmental flow.

Figure 55
Hydraulic axis of Volcán river in the Area under Study



5.2.1.6 Environmental Flow Calculation of Volcán River

i Hydrologic Information

Figure 56 shows the seasonal variation curve of the statistics' average in the situation with and without the project. The extreme values of the statistics, that is to say, the situation in the driest and wettest years of the statistics are shown in Table 14.

Figure 56
Hydraulic axis of Volcán river in the Area under Study

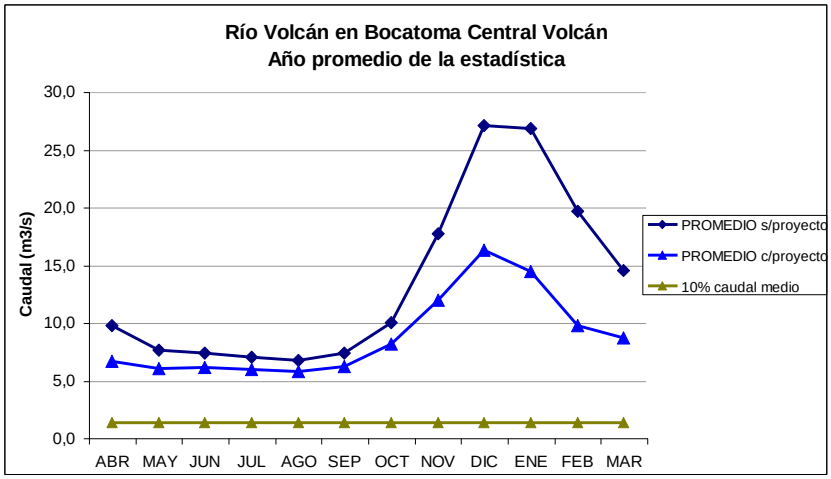


Table 14
Flow Statistics of Volcán River in the Intake of Volcán Power Plant

VOLCÁN EN BOCATOMA CENTRAL VOLCÁN			
	Caudales promedio		variación
PROMEDIO DE LA ESTADÍSTICA	sin proyecto	con proyecto	
Caudal medio	13,5	8,8	34,5%
Caudal medio invierno (abr-sep)	7,6	6,1	19,8%
Caudal medio verano (oct-mar)	19,3	11,5	40,3%
AÑO SECO			
Caudal medio	8,0	4,5	44,5%
Caudal medio invierno (abr-sep)	5,6	4,5	19,4%
Caudal medio verano (oct-mar)	10,5	4,4	58,0%
AÑO HÚMEDO			
Caudal medio	18,6	13,2	28,8%
Caudal medio invierno (abr-sep)	11,1	9,0	19,6%
Caudal medio verano (oct-mar)	26,0	17,5	32,7%

ii Habitat Simulation Method

The quality simulation of the aquatic habitat for fish was conducted based on the results of the hydraulic axes, using the *Oncorhynchus mykiss* as descriptive species, and using local depths (Figures 57, 58 and 59) and rates (Figure 60) as the descriptive variables of aquatic habitats. The rainbow trout was used as an indicator of the flow requirements, since it presents a larger space distribution in the basin, as well as a greater mobility. Even when there were not any fish found in the Volcán river during the creation of the base line, this criteria is considered a conservative approximation to the calculation of the environmental flows.

Both hydraulic axes as well as the runoff rate in the waterway were obtained from the MOSSEM model, by solving the equation of energy balance. With these data, the variation curves for the runoff depth (Figures 57, 58 and 59) and rate (Figure 60) are obtained.

From the hydraulic axes values under study, it is concluded that, on average, flows of the order of 1.86 m^3/s verify runoff heights of over 20 cm. In turn, rates lower than a 1 m/s are associated on average to flows lower than 3.1 m^3/s.

The prior implies that the runoff height requirement of over 20 cm, is fully met in the project situation (table 14). However, the rate condition is not met, and even less in natural conditions, due to the fact that the annual average flow of the Volcán river in the sensitive area is in the order of 14 m^3/s. Therefore, the changes in the habitat's quality would be mostly related to changes in the runoff depth than to rate variations.

Figure 57
Runoff Height of Volcán River in Profile 1

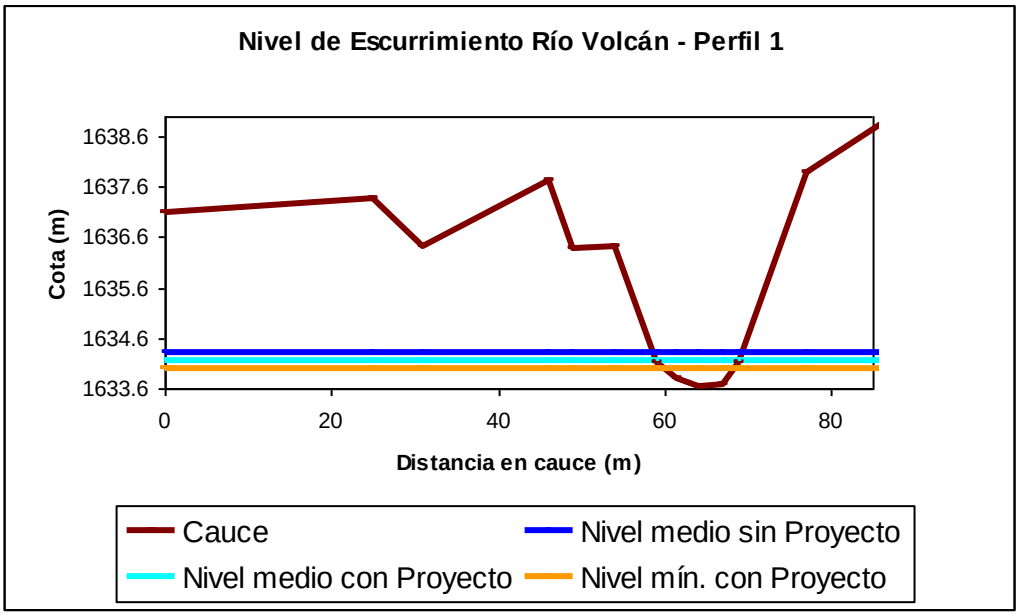


Figure 58
Runoff Height of Volcán River in Profile 6

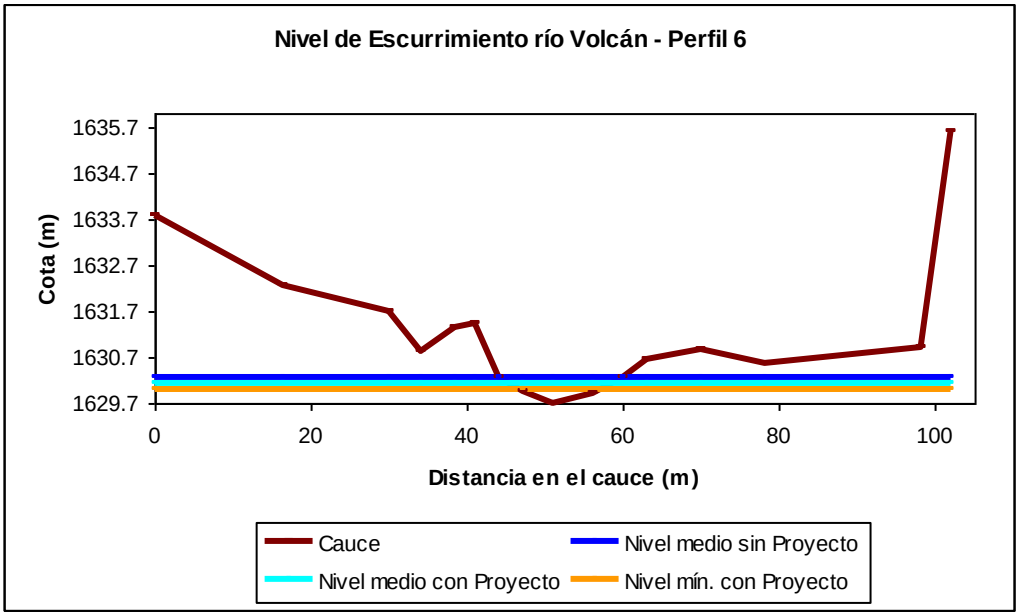


Figure 59
Runoff Height of Volcán River in Profile 11

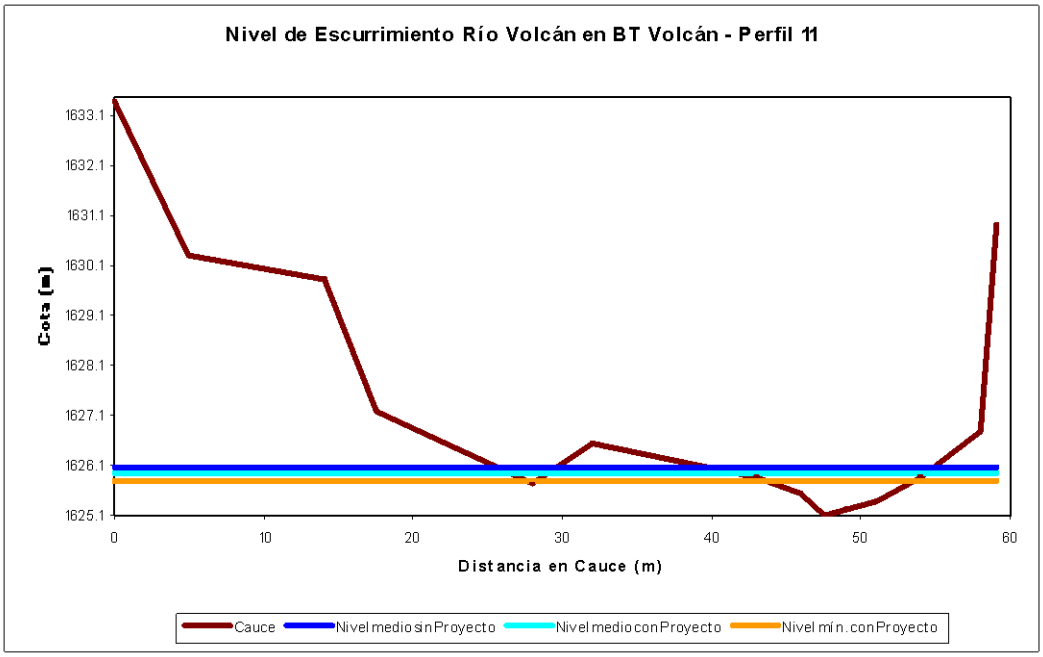
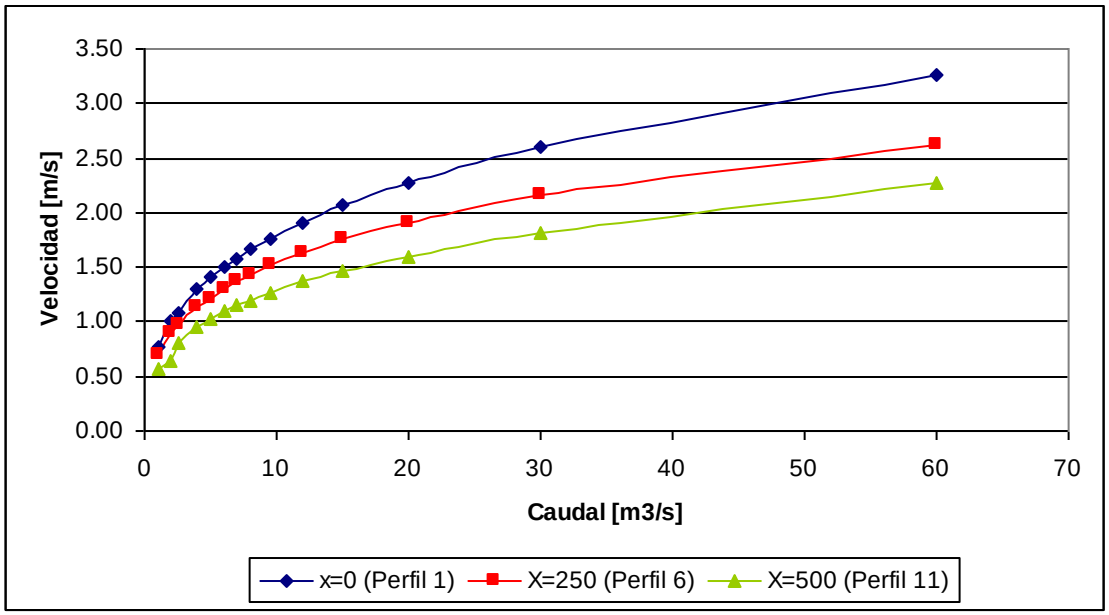


Figure 60
Runoff Rate of Volcán River



iii Conclusion

Considering the fact that the environmental flow area of Volcán river will have – in a project situation- an average annual flow of around 8.8 m^3/s and a minimum average flow of around 4.5 m^3/s, it can be affirmed that the runoff will keep a depth greater than 20 cm and lower than 1 m/s.

Despite the fact that the rate requirement is not met, this is also not verified in natural conditions, since the average annual flow of the river in the sensitive area is in the order of 14 m^3/s, while rates over 1 m/s already start being verified at approximately 3.1 m^3/s, therefore the changes in the quality of the habitat would be more related to the runoff depth than to rate variations. Therefore, the PHAM will not alter the conditions of the habitat for aquatic organisms.

5.2.2 Maipo River

5.2.2.1 Biological Characteristics

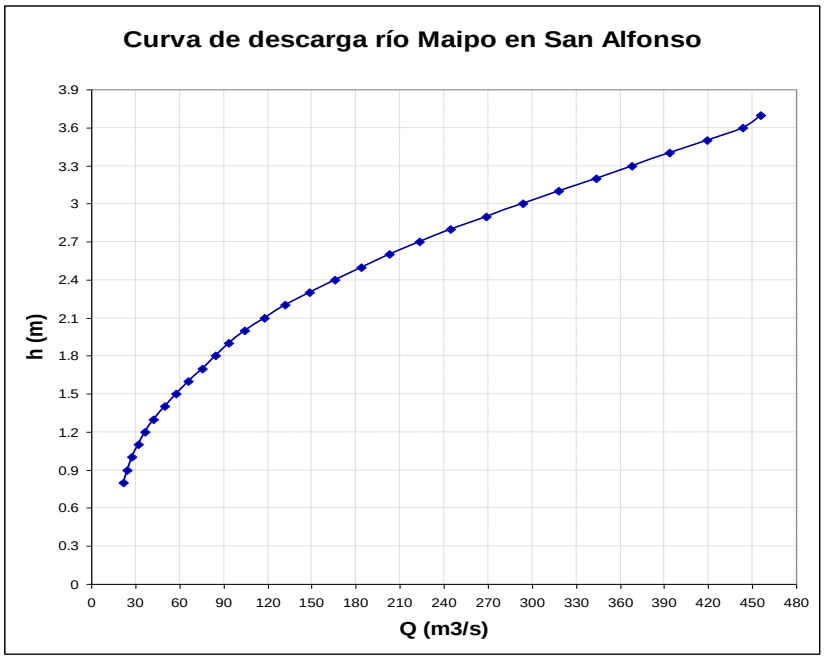
In the Maipo river the presence of fish was not detected, being this common during the spring season in elevated fluvial systems due to the high sediment load that watercourses carry and the runoff conditions, which creates a transitory shift towards fluvial bodies with greater transparency in the water column. This result is confirmed by specialized literature. As per the benthic macroinvertebrate fauna, the presence of 1 taxa (Oligochaeta) was detected, which allows to typify it in a mid to high pollution by organic matter condition.

5.2.2.2 Hydrologic Characteristics

Maipo river receives in its source, the contribution of Blanco, Negro and Barroso rivers. Later, in the area of the Maipo stream flow gauging station in Las Melosas, Maipo river presents an average flow of around 40 m^3/s. In the following 40 Km, Maipo river receives the contribution of innumerable rivers, streams and ravines, with the most important ones being Volcán, Yeso and Colorado rivers. In the Maipo power plant at El Manzano, located downstream from its confluence with Colorado river, Maipo river presents an average annual flow of over 100 m^3/s.

Figure 61 shows the discharge curve of Maipo river.

Figure 61
Discharge Curve of Maipo River



5.2.2.3 Hydraulic Characteristics of Maipo River

Figure 62 describes the granulometric curve obtained for Maipo river in the area being studied. The characteristic size of the particles present in the river bed is described in Table 15, with which the Manning roughness coefficient was determined (Table 16).

Figure 62
Granulometric Curve of Maipo River

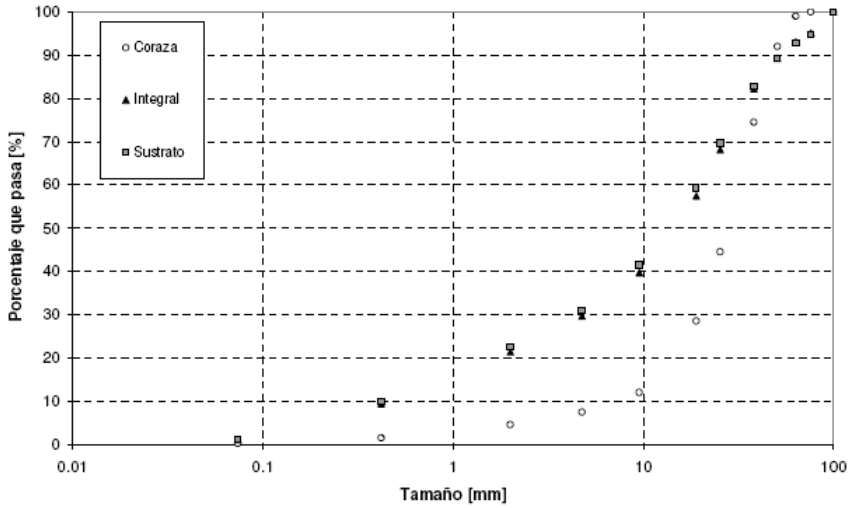


Table 15
Characteristic Sizes of Maipo River (mm)

	Shield	Integral	Substrate
D_{90}	210,2	252,8	257,9
D_{84}	153,3	221,5	229,6
sD_{50}	72,2	78,9	83,1
D_{16}	40,9	12,4	4,0

Table 16
Determination of the Manning Rigidity Coefficient

Area	d (mm)	n_o	n_1	n_2	n_3	n_4	m	n
Maipo River	53	0,023	0,010	0	0	0	1	0,033

5.2.2.4 Definition of the Environmental Flow Area of Maipo River

M

The environmental flow area of Maipo river was the stretch between the confluence of Colorado river and the Las Lajas area. The area under study was the stretch of a lower slope, where there are the most favorable conditions for preserving aquatic fauna (Figures 63 and 64).

Figure 63
Area Defined as the Environmental Flow Area in Maipo River

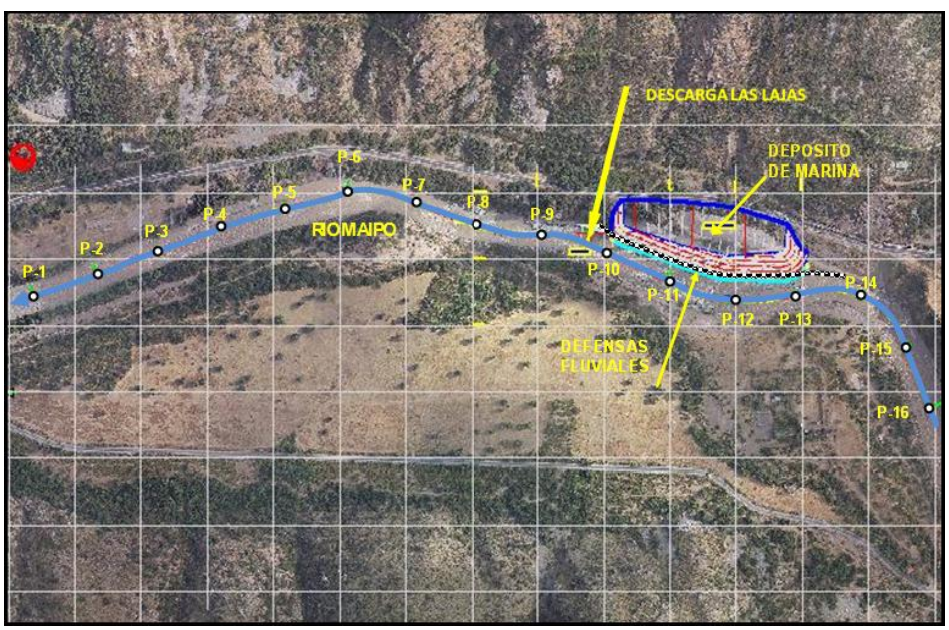
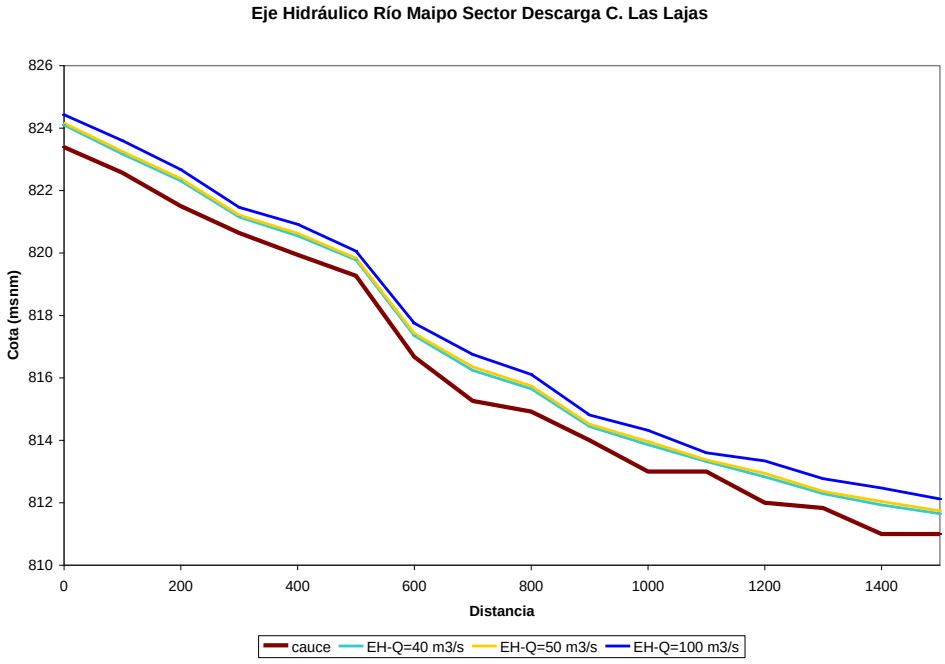


Figure 64
General Characteristics of the Area Defined as the Environmental Flow Area in Maipo River

5.2.2.5 Hydraulic Axis of the Environmental Flow Area of Maipo River

Figure 65
Hydraulic axis of Maipo river in the Area under Study



5.2.2.6 *Environmental Flow Calculation of Maipo River*

i Hydrologic information

The PHAM affects Maipo river indirectly by extracting resources from these last three affluents (Volcán, Yeso and Colorado rivers) and, thus, the analysis has been centered in such stretch, that is to say, between the confluence with the Volcán river and the discharge of the Las Lajas power plant, which would be located approximately 5 km downstream from the confluence with Colorado river.

Such analysis has been carried out considering the average values in the statistics, the dry years with a 95% surplus probability, and the wet years represented by a 5% surplus probability. In some cases, in which statistics show some inconsistencies, the average of the three most extreme years has been considered.

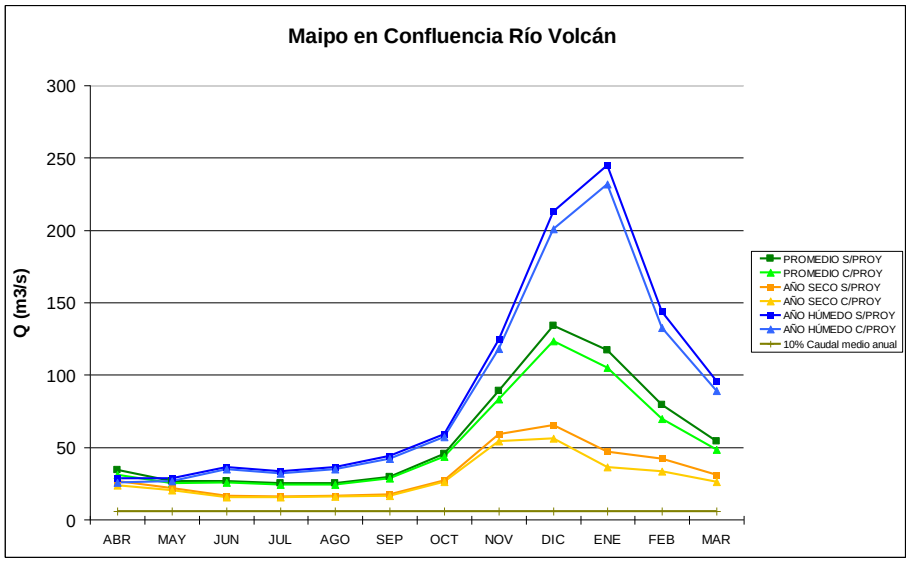
- Maipo river between the confluence of Volcán and Yeso rivers.

This stretch, of approximately 2 Km is represented by the statistics of Maipo river downstream from the connection with Volcán river and it has an average flow of 57 m^3/s, representing an affluent watershed of 2,040 km^2. Therefore, the resources collected by the affluents to the Volcán river (La Engorda, Colina, Las Placas and El Morado streams), represent, in terms of a contributing surface, 8.2% of the mentioned affluent watershed.

Table 17
Flow Statistics of Maipo River in Confluence with Volcán River

MAIPO EN CONFLUENCIA RÍO VOLCÁN			
	Caudales promedio		variación
PROMEDIO DE LA ESTADÍSTICA	sin proyecto	con proyecto	
Caudal medio	57,2	52,6	8,1%
Caudal medio invierno (abr-sep)	27,9	26,4	5,4%
Caudal medio verano (oct-mar)	86,6	78,8	9,0%
AÑO SECO			
Caudal medio	32,2	28,3	11,9%
Caudal medio invierno (abr-sep)	19,0	17,9	5,8%
Caudal medio verano (oct-mar)	45,3	38,7	14,5%
AÑO HÚMEDO			
Caudal medio	90,9	85,5	5,9%
Caudal medio invierno (abr-sep)	36,0	32,6	9,2%
Caudal medio verano (oct-mar)	145,8	138,3	5,1%

Figure 66
Annual Flow of Maipo River in Confluence with Volcán River in Different Scenarios



- Maipo river between the confluence of Yeso and Colorado rivers.

This stretch, of approximately 25 Km is represented conservatively by the statistics of Maipo river in San Alfonso, whose affluent watershed is 2,850 km^2. Between this stream flow gauging station and the confluence of Colorado river, Maipo river receives the contributions of the Coyanco and San José tributary streams, apart from numerous ravines and minor streams.

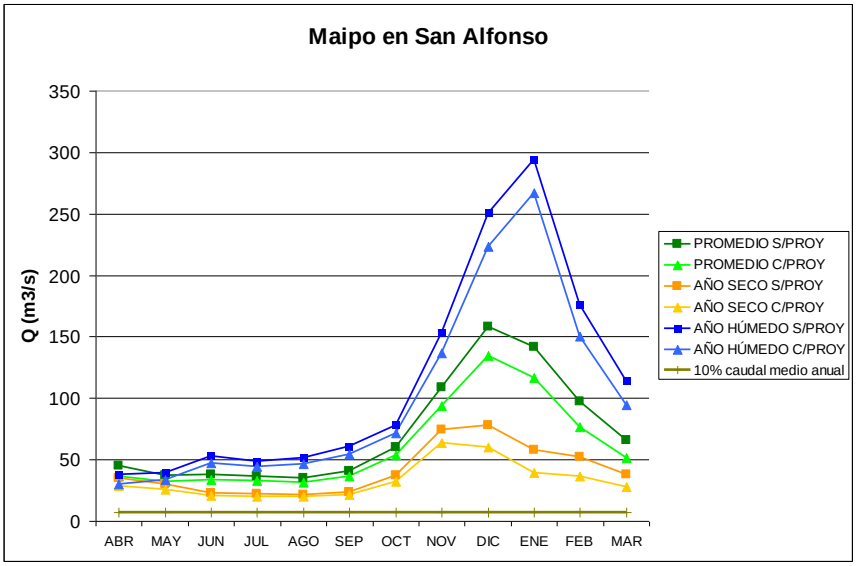
In terms of contributing surfaces, the resources collected from the sub-sub-basins of the Volcán and Yeso rivers, represent 18.3% of the watershed affluent to this section of Maipo river.

The average values of the statistics and the extreme values are summarized in the following table and graph:

Table 18
Statistics of the Flows of Maipo river at San Alfonso

	Caudales promedio		variación
	sin proyecto	con proyecto	
PROMEDIO DE LA ESTADÍSTICA			
Caudal medio	72,0	60,9	15,5%
Caudal medio invierno (abr-sep)	38,7	33,8	12,6%
Caudal medio verano (oct-mar)	105,3	87,9	16,5%
AÑO SECO			
Caudal medio	41,2	33,0	19,9%
Caudal medio invierno (abr-sep)	26,0	22,7	13,0%
Caudal medio verano (oct-mar)	56,3	43,3	23,1%
AÑO HÚMEDO			
Caudal medio	113,1	99,8	11,7%
Caudal medio invierno (abr-sep)	48,5	42,7	12,1%
Caudal medio verano (oct-mar)	177,6	157,0	11,6%

Figure 67
Annual Flow of Maipo River at San Alfonso in Different Scenarios



With the aim of conducting a comparative analysis of the current situation for the Project scenario, the flow and height variables of the runoff have been considered as valid indicators for establishing the conditions for sailing in Maipo river.

Regarding the flow, Maipo river at San Alfonso presents an average flow of 72 m^3/s. In a Project situation, the average flow will be of 60.9 m^3/s, which represents a variation of 15.5%.

As an example, using the discharge curve of Maipo station at San Alfonso of the National Waters Authority (see Annex 24), it is possible to calculate the runoff height variation due to the flow decrease of the river in that section, which under any scenario exceeds 15 cm. The prior, is shown in Table 19. Annex 24 includes information that supports the calculation.

Table 19
Limnimetric Level Variation in Maipo River at San Alfonso

Statistics Average	Limnimetric Level (m)		Level Variation	
	without project	with project	(cm)	%
Average flow	1.69	1.55	14	8.3%
Winter Average Flow (Apr-Sep)	1.21	1.12	9	7.4%
Summer Average Flow (Oct-Mar)	2.00	1.85	15	7.5%

Assuming a flow reduction of 15.5% average and a height reduction of 8,3%, it is predictable that sailing at Maipo river will not be interrupted or affected significantly during the months of winter where lower flows are observed. This effect will be insignificant in other periods of the year.

Thus, it is foreseen that the project will not interfere with the development of tourism in Maipo river.

- Maipo river between its confluence with Colorado river and the discharge of Las Lajas Power Plant.

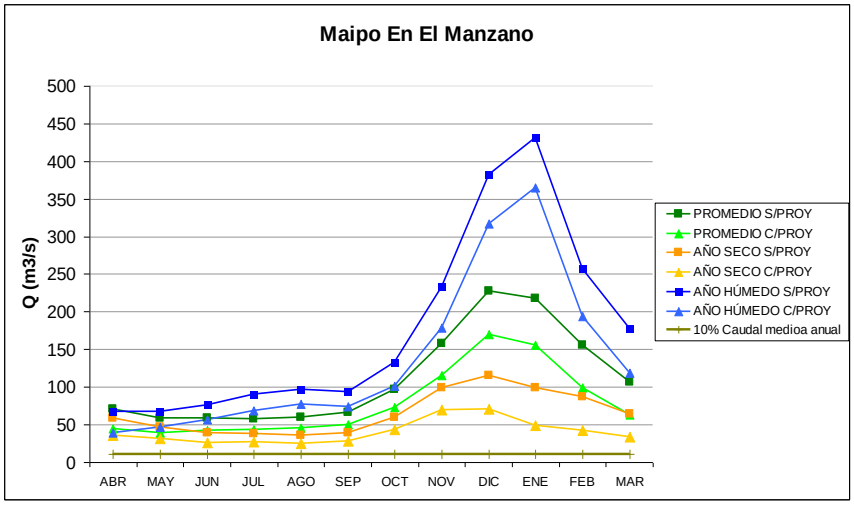
In this stretch, of approximately 5 Km, the Maipo stream flow gauging station at El Manzano is located, and whose affluent watershed is of 4,968 km^2. Downstream from this station, Maipo river receives the contribution of El Manzano stream. The discharge point of Las Lajas Power Plant, where the project returns all of the previously collected flows to the Maipo river, is located in front of the Las Lajas substation, in the lands of an old shoal.

The analysis of the effects of the PHAM has been carried out based on the data from the mentioned stream flow gauging station. The results are shown in the following table and chart:

Table 20
Flow Statistics of Maipo River at El Manzano

PROMEDIO DE LA ESTADÍSTICA	Caudales promedio		variación
	sin proyecto	con proyecto	
Caudal medio	111,4	78,5	29,5%
Caudal medio invierno (abr-sep)	62,2	44,3	28,7%
Caudal medio verano (oct-mar)	160,6	112,7	29,8%
AÑO SECO			
Caudal medio	65,3	40,3	38,2%
Caudal medio invierno (abr-sep)	43,2	29,1	32,7%
Caudal medio verano (oct-mar)	87,5	51,6	41,0%
AÑO HÚMEDO			
Caudal medio	175,6	136,6	22,2%
Caudal medio invierno (abr-sep)	82,2	60,6	26,3%
Caudal medio verano (oct-mar)	269,1	212,6	21,0%

Figure 68
Annual Flow of Maipo River at El Manzano in Different Scenarios



i Habitat Simulation Method

The quality simulation of the aquatic habitat for fish was conducted based on the results of the hydraulic axes, using the *Oncorhynchus mykiss* as descriptive species, using depth and the average rates as the descriptive values of aquatic habitats (Figures 69, 70, 71 and 72). The rainbow trout was used as an indicator of the flow requirements, since it presents a larger space distribution in the basin, as well as a greater mobility. Even when there were not any fish found in Maipo river during the creation of the base line, this criteria is considered as a conservative approach for the calculation of environmental flows.

Both the hydraulic axes as well as the runoff rate in the waterway were obtained from the Hec-Ras model. In this way, the depth and rate variation curves are obtained according to the stream (Figures 69, 70, 71 and 72).

From the hydraulic axes values under study, it is concluded that, on average, flows of the order of 12.8 m3/s verify runoff heights of over 20 cm. Moreover, rates lower than 1 m/s are associated to flows lower than 40 m^3/s.

Figure 69
Maipo River Flow v/s Altitude (m.a.s.l) and Rate (m/s) in Profile 8 (Current Situation)

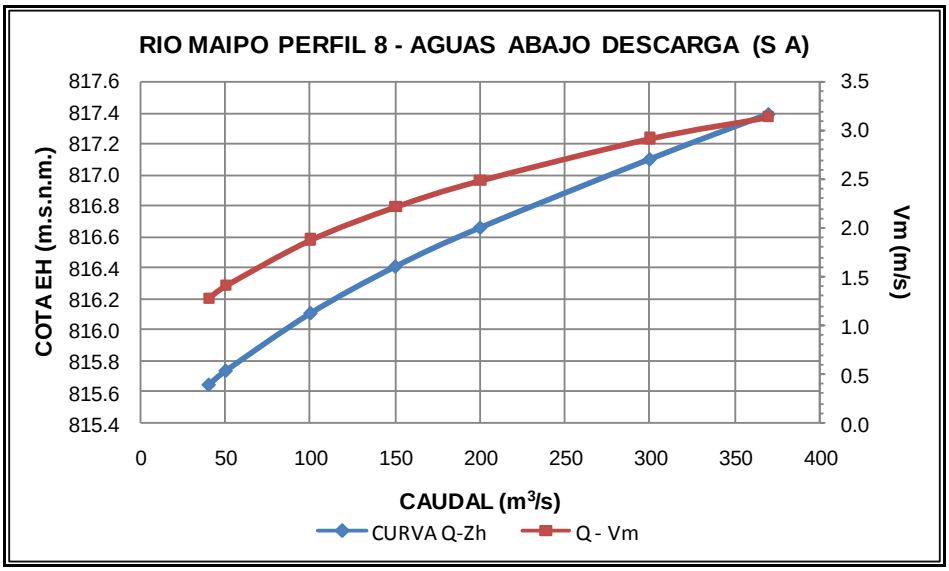


Figure 70
Maipo River Flow v/s Altitude (m.a.s.l.) and Rate (m/s) in Profile 8 (Project Situation)

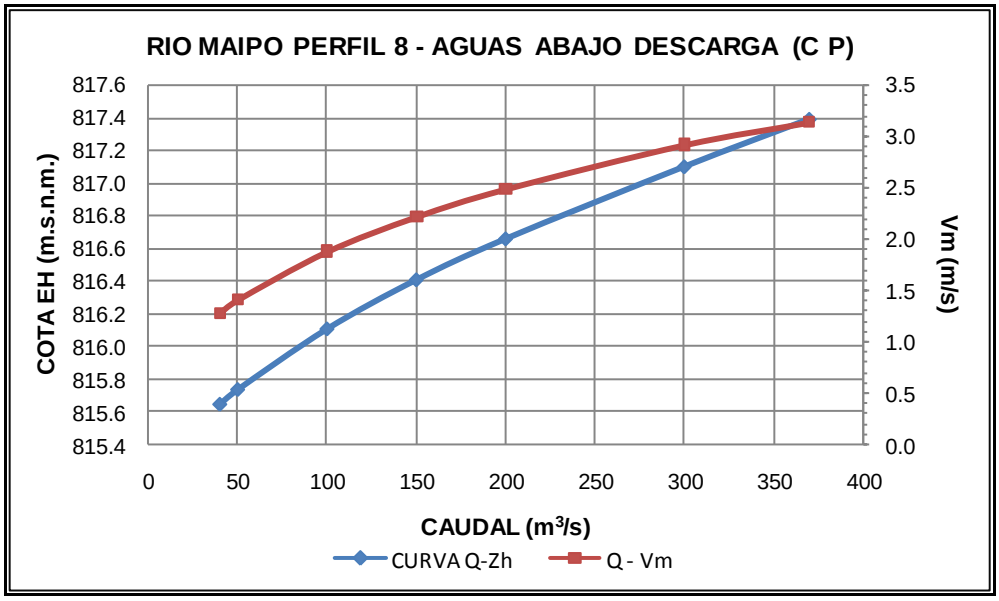


Figure 71
Maipo River Flow v/s Altitude (m.a.s.l.) and Rate (m/s) in Profile 9 (Current Situation)

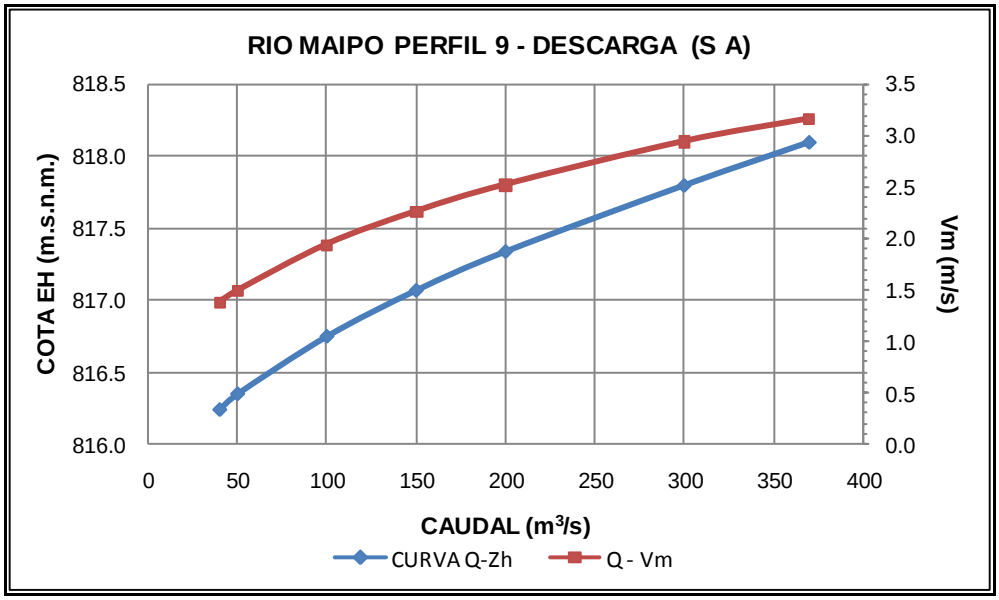
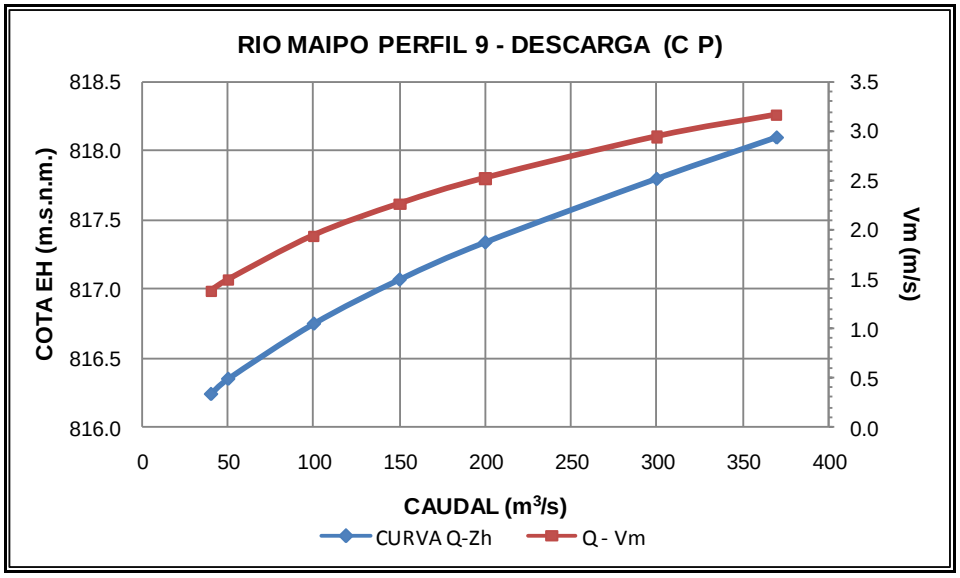


Figure 72
Maipo River Flow v/s Altitude (m.a.s.l.) and Rate (m/s) in Profile 9 (Project Situation)



ii Conclusion

Considering the fact that in the environmental flow area, Maipo river will have -in a project situation- an annual average flow of 78.5 m^3/s and a minimum flow in dry year conditions of around 29.1 m^3/s, it can be affirmed that the runoff will keep a height above 20 cm and a rate over 1 m/s.

Despite the fact that the rate requirement is not met, this is also not verified in natural conditions, since the average annual flow of the river in the sensitive area is in the order of [111] m^3/s, while rates over 1 m/s already start being verified at approximately 40 m3/s, so the changes in the quality of the habitat would be more related to the runoff depth than to rate variations. Therefore, the PHAM will not alter the conditions of the habitat for aquatic organisms.

6 CONCLUSIONS

<u>Characterization of the area under study</u>

From the theoretical point of view, it is possible to affirm that the differences in the abundance of benthic biota show differences in habitat conditions, specifically of food availability for fish. However, the results indicated that the presence of fish in the area under study was not related to food availability, since there were fish in areas with low and high abundance of bentos. These results suggest that the presence of fish during the study has to do with factors that are different from the availability of food, such as a larger or lower load of suspended particles. An evidence of the prior has to do with the fact that in areas of lower suspended particulate matter loads, such as the Aucayes, Cortaderas, El Manzanito streams and Yeso river, there was a greater presence of fish detected.

In this way the scarce fish fauna found in the area under study during the spring would be mainly due to the physical conditions of the habitat, basically due to the suspended particulate matter load, a natural condition in the mountain stretches of the basins with mild weather in which there is a larger superficial torrent in the thawing season, which significantly affects the dispersion of fish, making them move towards areas with lower turbidity.

The environmental requirements of native species differ from the requirements of introduced species. A favorable habitat for T aerolatus populations is a heterogeneous rocky substrate, with gravel and cobblestone between 3 and 10 cm, high transparency and oxygen concentration in the water column and a low runoff rate. These attributes were found predominantly in the prospected area of El Volcán and El Yeso rivers, however, the presence of T. areolatus was not detected in any of these systems and there were only specimens of the introduced species Salmo trutta found in Yeso river. The only sampling area where the T. areolatus was detected was in Colorado river, which did not present a favorable substrate for its development. These results indicate that the type of substrate is not regulating the fish populations during the current study period.

A characteristic of the upper stretch of the Maipo river basin, the area where the study area is located, is the presence of a fish ensemble in which the introduced O. mykiss and S. trutta species are predominant (Duarte et al 1971). The introduction of these ictic species that are highly invasive and aggressive for native species has had historical and current unfavorable effects on the native fish ensembles in the country (Soto et al 2006), this due to the production of ova for sports and recreation, mainly in the stretch of Maipo river located between the areas of La Obra and Tejas Verdes (Duarte et al 1971). These species have created a highly intervened condition in the area under study, and therefore, currently, a low presence of fish is detected in the upper stretches (from the source of Maipo river to the area of La Obra) and in the mid-lower stretches (from La Obra to Tejas Verdes) of the basin (Duarte et al 1971). The area under study is located in the upper area, and therefore, the findings of O. mykiss and S. trutta introduced species, agree with the information that exists for that basin, Duarte et al (1971), Vila et al (1999) and of the DGA (2004). These results allow stating that the biologic ensembles of the area under study have been frequently disturbed by the national and anthropic conditions mainly associated to irrigation, electric generation and recreational activities in the basin (DGA, 2004). Therefore, from a conservation point of view, it is possible to assign a low environmental value to the area under study.

Environmental Flow

i) Rivers directly affected by the construction and operation of the PHAM

1) Yeso River

For this river, the environmental flow needed to meet the habitat requirements in the stretch selected as the sensitive area is of 2.6 m^3/s.

Considering the fact that in the environmental flow area Yeso river will have – in a project situation- an average annual flow of around 4,2 m^3/s and a minimum monthly average flow of around 4.5 m^3/s, it can be affirmed that the runoff will keep a minimum depth of 20 cm and a rate higher than 1 m/s.

Despite the fact that the rate requirement is not met, this is also not verified in natural conditions, since the average annual flow of the river in the sensitive area is in the order of 10 m3/s, while rates over 1 m/s already start being verified at approximately 2 m3/s, so the changes in the quality of the habitat would be more related to the runoff depth than to rate variations.

Additionally, statistics show that the intermediate watershed by itself contributes abundantly with the environmental flow required by the sensitive area, which would make it unnecessary to let an environmental flow pass through the intake from the habitat point of view.

Nevertheless, to ensure that the waterway will not dry out in the stretch located immediately downstream from the collection works, the PHAM proposes to let 200 lt/s pass continuously in the intake of the project when the reservoir delivers water.

To verify the conditions of the waterway in the analyzed stretch, defined as sensitive area, the Owner proposes to run a monthly stream gauge for a year, before and after the operation of the project.

2) Colorado River

When considering the hydraulic parameters of Colorado river, it is found that the conditions of the waterway in the stretch of environmental interest are the following: minimum depth of 20 cm and maximum rates lower than 1 m/s. Both parameters are guaranteed with a 0.6 m^3/s flow and meet the thresholds proposed in section 4.2, to preserve the aquatic ecosystems.

The average flow in this area, with the project, is of 6 m^3/s, with a variability that would fluctuate between 0.5 m^3/s and 25 m^3/s

In these conditions, and as a way of guaranteeing the minimum flows required for the condition of the habitat, the PHAM has decided cease the collection of its legally constituted rights on Quempo stream, which will contribute to maintain at a minimum, the current situation of such stretch of the river, which, by the way*, has allowed for the existence of the native species* Trichomycterus aerolatus.

Finally, if necessary, the PHAM could allow passing 0.3 ^{m}3/s in the intake of Maitenes Power Plant.

3) La Engorda, Colina, Las Placas and Cajón El Morado Streams

The hydraulic axes calculated for La Engorda, Colina, Las Placas and Cajón El Morado streams, allow pointing out that the flow variations do not significantly alter the runoff conditions, mainly due to its high slope (torrent type runoff). These conditions strongly limit the development of aquatic organisms, due to the great cutting effort that such runoff creates and that avoids the settlement of aquatic flora and fauna. Additionally, the high sediment load creates a low quality environment for aquatic biota.

Similarly, due to the morphologic characteristics of these waterways, it was proven that the aquatic habitat quality conditions for the ictic fauna were not met naturally, and also proving, what was set forth in the Base Line regarding the fact that the presence of fish was not detected.

Based on the prior, it is proposed to establish environmental flows that incorporate the large seasonal variation that the flows in these waterways show, and therefore it was considered to keep a 10% flow of the monthly average flow, controlling their confluence in an integrated way.

ii) **Rivers indirectly affected by the construction and operation of the PHAM**

1) Volcán River

Considering the fact that the environmental flow area of Volcán river will have – in a project situation- an average annual flow of around 8,8 m^3/s and a minimum monthly average flow of around 4.5 m^3/s, it can be affirmed that the PHAM will not alter the habitat conditions for aquatic organisms.

2) Maipo River

Considering that in the environmental flow area Maipo river will present -in the project situation- an annual average flow of 78.5 m^3/s and a minimum flow in dry year conditions of around 29.1 m^3/s, it can be affirmed that the PHAM will not alter the conditions of the habitat for aquatic organisms.

With the aim of conducting a comparative analysis of the current situation regarding the scenario with the Project in the area next to San Alfonso, the flow and height variables of the runoff have been considered as valid indicators for establishing the conditions for sailing in Maipo river. The result of this analysis shows that, assuming a flow reduction of 15.5% average and a height reduction of 8,3%, it is predictable that sailing at Maipo river will not be interrupted or affected significantly during the months of winter where lower flows are observed. This effect will be insignificant in other periods of the year.

This analysis is considered conservative, since the contributions that Maipo river receives in the stretch under analysis such as the Coyanco and San José streams, among others, were not considered.

Thus, it is foreseen that the project will not interfere with the development of tourism in Maipo river.

III. ANALYSIS OF THE ENVIRONMENTAL FLOWS RELATED TO OTHER HYDRIC REQUIREMENTS OF THE SYSTEM

To support the environmental sustainability analysis of the Qe proposed by the PHAM, the validation of the Qe regarding the limnologic requirements of the system is complemented, through the incorporation of other variables or components of the environment linked to the water resource.

In this way, this section presents an analysis of the current situation and the expected tendency of the Project with the following variables or components: riverbank vegetation, scenery and recreational activities, in those waterway stretches where there is a surface runoff perceived.

This analysis focuses on the environmental valuation of the current situation of the mentioned components and a forecast of the effects that the PHAM would have in each one of them by area, in order to complement the environmental assessment within the EIA, and at the same time, to validate from a functional point of view, the determination of the Qe proposed by the PHAM for each course intervened.

1. EFFECT OF THE REDUCTION OF THE FLOW IN THE VEGETATION NEAR THE WATERWAYS

In general, in the area of the Project there is not a considerable development of the vegetation formations of the banks. An exception are the cases of the summer grazing areas of La Engorda and Lo Encañado, which, in spite of the fact of not being exactly riverbed vegetation, conform systems of wet meadows associated to the permanent presence of water (see Annex 42).

Therefore, in the area of the project, there are two situations for the vegetation near the waterways, which are:

- Areas of herbaceous and shrubby vegetation emplaced next to the waterways: This situation is observed in the areas of the Colorado, Maipo, and Yeso rivers, and Quempo and Aucayes streams. According to the abiotic conditions of the Andean environment present in the area, these waterways have predominantly nival feeding showing considerable flow fluctuations. The lowest flows are registered during the winter, while the highest ones take place during the spring. In case the seasonal vegetation, mainly colonizing herbaceous vegetation, uses the excavated section of the river in the dry portion of the waterway, during the flow increases due to thawing, this vegetation is entrained by the power of the water, thus starting a new cycle per season. This dynamics is less marked in rocky waterways and in high areas (>2,500 m.a.s.l.) where there is a greater presence of snow during most of the year and a lower abundance of vegetation. The riverbank vegetation does not manage to form a permanent structure and has been described as riparian scrubland; in the area of Andean ravines, over 1800 m of altitude there is a dominance of *Escallonia myrtoidea* and *E. illinita*, in the low ravines; at the level of rivers and streams with broader excavation sections there are *Baccharis salicifolia* (chilca) and *Psoralea glandulosa* (culén). As it has been mentioned, the stability of these formations depends on the variation of the river's flows.

- Areas of high-Andean grassland and scrubland, locally concentrated in Lo Encañado, Alto Volcán area and near El Yeso reservoir. These are areas with high vegetation productivity and an azonal distribution. Possibly these formations illustrate the presence of a superficial aquifer, and/or subsist leveraging the irrigation of the anastomosaded courses that drain the area, along with several runoff contributions from thaw-ravines. Currently, these areas are intervened in greater or lower extent by the pressure of grazing, a traditional activity of the area.

Now there is a description of the flora next to the waterways that will be intervened by the Project:

1.1 ALTO VOLCÁN SUB-BASIN

In the operation phase, the project will only affect a part of the riverbed vegetation that exists downstream from the intakes of El Morado, Las Placas, Colina and La Engorda streams and the head tunnel planned in the same area. This effect will be caused by the reduction of the flow in the mentioned courses, which will preserve the environmental flow proposed by the PHAM.

The vegetation in the summer grazing area, between El Morado, Las Placas, Colina and La Engorda streams, is nurtured by the subsuperficial aquifer and in part by the waters coming from the superficial watercourses and several intermittent runoff talweg[9] generated by thawing and precipitations (present during the entire year).

This high Andean area presents a nival and glacial type hydrologic regime, fed by approximately 36 km^2 of glaciers, among which the Marmolejo and Loma Larga stand out, apart from other snowdrifts whose source is in San José volcano. In general, water drain is of superficial and subsuperficial type, which is evidenced by the broad network of minor drains associated to the main streams, and small isolated upwellings that appear among the vegetation. The geologic material in this area is characterized by the presence of mudslide-torrent deposits formed by thick accumulations in the shape of fans or semi cones constituted by thick deposits. This surface would allow for forming a semi confined water table

Given the aforementioned, it is foreseen that the effect of the project associated to the flow reduction will be very locally circumscribed in the area located immediately downstream from each water intake. To verify this, there was a stereoscopic photo interpretation carried out in the area of the collections of El Morado, Las Placas, Colina and La Engorda streams, and whose results are shown in Figure 6.4.2.2 of the EIA. This activity allowed to identify and characterize the drainage network, and to estimate the effect of water extraction on vegetation. There were SAF 1990 aerial photographs used, at a scale of 1:20.000 and ortophotos year 2006.

[9] Talweg: Is an imaginary line formed by all of the lowest points of a valley (hydrographic basin), where the water drains.

The main findings of the analysis are the following:

— Given the conditions of the relief, the area between Colina and La Engorda streams is mainly irrigated by the course of la Engorda stream, which is anastomosed, that is to say, the water flow is ramified between long shoals of alluvium or sediments, and some of these flows or water branches feed Colina stream. In this area, the existence of a mild slope eases the deposit of sediments entrained from higher areas, forming a flood plain of approximately, 500 m wide. La Engorda stream develops a unique waterway next to its confluence with Colina stream, downstream from the water intake. This stream is mainly fed by the thawing in the highlands, through a significant amount of intermittent ravines that come down from the hillsides that surround the course (See Photo 1).

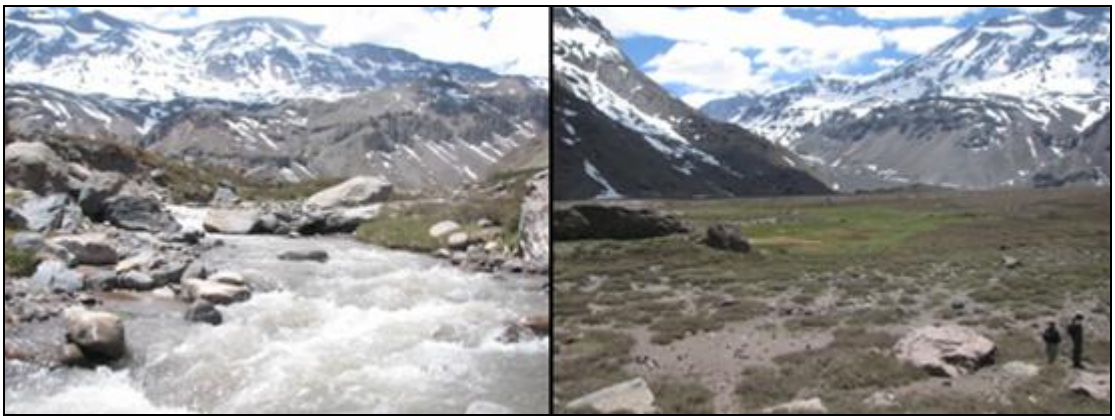


Photo 1. Environment of La Engorda stream's bank and panoramic view of La Engorda's summer grazing area

— Colina stream has a predominantly Northern-Southern direction, being flanked by mountains with hillsides covered by wide **talus fans** (See Picture 2). Then, it changes its direction to become predominantly East-West. This course runs in parallel to La Engorda stream before confluencing with El Morado stream. Colina stream develops a unique waterway in the area of the planned water intake, thus agreeing with a notorious slope change, which makes the waters flow towards El Morado stream, supposedly contributing with a low irrigation towards the area between Colina and La Engorda streams. This is evidenced in the change of the recorded vegetation for this area (see figure 5.4.1.29, Chapter 5 of the EIA).

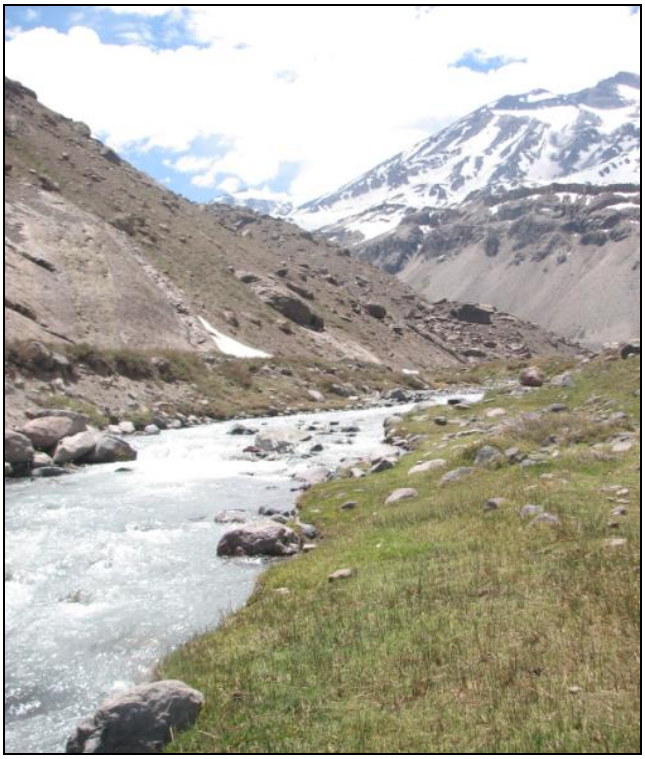


Photo 2. Environment of Colina stream's bank

— Las Placas stream moves from East to West, with a lower extension than the rest of the streams, and confluences with El Morado stream (See Photo 3).

Photo 3. Bank environment of Las Placas stream

- El Morado stream is extended predominantly towards the south forming a unique waterway at the planned water intake level. Upstream from this point, the course is anastomansed. Downstream from this point, the stream receives the contributions of several ravines.

- From the analysis carried out, it is inferred that the area covered with Andean scrubland and wet meadows (meadows) in this area receives water from different sources. On one hand, there are the watercourses of Colina and La Engorda streams; the talwegs or ravines of short development and of intermittent behavior that drain waters from thawing; solid and liquid precipitations, and the existing underground runoff.

- The results of the last campaign (November 2007) allowed to verify the later, meanwhile, there were wet meadow formations found associated to flood plains in mild slope areas with a higher altitude than the altitude of the waterways. In effect, the waterways of Colina and La Engorda streams are located 2 or 3 m below the level in which the mentioned meadows are and next to those courses, and therefore, probably these will subsist due to other hydric contributions (other superficial or sub-superficial runoffs that form the flood plain), and that also feed the streams. This allows supposing that the meadows will not be strongly impacted, since its water availability would be reduced in a low percentage, by not depending directly on the water that flows through the streams (Photo 4). It is important to point out that these meadows probably have a more seasonal character, since at the end of the summer and in the fall; they tend to decrease significantly their vegetation coverage in a natural way, probably due to the lower availability of water and the excessive grazing.

Photo 4. La Engorda stream, shows the slope of the stream bed, compared to the level in which the meadows are

Thus, it is presumed that the vegetation located downstream from the planned water intakes would continue being irrigated by the different stream branches that form flood plains and by ravines that go down from the hillsides that close the valley, during the thawing season. The most sensitive areas, given the drainage conditions, would be the areas immediately downstream from the planned water intakes in Las Placas, Colina and La Engorda streams, in which the formation of meadows associated directly to the waterway takes place, and that will in fact experience a lower availability of the resource. In the worst case scenario, in these areas a very local change in the composition of the current vegetation formation is seen, that is to say, it is expected to have a progressive replacement process that would favor the

emplacement of species with lower hydric requirements, mainly species that are part of the nearby Andean scrubland. Spatially this potential effect will be lowered by maintaining an environmental flow.

To verify the indicated effects and to attribute them to the project over time on the vegetation associated to the hydric resource, a monitoring of the vegetation of the area will take place, during the construction stage and the first 5 years of operation.

1.2 QUEMPO STREAM

According to what is indicated in the EIA, section 5.4.1.4 “Vegetation Results,” the predominant vegetation in the area of Quempo stream is a formation of sclerophyllous forest, open, and with a shrub stratum and another one of annual, seasonal herbs. The height of the trees is of up to 15 m, and the shrub stratum does not exceed 2 m. The vegetation coverage together with the three strata is very high. The dominant species are *Quillaja saponaria* (quillay), *Kageneckia angustifolia* (frangel), *Schinus polygamus* (huingán) among the trees, and among shrubs, *Colletia hystrix*, *Cestrum parqui* and *Muehlenbeckia hastulata* and, among herbs, *Bromus berterianus* (See Picture 5).

This formation does not present a location associated to the waterway or the area of the bank, since it is zonal vegetation that exists in the entire area. However, it is worth mentioning the presence of some isolated individuals of *Escallonia myrtoidea* (Lun), which are found in the margins of the stream, a species associated to watercourses, and adapted to flow changes in different times of the year.

As it was indicated before, according to the environmental optimization of the PHAM, the initially planned water intake in this stream and described in the EIA will not be built, and the Owner will desist from the collection of waters of Quempo stream.

Photo 5. Bank environment of Quempo stream

1.3 YESO RIVER

The predominant vegetation in Yeso river's river bank is a low woody formation with herbaceous, very clear or not very dense. It is a sparse scrubland comprised mainly by *Baccharis salicifolia* (chilca) and *Gymnophyton isatidicarpum*, both colonizing shrubs. In specific areas there are groups of *Cortaderia rudiuscula* (fox tail) observed that grown among them, and other scrublands that reach up to 2 m of height: *Discaria chacaye* (chacay) and *Escallonia alpina*, while others, such as *Berberis empetrifolia* are less.

This vegetation has a low abundance and does not include any protected species, finding them only in some specific places due to the characteristics of Yeso river, that presents a very rocky bed, with a steep slope and an erosive action of the banks (see Photo 6).

Thus, the project will not modify the structure of the vegetation that can be currently found near the waterway, since they are species adapted to water level fluctuations associated to seasonality and the operation of El Yeso reservoir. Probably some species such as *Cortaderia rudiuscula* and some herbaceous will colonize the margin of water change level during some seasons of the year.

It is worth mentioning that the wet prairie found in the area of Yeso river, will not be intervened by the works of the project, or affected by the reduction of the river's flow, since it is located at approximately 100 m above the level of the river's waterway, and it is fed by other sources of water.

Photo 6. Environment of Yeso river's bank. At the left you may see the road to Lo Encañado

1.4 COLORADO RIVER

The basin of Colorado river, between the confluence with Olivares river and before it joins Maipo river is seen more plain and with an approximate average altitude of 1.000 m.a.s.l. This stretch of the valley is emplaced in a mid-elevation mountain range, where pedogenetic processes allow for the development of shrubby and arboreous vegetation that promotes the existence of soil forming processes.

According to what is indicated in section 5.4.1.4 “Vegetation Results” of the EIA, the predominant vegetation in this stretch of the Colorado river is Andean Sclerophyllous Forest formation, with the presence, according to the composition of units, of the following associations: *Quillaja saponaria-Lithrea caustica*, *Cryptocarya alba-Lithrea caustica, Puya berteroniana-Adesmia confusa and Acacia caven-Lithrea caustica* (see Photo 7).

This formation does not present a location associated to the waterway or the area of the bank, since it is zonal vegetation that exists in the entire area.

Only in some small terraces of low elevation next to the river, we may find the following species: *Baccharis pingraea* and *Baccharis salicifolia* (chilca), along with annual herbaceous, a formation that many times disappears with the river's flow increases. All of these species are colonizing and are not found in the conservation category.

Therefore, in the stretch affected by Colorado river, there is not a significant vegetation change foreseen. An occupation of the margins of the river uncovered by the flow decrease will be kept by the mentioned species and those that currently exist and that have adapted to flow fluctuations and recolonization.

Photo 7. Environment of the bank of Colorado river

1.5 AUCAYES STREAM

Morphologically speaking, the waterway of Aucayes stream is emplaced in a mid-elevation mountain range, with a development of shrubby and arboreous vegetation.

According to what is indicated in section 5.4.1.4 “Vegetation Results" of the EIA, the predominant vegetation in the area of Aucayes stream, below the area of the water intake, is made up by two vegetation formations, that together correspond to a sclerophyllous forest with an arboreous stratum of 7-10 m of elevation, where the *Quillaja saponaria, Kageneckia oblonga* and *Lithrea caustica are predominant,* and out of these, only the quillay presents more frequently a purely arboreous form; in the arboreous stratum the *Gochnatia foliolosa* (mira-mira), *Baccharis rhomboidalis* (gaultro) *Trevoa quinquinervia* (tralhuén) and *Proustia cuneifolia* (huañil) grow; there is a seasonal herbaceous stratum where during the summer the following are predominant: Vulpia myurus, *Centaurea melitensis* and *Helenium aromaticum*. Also, there is a succulent plant stratum which includes *Echinopsis chiloensis* (quisco), and *Puya berteroniana* (chagual) species. The formation coverage reaches up to 70%, and they are found from 1600 m to the Colorado river canyon, in the lower area there is a greater predominance of quillay. Among the species in the conservation category we may find *Kageneckia angustifolia* (franjel). (Photo 8).

This vegetation is developed to the margins of Aucayes stream, which has a very narrow and rocky bed, where sometimes we may also find the development of species associated to watercourses such as *Escallonia myrtoidea* (lun), *Aristotelia chilensis* (maqui), *Baccharis salicifolia* (chilca), *Buddleja globosa* (matico) and some herbaceous such as *Mimulus* spp, cyperaceas, etc. These species do not manage to form a riverbed formation at this elevation, since they are mixed and spread in the zonal vegetation formations. Only above 1800 meters of altitude, they are constituted as riverbed formations thus forming pure lun and matico associations, even covering the side watercourses, however, the project does not present any interventions on those areas, nor over the meadows and wet prairie formations described in the EIA (section 5.4.1.4 “Vegetation Results”), and known as Aucayes summer grazing areas.

The prior, since the PHAM has desisted from emplacing a new collection in Aucayes stream, keeping the current situation intact, although the collected waters from Aucayes stream and that are sent to Maitenes power plant, in a project situation will be directed to the future Las Lajas power plant.

Photo 8. Environment of Aucayes stream's bank

1.6 MAIPO RIVER

The bank environment developed in the stretch of Maipo river is currently intervened, due to the continuous processes of human settlement that the commune has experienced over the last years. A considerable part of this settlement is intensive in certain areas next to Route G-25.

The vegetation developed in the bank of Maipo river corresponds mostly to introduced vegetation (*Eucayptus spp*, *Salix* spp., *Populus* spp, etc.), with remainders of zonal native vegetation, not associated to the watercourse.

The vegetation of the bank will not present any notorious changes due to the low flow decrease that this river will experience indirectly, and that was described in the previous sections (see section 5.2.2 of this Annex and Photo 9).

Photo 9. Environment of the bank of Maipo river

2 EFFECTS OF FLOW REDUCTION IN THE SCENERY AND RECREATIONAL ASPECTS

The area where the project is emplaced has a considerable scenery interest, with the waterways being an attribute that provides value to the Andean landscape, due to the presence of surface runoff, mirrors and waterfalls, the latter being abundant in the thawing season.

In general, in the area there is sightseeing, camping, hiking, and mountaineering tourism along with other ecotourism activities, where there is a marked seasonality, with some recreational activities related to the waterways and that consist of: beach resorts, fishing and sailing.

2.1 ALTO VOLCÁN SUB-BASIN

The area corresponds to a series of sub-basins of the upper part of the Volcán river. It is a landscape of high altitude mountains (> 2,000 m) with a predominance of abiotic features associated to an Andean type relief. During the fall and the winter a large part of the relief is covered by snow. The elements that form the landscape are rocky and abrupt hillsides, narrow and sinuous valleys, rocky material in general, valley bottoms dominated by fluvial material and torrent type watercourses, forming intermittently a series of summer grazing. The area is composed of a wide valley with a very irregular topography that allows visuals at different elevation plains, and it is difficult to access (see Photo 10 and 11). The area is visited by mountaineers and tourists in general, preferably during the spring-summer season.

The downstream stretch of the water intakes will produce a change in the landscape attributes due to the flow decrease. This effect will be observable only in the stretch between the planned collections of El Morado, Las Placas, La Engorda and Colina streams and the confluence of these with Estero Del Volcán stream (coming from the southern side of the sub-basin), which contributes with approximately 50% of the total flow of Volcán river.

The stretches for each stream between the planned water intake and the confluence with El Volcán stream are: 2.5 km for Colina stream, 2.5 km for La Engorda stream, 3 km for Las Placas stream, and 3 km for El Morado stream. In these stretches, an observer that accesses the area through the existing footprints will see the noticeable flow decrease of the streams.

Given the runoff regime in the streams of the area, the visual effect of the flow decrease will be more noticeable during the fall and winter, where naturally there are lower flows recorded, however, the presence of snow covers will attenuate the deterioration of the visual quality of the landscape.

Thus, preserving the environmental flow together with the stream's natural recoveries will lessen the impact on the landscape in the mentioned stretches.

In the stretches of each stream subject to flow reduction, there are not any recreational activities associated to the waterways that can be impacted. In those stretches, there are not any tourism infrastructures or facilities that are susceptible of being affected.

Photo 10. Geomorphology of the Alto Volcán sub-basin

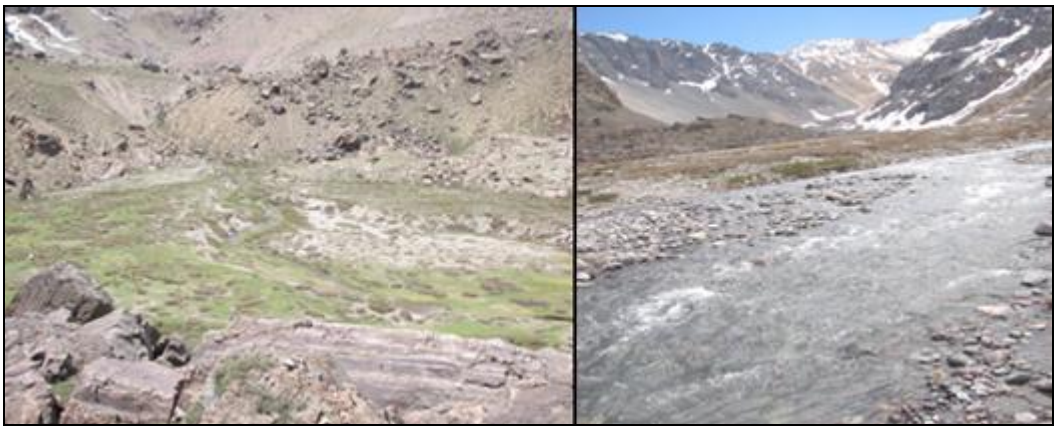


Photo 11. Landscape of the area of Las Placas and El Morado streams

2.2 QUEMPO STREAM

This area has a predominance of mountain scenery, where there is a higher anthropic intervention level given the presence of Alfalfal power plant and its annex facilities. Abiotic features stand out in the reliefs of higher altitude or in steepest slopes. In general, there is a predominance of a narrow and sinuous mountain valley, and therefore the visual basins are long and follow the direction and shape of the valley.

The area is of difficult access; through route G-345 it is possible to reach the confluence of the stream with Colorado river. Along the stretch under analysis there are not any tourist infrastructures or recreational equipment associated to the waterway of Quempo stream. In this area activities such as horseback riding and middle to high altitude mountain climbing take place.

As it has been mentioned before, according to the environmental optimization of the PHAM, the water intake initially planned for this stream will not be built.

2.3 YESO RIVER

Yeso river's sub-basin presents a mountain landscape developed over 2000 m.a.s.l, with narrow valleys, scarce herbaceous and shrubby vegetation, low and distributed unevenly and in general, with low human population. The area presents a dominance of the morphogenesis over pedogenesis (greater erosive activity and wear) (see Photo 12). Therefore, there is a predominance of free face slopes, mostly complex and talus. In parallel there are a series of deposits of large extent in the margins of Yeso river, which present instability mostly due to the low cohesion of the materials and the erosive action of the river over the basis of these deposits (see Photo 13).

The area has a high physical accessibility through route G-455. Along the stretch under analysis there are not any tourist infrastructures or recreational equipment associated to the waterway of Yeso river.

The flow decrease will be more accentuated in the upper and mid sections of Yeso river. In these sections the watercourse is surrounded by the power of side deposits, which in general show a low cohesion, and therefore there are not any means of fluvial deposit observed, such as, mid and side banks. Thus, in this area the waterway presents a higher slope and strongly eroded mountainsides. The visual accessibility in this upper section of Yeso river is low for an observer that travels through route G-455 (parallel to the river).

In the lower section of the stretch under analysis (the closest one to the confluence with Maipo river), the slope of the waterway is minor, occupying a wider excavated section that can be easily seen from the road, a situation that is extended until kilometer 2 of route G-455 (Photo 14). Also, the stretch of Maipo river, between its confluence with Yeso and Volcán rivers is clearly visible from the route (aprox. 2 km). This effect would be mostly perceived from the road to Lo Encañado lagoon, which is a private road, and therefore the physical access for an observer is very limited.

In a Project situation in the mentioned stretches, there will be a deterioration of the quality of the landscape since an observer that travels through route G-455 will be able to perceive the reduction in the flow, especially during the fall-winter season (in the months without snow.) This effect will be diminished by keeping an environmental flow, along with the contribution of several watercourses that feed Yeso river downstream from the planned collection (Cortaderas, Los Arenales, Los Chacayes, Las Lunes, El Rodeo de los Bueyes streams). Maintaining a Qe in this stretch, along with the mentioned intermediate contributions, will help avoid a significant deterioration of the panoramic views that in the presence of runoff constitutes an attribute that provides a landscape value.

Although it could be understood that the flow reduction would alter sceneries, the operation regime regulated by the reservoir determines that Yeso river will not receive discharges from the reservoir during some months of the year with a hydric deficit (according to official statistical records), due to which the runoff fluctuation of Yeso river is part of the landscape setup the area, so characteristic such as the summits and other natural components of the landscape.

Therefore, the materialization of the PHAM from the point of view of the quality of the landscape is supposed to maintain the current situation of the area, that is to say, a runoff fluctuation of Yeso river, although with a possible deterioration of the quality of the landscape which is very local and temporarily enclosed, in the stretch next to its confluence with Maipo river.

Photo 12. Landscape of the Yeso river area

Photo 13. Geomorphology of Yeso river's sub-basin

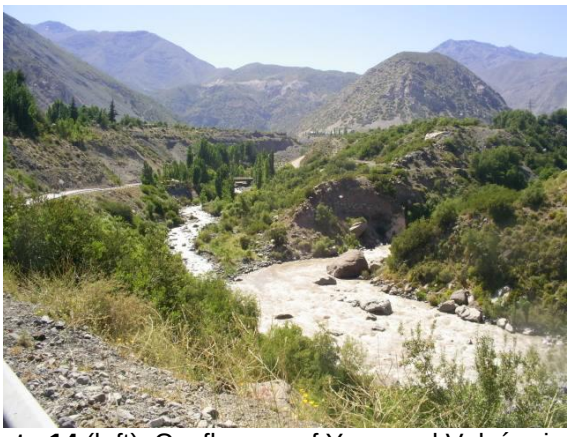


Photo 14 (left): Confluence of Yeso and Volcán rivers, view from route G-345.
Photo 15 (right): house and corrals in the area of Yeso river.

In Yeso river, there are some households (residential) that have caprine ranching and grazing as their main economic activity. There are not tourist infrastructures or equipment associated to the waterways that are susceptible of being affected by the development of the PHAM.

It is important to point out that in the lower area of Yeso river, that is to say, next to its confluence with Maipo river and particularly during the summer, it is common to see visitors that have informal “picnics” next to the waterway, that in this stretch occupies a wide excavated section and presents a very rocky substrate. This activity will not be interrupted by the Project, since, as it has been said, maintaining an environmental flow along with the contribution of the intermediate basin ensure a permanent runoff in this stretch. This takes place currently, because it has been recorded that even when the El Yeso reservoir does not discharge waters, the contributions of the intermediate basin allow having a minimum runoff in this section of the river.

2.4 COLORADO RIVER

This area presents morphologic and visual characteristic features of Andean valleys with a shrubby and arboreous vegetation formation of a sclerophyllous forest and that provide a high aesthetic value. Abiotic features are only present in the reliefs of higher altitude or in steepest slopes. Also, to this we may add anthropic elements widely distributed along the valley, although there is general condition of high naturality of the landscape maintained an aspect that mainly arises due to the visual effect of vegetation (see Photo 17). The only anthropic features that alter the balance have to do with Río Colorado mining company and the areas of Los Maitenes and El Alfalfal, which do not influence significantly in the rest of the landscape attributes.

The morphology of the valley is narrow and sinuous, with long visual basins that follow the direction and shape of the valley (See Photo 16).

Photo 16. Sub-basin landscape of Colorado river.

The area can be accessed through route G-345 that connects route G-25 with Alfalfal power plant. In this route there are some observation points that include the waterway as an attribute of the landscape, particularly in the high section of the stretch, since its mid and low sections present a waterway with a greater slope and markedly surrounded, which cannot be observed from the road.

Therefore, a flow reduction will be perceived mainly from the road in the high section, with a detriment in the quality of the landscape compared to a lower flow, accentuated in the last 2 kilometers before reaching the El Alfalfal bridge. This effect will be mainly perceived during the fall-winter season where the lower flows are recorded (see Photo 17).

With the exception of the last two kilometers of the road, along the route there are only some sporadic or partial views of the river, where it will become less visible with the reduction of the river's flow. In parking areas and scenic viewpoints informally used on the side of the road, an observer must walk and look for a place to get a view of the river due to vegetation and the steepness of the place (Photo 18). It is important to highlight that the waterway of Colorado river is developed (in most of the analyzed stretch) at significant altitude difference compared to the altitude of the road (between 30 and 50 m).

In a Project situation the maintenance of an environmental flow, along with the contribution of the intermediate basin between the water intake of the PHAM and the confluence of Colorado and Maipo rivers will avoid a significant deterioration of the panoramic views where the presence of the runoff constitutes an attribute that provides landscape value to Colorado river's sub-basin.

Along the stretch of Colorado river under analysis there is not any tourist infrastructure or recreational equipment associated to the waterway of the river. There are not any seasonal informal activities reported in the waterway, which are susceptible of being affected by the PHAM.

Photo 17: View of Colorado river from the road (Route G-25), at kilometer 28 (near Alfalfal).

Photo 18. Landscape of the mid and low sections of Colorado river

2.5 AUCAYES STREAM

The sub-basin of Aucayes stream has a characteristic landscape of the Andes in the Central area of Chile that takes place over 2000 m.a.s.l., where there is a dominance of abiotic elements, that is to say, rocky outcrops, mountainsides with loose material, scarce vegetation, torrential water courses and no human settlements, and therefore, it is highly natural (See Photo 16). Due to the shape of the valley, the visual basins are elongated. Its sinuosity creates views that have to do with the shape of the valley (from west to east) in general of short distance (<2,000 m).

The morphology characteristic of the area is determined by the presence of an Andean relief, with abrupt mountainsides and narrow valley bottoms (See Photo 19).

The area is of difficult access; through route G-345 it is possible to reach the confluence of the stream with Colorado river. Along the stretch under analysis there are not any tourist infrastructures or recreational equipment associated to the waterway of Aucayes stream.

Notwithstanding the aforementioned, in this area activities such as horseback riding and mid to high altitude mountain climbing take place.

Photo 19. Landscape of the Aucayes stream area

The effect of the flow reduction in this stream on the landscape and on recreational activities has not been analyzed, since the PHAM has desisted from the implementation of a new collection in the Aucayes stream.

2.6 MAIPO RIVER

The landscape of Maipo river in the stretch between its confluence with Volcán river and the PHAM's discharge point (Las Lajas area) is characterized by having a mountainous relief with marked anthropic features due to the important human settlement processes experienced over the last 20 or 30 years.

In this stretch of Maipo river, touristic and recreational or amusement activities are intense, and take place mostly during the summer. The area is characterized by having diverse touristic infrastructure in the towns along the G-25 route, with an easy access during most of the year. The development of activities directly related to Maipo river such as camping and picnic, rafting and kayaking (these 2 particularly in the area between San Alfonso and San José de Maipo) stands out. In this stretch of Maipo river there are not any beach resorts.

As it has been previously mentioned, the project will not directly affect Maipo river. The stretch of the river that will experience a flow decrease will be from the confluence of Volcán river to the discharge area of the project, in the area of Las Lajas and will have an extension of 39 km. Although Maipo river will not be directly intervened, the reduction of flow will be given by the reduction of the flows of its main tributaries: Colorado, Yeso and Volcán rivers, that have already been analyzed. Similarly, Maipo river presents in this stretch, intermediate contributions that feed its hydric system, corresponding to: San Gabriel, Romeral, San Alfonso, La Calchona, Las Cucas, Coyanco, El Sauce, San José, El Manzano, streams, among others.

In a project situation, the flow of Maipo river in the mentioned stretch will decrease in a dry year (95%) as a maximum, between 14 and 15 % in the stretch of San José de Maipo and San Alfonso.

Thus, the effects on the landscape will not be significant given the percentage in which the flows will be decreased. Likewise, the project will not intervene the development of tourist activities carried out in the river.

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Simbología

Localidades
- Localidades
- San José de Maipo

Curva de Nivel
- Curva nivel índice
- Curva nivel índice glaciar
- Curva nivel intermedia glaciar
- Curva nivel intermedia

Vialidad
- Camino pavimentado
- Camino ripio
- Camino tierra
- Huella

Hidrografía
- Río
- Estero
- Quebrada intermitente
- Quebrada permanente

Obras Proyecto PHAM
- Bocatoma
- Captación
- Caverna máquina
- Descarga
- Ventana
- Puente
- Pozo
- Subestación Eléctrica
- Estanque de Carga
- Portal Acceso
- Camino proyectado
- Túnel
- Ducto
- Cámara de carga

Sensibilidad del paisaje
- Área de sensibilidad paisajística por accesibilidad visual alta

Sensibilidad de la Vegetación
- Zona de pradera - Alta Sensibilidad
- Zona de vegetación riparia - Baja Sensibilidad (Escaso requerimiento hídrico del cause)
- Vegetación zonal - Sin Sensibilidad (No asociada a los causes)

4 0 4 8 Km

Escala 1:150.000
Coordenadas UTM en Metros
Datum PSAD 56 - Huso 19
Elipsoide Internacional de 1924

ESTUDIO DE IMPACTO AMBIENTAL
PROYECTO HIDROELÉCTRICO ALTO MAIPO

TÍTULO
ÁREAS SENSIBLES DE PAISAJE Y VEGETACIÓN EN CAUCES DIRECTAMENTE AFECTADOS POR LA REDUCCIÓN DE CAUDAL

ESCALA:	FECHA:	LÁMINA:	REV:
1:150.000	MAYO 2008	1	0

PREPARADO POR: ARCADIS GEOTECNICA

PREPARADO PARA: Gener

ESTERO LA ENGORDA
CAUDAL MEDIO MENSUAL (m³/s)
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	0,58	0,31	0,34	0,31	0,30	0,27	0,40	0,80	1,79	2,28	1,75	1,03	0,85
1951 / 52	0,53	0,36	0,31	0,30	0,30	0,29	0,40	0,89	1,70	2,30	1,69	0,97	0,84
1952 / 53	0,54	0,35	0,31	0,30	0,29	0,30	0,41	0,83	1,70	2,33	1,91	1,00	0,86
1953 / 54	0,57	0,36	0,32	0,30	0,32	0,38	0,45	1,19	2,19	3,35	2,74	1,35	1,13
1954 / 55	0,63	0,43	0,39	0,35	0,33	0,34	0,44	0,96	1,59	2,17	1,88	1,05	0,88
1955 / 56	0,55	0,34	0,25	0,22	0,22	0,23	0,32	0,92	1,49	2,05	1,64	0,96	0,77
1956 / 57	0,49	0,36	0,28	0,26	0,27	0,28	0,38	1,05	1,60	2,44	2,25	1,11	0,90
1957 / 58	0,55	0,33	0,28	0,26	0,27	0,29	0,41	0,98	1,81	2,10	1,41	0,86	0,80
1958 / 59	0,52	0,35	0,30	0,29	0,28	0,36	0,54	1,37	1,88	2,26	1,83	0,94	0,91
1959 / 60	0,59	0,39	0,32	0,32	0,34	0,38	0,51	1,33	2,24	3,00	2,61	1,23	1,11
1960 / 61	0,53	0,36	0,28	0,28	0,28	0,38	0,42	1,11	1,86	2,15	1,64	0,98	0,86
1961 / 62	0,62	0,38	0,32	0,30	0,30	0,30	0,58	1,43	2,58	3,02	2,37	1,44	1,14
1962 / 63	0,59	0,39	0,33	0,30	0,29	0,31	0,41	1,07	1,73	1,76	1,59	0,88	0,81
1963 / 64	0,52	0,34	0,29	0,28	0,26	0,33	0,43	0,85	2,37	4,66	3,57	1,60	1,29
1964 / 65	0,83	0,48	0,38	0,32	0,29	0,29	0,36	0,84	1,35	2,00	1,85	0,96	0,83
1965 / 66	0,57	0,38	0,33	0,31	0,37	0,39	0,58	1,18	1,78	3,71	2,46	1,26	1,11
1966 / 67	0,67	0,43	0,37	0,37	0,32	0,34	0,50	1,10	1,63	2,06	1,87	0,96	0,88
1967 / 68	0,56	0,36	0,38	0,25	0,23	0,23	0,33	0,74	1,52	1,80	1,51	0,85	0,73
1968 / 69	0,48	0,32	0,27	0,23	0,21	0,21	0,25	0,65	1,15	1,69	1,44	0,81	0,64
1969 / 70	0,41	0,27	0,26	0,24	0,23	0,27	0,32	0,72	1,99	2,35	1,77	0,86	0,81
1970 / 71	0,52	0,32	0,24	0,22	0,23	0,26	0,44	0,96	1,73	1,22	1,19	1,00	0,69
1971 / 72	0,54	0,27	0,22	0,25	0,25	0,28	0,47	1,15	1,63	1,98	1,53	0,93	0,79
1972 / 73	0,50	0,56	0,43	0,31	0,36	0,40	0,49	0,92	2,00	3,59	2,88	1,47	1,16
1973 / 74	0,91	0,52	0,35	0,32	0,28	0,30	0,56	1,00	1,49	2,69	1,90	1,02	0,94
1974 / 75	0,53	0,35	0,31	0,35	0,32	0,32	0,61	1,19	1,93	3,97	2,18	1,10	1,10
1975 / 76	0,57	0,33	0,27	0,25	0,25	0,28	0,38	0,85	1,76	2,01	2,34	0,99	0,86
1976 / 77	0,49	0,32	0,27	0,26	0,25	0,26	0,31	0,88	1,57	2,27	1,54	0,97	0,78
1977 / 78	0,53	0,34	0,29	0,37	0,39	0,41	0,61	1,28	2,31	2,92	2,22	1,10	1,07
1978 / 79	0,63	0,34	0,32	0,36	0,36	0,35	0,50	1,01	2,34	3,42	2,16	1,17	1,08
1979 / 80	0,71	0,49	0,35	0,30	0,32	0,29	0,36	0,78	1,74	2,85	2,22	1,23	0,97
1980 / 81	0,85	0,65	0,51	0,45	0,37	0,38	0,50	1,13	2,66	3,51	2,93	1,35	1,27
1981 / 82	0,66	0,46	0,36	0,30	0,30	0,29	0,42	1,00	1,59	2,20	1,98	1,01	0,88
1982 / 83	0,53	0,37	0,36	0,55	0,47	0,54	0,54	1,09	2,99	5,58	4,63	2,14	1,65
1983 / 84	1,05	0,60	0,44	0,38	0,36	0,35	0,52	1,21	2,33	3,18	2,58	1,28	1,19
1984 / 85	0,68	0,41	0,33	0,32	0,33	0,38	0,62	1,08	2,19	3,71	2,72	1,53	1,19
1985 / 86	0,76	0,19	0,41	0,37	0,34	0,32	0,36	1,04	1,74	2,25	1,74	0,99	0,88
1986 / 87	0,59	0,41	0,68	0,46	0,34	0,38	0,51	1,02	2,37	3,85	3,06	1,47	1,26
1987 / 88	0,70	0,46	0,41	0,51	0,42	0,39	0,59	1,44	2,90	4,24	3,26	1,58	1,41
1988 / 89	0,80	0,49	0,36	0,32	0,31	0,24	0,43	1,01	1,56	2,20	2,02	1,00	0,89
1989 / 90	0,53	0,34	0,27	0,24	0,31	0,35	0,50	1,30	1,99	2,63	1,78	0,95	0,93
1990 / 91	0,55	0,36	0,28	0,26	0,26	0,30	0,36	0,90	1,53	2,11	1,73	1,01	0,80
1991 / 92	0,54	0,50	0,50	0,42	0,38	0,46	0,55	1,10	1,53	3,73	2,62	1,49	1,15
1992 / 93	0,71	0,50	0,43	0,40	0,36	0,42	0,62	1,16	2,14	3,50	2,61	1,34	1,18
1993 / 94	0,77	0,60	0,53	0,52	0,42	0,42	0,67	1,15	1,94	3,17	2,09	1,22	1,12
1994 / 95	0,63	0,42	0,35	0,33	0,35	0,32	0,48	1,37	2,26	2,77	1,91	1,08	1,02
1995 / 96	0,64	0,40	0,33	0,30	0,29	0,37	0,46	1,13	2,00	2,11	1,76	1,04	0,90
1996 / 97	0,57	0,36	0,26	0,26	0,24	0,24	0,28	0,61	1,08	1,72	1,71	0,82	0,68
1997 / 98	0,48	0,31	0,35	0,34	0,39	0,58	0,44	1,14	2,30	4,35	2,49	1,34	1,21
1998 / 99	0,81	0,53	0,37	0,33	0,28	0,26	0,37	0,79	1,16	1,60	1,55	0,84	0,74
1999 / 00	0,47	0,31	0,25	0,23	0,24	0,26	0,44	0,98	1,60	1,84	1,68	0,84	0,76
2000 / 01	0,54	0,36	0,32	0,37	0,32	0,33	0,61	1,10	2,51	3,52	2,70	1,31	1,17
2001 / 02	0,67	0,45	0,36	0,36	0,40	0,43	0,59	1,16	2,52	3,17	2,38	1,23	1,14
2002 / 03	0,67	0,48	0,38	0,41	0,54	0,50	0,62	1,23	2,27	3,71	2,89	1,50	1,27
2003 / 04	0,77	0,49	0,42	0,37	0,36	0,38	0,56	1,04	1,57	2,33	1,91	1,11	0,94
2004 / 05	0,59	0,38	0,27	0,28	0,29	0,36	0,32	0,79	1,62	2,22	1,74	0,94	0,82
2005 / 06	0,54	0,38	0,41	0,41	0,42	0,46	0,63	1,35	2,47	4,17	3,04	1,34	1,30

PROM	0,61	0,40	0,34	0,33	0,32	0,34	0,47	1,04	1,92	2,78	2,17	1,14	0,99

ESTERO COLINA
CAUDAL MEDIO MENSUAL (m³/s)
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	2,06	1,02	0,95	0,87	0,84	0,76	1,12	2,87	6,23	8,04	6,35	3,61	2,89
1951 / 52	1,94	1,14	0,87	0,83	0,83	0,81	1,12	3,08	6,03	8,09	6,19	3,48	2,87
1952 / 53	1,97	1,12	0,87	0,83	0,82	0,84	1,15	2,93	6,02	8,17	6,73	3,56	2,92
1953 / 54	2,03	1,13	0,89	0,84	0,88	1,04	1,24	3,83	7,23	10,66	8,77	4,40	3,58
1954 / 55	2,18	1,31	1,08	0,96	0,92	0,93	1,23	3,26	5,75	7,77	6,67	3,67	2,98
1955 / 56	2,00	1,07	0,73	0,64	0,65	0,68	0,92	3,16	5,51	7,49	6,08	3,44	2,70
1956 / 57	1,83	1,14	0,81	0,75	0,77	0,78	1,08	3,47	5,79	8,45	7,56	3,82	3,02
1957 / 58	1,99	1,05	0,80	0,74	0,77	0,82	1,16	3,30	6,28	7,59	5,51	3,21	2,77
1958 / 59	1,91	1,12	0,85	0,80	0,78	0,98	1,46	4,26	6,47	8,00	6,53	3,40	3,05
1959 / 60	2,08	1,21	0,91	0,89	0,94	1,02	1,41	4,16	7,36	9,82	8,46	4,11	3,53
1960 / 61	1,95	1,12	0,80	0,79	0,79	1,03	1,17	3,62	6,41	7,72	6,07	3,49	2,91
1961 / 62	2,15	1,19	0,91	0,85	0,83	0,85	1,57	4,42	8,19	9,85	7,87	4,63	3,61
1962 / 63	2,09	1,21	0,92	0,84	0,81	0,86	1,15	3,52	6,10	6,77	5,96	3,26	2,79
1963 / 64	1,91	1,08	0,82	0,80	0,75	0,91	1,21	2,98	7,66	13,87	10,81	5,02	3,98
1964 / 65	2,68	1,42	1,05	0,88	0,81	0,81	1,04	2,96	5,17	7,35	6,59	3,44	2,85
1965 / 66	2,04	1,18	0,91	0,86	1,02	1,06	1,57	3,80	6,21	11,54	8,09	4,19	3,54
1966 / 67	2,27	1,29	1,02	1,01	0,88	0,94	1,38	3,60	5,84	7,50	6,64	3,45	2,99
1967 / 68	2,01	1,14	1,05	0,71	0,66	0,68	0,95	2,73	5,58	6,86	5,77	3,17	2,61
1968 / 69	1,82	1,04	0,79	0,66	0,63	0,61	0,76	2,49	4,68	6,60	5,58	3,09	2,40
1969 / 70	1,65	0,90	0,76	0,68	0,67	0,77	0,94	2,68	6,72	8,21	6,38	3,20	2,80
1970 / 71	1,92	1,03	0,71	0,65	0,66	0,73	1,22	3,26	6,09	5,45	4,97	3,54	2,52
1971 / 72	1,97	0,91	0,64	0,71	0,72	0,80	1,30	3,71	5,84	7,32	5,80	3,38	2,76
1972 / 73	1,86	1,62	1,16	0,87	0,98	1,08	1,35	3,15	6,75	11,26	9,11	4,69	3,66
1973 / 74	2,86	1,52	0,97	0,88	0,78	0,83	1,52	3,36	5,50	9,06	6,71	3,59	3,13
1974 / 75	1,94	1,11	0,87	0,95	0,89	0,89	1,63	3,83	6,57	12,17	7,41	3,80	3,50
1975 / 76	2,04	1,06	0,78	0,73	0,73	0,78	1,07	2,99	6,18	7,38	7,80	3,51	2,92
1976 / 77	1,83	1,03	0,77	0,73	0,71	0,74	0,92	3,05	5,70	8,02	5,83	3,47	2,73
1977 / 78	1,94	1,09	0,82	1,02	1,06	1,12	1,64	4,05	7,53	9,60	7,49	3,79	3,43
1978 / 79	2,18	1,07	0,90	0,98	0,99	0,96	1,36	3,38	7,60	10,84	7,34	3,96	3,46
1979 / 80	2,38	1,44	0,97	0,82	0,90	0,81	1,03	2,82	6,13	9,45	7,48	4,10	3,19
1980 / 81	2,71	1,85	1,36	1,20	1,01	1,04	1,38	3,67	8,37	11,05	9,22	4,42	3,94
1981 / 82	2,27	1,37	1,00	0,85	0,83	0,81	1,18	3,34	5,74	7,86	6,91	3,57	2,98
1982 / 83	1,94	1,16	1,01	1,46	1,25	1,43	1,46	3,58	9,18	16,13	13,39	6,33	4,86
1983 / 84	3,20	1,72	1,18	1,04	0,98	0,96	1,43	3,87	7,55	10,26	8,37	4,24	3,73
1984 / 85	2,29	1,27	0,92	0,87	0,91	1,02	1,66	3,55	7,23	11,54	8,73	4,84	3,74
1985 / 86	2,49	0,71	1,11	1,02	0,93	0,87	1,02	3,46	6,13	7,98	6,32	3,51	2,96
1986 / 87	2,08	1,27	1,79	1,22	0,95	1,03	1,41	3,40	7,67	11,89	9,54	4,69	3,91
1987 / 88	2,36	1,39	1,12	1,34	1,14	1,07	1,58	4,43	8,97	12,85	10,04	4,96	4,27
1988 / 89	2,60	1,44	1,01	0,88	0,86	0,70	1,20	3,37	5,67	7,85	7,00	3,55	3,01
1989 / 90	1,95	1,09	0,77	0,69	0,85	0,96	1,37	4,08	6,74	8,90	6,41	3,42	3,10
1990 / 91	1,98	1,13	0,81	0,74	0,74	0,84	1,04	3,12	5,59	7,63	6,30	3,56	2,79
1991 / 92	1,97	1,47	1,33	1,12	1,03	1,24	1,48	3,59	5,61	11,58	8,48	4,75	3,64
1992 / 93	2,37	1,46	1,17	1,09	0,98	1,12	1,66	3,74	7,10	11,03	8,46	4,38	3,71
1993 / 94	2,53	1,72	1,41	1,38	1,12	1,14	1,78	3,71	6,60	10,22	7,18	4,09	3,57
1994 / 95	2,18	1,27	0,97	0,92	0,95	0,88	1,33	4,27	7,39	9,25	6,74	3,74	3,32
1995 / 96	2,20	1,24	0,93	0,84	0,81	1,00	1,27	3,67	6,75	7,64	6,38	3,65	3,03
1996 / 97	2,04	1,14	0,76	0,73	0,70	0,69	0,83	2,40	4,49	6,66	6,24	3,11	2,48
1997 / 98	1,81	1,01	0,98	0,93	1,06	1,51	1,23	3,69	7,50	13,10	8,16	4,38	3,78
1998 / 99	2,62	1,55	1,03	0,90	0,78	0,73	1,06	2,84	4,71	6,37	5,85	3,15	2,63
1999 / 00	1,80	1,01	0,73	0,67	0,68	0,75	1,23	3,30	5,77	6,97	6,18	3,15	2,69
2000 / 01	1,97	1,12	0,91	1,00	0,89	0,90	1,65	3,59	8,01	11,09	8,66	4,31	3,67
2001 / 02	2,28	1,36	1,00	0,97	1,09	1,16	1,60	3,74	8,03	10,23	7,88	4,11	3,62
2002 / 03	2,28	1,43	1,05	1,10	1,43	1,33	1,66	3,91	7,41	11,55	9,15	4,76	3,92
2003 / 04	2,52	1,46	1,14	1,01	0,98	1,03	1,52	3,46	5,69	8,16	6,74	3,82	3,13
2004 / 05	2,09	1,17	0,77	0,78	0,80	0,98	0,93	2,83	5,82	7,89	6,33	3,40	2,82
2005 / 06	1,97	1,17	1,12	1,10	1,14	1,24	1,68	4,20	7,92	12,67	9,50	4,38	4,01

PROM	2,14	1,23	0,96	0,90	0,88	0,93	1,29	3,46	6,55	9,27	7,37	3,89	3,24

QUEBRADA LAS PLACAS
CAUDAL MEDIO MENSUAL (m³/s)
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	0,30	0,15	0,14	0,12	0,12	0,11	0,16	0,42	0,91	1,18	0,93	0,53	0,42
1951 / 52	0,29	0,16	0,12	0,12	0,12	0,12	0,16	0,45	0,88	1,18	0,91	0,51	0,42
1952 / 53	0,29	0,16	0,12	0,12	0,12	0,12	0,16	0,43	0,88	1,19	0,98	0,52	0,43
1953 / 54	0,30	0,16	0,13	0,12	0,13	0,15	0,18	0,55	1,05	1,54	1,27	0,64	0,52
1954 / 55	0,32	0,19	0,15	0,14	0,13	0,13	0,17	0,47	0,84	1,14	0,98	0,54	0,43
1955 / 56	0,29	0,16	0,10	0,09	0,09	0,10	0,13	0,46	0,81	1,10	0,89	0,50	0,39
1956 / 57	0,27	0,16	0,12	0,11	0,11	0,11	0,15	0,50	0,85	1,23	1,10	0,56	0,44
1957 / 58	0,29	0,15	0,11	0,10	0,11	0,12	0,16	0,48	0,92	1,11	0,81	0,47	0,40
1958 / 59	0,28	0,16	0,12	0,11	0,11	0,14	0,21	0,61	0,94	1,17	0,96	0,50	0,44
1959 / 60	0,30	0,17	0,13	0,13	0,13	0,15	0,20	0,60	1,07	1,42	1,23	0,60	0,51
1960 / 61	0,29	0,16	0,11	0,11	0,11	0,15	0,17	0,53	0,94	1,13	0,89	0,51	0,42
1961 / 62	0,31	0,17	0,13	0,12	0,12	0,12	0,22	0,64	1,18	1,43	1,14	0,67	0,52
1962 / 63	0,31	0,17	0,13	0,12	0,12	0,12	0,16	0,51	0,89	1,00	0,88	0,48	0,41
1963 / 64	0,28	0,16	0,12	0,11	0,11	0,13	0,17	0,44	1,11	1,99	1,55	0,72	0,57
1964 / 65	0,39	0,20	0,15	0,13	0,12	0,12	0,15	0,43	0,76	1,08	0,97	0,50	0,42
1965 / 66	0,30	0,17	0,13	0,12	0,14	0,15	0,22	0,55	0,91	1,66	1,18	0,61	0,51
1966 / 67	0,33	0,19	0,14	0,14	0,13	0,13	0,20	0,52	0,86	1,10	0,97	0,51	0,43
1967 / 68	0,29	0,16	0,15	0,10	0,09	0,10	0,14	0,40	0,82	1,01	0,85	0,47	0,38
1968 / 69	0,27	0,15	0,11	0,09	0,09	0,09	0,11	0,37	0,69	0,98	0,82	0,46	0,35
1969 / 70	0,24	0,13	0,11	0,10	0,10	0,11	0,13	0,39	0,98	1,20	0,94	0,47	0,41
1970 / 71	0,28	0,15	0,10	0,09	0,09	0,10	0,17	0,48	0,89	0,82	0,74	0,52	0,37
1971 / 72	0,29	0,13	0,09	0,10	0,10	0,11	0,18	0,54	0,86	1,08	0,85	0,50	0,40
1972 / 73	0,27	0,23	0,16	0,12	0,14	0,15	0,19	0,46	0,98	1,63	1,32	0,68	0,53
1973 / 74	0,41	0,22	0,14	0,12	0,11	0,12	0,22	0,49	0,81	1,32	0,98	0,53	0,46
1974 / 75	0,29	0,16	0,12	0,13	0,13	0,13	0,23	0,55	0,96	1,75	1,08	0,55	0,51
1975 / 76	0,30	0,15	0,11	0,10	0,10	0,11	0,15	0,44	0,90	1,09	1,13	0,51	0,43
1976 / 77	0,27	0,15	0,11	0,10	0,10	0,10	0,13	0,45	0,84	1,17	0,86	0,51	0,40
1977 / 78	0,28	0,16	0,12	0,14	0,15	0,16	0,23	0,59	1,09	1,39	1,09	0,55	0,50
1978 / 79	0,32	0,16	0,13	0,14	0,14	0,14	0,19	0,49	1,10	1,57	1,07	0,58	0,50
1979 / 80	0,35	0,21	0,14	0,12	0,13	0,12	0,15	0,41	0,90	1,37	1,09	0,60	0,46
1980 / 81	0,39	0,26	0,19	0,17	0,14	0,15	0,20	0,53	1,21	1,60	1,33	0,64	0,57
1981 / 82	0,33	0,20	0,14	0,12	0,12	0,12	0,17	0,49	0,84	1,15	1,01	0,52	0,43
1982 / 83	0,28	0,17	0,14	0,21	0,18	0,20	0,21	0,52	1,32	2,31	1,91	0,91	0,70
1983 / 84	0,46	0,25	0,17	0,15	0,14	0,14	0,20	0,56	1,10	1,49	1,21	0,62	0,54
1984 / 85	0,33	0,18	0,13	0,12	0,13	0,15	0,23	0,52	1,05	1,67	1,26	0,70	0,54
1985 / 86	0,36	0,11	0,16	0,14	0,13	0,12	0,15	0,50	0,90	1,17	0,93	0,51	0,43
1986 / 87	0,30	0,18	0,25	0,17	0,13	0,15	0,20	0,49	1,11	1,71	1,38	0,68	0,56
1987 / 88	0,34	0,20	0,16	0,19	0,16	0,15	0,22	0,64	1,29	1,85	1,45	0,72	0,61
1988 / 89	0,38	0,21	0,14	0,13	0,12	0,10	0,17	0,49	0,83	1,15	1,02	0,52	0,44
1989 / 90	0,29	0,16	0,11	0,10	0,12	0,14	0,19	0,59	0,98	1,30	0,94	0,50	0,45
1990 / 91	0,29	0,16	0,12	0,11	0,11	0,12	0,15	0,45	0,82	1,12	0,92	0,52	0,41
1991 / 92	0,29	0,21	0,19	0,16	0,15	0,18	0,21	0,52	0,82	1,67	1,23	0,69	0,53
1992 / 93	0,35	0,21	0,17	0,15	0,14	0,16	0,23	0,54	1,03	1,59	1,23	0,64	0,54
1993 / 94	0,37	0,25	0,20	0,20	0,16	0,16	0,25	0,54	0,96	1,48	1,05	0,60	0,52
1994 / 95	0,32	0,18	0,14	0,13	0,14	0,12	0,19	0,62	1,07	1,34	0,99	0,55	0,48
1995 / 96	0,32	0,18	0,13	0,12	0,12	0,14	0,18	0,53	0,98	1,12	0,94	0,53	0,44
1996 / 97	0,30	0,16	0,11	0,10	0,10	0,10	0,12	0,36	0,67	0,98	0,92	0,46	0,36
1997 / 98	0,27	0,15	0,14	0,13	0,15	0,21	0,17	0,53	1,09	1,88	1,18	0,64	0,55
1998 / 99	0,38	0,22	0,15	0,13	0,11	0,10	0,15	0,42	0,70	0,94	0,86	0,46	0,39
1999 / 00	0,27	0,15	0,10	0,10	0,10	0,11	0,18	0,48	0,85	1,03	0,91	0,46	0,39
2000 / 01	0,29	0,16	0,13	0,14	0,13	0,13	0,23	0,52	1,16	1,60	1,25	0,63	0,53
2001 / 02	0,33	0,19	0,14	0,14	0,15	0,16	0,23	0,54	1,16	1,48	1,15	0,60	0,52
2002 / 03	0,33	0,21	0,15	0,16	0,20	0,19	0,23	0,57	1,08	1,67	1,32	0,69	0,57
2003 / 04	0,37	0,21	0,16	0,14	0,14	0,15	0,22	0,50	0,84	1,19	0,99	0,56	0,45
2004 / 05	0,31	0,17	0,11	0,11	0,11	0,14	0,13	0,42	0,85	1,16	0,93	0,50	0,41
2005 / 06	0,29	0,17	0,16	0,16	0,16	0,18	0,24	0,61	1,15	1,82	1,37	0,64	0,58

PROM	0,31	0,18	0,14	0,13	0,13	0,13	0,18	0,50	0,96	1,35	1,07	0,57	0,47

CAJÓN DEL MORADO
CAUDAL MEDIO MENSUAL (m³/s)
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	1,00	0,54	0,60	0,55	0,53	0,47	0,70	1,37	3,07	3,91	3,00	1,76	1,46
1951 / 52	0,91	0,63	0,54	0,52	0,52	0,51	0,70	1,53	2,92	3,95	2,88	1,67	1,44
1952 / 53	0,93	0,62	0,54	0,52	0,51	0,53	0,72	1,42	2,92	4,01	3,27	1,72	1,48
1953 / 54	0,98	0,63	0,55	0,53	0,56	0,67	0,78	2,07	3,80	5,81	4,75	2,34	1,96
1954 / 55	1,08	0,75	0,69	0,61	0,59	0,59	0,78	1,66	2,73	3,72	3,23	1,81	1,52
1955 / 56	0,95	0,58	0,44	0,38	0,39	0,41	0,55	1,59	2,54	3,52	2,80	1,64	1,32
1956 / 57	0,83	0,63	0,50	0,46	0,48	0,49	0,66	1,81	2,75	4,21	3,88	1,91	1,55
1957 / 58	0,95	0,56	0,49	0,45	0,48	0,51	0,72	1,69	3,11	3,59	2,39	1,48	1,37
1958 / 59	0,89	0,62	0,53	0,50	0,48	0,63	0,95	2,38	3,24	3,88	3,13	1,61	1,57
1959 / 60	1,01	0,68	0,57	0,57	0,60	0,66	0,91	2,31	3,89	5,20	4,53	2,12	1,92
1960 / 61	0,92	0,62	0,49	0,49	0,49	0,67	0,73	1,92	3,20	3,68	2,79	1,68	1,47
1961 / 62	1,06	0,66	0,57	0,53	0,52	0,53	1,02	2,50	4,49	5,22	4,10	2,50	1,98
1962 / 63	1,02	0,68	0,57	0,53	0,51	0,55	0,72	1,85	2,98	2,99	2,72	1,51	1,39
1963 / 64	0,89	0,59	0,50	0,50	0,46	0,58	0,76	1,46	4,11	8,14	6,23	2,79	2,25
1964 / 65	1,45	0,84	0,67	0,56	0,51	0,51	0,64	1,44	2,30	3,42	3,18	1,64	1,43
1965 / 66	0,98	0,66	0,57	0,54	0,66	0,69	1,02	2,05	3,05	6,45	4,26	2,18	1,93
1966 / 67	1,15	0,74	0,65	0,65	0,56	0,60	0,88	1,91	2,79	3,52	3,21	1,65	1,53
1967 / 68	0,96	0,63	0,67	0,44	0,40	0,41	0,58	1,27	2,60	3,06	2,58	1,44	1,25
1968 / 69	0,82	0,56	0,48	0,40	0,37	0,36	0,44	1,10	1,94	2,87	2,44	1,39	1,10
1969 / 70	0,70	0,46	0,46	0,42	0,41	0,48	0,57	1,24	3,43	4,04	3,02	1,47	1,39
1970 / 71	0,90	0,55	0,42	0,39	0,40	0,45	0,77	1,66	2,97	2,04	2,00	1,71	1,19
1971 / 72	0,93	0,46	0,38	0,43	0,45	0,50	0,83	1,99	2,79	3,39	2,60	1,59	1,36
1972 / 73	0,85	0,98	0,75	0,55	0,63	0,70	0,86	1,58	3,45	6,25	5,00	2,55	2,01
1973 / 74	1,58	0,90	0,61	0,56	0,48	0,52	0,99	1,73	2,54	4,65	3,26	1,75	1,63
1974 / 75	0,91	0,61	0,54	0,61	0,56	0,57	1,07	2,07	3,32	6,91	3,76	1,90	1,90
1975 / 76	0,99	0,57	0,47	0,45	0,45	0,49	0,66	1,47	3,03	3,44	4,05	1,69	1,48
1976 / 77	0,83	0,55	0,47	0,45	0,44	0,45	0,55	1,51	2,69	3,90	2,62	1,66	1,34
1977 / 78	0,91	0,59	0,50	0,66	0,69	0,73	1,08	2,23	4,01	5,04	3,83	1,90	1,85
1978 / 79	1,09	0,58	0,56	0,63	0,64	0,62	0,87	1,75	4,06	5,95	3,72	2,02	1,87
1979 / 80	1,23	0,85	0,61	0,52	0,57	0,51	0,63	1,34	3,00	4,93	3,82	2,12	1,68
1980 / 81	1,47	1,15	0,89	0,79	0,65	0,68	0,89	1,96	4,62	6,10	5,08	2,35	2,22
1981 / 82	1,15	0,80	0,63	0,53	0,52	0,51	0,74	1,72	2,72	3,78	3,41	1,73	1,52
1982 / 83	0,91	0,65	0,64	0,98	0,83	0,96	0,94	1,89	5,21	9,78	8,11	3,73	2,89
1983 / 84	1,82	1,05	0,77	0,68	0,63	0,62	0,92	2,10	4,03	5,52	4,47	2,22	2,07
1984 / 85	1,17	0,72	0,58	0,55	0,58	0,66	1,09	1,87	3,80	6,45	4,73	2,65	2,07
1985 / 86	1,31	0,32	0,71	0,66	0,59	0,55	0,62	1,80	3,00	3,87	2,98	1,69	1,51
1986 / 87	1,01	0,72	1,20	0,80	0,61	0,67	0,91	1,76	4,12	6,70	5,32	2,55	2,20
1987 / 88	1,21	0,81	0,72	0,89	0,75	0,70	1,03	2,51	5,05	7,40	5,67	2,74	2,46
1988 / 89	1,39	0,85	0,64	0,56	0,55	0,43	0,75	1,74	2,67	3,78	3,47	1,72	1,55
1989 / 90	0,91	0,60	0,47	0,42	0,54	0,62	0,88	2,25	3,44	4,54	3,05	1,62	1,61
1990 / 91	0,94	0,62	0,50	0,46	0,46	0,53	0,64	1,55	2,61	3,62	2,96	1,73	1,38
1991 / 92	0,93	0,87	0,87	0,74	0,67	0,82	0,96	1,90	2,62	6,48	4,54	2,59	2,00
1992 / 93	1,22	0,87	0,75	0,71	0,63	0,73	1,09	2,00	3,70	6,08	4,53	2,32	2,05
1993 / 94	1,34	1,05	0,93	0,92	0,74	0,74	1,17	1,99	3,34	5,49	3,60	2,11	1,95
1994 / 95	1,08	0,73	0,61	0,59	0,61	0,56	0,85	2,39	3,91	4,79	3,29	1,86	1,77
1995 / 96	1,10	0,70	0,58	0,53	0,51	0,65	0,81	1,96	3,45	3,62	3,02	1,79	1,56
1996 / 97	0,98	0,63	0,46	0,45	0,43	0,42	0,49	1,04	1,81	2,92	2,92	1,40	1,16
1997 / 98	0,81	0,53	0,62	0,59	0,69	1,02	0,78	1,97	3,99	7,58	4,31	2,32	2,10
1998 / 99	1,41	0,93	0,66	0,57	0,48	0,45	0,65	1,35	1,97	2,70	2,64	1,43	1,27
1999 / 00	0,81	0,54	0,44	0,41	0,42	0,46	0,78	1,69	2,74	3,14	2,88	1,43	1,31
2000 / 01	0,93	0,62	0,57	0,64	0,57	0,57	1,08	1,90	4,36	6,12	4,68	2,27	2,03
2001 / 02	1,16	0,79	0,64	0,63	0,71	0,76	1,05	2,00	4,38	5,50	4,11	2,13	1,99
2002 / 03	1,15	0,84	0,67	0,72	0,96	0,88	1,09	2,13	3,92	6,46	5,03	2,60	2,20
2003 / 04	1,33	0,87	0,73	0,65	0,63	0,67	0,99	1,80	2,68	4,00	3,28	1,91	1,63
2004 / 05	1,02	0,66	0,47	0,49	0,50	0,63	0,56	1,35	2,77	3,80	2,98	1,61	1,40
2005 / 06	0,93	0,65	0,72	0,72	0,75	0,82	1,10	2,34	4,29	7,27	5,28	2,32	2,27

PROM	1,06	0,69	0,61	0,57	0,56	0,60	0,82	1,80	3,30	4,81	3,74	1,96	1,71

ESTERO LA ENGORDA
CAUDAL MEDIO MENSUAL CAPTADO (m³/s)

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	0,38	0,11	0,14	0,11	0,10	0,07	0,20	0,60	1,59	2,08	1,55	0,83	0,65
1951 / 52	0,33	0,16	0,11	0,10	0,10	0,09	0,20	0,69	1,50	2,10	1,49	0,77	0,64
1952 / 53	0,34	0,15	0,11	0,10	0,09	0,10	0,21	0,63	1,50	2,10	1,71	0,80	0,65
1953 / 54	0,37	0,16	0,12	0,10	0,12	0,18	0,25	0,99	1,99	2,10	2,10	1,15	0,80
1954 / 55	0,43	0,23	0,19	0,15	0,13	0,14	0,24	0,76	1,39	1,97	1,68	0,85	0,68
1955 / 56	0,35	0,14	0,05	0,02	0,02	0,03	0,12	0,72	1,29	1,85	1,44	0,76	0,57
1956 / 57	0,29	0,16	0,08	0,06	0,07	0,08	0,18	0,85	1,40	2,10	2,05	0,91	0,69
1957 / 58	0,35	0,13	0,08	0,06	0,07	0,09	0,21	0,78	1,61	1,90	1,21	0,66	0,60
1958 / 59	0,32	0,15	0,10	0,09	0,08	0,16	0,34	1,17	1,68	2,06	1,63	0,74	0,71
1959 / 60	0,39	0,19	0,12	0,12	0,14	0,18	0,31	1,13	2,04	2,10	2,10	1,03	0,82
1960 / 61	0,33	0,16	0,08	0,08	0,08	0,18	0,22	0,91	1,66	1,95	1,44	0,78	0,66
1961 / 62	0,42	0,18	0,12	0,10	0,10	0,10	0,38	1,23	2,10	2,10	2,10	1,24	0,85
1962 / 63	0,39	0,19	0,13	0,10	0,09	0,11	0,21	0,87	1,53	1,56	1,39	0,68	0,61
1963 / 64	0,32	0,14	0,09	0,08	0,06	0,13	0,23	0,65	2,10	2,10	2,10	1,40	0,78
1964 / 65	0,63	0,28	0,18	0,12	0,09	0,09	0,16	0,64	1,15	1,80	1,65	0,76	0,63
1965 / 66	0,37	0,18	0,13	0,11	0,17	0,19	0,38	0,98	1,58	2,10	2,10	1,06	0,78
1966 / 67	0,47	0,23	0,17	0,17	0,12	0,14	0,30	0,90	1,43	1,86	1,67	0,76	0,68
1967 / 68	0,36	0,16	0,18	0,05	0,03	0,03	0,13	0,54	1,32	1,60	1,31	0,65	0,53
1968 / 69	0,28	0,12	0,07	0,03	0,01	0,01	0,05	0,45	0,95	1,49	1,24	0,61	0,44
1969 / 70	0,21	0,07	0,06	0,04	0,03	0,07	0,12	0,52	1,79	2,10	1,57	0,66	0,60
1970 / 71	0,32	0,12	0,04	0,02	0,03	0,06	0,24	0,76	1,53	1,02	0,99	0,80	0,49
1971 / 72	0,34	0,07	0,02	0,05	0,05	0,08	0,27	0,95	1,43	1,78	1,33	0,73	0,59
1972 / 73	0,30	0,36	0,23	0,11	0,16	0,20	0,29	0,72	1,80	2,10	2,10	1,27	0,80
1973 / 74	0,71	0,32	0,15	0,12	0,08	0,10	0,36	0,80	1,29	2,10	1,70	0,82	0,71
1974 / 75	0,33	0,15	0,11	0,15	0,12	0,12	0,41	0,99	1,73	2,10	1,98	0,90	0,76
1975 / 76	0,37	0,13	0,07	0,05	0,05	0,08	0,18	0,65	1,56	1,81	2,10	0,79	0,65
1976 / 77	0,29	0,12	0,07	0,06	0,05	0,06	0,11	0,68	1,37	2,07	1,34	0,77	0,58
1977 / 78	0,33	0,14	0,09	0,17	0,19	0,21	0,41	1,08	2,10	2,10	2,02	0,90	0,81
1978 / 79	0,43	0,14	0,12	0,16	0,16	0,15	0,30	0,81	2,10	2,10	1,96	0,97	0,78
1979 / 80	0,51	0,29	0,15	0,10	0,12	0,09	0,16	0,58	1,54	2,10	2,02	1,03	0,72
1980 / 81	0,65	0,45	0,31	0,25	0,17	0,18	0,30	0,93	2,10	2,10	2,10	1,15	0,89
1981 / 82	0,46	0,26	0,16	0,10	0,10	0,09	0,22	0,80	1,39	2,00	1,78	0,81	0,68
1982 / 83	0,33	0,17	0,16	0,35	0,27	0,34	0,34	0,89	2,10	2,10	2,10	1,94	0,93
1983 / 84	0,85	0,40	0,24	0,18	0,16	0,15	0,32	1,01	2,10	2,10	2,10	1,08	0,89
1984 / 85	0,48	0,21	0,13	0,12	0,13	0,18	0,42	0,88	1,99	2,10	2,10	1,33	0,84
1985 / 86	0,56	0,00	0,21	0,17	0,14	0,12	0,16	0,84	1,54	2,05	1,54	0,79	0,68
1986 / 87	0,39	0,21	0,48	0,26	0,14	0,18	0,31	0,82	2,10	2,10	2,10	1,27	0,86
1987 / 88	0,50	0,26	0,21	0,31	0,22	0,19	0,39	1,24	2,10	2,10	2,10	1,38	0,92
1988 / 89	0,60	0,29	0,16	0,12	0,11	0,04	0,23	0,81	1,36	2,00	1,82	0,80	0,69
1989 / 90	0,33	0,14	0,07	0,04	0,11	0,15	0,30	1,10	1,79	2,10	1,58	0,75	0,70
1990 / 91	0,35	0,16	0,08	0,06	0,06	0,10	0,16	0,70	1,33	1,91	1,53	0,81	0,60
1991 / 92	0,34	0,30	0,30	0,22	0,18	0,26	0,35	0,90	1,33	2,10	2,10	1,29	0,81
1992 / 93	0,51	0,30	0,23	0,20	0,16	0,22	0,42	0,96	1,94	2,10	2,10	1,14	0,86
1993 / 94	0,57	0,40	0,33	0,32	0,22	0,22	0,47	0,95	1,74	2,10	1,89	1,02	0,85
1994 / 95	0,43	0,22	0,15	0,13	0,15	0,12	0,28	1,17	2,06	2,10	1,71	0,88	0,78
1995 / 96	0,44	0,20	0,13	0,10	0,09	0,17	0,26	0,93	1,80	1,91	1,56	0,84	0,70
1996 / 97	0,37	0,16	0,06	0,06	0,04	0,04	0,08	0,41	0,88	1,52	1,51	0,62	0,48
1997 / 98	0,28	0,11	0,15	0,14	0,19	0,38	0,24	0,94	2,10	2,10	2,10	1,14	0,82
1998 / 99	0,61	0,33	0,17	0,13	0,08	0,06	0,17	0,59	0,96	1,40	1,35	0,64	0,54
1999 / 00	0,27	0,11	0,05	0,03	0,04	0,06	0,24	0,78	1,40	1,64	1,48	0,64	0,56
2000 / 01	0,34	0,16	0,12	0,17	0,12	0,13	0,41	0,90	2,10	2,10	2,10	1,11	0,81
2001 / 02	0,47	0,25	0,16	0,16	0,20	0,23	0,39	0,96	2,10	2,10	2,10	1,03	0,85
2002 / 03	0,47	0,28	0,18	0,21	0,34	0,30	0,42	1,03	2,07	2,10	2,10	1,30	0,90
2003 / 04	0,57	0,29	0,22	0,17	0,16	0,18	0,36	0,84	1,37	2,10	1,71	0,91	0,74
2004 / 05	0,39	0,18	0,07	0,08	0,09	0,16	0,12	0,59	1,42	2,02	1,54	0,74	0,62
2005 / 06	0,34	0,18	0,21	0,21	0,22	0,26	0,43	1,15	2,10	2,10	2,10	1,14	0,87
PROM	0,41	0,20	0,14	0,13	0,12	0,14	0,27	0,84	1,67	1,97	1,77	0,94	0,72

ESTERO COLINA
CAUDAL MEDIO MENSUAL CAPTADO (m³/s)

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	1,71	0,72	0,65	0,57	0,54	0,46	0,82	2,57	5,54	6,00	4,21	2,82	2,22
1951 / 52	1,64	0,84	0,57	0,53	0,53	0,51	0,82	2,78	5,54	6,00	4,21	2,82	2,23
1952 / 53	1,67	0,82	0,57	0,53	0,52	0,54	0,85	2,63	5,54	6,00	4,21	2,82	2,22
1953 / 54	1,71	0,83	0,59	0,54	0,58	0,74	0,94	3,36	5,54	6,00	4,21	2,82	2,32
1954 / 55	1,71	1,01	0,78	0,66	0,62	0,63	0,93	2,96	5,45	6,00	4,21	2,82	2,31
1955 / 56	1,70	0,77	0,43	0,34	0,35	0,38	0,62	2,86	5,21	6,00	4,21	2,82	2,14
1956 / 57	1,53	0,84	0,51	0,45	0,47	0,48	0,78	3,17	5,49	6,00	4,21	2,82	2,23
1957 / 58	1,69	0,75	0,50	0,44	0,47	0,52	0,86	3,00	5,54	6,00	4,21	2,82	2,23
1958 / 59	1,61	0,82	0,55	0,50	0,48	0,68	1,16	3,36	5,54	6,00	4,21	2,82	2,31
1959 / 60	1,71	0,91	0,61	0,59	0,64	0,72	1,11	3,36	5,54	6,00	4,21	2,82	2,35
1960 / 61	1,65	0,82	0,50	0,49	0,49	0,73	0,87	3,32	5,54	6,00	4,21	2,82	2,29
1961 / 62	1,71	0,89	0,61	0,55	0,53	0,55	1,27	3,36	5,54	6,00	4,21	2,82	2,33
1962 / 63	1,71	0,91	0,62	0,54	0,51	0,56	0,85	3,22	5,54	6,00	4,21	2,82	2,29
1963 / 64	1,61	0,78	0,52	0,50	0,45	0,61	0,91	2,68	5,54	6,00	4,21	2,82	2,22
1964 / 65	1,71	1,12	0,75	0,58	0,51	0,51	0,74	2,66	4,87	6,00	4,21	2,82	2,21
1965 / 66	1,71	0,88	0,61	0,56	0,72	0,76	1,27	3,36	5,54	6,00	4,21	2,82	2,37
1966 / 67	1,71	0,99	0,72	0,71	0,58	0,64	1,08	3,30	5,54	6,00	4,21	2,82	2,36
1967 / 68	1,71	0,84	0,75	0,41	0,36	0,38	0,65	2,43	5,28	6,00	4,21	2,82	2,15
1968 / 69	1,52	0,74	0,49	0,36	0,33	0,31	0,46	2,19	4,38	6,00	4,21	2,79	1,98
1969 / 70	1,35	0,60	0,46	0,38	0,37	0,47	0,64	2,38	5,54	6,00	4,21	2,82	2,10
1970 / 71	1,62	0,73	0,41	0,35	0,36	0,43	0,92	2,96	5,54	5,15	4,21	2,82	2,13
1971 / 72	1,67	0,61	0,34	0,41	0,42	0,50	1,00	3,36	5,54	6,00	4,21	2,82	2,24
1972 / 73	1,56	1,31	0,86	0,57	0,68	0,78	1,05	2,85	5,54	6,00	4,21	2,82	2,35
1973 / 74	1,71	1,22	0,67	0,58	0,48	0,53	1,22	3,06	5,20	6,00	4,21	2,82	2,31
1974 / 75	1,64	0,81	0,57	0,65	0,59	0,59	1,33	3,36	5,54	6,00	4,21	2,82	2,34
1975 / 76	1,71	0,76	0,48	0,43	0,43	0,48	0,77	2,69	5,54	6,00	4,21	2,82	2,19
1976 / 77	1,53	0,73	0,47	0,43	0,41	0,44	0,62	2,75	5,40	6,00	4,21	2,82	2,15
1977 / 78	1,64	0,79	0,52	0,72	0,76	0,82	1,34	3,36	5,54	6,00	4,21	2,82	2,38
1978 / 79	1,71	0,77	0,60	0,68	0,69	0,66	1,06	3,08	5,54	6,00	4,21	2,82	2,32
1979 / 80	1,71	1,14	0,67	0,52	0,60	0,51	0,73	2,52	5,54	6,00	4,21	2,82	2,25
1980 / 81	1,71	1,31	1,06	0,90	0,71	0,74	1,08	3,36	5,54	6,00	4,21	2,82	2,45
1981 / 82	1,71	1,07	0,70	0,55	0,53	0,51	0,88	3,04	5,44	6,00	4,21	2,82	2,29
1982 / 83	1,64	0,86	0,71	1,16	0,95	1,13	1,16	3,28	5,54	6,00	4,21	2,82	2,46
1983 / 84	1,71	1,31	0,88	0,74	0,68	0,66	1,13	3,36	5,54	6,00	4,21	2,82	2,42
1984 / 85	1,71	0,97	0,62	0,57	0,61	0,72	1,36	3,25	5,54	6,00	4,21	2,82	2,36
1985 / 86	1,71	0,41	0,81	0,72	0,63	0,57	0,72	3,16	5,54	6,00	4,21	2,82	2,28
1986 / 87	1,71	0,97	1,17	0,92	0,65	0,73	1,11	3,10	5,54	6,00	4,21	2,82	2,41
1987 / 88	1,71	1,09	0,82	1,04	0,84	0,77	1,28	3,36	5,54	6,00	4,21	2,82	2,46
1988 / 89	1,71	1,14	0,71	0,58	0,56	0,40	0,90	3,07	5,37	6,00	4,21	2,82	2,29
1989 / 90	1,65	0,79	0,47	0,39	0,55	0,66	1,07	3,36	5,54	6,00	4,21	2,82	2,29
1990 / 91	1,68	0,83	0,51	0,44	0,44	0,54	0,74	2,82	5,29	6,00	4,21	2,82	2,19
1991 / 92	1,67	1,17	1,03	0,82	0,73	0,94	1,18	3,29	5,31	6,00	4,21	2,82	2,43
1992 / 93	1,71	1,16	0,87	0,79	0,68	0,82	1,36	3,36	5,54	6,00	4,21	2,82	2,44
1993 / 94	1,71	1,31	1,11	1,08	0,82	0,84	1,48	3,36	5,54	6,00	4,21	2,82	2,52
1994 / 95	1,71	0,97	0,67	0,62	0,65	0,58	1,03	3,36	5,54	6,00	4,21	2,82	2,35
1995 / 96	1,71	0,94	0,63	0,54	0,51	0,70	0,97	3,36	5,54	6,00	4,21	2,82	2,33
1996 / 97	1,71	0,84	0,46	0,43	0,40	0,39	0,53	2,10	4,19	6,00	4,21	2,81	2,01
1997 / 98	1,51	0,71	0,68	0,63	0,76	1,20	0,93	3,36	5,54	6,00	4,21	2,82	2,36
1998 / 99	1,71	1,25	0,73	0,60	0,48	0,43	0,76	2,54	4,41	6,00	4,21	2,82	2,16
1999 / 00	1,50	0,71	0,43	0,37	0,38	0,45	0,93	3,00	5,47	6,00	4,21	2,82	2,19
2000 / 01	1,67	0,82	0,61	0,70	0,59	0,60	1,35	3,29	5,54	6,00	4,21	2,82	2,35
2001 / 02	1,71	1,06	0,70	0,67	0,79	0,86	1,30	3,36	5,54	6,00	4,21	2,82	2,42
2002 / 03	1,71	1,13	0,75	0,80	1,06	1,03	1,36	3,36	5,54	6,00	4,21	2,82	2,48
2003 / 04	1,71	1,16	0,84	0,71	0,68	0,73	1,22	3,16	5,39	6,00	4,21	2,82	2,39
2004 / 05	1,71	0,87	0,47	0,48	0,50	0,68	0,63	2,53	5,52	6,00	4,21	2,82	2,20
2005 / 06	1,67	0,87	0,82	0,80	0,84	0,94	1,38	3,36	5,54	6,00	4,21	2,82	2,44

PROM	1,67	0,92	0,65	0,60	0,58	0,63	0,99	3,05	5,42	5,98	4,21	2,82	2,29

QUEBRADA LAS PLACAS
CAUDAL MEDIO MENSUAL CAPTADO (m³/s)

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	0,16	0,01	0,00	0,00	0,00	0,00	0,02	0,28	0,77	1,00	0,79	0,39	0,29
1951 / 52	0,15	0,02	0,00	0,00	0,00	0,00	0,02	0,31	0,74	1,00	0,77	0,37	0,28
1952 / 53	0,15	0,02	0,00	0,00	0,00	0,00	0,02	0,29	0,74	1,00	0,84	0,38	0,29
1953 / 54	0,16	0,02	0,00	0,00	0,00	0,01	0,04	0,41	0,91	1,00	1,00	0,50	0,34
1954 / 55	0,18	0,05	0,01	0,00	0,00	0,00	0,03	0,33	0,70	1,00	0,84	0,40	0,30
1955 / 56	0,15	0,02	0,00	0,00	0,00	0,00	0,00	0,32	0,67	0,96	0,75	0,36	0,27
1956 / 57	0,13	0,02	0,00	0,00	0,00	0,00	0,01	0,36	0,71	1,00	0,96	0,42	0,30
1957 / 58	0,15	0,01	0,00	0,00	0,00	0,00	0,02	0,34	0,78	0,97	0,67	0,33	0,27
1958 / 59	0,14	0,02	0,00	0,00	0,00	0,00	0,07	0,47	0,80	1,00	0,82	0,36	0,31
1959 / 60	0,16	0,03	0,00	0,00	0,00	0,01	0,06	0,46	0,93	1,00	1,00	0,46	0,34
1960 / 61	0,15	0,02	0,00	0,00	0,00	0,01	0,03	0,39	0,80	0,99	0,75	0,37	0,29
1961 / 62	0,17	0,03	0,00	0,00	0,00	0,00	0,08	0,50	1,00	1,00	1,00	0,53	0,36
1962 / 63	0,17	0,03	0,00	0,00	0,00	0,00	0,02	0,37	0,75	0,86	0,74	0,34	0,27
1963 / 64	0,14	0,02	0,00	0,00	0,00	0,00	0,03	0,30	0,97	1,00	1,00	0,58	0,34
1964 / 65	0,25	0,06	0,01	0,00	0,00	0,00	0,01	0,29	0,62	0,94	0,83	0,36	0,28
1965 / 66	0,16	0,03	0,00	0,00	0,00	0,01	0,08	0,41	0,77	1,00	1,00	0,47	0,33
1966 / 67	0,19	0,05	0,00	0,00	0,00	0,00	0,06	0,38	0,72	0,96	0,83	0,37	0,30
1967 / 68	0,15	0,02	0,01	0,00	0,00	0,00	0,00	0,26	0,68	0,87	0,71	0,33	0,25
1968 / 69	0,13	0,01	0,00	0,00	0,00	0,00	0,00	0,23	0,55	0,84	0,68	0,32	0,23
1969 / 70	0,10	0,00	0,00	0,00	0,00	0,00	0,00	0,25	0,84	1,00	0,80	0,33	0,28
1970 / 71	0,14	0,01	0,00	0,00	0,00	0,00	0,03	0,34	0,75	0,68	0,60	0,38	0,24
1971 / 72	0,15	0,00	0,00	0,00	0,00	0,00	0,04	0,40	0,72	0,94	0,71	0,36	0,28
1972 / 73	0,13	0,09	0,02	0,00	0,00	0,01	0,05	0,32	0,84	1,00	1,00	0,54	0,33
1973 / 74	0,27	0,08	0,00	0,00	0,00	0,00	0,08	0,35	0,67	1,00	0,84	0,39	0,31
1974 / 75	0,15	0,02	0,00	0,00	0,00	0,00	0,09	0,41	0,82	1,00	0,94	0,41	0,32
1975 / 76	0,16	0,01	0,00	0,00	0,00	0,00	0,01	0,30	0,76	0,95	0,99	0,37	0,30
1976 / 77	0,13	0,01	0,00	0,00	0,00	0,00	0,00	0,31	0,70	1,00	0,72	0,37	0,27
1977 / 78	0,14	0,02	0,00	0,00	0,01	0,02	0,09	0,45	0,95	1,00	0,95	0,41	0,34
1978 / 79	0,18	0,02	0,00	0,00	0,00	0,00	0,05	0,35	0,96	1,00	0,93	0,44	0,33
1979 / 80	0,21	0,07	0,00	0,00	0,00	0,00	0,01	0,27	0,76	1,00	0,95	0,46	0,31
1980 / 81	0,25	0,12	0,05	0,03	0,00	0,01	0,06	0,39	1,00	1,00	1,00	0,50	0,37
1981 / 82	0,19	0,06	0,00	0,00	0,00	0,00	0,03	0,35	0,70	1,00	0,87	0,38	0,30
1982 / 83	0,14	0,03	0,00	0,07	0,04	0,06	0,07	0,38	1,00	1,00	1,00	0,77	0,38
1983 / 84	0,32	0,11	0,03	0,01	0,00	0,00	0,06	0,42	0,96	1,00	1,00	0,48	0,36
1984 / 85	0,19	0,04	0,00	0,00	0,00	0,01	0,09	0,38	0,91	1,00	1,00	0,56	0,35
1985 / 86	0,22	0,00	0,02	0,00	0,00	0,00	0,01	0,36	0,76	1,00	0,79	0,37	0,29
1986 / 87	0,16	0,04	0,11	0,03	0,00	0,01	0,06	0,35	0,97	1,00	1,00	0,54	0,36
1987 / 88	0,20	0,06	0,02	0,05	0,02	0,01	0,08	0,50	1,00	1,00	1,00	0,58	0,38
1988 / 89	0,24	0,07	0,00	0,00	0,00	0,00	0,03	0,35	0,69	1,00	0,88	0,38	0,30
1989 / 90	0,15	0,02	0,00	0,00	0,00	0,00	0,05	0,45	0,84	1,00	0,80	0,36	0,31
1990 / 91	0,15	0,02	0,00	0,00	0,00	0,00	0,01	0,31	0,68	0,98	0,78	0,38	0,28
1991 / 92	0,15	0,07	0,05	0,02	0,01	0,04	0,07	0,38	0,68	1,00	1,00	0,55	0,33
1992 / 93	0,21	0,07	0,03	0,01	0,00	0,02	0,09	0,40	0,89	1,00	1,00	0,50	0,35
1993 / 94	0,23	0,11	0,06	0,06	0,02	0,02	0,11	0,40	0,82	1,00	0,91	0,46	0,35
1994 / 95	0,18	0,04	0,00	0,00	0,00	0,00	0,05	0,48	0,93	1,00	0,85	0,41	0,33
1995 / 96	0,18	0,04	0,00	0,00	0,00	0,00	0,04	0,39	0,84	0,98	0,80	0,39	0,31
1996 / 97	0,16	0,02	0,00	0,00	0,00	0,00	0,00	0,22	0,53	0,84	0,78	0,32	0,24
1997 / 98	0,13	0,01	0,00	0,00	0,01	0,07	0,03	0,39	0,95	1,00	1,00	0,50	0,34
1998 / 99	0,24	0,08	0,01	0,00	0,00	0,00	0,01	0,28	0,56	0,80	0,72	0,32	0,25
1999 / 00	0,13	0,01	0,00	0,00	0,00	0,00	0,04	0,34	0,71	0,89	0,77	0,32	0,27
2000 / 01	0,15	0,02	0,00	0,00	0,00	0,00	0,09	0,38	1,00	1,00	1,00	0,49	0,34
2001 / 02	0,19	0,05	0,00	0,00	0,01	0,02	0,09	0,40	1,00	1,00	1,00	0,46	0,35
2002 / 03	0,19	0,07	0,01	0,02	0,06	0,05	0,09	0,43	0,94	1,00	1,00	0,55	0,37
2003 / 04	0,23	0,07	0,02	0,00	0,00	0,01	0,08	0,36	0,70	1,00	0,85	0,42	0,31
2004 / 05	0,17	0,03	0,00	0,00	0,00	0,00	0,00	0,28	0,71	1,00	0,79	0,36	0,28
2005 / 06	0,15	0,03	0,02	0,02	0,02	0,04	0,10	0,47	1,00	1,00	1,00	0,50	0,36
PROM	0,17	0,04	0,01	0,01	0,00	0,01	0,04	0,36	0,81	0,97	0,88	0,43	0,31

CAJÓN DEL MORADO
CAUDAL MEDIO MENSUAL CAPTADO (m³/s)

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	0,76	0,30	0,36	0,31	0,29	0,23	0,46	1,13	2,83	3,67	2,76	1,52	1,22
1951 / 52	0,67	0,39	0,30	0,28	0,28	0,27	0,46	1,29	2,68	3,70	2,64	1,43	1,20
1952 / 53	0,69	0,38	0,30	0,28	0,27	0,29	0,48	1,18	2,68	3,70	3,03	1,48	1,23
1953 / 54	0,74	0,39	0,31	0,29	0,32	0,43	0,54	1,83	3,56	3,70	3,45	2,10	1,47
1954 / 55	0,84	0,51	0,45	0,37	0,35	0,35	0,54	1,42	2,49	3,48	2,99	1,57	1,28
1955 / 56	0,71	0,34	0,20	0,14	0,15	0,17	0,31	1,35	2,30	3,28	2,56	1,40	1,08
1956 / 57	0,59	0,39	0,26	0,22	0,24	0,25	0,42	1,57	2,51	3,70	3,45	1,67	1,27
1957 / 58	0,71	0,32	0,25	0,21	0,24	0,27	0,48	1,45	2,87	3,35	2,15	1,24	1,13
1958 / 59	0,65	0,38	0,29	0,26	0,24	0,39	0,71	2,14	3,00	3,64	2,89	1,37	1,33
1959 / 60	0,77	0,44	0,33	0,33	0,36	0,42	0,67	2,07	3,65	3,70	3,45	1,88	1,51
1960 / 61	0,68	0,38	0,25	0,25	0,25	0,43	0,49	1,68	2,96	3,44	2,55	1,44	1,23
1961 / 62	0,82	0,42	0,33	0,29	0,28	0,29	0,78	2,26	3,70	3,70	3,45	2,26	1,55
1962 / 63	0,78	0,44	0,33	0,29	0,27	0,31	0,48	1,61	2,74	2,75	2,48	1,27	1,15
1963 / 64	0,65	0,35	0,26	0,26	0,22	0,34	0,52	1,22	3,70	3,70	3,45	2,31	1,41
1964 / 65	1,21	0,60	0,43	0,32	0,27	0,27	0,40	1,20	2,06	3,18	2,94	1,40	1,19
1965 / 66	0,74	0,42	0,33	0,30	0,42	0,45	0,78	1,81	2,81	3,70	3,45	1,94	1,43
1966 / 67	0,91	0,50	0,41	0,41	0,32	0,36	0,64	1,67	2,55	3,28	2,97	1,41	1,29
1967 / 68	0,72	0,39	0,43	0,20	0,16	0,17	0,34	1,03	2,36	2,82	2,34	1,20	1,01
1968 / 69	0,58	0,32	0,24	0,16	0,13	0,12	0,20	0,86	1,70	2,63	2,20	1,15	0,86
1969 / 70	0,46	0,22	0,22	0,18	0,17	0,24	0,33	1,00	3,19	3,70	2,78	1,23	1,14
1970 / 71	0,66	0,31	0,18	0,15	0,16	0,21	0,53	1,42	2,73	1,80	1,76	1,47	0,95
1971 / 72	0,69	0,22	0,14	0,19	0,21	0,26	0,59	1,75	2,55	3,15	2,36	1,35	1,12
1972 / 73	0,61	0,74	0,51	0,31	0,39	0,46	0,62	1,34	3,21	3,70	3,45	2,31	1,47
1973 / 74	1,34	0,66	0,37	0,32	0,24	0,28	0,75	1,49	2,30	3,70	3,02	1,51	1,33
1974 / 75	0,67	0,37	0,30	0,37	0,32	0,33	0,83	1,83	3,08	3,70	3,45	1,66	1,41
1975 / 76	0,75	0,33	0,23	0,21	0,21	0,25	0,42	1,23	2,79	3,20	3,45	1,45	1,21
1976 / 77	0,59	0,31	0,23	0,21	0,20	0,21	0,31	1,27	2,45	3,66	2,38	1,42	1,10
1977 / 78	0,67	0,35	0,26	0,42	0,45	0,49	0,84	1,99	3,70	3,70	3,45	1,66	1,50
1978 / 79	0,85	0,34	0,32	0,39	0,40	0,38	0,63	1,51	3,70	3,70	3,45	1,78	1,45
1979 / 80	0,99	0,61	0,37	0,28	0,33	0,27	0,39	1,10	2,76	3,70	3,45	1,88	1,34
1980 / 81	1,23	0,91	0,65	0,55	0,41	0,44	0,65	1,72	3,70	3,70	3,45	2,11	1,63
1981 / 82	0,91	0,56	0,39	0,29	0,28	0,27	0,50	1,48	2,48	3,54	3,17	1,49	1,28
1982 / 83	0,67	0,41	0,40	0,74	0,59	0,72	0,70	1,65	3,70	3,70	3,45	2,31	1,59
1983 / 84	1,40	0,81	0,53	0,44	0,39	0,38	0,68	1,86	3,70	3,70	3,45	1,98	1,61
1984 / 85	0,93	0,48	0,34	0,31	0,34	0,42	0,85	1,63	3,56	3,70	3,45	2,31	1,53
1985 / 86	1,07	0,08	0,47	0,42	0,35	0,31	0,38	1,56	2,76	3,63	2,74	1,45	1,27
1986 / 87	0,77	0,48	0,96	0,56	0,37	0,43	0,67	1,52	3,70	3,70	3,45	2,31	1,58
1987 / 88	0,97	0,57	0,48	0,65	0,51	0,46	0,79	2,27	3,70	3,70	3,45	2,31	1,66
1988 / 89	1,15	0,61	0,40	0,32	0,31	0,19	0,51	1,50	2,43	3,54	3,23	1,48	1,31
1989 / 90	0,67	0,36	0,23	0,18	0,30	0,38	0,64	2,01	3,20	3,70	2,81	1,38	1,32
1990 / 91	0,70	0,38	0,26	0,22	0,22	0,29	0,40	1,31	2,37	3,38	2,72	1,49	1,14
1991 / 92	0,69	0,63	0,63	0,50	0,43	0,58	0,72	1,66	2,38	3,70	3,45	2,31	1,47
1992 / 93	0,98	0,63	0,51	0,47	0,39	0,49	0,85	1,76	3,46	3,70	3,45	2,08	1,57
1993 / 94	1,10	0,81	0,69	0,68	0,50	0,50	0,93	1,75	3,10	3,70	3,36	1,87	1,58
1994 / 95	0,84	0,49	0,37	0,35	0,37	0,32	0,61	2,15	3,67	3,70	3,05	1,62	1,46
1995 / 96	0,86	0,46	0,34	0,29	0,27	0,41	0,57	1,72	3,21	3,38	2,78	1,55	1,32
1996 / 97	0,74	0,39	0,22	0,21	0,19	0,18	0,25	0,80	1,57	2,68	2,68	1,16	0,92
1997 / 98	0,57	0,29	0,38	0,35	0,45	0,78	0,54	1,73	3,70	3,70	3,45	2,08	1,50
1998 / 99	1,17	0,69	0,42	0,33	0,24	0,21	0,41	1,11	1,73	2,46	2,40	1,19	1,03
1999 / 00	0,57	0,30	0,20	0,17	0,18	0,22	0,54	1,45	2,50	2,90	2,64	1,19	1,07
2000 / 01	0,69	0,38	0,33	0,40	0,33	0,33	0,84	1,66	3,70	3,70	3,45	2,03	1,49
2001 / 02	0,92	0,55	0,40	0,39	0,47	0,52	0,81	1,76	3,70	3,70	3,45	1,89	1,55
2002 / 03	0,91	0,60	0,43	0,48	0,72	0,64	0,85	1,89	3,68	3,70	3,45	2,31	1,64
2003 / 04	1,09	0,63	0,49	0,41	0,39	0,43	0,75	1,56	2,44	3,70	3,04	1,67	1,38
2004 / 05	0,78	0,42	0,23	0,25	0,26	0,39	0,32	1,11	2,53	3,56	2,74	1,37	1,16
2005 / 06	0,69	0,41	0,48	0,48	0,51	0,58	0,86	2,10	3,70	3,70	3,45	2,08	1,59

PROM	0,81	0,45	0,37	0,33	0,32	0,36	0,58	1,56	2,96	3,48	3,04	1,69	1,33

ESTERO LA ENGORDA
CAUDAL MEDIO MENSUAL REMANENTE (m^3/s)

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1951 / 52	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1952 / 53	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,23	0,20	0,20	0,20
1953 / 54	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	1,25	0,64	0,20	0,32
1954 / 55	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1955 / 56	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1956 / 57	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,34	0,20	0,20	0,21
1957 / 58	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1958 / 59	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1959 / 60	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,90	0,51	0,20	0,28
1960 / 61	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1961 / 62	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,48	0,92	0,27	0,20	0,29
1962 / 63	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1963 / 64	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,27	2,56	1,47	0,20	0,51
1964 / 65	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1965 / 66	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	1,61	0,36	0,20	0,33
1966 / 67	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1967 / 68	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1968 / 69	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1969 / 70	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,25	0,20	0,20	0,20
1970 / 71	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1971 / 72	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1972 / 73	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	1,49	0,78	0,20	0,36
1973 / 74	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,59	0,20	0,20	0,23
1974 / 75	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	1,87	0,20	0,20	0,34
1975 / 76	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,24	0,20	0,20
1976 / 77	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1977 / 78	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,21	0,82	0,20	0,20	0,25
1978 / 79	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,24	1,32	0,20	0,20	0,30
1979 / 80	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,75	0,20	0,20	0,25
1980 / 81	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,56	1,41	0,83	0,20	0,38
1981 / 82	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1982 / 83	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,89	3,48	2,53	0,20	0,72
1983 / 84	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,23	1,08	0,48	0,20	0,30
1984 / 85	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	1,61	0,62	0,20	0,35
1985 / 86	0,20	0,19	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1986 / 87	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,27	1,75	0,96	0,20	0,40
1987 / 88	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,80	2,14	1,16	0,20	0,49
1988 / 89	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1989 / 90	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,53	0,20	0,20	0,23
1990 / 91	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1991 / 92	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	1,63	0,52	0,20	0,35
1992 / 93	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	1,40	0,51	0,20	0,33
1993 / 94	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	1,07	0,20	0,20	0,27
1994 / 95	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,67	0,20	0,20	0,24
1995 / 96	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1996 / 97	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1997 / 98	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	2,25	0,39	0,20	0,39
1998 / 99	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
1999 / 00	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
2000 / 01	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,41	1,42	0,60	0,20	0,35
2001 / 02	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,42	1,07	0,28	0,20	0,30
2002 / 03	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	1,61	0,79	0,20	0,37
2003 / 04	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,23	0,20	0,20	0,20
2004 / 05	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
2005 / 06	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,37	2,07	0,94	0,20	0,43

PROM	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,25	0,81	0,39	0,20	0,27

ESTERO COLINA
CAUDAL MEDIO MENSUAL REMANENTE (m³/s)

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	0,35	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,69	2,04	2,14	0,79	0,68
1951 / 52	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,49	2,09	1,98	0,66	0,63
1952 / 53	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,48	2,17	2,52	0,74	0,69
1953 / 54	0,32	0,30	0,30	0,30	0,30	0,30	0,30	0,47	1,69	4,66	4,56	1,58	1,26
1954 / 55	0,47	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	1,77	2,46	0,85	0,66
1955 / 56	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	1,49	1,87	0,62	0,56
1956 / 57	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	2,45	3,35	1,00	0,79
1957 / 58	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,74	1,59	1,30	0,39	0,54
1958 / 59	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,90	0,93	2,00	2,32	0,58	0,74
1959 / 60	0,37	0,30	0,30	0,30	0,30	0,30	0,30	0,80	1,82	3,82	4,25	1,29	1,18
1960 / 61	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,87	1,72	1,86	0,67	0,63
1961 / 62	0,44	0,30	0,30	0,30	0,30	0,30	0,30	1,06	2,65	3,85	3,66	1,81	1,27
1962 / 63	0,38	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,56	0,77	1,75	0,44	0,50
1963 / 64	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	2,12	7,87	6,60	2,20	1,77
1964 / 65	0,97	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	1,35	2,38	0,62	0,64
1965 / 66	0,33	0,30	0,30	0,30	0,30	0,30	0,30	0,44	0,67	5,54	3,88	1,37	1,17
1966 / 67	0,56	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	1,50	2,43	0,63	0,63
1967 / 68	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,86	1,56	0,35	0,46
1968 / 69	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,60	1,37	0,30	0,41
1969 / 70	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	1,18	2,21	2,17	0,38	0,70
1970 / 71	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,55	0,30	0,76	0,72	0,39
1971 / 72	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,35	0,30	1,32	1,59	0,56	0,52
1972 / 73	0,30	0,31	0,30	0,30	0,30	0,30	0,30	0,30	1,21	5,26	4,90	1,87	1,30
1973 / 74	1,15	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	3,06	2,50	0,77	0,82
1974 / 75	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,47	1,03	6,17	3,20	0,98	1,16
1975 / 76	0,33	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,64	1,38	3,59	0,69	0,73
1976 / 77	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	2,02	1,62	0,65	0,58
1977 / 78	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,69	1,99	3,60	3,28	0,97	1,05
1978 / 79	0,47	0,30	0,30	0,30	0,30	0,30	0,30	0,30	2,06	4,84	3,13	1,14	1,15
1979 / 80	0,67	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,59	3,45	3,27	1,28	0,95
1980 / 81	1,00	0,54	0,30	0,30	0,30	0,30	0,30	0,31	2,83	5,05	5,01	1,60	1,49
1981 / 82	0,56	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	1,86	2,70	0,75	0,69
1982 / 83	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	3,64	10,13	9,18	3,51	2,41
1983 / 84	1,49	0,41	0,30	0,30	0,30	0,30	0,30	0,51	2,01	4,26	4,16	1,42	1,31
1984 / 85	0,58	0,30	0,30	0,30	0,30	0,30	0,30	0,30	1,69	5,54	4,52	2,02	1,37
1985 / 86	0,78	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,59	1,98	2,11	0,69	0,69
1986 / 87	0,37	0,30	0,62	0,30	0,30	0,30	0,30	0,30	2,13	5,89	5,33	1,87	1,50
1987 / 88	0,65	0,30	0,30	0,30	0,30	0,30	0,30	1,07	3,43	6,85	5,83	2,14	1,81
1988 / 89	0,89	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	1,85	2,79	0,73	0,72
1989 / 90	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,72	1,20	2,90	2,20	0,60	0,81
1990 / 91	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	1,63	2,09	0,74	0,60
1991 / 92	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	5,58	4,27	1,93	1,21
1992 / 93	0,66	0,30	0,30	0,30	0,30	0,30	0,30	0,38	1,56	5,03	4,25	1,56	1,27
1993 / 94	0,82	0,41	0,30	0,30	0,30	0,30	0,30	0,35	1,06	4,22	2,97	1,27	1,05
1994 / 95	0,47	0,30	0,30	0,30	0,30	0,30	0,30	0,91	1,85	3,25	2,53	0,92	0,98
1995 / 96	0,49	0,30	0,30	0,30	0,30	0,30	0,30	0,31	1,21	1,64	2,17	0,83	0,70
1996 / 97	0,33	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,66	2,03	0,30	0,48
1997 / 98	0,30	0,30	0,30	0,30	0,30	0,31	0,30	0,33	1,96	7,10	3,95	1,56	1,42
1998 / 99	0,91	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,37	1,64	0,33	0,47
1999 / 00	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,97	1,97	0,33	0,50
2000 / 01	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	2,47	5,09	4,45	1,49	1,32
2001 / 02	0,57	0,30	0,30	0,30	0,30	0,30	0,30	0,38	2,49	4,23	3,67	1,29	1,20
2002 / 03	0,57	0,30	0,30	0,30	0,37	0,30	0,30	0,55	1,87	5,55	4,94	1,94	1,44
2003 / 04	0,81	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	2,16	2,53	1,00	0,74
2004 / 05	0,38	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	1,89	2,12	0,58	0,61
2005 / 06	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,84	2,38	6,67	5,29	1,56	1,57

PROM	0,48	0,31	0,31	0,30	0,30	0,30	0,30	0,40	1,13	3,29	3,16	1,07	0,94

QUEBRADA LAS PLACAS
CAUDAL MEDIO MENSUAL REMANENTE (m^3/s)

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	0,14	0,14	0,14	0,12	0,12	0,11	0,14	0,14	0,14	0,18	0,14	0,14	0,14
1951 / 52	0,14	0,14	0,12	0,12	0,12	0,12	0,14	0,14	0,14	0,18	0,14	0,14	0,14
1952 / 53	0,14	0,14	0,12	0,12	0,12	0,12	0,14	0,14	0,14	0,19	0,14	0,14	0,14
1953 / 54	0,14	0,14	0,13	0,12	0,13	0,14	0,14	0,14	0,14	0,54	0,27	0,14	0,18
1954 / 55	0,14	0,14	0,14	0,14	0,13	0,13	0,14	0,14	0,14	0,14	0,14	0,14	0,14
1955 / 56	0,14	0,14	0,10	0,09	0,09	0,10	0,13	0,14	0,14	0,14	0,14	0,14	0,12
1956 / 57	0,14	0,14	0,12	0,11	0,11	0,11	0,14	0,14	0,14	0,23	0,14	0,14	0,14
1957 / 58	0,14	0,14	0,11	0,10	0,11	0,12	0,14	0,14	0,14	0,14	0,14	0,14	0,13
1958 / 59	0,14	0,14	0,12	0,11	0,11	0,14	0,14	0,14	0,14	0,17	0,14	0,14	0,14
1959 / 60	0,14	0,14	0,13	0,13	0,13	0,14	0,14	0,14	0,14	0,42	0,23	0,14	0,17
1960 / 61	0,14	0,14	0,11	0,11	0,11	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,13
1961 / 62	0,14	0,14	0,13	0,12	0,12	0,12	0,14	0,14	0,18	0,43	0,14	0,14	0,16
1962 / 63	0,14	0,14	0,13	0,12	0,12	0,12	0,14	0,14	0,14	0,14	0,14	0,14	0,13
1963 / 64	0,14	0,14	0,12	0,11	0,11	0,13	0,14	0,14	0,14	0,99	0,55	0,14	0,24
1964 / 65	0,14	0,14	0,14	0,13	0,12	0,12	0,14	0,14	0,14	0,14	0,14	0,14	0,13
1965 / 66	0,14	0,14	0,13	0,12	0,14	0,14	0,14	0,14	0,14	0,66	0,18	0,14	0,18
1966 / 67	0,14	0,14	0,14	0,14	0,13	0,13	0,14	0,14	0,14	0,14	0,14	0,14	0,14
1967 / 68	0,14	0,14	0,14	0,10	0,09	0,10	0,14	0,14	0,14	0,14	0,14	0,14	0,13
1968 / 69	0,14	0,14	0,11	0,09	0,09	0,09	0,11	0,14	0,14	0,14	0,14	0,14	0,12
1969 / 70	0,14	0,13	0,11	0,10	0,10	0,11	0,13	0,14	0,14	0,20	0,14	0,14	0,13
1970 / 71	0,14	0,14	0,10	0,09	0,09	0,10	0,14	0,14	0,14	0,14	0,14	0,14	0,13
1971 / 72	0,14	0,13	0,09	0,10	0,10	0,11	0,14	0,14	0,14	0,14	0,14	0,14	0,13
1972 / 73	0,14	0,14	0,14	0,12	0,14	0,14	0,14	0,14	0,14	0,63	0,32	0,14	0,19
1973 / 74	0,14	0,14	0,14	0,12	0,11	0,12	0,14	0,14	0,14	0,32	0,14	0,14	0,15
1974 / 75	0,14	0,14	0,12	0,13	0,13	0,13	0,14	0,14	0,14	0,75	0,14	0,14	0,19
1975 / 76	0,14	0,14	0,11	0,10	0,10	0,11	0,14	0,14	0,14	0,14	0,14	0,14	0,13
1976 / 77	0,14	0,14	0,11	0,10	0,10	0,10	0,13	0,14	0,14	0,17	0,14	0,14	0,13
1977 / 78	0,14	0,14	0,12	0,14	0,14	0,14	0,14	0,14	0,14	0,39	0,14	0,14	0,16
1978 / 79	0,14	0,14	0,13	0,14	0,14	0,14	0,14	0,14	0,14	0,57	0,14	0,14	0,17
1979 / 80	0,14	0,14	0,14	0,12	0,13	0,12	0,14	0,14	0,14	0,37	0,14	0,14	0,15
1980 / 81	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,21	0,60	0,33	0,14	0,20
1981 / 82	0,14	0,14	0,14	0,12	0,12	0,12	0,14	0,14	0,14	0,15	0,14	0,14	0,14
1982 / 83	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,32	1,31	0,91	0,14	0,32
1983 / 84	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,49	0,21	0,14	0,17
1984 / 85	0,14	0,14	0,13	0,12	0,13	0,14	0,14	0,14	0,14	0,67	0,26	0,14	0,19
1985 / 86	0,14	0,11	0,14	0,14	0,13	0,12	0,14	0,14	0,14	0,17	0,14	0,14	0,14
1986 / 87	0,14	0,14	0,14	0,14	0,13	0,14	0,14	0,14	0,14	0,71	0,38	0,14	0,21
1987 / 88	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,29	0,85	0,45	0,14	0,24
1988 / 89	0,14	0,14	0,14	0,13	0,12	0,10	0,14	0,14	0,14	0,15	0,14	0,14	0,13
1989 / 90	0,14	0,14	0,11	0,10	0,12	0,14	0,14	0,14	0,14	0,30	0,14	0,14	0,15
1990 / 91	0,14	0,14	0,12	0,11	0,11	0,12	0,14	0,14	0,14	0,14	0,14	0,14	0,13
1991 / 92	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,67	0,23	0,14	0,19
1992 / 93	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,59	0,23	0,14	0,18
1993 / 94	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,48	0,14	0,14	0,17
1994 / 95	0,14	0,14	0,14	0,13	0,14	0,12	0,14	0,14	0,14	0,34	0,14	0,14	0,15
1995 / 96	0,14	0,14	0,13	0,12	0,12	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14
1996 / 97	0,14	0,14	0,11	0,10	0,10	0,10	0,12	0,14	0,14	0,14	0,14	0,14	0,13
1997 / 98	0,14	0,14	0,14	0,13	0,14	0,14	0,14	0,14	0,14	0,88	0,18	0,14	0,20
1998 / 99	0,14	0,14	0,14	0,13	0,11	0,10	0,14	0,14	0,14	0,14	0,14	0,14	0,13
1999 / 00	0,14	0,14	0,10	0,10	0,10	0,11	0,14	0,14	0,14	0,14	0,14	0,14	0,13
2000 / 01	0,14	0,14	0,13	0,14	0,13	0,13	0,14	0,14	0,16	0,60	0,25	0,14	0,19
2001 / 02	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,16	0,48	0,15	0,14	0,17
2002 / 03	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,67	0,32	0,14	0,20
2003 / 04	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,19	0,14	0,14	0,14
2004 / 05	0,14	0,14	0,11	0,11	0,11	0,14	0,13	0,14	0,14	0,16	0,14	0,14	0,13
2005 / 06	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,15	0,82	0,37	0,14	0,22
PROM	0,14	0,14	0,13	0,12	0,12	0,13	0,14	0,14	0,15	0,38	0,20	0,14	0,16

CAJÓN DEL MORADO
CAUDAL MEDIO MENSUAL REMANENTE (m³/s)

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1951 / 52	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,25	0,24	0,24	0,24
1952 / 53	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,31	0,24	0,24	0,25
1953 / 54	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	2,11	1,30	0,24	0,48
1954 / 55	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1955 / 56	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1956 / 57	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,51	0,43	0,24	0,28
1957 / 58	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1958 / 59	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1959 / 60	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	1,50	1,08	0,24	0,42
1960 / 61	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1961 / 62	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,79	1,52	0,65	0,24	0,43
1962 / 63	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1963 / 64	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,41	4,44	2,78	0,48	0,84
1964 / 65	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1965 / 66	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	2,75	0,81	0,24	0,50
1966 / 67	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1967 / 68	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1968 / 69	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1969 / 70	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,34	0,24	0,24	0,25
1970 / 71	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1971 / 72	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1972 / 73	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	2,55	1,55	0,24	0,54
1973 / 74	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,95	0,24	0,24	0,30
1974 / 75	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	3,21	0,31	0,24	0,49
1975 / 76	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,60	0,24	0,27
1976 / 77	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1977 / 78	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,31	1,34	0,38	0,24	0,35
1978 / 79	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,36	2,25	0,27	0,24	0,42
1979 / 80	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	1,23	0,37	0,24	0,33
1980 / 81	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,92	2,40	1,63	0,24	0,59
1981 / 82	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1982 / 83	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	1,51	6,08	4,66	1,42	1,30
1983 / 84	0,42	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,33	1,82	1,02	0,24	0,46
1984 / 85	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	2,75	1,28	0,34	0,54
1985 / 86	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1986 / 87	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,42	3,00	1,87	0,24	0,62
1987 / 88	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	1,35	3,70	2,22	0,43	0,80
1988 / 89	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1989 / 90	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,84	0,24	0,24	0,29
1990 / 91	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1991 / 92	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	2,78	1,09	0,28	0,53
1992 / 93	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	2,38	1,08	0,24	0,49
1993 / 94	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	1,79	0,24	0,24	0,37
1994 / 95	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	1,09	0,24	0,24	0,31
1995 / 96	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1996 / 97	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1997 / 98	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,29	3,88	0,86	0,24	0,60
1998 / 99	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
1999 / 00	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
2000 / 01	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,66	2,42	1,23	0,24	0,54
2001 / 02	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,68	1,80	0,66	0,24	0,44
2002 / 03	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	2,76	1,58	0,29	0,56
2003 / 04	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,30	0,24	0,24	0,25
2004 / 05	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24
2005 / 06	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,59	3,57	1,83	0,24	0,68

PROM	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,34	1,33	0,70	0,27	0,38

RÍO VOLCÁN EN BOCATOMA DE LA CENTRAL VOLCÁN
CAUDALES MEDIOS MENSUALES Y ANUALES (m^3/s)
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	8,10	6,32	5,45	4,91	5,02	5,66	8,38	12,07	24,69	21,57	16,34	12,64	10,93
1951 / 52	7,75	6,69	6,44	6,31	6,32	6,16	8,41	14,19	23,04	21,78	15,57	11,75	11,20
1952 / 53	7,96	6,53	6,47	6,37	6,19	6,45	8,63	12,66	23,00	22,15	18,04	12,25	11,39
1953 / 54	8,59	6,66	6,67	6,40	6,88	8,37	9,56	21,52	32,88	33,48	27,32	18,17	15,54
1954 / 55	10,02	8,39	8,50	7,59	7,22	7,28	9,44	15,87	20,79	20,35	17,76	13,08	12,19
1955 / 56	8,25	6,07	5,10	4,45	4,58	4,82	6,44	14,98	18,76	19,06	15,08	11,46	9,92
1956 / 57	6,58	6,72	5,90	5,51	5,77	5,87	7,94	17,95	21,06	23,41	21,83	14,09	11,88
1957 / 58	8,21	5,83	5,77	5,41	5,73	6,20	8,73	16,33	25,10	19,52	12,51	9,86	10,77
1958 / 59	7,40	6,52	6,29	6,07	5,82	7,83	11,75	25,71	26,63	21,36	17,16	11,18	12,81
1959 / 60	9,05	7,45	6,87	6,92	7,41	8,24	11,20	24,80	33,89	29,64	25,91	16,13	15,63
1960 / 61	7,78	6,56	5,81	5,95	5,92	8,35	8,84	19,48	26,19	20,12	15,03	11,80	11,82
1961 / 62	9,73	7,19	6,82	6,50	6,32	6,50	12,76	27,30	40,71	29,77	23,21	19,78	16,38
1962 / 63	9,19	7,40	6,93	6,48	6,19	6,65	8,71	18,45	23,64	15,79	14,54	10,18	11,18
1963 / 64	7,40	6,13	5,95	6,03	5,51	7,16	9,25	13,18	36,38	48,05	36,59	22,52	17,01
1964 / 65	14,99	9,52	8,20	6,88	6,18	6,18	7,59	13,00	16,00	18,45	17,42	11,43	11,32
1965 / 66	8,72	7,13	6,90	6,64	8,16	8,64	12,75	21,24	24,50	37,45	24,24	16,69	15,25
1966 / 67	10,95	8,25	7,92	8,07	6,85	7,43	10,91	19,26	21,54	19,09	17,63	11,52	12,45
1967 / 68	8,39	6,74	8,20	5,18	4,67	4,84	6,74	10,69	19,39	16,22	13,67	9,55	9,52
1968 / 69	6,55	5,77	5,65	4,66	4,34	4,15	4,86	8,37	11,98	15,04	12,80	8,99	7,76
1969 / 70	4,81	4,38	5,38	4,90	4,75	5,76	6,63	10,22	28,70	22,35	16,47	9,76	10,34
1970 / 71	7,52	5,70	4,91	4,58	4,64	5,35	9,36	15,92	23,50	8,90	10,04	12,14	9,38
1971 / 72	7,98	4,45	4,25	5,12	5,30	6,01	10,12	20,36	21,53	18,28	13,81	10,99	10,68
1972 / 73	6,94	11,46	9,34	6,75	7,77	8,78	10,59	14,83	28,91	36,20	28,87	20,22	15,89
1973 / 74	16,73	10,42	7,46	6,80	5,83	6,32	12,35	16,91	18,70	26,19	17,98	12,49	13,18
1974 / 75	7,73	6,40	6,47	7,51	6,90	6,94	13,40	21,47	27,50	40,35	21,12	13,96	14,98
1975 / 76	8,73	5,90	5,59	5,32	5,32	5,86	7,92	13,31	24,25	18,58	22,92	11,97	11,31
1976 / 77	6,61	5,61	5,53	5,35	5,16	5,41	6,37	13,85	20,37	21,48	13,94	11,67	10,11
1977 / 78	7,70	6,20	5,98	8,19	8,55	9,17	13,50	23,66	35,30	28,66	21,51	13,93	15,20
1978 / 79	10,08	6,09	6,80	7,77	7,87	7,60	10,75	17,09	35,86	34,31	20,83	15,12	15,02
1979 / 80	11,99	9,69	7,43	6,29	6,99	6,15	7,50	11,56	23,85	27,95	21,48	16,08	13,08
1980 / 81	15,30	13,72	11,26	10,00	8,09	8,45	10,92	19,93	42,22	35,26	29,39	18,28	18,57
1981 / 82	10,90	8,97	7,73	6,50	6,37	6,15	9,00	16,73	20,69	20,74	18,88	12,34	12,08
1982 / 83	7,70	6,96	7,82	12,53	10,49	12,26	11,72	19,11	48,79	58,35	48,33	31,70	22,98
1983 / 84	20,07	12,42	9,55	8,44	7,82	7,62	11,40	21,89	35,51	31,64	25,52	17,04	17,41
1984 / 85	11,17	7,98	6,98	6,78	7,09	8,25	13,63	18,74	32,87	37,48	27,15	21,25	16,61
1985 / 86	13,09	2,55	8,83	8,16	7,30	6,77	7,40	17,88	23,85	21,30	16,20	11,96	12,11
1986 / 87	9,07	7,96	15,45	10,16	7,48	8,30	11,20	17,29	36,50	39,06	30,84	20,21	17,79
1987 / 88	11,80	9,14	8,96	11,35	9,40	8,69	12,92	27,40	47,08	43,41	33,09	22,08	20,44
1988 / 89	14,22	9,70	7,82	6,86	6,67	5,05	9,15	16,99	20,12	20,70	19,29	12,14	12,39
1989 / 90	7,76	6,25	5,50	4,99	6,53	7,61	10,85	23,97	28,82	25,49	16,62	11,27	12,97
1990 / 91	8,14	6,63	5,89	5,43	5,44	6,43	7,59	14,50	19,39	19,61	16,01	12,23	10,61
1991 / 92	7,98	9,88	10,99	10,99	8,31	10,35	11,93	19,20	19,65	37,67	25,99	20,65	16,13
1992 / 93	11,95	9,92	9,37	8,86	7,83	9,20	13,64	20,59	31,80	35,14	25,93	18,05	16,86
1993 / 94	13,49	12,41	11,80	11,72	9,22	9,34	14,77	20,27	27,56	31,33	19,97	15,92	16,48
1994 / 95	10,07	8,03	7,46	7,23	7,56	6,82	10,42	25,81	34,17	27,04	10,10	13,53	14,02
1995 / 96	10,20	7,70	7,03	6,45	6,16	8,02	9,84	19,85	28,96	19,73	8,29	12,84	12,09
1996 / 97	8,67	6,74	5,34	5,40	5,05	4,92	5,52	7,52	10,45	15,23	15,74	9,13	8,31
1997 / 98	6,38	5,42	7,53	7,32	8,61	13,03	9,45	20,10	35,06	44,36	16,41	18,04	15,98
1998 / 99	14,41	10,73	8,04	7,03	5,82	5,40	7,80	11,75	12,22	13,98	5,95	9,39	9,38
1999 / 00	6,30	5,41	5,05	4,79	4,90	5,52	9,42	16,28	20,93	16,70	15,49	9,40	10,02
2000 / 01	7,97	6,56	6,84	7,97	6,97	7,04	13,53	19,18	39,21	35,40	18,80	17,53	15,58
2001 / 02	11,03	8,86	7,76	7,74	8,91	9,57	13,11	20,51	39,43	31,51	15,21	16,17	15,82
2002 / 03	11,02	9,58	8,22	8,93	12,20	11,24	13,63	22,34	34,33	37,50	21,18	20,70	17,57
2003 / 04	13,42	9,90	9,11	8,11	7,85	8,30	12,30	17,88	20,31	22,11	10,24	14,10	12,80
2004 / 05	9,03	6,94	6,25	5,88	6,05	7,69	9,34	12,74	21,12	20,73	15,98	11,06	11,07
2005 / 06													
PROM	9,70	7,61	7,30	6,99	6,77	7,31	10,03	17,72	27,08	26,86	19,60	14,52	13,46

RÍO VOLCÁN EN QUELTEHUES
CAUDALES MEDIOS MENSUALES Y ANUALES (m³/s)
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	9,44	7,37	6,35	5,72	5,85	6,60	9,77	14,07	28,78	25,14	19,04	14,73	12,74
1951 / 52	9,03	7,80	7,51	7,35	7,37	7,18	9,80	16,54	26,85	25,39	18,15	13,69	13,06
1952 / 53	9,28	7,61	7,54	7,42	7,22	7,52	10,06	14,75	26,81	25,81	21,03	14,28	13,28
1953 / 54	10,01	7,76	7,77	7,46	8,02	9,76	11,14	25,08	38,32	39,02	31,84	21,18	18,11
1954 / 55	11,68	9,78	9,91	8,85	8,42	8,49	11,00	18,50	24,23	23,72	20,70	15,25	14,21
1955 / 56	9,61	7,07	5,94	5,19	5,34	5,62	7,50	17,46	21,86	22,22	17,58	13,36	11,56
1956 / 57	7,67	7,83	6,88	6,42	6,72	6,84	9,25	20,92	24,54	27,29	25,44	16,42	13,85
1957 / 58	9,57	6,79	6,72	6,31	6,68	7,23	10,17	19,03	29,25	22,75	14,58	11,49	12,55
1958 / 59	8,63	7,60	7,33	7,08	6,78	9,12	13,69	29,96	31,04	24,90	20,00	13,03	14,93
1959 / 60	10,55	8,68	8,01	8,07	8,64	9,60	13,05	28,90	39,50	34,55	30,20	18,80	18,21
1960 / 61	9,07	7,64	6,77	6,94	6,90	9,73	10,30	22,70	30,53	23,45	17,52	13,75	13,78
1961 / 62	11,34	8,38	7,95	7,57	7,37	7,57	14,87	31,82	47,45	34,70	27,05	23,05	19,09
1962 / 63	10,71	8,62	8,08	7,55	7,21	7,75	10,15	21,50	27,55	18,40	16,95	11,86	13,03
1963 / 64	8,63	7,14	6,93	7,03	6,42	8,35	10,78	15,36	42,40	56,00	42,65	26,25	19,83
1964 / 65	17,47	11,09	9,56	8,02	7,20	7,20	8,85	15,15	18,65	21,50	20,30	13,32	13,19
1965 / 66	10,16	8,31	8,04	7,74	9,51	10,07	14,86	24,75	28,55	43,65	28,25	19,45	17,78
1966 / 67	12,76	9,61	9,23	9,41	7,98	8,66	12,72	22,45	25,10	22,25	20,55	13,43	14,51
1967 / 68	9,78	7,86	9,56	6,04	5,44	5,64	7,85	12,46	22,60	18,90	15,93	11,13	11,10
1968 / 69	7,63	6,72	6,59	5,43	5,06	4,84	5,67	9,76	13,96	17,53	14,92	10,48	9,05
1969 / 70	5,61	5,11	6,27	5,71	5,54	6,71	7,73	11,91	33,45	26,05	19,20	11,37	12,06
1970 / 71	8,77	6,64	5,72	5,34	5,41	6,23	10,91	18,56	27,39	10,37	11,70	14,15	10,93
1971 / 72	9,30	5,19	4,95	5,97	6,18	7,01	11,79	23,73	25,09	21,31	16,09	12,81	12,45
1972 / 73	8,09	13,36	10,89	7,87	9,06	10,23	12,34	17,28	33,70	42,19	33,65	23,57	18,52
1973 / 74	19,50	12,15	8,69	7,92	6,79	7,37	14,39	19,71	21,80	30,53	20,95	14,56	15,36
1974 / 75	9,01	7,46	7,54	8,75	8,04	8,09	15,62	25,02	32,05	47,03	24,61	16,27	17,46
1975 / 76	10,18	6,88	6,51	6,20	6,20	6,83	9,23	15,51	28,26	21,66	26,71	13,95	13,18
1976 / 77	7,70	6,54	6,44	6,24	6,01	6,31	7,42	16,14	23,74	25,03	16,25	13,60	11,79
1977 / 78	8,98	7,23	6,97	9,55	9,97	10,69	15,74	27,58	41,14	33,40	25,07	16,24	17,71
1978 / 79	11,75	7,10	7,93	9,06	9,17	8,86	12,53	19,92	41,80	39,99	24,28	17,62	17,50
1979 / 80	13,98	11,29	8,66	7,33	8,15	7,17	8,74	13,47	27,80	32,58	25,03	18,74	15,25
1980 / 81	17,83	15,99	13,12	11,66	9,43	9,85	12,73	23,23	49,21	41,09	34,25	21,31	21,64
1981 / 82	12,70	10,45	9,01	7,57	7,42	7,17	10,49	19,50	24,11	24,17	22,01	14,38	14,08
1982 / 83	8,98	8,11	9,11	14,60	12,23	14,29	13,66	22,27	56,86	68,01	56,33	36,95	26,78
1983 / 84	23,39	14,47	11,13	9,84	9,11	8,88	13,29	25,51	41,39	36,88	29,74	19,86	20,29
1984 / 85	13,02	9,30	8,14	7,90	8,26	9,61	15,89	21,84	38,31	43,68	31,64	24,77	19,36
1985 / 86	15,26	2,97	10,29	9,51	8,51	7,89	8,62	20,84	27,80	24,82	18,88	13,94	14,11
1986 / 87	10,57	9,28	18,01	11,84	8,72	9,67	13,05	20,15	42,54	45,53	35,94	23,56	20,74
1987 / 88	13,75	10,65	10,44	13,23	10,96	10,13	15,06	31,93	54,87	50,59	38,57	25,73	23,83
1988 / 89	16,57	11,31	9,11	7,99	7,77	5,89	10,67	19,80	23,45	24,13	22,48	14,15	14,44
1989 / 90	9,05	7,29	6,41	5,82	7,61	8,87	12,64	27,94	33,59	29,71	19,37	13,14	15,12
1990 / 91	9,49	7,73	6,87	6,33	6,34	7,49	8,85	16,90	22,60	22,85	18,66	14,25	12,36
1991 / 92	9,30	11,52	12,81	12,81	9,69	12,06	13,91	22,38	22,90	43,91	30,29	24,07	18,80
1992 / 93	13,93	11,56	10,92	10,33	9,12	10,72	15,90	24,00	37,06	40,96	30,22	21,04	19,65
1993 / 94	15,72	14,46	13,75	13,66	10,75	10,89	17,21	23,63	32,12	36,51	23,28	18,56	19,21
1994 / 95	11,74	9,36	8,70	8,43	8,81	7,95	12,15	30,08	39,82	31,52	20,92	15,77	17,10
1995 / 96	11,89	8,98	8,19	7,52	7,18	9,35	11,47	23,13	33,75	23,00	18,76	14,96	14,85
1996 / 97	10,11	7,86	6,22	6,29	5,88	5,73	6,43	8,76	12,18	17,75	18,35	10,64	9,68
1997 / 98	7,44	6,32	8,78	8,53	10,03	15,19	11,01	23,43	40,86	51,70	28,23	21,03	19,38
1998 / 99	16,80	12,50	9,37	8,19	6,78	6,29	9,09	13,70	14,24	16,29	16,04	10,94	11,69
1999 / 00	7,34	6,31	5,89	5,58	5,71	6,43	10,98	18,98	24,39	19,46	18,05	10,96	11,67
2000 / 01	9,29	7,65	7,97	9,29	8,12	8,20	15,77	22,35	45,70	41,26	30,99	20,43	18,92
2001 / 02	12,86	10,33	9,05	9,02	10,38	11,15	15,28	23,90	45,95	36,73	26,79	18,85	19,19
2002 / 03	12,84	11,17	9,58	10,41	14,22	13,10	15,89	26,04	40,01	43,71	33,79	24,13	21,24
2003 / 04	15,64	11,54	10,62	9,45	9,15	9,67	14,34	20,84	23,67	25,77	21,01	16,43	15,68
2004 / 05	10,52	8,09	7,28	6,85	7,05	8,96	10,89	14,85	24,61	24,16	18,62	12,89	12,90
2005 / 06													
PROM	11,31	8,87	8,51	8,15	7,89	8,52	11,69	20,65	31,57	31,30	24,17	16,92	15,80

RÍO YESO EN DESEMBOCADURA
CAUDALES MEDIOS MENSUALES Y ANUALES (m³/s)
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	6,91	5,70	5,23	5,19	4,23	5,09	6,29	7,70	12,59	14,35	8,31	7,90	7,46
1951 / 52	6,78	5,89	6,32	6,43	6,48	6,16	7,56	12,81	15,05	14,18	10,75	10,15	9,05
1952 / 53	8,19	7,00	6,68	6,96	6,14	6,96	7,07	9,25	16,49	13,86	12,73	7,59	9,08
1953 / 54	5,57	7,75	6,09	5,95	6,96	10,03	10,00	19,46	26,78	30,68	23,01	15,98	14,02
1954 / 55	11,18	8,63	7,83	8,61	8,50	8,44	10,41	17,41	15,96	16,27	12,14	9,17	11,21
1955 / 56	6,09	6,54	5,27	5,20	4,14	4,61	5,75	12,13	12,65	12,80	11,22	6,54	7,75
1956 / 57	6,99	7,36	6,56	6,29	5,81	6,50	7,65	11,27	10,26	9,57	9,24	6,92	7,87
1957 / 58	5,44	5,42	5,02	6,10	4,81	5,49	7,67	11,68	15,92	21,45	13,12	8,14	9,19
1958 / 59	6,98	6,67	7,70	5,50	4,22	6,47	12,73	12,95	14,62	11,76	10,89	8,29	9,07
1959 / 60	6,92	7,22	6,77	7,20	7,19	7,57	8,69	14,78	23,49	18,15	10,64	7,43	10,50
1960 / 61	7,33	7,20	6,72	6,35	5,85	6,72	9,00	13,72	15,68	13,61	10,34	11,63	9,51
1961 / 62	8,15	8,60	8,89	5,93	8,88	6,55	11,05	17,29	28,26	23,31	18,25	11,77	13,08
1962 / 63	10,80	9,39	7,31	6,09	5,83	6,58	8,96	15,44	16,05	16,59	14,05	8,90	10,50
1963 / 64	7,66	6,75	5,72	7,43	5,80	7,85	12,93	12,58	27,51	35,59	20,25	13,52	13,63
1964 / 65	10,56	8,55	9,33	5,87	4,03	7,47	7,11	7,73	7,97	10,61	10,27	7,36	8,07
1965 / 66	6,41	6,32	6,08	5,39	6,50	7,71	11,45	19,87	18,95	25,45	17,92	12,06	12,01
1966 / 67	11,27	6,96	6,64	6,42	4,80	6,34	8,47	12,39	23,80	16,13	15,24	8,69	10,60
1967 / 68	7,44	6,46	4,74	4,85	3,44	4,02	8,78	7,79	10,65	12,63	10,50	6,47	7,32
1968 / 69	6,71	4,62	2,83	4,09	2,28	2,82	5,39	4,99	3,88	6,01	6,26	4,95	4,57
1969 / 70	3,92	3,86	4,85	3,22	3,24	4,04	9,68	11,48	22,60	17,89	16,45	8,30	9,13
1970 / 71	7,08	5,34	4,60	4,68	3,01	5,02	7,66	11,61	10,32	9,04	8,84	5,27	6,87
1971 / 72	4,84	4,33	3,30	4,87	3,57	3,92	8,49	13,68	17,33	14,94	10,52	6,35	8,01
1972 / 73	7,04	8,68	13,29	8,01	9,69	9,87	12,18	17,09	29,30	47,82	27,28	17,92	17,35
1973 / 74	16,13	8,57	8,93	8,57	6,61	6,75	8,69	14,16	15,95	20,13	15,12	10,10	11,64
1974 / 75	7,52	7,34	7,47	6,82	5,17	5,69	12,07	16,80	16,21	22,15	13,49	9,87	10,88
1975 / 76	8,43	6,93	5,66	5,76	5,30	6,71	9,32	10,74	13,45	13,48	10,75	8,04	8,71
1976 / 77	6,07	5,10	5,14	4,94	4,34	5,37	5,65	9,96	14,73	12,78	9,63	7,01	7,56
1977 / 78	6,67	6,18	5,99	7,36	6,10	8,70	11,95	21,43	31,09	25,73	19,08	11,03	13,44
1978 / 79	8,29	7,16	5,56	14,40	7,92	7,40	8,41	19,28	35,31	40,82	20,77	14,34	15,81
1979 / 80	9,27	8,35	6,80	6,76	5,91	6,43	12,01	11,67	14,20	28,18	18,42	14,54	11,88
1980 / 81	12,55	13,72	11,63	11,09	11,01	10,87	10,91	12,99	30,15	26,48	22,89	14,57	15,74
1981 / 82	10,20	9,46	7,81	6,96	6,52	7,00	9,48	12,88	14,36	15,18	12,46	8,32	10,05
1982 / 83	6,96	6,79	11,68	13,02	10,34	14,91	12,04	21,46	42,10	55,33	43,83	25,10	21,96
1983 / 84	16,83	12,91	10,22	10,27	8,85	7,16	11,99	18,85	26,07	23,10	17,31	9,86	14,45
1984 / 85	7,04	6,80	7,50	6,85	6,84	7,72	13,13	16,59	24,89	28,72	22,06	15,50	13,64
1985 / 86	11,33	12,04	9,51	7,54	6,23	5,79	9,03	14,97	17,25	16,66	13,58	9,66	11,13
1986 / 87	8,30	7,49	19,79	8,84	7,22	9,09	12,83	15,01	32,98	35,07	27,45	16,04	16,68
1987 / 88	11,36	10,00	9,38	13,09	11,06	10,36	12,87	26,49	37,37	40,13	28,16	18,28	19,04
1988 / 89	13,52	11,03	8,78	7,43	6,43	7,43	10,21	13,00	12,72	11,54	12,50	7,63	10,19
1989 / 90	7,41	6,27	5,06	4,79	6,79	7,37	9,39	16,10	16,22	16,46	10,16	7,09	9,43
1990 / 91	7,27	5,29	5,05	5,07	4,81	5,72	6,00	9,40	12,43	12,93	11,22	8,70	7,82
1991 / 92	6,29	10,17	8,28	8,96	7,36	9,67	11,19	17,21	21,00	30,85	22,09	15,36	14,03
1992 / 93	9,94	8,29	8,25	7,48	6,13	8,54	13,06	17,03	21,92	25,35	17,73	11,81	12,96
1993 / 94	10,32	9,56	11,19	7,25	7,68	9,07	9,17	12,95	19,61	22,12	13,17	9,48	11,80
1994 / 95	7,21	6,90	5,29	9,23	6,88	6,62	8,05	16,68	23,86	17,57	12,27	7,79	10,70
1995 / 96	6,63	6,49	5,80	6,78	5,93	8,35	7,25	15,57	19,30	14,06	10,25	5,96	9,37
1996 / 97	6,69	4,44	3,77	3,56	3,27	2,89	6,38	8,61	8,54	7,98	7,77	6,81	5,89
1997 / 98	4,14	3,22	6,35	5,41	7,86	11,66	9,07	15,38	23,58	37,95	25,90	10,78	13,44
1998 / 99	9,36	8,02	6,49	4,96	3,76	3,65	6,02	6,11	8,72	9,26	9,09	5,14	6,72
1999 / 00	3,65	3,47	3,11	3,06	3,04	4,65	8,32	12,96	13,30	13,92	8,51	6,95	7,08
2000 / 01	4,38	3,35	7,72	8,80	4,66	5,03	13,00	16,70	29,41	32,13	25,19	11,58	13,50
2001 / 02	8,78	8,54	5,56	8,95	8,80	8,41	9,74	16,12	28,45	21,33	15,77	10,79	12,60
2002 / 03	6,71	7,85	9,14	6,84	7,85	5,64	8,10	15,31	24,03	29,28	23,62	15,06	13,29
2003 / 04	10,28	8,95	8,63	7,27	6,21	6,51	9,14	14,48	13,87	14,95	11,69	7,26	9,94
2004 / 05	6,14	5,12	4,78	4,09	3,93	6,26	5,93	8,19	11,63	13,73	10,79	6,69	7,27
2005 / 06													
PROM	8,11	7,29	7,17	6,89	6,11	6,98	9,37	14,00	19,47	20,87	15,47	10,15	10,99

AFLUENTES AL EMBALSE EL YESO
CAUDALES MEDIOS MENSUALES Y ANUALES (m³/s)
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	5,30	3,41	3,38	3,07	2,35	2,73	3,31	4,84	10,00	12,90	6,96	7,05	5,44
1951 / 52	5,21	3,84	3,47	3,29	3,54	3,34	4,28	9,50	12,40	12,40	9,64	9,07	6,67
1952 / 53	6,69	4,62	4,12	3,89	3,28	3,89	4,62	6,73	14,20	12,50	11,30	6,84	6,89
1953 / 54	3,66	5,83	3,79	3,37	3,71	5,35	5,87	13,40	22,08	27,50	20,60	14,70	10,82
1954 / 55	8,95	6,19	4,95	4,46	4,43	4,22	5,30	12,30	13,50	14,80	10,90	8,37	8,20
1955 / 56	4,59	4,13	3,32	3,48	2,55	2,92	3,80	9,13	11,00	11,60	10,00	5,93	6,04
1956 / 57	5,21	4,63	4,29	3,19	2,94	3,72	4,79	7,39	8,55	8,54	8,50	6,33	5,67
1957 / 58	3,70	3,57	3,37	3,69	3,12	3,44	4,57	7,60	13,24	18,90	11,30	6,84	6,95
1958 / 59	4,67	3,29	4,24	2,54	2,24	3,15	7,15	10,00	12,30	10,59	9,81	7,37	6,45
1959 / 60	5,40	4,64	4,00	3,90	3,84	4,24	5,38	10,53	19,52	16,14	9,87	7,06	7,88
1960 / 61	5,61	4,57	3,94	3,50	2,89	3,67	5,41	9,63	13,13	12,15	9,29	10,22	7,00
1961 / 62	6,31	5,39	4,60	3,37	4,49	3,68	6,46	12,25	24,05	20,39	16,04	10,66	9,81
1962 / 63	8,67	6,81	4,78	3,43	3,19	3,73	5,32	11,20	13,80	11,80	11,00	7,92	7,64
1963 / 64	5,99	4,50	3,41	4,44	3,14	4,30	7,36	6,02	21,70	34,40	17,87	12,30	10,45
1964 / 65	8,70	5,95	5,53	3,37	2,78	3,92	4,08	5,36	6,47	9,12	9,10	7,02	5,95
1965 / 66	5,26	4,13	3,71	2,99	3,59	4,33	6,71	14,70	13,70	22,10	16,50	10,80	9,04
1966 / 67	9,05	4,55	4,00	3,35	2,80	3,64	6,14	8,65	15,29	14,19	13,39	7,84	7,74
1967 / 68	5,73	4,17	3,59	3,00	2,45	2,45	4,91	4,80	8,70	8,41	8,12	5,80	5,18
1968 / 69	3,96	2,88	2,27	2,00	1,65	2,14	2,13	3,52	3,54	5,59	5,50	4,37	3,30
1969 / 70	3,12	2,49	2,51	2,18	1,94	3,17	6,07	6,82	18,77	16,24	12,23	7,50	6,92
1970 / 71	5,11	3,56	3,10	3,53	2,43	3,08	4,57	6,61	8,77	8,00	7,99	5,02	5,15
1971 / 72	3,92	2,85	2,23	2,80	2,37	3,23	5,59	12,00	14,50	13,20	9,41	5,64	6,48
1972 / 73	6,06	4,59	5,37	2,38	4,48	4,79	5,48	9,18	24,40	40,70	23,52	16,02	12,25
1973 / 74	13,10	5,59	5,35	4,82	3,76	4,18	6,04	10,30	13,10	17,80	13,50	9,13	8,89
1974 / 75	5,87	5,19	5,20	3,49	3,14	2,83	7,14	11,40	12,90	19,40	12,80	8,84	8,18
1975 / 76	6,49	5,01	3,44	3,47	3,24	4,37	6,60	7,18	12,60	12,00	9,61	7,23	6,77
1976 / 77	4,82	3,67	3,20	2,86	2,52	3,04	3,05	6,81	8,92	11,20	8,58	6,33	5,42
1977 / 78	5,38	3,99	3,50	3,17	2,93	3,74	7,37	15,50	26,60	22,80	15,20	9,88	10,01
1978 / 79	6,54	4,84	3,91	4,74	3,80	3,45	5,99	12,20	28,70	35,40	17,82	12,40	11,65
1979 / 80	7,05	5,91	4,80	3,66	3,35	2,87	4,88	7,34	12,20	23,40	16,60	13,20	8,77
1980 / 81	8,86	7,71	6,05	5,65	5,27	6,21	7,50	12,50	27,90	23,47	20,34	13,14	12,05
1981 / 82	7,78	5,90	4,30	3,90	3,70	4,00	5,86	8,80	12,06	13,41	11,16	7,51	7,37
1982 / 83	5,37	4,41	5,27	6,76	5,35	7,78	5,70	14,09	33,12	46,26	37,45	22,14	16,14
1983 / 84	12,82	7,98	6,16	5,96	5,13	3,84	6,71	12,89	22,00	20,28	15,06	8,51	10,61
1984 / 85	4,96	4,18	5,23	3,73	4,22	4,49	7,87	11,73	20,20	24,31	18,88	13,89	10,31
1985 / 86	9,04	7,45	6,13	4,24	3,67	3,37	6,07	10,80	14,57	14,81	11,96	8,75	8,40
1986 / 87	6,56	4,70	8,09	5,02	3,94	4,77	7,43	11,33	28,20	31,02	24,00	14,17	12,44
1987 / 88	8,89	6,91	6,11	7,14	6,09	5,65	7,02	18,75	31,23	35,00	24,22	16,31	14,44
1988 / 89	10,50	7,74	5,82	4,64	3,68	4,53	6,75	8,99	10,78	10,03	11,00	6,49	7,58
1989 / 90	5,96	4,20	3,00	2,70	3,20	3,00	5,20	10,60	12,80	11,80	9,00	6,50	6,50
1990 / 91	4,60	2,70	3,00	1,90	2,40	2,90	3,70	7,40	11,10	11,50	9,00	6,50	5,56
1991 / 92	3,80	5,20	4,40	4,50	4,20	5,90	4,90	10,90	16,70	26,77	20,70	13,67	10,14
1992 / 93	7,91	5,37	3,67	2,74	2,11	3,24	6,66	12,21	17,27	20,61	15,59	10,46	8,99
1993 / 94	7,21	6,28	6,19	2,72	4,67	5,00	5,12	9,34	16,15	18,68	11,24	8,42	8,42
1994 / 95	5,10	4,08	2,03	4,74	3,80	2,61	4,04	12,40	19,80	15,32	10,32	6,54	7,57
1995 / 96	4,15	3,15	2,10	3,71	3,23	4,59	3,51	10,22	15,99	12,44	8,53	5,00	6,39
1996 / 97	5,22	2,39	1,74	1,57	1,37	1,32	4,03	5,74	7,27	7,89	7,12	6,10	4,31
1997 / 98	2,64	2,06	2,43	1,76	4,19	6,38	3,88	9,24	17,86	32,42	21,84	8,99	9,47
1998 / 99	6,32	4,32	3,16	2,13	1,69	1,81	3,20	3,95	7,21	8,12	7,72	4,45	4,51
1999 / 00	2,26	1,66	1,23	1,21	1,42	1,83	4,31	8,61	10,91	12,15	7,32	6,22	4,93
2000 / 01	2,75	1,28	2,69	3,64	1,75	2,08	6,90	10,78	23,24	30,05	21,34	9,99	9,71
2001 / 02	5,94	4,57	2,54	3,90	3,75	3,39	4,01	11,96	23,10	18,78	13,40	9,51	8,74
2002 / 03	4,65	4,97	5,15	3,44	3,79	2,56	4,43	11,36	19,96	25,45	20,35	13,18	9,94
2003 / 04	7,09	5,40	4,25	2,78	2,84	2,52	5,01	10,11	11,22	12,76	9,63	6,16	6,65
2004 / 05	3,82	2,49	2,04	1,34	1,32	2,74	2,38	5,22	9,32	11,84	9,48	5,69	4,81
2005 / 06													
PROM	6,08	4,58	4,00	3,51	3,27	3,71	5,32	9,69	15,97	18,17	13,45	9,02	8,06

RÍO YESO EN DESCARGA DE EMBALSE EL YESO
CAUDALES MEDIOS MENSUALES Y ANUALES (m³/s)
DESCARGAS HISTÓRICAS

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51													
1951 / 52													
1952 / 53													
1953 / 54													
1954 / 55													
1955 / 56													
1956 / 57													
1957 / 58													
1958 / 59													
1959 / 60													
1960 / 61													
1961 / 62													
1962 / 63													
1963 / 64													
1964 / 65													
1965 / 66													
1966 / 67													
1967 / 68										S/Inf.	2,61	14,90	8,76
1968 / 69	7,87	4,77	0,00	0,00	0,00	6,49	12,26	10,03	3,41	3,07	2,80	3,63	4,53
1969 / 70	S/Inf.	0,22	0,00	0,00	0,29	8,31	29,37	9,17	0,00	0,00	0,00	1,64	4,46
1970 / 71	1,17	5,53	6,32	8,63	0,44	8,27	14,30	0,00	0,01	9,43	11,82	11,59	6,46
1971 / 72	4,67	0,00	0,00	0,00	0,00	2,91	4,46	0,00	2,02	12,50	13,33	21,40	5,11
1972 / 73	16,40	3,15	0,00	0,00	0,00	0,00	19,05	13,16	1,90	27,73	39,73	36,66	13,15
1973 / 74	34,02	6,33	0,00	0,00	0,00	5,06	14,70	7,62	2,28	0,00	7,90	6,20	7,01
1974 / 75	5,93	10,32	16,70	0,00	0,00	10,42	20,13	16,88	1,27	0,00	4,45	13,27	8,28
1975 / 76	10,99	10,96	1,47	1,68	3,34	11,13	22,16	17,55	0,00	0,00	15,37	24,39	9,92
1976 / 77	6,20	2,45	0,00	0,00	0,00	6,75	0,01	0,84	3,06	0,32	18,84	17,53	4,67
1977 / 78	10,11	0,00	0,00	0,00	0,00	0,00	3,49	21,92	33,74	16,25	1,27	9,50	8,02
1978 / 79	6,41	4,94	4,20	6,72	7,62	3,53	8,41	21,16	14,10	34,78	28,65	4,85	12,11
1979 / 80	0,00	7,24	9,65	1,27	0,00	0,00	0,52	5,90	8,04	22,54	9,22	9,95	6,19
1980 / 81	9,09	7,97	12,99	17,50	15,30	11,34	12,71	14,53	27,55	23,13	19,26	12,93	15,36
1981 / 82	3,35	0,00	0,03	3,60	3,60	4,55	6,63	1,50	0,00	1,11	9,90	6,73	3,42
1982 / 83	8,70	1,34	0,55	6,50	3,39	3,66	11,95	30,88	22,03	31,60	31,36	21,34	14,44
1983 / 84	25,79	5,89	5,95	15,25	13,38	4,30	6,35	5,31	4,01	8,23	14,02	7,61	9,67
1984 / 85	7,26	11,58	5,33	4,12	4,03	4,21	22,24	22,56	19,83	6,54	0,56	9,39	9,80
1985 / 86	8,38	16,09	12,13	0,00	2,06	19,63	19,36	4,65	0,00	0,44	5,20	12,82	8,40
1986 / 87	11,60	0,00	6,94	13,10	0,27	13,91	15,86	0,00	11,00	27,77	22,28	17,03	11,65
1987 / 88	17,71	8,77	6,02	1,19	11,75	25,03	13,69	17,44	31,04	6,80	10,92	15,39	13,81
1988 / 89	14,34	11,65	6,60	1,03	0,05	7,43	19,31	1,66	0,10	5,45	8,83	13,08	7,46
1989 / 90	9,67	3,29	0,00	0,00	0,00	0,00	4,02	8,79	11,95	10,83	9,02	8,12	5,47
1990 / 91	3,44	7,84	6,58	6,72	5,32	0,00	4,13	7,09	1,16	1,22	6,84	5,74	4,67
1991 / 92	6,60	4,96	4,80	8,63	5,98	5,32	9,17	10,00	3,04	23,10	22,57	19,47	10,30
1992 / 93	11,13	5,05	8,49	7,30	9,74	5,72	3,16	2,92	5,01	9,12	9,58	9,77	7,25
1993 / 94	6,63	4,84	10,76	6,18	7,25	8,01	7,28	4,26	1,02	6,59	9,86	6,84	6,63
1994 / 95	9,40	7,43	6,93	7,67	9,85	7,15	5,34	0,88	0,86	9,16	12,40	10,21	7,27
1995 / 96	9,47	5,65	7,95	7,16	7,02	5,82	6,87	0,86	0,54	0,81	4,67	7,99	5,40
1996 / 97	7,79	4,92	5,07	4,98	4,74	4,94	9,41	4,29	2,20	3,85	3,15	3,74	4,92
1997 / 98	3,33	3,04	2,09	3,14	2,81	2,14	0,50	5,31	11,93	17,18	2,87	6,99	5,11
1998 / 99	5,73	4,30	5,68	5,48	5,80	5,03	4,97	4,48	3,57	3,93	3,89	5,29	4,85
1999 / 00	5,97	5,97	5,86	6,39	6,39	5,18	3,95	1,62	0,61	2,68	8,79	9,19	5,22
2000 / 01	5,21	9,98	6,36	0,00	5,03	3,61	0,00	0,06	5,33	14,29	12,50	8,44	5,90
2001 / 02	6,18	3,63	7,90	4,16	2,24	0,49	12,95	10,31	15,26	12,08	12,03	9,18	8,03
2002 / 03	6,38	3,38	10,07	2,72	4,07	3,54	3,68	10,55	18,57	19,63	15,77	12,48	9,24
2003 / 04	7,46	3,98	3,94	5,25	3,58	5,92	8,93	0,24	6,66	11,97	9,01	8,45	6,28
2004 / 05	5,88	5,63	7,30	8,21	6,25	4,25	9,38	2,01	0,00	1,98	1,58	4,21	4,72
2005 / 06													
PROM	8,90	5,49	5,26	4,45	4,10	6,06	10,02	8,01	7,38	10,44	11,13	11,26	7,74

HOYA INTERMEDIA RÍO YESO (entre Embalse y Desembocadura)
CAUDALES MEDIOS MENSUALES Y ANUALES (m³/s)
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	1,61	2,29	1,85	2,12	1,88	2,36	2,98	2,86	2,59	1,45	1,35	0,85	2,02
1951 / 52	1,57	2,05	2,85	3,14	2,94	2,82	3,28	3,31	2,65	1,78	1,11	1,08	2,38
1952 / 53	1,50	2,38	2,56	3,07	2,86	3,07	2,45	2,52	2,29	1,36	1,43	0,75	2,19
1953 / 54	1,92	1,92	2,30	2,58	3,25	4,68	4,13	6,06	4,70	3,18	2,41	1,28	3,20
1954 / 55	2,23	2,44	2,88	4,15	4,07	4,22	5,11	5,11	2,46	1,47	1,24	0,80	3,01
1955 / 56	1,50	2,41	1,95	1,72	1,59	1,69	1,95	3,00	1,65	1,20	1,22	0,61	1,71
1956 / 57	1,78	2,73	2,27	3,10	2,87	2,78	2,86	3,88	1,71	1,03	0,74	0,59	2,20
1957 / 58	1,74	1,85	1,65	2,41	1,69	2,05	3,10	4,08	2,68	2,55	1,82	1,30	2,24
1958 / 59	2,31	3,38	3,46	2,96	1,98	3,32	5,59	2,95	2,31	1,16	1,08	0,92	2,62
1959 / 60	1,52	2,58	2,78	3,29	3,35	3,33	3,31	4,25	3,98	2,01	0,77	0,37	2,63
1960 / 61	1,72	2,64	2,78	2,85	2,96	3,04	3,60	4,09	2,55	1,45	1,05	1,40	2,51
1961 / 62	1,84	3,22	4,29	2,57	4,39	2,87	4,59	5,05	4,21	2,93	2,21	1,10	3,27
1962 / 63	2,13	2,58	2,53	2,66	2,64	2,85	3,64	4,24	2,25	4,79	3,05	0,98	2,86
1963 / 64	1,67	2,25	2,31	2,99	2,66	3,55	5,57	6,56	5,81	1,19	2,38	1,22	3,18
1964 / 65	1,86	2,60	3,80	2,51	1,25	3,55	3,03	2,37	1,50	1,49	1,17	0,34	2,12
1965 / 66	1,15	2,19	2,37	2,40	2,91	3,38	4,74	5,17	5,25	3,35	1,42	1,26	2,97
1966 / 67	2,22	2,41	2,63	3,07	2,00	2,70	2,33	3,73	8,51	1,93	1,84	0,85	2,85
1967 / 68	1,71	2,29	1,15	1,85	1,00	1,57	3,87	2,99	1,95	4,22	2,38	0,67	2,14
1968 / 69	2,75	1,74	0,56	2,09	0,63	0,68	3,26	1,47	0,34	0,42	0,76	0,58	1,27
1969 / 70	0,80	1,37	2,34	1,04	1,30	0,87	3,61	4,66	3,83	1,65	4,22	0,80	2,21
1970 / 71	1,97	1,78	1,50	1,15	0,58	1,94	3,09	5,00	1,55	1,04	0,85	0,25	1,73
1971 / 72	0,92	1,48	1,07	2,07	1,20	0,69	2,90	1,68	2,83	1,74	1,11	0,71	1,53
1972 / 73	0,98	4,09	7,92	5,63	5,21	5,07	6,70	7,91	4,90	7,12	3,76	1,90	5,10
1973 / 74	3,03	2,98	3,58	3,75	2,85	2,57	2,65	3,86	2,85	2,33	1,62	0,97	2,75
1974 / 75	1,65	2,15	2,27	3,33	2,03	2,86	4,93	5,40	3,31	2,75	0,69	1,03	2,70
1975 / 76	1,94	1,92	2,22	2,29	2,06	2,34	2,72	3,56	0,85	1,48	1,14	0,81	1,94
1976 / 77	1,25	1,43	1,94	2,08	1,82	2,33	2,60	3,15	5,81	1,58	1,06	0,68	2,14
1977 / 78	1,29	2,19	2,49	4,19	3,17	4,96	4,58	5,93	4,49	2,93	3,88	1,15	3,44
1978 / 79	1,75	2,32	1,65	9,66	4,12	3,95	2,42	7,08	6,61	5,42	2,96	1,94	4,16
1979 / 80	2,22	2,44	2,00	3,10	2,56	3,56	7,13	4,33	2,00	4,78	1,82	1,34	3,11
1980 / 81	3,69	6,01	5,58	5,44	5,74	4,66	3,41	0,49	2,25	3,01	2,55	1,43	3,69
1981 / 82	2,42	3,56	3,51	3,06	2,82	3,00	3,62	4,08	2,30	1,77	1,30	0,81	2,69
1982 / 83	1,59	2,38	6,41	6,26	4,99	7,13	6,34	7,37	8,98	9,07	6,38	2,96	5,82
1983 / 84	4,01	4,93	4,06	4,31	3,72	3,32	5,28	5,96	4,07	2,82	2,25	1,35	3,84
1984 / 85	2,08	2,62	2,27	3,12	2,62	3,23	5,26	4,86	4,69	4,41	3,18	1,61	3,33
1985 / 86	2,29	4,59	3,38	3,30	2,56	2,42	2,96	4,17	2,68	1,85	1,62	0,91	2,73
1986 / 87	1,74	2,79	11,70	3,82	3,28	4,32	5,40	3,68	4,78	4,05	3,45	1,86	4,24
1987 / 88	2,47	3,09	3,27	5,95	4,97	4,71	5,85	7,74	6,14	5,13	3,94	1,97	4,60
1988 / 89	3,02	3,29	2,96	2,79	2,75	2,90	3,46	4,01	1,94	1,51	1,50	1,14	2,61
1989 / 90	1,45	2,07	2,06	2,09	3,59	4,37	4,19	5,50	3,42	4,66	1,16	0,59	2,93
1990 / 91	2,67	2,59	2,05	3,17	2,41	2,82	2,30	2,00	1,33	1,43	2,22	2,20	2,26
1991 / 92	2,49	4,97	3,88	4,46	3,16	3,77	6,29	6,31	4,30	4,08	1,39	1,69	3,90
1992 / 93	2,03	2,92	4,58	4,75	4,02	5,30	6,40	4,82	4,65	4,74	2,14	1,35	3,98
1993 / 94	3,12	3,28	5,00	4,53	3,01	4,07	4,06	3,61	3,47	3,44	1,92	1,06	3,38
1994 / 95	2,11	2,82	3,26	4,49	3,08	4,01	4,01	4,27	4,06	2,25	1,95	1,24	3,13
1995 / 96	2,49	3,33	3,70	3,07	2,70	3,76	3,74	5,35	3,31	1,63	1,72	0,97	2,98
1996 / 97	1,47	2,05	2,03	1,99	1,90	1,57	2,35	2,87	1,28	0,09	0,65	0,72	1,58
1997 / 98	1,50	1,16	3,92	3,65	3,67	5,28	5,19	6,14	5,72	5,53	4,06	1,79	3,97
1998 / 99	3,04	3,70	3,33	2,83	2,07	1,84	2,82	2,16	1,51	1,14	1,37	0,69	2,21
1999 / 00	1,39	1,81	1,88	1,85	1,62	2,82	4,01	4,35	2,39	1,77	1,19	0,73	2,15
2000 / 01	1,63	2,07	5,03	5,16	2,91	2,95	6,10	5,92	6,17	2,08	3,85	1,59	3,79
2001 / 02	2,84	3,97	3,02	5,05	5,05	5,02	5,73	4,16	5,35	2,55	2,37	1,29	3,87
2002 / 03	2,06	2,89	3,99	3,40	4,06	3,09	3,67	3,95	4,08	3,83	3,26	1,88	3,35
2003 / 04	3,19	3,55	4,38	4,49	3,37	3,99	4,13	4,38	2,65	2,19	2,06	1,10	3,29
2004 / 05	2,32	2,63	2,74	2,75	2,61	3,52	3,54	2,97	2,32	1,89	1,31	1,00	2,47
2005 / 06													
PROM	2,03	2,71	3,16	3,37	2,85	3,26	4,05	4,32	3,50	2,70	2,02	1,14	2,93

CAJÓN LAS CORTADERAS
CAUDALES MEDIOS MENSUALES Y ANUALES (m³/s)
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	0,24	0,28	0,21	0,19	0,19	0,16	0,21	0,18	0,43	0,36	0,20	0,23	0,24
1951 / 52	0,17	0,19	0,19	0,17	0,20	0,19	0,26	0,54	0,63	0,52	0,34	0,44	0,32
1952 / 53	0,29	0,28	0,27	0,25	0,20	0,24	0,30	0,31	0,64	0,54	0,42	0,29	0,33
1953 / 54	0,26	0,32	0,22	0,20	0,21	0,31	0,36	0,63	0,96	1,02	0,85	0,77	0,51
1954 / 55	0,42	0,31	0,29	0,29	0,29	0,28	0,34	0,53	0,45	0,47	0,33	0,29	0,36
1955 / 56	0,15	0,20	0,16	0,17	0,14	0,15	0,22	0,42	0,44	0,39	0,31	0,23	0,25
1956 / 57	0,18	0,26	0,25	0,19	0,20	0,22	0,31	0,34	0,27	0,17	0,51	0,20	0,26
1957 / 58	0,10	0,18	0,19	0,23	0,17	0,19	0,28	0,30	0,89	0,87	0,45	0,25	0,34
1958 / 59	0,17	0,16	0,30	0,14	0,12	0,17	0,76	0,56	0,33	0,30	0,19	0,19	0,28
1959 / 60	0,15	0,27	0,25	0,23	0,24	0,26	0,34	0,53	0,85	0,61	0,31	0,28	0,36
1960 / 61	0,22	0,26	0,24	0,23	0,20	0,22	0,34	0,50	0,69	0,41	0,26	0,31	0,32
1961 / 62	0,38	0,29	0,37	0,27	0,27	0,28	0,55	0,92	1,39	0,89	0,69	0,48	0,56
1962 / 63	0,31	0,33	0,24	0,18	0,20	0,21	0,31	0,52	0,58	0,44	0,20	0,11	0,30
1963 / 64	0,14	0,29	0,21	0,12	0,09	0,14	0,32	0,30	1,23	1,67	1,11	0,58	0,52
1964 / 65	0,41	0,44	0,28	0,25	0,22	0,24	0,27	0,19	0,13	0,16	0,28	0,26	0,26
1965 / 66	0,22	0,29	0,25	0,18	0,24	0,29	0,44	0,52	0,57	1,02	0,82	0,50	0,44
1966 / 67	0,31	0,32	0,34	0,19	0,16	0,22	0,46	0,75	0,55	0,98	0,70	0,48	0,46
1967 / 68	0,36	0,23	0,19	0,16	0,16	0,18	0,21	0,13	0,24	0,15	0,17	0,15	0,19
1968 / 69	0,11	0,14	0,12	0,10	0,07	0,11	0,11	0,06	0,14	0,14	0,01	0,07	0,10
1969 / 70	0,06	0,11	0,13	0,11	0,09	0,18	0,38	0,26	0,85	0,62	0,42	0,14	0,28
1970 / 71	0,18	0,18	0,17	0,21	0,13	0,17	0,28	0,24	0,25	0,12	0,16	0,16	0,19
1971 / 72	0,11	0,13	0,11	0,15	0,12	0,18	0,35	0,57	0,60	0,44	0,25	0,14	0,26
1972 / 73	0,24	0,26	0,19	0,12	0,18	0,17	0,34	0,40	1,19	2,10	1,70	1,16	0,67
1973 / 74	0,66	0,50	0,33	0,30	0,22	0,25	0,38	0,47	0,51	0,72	0,49	0,36	0,43
1974 / 75	0,22	0,30	0,32	0,20	0,18	0,26	0,46	0,53	0,50	0,81	0,45	0,34	0,38
1975 / 76	0,26	0,29	0,20	0,20	0,18	0,26	0,42	0,28	0,48	0,36	0,26	0,24	0,29
1976 / 77	0,16	0,19	0,18	0,16	0,13	0,17	0,17	0,26	0,26	0,32	0,37	0,33	0,23
1977 / 78	0,19	0,21	0,20	0,18	0,16	0,22	0,48	0,78	1,33	1,02	0,60	0,40	0,48
1978 / 79	0,27	0,27	0,23	0,29	0,22	0,20	0,38	0,58	1,45	1,78	1,03	0,55	0,60
1979 / 80	0,30	0,35	0,29	0,21	0,19	0,16	0,30	0,29	0,46	1,05	0,68	0,60	0,41
1980 / 81	0,41	0,48	0,38	0,35	0,33	0,39	0,48	0,60	1,41	1,06	0,91	0,60	0,62
1981 / 82	0,34	0,35	0,26	0,23	0,22	0,24	0,37	0,38	0,45	0,45	0,35	0,26	0,32
1982 / 83	0,19	0,24	0,33	0,43	0,22	0,26	0,36	0,70	1,72	0,62	1,94	1,14	0,68
1983 / 84	0,64	0,50	0,39	0,38	0,32	0,23	0,43	0,62	1,05	0,87	0,59	0,32	0,53
1984 / 85	0,17	0,23	0,32	0,22	0,25	0,27	0,51	0,55	0,94	1,11	0,82	0,64	0,50
1985 / 86	0,42	0,46	0,39	0,26	0,22	0,31	0,38	0,50	0,60	0,72	0,40	0,33	0,41
1986 / 87	0,27	0,26	0,48	0,31	0,23	0,29	0,48	0,53	1,42	1,51	1,13	0,75	0,64
1987 / 88	0,41	0,42	0,39	0,46	0,39	0,35	0,45	0,98	1,61	1,76	1,14	0,79	0,76
1988 / 89	0,50	0,48	0,37	0,28	0,22	0,28	0,43	0,39	0,37	0,25	0,34	0,20	0,34
1989 / 90	0,23	0,23	0,17	0,15	0,18	0,16	0,32	0,25	0,49	0,35	0,22	0,19	0,25
1990 / 91	0,15	0,13	0,17	0,09	0,12	0,16	0,22	0,29	0,39	0,33	0,22	0,20	0,21
1991 / 92	0,10	0,30	0,27	0,27	0,25	0,37	0,30	0,50	0,73	1,26	0,91	0,63	0,49
1992 / 93	0,35	0,31	0,22	0,15	0,11	0,18	0,42	0,58	0,76	0,79	0,62	0,44	0,41
1993 / 94	0,31	0,38	0,22	0,15	0,11	0,14	0,32	0,41	0,69	0,77	0,36	0,31	0,35
1994 / 95	0,18	0,22	0,10	0,11	0,06	0,14	0,24	0,60	0,92	0,57	0,30	0,20	0,30
1995 / 96	0,12	0,16	0,11	0,07	0,07	0,15	0,20	0,46	0,69	0,39	0,19	0,11	0,23
1996 / 97	0,14	0,10	0,08	0,07	0,05	0,05	0,04	0,14	0,14	0,14	0,00	0,03	0,08
1997 / 98	0,03	0,08	0,13	0,08	0,12	0,16	0,24	0,39	0,80	1,16	0,66	0,35	0,35
1998 / 99	0,25	0,24	0,18	0,11	0,08	0,08	0,18	0,08	0,15	0,13	0,15	0,07	0,14
1999 / 00	0,12	0,05	0,04	0,04	0,06	0,09	0,26	0,37	0,38	0,37	0,12	0,06	0,16
2000 / 01	0,04	0,02	0,15	0,21	0,08	0,10	0,44	0,50	1,12	0,93	0,67	0,41	0,39
2001 / 02	0,23	0,26	0,14	0,23	0,22	0,20	0,24	0,34	1,12	0,77	0,52	0,38	0,39
2002 / 03	0,15	0,28	0,32	0,20	0,22	0,14	0,27	0,53	0,93	1,18	0,91	0,60	0,48
2003 / 04	0,30	0,31	0,26	0,15	0,16	0,13	0,31	0,46	0,40	0,41	0,26	0,18	0,28
2004 / 05	0,10	0,11	0,10	0,05	0,05	0,15	0,12	0,16	0,28	0,35	0,25	0,15	0,16
2005 / 06													
PROM	0,24	0,26	0,23	0,20	0,18	0,21	0,33	0,44	0,71	0,70	0,52	0,36	0,37

HOYA INTERMEDIA RÍO YESO (entre Embalse y Cajón Las Cortaderas inclusive)
CAUDALES MEDIOS MENSUALES Y ANUALES (m³/s)
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	0,75	1,06	0,86	0,99	0,87	1,10	1,38	1,33	1,20	0,67	0,62	0,40	0,94
1951 / 52	0,73	0,95	1,33	1,46	1,37	1,31	1,53	1,54	1,23	0,83	0,52	0,50	1,11
1952 / 53	0,70	1,10	1,19	1,43	1,33	1,42	1,14	1,17	1,07	0,63	0,66	0,35	1,02
1953 / 54	0,89	0,89	1,07	1,20	1,51	2,17	1,92	2,82	2,18	1,48	1,12	0,59	1,49
1954 / 55	1,04	1,13	1,34	1,93	1,89	1,96	2,37	2,37	1,14	0,68	0,57	0,37	1,40
1955 / 56	0,70	1,12	0,91	0,80	0,74	0,79	0,90	1,39	0,77	0,56	0,57	0,28	0,79
1956 / 57	0,82	1,27	1,05	1,44	1,34	1,29	1,33	1,80	0,79	0,48	0,35	0,27	1,02
1957 / 58	0,81	0,86	0,77	1,12	0,78	0,95	1,44	1,89	1,24	1,18	0,85	0,60	1,04
1958 / 59	1,07	1,57	1,61	1,38	0,92	1,54	2,60	1,37	1,08	0,54	0,50	0,43	1,22
1959 / 60	0,71	1,20	1,29	1,53	1,56	1,55	1,54	1,98	1,85	0,93	0,36	0,17	1,22
1960 / 61	0,80	1,23	1,29	1,33	1,37	1,41	1,67	1,90	1,18	0,68	0,49	0,65	1,17
1961 / 62	0,86	1,49	1,99	1,19	2,04	1,33	2,13	2,34	1,96	1,36	1,03	0,51	1,52
1962 / 63	0,99	1,20	1,18	1,24	1,23	1,32	1,69	1,97	1,05	2,23	1,42	0,46	1,33
1963 / 64	0,78	1,05	1,07	1,39	1,24	1,65	2,59	3,05	2,70	0,55	1,11	0,57	1,48
1964 / 65	0,87	1,21	1,76	1,16	0,58	1,65	1,41	1,10	0,69	0,69	0,55	0,16	0,99
1965 / 66	0,53	1,02	1,10	1,11	1,35	1,57	2,20	2,40	2,44	1,56	0,66	0,59	1,38
1966 / 67	1,03	1,12	1,22	1,43	0,93	1,25	1,08	1,73	3,95	0,90	0,86	0,39	1,33
1967 / 68	0,80	1,07	0,53	0,86	0,46	0,73	1,80	1,39	0,91	1,96	1,11	0,31	0,99
1968 / 69	1,28	0,81	0,26	0,97	0,29	0,31	1,52	0,68	0,16	0,20	0,35	0,27	0,59
1969 / 70	0,37	0,64	1,09	0,48	0,60	0,41	1,68	2,16	1,78	0,77	1,96	0,37	1,03
1970 / 71	0,91	0,83	0,70	0,53	0,27	0,90	1,43	2,32	0,72	0,48	0,39	0,12	0,80
1971 / 72	0,43	0,69	0,50	0,96	0,56	0,32	1,35	0,78	1,31	0,81	0,51	0,33	0,71
1972 / 73	0,46	1,90	3,68	2,62	2,42	2,36	3,11	3,67	2,28	3,31	1,75	0,88	2,37
1973 / 74	1,41	1,38	1,66	1,74	1,33	1,19	1,23	1,79	1,32	1,08	0,75	0,45	1,28
1974 / 75	0,76	1,00	1,05	1,55	0,94	1,33	2,29	2,51	1,54	1,28	0,32	0,48	1,25
1975 / 76	0,90	0,89	1,03	1,06	0,96	1,09	1,27	1,65	0,40	0,69	0,53	0,38	0,90
1976 / 77	0,58	0,67	0,90	0,97	0,84	1,08	1,21	1,47	2,70	0,73	0,49	0,31	1,00
1977 / 78	0,60	1,02	1,16	1,94	1,47	2,31	2,13	2,75	2,09	1,36	1,80	0,54	1,60
1978 / 79	0,81	1,08	0,77	4,49	1,91	1,84	1,13	3,29	3,07	2,52	1,37	0,90	1,93
1979 / 80	1,03	1,13	0,93	1,44	1,19	1,65	3,31	2,01	0,93	2,22	0,85	0,62	1,44
1980 / 81	1,72	2,79	2,59	2,53	2,67	2,17	1,58	0,23	1,04	1,40	1,19	0,66	1,71
1981 / 82	1,12	1,66	1,63	1,42	1,31	1,39	1,68	1,90	1,07	0,82	0,60	0,38	1,25
1982 / 83	0,74	1,10	2,98	2,91	2,32	3,31	2,94	3,42	4,17	4,21	2,96	1,38	2,70
1983 / 84	1,86	2,29	1,89	2,00	1,73	1,54	2,46	2,77	1,89	1,31	1,05	0,63	1,78
1984 / 85	0,97	1,22	1,05	1,45	1,22	1,50	2,44	2,26	2,18	2,05	1,48	0,75	1,55
1985 / 86	1,07	2,13	1,57	1,53	1,19	1,13	1,37	1,94	1,25	0,86	0,75	0,42	1,27
1986 / 87	0,81	1,29	5,44	1,77	1,53	2,01	2,51	1,71	2,22	1,88	1,60	0,87	1,97
1987 / 88	1,15	1,43	1,52	2,76	2,31	2,19	2,72	3,60	2,85	2,38	1,83	0,91	2,14
1988 / 89	1,40	1,53	1,38	1,30	1,28	1,35	1,61	1,87	0,90	0,70	0,70	0,53	1,21
1989 / 90	0,67	0,96	0,96	0,97	1,67	2,03	1,95	2,56	1,59	2,17	0,54	0,27	1,36
1990 / 91	1,24	1,20	0,95	1,47	1,12	1,31	1,07	0,93	0,62	0,66	1,03	1,02	1,05
1991 / 92	1,15	2,31	1,80	2,07	1,47	1,75	2,92	2,93	2,00	1,89	0,64	0,78	1,81
1992 / 93	0,94	1,36	2,13	2,21	1,87	2,46	2,97	2,24	2,16	2,20	0,99	0,63	1,85
1993 / 94	1,45	1,52	2,32	2,11	1,40	1,89	1,89	1,68	1,61	1,60	0,89	0,49	1,57
1994 / 95	0,98	1,31	1,51	2,08	1,43	1,86	1,86	1,98	1,89	1,05	0,91	0,58	1,45
1995 / 96	1,15	1,55	1,72	1,43	1,26	1,75	1,74	2,49	1,54	0,76	0,80	0,45	1,38
1996 / 97	0,68	0,95	0,94	0,93	0,88	0,73	1,09	1,33	0,59	0,04	0,30	0,33	0,73
1997 / 98	0,70	0,54	1,82	1,70	1,70	2,45	2,41	2,85	2,66	2,57	1,89	0,83	1,84
1998 / 99	1,41	1,72	1,55	1,31	0,96	0,86	1,31	1,01	0,70	0,53	0,64	0,32	1,03
1999 / 00	0,64	0,84	0,87	0,86	0,75	1,31	1,86	2,02	1,11	0,82	0,55	0,34	1,00
2000 / 01	0,76	0,96	2,34	2,40	1,35	1,37	2,84	2,75	2,87	0,97	1,79	0,74	1,76
2001 / 02	1,32	1,84	1,40	2,35	2,35	2,33	2,66	1,93	2,49	1,18	1,10	0,60	1,80
2002 / 03	0,96	1,34	1,85	1,58	1,89	1,43	1,71	1,83	1,89	1,78	1,52	0,87	1,55
2003 / 04	1,48	1,65	2,03	2,09	1,57	1,86	1,92	2,03	1,23	1,02	0,96	0,51	1,53
2004 / 05	1,08	1,22	1,27	1,28	1,21	1,64	1,65	1,38	1,08	0,88	0,61	0,47	1,15
2005 / 06													
PROM	0,94	1,26	1,47	1,57	1,32	1,52	1,88	2,01	1,62	1,26	0,94	0,53	1,36

HOYA INTERMEDIA RÍO YESO (entre Cajón Las Cortaderas y Desembocadura) descontado estero Cortaderas
CAUDALES MEDIOS MENSUALES Y ANUALES (m³/s)
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	0,86	1,23	0,99	1,14	1,01	1,26	1,59	1,53	1,39	0,78	0,72	0,46	1,08
1951 / 52	0,84	1,10	1,53	1,68	1,57	1,51	1,76	1,77	1,42	0,95	0,59	0,58	1,28
1952 / 53	0,80	1,27	1,37	1,65	1,53	1,64	1,31	1,35	1,23	0,73	0,76	0,40	1,17
1953 / 54	1,03	1,03	1,23	1,38	1,74	2,51	2,21	3,24	2,52	1,70	1,29	0,68	1,71
1954 / 55	1,19	1,30	1,54	2,22	2,18	2,26	2,74	2,74	1,31	0,78	0,66	0,43	1,61
1955 / 56	0,80	1,29	1,05	0,92	0,85	0,91	1,04	1,60	0,88	0,64	0,66	0,33	0,91
1956 / 57	0,95	1,46	1,22	1,66	1,54	1,49	1,53	2,08	0,91	0,55	0,40	0,32	1,18
1957 / 58	0,93	0,99	0,89	1,29	0,90	1,10	1,66	2,18	1,43	1,36	0,98	0,70	1,20
1958 / 59	1,24	1,81	1,85	1,59	1,06	1,78	2,99	1,58	1,24	0,62	0,58	0,49	1,40
1959 / 60	0,81	1,38	1,49	1,76	1,80	1,78	1,77	2,28	2,13	1,08	0,41	0,20	1,41
1960 / 61	0,92	1,41	1,49	1,53	1,58	1,63	1,93	2,19	1,36	0,78	0,56	0,75	1,34
1961 / 62	0,99	1,72	2,30	1,37	2,35	1,54	2,45	2,70	2,25	1,57	1,18	0,59	1,75
1962 / 63	1,14	1,38	1,35	1,42	1,41	1,53	1,95	2,27	1,21	2,57	1,64	0,53	1,53
1963 / 64	0,89	1,20	1,24	1,60	1,43	1,90	2,98	3,51	3,11	0,64	1,27	0,66	1,70
1964 / 65	1,00	1,39	2,03	1,34	0,67	1,90	1,62	1,27	0,80	0,80	0,63	0,18	1,14
1965 / 66	0,62	1,17	1,27	1,28	1,56	1,81	2,54	2,77	2,81	1,80	0,76	0,67	1,59
1966 / 67	1,19	1,29	1,41	1,65	1,07	1,44	1,25	2,00	4,56	1,03	0,99	0,45	1,53
1967 / 68	0,92	1,23	0,62	0,99	0,53	0,84	2,07	1,60	1,05	2,26	1,27	0,36	1,15
1968 / 69	1,47	0,93	0,30	1,12	0,34	0,36	1,75	0,79	0,18	0,23	0,41	0,31	0,68
1969 / 70	0,43	0,73	1,25	0,56	0,70	0,47	1,93	2,49	2,05	0,89	2,26	0,43	1,18
1970 / 71	1,05	0,96	0,80	0,61	0,31	1,04	1,65	2,68	0,83	0,56	0,45	0,14	0,92
1971 / 72	0,49	0,79	0,57	1,11	0,64	0,37	1,55	0,90	1,51	0,93	0,59	0,38	0,82
1972 / 73	0,53	2,19	4,24	3,01	2,79	2,71	3,59	4,23	2,62	3,81	2,01	1,02	2,73
1973 / 74	1,62	1,59	1,91	2,01	1,53	1,37	1,42	2,07	1,52	1,25	0,86	0,52	1,47
1974 / 75	0,88	1,15	1,21	1,78	1,09	1,53	2,64	2,89	1,77	1,47	0,37	0,55	1,45
1975 / 76	1,04	1,03	1,19	1,22	1,10	1,25	1,46	1,90	0,46	0,79	0,61	0,43	1,04
1976 / 77	0,67	0,77	1,04	1,12	0,97	1,25	1,39	1,69	3,11	0,85	0,57	0,36	1,15
1977 / 78	0,69	1,17	1,33	2,24	1,70	2,66	2,45	3,17	2,40	1,57	2,08	0,62	1,84
1978 / 79	0,94	1,24	0,89	5,17	2,20	2,12	1,30	3,79	3,54	2,90	1,58	1,04	2,23
1979 / 80	1,19	1,30	1,07	1,66	1,37	1,91	3,81	2,32	1,07	2,56	0,98	0,72	1,66
1980 / 81	1,98	3,22	2,99	2,91	3,07	2,50	1,82	0,26	1,20	1,61	1,37	0,77	1,97
1981 / 82	1,29	1,91	1,88	1,64	1,51	1,61	1,94	2,18	1,23	0,95	0,69	0,44	1,44
1982 / 83	0,85	1,27	3,43	3,35	2,67	3,82	3,39	3,95	4,81	4,86	3,42	1,59	3,12
1983 / 84	2,15	2,64	2,17	2,31	1,99	1,78	2,83	3,19	2,18	1,51	1,21	0,72	2,06
1984 / 85	1,11	1,40	1,21	1,67	1,40	1,73	2,81	2,60	2,51	2,36	1,70	0,86	1,78
1985 / 86	1,23	2,46	1,81	1,77	1,37	1,30	1,58	2,23	1,44	0,99	0,87	0,49	1,46
1986 / 87	0,93	1,49	6,26	2,04	1,76	2,32	2,89	1,97	2,56	2,17	1,85	1,00	2,27
1987 / 88	1,32	1,65	1,75	3,18	2,66	2,52	3,13	4,14	3,29	2,75	2,11	1,05	2,46
1988 / 89	1,62	1,76	1,59	1,49	1,47	1,55	1,85	2,15	1,04	0,81	0,80	0,61	1,40
1989 / 90	0,78	1,11	1,10	1,12	1,92	2,34	2,25	2,95	1,83	2,49	0,62	0,31	1,57
1990 / 91	1,43	1,38	1,10	1,69	1,29	1,51	1,23	1,07	0,71	0,77	1,19	1,18	1,21
1991 / 92	1,33	2,66	2,07	2,39	1,69	2,02	3,37	3,38	2,30	2,18	0,74	0,90	2,09
1992 / 93	1,08	1,56	2,45	2,54	2,15	2,84	3,43	2,58	2,49	2,54	1,15	0,72	2,13
1993 / 94	1,67	1,75	2,68	2,43	1,61	2,18	2,17	1,93	1,86	1,84	1,03	0,57	1,81
1994 / 95	1,13	1,51	1,74	2,40	1,65	2,15	2,15	2,29	2,17	1,20	1,04	0,67	1,68
1995 / 96	1,33	1,78	1,98	1,65	1,45	2,01	2,00	2,86	1,77	0,87	0,92	0,52	1,60
1996 / 97	0,79	1,10	1,09	1,07	1,02	0,84	1,26	1,54	0,68	0,05	0,35	0,38	0,85
1997 / 98	0,81	0,62	2,10	1,95	1,96	2,83	2,78	3,29	3,06	2,96	2,17	0,96	2,12
1998 / 99	1,63	1,98	1,78	1,51	1,11	0,99	1,51	1,16	0,81	0,61	0,73	0,37	1,18
1999 / 00	0,74	0,97	1,01	0,99	0,87	1,51	2,15	2,33	1,28	0,95	0,64	0,39	1,15
2000 / 01	0,87	1,11	2,70	2,76	1,56	1,58	3,27	3,17	3,30	1,11	2,06	0,85	2,03
2001 / 02	1,52	2,13	1,62	2,70	2,70	2,68	3,07	2,23	2,86	1,36	1,27	0,69	2,07
2002 / 03	1,10	1,54	2,14	1,82	2,18	1,65	1,97	2,11	2,18	2,05	1,75	1,01	1,79
2003 / 04	1,71	1,90	2,34	2,40	1,81	2,14	2,21	2,34	1,42	1,17	1,10	0,59	1,76
2004 / 05	1,24	1,41	1,47	1,47	1,40	1,88	1,90	1,59	1,24	1,01	0,70	0,54	1,32
2005 / 06													
PROM	1,09	1,45	1,69	1,81	1,52	1,75	2,17	2,31	1,87	1,45	1,08	0,61	1,57

AFLUENTES CUENCA LAGUNA NEGRA
CAUDALES MEDIOS MENSUALES Y ANUALES (m³/s)
RÉGIMEN NATURAL

AÑO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	QMA
1950 / 51	0,47	0,61	0,57	1,33	1,16	0,68	0,71	0,52	0,57	0,55	0,49	0,57	0,68
1951 / 52	0,55	0,75	1,60	1,89	1,61	1,08	1,34	0,86	0,81	0,79	0,71	0,57	1,05
1952 / 53	0,69	0,88	0,93	1,93	1,67	1,30	0,90	0,79	0,94	0,65	0,57	0,60	0,99
1953 / 54	0,89	1,05	1,85	2,85	3,06	2,56	2,27	1,24	0,90	0,85	0,85	0,83	1,60
1954 / 55	0,81	0,98	1,57	1,37	1,47	1,05	0,88	0,45	0,59	0,47	0,49	0,41	0,88
1955 / 56	0,45	0,63	1,25	1,35	1,23	1,00	0,72	0,54	0,75	0,71	0,55	0,57	0,81
1956 / 57	0,65	0,90	1,02	0,87	0,60	1,58	0,64	0,31	0,53	0,55	0,67	0,51	0,73
1957 / 58	0,55	0,81	0,92	2,65	2,61	1,38	0,78	0,51	0,47	0,88	0,41	0,34	1,02
1958 / 59	0,51	2,20	1,67	1,04	0,96	0,63	0,59	0,45	0,78	0,71	0,68	0,69	0,91
1959 / 60	0,76	1,00	1,56	2,53	1,87	0,99	0,86	0,65	0,75	0,69	0,68	0,58	1,08
1960 / 61	0,64	0,99	1,47	2,07	1,28	0,85	0,94	1,12	0,85	1,08	0,80	0,77	1,07
1961 / 62	0,82	1,60	2,69	4,11	2,68	2,08	1,45	0,92	0,98	0,69	0,53	0,57	1,59
1962 / 63	0,61	0,90	1,55	1,77	1,39	0,66	0,37	0,44	0,84	0,61	0,34	0,26	0,81
1963 / 64	0,41	0,92	0,92	3,65	4,95	3,31	1,74	1,23	1,28	0,81	0,71	0,65	1,71
1964 / 65	0,69	0,77	0,58	0,45	0,58	0,91	0,79	0,67	0,84	0,73	0,53	0,69	0,69
1965 / 66	0,83	1,28	1,53	1,71	3,07	2,45	1,50	0,91	0,94	0,98	0,56	0,48	1,35
1966 / 67	0,65	1,34	2,20	1,68	2,93	2,12	1,44	1,06	0,67	0,56	0,47	0,45	1,30
1967 / 68	0,51	0,61	0,43	0,78	0,53	0,58	0,50	0,34	0,40	0,34	0,28	0,21	0,46
1968 / 69	0,31	0,31	0,20	0,48	0,51	0,12	0,24	0,19	0,32	0,39	0,32	0,27	0,31
1969 / 70	0,52	1,11	0,78	2,55	1,90	1,30	0,44	0,54	0,54	0,51	0,60	0,37	0,93
1970 / 71	0,50	0,81	0,74	0,80	0,46	0,56	0,50	0,34	0,40	0,33	0,45	0,36	0,52
1971 / 72	0,53	1,02	1,69	1,80	1,37	0,81	0,47	0,71	0,75	0,55	0,36	0,52	0,88
1972 / 73	0,49	0,99	1,19	3,54	6,20	5,03	3,43	1,95	1,47	0,97	0,86	0,64	2,23
1973 / 74	0,73	1,11	1,39	1,56	2,18	1,52	1,08	0,68	0,87	0,94	0,59	0,52	1,10
1974 / 75	0,75	1,33	1,58	1,52	2,46	1,40	1,03	0,79	0,84	0,58	0,58	0,54	1,12
1975 / 76	0,77	1,22	0,84	1,47	1,16	0,84	0,75	0,49	0,56	0,53	0,46	0,39	0,79
1976 / 77	0,50	0,50	0,78	0,82	1,02	1,15	1,02	0,59	0,63	0,59	0,52	0,47	0,72
1977 / 78	0,64	1,38	2,30	3,93	3,05	1,82	1,21	0,80	0,80	0,67	0,84	0,65	1,51
1978 / 79	0,58	1,10	1,72	4,30	5,27	3,07	1,65	0,88	1,02	0,85	0,62	0,56	1,80
1979 / 80	0,46	0,87	0,87	1,40	3,16	2,07	1,79	1,20	1,39	1,11	1,03	0,95	1,36
1980 / 81	1,14	1,41	1,78	4,15	3,17	2,72	1,78	1,01	1,02	0,75	0,67	0,63	1,69
1981 / 82	0,69	1,07	1,13	1,37	1,41	1,11	0,80	0,59	0,71	0,95	1,25	0,65	0,98
1982 / 83	0,76	1,04	2,06	5,07	1,91	5,73	3,36	1,90	1,44	1,13	1,09	0,92	2,20
1983 / 84	0,66	1,24	1,85	3,12	2,61	1,80	0,97	0,52	0,67	0,94	0,64	0,74	1,31
1984 / 85	0,79	1,48	1,64	2,80	3,32	2,47	1,92	1,23	1,34	1,13	0,74	0,62	1,62
1985 / 86	0,91	1,11	1,48	1,82	2,18	1,25	1,01	0,80	0,77	1,40	0,90	0,68	1,19
1986 / 87	0,85	1,39	1,57	4,21	4,50	3,37	2,22	1,21	1,22	1,12	1,33	1,12	2,01
1987 / 88	1,03	1,31	2,87	4,74	5,20	3,41	2,34	1,49	1,39	1,06	0,82	0,63	2,19
1988 / 89	0,80	1,25	1,16	1,15	0,81	1,08	0,62	0,69	0,66	0,48	0,43	0,53	0,81
1989 / 90	0,48	0,93	0,76	1,50	1,13	0,74	0,61	0,46	0,37	0,49	0,26	0,36	0,67
1990 / 91	0,46	0,63	0,87	1,21	1,06	0,73	0,62	0,31	0,87	0,77	0,79	0,73	0,76
1991 / 92	1,09	0,88	1,50	2,19	3,75	2,73	1,88	1,04	0,91	0,63	0,43	0,31	1,44
1992 / 93	0,54	1,23	1,73	2,29	2,41	1,89	1,31	0,91	1,10	0,63	0,43	0,33	1,23
1993 / 94	0,41	0,92	1,22	2,09	2,33	1,14	0,96	0,54	0,65	0,28	0,33	0,17	0,92
1994 / 95	0,41	0,70	1,76	2,73	1,74	0,97	0,63	0,38	0,46	0,31	0,19	0,22	0,87
1995 / 96	0,42	0,59	1,37	2,06	1,23	0,65	0,35	0,43	0,30	0,23	0,20	0,15	0,67
1996 / 97	0,14	0,12	0,44	0,48	0,51	0,10	0,15	0,11	0,24	0,37	0,23	0,33	0,27
1997 / 98	0,45	0,69	1,15	2,39	3,48	2,00	1,06	0,76	0,70	0,52	0,31	0,22	1,14
1998 / 99	0,24	0,53	0,28	0,52	0,48	0,51	0,26	0,38	0,15	0,13	0,12	0,16	0,31
1999 / 00	0,25	0,75	1,09	1,17	1,18	0,44	0,23	0,13	0,08	0,42	0,62	0,23	0,55
2000 / 01	0,30	1,28	1,47	3,34	2,79	2,04	1,23	0,69	0,75	0,39	0,67	0,64	1,30
2001 / 02	0,57	0,69	1,01	3,31	2,35	1,59	1,15	0,46	0,83	0,93	0,58	0,65	1,18
2002 / 03	0,40	0,78	1,58	2,76	3,52	2,73	1,79	0,89	0,92	0,74	0,44	0,45	1,42
2003 / 04	0,39	0,90	1,36	1,23	1,29	0,84	0,56	0,32	0,32	0,29	0,15	0,14	0,65
2004 / 05	0,43	0,36	0,50	0,89	1,13	0,82	0,48	0,22	0,40	0,76	0,73	0,89	0,63
2005 / 06	1,02	1,30	2,86	4,71	5,17	3,39	2,33	1,48	1,39	1,06	0,82	0,62	2,18

PROM	0,61	0,97	1,34	2,17	2,20	1,63	1,12	0,73	0,77	0,69	0,58	0,52	1,11
MAX	1,14	2,20	2,87	5,07	6,20	5,73	3,43	1,95	1,47	1,40	1,33	1,12	2,23
MIN	0,14	0,12	0,20	0,45	0,46	0,10	0,15	0,11	0,08	0,13	0,12	0,14	0,27

AFLUENTES CUENCA LAGUNA LO ENCAÑADO
CAUDALES MEDIOS MENSUALES Y ANUALES (m³/s)
RÉGIMEN NATURAL

AÑO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	QMA
1950 / 51	0,30	0,39	0,34	0,80	0,68	0,38	0,42	0,32	0,36	0,35	0,31	0,36	0,42
1951 / 52	0,35	0,48	1,00	1,16	0,97	0,64	0,82	0,53	0,52	0,51	0,45	0,36	0,65
1952 / 53	0,44	0,56	0,57	1,18	1,00	0,77	0,54	0,49	0,59	0,42	0,36	0,38	0,61
1953 / 54	0,57	0,67	1,16	1,77	1,89	1,58	1,42	0,78	0,57	0,55	0,55	0,53	1,00
1954 / 55	0,52	0,62	0,98	0,83	0,88	0,61	0,53	0,27	0,37	0,30	0,31	0,26	0,54
1955 / 56	0,29	0,40	0,78	0,81	0,72	0,58	0,43	0,33	0,48	0,45	0,35	0,36	0,50
1956 / 57	0,42	0,57	0,63	0,51	0,32	0,95	0,38	0,18	0,33	0,35	0,43	0,32	0,45
1957 / 58	0,35	0,52	0,56	1,64	1,61	0,83	0,47	0,31	0,29	0,56	0,26	0,22	0,63
1958 / 59	0,32	1,41	1,05	0,62	0,55	0,35	0,35	0,27	0,50	0,46	0,43	0,44	0,56
1959 / 60	0,49	0,64	0,98	1,57	1,13	0,58	0,52	0,40	0,47	0,44	0,43	0,37	0,67
1960 / 61	0,41	0,63	0,92	1,28	0,75	0,49	0,57	0,70	0,54	0,69	0,51	0,49	0,66
1961 / 62	0,52	1,02	1,70	2,58	1,65	1,27	0,89	0,57	0,62	0,44	0,34	0,36	1,00
1962 / 63	0,39	0,57	0,97	1,08	0,82	0,37	0,21	0,26	0,53	0,39	0,22	0,17	0,50
1963 / 64	0,26	0,58	0,56	2,28	3,10	2,06	1,08	0,77	0,82	0,52	0,45	0,42	1,08
1964 / 65	0,44	0,49	0,35	0,24	0,31	0,52	0,48	0,41	0,53	0,47	0,34	0,44	0,42
1965 / 66	0,53	0,82	0,96	1,05	1,90	1,51	0,93	0,57	0,59	0,62	0,36	0,30	0,85
1966 / 67	0,41	0,86	1,38	1,03	1,81	1,30	0,89	0,66	0,42	0,36	0,30	0,29	0,81
1967 / 68	0,33	0,39	0,25	0,45	0,27	0,31	0,29	0,20	0,25	0,22	0,18	0,14	0,27
1968 / 69	0,20	0,20	0,11	0,26	0,26	0,02	0,13	0,11	0,20	0,25	0,20	0,17	0,18
1969 / 70	0,33	0,71	0,48	1,58	1,15	0,77	0,25	0,33	0,34	0,32	0,38	0,24	0,57
1970 / 71	0,32	0,52	0,45	0,46	0,23	0,30	0,29	0,20	0,25	0,21	0,29	0,23	0,31
1971 / 72	0,34	0,65	1,06	1,10	0,81	0,46	0,27	0,44	0,48	0,35	0,23	0,33	0,54
1972 / 73	0,31	0,63	0,74	2,21	3,89	3,16	2,16	1,23	0,93	0,62	0,55	0,41	1,40
1973 / 74	0,47	0,71	0,87	0,95	1,33	0,92	0,66	0,42	0,55	0,60	0,38	0,33	0,68
1974 / 75	0,48	0,85	0,99	0,92	1,50	0,84	0,63	0,49	0,53	0,37	0,37	0,34	0,69
1975 / 76	0,49	0,78	0,52	0,89	0,68	0,48	0,45	0,30	0,36	0,34	0,29	0,25	0,48
1976 / 77	0,32	0,32	0,48	0,48	0,59	0,68	0,62	0,36	0,40	0,38	0,33	0,30	0,44
1977 / 78	0,41	0,88	1,45	2,46	1,89	1,11	0,74	0,49	0,51	0,43	0,54	0,42	0,94
1978 / 79	0,37	0,70	1,08	2,70	3,30	1,90	1,03	0,55	0,65	0,55	0,40	0,36	1,13
1979 / 80	0,29	0,56	0,53	0,85	1,95	1,26	1,12	0,75	0,88	0,71	0,66	0,61	0,85
1980 / 81	0,73	0,90	1,11	2,61	1,96	1,68	1,11	0,63	0,65	0,48	0,43	0,40	1,06
1981 / 82	0,44	0,68	0,70	0,83	0,83	0,65	0,48	0,36	0,45	0,61	0,80	0,41	0,60
1982 / 83	0,49	0,66	1,29	3,19	1,15	3,60	2,12	1,20	0,92	0,72	0,70	0,59	1,39
1983 / 84	0,42	0,79	1,16	1,94	1,60	1,09	0,59	0,31	0,42	0,60	0,41	0,47	0,82
1984 / 85	0,51	0,95	1,03	1,74	2,06	1,52	1,19	0,77	0,85	0,72	0,47	0,40	1,02
1985 / 86	0,58	0,71	0,92	1,11	1,33	0,74	0,62	0,49	0,49	0,90	0,57	0,43	0,74
1986 / 87	0,54	0,89	0,98	2,64	2,81	2,09	1,39	0,75	0,78	0,72	0,85	0,71	1,26
1987 / 88	0,66	0,84	1,81	2,98	3,25	2,12	1,46	0,94	0,89	0,68	0,52	0,40	1,38
1988 / 89	0,51	0,80	0,72	0,69	0,45	0,64	0,36	0,43	0,42	0,31	0,28	0,34	0,50
1989 / 90	0,30	0,59	0,47	0,91	0,66	0,41	0,36	0,28	0,23	0,32	0,17	0,23	0,41
1990 / 91	0,29	0,41	0,54	0,72	0,61	0,41	0,37	0,18	0,55	0,49	0,50	0,46	0,46
1991 / 92	0,69	0,56	0,93	1,35	2,33	1,69	1,17	0,65	0,58	0,40	0,28	0,20	0,90
1992 / 93	0,34	0,79	1,08	1,41	1,47	1,15	0,81	0,57	0,70	0,40	0,27	0,21	0,77
1993 / 94	0,26	0,59	0,76	1,29	1,42	0,67	0,58	0,33	0,41	0,18	0,21	0,11	0,57
1994 / 95	0,26	0,45	1,10	1,70	1,05	0,56	0,37	0,22	0,29	0,20	0,12	0,14	0,54
1995 / 96	0,27	0,38	0,85	1,27	0,72	0,36	0,20	0,26	0,19	0,15	0,12	0,10	0,41
1996 / 97	0,09	0,07	0,26	0,26	0,26	0,01	0,06	0,05	0,15	0,24	0,15	0,21	0,15
1997 / 98	0,29	0,44	0,71	1,48	2,16	1,22	0,64	0,47	0,44	0,33	0,20	0,14	0,71
1998 / 99	0,16	0,34	0,15	0,29	0,24	0,27	0,13	0,22	0,09	0,08	0,08	0,11	0,18
1999 / 00	0,16	0,48	0,68	0,70	0,69	0,22	0,12	0,07	0,04	0,27	0,40	0,15	0,33
2000 / 01	0,19	0,82	0,92	2,08	1,72	1,25	0,76	0,42	0,47	0,25	0,43	0,41	0,81
2001 / 02	0,36	0,44	0,63	2,07	1,44	0,96	0,70	0,28	0,53	0,59	0,37	0,41	0,73
2002 / 03	0,25	0,50	0,99	1,72	2,18	1,69	1,11	0,55	0,58	0,47	0,28	0,29	0,88
2003 / 04	0,25	0,57	0,84	0,74	0,76	0,48	0,33	0,19	0,20	0,19	0,09	0,09	0,39
2004 / 05	0,28	0,23	0,30	0,52	0,66	0,47	0,27	0,13	0,25	0,48	0,47	0,57	0,39
2005 / 06	0,65	0,83	1,80	2,96	3,24	2,11	1,46	0,93	0,88	0,68	0,52	0,40	1,37

PROM	0,39	0,62	0,83	1,34	1,34	0,98	0,68	0,45	0,49	0,44	0,37	0,33	0,69
MAX	0,73	1,41	1,81	3,19	3,89	3,60	2,16	1,23	0,93	0,90	0,85	0,71	1,40
MIN	0,09	0,07	0,11	0,24	0,23	0,01	0,06	0,05	0,04	0,08	0,08	0,09	0,15

RÍO COLORADO EN DESEMBOCADURA
CAUDALES MEDIOS MENSUALES Y ANUALES (m³/s)
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	17,35	14,28	12,95	12,73	11,40	12,30	21,40	20,90	46,10	43,30	35,00	30,90	23,22
1951 / 52	18,74	15,10	12,40	14,80	15,00	14,50	19,70	31,30	57,70	84,20	44,80	33,32	30,13
1952 / 53	17,46	14,40	13,70	13,20	12,70	17,70	20,70	30,70	44,12	47,65	45,00	28,20	25,46
1953 / 54	18,60	14,30	16,00	15,39	16,56	22,18	28,36	47,72	65,14	69,65	58,69	42,90	34,62
1954 / 55	28,27	17,81	15,91	15,30	15,20	15,40	17,20	36,70	41,40	36,60	36,70	24,40	25,07
1955 / 56	17,49	12,70	12,30	11,30	11,00	12,70	15,00	30,50	35,20	40,10	30,10	23,40	20,98
1956 / 57	15,00	13,73	13,10	10,40	11,90	14,80	18,50	26,80	27,30	39,56	37,00	28,00	21,34
1957 / 58	17,50	12,60	12,60	11,20	11,00	13,20	16,40	25,40	52,50	62,00	43,50	32,58	25,87
1958 / 59	18,85	14,60	13,92	13,50	11,80	14,60	24,66	36,50	45,70	41,10	38,78	29,90	25,33
1959 / 60	17,40	14,50	12,30	17,70	12,80	23,40	24,90	39,50	46,47	52,11	42,78	36,20	28,34
1960 / 61	21,01	16,30	14,00	14,40	15,20	16,40	27,10	54,50	72,50	50,41	48,70	36,54	32,25
1961 / 62	22,61	17,10	19,80	15,70	15,80	18,60	33,70	58,10	72,10	63,50	50,70	39,60	35,61
1962 / 63	22,70	16,00	14,90	12,60	13,90	15,60	29,40	52,90	57,60	54,40	41,80	29,29	30,09
1963 / 64	19,72	14,50	12,90	14,23	19,05	23,76	36,29	31,25	80,18	91,94	86,39	48,34	39,88
1964 / 65	24,85	17,73	13,80	12,10	14,39	12,06	12,48	19,34	19,01	31,46	29,87	28,74	19,65
1965 / 66	16,27	12,94	10,89	10,38	18,72	15,23	29,38	53,11	58,67	75,80	51,52	33,25	32,18
1966 / 67	20,65	15,78	13,84	15,28	13,16	18,69	23,45	36,26	37,50	51,27	60,27	30,57	28,06
1967 / 68	20,44	15,35	12,77	10,20	9,80	10,88	14,60	15,08	32,90	36,60	38,71	22,72	20,00
1968 / 69	13,83	6,82	11,78	9,42	8,33	7,37	8,47	16,40	25,07	31,94	32,88	23,00	16,28
1969 / 70	10,02	7,90	8,99	8,60	8,20	9,54	11,01	22,35	55,92	45,75	45,59	27,75	21,80
1970 / 71	17,04	14,21	12,80	13,57	14,11	11,72	21,30	20,48	34,31	31,76	29,60	21,35	20,19
1971 / 72	11,74	10,91	9,62	12,98	12,47	15,64	24,49	42,71	51,39	49,62	38,81	22,24	25,22
1972 / 73	13,82	15,10	21,60	16,01	22,98	25,79	31,08	49,77	94,41	107,41	88,35	59,82	45,51
1973 / 74	34,57	24,25	19,71	20,81	17,21	19,59	18,73	33,85	39,89	60,64	45,92	31,65	30,57
1974 / 75	19,71	14,97	16,61	16,78	15,42	17,10	27,83	37,48	53,29	72,54	46,57	31,18	30,79
1975 / 76	18,89	13,35	12,70	12,34	12,46	13,90	18,84	20,77	35,37	40,85	26,98	18,95	20,45
1976 / 77	15,80	12,89	12,32	10,49	9,56	10,60	14,06	23,52	28,70	33,57	29,24	26,75	18,96
1977 / 78	15,97	13,68	14,12	19,06	15,56	22,76	35,95	59,78	80,74	66,72	51,44	32,15	35,66
1978 / 79	22,32	17,01	14,62	22,40	17,88	20,90	35,17	55,16	98,80	98,21	56,87	42,53	41,82
1979 / 80	25,99	18,58	14,72	13,24	15,47	16,37	22,21	28,49	40,33	63,42	45,56	37,67	28,50
1980 / 81	33,22	30,47	18,23	23,30	21,54	22,55	29,75	42,68	84,85	74,43	70,95	45,09	41,42
1981 / 82	23,95	21,77	17,32	17,21	17,37	15,56	21,35	33,07	44,05	56,68	41,41	22,11	27,65
1982 / 83	17,85	16,29	28,86	33,35	27,45	33,07	36,94	61,92	115,53	114,02	97,50	61,20	53,66
1983 / 84	38,40	26,40	21,60	22,44	19,71	18,60	33,40	63,39	89,87	90,69	75,41	34,86	44,56
1984 / 85	22,31	16,33	12,85	17,87	18,41	20,44	34,69	47,66	61,10	81,59	54,60	43,90	35,98
1985 / 86	25,10	19,20	16,10	15,60	13,90	13,00	17,90	40,40	55,20	60,20	50,00	32,10	29,89
1986 / 87	18,10	16,30	38,61	26,29	18,70	19,20	27,40	44,20	82,80	102,37	79,88	47,10	43,41
1987 / 88	25,70	21,45	17,72	35,20	31,40	28,66	30,74	71,42	95,30	98,78	94,05	60,50	50,91
1988 / 89	38,10	23,00	17,20	14,40	14,40	13,60	19,30	36,20	47,70	57,40	64,40	34,40	31,68
1989 / 90	19,80	14,60	12,50	11,70	19,90	22,30	34,80	63,80	69,30	61,39	48,15	30,34	34,05
1990 / 91	19,20	15,00	12,60	11,70	12,20	15,60	19,57	34,20	40,25	48,60	43,60	27,54	25,00
1991 / 92	20,60	21,50	19,30	28,30	21,60	29,40	34,00	54,80	62,30	73,90	64,60	46,60	39,74
1992 / 93	25,40	20,80	20,59	18,00	17,40	22,40	33,90	46,00	63,30	89,09	56,60	36,70	37,52
1993 / 94	26,60	24,12	24,00	21,60	19,10	20,70	27,90	40,30	54,90	74,10	49,50	37,20	35,00
1994 / 95	18,00	16,00	14,80	17,60	15,70	17,50	22,10	44,30	69,90	61,00	43,70	30,00	30,88
1995 / 96	20,80	17,00	15,50	14,20	13,80	18,50	20,30	40,00	56,60	42,00	38,80	31,00	27,38
1996 / 97	17,80	13,70	11,70	10,60	10,50	10,00	9,69	14,40	24,20	38,60	30,80	22,16	17,85
1997 / 98	13,49	10,44	19,55	13,05	17,66	30,08	32,07	53,86	78,88	122,16	54,44	33,04	39,89
1998 / 99	25,06	18,51	15,12	14,07	11,14	10,73	13,85	20,87	37,88	41,72	37,39	23,97	22,53
1999 / 00	13,24	11,36	10,41	8,93	13,20	12,02	21,96	35,25	41,86	49,39	35,19	22,13	22,91
2000 / 01	15,19	12,19	19,47	17,86	14,03	17,55	36,06	45,38	86,08	97,91	59,24	36,23	38,10
2001 / 02	23,29	17,55	15,03	20,13	23,12	23,49	34,86	44,44	85,23	67,11	49,90	37,77	36,83
2002 / 03	17,26	15,78	17,37	21,40	18,19	27,77	37,21	44,25	85,80	99,47	76,28	53,57	42,86
2003 / 04	33,02	24,15	20,99	17,52	17,59	16,56	26,35	40,14	47,17	58,24	45,06	34,46	31,77
2004 / 05	20,83	15,12	12,95	10,41	9,94	15,17	14,81	25,35	38,50	46,24	40,06	24,49	22,82
2005 / 06													
PROM	20,85	16,33	15,78	15,98	15,58	17,78	24,60	39,01	57,25	63,29	50,17	33,86	30,88

RÍO COLORADO EN DESCARGA CENTRAL ALFALFAI
CAUDALES MEDIOS MENSUALES Y ANUALES (m³/s)
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	16,7	13,1	11,4	10,4	10,3	11,1	17,1	18,1	39,5	36,4	30,0	25,5	20,0
1951 / 52	17,7	13,8	11,7	11,1	11,9	13,1	15,0	25,1	37,8	57,0	37,7	30,2	23,5
1952 / 53	16,5	14,4	11,9	11,0	10,9	13,4	15,8	24,1	43,0	43,3	40,0	26,4	22,6
1953 / 54	18,1	14,2	12,8	11,9	12,9	17,6	22,1	38,2	54,7	61,2	52,3	39,5	29,6
1954 / 55	26,6	16,5	13,5	11,5	12,0	12,4	14,0	28,2	35,3	34,1	31,5	23,5	21,6
1955 / 56	16,5	12,4	11,5	10,6	9,6	9,2	11,6	21,9	26,0	32,9	29,4	21,8	17,8
1956 / 57	15,0	12,6	11,1	9,9	10,0	11,4	15,8	23,7	27,2	28,4	30,1	25,9	18,4
1957 / 58	15,4	12,2	11,3	10,2	10,1	10,9	13,6	20,9	33,7	41,4	35,7	29,7	20,4
1958 / 59	17,8	13,6	12,1	11,0	10,8	12,2	18,8	25,3	34,1	31,4	32,7	28,0	20,7
1959 / 60	16,9	13,5	11,5	11,9	11,5	14,8	18,1	27,5	38,4	43,0	37,4	30,7	22,9
1960 / 61	19,8	14,6	12,2	11,3	12,0	12,8	20,8	37,4	52,5	49,8	39,3	35,5	26,5
1961 / 62	21,3	15,2	14,2	12,1	12,1	14,0	24,3	37,6	52,4	53,7	44,8	36,5	28,2
1962 / 63	22,6	15,3	12,2	11,0	11,4	12,9	22,1	43,5	50,1	51,1	41,3	26,5	26,7
1963 / 64	18,6	12,2	11,0	10,5	11,1	14,2	29,7	29,0	73,5	85,4	64,1	40,0	33,3
1964 / 65	23,4	16,2	12,5	10,8	11,3	11,6	11,2	15,9	15,8	29,2	29,9	26,0	17,8
1965 / 66	15,4	11,5	10,0	10,1	12,8	12,8	25,7	43,4	54,9	70,9	49,4	32,7	29,1
1966 / 67	20,3	15,6	13,5	12,4	11,2	14,0	19,2	30,7	29,4	46,4	46,7	27,7	23,9
1967 / 68	19,2	14,0	12,1	9,3	9,2	9,7	11,6	13,6	30,0	35,3	35,5	21,1	18,4
1968 / 69	13,1	6,2	8,8	7,4	6,9	6,6	6,6	13,7	20,1	29,7	29,5	18,1	13,9
1969 / 70	9,5	7,6	7,5	6,7	6,6	7,4	9,0	20,0	49,7	31,0	43,1	26,4	18,7
1970 / 71	16,9	12,9	11,1	10,9	11,2	11,6	16,5	18,8	28,0	24,6	25,8	19,3	17,3
1971 / 72	11,3	9,9	9,2	9,8	9,9	12,4	19,3	32,7	40,3	44,7	35,6	19,8	21,2
1972 / 73	13,5	13,8	14,3	12,7	14,6	17,2	22,0	34,6	80,5	82,7	78,6	52,1	36,4
1973 / 74	32,6	22,8	15,9	13,3	12,7	13,6	15,4	27,2	34,5	51,4	39,6	29,5	25,7
1974 / 75	18,8	13,9	12,9	12,1	12,0	13,5	21,0	29,6	44,4	60,6	40,1	29,1	25,7
1975 / 76	18,2	12,9	11,4	10,7	10,8	11,6	15,5	18,4	30,9	35,9	26,0	18,7	18,4
1976 / 77	14,9	11,7	11,3	10,0	9,4	9,6	12,3	20,3	25,8	30,0	27,0	22,8	17,1
1977 / 78	15,8	12,6	11,6	12,1	11,5	18,3	28,7	45,9	70,9	58,0	42,5	27,1	29,6
1978 / 79	19,6	15,3	12,7	14,2	14,0	14,1	26,3	40,5	69,2	80,9	47,4	36,2	32,5
1979 / 80	24,4	18,5	14,7	12,4	12,2	12,6	18,0	23,8	35,5	50,8	39,7	34,3	24,8
1980 / 81	25,9	19,9	15,8	16,3	15,7	15,8	22,1	32,7	68,3	64,0	57,7	39,3	32,8
1981 / 82	19,3	14,9	14,1	13,6	13,4	13,0	15,2	23,6	32,7	45,0	37,9	21,2	22,0
1982 / 83	17,4	14,3	21,0	19,5	16,9	25,2	27,0	47,3	87,2	99,0	87,0	52,1	42,8
1983 / 84	35,4	23,4	18,1	20,1	17,3	13,9	23,3	39,7	75,6	77,9	65,0	32,3	36,8
1984 / 85	19,7	15,1	10,9	13,8	14,2	15,8	26,4	36,9	57,4	60,8	53,0	38,3	30,2
1985 / 86	21,6	17,2	14,9	13,3	11,9	11,0	15,0	33,3	52,2	55,7	44,8	31,3	26,8
1986 / 87	17,3	15,0	22,3	18,5	15,2	16,7	20,2	36,1	70,9	88,5	70,2	45,7	36,4
1987 / 88	25,5	19,6	15,2	22,3	20,2	19,5	24,0	70,4	76,7	85,0	81,4	54,3	42,8
1988 / 89	35,9	19,2	12,4	10,2	9,6	10,4	17,5	30,6	36,8	43,8	49,6	26,1	25,2
1989 / 90	17,6	12,5	10,6	11,4	13,6	16,1	23,1	51,0	55,7	53,9	42,5	28,6	28,0
1990 / 91	16,4	13,1	11,7	11,4	11,6	13,1	16,3	29,6	37,8	35,5	41,7	24,9	21,9
1991 / 92	15,9	17,2	14,7	17,7	14,6	19,3	24,1	41,2	55,5	64,3	56,6	46,0	32,3
1992 / 93	23,6	18,7	16,6	14,4	13,9	16,5	25,6	36,8	57,2	76,4	51,2	34,0	32,1
1993 / 94	23,5	23,9	18,6	16,2	15,0	15,8	20,8	31,5	39,9	53,6	45,3	33,2	28,1
1994 / 95	17,8	14,1	12,6	12,5	12,5	13,6	17,3	36,3	60,8	53,2	43,4	28,4	26,9
1995 / 96	19,0	14,6	12,9	11,6	11,0	14,1	16,2	33,7	51,6	41,0	37,9	29,5	24,4
1996 / 97	16,1	12,5	10,7	9,6	9,8	8,6	8,6	13,5	21,9	33,1	28,4	21,7	16,2
1997 / 98	12,3	8,9	16,4	9,9	13,8	17,9	21,2	40,4	71,9	106,4	54,1	30,6	33,6
1998 / 99	24,8	17,1	14,0	13,5	10,5	9,5	12,4	18,9	32,8	33,5	35,2	22,6	20,4
1999 / 00	12,9	10,6	9,4	8,4	9,0	9,8	15,3	25,2	36,8	46,6	33,6	19,9	19,8
2000 / 01	13,6	10,8	11,5	12,0	10,6	12,6	24,1	33,1	79,5	84,4	53,4	32,8	31,5
2001 / 02	19,2	15,1	12,8	13,1	13,8	14,9	22,6	33,7	80,2	54,4	46,0	29,6	29,6
2002 / 03	16,3	14,4	14,3	13,0	13,5	18,3	26,9	38,9	80,8	93,1	73,4	49,2	37,7
2003 / 04	28,2	22,0	18,8	13,2	17,1	14,1	21,9	33,5	40,8	51,7	36,8	29,4	27,3
2004 / 05	17,8	13,2	11,1	10,0	9,7	12,1	13,5	18,5	31,0	43,4	38,9	23,8	20,3
PROM	19,3	14,7	13,1	12,3	12,1	13,5	18,9	30,8	48,2	53,7	44,5	30,6	26,0

RÍO COLORADO EN DESCARGA CENTRAL MAITENES
CAUDALES MEDIOS MENSUALES Y ANUALES (m³/s)
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	17,0	13,5	12,0	11,2	10,7	11,5	18,6	19,1	41,8	38,8	31,8	27,4	21,1
1951 / 52	18,0	14,3	12,0	12,4	13,0	13,6	16,6	27,2	44,8	66,5	40,2	31,3	25,8
1952 / 53	16,8	14,4	12,6	11,8	11,5	14,9	17,5	26,4	43,4	44,8	41,7	27,1	23,6
1953 / 54	18,3	14,2	13,9	13,1	14,2	19,2	24,3	41,5	58,4	64,2	54,5	40,7	31,4
1954 / 55	27,2	16,9	14,3	12,9	13,1	13,4	15,1	31,2	37,4	35,0	33,3	23,8	22,8
1955 / 56	16,8	12,5	11,8	10,8	10,1	10,5	12,8	24,9	29,2	35,4	29,7	22,4	18,9
1956 / 57	15,0	13,0	11,8	10,1	10,7	12,6	16,8	24,8	27,2	32,3	32,5	26,6	19,5
1957 / 58	16,1	12,4	11,8	10,5	10,4	11,7	14,6	22,5	40,3	48,6	38,5	30,7	22,3
1958 / 59	18,1	13,9	12,7	11,9	11,2	13,0	20,9	29,2	38,2	34,8	34,8	28,6	22,3
1959 / 60	17,1	13,8	11,8	14,0	12,0	17,8	20,5	31,7	41,3	46,2	39,3	32,6	24,8
1960 / 61	20,2	15,2	12,8	12,4	13,1	14,1	23,0	43,4	59,5	50,0	42,6	35,9	28,5
1961 / 62	21,7	15,8	16,2	13,4	13,4	15,6	27,6	44,8	59,3	57,2	46,9	37,6	30,8
1962 / 63	22,6	15,6	13,1	11,6	12,2	13,9	24,6	46,8	52,7	52,3	41,5	27,5	27,9
1963 / 64	19,0	13,0	11,6	11,8	13,9	17,6	32,0	29,8	75,9	87,7	71,9	42,9	35,6
1964 / 65	23,9	16,7	12,9	11,3	12,4	11,8	11,7	17,1	16,9	30,0	29,9	27,0	18,5
1965 / 66	15,7	12,0	10,3	10,2	14,9	13,6	27,0	46,8	56,2	72,6	50,1	32,9	30,2
1966 / 67	20,4	15,7	13,6	13,4	11,9	15,6	20,7	32,6	32,3	48,1	51,5	28,7	25,4
1967 / 68	19,6	14,5	12,4	9,6	9,4	10,1	12,7	14,1	31,0	35,7	36,6	21,6	19,0
1968 / 69	13,3	6,4	9,8	8,1	7,4	6,8	7,2	14,6	21,9	30,5	30,7	19,9	14,7
1969 / 70	9,7	7,7	8,0	7,4	7,1	8,2	9,7	20,8	51,9	36,2	44,0	26,9	19,8
1970 / 71	17,0	13,4	11,7	11,8	12,2	11,7	18,2	19,4	30,2	27,1	27,1	20,0	18,3
1971 / 72	11,5	10,3	9,4	10,9	10,8	13,5	21,1	36,2	44,2	46,4	36,7	20,6	22,6
1972 / 73	13,6	14,2	16,8	13,9	17,5	20,2	25,2	39,9	85,4	91,4	82,0	54,8	39,6
1973 / 74	33,3	23,3	17,2	15,9	14,3	15,7	16,5	29,5	36,4	54,7	41,8	30,3	27,4
1974 / 75	19,1	14,3	14,2	13,7	13,2	14,7	23,4	32,4	47,5	64,8	42,4	29,9	27,5
1975 / 76	18,4	13,0	11,9	11,2	11,4	12,4	16,6	19,2	32,5	37,6	26,4	18,8	19,1
1976 / 77	15,2	12,1	11,6	10,2	9,5	10,0	12,9	21,4	26,8	31,3	27,8	24,2	17,7
1977 / 78	15,8	13,0	12,5	14,5	12,9	19,8	31,3	50,7	74,3	61,1	45,6	28,9	31,7
1978 / 79	20,6	15,9	13,4	17,1	15,4	16,5	29,4	45,7	79,6	87,0	50,7	38,4	35,8
1979 / 80	25,0	18,5	14,7	12,7	13,3	13,9	19,5	25,4	37,2	55,2	41,8	35,5	26,1
1980 / 81	28,5	23,6	16,6	18,8	17,7	18,2	24,8	36,2	74,1	67,6	62,3	41,3	35,8
1981 / 82	20,9	17,3	15,2	14,8	14,8	13,9	17,3	26,9	36,7	49,1	39,1	21,5	24,0
1982 / 83	17,5	15,0	23,8	24,4	20,6	27,9	30,5	52,4	97,1	104,3	90,7	55,3	46,6
1983 / 84	36,5	24,5	19,3	20,9	18,1	15,5	26,8	48,0	80,6	82,4	68,7	33,2	39,5
1984 / 85	20,6	15,5	11,6	15,2	15,7	17,4	29,3	40,7	58,7	68,1	53,5	40,2	32,2
1985 / 86	22,8	17,9	15,3	14,1	12,6	11,7	16,0	35,8	53,2	57,3	46,6	31,6	27,9
1986 / 87	17,6	15,5	28,0	21,2	16,4	17,6	22,7	38,9	75,1	93,3	73,6	46,2	38,8
1987 / 88	25,6	20,2	16,1	26,8	24,1	22,7	26,4	70,8	83,2	89,8	85,8	56,5	45,7
1988 / 89	36,7	20,6	14,1	11,7	11,3	11,5	18,1	32,6	40,6	48,6	54,8	29,0	27,5
1989 / 90	18,4	13,3	11,3	11,5	15,8	18,3	27,2	55,5	60,4	56,5	44,5	29,2	30,1
1990 / 91	17,4	13,8	12,0	11,5	11,8	14,0	17,5	31,2	38,6	40,1	42,4	25,8	23,0
1991 / 92	17,6	18,7	16,3	21,4	17,0	22,8	27,6	46,0	57,9	67,7	59,4	46,2	34,9
1992 / 93	24,2	19,4	18,0	15,7	15,1	18,6	28,5	40,0	59,3	80,9	53,1	34,9	34,0
1993 / 94	24,6	24,0	20,5	18,1	16,4	17,5	23,3	34,6	45,2	60,8	46,7	34,6	30,5
1994 / 95	17,9	14,8	13,4	14,3	13,6	15,0	19,0	39,1	64,0	56,0	43,5	29,0	28,3
1995 / 96	19,7	15,4	13,8	12,5	12,0	15,6	17,6	35,9	53,3	41,4	38,2	30,0	25,5
1996 / 97	16,7	12,9	11,1	10,0	10,0	9,1	9,0	13,8	22,7	35,0	29,2	21,8	16,8
1997 / 98	12,7	9,5	17,5	11,0	15,1	22,2	25,0	45,1	74,3	111,9	54,2	31,5	35,8
1998 / 99	24,9	17,6	14,4	13,7	10,7	9,9	12,9	19,6	34,6	36,4	35,9	23,1	21,1
1999 / 00	13,0	10,8	9,7	8,6	10,5	10,6	17,7	28,7	38,6	47,6	34,1	20,7	20,9
2000 / 01	14,2	11,3	14,3	14,1	11,8	14,3	28,3	37,4	81,8	89,2	55,5	34,0	33,8
2001 / 02	20,6	16,0	13,6	15,5	17,1	17,9	26,9	37,5	82,0	58,9	47,4	32,5	32,1
2002 / 03	16,6	14,9	15,4	16,0	15,2	21,6	30,5	40,8	82,6	95,4	74,4	50,7	39,5
2003 / 04	29,9	22,8	19,6	14,7	17,2	15,0	23,5	35,8	43,0	54,0	39,7	31,2	28,9
2004 / 05	18,8	13,9	11,8	10,1	9,8	13,2	14,0	20,9	33,7	44,4	39,3	24,1	21,2
PROM	19,8	15,2	14,0	13,6	13,3	15,0	20,9	33,7	51,4	57,1	46,5	31,8	27,7

CAUDALES MEDIOS MENSUALES Y ANUALES (m³/s)
ESTERO QUEMPO EN DESEMBOCADURA
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	0,42	0,35	0,34	0,30	0,33	0,32	0,40	0,59	1,12	1,13	0,87	0,58	0,56
1951 / 52	0,35	0,31	0,33	0,32	0,34	0,35	0,43	0,74	1,05	1,15	0,91	0,63	0,57
1952 / 53	0,35	0,35	0,32	0,30	0,29	0,38	0,43	0,60	1,07	1,09	0,99	0,58	0,56
1953 / 54	0,39	0,33	0,35	0,27	0,44	0,59	0,66	1,15	1,67	1,65	1,36	0,80	0,80
1954 / 55	0,49	0,35	0,36	0,32	0,33	0,35	0,38	0,75	1,00	1,13	0,84	0,53	0,57
1955 / 56	0,35	0,29	0,29	0,30	0,28	0,27	0,33	0,66	0,88	0,92	0,80	0,52	0,49
1956 / 57	0,33	0,29	0,36	0,23	0,26	0,30	0,33	0,61	0,80	0,91	0,84	0,53	0,48
1957 / 58	0,37	0,28	0,28	0,27	0,28	0,31	0,30	0,62	0,99	1,10	0,87	0,53	0,52
1958 / 59	0,32	0,28	0,34	0,28	0,27	0,38	0,57	0,78	0,99	1,04	0,89	0,60	0,56
1959 / 60	0,41	0,35	0,31	0,34	0,36	0,53	0,57	0,90	1,47	1,92	1,26	0,82	0,77
1960 / 61	0,43	0,37	0,33	0,33	1,14	0,41	0,62	1,24	1,65	1,63	1,11	1,02	0,86
1961 / 62	0,43	0,39	0,45	0,36	0,36	0,42	0,77	1,32	1,64	1,44	1,15	0,90	0,80
1962 / 63	0,52	0,36	0,34	0,29	0,32	0,35	0,67	1,20	1,31	1,24	0,95	0,56	0,68
1963 / 64	0,34	0,33	0,29	0,40	0,51	0,55	0,73	1,02	2,25	2,37	1,82	0,67	0,94
1964 / 65	0,40	0,34	0,31	0,28	0,25	0,28	0,29	0,34	0,42	0,78	0,77	0,51	0,41
1965 / 66	0,36	0,26	0,25	0,24	0,43	0,37	0,66	1,17	1,36	1,57	0,75	0,53	0,66
1966 / 67	0,35	0,31	0,28	0,34	0,31	0,43	0,55	0,83	0,81	1,11	1,15	0,61	0,59
1967 / 68	0,48	0,28	0,25	0,23	0,20	0,23	0,31	0,32	0,75	0,81	0,81	0,41	0,42
1968 / 69	0,25	0,18	0,15	0,14	0,13	0,13	0,14	0,28	0,19	0,33	0,74	0,79	0,29
1969 / 70	0,20	0,20	0,22	0,15	0,20	0,23	0,27	0,54	1,51	1,20	1,18	0,68	0,55
1970 / 71	0,41	0,28	0,23	0,23	0,23	0,30	0,41	0,64	0,77	0,63	0,41	0,27	0,40
1971 / 72	0,22	0,22	0,29	0,28	0,36	0,54	0,95	1,14	1,61	1,29	0,98	0,50	0,70
1972 / 73	0,32	0,47	0,55	0,36	0,52	0,58	0,68	1,09	2,18	2,48	2,02	1,35	1,05
1973 / 74	0,78	0,56	0,45	0,47	0,39	0,41	0,46	0,78	0,90	1,36	0,99	0,69	0,69
1974 / 75	0,44	0,35	0,38	0,39	0,35	0,39	0,55	0,87	1,06	1,53	1,04	0,71	0,67
1975 / 76	0,48	0,34	0,29	0,29	0,28	0,31	0,45	0,47	0,81	0,91	0,61	0,44	0,47
1976 / 77	0,29	0,25	0,28	0,24	0,21	0,24	0,31	0,55	0,68	0,87	0,65	0,60	0,43
1977 / 78	0,36	0,31	0,35	0,43	0,35	0,51	0,92	1,16	1,82	1,52	1,16	0,73	0,80
1978 / 79	0,51	0,39	0,33	0,51	0,40	0,46	0,80	1,24	2,28	2,28	1,42	0,89	0,96
1979 / 80	0,54	0,42	0,33	0,30	0,35	0,37	0,56	0,65	0,91	1,43	1,04	0,87	0,65
1980 / 81	0,91	1,20	0,99	0,53	0,49	0,53	0,68	0,97	1,86	1,61	1,56	0,98	1,03
1981 / 82	0,52	0,52	0,48	0,39	0,40	0,40	0,41	0,64	0,97	1,26	1,08	0,50	0,63
1982 / 83	0,44	0,41	0,71	0,80	0,65	0,77	0,84	1,37	2,34	2,55	2,22	1,39	1,21
1983 / 84	0,87	0,60	0,49	0,46	0,42	0,42	0,76	1,06	1,68	1,63	1,74	1,81	1,00
1984 / 85	1,46	1,63	1,41	1,07	1,49	1,31	1,37	1,49	1,39	1,25	1,24	1,00	1,34
1985 / 86	0,57	0,44	0,37	0,35	0,32	0,30	0,41	0,92	1,26	1,37	1,14	0,73	0,68
1986 / 87	0,41	0,37	0,58	0,42	0,43	0,44	0,62	1,01	1,88	1,82	1,49	1,07	0,88
1987 / 88	0,58	0,43	0,43	0,71	0,80	0,71	1,06	1,87	2,50	2,38	1,71	1,38	1,21
1988 / 89	0,87	0,52	0,39	0,33	0,33	0,31	0,44	0,82	1,09	1,31	1,47	0,78	0,72
1989 / 90	0,45	0,33	0,28	0,27	0,45	0,51	0,79	1,45	1,58	1,43	1,09	0,70	0,78
1990 / 91	0,44	0,34	0,29	0,27	0,28	0,35	0,50	0,78	1,12	1,11	0,99	0,79	0,60
1991 / 92	0,47	0,49	0,44	0,64	0,49	0,67	0,77	1,25	1,42	1,77	1,47	1,06	0,91
1992 / 93	0,58	0,47	0,47	0,41	0,40	0,51	0,77	1,05	1,44	1,62	1,29	0,84	0,82
1993 / 94	0,61	0,86	0,55	0,49	0,43	0,47	0,63	0,92	1,25	1,69	1,13	0,85	0,82
1994 / 95	0,41	0,36	0,34	0,40	0,36	0,40	0,50	1,01	1,59	1,38	0,99	0,68	0,70
1995 / 96	0,47	0,39	0,35	0,32	0,31	0,42	0,46	0,91	1,29	0,95	0,88	0,71	0,62
1996 / 97	0,41	0,31	0,27	0,24	0,24	0,23	0,22	0,33	0,55	0,88	0,70	0,51	0,41
1997 / 98	0,31	0,24	0,52	0,30	0,40	0,68	0,73	1,22	1,79	2,30	1,24	0,75	0,87
1998 / 99	0,57	0,42	0,34	0,34	0,37	0,24	0,32	0,47	0,86	0,95	0,97	0,55	0,53
1999 / 00	0,30	0,26	0,24	0,20	0,30	0,52	0,50	0,80	0,95	1,12	0,80	0,50	0,54
2000 / 01	0,35	0,28	0,45	0,41	0,32	0,40	0,82	1,03	1,48	1,55	1,35	0,68	0,76
2001 / 02	0,53	0,38	0,32	0,44	0,52	0,53	0,81	1,03	1,87	1,51	1,28	0,88	0,84
2002 / 03	0,54	0,50	0,60	0,48	0,73	0,64	0,87	1,43	1,89	2,12	1,63	1,13	1,05
2003 / 04	0,68	0,43	0,43	0,36	0,32	0,38	0,60	0,91	1,07	1,33	1,10	0,78	0,70
2004 / 05	0,47	0,34	0,29	0,24	0,23	0,35	0,34	0,58	0,88	1,05	0,91	0,56	0,52
2005 / 06	0,31	0,29	0,59	0,52	0,66	0,68	0,89	1,52	2,23	2,17	1,50	0,87	1,02
PROM	0,47	0,40	0,40	0,37	0,40	0,44	0,58	0,91	1,32	1,41	1,13	0,76	0,72

ESTERO AUCAYES EN DESEMBOCADURA
CAUDALES MEDIOS MENSUALES Y ANUALES (m³/s)
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	0,44	0,37	0,36	0,31	0,34	0,34	0,42	0,63	1,17	1,19	0,92	0,61	0,59
1951 / 52	0,36	0,32	0,34	0,34	0,36	0,37	0,45	0,78	1,10	1,21	0,95	0,66	0,60
1952 / 53	0,37	0,37	0,33	0,32	0,31	0,40	0,45	0,63	1,12	1,14	1,04	0,61	0,59
1953 / 54	0,41	0,35	0,36	0,29	0,46	0,62	0,69	1,21	1,76	1,74	1,43	0,84	0,85
1954 / 55	0,51	0,37	0,38	0,34	0,35	0,37	0,39	0,78	1,06	1,19	0,89	0,56	0,60
1955 / 56	0,36	0,30	0,30	0,32	0,29	0,29	0,35	0,69	0,92	0,97	0,84	0,54	0,51
1956 / 57	0,34	0,30	0,38	0,24	0,27	0,31	0,34	0,64	0,84	0,95	0,88	0,56	0,51
1957 / 58	0,39	0,29	0,29	0,28	0,29	0,32	0,32	0,65	1,04	1,16	0,92	0,56	0,54
1958 / 59	0,34	0,29	0,35	0,29	0,29	0,40	0,60	0,82	1,04	1,09	0,93	0,64	0,59
1959 / 60	0,43	0,37	0,33	0,36	0,37	0,56	0,60	0,95	1,55	2,02	1,33	0,87	0,81
1960 / 61	0,46	0,39	0,35	0,34	1,20	0,43	0,65	1,30	1,74	1,72	1,17	1,07	0,90
1961 / 62	0,45	0,41	0,47	0,38	0,38	0,45	0,81	1,39	1,73	1,52	1,21	0,95	0,84
1962 / 63	0,54	0,38	0,36	0,30	0,33	0,37	0,70	1,27	1,38	1,30	1,00	0,58	0,71
1963 / 64	0,36	0,35	0,31	0,42	0,54	0,58	0,77	1,07	2,37	2,49	1,91	0,71	0,99
1964 / 65	0,42	0,36	0,33	0,29	0,26	0,29	0,30	0,36	0,45	0,82	0,81	0,54	0,44
1965 / 66	0,38	0,27	0,26	0,25	0,45	0,39	0,69	1,23	1,43	1,65	0,79	0,56	0,70
1966 / 67	0,37	0,33	0,30	0,36	0,33	0,45	0,58	0,87	0,86	1,17	1,21	0,64	0,62
1967 / 68	0,51	0,29	0,26	0,24	0,22	0,24	0,33	0,34	0,79	0,86	0,85	0,43	0,44
1968 / 69	0,27	0,18	0,16	0,15	0,14	0,14	0,14	0,29	0,20	0,34	0,78	0,83	0,30
1969 / 70	0,21	0,21	0,23	0,16	0,21	0,24	0,28	0,57	1,59	1,26	1,24	0,72	0,58
1970 / 71	0,44	0,30	0,25	0,24	0,24	0,31	0,43	0,67	0,81	0,66	0,44	0,28	0,42
1971 / 72	0,23	0,23	0,30	0,30	0,38	0,57	1,00	1,20	1,70	1,36	1,03	0,53	0,74
1972 / 73	0,34	0,50	0,57	0,38	0,55	0,61	0,71	1,15	2,29	2,61	2,13	1,42	1,10
1973 / 74	0,82	0,58	0,47	0,50	0,41	0,43	0,48	0,82	0,95	1,43	1,04	0,73	0,72
1974 / 75	0,46	0,36	0,40	0,41	0,37	0,41	0,58	0,92	1,12	1,61	1,09	0,75	0,71
1975 / 76	0,50	0,36	0,30	0,30	0,30	0,33	0,47	0,49	0,85	0,96	0,64	0,47	0,50
1976 / 77	0,30	0,27	0,29	0,25	0,22	0,25	0,33	0,58	0,71	0,91	0,69	0,63	0,45
1977 / 78	0,38	0,33	0,37	0,45	0,37	0,53	0,96	1,22	1,92	1,60	1,22	0,77	0,84
1978 / 79	0,53	0,41	0,35	0,54	0,42	0,48	0,84	1,30	2,39	2,39	1,49	0,94	1,01
1979 / 80	0,57	0,44	0,35	0,32	0,36	0,39	0,59	0,68	0,96	1,51	1,09	0,91	0,68
1980 / 81	0,96	1,26	1,04	0,55	0,52	0,55	0,72	1,02	1,96	1,69	1,64	1,03	1,08
1981 / 82	0,55	0,55	0,50	0,41	0,42	0,42	0,43	0,67	1,02	1,32	1,14	0,52	0,66
1982 / 83	0,47	0,43	0,74	0,84	0,68	0,81	0,88	1,45	2,47	2,68	2,33	1,46	1,27
1983 / 84	0,92	0,63	0,52	0,49	0,44	0,45	0,80	1,12	1,77	1,71	1,83	1,90	1,05
1984 / 85	1,53	1,72	1,48	1,12	1,56	1,38	1,44	1,56	1,46	1,31	1,31	1,05	1,41
1985 / 86	0,60	0,46	0,39	0,37	0,33	0,31	0,43	0,97	1,32	1,44	1,20	0,77	0,72
1986 / 87	0,43	0,39	0,61	0,45	0,45	0,46	0,66	1,06	1,98	1,91	1,57	1,13	0,92
1987 / 88	0,62	0,45	0,45	0,75	0,84	0,75	1,12	1,96	2,63	2,51	1,80	1,45	1,28
1988 / 89	0,91	0,55	0,41	0,34	0,34	0,33	0,46	0,87	1,14	1,37	1,54	0,82	0,76
1989 / 90	0,47	0,35	0,30	0,28	0,48	0,53	0,83	1,53	1,66	1,50	1,15	0,74	0,82
1990 / 91	0,46	0,36	0,30	0,28	0,29	0,37	0,53	0,82	1,18	1,16	1,04	0,83	0,63
1991 / 92	0,49	0,51	0,46	0,68	0,52	0,70	0,81	1,31	1,49	1,86	1,55	1,12	0,96
1992 / 93	0,61	0,50	0,49	0,43	0,42	0,54	0,81	1,10	1,51	1,71	1,35	0,88	0,86
1993 / 94	0,64	0,91	0,57	0,52	0,46	0,50	0,67	0,96	1,31	1,77	1,18	0,89	0,87
1994 / 95	0,43	0,38	0,35	0,42	0,38	0,42	0,53	1,06	1,67	1,46	1,05	0,72	0,74
1995 / 96	0,50	0,41	0,37	0,34	0,33	0,44	0,49	0,96	1,35	1,00	0,93	0,74	0,65
1996 / 97	0,43	0,33	0,28	0,25	0,25	0,24	0,23	0,34	0,58	0,92	0,74	0,53	0,43
1997 / 98	0,32	0,25	0,54	0,31	0,42	0,72	0,77	1,29	1,89	2,42	1,30	0,79	0,92
1998 / 99	0,60	0,44	0,36	0,36	0,39	0,26	0,33	0,50	0,91	1,00	1,02	0,57	0,56
1999 / 00	0,32	0,27	0,25	0,21	0,32	0,55	0,53	0,84	1,00	1,18	0,84	0,53	0,57
2000 / 01	0,36	0,29	0,47	0,43	0,34	0,42	0,86	1,09	1,55	1,63	1,42	0,71	0,80
2001 / 02	0,56	0,40	0,34	0,46	0,55	0,56	0,85	1,09	1,97	1,59	1,35	0,93	0,89
2002 / 03	0,57	0,52	0,64	0,51	0,77	0,67	0,92	1,51	1,99	2,23	1,72	1,19	1,10
2003 / 04	0,72	0,45	0,45	0,38	0,34	0,40	0,63	0,96	1,13	1,39	1,16	0,82	0,74
2004 / 05	0,50	0,36	0,31	0,25	0,24	0,36	0,35	0,61	0,92	1,11	0,96	0,59	0,55
2005 / 06	0,32	0,30	0,62	0,55	0,70	0,72	0,94	1,60	2,35	2,28	1,58	0,91	1,07
PROM	0,50	0,42	0,42	0,39	0,42	0,46	0,61	0,96	1,39	1,48	1,19	0,80	0,75

HOYA INTERMEDIA RÍO COLORADO
CAUDALES MEDIOS MENSUALES Y ANUALES (m³/s)
RÉGIMEN NATURAL

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	QMA
1950 / 51	0,62	1,16	1,52	2,34	1,13	1,17	4,30	2,81	6,63	6,95	4,96	5,40	3,25
1951 / 52	1,08	1,30	0,66	3,73	3,14	1,38	4,71	6,24	19,85	27,21	7,09	3,16	6,63
1952 / 53	0,99	0,01	1,76	2,23	1,78	4,27	4,87	6,58	1,11	4,38	5,03	1,77	2,90
1953 / 54	0,52	0,14	3,24	3,46	3,65	4,59	6,22	9,56	10,39	8,45	6,41	3,42	5,00
1954 / 55	1,71	1,33	2,44	3,77	3,24	3,03	3,16	8,51	6,13	2,45	5,18	0,87	3,48
1955 / 56	1,00	0,34	0,81	0,74	1,38	3,46	3,35	8,59	9,18	7,18	0,66	1,57	3,19
1956 / 57	0,00	1,13	1,98	0,51	1,87	3,36	2,68	3,07	0,10	11,15	6,89	2,10	2,90
1957 / 58	2,10	0,38	1,28	1,00	0,86	2,30	2,75	4,47	18,76	20,65	7,78	2,91	5,44
1958 / 59	1,09	1,01	1,81	2,45	0,97	2,41	5,83	11,20	11,55	9,73	6,11	1,93	4,67
1959 / 60	0,52	1,04	0,80	5,77	1,26	8,59	6,83	12,02	8,03	9,14	5,34	5,52	5,41
1960 / 61	1,23	1,72	1,84	3,14	3,18	3,62	6,35	17,09	19,98	0,59	9,39	1,03	5,76
1961 / 62	1,33	1,94	5,57	3,55	3,66	4,61	9,44	20,53	19,71	9,75	5,89	3,07	7,42
1962 / 63	0,10	0,68	2,70	1,59	2,55	2,66	7,34	9,38	7,54	3,31	0,46	2,79	3,43
1963 / 64	1,14	2,30	1,95	3,75	7,99	9,55	6,60	2,27	6,65	6,53	22,28	8,38	6,62
1964 / 65	1,48	1,57	1,33	1,27	3,05	0,42	1,27	3,48	3,25	2,23	0,01	2,74	1,84
1965 / 66	0,91	1,46	0,94	0,24	5,89	2,45	3,67	9,69	3,81	4,90	2,12	0,56	3,06
1966 / 67	0,35	0,16	0,36	2,87	1,97	4,73	4,25	5,59	8,05	4,92	13,56	2,91	4,14
1967 / 68	1,26	1,37	0,63	0,87	0,58	1,21	2,95	1,48	2,86	1,33	3,26	1,66	1,62
1968 / 69	0,75	0,63	2,98	1,99	1,39	0,81	1,89	2,72	4,95	2,28	3,40	4,85	2,39
1969 / 70	0,50	0,30	1,52	1,87	1,63	2,10	2,04	2,38	6,19	14,71	2,49	1,33	3,09
1970 / 71	0,10	1,27	1,70	2,68	2,93	0,10	4,75	1,70	6,28	7,20	3,80	2,06	2,88
1971 / 72	0,41	0,98	0,40	3,20	2,52	3,27	5,15	10,06	11,08	4,91	3,25	2,47	3,97
1972 / 73	0,36	1,34	7,33	3,32	8,38	8,60	9,05	15,19	13,88	24,74	9,71	7,70	9,13
1973 / 74	1,96	1,49	3,85	7,55	4,50	6,01	3,36	6,70	5,43	9,22	6,30	2,10	4,87
1974 / 75	0,87	1,09	3,74	4,70	3,43	3,65	6,82	7,87	8,85	11,95	6,48	2,04	5,13
1975 / 76	0,68	0,49	1,26	1,68	1,70	2,27	3,39	2,36	4,44	4,95	0,96	0,24	2,04
1976 / 77	0,88	1,15	1,05	0,50	0,13	0,98	1,79	3,27	2,94	3,57	2,24	3,98	1,87
1977 / 78	0,22	1,09	2,49	7,01	4,10	4,50	7,22	13,92	9,86	8,72	8,95	5,03	6,09
1978 / 79	2,69	1,73	1,88	8,17	3,85	6,80	8,87	14,62	29,63	17,27	9,43	6,35	9,27
1979 / 80	1,56	0,05	0,02	0,85	3,29	3,74	4,17	4,70	4,82	12,65	5,83	3,34	3,75
1980 / 81	7,29	10,61	2,46	6,97	5,88	6,73	7,62	9,94	16,53	10,45	13,25	5,81	8,63
1981 / 82	4,65	6,84	3,26	3,65	3,94	2,54	6,18	9,49	11,34	11,68	3,53	0,94	5,67
1982 / 83	0,47	2,03	7,83	13,80	10,56	7,89	9,90	14,64	28,36	15,03	10,51	9,09	10,84
1983 / 84	3,00	2,99	3,47	2,34	2,44	4,71	10,13	23,72	14,26	12,81	10,40	2,56	7,74
1984 / 85	2,66	1,21	1,93	4,11	4,25	4,62	8,25	10,79	3,72	20,78	1,65	5,63	5,80
1985 / 86	3,53	1,98	1,24	2,30	1,97	1,98	2,94	7,13	3,03	4,50	5,20	0,78	3,05
1986 / 87	0,78	1,26	16,35	7,79	3,52	2,46	7,24	8,14	11,87	13,92	9,68	1,39	7,03
1987 / 88	0,23	1,89	2,57	12,88	11,23	9,13	6,74	0,97	18,63	13,80	12,69	6,24	8,08
1988 / 89	2,17	3,75	4,79	4,22	4,76	3,23	1,82	5,60	10,92	13,62	14,80	8,34	6,50
1989 / 90	2,20	2,05	1,92	0,30	6,35	6,23	11,68	12,82	13,64	7,48	5,66	1,77	6,01
1990 / 91	2,81	1,88	0,93	0,34	0,57	2,49	3,24	4,61	2,46	13,10	1,91	2,63	3,08
1991 / 92	4,69	4,33	4,65	10,56	7,03	10,11	9,90	13,63	6,79	9,57	7,98	0,56	7,48
1992 / 93	1,84	2,11	3,97	3,61	3,54	5,86	8,25	9,18	6,09	12,66	5,36	2,73	5,43
1993 / 94	3,12	0,21	5,45	5,42	4,11	4,92	7,05	8,81	15,01	20,45	4,24	3,98	6,90
1994 / 95	0,17	1,87	2,22	5,11	3,17	3,85	4,83	7,95	9,11	7,75	0,31	1,55	3,99
1995 / 96	1,76	2,43	2,57	2,58	2,78	4,39	4,11	6,29	5,02	1,00	0,90	1,50	2,94
1996 / 97	1,74	1,16	0,95	0,97	0,71	1,44	1,09	0,93	2,34	5,54	2,40	0,49	1,65
1997 / 98	1,21	1,51	3,13	3,20	3,89	12,20	10,88	13,48	6,99	15,80	0,31	2,39	6,25
1998 / 99	0,24	1,42	1,15	0,57	0,67	1,20	1,49	1,92	5,12	8,25	2,23	1,33	2,13
1999 / 00	0,33	0,80	1,03	0,55	4,24	2,25	6,63	10,09	5,06	2,76	1,62	2,24	3,13
2000 / 01	1,54	1,39	8,00	5,84	3,40	4,94	11,94	12,33	6,57	13,49	5,81	3,43	6,56
2001 / 02	4,11	2,45	2,24	7,08	9,28	8,56	12,22	10,73	5,03	12,71	3,91	8,16	7,21
2002 / 03	0,98	1,40	3,03	8,38	4,66	9,44	10,28	5,32	5,01	6,33	2,84	4,41	5,17
2003 / 04	4,80	2,12	2,15	4,35	0,53	2,44	4,42	6,62	6,41	6,51	8,25	5,01	4,47
2004 / 05	3,07	1,95	1,81	0,42	0,27	3,04	1,26	6,89	7,47	2,88	1,12	0,66	2,57
PROM	1,60	1,68	2,71	3,71	3,45	4,24	5,73	8,18	9,07	9,56	5,67	3,22	4,90

RÍO COLORADO CON PROYECTO
CAUDALES MEDIOS MENSUALES Y ANUALES (m³/s)

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	ANUAL
1950/51	2,80	2,80	2,80	2,80	2,80	2,80	4,55	3,26	7,61	7,93	5,69	5,84	4,31
1951/52	2,80	2,80	2,80	3,91	3,34	2,80	5,00	6,84	20,76	45,20	7,85	3,65	8,98
1952/53	2,80	2,80	2,80	2,80	2,80	4,51	5,15	7,04	5,04	8,59	5,87	2,80	4,42
1953/54	2,80	2,80	3,44	3,59	3,95	5,04	6,73	10,57	26,66	31,16	19,91	4,08	10,06
1954/55	2,80	2,80	2,80	3,95	3,43	3,24	3,39	9,11	6,99	3,44	5,88	2,80	4,22
1955/56	2,80	2,80	2,80	2,80	2,80	3,59	3,54	9,10	9,92	7,96	2,80	2,80	4,48
1956/57	2,80	2,80	2,80	2,80	2,80	3,51	2,86	3,53	2,80	11,91	7,58	2,80	4,08
1957/58	2,80	2,80	2,80	2,80	2,80	2,80	2,91	4,94	19,60	22,96	8,51	3,30	6,59
1958/59	2,80	2,80	2,80	2,80	2,80	2,80	6,26	11,83	12,40	10,62	6,86	2,80	5,63
1959/60	2,80	2,80	2,80	5,96	2,80	8,98	7,26	12,78	9,35	13,89	6,46	6,20	6,84
1960/61	2,80	2,80	2,80	3,32	4,17	3,89	6,82	18,19	34,01	11,89	10,35	2,80	8,65
1961/62	2,80	2,80	5,88	3,76	3,88	4,89	10,06	21,71	33,60	24,80	11,71	3,83	10,81
1962/63	2,80	2,80	2,90	2,80	2,80	2,87	7,86	13,96	18,77	15,49	2,80	3,20	6,59
1963/64	2,80	2,80	2,80	4,00	8,36	9,96	7,19	3,14	42,29	54,16	48,06	8,91	16,21
1964/65	2,80	2,80	2,80	2,80	3,15	2,80	2,80	3,67	3,53	2,87	2,80	3,11	2,99
1965/66	2,80	2,80	2,80	2,80	6,17	2,80	4,18	14,14	19,88	37,22	12,13	2,80	9,21
1966/67	2,80	2,80	2,80	3,06	2,80	5,02	4,66	6,27	8,72	12,23	21,28	3,38	6,32
1967/68	2,80	2,80	2,80	2,80	2,80	2,80	3,12	2,80	3,46	2,80	3,92	2,80	2,98
1968/69	2,80	2,80	2,98	2,80	2,80	2,80	2,80	2,86	5,00	2,80	4,00	5,50	3,33
1969/70	2,80	2,80	2,80	2,80	2,80	2,80	2,80	2,80	17,29	15,77	6,63	2,80	5,41
1970/71	2,80	2,80	2,80	2,80	3,02	2,80	5,02	2,80	6,91	7,68	4,07	2,80	3,86
1971/72	2,80	2,80	2,80	3,34	2,80	3,67	5,96	11,06	12,86	10,77	4,08	2,83	5,48
1972/73	2,80	2,80	7,73	3,54	8,76	9,03	9,59	16,14	56,44	69,75	50,22	21,03	21,49
1973/74	2,80	2,80	4,16	7,88	4,75	6,27	3,68	7,33	6,19	21,85	7,15	2,80	6,47
1974/75	2,80	2,80	3,98	4,95	3,64	3,89	7,22	8,60	14,21	33,93	7,46	2,80	8,02
1975/76	2,80	2,80	2,80	2,80	2,80	2,80	3,69	2,80	5,11	5,73	2,80	2,80	3,31
1976/77	2,80	2,80	2,80	2,80	2,80	2,80	2,80	3,67	3,48	4,29	2,80	4,43	3,19
1977/78	2,80	2,80	2,80	7,30	4,31	4,86	8,00	20,80	42,42	28,10	12,46	5,62	11,85
1978/79	3,05	2,80	2,80	8,54	4,11	7,12	9,52	16,25	60,93	60,34	18,14	7,09	16,72
1979/80	2,80	2,80	2,80	2,80	3,49	3,97	4,59	5,21	5,59	24,71	6,72	4,07	5,80
1980/81	8,06	11,66	3,31	7,35	6,23	7,11	8,16	10,77	46,57	35,89	32,37	6,65	15,34
1981/82	5,03	7,22	3,59	3,89	4,19	2,80	6,44	9,99	12,16	17,79	4,47	2,80	6,70
1982/83	2,80	2,80	8,39	14,46	11,06	8,52	10,59	23,15	77,73	76,42	59,57	22,45	26,50
1983/84	3,73	3,45	3,82	2,80	2,80	4,98	10,75	24,64	51,40	52,17	37,01	4,22	16,81
1984/85	3,98	2,80	3,20	5,04	5,59	5,78	9,47	12,13	22,35	42,69	15,70	6,49	11,27
1985/86	3,96	2,80	2,80	2,80	2,80	2,80	3,20	7,90	16,31	21,43	10,99	2,80	6,72
1986/87	2,80	2,80	16,78	8,07	3,80	2,80	7,72	9,00	44,54	64,04	41,22	8,03	17,63
1987/88	2,80	2,80	2,85	13,45	11,89	9,70	7,66	33,14	57,65	61,02	55,61	21,73	23,36
1988/89	2,89	4,13	5,04	4,40	4,94	3,39	2,80	6,28	11,86	18,56	25,72	8,98	8,25
1989/90	2,80	2,80	2,80	2,80	6,66	6,59	12,33	25,11	30,73	22,67	9,10	2,80	10,60
1990/91	3,10	2,80	2,80	2,80	2,80	2,80	3,60	5,24	3,44	14,06	4,45	3,27	4,26
1991/92	5,02	4,68	4,94	11,06	7,38	10,63	10,53	15,90	23,57	35,52	25,93	7,52	13,56
1992/93	2,80	2,80	4,30	3,88	3,80	6,22	8,88	10,08	24,60	50,57	17,74	3,42	11,59
1993/94	3,58	2,80	5,85	5,77	4,40	5,25	7,54	9,58	16,11	35,64	10,48	4,68	9,31
1994/95	2,80	2,80	2,80	5,37	3,39	4,11	5,19	8,82	31,34	22,24	4,55	2,80	8,02
1995/96	2,80	2,80	2,80	2,80	2,95	4,67	4,43	7,05	17,74	2,81	2,80	2,80	4,70
1996/97	2,80	2,80	2,80	2,80	2,80	2,80	2,80	2,80	2,80	6,27	2,96	2,80	3,10
1997/98	2,80	2,80	3,51	3,35	4,15	12,74	11,46	14,94	40,53	84,32	15,53	3,00	16,60
1998/99	2,80	2,80	2,80	2,80	2,80	2,80	2,80	2,80	5,84	9,05	3,06	2,80	3,60
1999/00	2,80	2,80	2,80	2,80	4,39	2,80	6,98	10,75	5,87	10,37	2,80	2,80	4,83
2000/01	2,80	2,80	8,31	6,10	3,57	5,19	12,62	13,21	47,41	59,32	20,44	3,97	15,48
2001/02	4,50	2,80	2,80	7,37	9,65	8,95	12,89	11,62	46,96	28,48	11,03	8,90	13,00
2002/03	2,80	2,80	3,49	8,72	5,24	9,94	11,01	6,61	47,54	61,44	37,77	14,56	17,66
2003/04	5,34	2,80	2,80	4,57	2,80	2,80	4,87	7,39	8,10	19,42	9,21	5,66	6,31
2004/05	3,41	2,80	2,80	2,80	2,80	3,24	2,80	7,32	8,20	7,15	2,80	2,80	4,08
PROMEDIO	3,15	3,11	3,70	4,54	4,24	4,86	6,32	10,17	22,24	26,73	14,19	5,29	9,05

ESTACIÓN: RÍO MAIPO EN SAN ALFONSO
CAUDALES MEDIOS MENSUALES (m3/s)
RÉGIMEN NATURAL
ESTADISTICA 1950/51 - 2004/05 CORREGIDA

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	ANUAL
1950/51	36,58	31,08	24,46	24,61	23,82	29,78	45,18	71,10	123,50	89,40	67,90	51,70	51,59
1951/52	35,62	29,80	33,70	34,00	35,30	35,00	49,50	86,40	126,00	101,00	62,40	60,65	57,45
1952/53	36,30	33,30	32,00	34,20	34,20	38,00	41,10	67,49	116,02	86,49	76,81	47,49	53,62
1953/54	39,69	30,65	29,84	30,05	38,70	55,70	61,60	149,00	214,00	179,18	127,65	80,75	86,40
1954/55	50,90	37,57	37,77	44,20	46,60	49,30	71,40	124,00	118,00	90,50	70,10	51,60	65,99
1955/56	34,63	32,60	24,80	21,50	21,10	23,20	32,30	81,22	86,77	76,50	65,70	40,60	45,08
1956/57	37,00	36,70	29,24	32,70	33,50	34,70	44,90	99,10	88,90	72,30	57,10	43,39	50,79
1957/58	36,90	26,80	23,26	27,96	23,80	28,42	48,20	101,00	130,00	132,00	82,70	63,90	60,41
1958/59	44,70	40,90	39,10	31,70	25,43	41,10	81,10	93,80	119,00	76,70	63,50	52,79	59,15
1959/60	36,60	36,20	34,10	36,50	40,30	42,70	54,10	117,00	189,00	122,00	64,00	45,30	68,15
1960/61	38,00	35,60	32,83	31,68	34,32	39,80	54,50	107,00	127,00	87,20	59,50	73,16	60,05
1961/62	42,70	42,30	46,70	30,05	48,30	36,13	70,79	136,09	209,19	159,00	112,00	72,40	83,80
1962/63	48,30	38,30	33,00	30,80	32,30	36,20	54,70	110,00	115,00	82,60	66,70	54,22	58,51
1963/64	37,30	31,60	28,70	33,72	31,65	43,40	55,90	86,10	254,00	258,79	134,62	81,49	89,77
1964/65	51,50	40,10	45,00	30,05	27,20	36,50	45,60	63,81	74,00	83,50	66,00	50,80	51,17
1965/66	44,30	31,90	30,60	28,60	37,20	43,70	72,70	144,00	152,00	184,72	129,00	74,44	81,10
1966/67	52,00	35,50	34,20	35,64	27,40	35,70	65,80	99,20	148,00	105,00	91,40	51,00	65,07
1967/68	38,80	32,36	22,30	22,85	23,09	21,70	46,80	67,44	102,49	81,59	68,51	40,47	47,37
1968/69	36,24	27,28	21,49	22,71	17,67	17,80	25,73	40,04	28,62	38,11	44,17	35,24	29,59
1969/70	19,61	19,74	27,40	21,07	21,47	25,50	39,40	78,99	177,30	100,99	75,29	46,95	54,48
1970/71	36,17	28,83	20,77	23,15	20,77	27,10	42,89	75,60	85,05	55,33	46,14	31,60	41,12
1971/72	25,74	21,18	18,71	24,21	23,94	28,89	61,75	122,84	122,37	95,76	59,94	43,40	54,06
1972/73	27,50	54,19	73,09	43,75	52,20	58,99	78,00	123,76	218,40	335,36	174,35	138,07	114,81
1973/74	73,73	44,15	42,50	40,68	34,23	33,81	48,97	100,40	127,96	130,89	84,77	57,67	68,31
1974/75	37,24	31,76	30,80	37,03	28,01	35,69	75,91	134,92	153,10	164,00	98,45	61,15	74,00
1975/76	43,07	28,95	27,63	26,69	26,53	31,46	45,20	74,50	122,30	86,20	71,89	49,50	52,83
1976/77	29,56	22,92	25,09	24,61	23,61	29,54	38,49	80,49	104,90	92,30	57,72	43,64	47,74
1977/78	31,89	30,63	30,27	43,89	39,23	54,46	94,77	150,43	214,53	159,97	108,50	66,53	85,42
1978/79	44,50	36,23	32,51	58,82	43,39	46,59	60,99	127,74	286,61	267,61	134,15	78,59	101,48
1979/80	51,14	38,81	29,38	34,09	35,26	40,92	61,46	99,78	133,81	192,26	119,70	78,96	76,30
1980/81	76,90	77,03	63,57	57,80	49,57	56,48	69,46	121,66	243,84	171,31	134,04	84,63	100,52
1981/82	53,32	47,94	41,28	34,26	34,50	37,19	55,38	102,74	111,41	100,25	73,56	50,47	61,86
1982/83	35,93	33,61	65,41	68,00	58,96	83,91	87,70	170,78	383,54	435,98	292,47	162,97	156,61
1983/84	90,70	66,21	49,60	47,92	45,07	41,54	77,00	147,10	196,31	157,17	115,00	75,80	92,45
1984/85	46,21	36,74	31,40	34,84	34,24	42,13	80,46	122,30	212,00	224,36	149,57	95,07	92,44
1985/86	55,45	51,09	43,30	38,34	33,42	32,26	46,58	107,71	130,01	105,19	81,29	54,76	64,95
1986/87	40,73	38,69	119,20	45,29	39,89	51,94	78,68	98,63	227,18	220,33	167,49	103,12	102,60
1987/88	56,15	44,92	42,54	64,66	58,29	56,59	85,18	191,83	286,73	267,62	185,41	111,00	120,91
1988/89	68,07	48,22	38,50	33,41	34,25	35,57	54,73	102,01	97,80	87,69	80,30	60,54	61,76
1989/90	34,72	29,89	25,83	24,11	40,61	49,75	63,07	138,93	158,13	113,64	64,54	48,01	65,94
1990/91	39,84	32,74	28,59	28,29	27,05	33,93	46,69	84,86	97,22	84,88	66,22	50,13	51,70
1991/92	46,87	51,88	48,05	58,87	40,11	56,53	71,67	148,29	159,07	199,73	138,16	98,47	93,14
1992/93	56,31	47,60	47,41	43,92	39,05	49,14	86,83	140,89	180,67	174,85	123,16	78,70	89,04
1993/94	65,27	49,81	59,75	50,13	40,40	51,22	66,09	98,89	161,56	177,32	94,36	64,24	81,59
1994/95	45,58	38,45	36,65	46,57	38,17	45,35	59,44	120,39	192,29	126,65	82,82	65,93	74,86
1995/96	49,81	41,69	39,72	34,12	32,82	46,51	55,32	130,94	157,95	93,11	71,86	53,83	67,31
1996/97	35,31	28,40	24,14	22,71	23,03	20,67	35,83	66,84	61,28	42,10	45,65	41,86	37,32
1997/98	30,52	18,64	42,37	37,46	44,63	67,36	70,89	144,71	245,86	280,28	167,44	92,73	103,57
1998/99	64,47	49,62	39,00	31,38	25,68	24,07	42,69	57,13	70,75	64,74	57,33	39,71	47,21
1999/2000	28,45	24,05	22,07	20,57	20,58	32,73	58,57	106,93	113,57	94,23	62,51	42,80	52,26
2000/01	34,21	27,29	50,73	51,38	34,01	35,86	88,51	141,07	270,66	211,25	163,28	86,31	99,55
2001/02	57,39	50,11	35,63	50,51	56,04	58,03	81,06	120,50	244,00	145,89	104,80	73,44	89,78
2002/03	45,48	41,72	46,48	39,15	51,72	42,42	59,94	109,43	193,28	204,94	146,68	103,32	90,38
2003/04	66,10	48,42	49,70	45,68	39,97	46,83	63,92	110,76	121,37	116,08	85,75	61,32	71,32
2004/05	45,84	33,88	31,12	28,66	30,00	42,22	51,49	74,18	109,67	103,12	68,98	53,74	56,07
2005/06													

PROMEDIO	44,87	37,57	37,88	36,36	34,96	40,76	60,13	108,60	158,07	141,64	97,52	65,82	72,01
MÁXIMO	90,70	77,03	119,20	68,00	58,96	83,91	94,77	191,83	383,54	435,98	292,47	162,97	156,61
MÍNIMO	19,61	18,64	18,71	20,57	17,67	17,80	25,73	40,04	28,62	38,11	44,17	31,60	29,59

NOTA: Estadística corregida y rellenada con métodos hidrológicos convencionales.

ESTACIÓN: RÍO MAIPO EN EL MANZANO
CAUDALES MEDIOS MENSUALES (m3/s)
RÉGIMEN NATURAL
ESTADISTICA 1950/51 - 2004/05 CORREGIDA

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	ANUAL
1950/51	54,67	45,90	40,70	37,50	37,60	49,10	71,60	102,00	174,00	140,00	109,57	86,33	79,08
1951/52	59,03	49,30	53,00	55,60	58,00	57,88	76,70	135,00	186,71	193,56	114,15	94,46	94,45
1952/53	58,37	55,80	50,00	51,00	54,95	62,90	76,50	101,00	163,00	135,00	129,71	81,54	84,98
1953/54	60,04	48,60	46,43	47,55	66,96	89,09	115,00	206,00	305,00	262,00	197,00	133,19	131,41
1954/55	83,32	56,20	58,90	68,27	72,18	75,57	100,49	171,99	160,00	158,00	113,72	79,18	99,82
1955/56	56,60	48,98	40,67	36,43	37,84	42,06	59,20	113,00	129,64	117,93	102,01	66,18	70,88
1956/57	56,47	61,36	45,53	48,71	53,22	57,88	69,07	134,84	119,65	119,41	100,20	74,19	78,38
1957/58	55,99	40,70	42,10	43,30	40,96	45,67	71,97	135,37	185,51	203,27	126,68	103,93	91,29
1958/59	69,01	58,35	54,60	50,05	40,30	61,70	127,58	135,00	167,83	124,00	108,91	89,07	90,53
1959/60	66,30	57,70	50,30	59,70	61,30	69,20	89,90	167,51	256,14	185,86	116,00	85,30	105,43
1960/61	60,80	52,20	57,10	55,40	58,10	66,50	93,50	171,00	205,00	149,00	115,21	114,00	99,82
1961/62	76,90	62,26	74,70	47,55	74,83	60,65	120,43	200,36	300,00	237,52	164,00	122,00	128,43
1962/63	73,40	57,00	56,90	48,41	58,60	58,30	91,40	176,00	187,00	146,25	115,53	84,40	96,10
1963/64	61,92	47,60	45,61	51,10	57,90	69,30	106,26	129,00	337,00	360,00	224,00	139,85	135,79
1964/65	81,90	59,30	64,48	48,30	42,30	49,90	62,00	84,30	98,86	115,00	102,08	85,68	74,51
1965/66	60,89	45,70	46,50	43,90	71,00	72,89	115,00	198,00	216,05	278,00	182,00	116,00	120,49
1966/67	75,13	54,13	58,60	57,00	53,40	72,20	95,40	145,05	188,49	167,00	153,72	87,87	100,67
1967/68	64,33	51,58	35,61	34,50	34,58	37,70	70,77	88,52	143,91	126,17	114,18	68,07	72,49
1968/69	54,37	42,73	36,89	34,27	31,08	28,79	39,42	60,53	57,07	70,11	82,04	62,73	50,00
1969/70	31,87	34,34	42,70	31,47	35,87	41,06	55,11	101,69	247,89	156,10	128,72	80,46	82,27
1970/71	57,78	44,52	37,23	40,66	36,47	41,60	73,98	100,30	126,87	92,96	80,65	57,04	65,84
1971/72	40,70	34,69	31,42	37,41	38,24	47,89	91,85	181,60	184,69	155,20	99,04	67,95	84,22
1972/73	44,87	82,42	111,47	70,14	94,96	102,70	128,71	193,76	318,40	497,30	272,81	215,40	177,75
1973/74	117,60	73,95	66,30	70,64	60,20	54,33	72,51	159,70	188,10	196,50	131,55	96,21	107,30
1974/75	61,85	50,52	49,10	57,63	54,21	57,93	115,90	184,21	219,37	245,00	147,85	99,46	111,92
1975/76	67,28	46,15	43,13	41,62	52,03	53,36	67,20	102,17	162,30	142,60	105,28	73,73	79,74
1976/77	48,06	38,42	44,49	37,41	36,01	46,99	59,39	119,79	142,00	129,50	88,72	75,82	72,22
1977/78	51,97	44,33	47,07	71,11	69,29	91,26	166,52	227,06	339,53	251,97	167,60	102,63	135,86
1978/79	69,70	54,63	48,11	95,83	73,09	77,09	121,39	214,74	418,80	401,37	219,15	134,09	160,67
1979/80	81,54	68,21	52,08	47,44	63,06	67,99	102,02	138,12	200,81	279,26	173,70	123,61	116,49
1980/81	123,28	117,00	91,27	89,79	76,87	86,28	111,56	174,66	350,95	250,95	207,06	131,91	150,97
1981/82	80,72	80,04	70,48	55,56	52,40	53,69	77,38	138,84	165,24	167,52	122,42	73,87	94,85
1982/83	55,13	52,41	104,00	110,89	100,06	144,37	148,30	239,78	549,54	605,98	459,07	260,97	235,87
1983/84	147,41	101,69	78,90	81,12	79,27	73,94	147,00	225,73	314,31	252,17	202,75	119,20	151,96
1984/85	71,15	57,38	49,08	63,34	60,14	71,83	131,26	178,30	313,00	307,40	217,40	149,72	139,17
1985/86	87,23	76,00	65,88	55,94	57,29	53,29	67,78	152,71	188,01	168,59	133,69	87,46	99,49
1986/87	61,82	61,19	176,86	80,09	70,08	74,14	114,28	170,93	326,45	354,30	271,96	160,80	160,24
1987/88	86,85	66,82	69,04	105,38	123,99	102,39	148,18	289,84	409,95	394,76	279,85	184,74	188,48
1988/89	115,29	72,36	58,40	51,31	55,95	53,17	78,73	145,71	145,90	148,59	148,00	102,26	97,97
1989/90	63,52	53,19	43,03	38,31	71,53	84,94	122,37	225,93	241,74	186,84	121,82	83,48	111,39
1990/91	63,25	53,19	46,51	44,58	48,99	59,35	77,56	123,18	144,32	138,38	110,92	78,43	82,39
1991/92	73,27	79,34	78,15	98,43	76,41	102,13	120,17	213,29	229,07	278,73	204,16	151,47	142,05
1992/93	89,41	78,10	74,91	66,32	60,45	77,84	135,13	204,89	245,67	281,75	192,16	116,90	135,29
1993/94	102,97	79,94	90,31	81,41	71,11	72,82	108,47	149,26	230,07	266,13	153,18	109,27	126,24
1994/95	64,58	56,85	54,85	70,67	67,19	77,20	96,37	172,06	280,29	188,32	134,72	103,34	113,87
1995/96	76,67	58,79	56,62	51,52	52,62	73,61	86,61	177,94	224,62	139,01	115,06	93,03	100,51
1996/97	63,01	47,00	39,14	37,61	34,93	34,20	47,04	83,85	90,85	86,15	77,49	68,96	59,19
1997/98	47,79	32,67	65,59	59,68	79,38	119,78	117,60	212,14	340,98	421,54	236,26	137,65	155,92
1998/99	102,80	71,84	57,07	46,97	40,31	35,61	58,73	82,69	108,94	113,65	100,85	68,59	74,00
1999/2000	45,27	36,82	33,41	32,39	35,53	57,24	86,89	145,15	165,21	153,31	98,26	66,28	79,65
2000/01	52,51	43,26	78,07	80,41	65,64	61,10	142,53	195,11	375,98	330,03	233,28	130,13	149,00
2001/02	88,40	73,78	55,53	79,85	90,43	85,91	124,48	177,74	338,35	221,48	164,72	119,80	135,04
2002/03	71,19	64,47	76,31	66,19	94,00	75,27	111,97	179,58	305,46	338,88	259,66	181,86	152,07
2003/04	105,61	73,63	73,19	68,34	69,29	65,60	103,57	161,68	171,97	182,17	139,29	103,17	109,79
2004/05	70,55	52,98	44,69	41,80	45,57	63,22	68,02	104,50	148,85	159,44	116,11	84,27	83,33
2005/06													

PROMEDIO	71,13	58,33	59,33	57,78	59,96	66,70	97,07	158,24	227,91	217,67	156,11	106,69	111,41
MÁXIMO	147,41	117,00	176,86	110,89	123,99	144,37	166,52	289,84	549,54	605,98	459,07	260,97	235,87
MÍNIMO	31,87	32,67	31,42	31,47	31,08	28,79	39,42	60,53	57,07	70,11	77,49	57,04	50,00

NOTA: Estadística corregida y rellenada con métodos hidrológicos convencionales.

ESTACIÓN: RÍO MAIPO EN LAS MELOSAS
CAUDALES MEDIOS MENSUALES (m3/s)
RÉGIMEN NATURAL
ESTADISTICA 1950/51 - 2004/05 CORREGIDA

AÑO	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ENE	FEB	MAR	ANUAL
1950/51	17,82	14,57	10,09	10,50	10,90	14,55	24,65	45,02	78,23	47,73	38,53	27,78	28,36
1951/52	17,44	13,03	15,57	15,50	17,03	17,41	27,20	52,07	80,10	58,75	31,83	35,19	31,76
1952/53	16,58	15,12	13,94	15,19	16,54	18,91	20,29	39,69	69,26	44,78	40,91	24,49	27,98
1953/54	21,23	12,24	12,52	12,76	18,83	28,86	34,24	95,34	141,83	104,71	69,16	41,67	49,45
1954/55	24,69	15,50	15,70	20,50	23,56	26,02	42,31	80,40	74,12	48,31	35,40	25,98	36,04
1955/56	16,67	15,36	10,65	8,52	9,22	10,43	16,12	47,13	49,78	39,67	35,06	19,79	23,20
1956/57	19,67	17,39	12,38	15,32	16,64	17,17	23,69	61,07	51,53	33,90	21,30	19,17	25,77
1957/58	19,27	11,80	9,02	11,92	9,77	12,62	25,69	64,16	80,80	83,97	52,25	42,32	35,30
1958/59	25,61	21,54	18,87	14,65	11,45	20,50	46,27	46,45	69,86	38,30	30,98	30,08	31,21
1959/60	16,84	16,42	15,14	16,28	19,42	20,52	27,39	66,92	120,03	66,27	22,00	18,52	35,48
1960/61	19,02	16,79	15,16	14,10	17,13	18,77	29,78	64,42	76,96	47,96	30,06	45,68	32,99
1961/62	20,43	20,48	23,40	12,69	25,44	17,70	37,97	79,39	127,14	96,58	63,37	35,92	46,71
1962/63	23,59	16,41	13,80	13,15	15,29	17,58	30,12	66,69	68,01	40,40	31,10	31,98	30,68
1963/64	18,50	14,32	12,58	14,77	15,42	21,87	23,80	48,30	175,35	165,40	68,14	39,87	51,53
1964/65	20,66	16,55	20,40	12,39	14,10	16,49	25,08	37,35	45,14	49,15	33,66	29,60	26,71
1965/66	26,00	13,96	12,92	11,86	16,82	20,84	39,26	91,60	96,60	110,57	80,70	41,04	46,85
1966/67	24,63	15,31	14,37	15,19	11,61	16,64	41,10	58,75	86,30	63,72	52,84	27,61	35,67
1967/68	19,00	14,59	6,27	9,17	12,71	9,68	24,34	42,70	66,30	43,70	38,50	21,86	25,73
1968/69	17,76	13,31	11,22	10,06	9,39	9,12	9,75	23,09	10,27	13,93	21,84	18,93	14,06
1969/70	8,87	8,71	12,76	10,58	10,73	13,43	16,56	48,60	115,50	54,55	33,30	26,07	29,97
1970/71	17,36	14,16	8,19	11,41	11,47	12,94	19,68	37,90	45,00	34,35	24,32	11,80	20,72
1971/72	10,21	9,43	8,86	10,25	12,39	16,91	37,10	82,90	75,70	56,90	31,67	23,17	31,29
1972/73	10,89	26,01	37,00	19,40	25,60	31,27	43,40	77,50	148,02	234,64	107,76	93,72	71,27
1973/74	33,55	18,95	19,50	18,54	16,53	15,83	21,91	60,73	85,93	76,73	46,28	31,55	37,17
1974/75	18,24	13,71	12,38	16,45	11,75	17,62	40,81	84,97	99,86	90,68	59,30	33,47	41,60
1975/76	21,53	12,24	12,12	11,30	11,93	14,41	22,55	42,90	79,30	48,83	32,71	26,30	28,01
1976/77	13,90	9,12	10,59	10,29	10,53	14,36	21,51	49,64	57,70	52,11	30,25	22,01	25,17
1977/78	14,30	13,93	13,57	20,69	18,38	27,60	60,20	92,50	135,55	96,44	58,52	37,52	49,10
1978/79	21,83	18,49	16,53	20,82	20,11	24,38	36,40	77,90	199,56	178,65	84,65	43,70	61,92
1979/80	24,56	15,51	10,91	15,33	17,36	21,97	30,00	68,13	88,80	124,30	73,50	43,66	44,50
1980/81	40,96	38,27	30,43	26,87	20,50	28,75	40,70	84,70	161,10	99,21	73,07	46,60	57,60
1981/82	26,79	22,67	19,17	15,13	16,32	18,51	29,97	64,22	69,48	58,25	37,14	26,54	33,68
1982/83	17,60	15,13	34,97	30,95	28,89	43,98	52,47	115,96	271,07	299,00	182,72	96,46	99,10
1983/84	44,45	31,40	22,14	21,32	21,52	20,50	43,76	93,78	122,74	92,95	64,56	44,04	51,93
1984/85	23,03	16,69	12,36	15,40	15,19	19,93	43,53	76,55	141,73	145,33	91,09	52,38	54,43
1985/86	25,41	29,18	18,42	16,32	14,83	14,94	24,49	65,63	80,93	60,93	46,39	29,78	35,60
1986/87	19,25	17,73	63,80	18,87	19,01	26,67	44,69	57,93	144,45	133,63	98,90	60,72	58,80
1987/88	27,33	19,63	17,81	29,40	28,79	29,02	48,45	121,77	185,26	169,18	112,76	64,04	71,12
1988/89	33,44	20,93	16,15	13,79	15,92	17,89	28,65	63,17	58,70	49,75	43,06	37,05	33,21
1989/90	16,08	13,20	11,25	10,35	20,80	26,94	34,73	86,61	103,18	60,46	33,26	26,91	36,98
1990/91	19,05	15,83	13,59	12,14	12,29	16,49	28,39	55,56	60,20	46,95	33,01	23,87	28,11
1991/92	27,55	22,70	21,13	30,40	18,30	29,12	37,12	99,22	108,70	118,84	83,70	56,50	54,44
1992/93	29,40	23,35	21,34	18,96	17,75	21,91	48,24	92,60	114,70	101,40	71,98	43,83	50,46
1993/94	34,53	20,86	27,28	22,40	17,44	25,13	33,60	56,87	104,61	113,51	55,02	34,60	45,49
1994/95	23,44	17,95	17,76	22,17	17,84	24,74	33,21	67,20	122,50	74,18	55,85	40,51	43,11
1995/96	27,55	21,21	20,17	15,19	15,64	23,16	30,97	84,19	99,92	53,60	49,35	31,45	39,37
1996/97	16,30	13,02	11,09	9,86	11,02	9,69	19,49	45,15	38,63	16,23	18,56	23,33	19,36
1997/98	16,67	7,36	21,36	18,03	21,23	32,56	42,99	96,66	172,81	182,31	116,30	58,23	65,54
1998/99	33,73	23,54	18,14	13,97	12,01	11,36	23,34	34,06	45,52	37,49	39,24	22,58	26,25
1999/2000	15,38	11,54	10,25	9,15	9,39	17,40	33,23	68,45	72,28	58,20	34,16	23,79	30,27
2000/01	18,09	13,18	27,46	25,52	16,85	18,19	50,55	93,12	186,27	134,74	110,38	51,90	62,19
2001/02	31,48	25,27	16,48	24,95	29,25	30,93	47,43	74,22	161,55	84,00	67,75	41,87	52,93
2002/03	22,83	18,36	21,76	16,79	23,54	19,04	30,42	62,14	123,10	126,19	93,47	61,30	51,58
2003/04	35,38	22,59	23,87	22,20	19,54	24,63	34,22	68,85	79,85	72,07	59,03	35,96	41,52
2004/05	25,69	16,72	14,94	13,58	15,10	21,70	29,34	46,68	69,94	62,38	37,60	32,66	32,19
2005/06													

PROMEDIO	22,40	17,33	17,45	16,24	16,67	20,36	32,97	67,45	101,78	85,40	56,15	37,04	40,94
MÁXIMO	44,45	38,27	63,80	30,95	29,25	43,98	60,20	121,77	271,07	299,00	182,72	96,46	99,10
MÍNIMO	8,87	7,36	6,27	8,52	9,22	9,12	9,75	23,09	10,27	13,93	18,56	11,80	14,06

NOTA: Estadística corregida y rellenada con métodos hidrológicos convencionales.

Santiago 26 de diciembre del 2007

AES gener S.A.
27 DIC 2007
280
PROYECTO HIDROELECTRICO ALTO MAIPO

Sra. Patricia Alvarado
AESGENER

Informo a Ud. De aforos realizados en el río Yeso desde Aguas Abajo Embalse, río Yeso frente administración Aguas Andinas, dos kilómetros Aguas Abajo Administración y frente a Quebrada La Cortadera.
Estos aforos se realizaron el día 22 de diciembre del 2007 y el resultado es el siguiente :

1° Río yeso aguas abajo embalse

22-12-2007	9:30 hrs.	126 lts/seg

2° Río yeso frente administración

22-12-2007	13:00 hrs.	380 lts/seg

3° Río yeso dos kilómetros abajo de la administración

22-12-2007	14:00 hrs.	498 lts/seg

4° Río yeso antes quebrada la cortadera

22-12-2007	15:00 hrs.	650 lts/seg

El embalse no estaba entregando agua. El agua medida corresponde solo a filtraciones del embalse.

Atentamente

DAVID GALVEZ CAPRILE
TÉCNICO HIDROMENSOR

22-12-2003

Corriente de Agua: Rio Yeso aguas abajo Embalse

Hora: 9:30

COEF. ANGUL.	ABSCISA	ANCHO AREA DE CALCULO	PROFUNDIDAD Total	PROFUNDIDAD de Observac.	Nº VUELTAS	TIEMPO SEG.	VELOCIDAD Observada	VELOCIDAD Media	VELOCIDAD Corregida	AREA	GASTO
	0.00	0.25	0.10		4	40					
	0.50	0.50	0.14	0.07	6	61	0.07			0.070	0.005
	1.00	0.40	0.14	0.07	16	60	0.18			0.056	0.010
	1.30	0.30	0.20	0.10	36	61	0.40			0.060	0.024
	1.60	0.30	0.20	0.10	32	60	0.36			0.060	0.022
	1.90	0.30	0.20	0.10	40	60	0.45			0.060	0.027
	2.20	0.25	0.20	0.10	44	62	0.48			0.050	0.024
	2.40	0.15	0.28	0.14	30	61	0.33			0.042	0.014
	2.50	0.05	0.28		20	40					
											0.126

Coordenadas UTM

N 6274007

E 389449

0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.75 0.80

0.85 0.90 0.92 0.94 0.96 0.97 0.98 0.99 1.00 0.99 0.98 0.97 0.96 0.94 0.92 0.90 0.85

22-12-2007

Cauciente de Agua. Río Yeso frente administración 13:05 hrs.

COEF. ANGUL.	ABSCISA	ANCHO AREA DE CALCULO	PROFUNDIDAD Total	PROFUNDIDAD de Observac.	Nº VUELTAS	TIEMPO SEG.	VELOCIDAD Observada	VELOCIDAD Media	VELOCIDAD Corregida	AREA	GASTO
	0.00	0.15	0.20		9	44					
	0.30	0.25	0.40	0.24	14	64	0.15			0.100	0.015
	0.50	0.35	0.21	0.11	14	66	0.16			0.074	0.012
	1.00	0.50	0.40	0.24	18	60	0.20			0.200	0.040
	1.50	0.50	0.48	0.29	18	64	0.19			0.240	0.046
	2.00	0.50	0.40	0.24	32	62	0.35			0.200	0.070
	2.50	0.50	0.58	0.35	32	61	0.36			0.290	0.104
	3.00	0.40	0.40	0.24	38	62	0.31			0.160	0.050
	3.30	0.25	0.40	0.24	38	60	0.43			0.100	0.043
	3.50	0.10	0.35		25	40					
											0.380 Lt/seg

Coordenadas UTM

N 6273294

E 399071

22-12-2004

Corriente de Agua: Río Yeso 2 Km aguas abajo administración 14 kilómetros

COEF. ANGUL.	ABSCISA	ANCHO AREA DE CALCULO	PROFUNDIDAD Total	PROFUNDIDAD de Observac.	Nº VUELTAS	TIEMPO SEG.	VELOCIDAD Observada	VELOCIDAD Media	VELOCIDAD Corregida	AREA	GASTO
	0.00	0.25	0.18		9	46					
	0.50	0.50	0.16	0.08	14	70	0.44			0.075	0.011
	1.00	0.50	0.18	0.09	36	61	0.40			0.090	0.036
	1.50	0.50	0.20	0.10	16	61	0.18			0.100	0.018
	2.00	0.50	0.20	0.10	38	60	0.43			0.100	0.043
	2.50	0.50	0.25	0.13	64	60	0.75			0.125	0.094
	3.00	0.50	0.20	0.10	62	60	0.70			0.100	0.070
	3.50	0.50	0.35	0.21	34	61	0.38			0.175	0.066
	4.00	0.50	0.48	0.29	10	60	0.11			0.240	0.026
	4.50	0.50	0.40	0.24	48	60	0.54			0.200	0.108
	5.00	0.30	0.14	0.07	56	62	0.61			0.042	0.026
	5.10	0.05	0.30		37	41					
											0.498 Lts/seg
		Coordenadas UTM									
		N	6271667								
		E	397136								

22-12-2004

Corriente de Agua: Río Yeso ante Quebrada Cortadera

15 m

COEF. ANGUL.	ABSCISA	ANCHO AREA DE CALCULO	PROFUNDIDAD Total	PROFUNDIDAD de Observac.	Nº VUELTAS	TIEMPO SEG.	VELOCIDAD Observada	VELOCIDAD Media	VELOCIDAD Corregida	AREA	GASTO
	0,00	0,25	0,18		33	41					
	0,50	0,50	0,20	0,10	50	62	0,55			0,100	0,055
	1,00	0,50	0,20	0,10	26	60	0,27			0,100	0,026
	1,50	0,50	0,24	0,12	48	60	0,54			0,120	0,065
	2,00	0,50	0,20	0,10	38	60	0,43			0,100	0,043
	2,50	0,50	0,30	0,15	44	60	0,50			0,150	0,075
	3,00	0,50	0,25	0,13	44	60	0,50			0,125	0,062
	3,50	0,50	0,30	0,15	22	60	0,25			0,150	0,038
	4,00	0,50	0,20	0,10	18	64	0,19			0,100	0,019
	4,50	0,50	0,25	0,13	32	62	0,35			0,125	0,044
	5,00	0,50	0,45	0,27	18	66	0,18			0,225	0,041
	5,50	0,50	0,40	0,24	51	61	0,64			0,200	0,128
	6,00	0,35	0,40	0,24	40	61	0,39			0,140	0,054
	6,20	0,10	0,38		26	46					
											0,650 lts/seg

Coordenadas UTM

N 6269990

E 395720