



GENERAL IMPACTS OF THE EL PORTÓN DAM IN THE PUELO RIVER BASIN GEOAUSTRAL REPORT ~ JUNE 2007

This report investigates the situation currently facing the Puelo River watershed in southern Chile, where the Spanish energy company Endesa has proposed the construction of a dam and 12,000+ acre reservoir. This report provides: background on Chile's Water Code and the bodies that govern water use; an analysis of Chile's current energy 'crisis'; an overview of the Chilean energy matrix and comparative consumption by sector; and detailed treatment of the Puelo River watershed and anticipated impacts (environmental, socio-economic, geopolitical, and geologic) of the proposed dam. The report also briefly discusses proposed hydroelectric projects in other watersheds of Patagonia. It concludes with a corporate history of Endesa, an analysis of the company's role in domestic and international markets, and a review of its environmental legacy.

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INTRODUCTION

On April 17, 2006, the Spanish energy company Endesa announced its intentions to build a dam in southern Chile's Puelo River watershed and to assert the company's water rights to the basin (Santiago's *Las Ultimas Noticias* newspaper, 4/17/06). The proposed project calls for the construction of a 300-foot dam and the formation of a reservoir of over 5,000 ha (over 12,000 acres) to produce energy for consumption in the north of Chile.

1. BACKGROUND

Chile's Andean-Patagonian watersheds have been threatened by proposed dams for years, but the issue has now come to the forefront due to energy speculation. Historically, rights to waters designated as 'free' for agricultural or energy use have been regulated by Chile's Water Code, which is administered by the General Water Administration (in Spanish, Dirección General de Aguas or DGA) under the Ministry of Public Works. The DGA's mission is to administer, regulate, and supervise the appropriate use of freshwaters, streams, continental and subsurface waters for multiple purposes that include agriculture, mining, and real estate. Unfortunately, the DGA has also been responsible for the poor use and mismanagement of Chile's watersheds.

The process of obtaining water rights in Chile is open to nearly all individuals or legal entities who comply with the flexible laws of Chile's water sector. While the Water Code itself is straightforward, it demonstrates a marked bias in favor of water speculation and privatization. While the law allows for impacted or injured parties to oppose petitions to obtain water rights, opposition is not usually welcomed. Although the current Water Code has attempted to prohibit speculation on requested water rights, the ambiguity of the law and its inclination towards privatization have granted large corporations unrestricted access to the use of continental waters. The Water Code is further limited by the fact that the Spanish energy company Endesa España retains rights to more than 80% of Chile's rivers and has the resources to pay for permits to continue plans to dam Patagonia's rivers.

2. CHILE'S ENERGY CRISIS

Chile's supposed energy crisis is a result of 1) the reduction of gas imports from Argentina and 2) the Bolivian government's statement to share "not one gas molecule with Chile". Rising consumption and higher energy needs for the country's steadily growing economy have spurred the government to develop an energy matrix with the goal of bringing Chile to a state of complete energy independence. Daily demand in Chile is 20 million cubic meters of natural gas, or the equivalent of 20% of Argentina's total daily consumption.

It should be noted that Chile's energy situation is considered a 'crisis' only from the perspective of energy sources. The fundamental problem is the inefficient use of energy and a system that favors energy excess and waste. To be precise, there is currently no crisis; the creation of a 'crisis' is solely a mechanism to satisfy the energy demands of transnational mining companies from the north of Chile. This is corroborated by the fact that most of the consumers and plants are located in the north as well as by the high present cost of crude oil derivatives. From 2005-2007, Canadian Transelec – the corporation with the largest network of energy transport lines in Chile – invested in increasing the capacity of its high-tension lines in Chile to support higher energy flow between Puerto Montt and Tal Tal, where the greatest distribution centers and consumption of mining corporations are located. Additionally, the Puerto Montt substation, which acts as a means of access to the circuit (switch) for the interconnecting electrical system (SIC) from the southern part of the country, was equipped with

three CER reactors (Compensación Estática de Reactivos) that function with radioactive elements. Local and national authorities have neglected to investigate this reactor system.

For years, gas shortages from Argentina have coincided with attempts by transnational and Chilean corporations to appropriate Patagonia’s rivers and generate lucrative business deals with mining companies from northern Chile.

Distribution of energy consumption in Chile’s energy matrix is outlined by sector in Table 1. This information was published in July 2005 by Chile’s National Statistics Institute, Subdepartment of Statistics Related to Industry, Mining, Improvements, and Energy (*Anuario Estadístico Sector Eléctrico 2004*):

Table 1

Sector	Hourly consumption (GW)	Percentage of total sector
Mining	17,000	37%
Industrial	15,500	34%
Commercial	5,000	11%
Agricultural	500	1%
Residential	8,000	17%

Source: INE 2005. Compiled by Geoaustral

Table 1 demonstrates that two economic sectors (mining and industry) are alone responsible for consuming over 70% of Chile’s energy matrix. For the most part, these do not reflect state-owned companies but rather transnationals that do not pay taxes or produce jobs from a natural resource that belongs to all Chileans. Chile’s citizens consume only 17% of energy (through the residential sector), yet – through the damming of Patagonia’s natural resources – are expected to subsidize the energy consumption of Chile’s wealthy mining and industrial interests.

The current structure of free market economics and the matrix utilized is based on providing the incentive for energy *consumption*, rather than for efficient energy use. Thus, in the context of excessive consumption and a perceived energy crisis, large energy corporations have taken the opportunity to plan the development of hydroelectric plants, under the premise that in a “problem country”, the lack of energy verges on a national emergency. Although the companies promote reservoirs and hydroelectric stations as clean energy, these technologies have never been clean. They are a significant contributor to global warming, generate millions of tons of methane and carbon dioxide, and are statistically proven to pollute more than electro-thermal stations.

The objective of energy companies such as Endesa and Colbun and mining companies like Xstrata (formerly Falcon Bridge) is to gain control of Patagonian waters to establish highly lucrative business. They are not above manipulating the citizenry and “selling a green image” of their efforts or presenting commercial interests as altruistic while simultaneously seeking political support through influence-peddling. In technical plans, investigations to exempt their projects are also riddled with irregularities, and environmental consultants are hired to demonstrate that dams are beneficial to the environment. Sociologists and psychologists are employed to target communities that may be in resistance to a proposed development. The companies promote the social benefits that will result from corporate plans to exploit the region’s natural resources and do not acknowledge the social costs to be incurred by Patagonia’s inhabitants. They fail to communicate that the prime economic benefit of proposed development is corporate, while the prime cost to be borne is social.

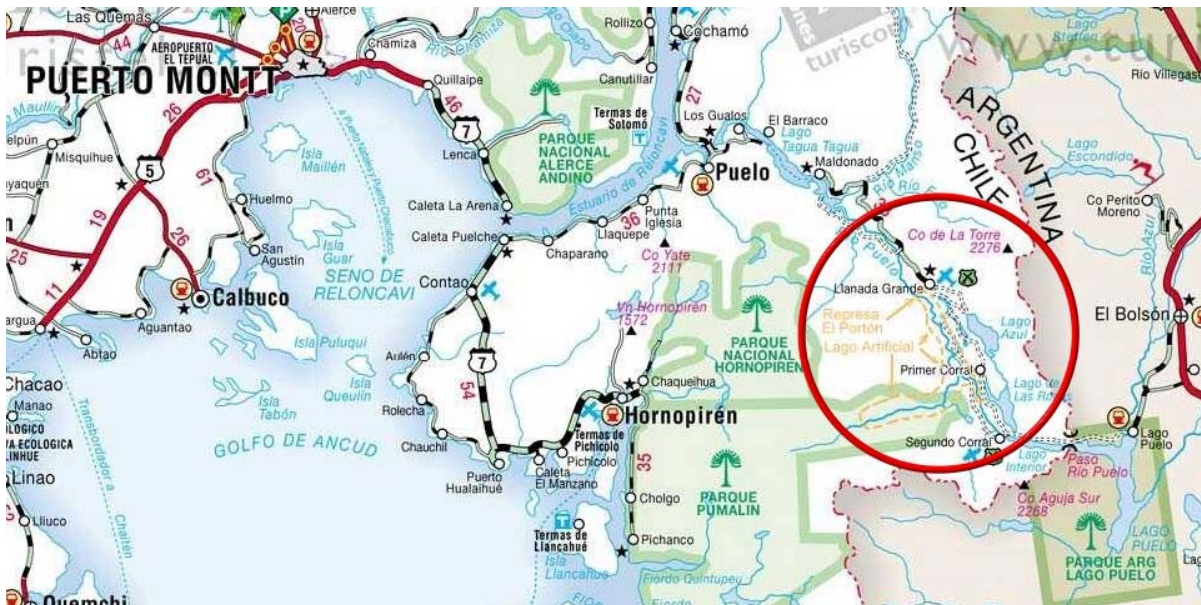
3. THE PUELO RIVER WATERSHED

The binational Puelo River basin is one of the most important shared hydrologic complexes in Patagonia [Map1]. It has an area of approximately 880,000 hectares (2.18 million acres), of which 300,000 ha (741,000 acres) are in Chile and 580,000 ha (1.4 million acres) in Argentina. On the Argentine side, the basin is protected by Lago Puelo National Park and stands out for the important valleys of Río Azul, Epuyén, and Cholila and for the flow input to Lago Puelo. On the Chilean side, the basin is comprised of diverse hydric systems that include lakes (Lower Lago Puelo, Las Rocas-Azul, Totoral, Blanco, and Tagua Tagua) and rivers (Ventisquero, Traidor, Tigre and Manso, among others).

According to hydrological studies obtained through historical records from Endesa's Carrera de Basilio station from 1943-1987, the average flow of the Puelo River is 666 m³ per second (23,520 cfs). This volume classifies it as one of the rivers with the highest flow in Patagonia, after the Baker River in Aysén province. From a biological point of view, the watershed stands out for its floral and faunal diversity, principally due to the abundant temperate evergreen rainforest and presence of conifers (*Austrocedrus chilensis* – ciprés de la Cordillera and *Fitzroya cupressoides* - alerce).



Populations of the native camelid *huemul* (*Hippocamelus bisulcus*) are notable as well and have yet to be thoroughly studied. In recent decades, the watershed has experienced an increase in visitation by tourists, who enjoy the area's biological offerings and minimal human intervention on the landscape, despite its proximity to urban areas.



Map 1: Location of the Puelo River Watershed

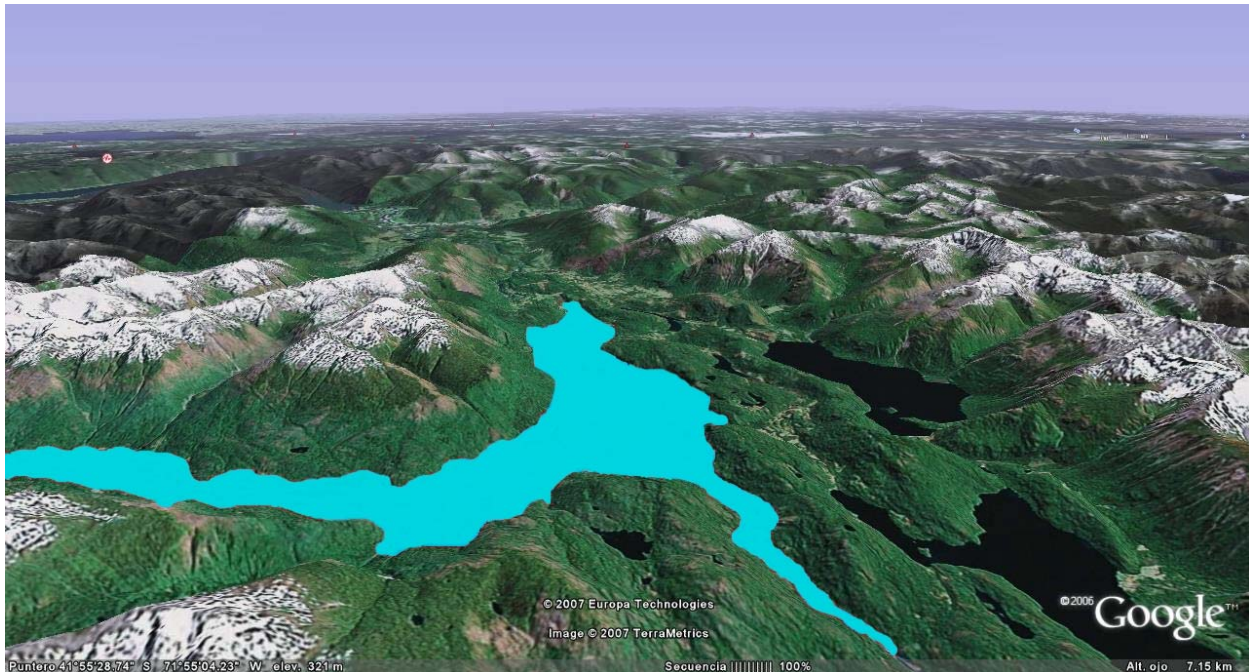
- Dams

Endesa España, the largest hydroelectric company operating in Chile through various power stations, has held water rights to the entire flow of the Puelo River since 1990. Originally, Endesa had

planned to build a 180-meter dam with 1250 megawatts of power near Tagua Lake, which would have created the largest artificial lake in Chile. The project was delayed for various reasons and recently modified in scale and location (reduction of the flow and location of the dam). The new location is slated to be in the El Portón zone, in front of Llanada Grande. Satellite imagery from Google Earth (2006) shows the location of the dam project. The red line marks the limits of flooding and the affected zones, which will cover more than 5,000 ha (12,350 acres).



Puelo River Basin (3D). Before



Puelo River Basin (3D). After 2010

- **Water rights**

The construction of El Portón dam on the Puelo River is dependent on the concession of water rights granted by the General Water Administration (DGA) in the Lakes Region. Under DGA Decree 570 (September 12, 1990), Endesa España was given non-consumptive use rights and permanent tenure of surface waters for 850 m³/second (30,000 cfs) on the Puelo River in Llanquihue province in the municipality of Cochamo.

This right was obtained through special process, as the DGA at the time rejected the request due to technical defects. Later, through judicial petition, Endesa was able to compel the DGA to expedite the corresponding right through DGA Decree 570 (1990) for non-consumptive use and permanent tenure of surface waters for 850 m³/second (30,000 cfs) of the river's volume. An analysis of the data used during this period (Carrera de Basilio measuring station, 1943-1987), clearly demonstrates that average flow was only 666 m³ per second (23,520 cfs). This discrepancy suggests that Endesa requested more water than was naturally available and altered the data to obtain rights to more water.

On April 17, 2006 Endesa España announced (in *Las Ultimas Noticias* as well as in the *Diario Oficial de Chile*, the official newspaper of the Chilean government) its intention to assert its use rights to the Puelo River, albeit with some changes in structure and volume from previous plans. In essence, Endesa proposed to move the dam and hydroelectric station to El Portón, in front of Llanada Grande, where it is slated to have an installed capacity of 320 megawatts and a flow of 400 m³/second (14,125 cfs). This will require a 103-meter dam and damming of the river up to 170 meters above sea level. The new reservoir will be over 5,000 ha (12,000 acres) in size and will allow the accumulation of 170 million m³ of water (over 6 billion cubic feet).

With this change in position and reduction in flow, Endesa is yet again submitting a claim for non-existent waters, as the recorded flow in the new proposed location does not exceed 300 m³/second

(~10,600 cfs). Geoaustral has conducted a volume and flow analysis of the Puelo River from Los Hitos to Reloncavi Sound, using 1972-1985 data from the limnimeter located in Los Hitos (owned by Endesa, currently inactive) as well as additional flow input from the Ventisquero, Cataratas, and Totoral Rivers. These figures have been compared with volumes registered in the Cerro Mesa area and 1962-1984 data from another limnimeter in the area (owned by Endesa). Through its investigation, Geoaustral has determined that Endesa is again claiming more water than that available in the river. Chilean authorities continue to overlook technical details such as this.

- **Mining rights**

On May 9, 2007 at 1:40pm in Chile, in the branch offices of the First Civil Court in the city of Puerto Montt, Endesa representative Maria Teresa Cañas Pinochet submitted 52 requests for mining reconnaissance for 12,500 ha (~31,000 acres) along the Puelo River and watershed. Through this process, Endesa is utilizing the Mining Code to assume control of the land and devalue properties that will flood once the project commences. The requests cover the area of Los Guindos near the confluence of the Manso and Puelo Rivers, as well as Santo Domingo, El Portón, the Primer Corral cemetery, walkway, most of Ventisquero Stream and also along the Puelo River until Mosquito Lake or Las Rocas Lake, very near the outlet of Lower Lake Puelo.

4. ANTICIPATED IMPACTS OF THE EL PORTÓN DAM

Damming the binational Puelo River watershed would involve a series of potential risks that do not appear to be of concern to Endesa. Despite Chile's law (Law 19.300 Basis of the Environment) that requires companies to present environmental impact assessments and notify impacted communities, judgments tend to benefit corporations rather than protect the environment or communities. Political application of the law creates the impression that it was created to protect investment and development of projects that exploit natural resources under the guise of protecting them.



Digueñe or Llao Llao (*Cyttaria spinosae*).

The effects of damming the Puelo River will have important impacts at environmental, social, economic, and political scales. The most evident are detailed in the following section

4A. ENVIRONMENTAL IMPACTS

The damming of the river, cutoff of water flow from Reloncavi Sound and new body of water formed by the respective reservoir and its surface waters will produce marked environmental changes along the entire watershed, from its source in the Puelo Lake zone in Argentina to Reloncavi Sound in Chile. General impacts will include the following:

CLIMATE

Effects on climate will be glaring but at the same time very difficult to predict with models, as linear formulas are of limited use when applied to the non-linear biological patterns of nature. Predictive models allow little room for the variation and unplanned effects that occur in natural cycles. The most overt climate-related effects will be:

- The water surface and increased level of evapotranspiration will provoke a strong variation of weather patterns.
- Increase in relative humidity indices.
- Increase in precipitation.
- Reduction of average minimum and maximum temperatures.
- Variation in number of sunny days in the watershed.

FLORA AND FAUNA

The impact on flora and fauna will be both direct and indirect. The most acute effects will result from the damming of the river and flooding of thousands of acres of forest and associated wildlife habitat. Flooding will result in the asphyxiation of thousands of species that form part of the diverse mountain ecosystem. Additionally, the change in climate will provoke disturbances to biological patterns of species that inhabit other areas of the basin, in particular sensitive species such as the *huemul* that live in proximity of the zone to be flooded. Key impacts will be:

- Impact on biological cycles of terrestrial and aquatic species.
- Destruction of thousands of acres of evergreen temperate forest.
- Destruction of important populations of conifers (Cipres de la Cordillera, Alerce) along the length of the basin.
- Increase in forest destruction conducted purely for energy purposes.
- Increase in trash and residues due to the increase in personnel contracted to work in the construction crews.
- Immediate death and subsequent decomposition of thousands of species and carbon-fixing organisms, which will add thousands of tons of methane and carbon dioxide to the atmosphere, thus increasing the effect of global warming.

RELONCAVI SOUND AND ESTUARY

Damming the Puelo River would also have serious effects on Reloncavi Sound, as the Puelo's large flow "represents approximately 68% of the total input of fresh water that enters the estuary" (Jorge Leon, 2005). The Puelo River is the highest contributor of dissolved oxygen to the estuary and drastically influences the water column, reduces salinity indices and dissolved chlorides, and annually inputs hundreds of tons of organic material and mud to maintain the food chain. In sum, the cut-off of the freshwater flow to the estuary would provoke an environmental catastrophe and have irreversible effects on the flora and fauna. This environmental impact would have grave consequences for the coastal fishing economy, with the greatest losses to be felt by the salmon farming sector, mussel sector, and local fishermen. The impact on Reloncavi Sound and estuary must be studied in greater depth, as the proposed dam could provoke one of the greatest environmental and economic disasters on an inland body of water.

The city of Puerto Montt empties over 90% of its liquid residues into the bay through a submerged outlet. Dilution and recycling of the mud depends on the level of dissolved oxygen in the inland

waters, the temperatures in the top of the water column, and the currents and surges present. The most probable impacts on Reloncavi Sound and estuary are the following:

- Drastic reduction in dissolved oxygen in the water column along the zone of influence of the Puelo River, especially in Reloncavi Fjord.
- Complete loss of input of organic matter (mud) to Reloncavi Sound and attendant loss of the basic source of nutrients for trophic chains.
- Increase in average water temperature and in loss of dissolved oxygen in the water column.
- Excessive increase in salinity indices.
- Massive death of ichthic species due to lack of oxygen.
- Increase of species (marine worms, etc.) that proliferate in less-oxygenated habitats and with high salinity indices.
- Increased algal blooms or incidences of toxins such as *Alexandrium catenella*, *Dinophysis acuta*, *Heterosigma akashiwo*, etc.
- Negative effects and reduction of the phytoplankton base that maintains the food chain of filterer species.
- Increase in mortality indices of cultivated salmon due to low oxygen or algae blooms.
- Reduction of the percentages of dilution of residues emptied by the sanitation service ESSAL (Empresa de Servicios Sanitarios) to the Sound and increase in pollution along the coast.
- Lowering in quality of inland waters and increase in the presence of fecal coliforms and other contaminants.
- Catastrophic and irreversible effects to the marine ecosystem of Reloncavi Sound.
- Significant macroeconomic effects on the Puerto Montt business community and on communities bordering Reloncavi Sound.
- Significant loss in the appreciation of coastal properties.
- Critical reduction in the area's revenue stream due to reduced tourist flow.

4B. SOCIOECONOMIC IMPACTS

IMPACTS WITHIN THE ENTIRE WATERSHED (CHILE AND ARGENTINA)

Throughout the 880,000-ha watershed, damming would have a cascade effect that would exacerbate ecosystem damages and make predictions through simulation modeling a challenge. From an economic perspective, the financial health of the watershed's population would be significantly impacted, as the principal revenue stream comes from tourism and agricultural activities that are highly sensitive to excessive moisture. The new hydrological regime and climate parameters would provoke grave changes that include:

- Reduction in the number of visitors to Puelo Lake National Park who access the Pacific (Chilean) side of the watershed.
- Negative effects on the operations and profitability of tourist services in the El Bolsón (Argentina) area and along the length of the watershed.
- Shift in seasonality of agricultural crops and arrival of disease and pests favored by the increase in relative humidity.
- Grave effects on early crops due to increase in number of cold and freezing days.
- Increase in unemployment or loss of jobs due to a decline in the revenue stream entering the tourist and agricultural livelihood sectors.
- Increase in social municipal costs and government resources needed to compensate for revenue losses in the tourism and agricultural sectors.

- Increase in bank credit conflicts upon failure to comply with expectations of established tourist businesses.
- Displacement of small-scale tourist operations established by local farmers along the length of the watershed and in the zone to be flooded.
- Destruction of fly-fishing zones along Puelo River and Ventisquero Stream.
- Eradication of fly-fishing lodges established in the Puelo River area.
- Increased governmental expenses to create training programs for people directly and indirectly affected by the loss of land or the decline of ecotourism activities.

The impact on the local population living in the zone to be flooded would be extremely severe. The creation of a 5,000-ha reservoir would mean that occupied homes, agricultural fields, grazing areas, and historic sites such as El Portón (the main gate), El Balseo (the ferry landing), La Pasarela (the walkway), Primer Corral and its cemetery, the valley of Ventisquero River, Lago Verde, La Vega and other places would disappear completely. The most notable social effects would be:

- Displacement of all inhabitants and loss of culture and quality of life.
- Irreversible destruction of local traditions of the families of the region's first colonists.
- Loss of ancestral memory upon inundation of the Primer Corral cemetery.
- Increased marginalization of families upon displacement and eradication of rural lifestyles and statistical likelihood of a growing urban poor population in nearby cities.
- Increase in crime on a local scale (Llanada Grande) with the arrival of hundreds of foreign workers.
- Increase in social municipal costs to contain the rise in prostitution and sexually-transmitted diseases.
- Increase in rates of alcoholism and related social costs.
- Loss in value and in appreciation of properties bordering the area to be flooded.
- Destruction of connecting roads and works of art between Llanada Grande, La Pasarela, and Primer Corral.
- Increase in the rates of poverty as result of rising costs and credit indebtedness of residents.
- Increase in pollution and forest destruction due to excessive firewood consumption for energy needs.

It should be emphasized that the Puelo River plays a critical role in maintaining the ecological balance of Reloncavi Sound and that any variation in waterflow will cause serious environmental and socio-economic consequences throughout the coastal zone. This will directly impact one of the cities (Puerto Montt) that has the highest growth rate (8%) in Chile. The most serious effects on the coastal zone and Puerto Montt are detailed in the following section.

IMPACTS BEYOND THE WATERSHED

In addition to the aforementioned impacts incurred by a dam on the Puelo River watershed, drastic effects would also be felt beyond the watershed, due to the proposed emptying of the large volume of freshwater in Reloncavi Sound. This inland waterbody is highly sensitive to changes in the Puelo River, and the impacts of proposed development have not been adequately studied. The Puelo River contributes over 60% of the freshwater to this inland waterbody complex (Reloncavi Sound), oxygenating its water, regulating rates of salinity at the top of the water column, and controlling increases in temperature. The Puelo River basin is the true biological clock of Reloncavi Sound and Estuary. A reduction in flow would result in serious impacts on the ecosystem and consequently on the economic, aquacultural and social structure of the region. It is projected that such a reduction

could trigger irreparable losses to the development of Puerto Montt and of communities along the estuary or coastal zone, the most notable of which would be:

- Drastic reduction in commercial biomass in fishing areas in the inner estuary and sound.
- Excessive rise in maintenance and operational costs of aquaculture workers and local fishermen.
- Displacement of feeding and migration patterns for commercial fish species (southern hake, etc) in the inner waters of the sound.
- Drastic effects on the local fishing economy and on the financial stability of towns in Cochamo and along the coast.
- Impact on economic development of Puerto Montt and towns along the estuary.
- Increase in unemployment and related social costs in Cochamo due to the decline in fish stocking levels and aquaculture operations in the estuary.
- Increase in credit indebtedness of local fishermen and direct and indirect damages to the numerous groups of local fishermen operating in the sound and estuary.

4C. GEOPOLITICAL IMPACTS

Laws governing water use in a watershed normally do not consider whether a basin is shared; this is usually only taken into account when one of the parties acts on a use right. While the Puelo River basin lies in two countries, it is one contiguous watershed, and as such is subject to the norms and protocols that oblige both parties to consider the shared waters as one body. This is stated explicitly in the Specific Additional Protocol Governing Shared Hydric Resources Between Chile and Argentina, a protocol that reiterates Article II, Pt. 3 of the Environmental Treaty between Chile and Argentina (August 9, 1991) and that established the Hydrographic Basins Act of Santiago (June 26, 1971). Failure to comply with these protocols could produce serious effects in bilateral relations between Chile and Argentina.

The governments of both countries are currently working to create a North Patagonian-Andean Transboundary Reserve to be incorporated under UNESCO's Man and Biosphere (MAB) program. The center of the reserve is located at 41°18" and 72°19", near the mouth of Reloncavi Estuary. The Puelo River basin is at the center of this binational integration project. The proposed reserve would cover over 2 million hectares (nearly 5 million acres) on both sides of the Andes between Chile and Argentina. Endesa's proposed dam threatens the realization of this project. Likely geopolitical impacts that could arise from the damming of the Puelo River include:

- Failure to honor the Argentine-Chilean Environmental Treaty of 1991.
- Violation on the part of the Chilean government of the protocol governing shared hydric resources between Argentina and Chile (1991), including the 1991 Environmental Treaty.
- Infringement on the 1971 Hydrographic Basins Act of Santiago.
- Irresponsible action to promote damming of a binational river and a national park that is part of the proposed North Patagonian Transboundary World Reserve.
- Irritation on the part of Argentine authorities in Chubut and Río Negro provinces due to the actions of the Chilean government.
- Actions by Argentine citizens against Chilean economic interests.
- Conflict in the region's mountain passes in protest of the Chilean government's attitude, to be carried out by Argentine citizens and groups impacted by the proposed dam.

4D. GEOLOGIC IMPACTS

One of the most dramatic and unacknowledged impacts is the extreme geologic instability that could occur with the development of a 5,000 ha reservoir (with capacity of 170 million cubic meters or tons) in this volcanic region. The fragile Liquiñe-Ofqui Fault Zone (ZFLO) lies beneath the Puelo River basin and “constitutes part of the North Patagonian batholith and represents developing magma activity” (Evolución Geológica by P. Durhart, D. Quiroz of the National Geologic and Mining Service - Sernageomin). This fault zone moves beneath the Puelo River basin starting at the mouth of the Puelo River in Reloncavi Sound and continuing along the length of the riverbed until the Lower Lake Puelo area. It is an oblique fault highly influenced by volcanic activity.

This fault zone has been in the news in recent months for frequent rumblings in Aysén Fjord. The ZFLO is active throughout the Puelo River basin as well. It is clear that construction of a large, heavy structure along this sensitive faultline would significantly increase the possibility of activating the fault and the probability of tremors and small earthquakes in the Puelo River basin (Llanada Grande in Chile and El Bolsón in Argentina).

Since May 6, 2007, increasing low-intensity seismic activity has been recorded along the chain of volcanoes that includes Carran, Los Venados, Riñinahue, Puyehue, Mirador and other smaller cones. Seismic activity monitoring by the National Geologic and Mining Agency (Sernageomin) and the National Emergency Office (Onemi) further confirms that the Puelo River basin is located along the northeast geologic fracture zone of Liquiñe-Ofqui (ZFLO). It is illogical to allow the disturbance of such an unstable fault such as the ZFLO. Further technical studies must be conducted before considering intervention in the Puelo River basin.



Image. Sernageomin.

5. THE MANSO RIVER

The Manso River is a sub-watershed linked to the Puelo River's flow that also has its source in Argentina and endpoint in Chile. The Manso River is also the focus of energy interests, with Endesa planning to build the Steffens hydroelectric station, slated to use a total of 193 m³/second (6800 cfs) and produce 210 megawatts. Details of this project are available in Geoaustral's report entitled 'Situation of the Manso River and Cochamo, Region X', available as a pdf.

Other efforts to develop hydroelectric projects are being carried out by Madrid Engineering & Construction Company, a Santiago-based firm. The company presented five requests for water use on April 1 in Chile's official newspaper (front section, page 7). Requests were for use of the flow for 23.5 m³/second (830 cfs), 106.5 m³/second (3760 cfs), 116.5 m³/second (4115 cfs), 12.5 m³/second (440 cfs) and 136 m³/second (4800 cfs). These petitions are in addition to two others solicited for the Upper Puelo River basin, near the mouth of Lower Lake. These requests have been rejected by the General Water Administration.

6. BACKGROUND ON ENDESA

On December 1, 1943, Endesa Chile was created as an incorporated partnership, an affiliate of the Public Works & Production Company (CORFO). The corporation was founded to develop the country's electrification plan, which included the generation, transport, production and distribution of electrical energy.



The company belonged to the Chilean government for 42 years, during which it played a dominant role in the electrical sector and served as the base for the development of the country's hydroelectric sector. Endesa Chile became one of Chile's most important companies, attracting substantial investments that made possible great feats of engineering, electricity, and irrigation.

Endesa Chile went out for public offering in 1987, during Chile's era of privatization in the 1980s. Sale of the company to Endesa España was finalized in 1989, with the assets used to form the affiliate Endesa Chile.

In May 1992, Endesa Chile went international with the acquisition of Argentina's Costanera hydroelectric station and subsequently, in August 1993, through the purchase of the El Chocón station (also in Argentina). In October 1995, the company acquired Edegel and in December 1996 bought the Colombian hydroelectric station in Betania. In September 1997, in partnership with Endesa España, it acquired Emgesa, another Colombian company. Finally, in September 1997, it bought the Cachoeira Dourada electrical station in Brazil.

On September 27, 2004, the Ralco (Chile) hydroelectric station was inaugurated. One of the largest undertakings in recent times in all of Latin America, the station required an investment of \$570 million dollars (U.S.). It supplies 570 megawatts, or 9% of the total demand of Chile's electrical system. Development of the Ralco station involved a long battle with indigenous Pehuenche

communities in the Alto Bio Bio zone and was the site of environmental and ethnic tragedy as indigenous communities were displaced.

Endesa Chile is currently traded on Chile's commercial markets, in the New York Stock Exchange and in the Latin American market of the Madrid Stock Exchange, Latibex. Endesa Chile operates in Argentina, Brazil, Colombia, Peru and Chile and has an installed potency of 12.3 billion megawatts throughout the region. It is one of the most important energy-generating companies in Latin America.

Endesa's environmental record is blemished by ecological disasters, among them the destruction of the Chapo lake and watershed in Chile's Lakes Region, with the introduction of the Canutillar o Cenelca station, currently owned by Eliodoro Matte (Colbun). This station has negatively impacted the Llanquihue Forest Reserve and Alerce Andino National Park, where thousands of alerce (Chilean redwood) trees were cut to install high-tension powerlines. Another high-profile social and ecological conflict was Endesa's damming of the Bio Bio river and subsequent displacement of Pehuenche communities in the Pangué and Ralco areas.

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