

PROJECT “ELECTRIC TRANSMISSION LINES
MAITENES S/E – ALFALFAL S/E, AND
ALFALFAL II POWER PLANT - ALFALFAL S/E”

ENVIRONMENTAL IMPACT STUDY FOR PROJECT
“ELECTRIC TRANSMISSION LINES MAITENES S/E –
ALFALFAL S/E AND ALFALFAL II POWER PLANT –
ALFALFAL S/E”

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1.- PROJECT DESCRIPTION

1.1 Presentation of the Project

The Project “Electric Transmission Lines Maitenes S/E – Alfalfal S/E and Alfalfal II Power plant – Alfalfal S/E”, which owner is AES Gener S.A., consists of two electric transmission lines totaling 17.1km connecting the Central Interconnected Grid (SIC) to the power plants of Las Lajas and Alfalfal II. Both have been approved under the framework of PHAM by Exempt Resolution N° 256/09 from March 30, 2009.

Therefore the electric transmission system comprises two lines:

- The line connecting Maitenes S/E and Alfalfal S/E, in a 110 kW, 7.6km circuit, and
- The line connecting the Alfalfal II power plant and the Alfalfal S/E in two 220 kW, 9.5km long circuits.

The Project will leverage the existing transmission line connecting Alto Maipo S/E and Maitenes S/E to then connect Las Lajas power plant.

For those sections already indicated the lines connecting Maitenes S/E and Alfalfal S/E will be completely built as well as the connection between the latter and Alfalfal II power plant. On the other hand the existing section between Alto Maipo S/E and Maitenes S/E will be used as to connect the energy from Las Lajas power plant. On the other hand, the Project also considers the expansion of the existing Alfalfal S/E in 0.45ha as to do the respective connections to the new lines.

1.2 Project Objective

The purpose of the Project “Electric Transmission Lines Maitenes S/E – Alfalfal S/E and Alfalfal II power plant – Alfalfal S/E” is to enable the electric connection of PHAM, particularly power plants at Alfalfal II and Las Lajas to the Central Interconnected Grid (SIC).

1.3 Location of the Project

The Project will be completely developed inside the property of Hacienda Rio Colorado in the municipality of San José de Maipo, Cordillera province in the Metropolitan region of Santiago. The approximate UTM coordinates (Datum PSAD56 node 19) are as followed:

Table 1 Location Coordinates of the Project

Tower/Crowns	Datum UTM Coordinates PSAD56 Node 19	
	East	North
Line between Maitenes S/E and Alfalfal S/E		
Start	382914	6289490
End	389230	6292780
Line between Alfalfal II Power plant and Alfalfal S/E		
Start	385243	6287124
End	389350	6292748
Expansion Alfalfal S/E		
Reference Coordinates	389261	6292827

Source: AES
Gener S.A.

1.4 Justification for the location

The final design of the layout was established as a result of a study of the different location variables in order to minimize the impacts and considering the natural characteristics of the area considered for the location of the Project. Therefore the layout was determined nearby existing and projected roads (a future access road to Alfalfal II power plant, already environmentally assessed) using the already existing and intervened strips of land and avoiding enabling new access roads for tower construction purposes.

Therefore, below are the general criteria considered for the location of the Project:

- Areas near the road and existing paths were preferred as well as areas already intervened as to place the towers.
- Location of the structures was established preferring areas without native vegetation under the category of conservation.

1.1 Project Surface

The total area of intervention of the Project totals 61.25ha, wherein the effective surface area to be covered by the works is 1.35ha with the following distribution:

- Structures for electric transmission: The Project considers a surface area of 0.9ha to locate its 61 towers¹.
- Substation: Only considers the expansion of Alfalfal S/E equivalent to 0.45ha.

¹ An intervention area of 12*12m is considered for each tower.

The remaining surface area includes the restriction strip for both lines totaling 59.90ha. The strip considers pruning of trees as provided with the regulations under Regulation NSEG 5 En 71 as well as in compliance with silvocultural criteria.

1.6 Amount of investment and Labor

The total investment amount for engineering, procurement, permitting, construction, erection, tests, and commissioning of the Project amounts to US\$13,000,000 approximately. Both qualified and non-qualified labor to be required for the construction of the lines is in average 115 people, reaching a maximum of 145 people working at the same time in the different stages of the construction phase. The phase of operation will not use additional labor. Operation of transmission lines will be done remotely from the Load Dispatch Center in AES Gener S.A. located at Renca power plant while maintenance and servicing will be provided by the staff currently conducting those activities for AES Gener S.A.

1.7 Working Life

The estimated working life for the Project “Electric Transmission Lines Maitenes S/E – Alfalfal S/E and Alfalfal II power plant – Alfalfal S/E” is 50 years. By the end of that period replacement of equipment and transmission system will be performed if necessary due to deterioration or inefficiency.

1.8 Schedule of Activities

The start-up date in operation for the Project is scheduled for the first semester of 2013; the duration of construction activities is estimated in 24 months.

1.9 Definition of the parties, actions, and physical works comprising the Project

The Project consists of two electric transmission lines and the expansion of Alfalfal S/E in three sections of 220 kW and one section of 110 kW, and includes the installation of a 110/220 kW, 300 MVA transformer to connect the circuit from Alto Maipo S/E.

The transmission line will run for approximately 17.1km, from which:

- the first line, between Maitenes S/E and Alfalfal S/E, 7.6km long considers the construction of one circuit and two conductors by phase with a rated voltage of 110 kV and with capacity to carry 300 MVA. This needs to have a 30m wide restriction strip; and
- The second line, between Alfalfal II power plant and Alfalfal S/E, 9.5km long considers the construction of one, double circuit line, and one conductor per phase with a rated voltage of 220kV and capacity to carry 300MVA. This needs a 40m restriction strip.

Based on the above the projected transmission lines will have the basic characteristics listed in the following table:

Table 2 Characteristics of projected transmission lines

Parameter	Projected Lines	
	Line between Maitenes S/E and	Line between Alfalfal II Power plant and
Rated Voltage (kW)	110	220
Maximum Voltage (kW)	123	245
N° of	29	32
Level of Air insulation mm/kV	20	20
Rated Frequency (Hz)	50	50
Number of Circuits	1	2
Number of Phases	3	3
Number of conductors by	2	1
Line length (km)	7.6	9.5
Class of insulation	20	20
Insulation Basic Impulse Level (BIL)	550	1050
Maximum Temperature of	80	60

Source: AES
Gener S.A.

1.10 Description of Line Components

The Project will have tower structures with simple circuit and two aluminum conductors per phase for the line section between Maitenes S/E and Alfalfal S/E and double circuit and one aluminum conductor per phase for the line section between Alfalfal II power plant and Alfalfal S/E.

There will be two basic types of structure: hanging and anchoring. Determination of when to use each of those will depend on the need of using anchor-type towers in each end provided the line creates a non-extended angle as well as due to the topography of the land. Also, the structures will have variations in height as to facilitate their accommodation to the land. Total width of the towers for the line between Maitenes S/E and Alfalfal S/E is 8.4m in the cross bracing and a maximum of 7.5m at the base. On the other hand, the maximum width for the line towers to be developed between Alfalfal II power plant and Alfalfal S/E is 11.3m in the cross bracing and 8m at the base. Lightning arresters will be installed in the end points of the line as to prevent the propagation of the discharge wave to equipment and insulated cables located beyond the end points of the lines.

1.11 Restriction Strips

As provided under NSEG 571 and in compliance with PRMS (1994), the width of the restriction strips for the activities conducted under the line is determined by the width of the cross bracings, the maximum deformation, and the effect of wind deviation over the conductor and hanging chains, when these are in place.

1.12 Crossings

The line projected crosses the 12 kW Maitenes – Alfalfal electric line owned by AES Gener S.A. as well as interferences with other existing installations which include roads and rivers. With regard to these crossings and intersections, the provisions under NSEG 5 En 71 “Installation of Strong Currents” and NSEG 6 En 71 “Crossings and parallelism of electric lines.”

1.13 Parallelism with other overhead lines

Parallelisms with other existing lines between Alfalfal II power plant and Alfalfal S/E and between Maitenes S/E and Alfalfal S/E with other lines and between them thereof include parallelism with lines also belonging to the Company. In any case the Project will meet the restrictions provided under NSEG 6 En 71.

1.14 Description of the parties relative to the expansion of Alfalfal S/E

The Alfalfal Sub-station will be expanded considering three 220 kW sections, one 110 kW section, and one three-phase power transformer of 110/220 kW and 300 MVA (OFAF). The high voltage equipment is the standard equipment for this type of voltage with insulating elements with a leakage distance greater than standards as the sub-station is located at 1,300 masl. It is also necessary to expand the sub-station structures as to accommodate the new equipment, including concrete foundations, the extension of cable chute, and underground and overhead grid, extension of the perimeter fence, laying out of new control cables and equipment for supervision, measurement, protection and control; equipment to be installed in the existing control building at Alfalfal power plant (adjacent to Alfalfal S/E).

1.15 Description of the Phase of Construction

Construction of the lines project considers these activities: definition of work faces, new layout of line structures, clearance in the area where the structures will be placed, earthworks, construction of foundations, compacted backfill, evection, enabling of restriction strip (if necessary), layout and stretching of conductors, termination, testing and commissioning, and demobilization.

1.16 Expansion Activities of Alfalfal S/E

Expansion of Alfalfal S/E shall start after the construction of both lines. Once all expansion works are completed, the two lines projected will be connected. Therefore Alfalfal S/E includes the following works: new layout, construction of foundations, erection of structures and equipment, termination, tests and commissioning, and demobilization.

1.17 Service Roads

The construction phase of new lines and expansion of Alfalfal S/E access to the structures will be using the main roads, that is, Route G-345 and the future access road to

Alfalfal II power plant. It is important to point out that when it is not possible to access the site considered for the construction of structures using the roads already mentioned. Transportation of structures and other elements using animal force methods in the existing trails and paths will be used as to prevent creating new trails and roads in the area.

1.18 Transportations

This Project has considered two types of transportation. The first is from the Contractor's warehouse to the stock area located at Alfalfal power plant. This transportation will be using the main roads existing, preferably using 28 tons trucks. Then, a second type of transportation will take place. This is called internal transportation as it is scheduled and coordinated toward work faces. Therefore their route will be mostly through access roads to the structures (Route G-345 and future road to Alfalfal II power plant).

1.19 Lodging and Food

Due to the proximity the works have to the city, Contractor staff will travel daily to Santiago. Therefore it is not required to provide local facilities to lodge the staff. Meals will be provided in shifts using the facilities of a cafeteria at Camp 4 of Project PHAM. Also, when necessary, the cafeteria located at Alfalfal power plant will be used.

1.20 Equipment and Machinery

Main equipment and machinery used in the construction of the new lines and the expansion of Alfalfal S/E will be buses for staff transportation, pickup trucks for inspection visits of the works at the work faces as well as to transfer waste; trucks for the transportation of supplies, compressors, pavement breakers for excavations, mixing truck for concrete, hoists and breaks for layout of conductors, front-end loaders for moving of debris, backhoes for excavation in soft soil with easy access, and finally minor equipment such as pickax, pulleys, portable hoists, and minor tooling.

1.21 Input and Sourcing

1.21.1 **Water**

Drinking water supply will be provided depending on the section where the works are located. Therefore, staff working at Alfalfal S/E will have drinking water from Alfalfa power plant. On the other hand, staff working at the work faces of the lines will daily use drinking water from sealed bottles. This water will be sourced by the same power plant. In both cases, quality condition of the drinking water complies with NCh N°409.

During the construction phase, water for industrial use will be preferably used for concrete preparation at the work faces with an estimated use of 6 m³/day when is necessary to conduct this activity.

1.21.2 Fuel

All vehicles (including pickup trucks, buses, and trucks) will be sourced with fuel in populated towns and service stations close to the works. Fuel used for heavy machinery operation will be transported by authorized distributors and stored in tanks located at Camp 4 of PHAM.

1.21.3 Other supplies

It will also be necessary to have access to formwork, concrete, iron work, among other, which are to be provided by the contractor. In the case of equipment from abroad they should meet Ex. Res. N° 1.825.

1.22 Waste Water Treatment System

Portable toilets will be available at the work faces in a number sufficient the number of workers, and their removal and cleaning will be done directly by authorized companies. Similarly workers performing activities in the expansion of Alfalfal S/E will use the restrooms of Alfalfal power plant. In both cases the number of toilets and hand washer will be in accordance with 23 and 24 of S.D. N° 594/00.

1.23 Waste Management

Waste generated during the construction of the Project will be sorted in three main types: domestic or similar to domestic, construction, and vegetation (associated to pruning in the areas and periods necessary).

1.24 Safety Conditions

AES Gener S.A. will periodically inspect and report all works, facilities, and construction activities involved in the Project and will include in its contracts a mandatory clause whereas Contractors need to comply with risk prevention and safety standards. Also, said contract will include all clauses deem necessary to ensure observance and compliance with all applicable legal standards and regulations relative to occupational health and safety which will also be applicable to all potential sub-contractors in the Project.

1.25 Description of the Phase of Operation and/or Maintenance

Maintenance of electric lines, in general, includes preventative, scheduled corrective, and corrective with failures actions. These actions are very low in frequency and will be developed for both lines. People participating in maintenance activities should be duly trained in their tasks through an induction in their specific topic besides those topics that are environmentally relevant forming part of the assessment process of this Project. Maintenance in the case of the expansion of Alfalfal S/E will be completely conducted along with maintenance of the remaining sub-station facilities which basically consist of housekeeping in the insulating components that are energized and potential adjustment to high voltage equipment.

Maintenance of the restriction strip of the line will consist of a pruning -controlled and under silvocultural criteria- of trees and new sprouts in bushes with a height greater than that provided under NSEG 5 En71. The frequency of this type of maintenance will depend on the growth of the species present in the restriction strip.

1.26 Description of the Phase of Closing and/or Abandonment

No abandonment phase is considered for the Project and its working life might be extended through maintenance and replacement of equipment.

1.27 Description of Emissions and Discharges to the Environment

1.27.1 Phase of Construction

i) Emissions to the Atmosphere

Few atmospheric emissions will be produced during the construction phase of the Project, mostly particle matter (MP10) and combustion gases from engines, produced from excavation activities, earthwork, and traffic, among others. These are temporary emissions, of low magnitude and local.

To control these emissions and avoid dust suspended in the vicinity of populated areas (Los Maitenes and El Alfalfal), transportation of material necessary for the Project will be controlled by covering the bins of trucks and avoid dispersion of dust in the air and spillage of solid material.

ii) Noise Emissions

Sound emissions will be created during the construction phase from the activities developed at the work faces (operation of equipment and machinery.) It should be noted that these emissions will be restricted to time (day shift) and usually distant from populated areas. Depending on the work executed, it is estimated that all the machinery will produce 84 dB(A) max at a distance of 15m. This will be originated from the phase of excavation, considering the worst case scenario, that is, that all equipment is running at the same time.

All those workers exposed to high levels of sound pressure will have ear protection and all necessary safety equipment as per current regulation.

iii) Liquid Effluents

Work faces will have portable toilets as provided under Articles 23-24 of S.D N° 594/00; these portable toilets will be serviced and removed by a company specialized to conduct these type of activities. Said company will keep record of all servicing done to these toilets. No liquid industrial waste will be produced at Alfalfal S/E during the construction phase.

iv) Solid Waste

Waste generated at the working faces of the Project will be taken to the waste management yard at Camp 4 of PHAM. The following waste will be managed in this yard: domestic or similar to domestic and construction. It is important to highlight that as minimum working faces will be generating hazardous waste which will be transferred daily (when produced) to the hazardous waste management yard at Camp 4, to be kept as provided under S.D. N° 148/03.

1.27.2 Phase of Operation

During the phase of operation main emissions come from electromagnetic fields generated by the normal operation of the line as well as occasional and temporary generation of solid waste from maintenance activities.

The Project therefore considers 30m and 40m wide restriction strips depending on the voltage of the conductor as provided by law, as to safeguard sensible agents from the electromagnetic waves produced by the Project. In this case in particular there is not any town or isolated houses (that is, people) in the vicinity of the line that might be affected by these fields.

On the other hand, solid waste will be generated from maintenance activities of the lines. This waste will be transferred to the waste management plant at Alfalfal power plant. Generation of hazardous waste during this phase is not expected. Maintenance to vehicles used during this phase will continue to be conducted at authorized workshops in the nearby cities.

2 COMPLIANCE PLAN WITH ENVIRONMENTAL LEGISLATION

2.1 General Environmental Regulations

The 1980 Political Constitution in its Article 19 N° 8 guarantees to all individuals “The right to live in an environment free of contamination”, and adds in the same Article “the State has the duty of ensuring that this right is not affected as well as safeguarding the protection of nature.” Law N° 19,300 about General Base of the Environment provides the legal framework of environmental protection applicable to the development of projects or works likely to have environmental effects. Said legal entity provides the instruments for environmental management aiming at protecting the environment, including the System of Environmental Impact Assessment (SEIA).

Projects or activities requiring entry into SEIA shall produce an Environmental Impact Study if they generate or at least produce one of the effects, characteristics or circumstances detailed under Article 11 of the Law. The Project submitted for environmental assessment falls within Article 10 of the Law N° 19,300, Letter b) as it is a new high voltage, electric transmission line and expansion of Alfalfal S/E; and Letter p), as it is a work to be developed in an Area with Tourist Interest (as per L.D. N° 1.224) which is under official protection.

Consequently, this Project requires entry into the System of Environmental Impact Assessment (SEIA). Based on the analysis conducted, the Project will be subject to the SEIA through a Study of

Environmental Impact (EIA), in compliance with the provisions under Law N° 19.300, as to obtain the respective Resolution of Environmental Qualification.

2.2 Specific Applicable Regulation

2.2.1 Air Quality

- Supreme Decree N° 144/61. Sets the regulations to prevent atmospheric contaminants or fumes of any kind. Date of publishing: May 18, 1961. Ministry of Health.
- Supreme Decree N° 59/98. Sets the primary quality standard for breathable particle material MP10. Date of publishing: May 5, 1998, amended by S.D. N° 45/2001 of September 10, 2002. Ministry General Secretary of the President of the Republic.
- Supreme Decree N° 45/01. Amends decree N° 59/98 Primary Annual Standard of Air Quality for Particle Material. Date of publishing: Sep 11, 2001. Ministry General Secretary of the President of the Republic.
- Supreme Decree N° 112/03. Primary Standard for Air Quality for Ozone (O3). Date of publishing: Mar 6, 2003. Ministry General Secretary of the President of the Republic.
- Supreme Decree N° 113/03. Primary Standard for Air Quality for Sulphur Dioxide (SO2). Date of publishing: Mar 6, 2003. Ministry General Secretary of the President of the Republic.
- Supreme Decree N° 114/03. Primary Standard for Air Quality for Nitrogen Dioxide (NO2). Date of publishing: Mar 6, 2003. Ministry General Secretary of the President of the Republic.
- Supreme Decree N° 115/02. Primary Standard for Air Quality for Carbon Monoxide (CO). Date of publishing: Sep 10, 2002. Ministry General Secretary of the President of the Republic.
- Supreme Decree N° 58/04. Reformulates and updates the Plan for Prevention and Atmospheric Decontamination for the Metropolitan Region (PPDA). Date of Publishing: January 29, 2004. Ministry General Secretary of the President of the Republic.
- Decree N° 55/94 Sets applicable emission standards for heavy motor vehicles it details. Date of publishing: Apr 16, 1994. Ministry of Transportation and Telecommunications.
- Supreme Decree N° 4/94. Sets emission standards for contaminants applicable to motor vehicles as well as set control procedures. Date of publishing: Jan 7, 1994. Ministry of Transportation and Telecommunications.

2.2.2 Noise

- Supreme Decree N° 146/98. Regulation for maximum allowable levels of disturbing noises generated from fix sources. Date of publishing: Apr 17, 1998. Ministry General Secretary of the President of the Republic.

- Supreme Decree N° 594/00 Regulations for Basic Sanitary and Environmental Conditions at work places. Date of publishing: Apr 29, 2000. Ministry of Health.

2.2.3 Waste

- Decree with force of law N° 725/00. Sanitary Code. Of Environmental Safety and Health. Date of publishing January 31, 1968; updated on July 13, 2005. Ministry of Health.
- Supreme Decree N° 594/00 Regulations for Basic Sanitary and Environmental Conditions at work places. Date of publishing: Apr 29, 2000. Ministry of Health.
- Supreme Decree N° 148/03 Sanitary Regulation for Hazardous Waste Management. Date of publishing: Jun 16, 2004. Ministry of Health.

2.2.4 Archaeological and Cultural Heritage

- Law N° 17,288 National Monuments and Supreme Decree N° 484/90 Regulation on Archaeological, Anthropological, and Paleontological Prospection and Excavations. Dates of publishing February 4, 1970 and April 2, 1991. Ministry of Education.

2.2.5 Wildlife

- Supreme Decree N° 4,363/31 Law of Forests and Decree Law N° 701 Regulation for Forest Development. Dates of publishing July 31, 1931 and October 28, 1974. Ministries of Land and Settlement, and Agriculture, respectively.
- Law N° 20,283 Law of Native Forest Recovery and Forest Development. Date of Publishing July 2, 2008. Ministry of Agriculture.
- Law N° 19,473, replaces text body in Law N° 4,601 about Hunting and Article 609 of the Civil Code.
Decree N° 5. Regulation of the Law of Hunting. Date of publishing: Sep 27 1996. Ministry of Agriculture.
- Supreme Decree N° 82/74. Prohibits cutting of trees and bushes in the Andean foothills and hills, with a Date of publishing in July 3, 1974. Ministry of Agriculture.
- Exempt Decree N° 693/03 Sets a closed period for conservation for 30 years in 661,057 hectares in the Andean hills in the Provinces of Santiago and Cordillera. Date of Publishing: February 8, 2003. Ministry of Agriculture.
- Exempt Resolution N° 1,825. Regulation for packing woods. Date of publishing: Aug 5, 1994. Ministry of Agriculture.

2.2.6 Land Planning

- Supreme Decree N° 89/98 modifying Decree modifying N° 47/92. General Ordinance of Urban Planning and Construction (OGUC) Date of publishing: July 29, 1998. Ministry of Housing and Urban Planning.

- Resolution N° 20 and its amendments, from the Regional Metropolitan Government of Santiago, passes the Urban Regulation Plan for Santiago. Date of publishing: Nov 4, 1994. Ministry of Housing and Urban Planning.
- Decree Law N° 1,224. Refers to the procedures and effects inferred from statements such as Zone and/or Center of National Tourist Interest. Date of Publishing: November 21, 2001. National Tourism Service.

2.3 Other Regulations Environmentally Relevant

- Decree with the Force of Law N° 4/20,018. Set body of text summed up, coordinated and systematized of Decree with the Force of Law N°1, of Mining from 1982, General Law of Electric Utilities, in the matters of Electric Energy. Date of publishing: February 5, 2007. Ministry of Economy.
- Supreme Decree N° 327. Sets the Regulation of the General Law of Electric Utilities Date of publishing: September 1, 1998. Ministry of Mining.
- NSEG 5 In 1971 “Electricity, electric facilities of high voltage”, Supreme Decree N° 4,188/55 from the Ministry of Interior, re-updated by Resolution N° 692/71 of the Superintendence of Gas and Electric Utilities”.
- NSEG 6 In 1971 “Electricity, crossing, and parallelism”, passed by Supreme Decree N° 1261/57 from the Ministry of Interior, re-updated by Resolution N° 692/71 of the Superintendence of Gas and Electric Utilities”.
- Supreme Decree N° 75/87. Sets the conditions to carry the load indicated Date of publishing: Jul 7, 1987. Ministry of Transportation and Telecommunications.
- Decree with force of law N° 850. This regulation prohibits using, closing, obstructing or deviating public roads and, in general, to do any kind of works thereof. Date of publishing: Feb 25, 1998. Ministry of Public Works.
- Supreme Decree N° 158/80 and Decree N° 1,910/00. Sets the limit by weight of axles and total gross weight limit. Date of publishing: Apr 7, 1980. Ministry of Public Works.
- Exempt Decree N° 130. Sets the restriction for loaded trucks. Date of publishing: Jun 12, 1997. Municipality of San José de Maipo.

2.4 Sectorial Environmental Permits

The Owner requests the Sectorial Environmental Permit relative to Article 99 of SEIA Regulation. It is the permit for hunting or capture of specimens that are considered protected species detailed under Article 9° of Law N° 4,601, about Hunting, requirements for granting such as well as the technical and formal contents necessary to certify its compliance, which are listed thereof.

3 RELEVANCE OF ENTRY INTO THE SYSTEM OF ENVIRONMENTAL IMPACT ASSESSMENT

Article 10 of Law N° 19,300 about General Base of the Environment (hereafter LBGMA) as well as Article 3 of the Regulation of the System of Environmental Impact Assessment (SEIA) approved by S.D. N° 30/97 and modified by S.D. N° 95/01, from the Ministry General Secretary of the President decides and list the projects or activities that are susceptible to cause an environmental impact during any of its phases and which, consequently, should be subject to SEIA.

The Project “Electric Transmission Lines Maitenes S/E – Alfalfal S/E and Alfalfal II power plant – Alfalfal S/E” shall be subject to SEIA as it is included in the following letters of the SEIA Regulation:

- Letter b) of Article 10 of Law N° 19,300 and Letter b) of Article 3 of the Regulation of the System of Environmental Impact Assessment (S.D. N° 95/01 of MINSEGPRES) as it is a new electric, high voltage transmission line and an expansion of Alfalfal S/E.
- Letter p) of Article 10 of Law N° 19,300 and Letter p) of Article 3 of the Regulation of the System of Environmental Impact Assessment (S.D. N° 95/01 of the MINSEGPRES) as it is a work to be developed in an Area with Tourist Interest (as per D.L. N° 1,224) which is under official protection.

Projects or activities requiring entry into SEIA shall produce an Environmental Impact Study if they generate or at least produce one of the effects, characteristics or circumstances detailed under Article 11 of the Law. Also SEIA Regulation provides under its Articles 5-11 the effects, characteristics or circumstances requiring submitting an Environmental Impact Study.

Under this context Articles 5-11 of the SEIA Regulation describing the effects, characteristics or circumstances that give origin to the need of conducting an Environmental Impact Study for the Project were analyzed.

A conclusion from that analysis is that the Project will be located in the Municipality of San José de Maipo which is considered as an Area with Tourist Interest as per Decree Law N° 1,224 y S.D. N°

515; accordingly and in compliance with Law N° 19,300 and Article 10 letter d) of the SEIA Regulation, the present Project is thereby subject to the System of Environmental Impact Assessment through an Environmental Impact Study. It is important to point out that the Project considers the application of environmental management measures aiming to avoid impacts on the area analyzed.

4 CHARACTERIZATION OF AREA OF INFLUENCE CIÓN (BASELINE)

4.1 Climate and meteorology

Based on Köppen classification, the analyzed zone is located in warm temperate climate with a prolonged dry season. It is characterized by intense winter rainfall and snow. Average temperature for the coldest month is 3°C-18°C from Las Melosas until the border with

Argentina, and also including all the high mountain section in the canyon. It is defined as an ice climate due to the effect of height, where the warmest month temperature is under 10°C and it has a minimum average temperature in the coldest month under 5°C.

With regard to rainfall, annual average is 500-800mm. Rainfall comes from the winds strongly blowing the northern side of the hills.

This weather, which is typical of the mountain, favors tourist activities in summer time such as swimming in rivers and ravines, mountain hiking, thermal ponds, and others. In winter time it is possible to practice ski, ice hiking and others such as thermal ponds, as well as boulder and geological observation.

4.2 Noise

Measurements were taken of the equivalent level of noise (NPSeq) with a weighting filter A and Slow response using the methodology set by S.D. N° 146/97 to measure background noise. The instrument was located at 1.5m high.

The Equivalent levels of noise measured at the points evaluated range from 52-63 dB(A) with an average level of 59 dB(A) in daytime while for night time it ranges between 46-52 dB(A) with an average level of 52 dB(A).

Prominent sources of noise come from heavy and light vehicles, Colorado river and the typical noises from semi-rural areas such as birds, the wind, domestic animals, wind/canopy and insects among others.

4.3 Geology and Geo-morphology

i) Geology

Most of the Project will be located over sedimentary, volcanic and continental rocks from the quaternary age while other parts of the Project will be based on the upper tertiary. The geological units identified in the area of the Project are fluvial, fluvial-glacier; lacustrine alluvial and gravitational sediments (Q); all of these are associated to the filling in the Central basin. The area of the Project also has a formation of headlands (Tsf).

ii) Geo-morphology

In general the Project will be placed in the flatter areas near the Colorado canyon where several sediments are present. However, some of the vortices present in steep areas facing north at 750-1500masl, which are the Andean foothills.

Therefore the geo-morphology results from the joint process of sedimentation and erosion of sediments through the years. It is possible to identify different geo-morphological features that will be detailed later.

The section of the Project between Maitenes S/E and Alfalfal S/E will also be located in the north side of the Colorado canyon; it will however also cross flat areas which is a second level of terrace older than the current one

of the river; this terrace could be considered as alluvial due to the sediments. The plateau or alluvial terrace where most of the layout is located is a system of benched terraces with different slope successions and horizontal plane surfaces from old fluvial plains abandoned by the river.

The section of the Project to be developed between Alfalfal II power plant and Alfalfal S/E is also located in the upper terrace of Aucayes ravine, especially in the north-west hill. There is a section in the line to be located in the south hill which has steep slopes.

iii) Natural Risks

Natural risk is considered as such when there is human population or when a natural phenomenon can affect the normal development of human activities, including the infrastructure and associated facilities.

Geological risks include the probability of seismic movement in areas nearby the Project or its radio of influence (between parallel $33^{\circ} 00'$ and $33^{\circ} 30'$ and a longitude of $70^{\circ} 30'$ and $71^{\circ}00'$); this probability is inferred from significant seismic movements registered and the failures existing in the area.

Geo-morphological risks area mainly the formation processes of geological shapes described in the section about geo-morphology present in the Project which include landslides and drifts among others.

4.4 Land use and Quality

Soils in the area of influence of the Project belong to the valley created by Maipo river and include soils of alluvial and colluvial origin or a combination of both. In the case of Miscellaneous rivers (MR) and stratified alluvial terraces (TE), soils are occasionally used for agricultural production at a small scale as one of the features of these soils is water retention and mostly coarse texture. Based on the information at CIREN, there are three soil series in the Project area, all of them located in the hillside and terraces created by Colorado river. Their use capacity range from VI to VIII. Other areas identified have not been allocated a use capacity as they belong to the river canyon as such. The types of soil identified are miscellaneous colluvial, miscellaneous river, and stratified alluvial terraces (TE-7).

4.5 Hydrology and hydro-geology

i) Hydrological Characterization

The Project will be located in the sub-basin of Colorado river, one of the main tributaries of Maipo river running from Maitenes S/E crossing Alfalfal S/E and from there to the future location of Alfalfal II power plant.

The drainage network present along this reduce layout is dendritic where tributary currents subdivide upstream similarly to the branches of a tree. The main course is Colorado river where Alfalfal S/E is located on its east bench.

Colorado river is a second order course originating from the high summits of the Tupungato volcano receiving as the main affluent the Olivares river.

The Aucayes ravine is characterized for having natural vegetation from the area by the edges and banks of the ravine with a very clear axis as the flow rate is permanent and mostly used in the high area for human use, irrigation, and other activities. It has an average slope of 6%.

ii) Hydro geological Characterization

The hydro geological units identified in the area of the Project are Rock Unit and Filling Unit; below is a brief description of both.

Rock Unit

This unit shows lithological, structural, geomechanical and/or hydraulic characteristics which render this unit not appropriate to develop good aquifers.

Filling Units

The area in the section Maitenes S/E and Alfalfal S/E has different filling units which based on their waterproof characteristics form different geological units, that is, fluvial deposit (Qf), old fluvial deposits (Qfa), side dumps and/or cones (Qe)

The hydraulic properties considered were seepage, static level, and movement of underground water and yield of wells.

4.6 Flora and Vegetation

Local flora consists of a total 144 species of vascular flora belonging to 106 genders in 49 families. Based on their geographic origin these entities are divided in 115 native species and 29 foreign species. Four species with conservation issues were detected, a rare succulent (*Austrocactus spiniflorus*) and three vulnerable from which the least frequent is *Kageneckia angustifolia* (Franjel) identified in one single inventory mainly due to the fact that the route is developed outside of the preferred area of distribution of that species, higher in altitude ; *Puya berteriana* (chagual) listed in three inventories given its preferred occurrence in rocks with warm exposition (with north and west components). The remaining species is currently classified as vulnerable (*Pyrrhocactus curvispinus*: Quisquito), a frequent entity for which there would not be any difficulties preventing its damage.

The vegetation was delimited and characterized in 107 polygon grouped in 10 types of land use or types of vegetation of two land uses considering natural vegetation and non-vegetation uses.

The units with natural vegetation cover 307.89 hectares in the evaluated area (418.18), while the non-vegetation uses including the river, industrial and weathered areas as well as residential areas, cover 110.29 ha approx.

When evaluating the structures of this vegetation and the composition of the prominent species a high degree of alteration due to the trend to forest structures as well as

the prominent species, mostly, high ligneous species, probably remnants of the original vegetation and a high participation of foreign herbaceous species with ruderal behavior are identified.

4.7 Fauna

It was possible to identify at least 27 species in the area of the study. Out of these 20 are birds, 5 are reptiles, and 2 are mammals; no amphibians were identified (although it is possible that they are present). Seven of the total of the species (that is 25.9%): 5 lizards, a condor, and a mammal (culpeo fox) are present in some of the 5 “states of conservation” defined by SAG (2006), 5 of these species are considered vulnerable, 4 lizards: *Liolaemus lemniscatus*, *L. nigroviridis*, *L. monticola* and *L. tenuis*, and the cóndor (*Vultur gryphus*), while a species is considered as inadequately known: zorro culpeo (*Pseudalopex culpaeus*) and a species is considered as out of danger: *Liolaemus fuscus*. Considering the protection criteria (SAG, 2006), 22 species (81.5%) have certain level of protection. Therefore, 17 species are considered as beneficial for silvo-agricultural-live stock activity (B), 16 species are considered beneficial to keep the balance of natural ecosystems (E) and 5 species are considered to have reduced populations.

This sampling identified 5 species of lizards with a total of 64 specimens, in 7 of the 9 stations. The most prominent species is a lagartija lemniscata (*Liolaemus lemniscatus*), followed by lagartija de monte (*L. monticola*). Other species were lagartija oscura (*L. fuscus*), lagartija esbelta (*L. tenuis*) and lagartija negroverdosa (*L. nigroviridis*).

The sampling activity identified 56 specimens of 20 species of birds which include thrush with 9 specimens (16.1%), followed by collared dove (10.7%) and diuca finch (8.9%), while the rest of the species was recorded in less numbers (from 1-4 specimens). In the mammals observed, indirect evidence of zorro culpeo (feces) in one of the station and rabbit feces in 4 stations were recorded. The vast number of species by sampling stations ranged from 2-12 species.

4.8 Social Medium

The Project will be placed inside the property of Hacienda Rio Colorado in the municipality of San José de Maipo, Cordillera province in the Metropolitan region of Santiago. The Municipality of San José de Maipo has an estimated population of 14,316 inhabitants with 70% of urban development.

San José de Maipo has become an area of tourism and recreation and the center of interest in the real estate market in recent years. On the other hand, the development of projects in this area is highly restricted based on the provisions of the Metropolitan Urban Regulation Plan from 1994 (which declares a good part of the area as an area of Ecological Preservation); it was also declared an Area of Tourist Interest. This has led to large recreational states and isolated homes in the main towns in the municipality (El Canelo, El Manzano, San José de Maipo, El Volcán, Lo Valdés, and Los Maitenes, to name few), thus preventing higher demographics.

The transmission line starts from Maitenes S/E from where it runs to the west following the course of Colorado river and Route G-345, until reaching Alfalfal S/E, which is

located on the west side of the town with the same name. On the other hand, the line to be connected between the future Alfalfal II power plant and Alfalfal S/E will be mainly developed over the range of mountains bordering the Colorado valley toward the south-west. There are no populated areas along this route with the exception of El Alfalfal, which is close to the connecting sub-station (El Alfalfal).

The towns of Los Maitenes and El Alfalfal are in the municipality of San José de Maipo, at km 13 and km 22 in Route G-345, communicating with the Camino El Volcán. Los Maitenes is at 1,350masl and 59km from Santiago downtown while El Alfalfal is at 1,500masl and 68km approx. from downtown. According to the INE Los Maitenes and El Alfalfal are considered as hamlets, that is, a human settlement with its own name that has three or more homes near to each other, with less than 301 inhabitants and which are no part of any other entity. Los Maitenes has a total population of 149 inhabitants while El Alfalfal has 98 inhabitants, and the prominent population in both places are men.

4.9 Archaeological and Cultural Heritage

The cabinet bibliographic analysis and the revision of the Files of the Council of National Monuments about the area of direct influence of the Project allows to determine that there are not any monuments declared as national monuments, that is, historical, sanctuary of nature, and typical zone.

On the other hand there is archaeological prospection and research in the area in general as well as in areas near to the Project works, both scientific as within the SEIA framework. There is background information about the presence of very close or near archaeological sites to the areas involved in the Project, corresponding to Colorado river and Aucayes ravine. In the area of Colorado river, there is background information of the sites from the Early Agricultural Ceramic Period in the Quempe ravine, although far from the Project works (Cornejo et al., 1997) as well as in Aucayes ravine, a small camp from the Agricultural Ceramic period which is distant from the area of the Project (Sánchez 2007).

The archeological prospection conducted allows recording one archaeological site from which there was previous information (Sánchez, 2007). The area in general is medium obtrusive area given the presence of native forest and pasture. The 9.5km power line connecting Alfalfal II power plant - Alfalfal S/E will be placed near to this site where hills are steep and there are scarce terraces to the east side of Colorado river, with the exception of a small area in Alfalfal. The prospection allowed an accurate location of the archaeological site mentioned corresponding to a small camp with lithic material, ceramic, and milling material in the south bank of Aucayes ravine, that is, the side opposite to the place where the Project is developed.

4.7 Landscape

The landscape units in the area of the study was characterized by evaluating each homogeneous unit through describing the different landscape components and the esthetic categories. Once the information leading to the definition of the visual fragility and quality was obtained, classified, and analyzed, the results of the landscape values were grouped and interpreted in different way as per the particular characteristics of the area of study.

From the combination of the indices obtained for visual fragility and quality from this analysis,
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these were grouped and interpreted as per the classification described in the methodology. These results from cross-referencing values allow zoning of the land based on the class of landscape present in the area of the study.

The table below summarizes the indices obtained from the evaluation of the visual fragility and quality of the landscape through which the landscape classification is analyzed.

Table 3 Quality and Visual fragility of Landscape Units

N° UP	Name	Visual Quality	Visual Fragilit	Class
UP1	Colorado river canyon	VQ Medium	VF Medium	III
UP2	Range of mountain	VQ Medium	High VF	III
UP3	Aucayes	VQ High	VF Medium	II

Source: In-house preparation

The evaluated landscape units are classified in Classes II and III, in accordance with the combination of the results for fragility and quality. The ratio of medium visual quality and variable fragility (in the case of UP1 medium and UP2 high) renders a Class III, and high visual quality and medium fragility a Class II.

UP1 of Colorado canyon and UP2 mountain range, are for a landscape Class III, defined as medium quality and high and medium fragility, respectively, which can be incorporated to the category of Class II as appropriate that is, when any of the items evaluated requires protection based on its individual value; as is the case of brooks and ravines and native bush and forest, sclerophyllous, where visual characteristics contribute with color, texture and certain level of riches and diversity in terms of wildlife. This also includes rock outbreaks and water falls as areas that are particular and/or have landscape interest.

A Class III landscape has a variable restriction degree, that is, allows greater pressure over the landscape but does not accept strong landscape impacts.

UP3, Aucayes ravine, on the other hand is classified as Class II landscape defined as with high quality and medium fragility, initially appropriate for promoting activities requiring landscaping quality and low impact on the landscape. It has a high restriction degree (for example, tourism in general, low impact projects or projects adding landscape values, other).

4.11 Tourism

In general the tourist offer, both in terms of attractions as the tourist offer mostly concentrates in the main towns and existing connecting routes and towns. In this case, the Route G-345 (the area of Colorado river) and nearby towns, including the section of the route and layout where the Aucayes ravine is located.

The Municipality of San José de Maipo has a tourist appeal to it due to its location in the Andean hills, its comparative advantages associated to a large territory made up of valleys and mountains with great landscape value, and appropriate for sport practices and entertainment. According to the cadaster of SERNATUR (2007), the municipality has 38 attractions of different categories. Out of the total of attractions (an identified number of 38), 52% falls in the category of Natural site while 32% fall in the category of Museum or Cultural expression. In least proportion

it is possible to find the attractions in the categories of Folklore and Technical, Scientific or Artistic achievement, with 11% and 5% respectively.

In January 2001 and in compliance with D.L. N° 1.224 and S.D. N° 515 the process to declare the municipality of San José de Maipo as an National Area with Tourist Interest (ZOIT) was initiated.

Only two tourist attractions, both considered as local, were identified in the area specific to the Project: Los Maitenes in the category of folklore and El Alfalfal in the category of natural site.

Several minor tourist activities are developed in the area. These are specifically located, and are more prominent those that are conducted at a specific natural space or site (special interests).

With regard to the tourist offer, it consists of services for food, lodging and other services. The offer in the area from Los Maitenes to El Alfalfal is very restricted with only one type of inn located at Los Maitenes. In general this area lacks a tourist infrastructure with the exception of the inn at Los Maitenes, and some informal businesses as well as private properties that provide camping, picnic, entertainment near the river, horse riding and hiking.

4.12 Energy Infrastructure

The energy infrastructure in the surrounding of the Project consists of the hydroelectric power plants Los Maitenes, Alfalfal I, Queltehues, and Volcán, along with the corresponding sub-stations and transmission lines necessary to transport the energy generated.

All power plants mentioned are owned by AES Gener S.A. and are located in the basin of Maipo river. In the case of power plants Queltehues and Volcán, and at the canyon of Colorado river for the power plants at Maitenes and Alfalfal I. In the latter construction of power plants Alfalfal II and Las Lajas is projected. These are part of the PHAM, also owned by AES Gener S.A.

Sub-stations Alfalfal, Maitenes (on the canyon of Colorado river) and Las Lajas (on the canyon of Maipo river) are all located in the surrounding of the Project location; all of these are owned by AES Gener S.A. Sub-stations Las Vizcachas and La Florida are located in the area of Puente Alto and La Florida. As part of the construction of PHAM the construction of Alto Maipo S/E is expected which will be placed at the south of Maitenes S/E, as well as in the canyon of Colorado river. Also, the proximity of the Project area include electrical transmission lines.

4.13 Roads

Roads include information related to the road infrastructure in the surrounding of the Project and which will be used for transportation of supplies and input during the construction of the line and the expansion of Alfalfal S/E as well as to provide maintenance during operation.

Considering that most vehicle flow associated to the Project will access Route G-25 from Av. Circunvalación Américo Vespucio, both from the north as from the south, the area of direct influence was determined by the number of sections of roads and relevant crossings between Departamental Av. in the municipality of La Florida and El Manzano in the municipality of San José de Maipo.

This area includes Route G-25 (between Departamental and El Manzano) and Route G-345 (between El Manzano and Alfalfal power plant), roads to be used for transportation of staff and material and supplies required by the Project.

5 ENVIRONMENTAL IMPACT ASSESSMENT AND PROJECTION

Below is a description of the negative impacts requiring certain mitigation measures of environmental management.

ICA1: Local, temporal and intermittent deterioration of air quality

A consequence of the activities is raise of particle material (MP10) resulting from excavations and earth work in the work faces, dust raised on the roads (in a low magnitude as all roads are paved), as well as the production of combustion gases (CO, NO_x and HC) resulting from the operation and traffic of machinery and vehicles.

Based on the information presented under Annex 6 of EIA, the particle material and gases generated by the Project meet the limits provided under S.D. N° 58/2003 of the MINSEGPRES which reformulates and updates the Prevention and Atmospheric Decontamination Plan for the Metropolitan Region (PPDA). This intervention will be limited in time and space thus allowing setting a low magnitude associated to this impact.

By the same way, particle material emissions and combustion gases are temporary and reversible in nature as they will be reflected on the air quality during the construction phase (approximately 2 years), returning to its original condition after said period of time. This impact has been considered as direct as it is directly related to the activities required for the construction of the Project.

Based on the information already mentioned, it is possible to assess the impact as local, temporary and intermittent which, as per the evaluation methodology, is considered as MINOR NEGATIVE. Notwithstanding the above, table 4 in section 6 of this Executive Summary lists the measures for environmental management.

5.1 Noise

IR1: Noise generation on subjects near the Project

The impact expected from the construction of the Project will be low in magnitude for points B and C studied while for point A it will be medium as this exceeds in 4.3 dB(A) the limits set by S.D. N° 146/97 for that area.

Therefore, this impact has been evaluated as MINOR NEGATIVE for points B and C, and MITIGABLE NEGATIVE for point A. Accordingly, table 4 in section 6 of the present Executive Summary illustrates a number of measures aiming to mitigate this impact.

5.2 Flora and Vegetation

IFV1: Decrease in tree foliage coverage

This impact refers to the decrease in the tree canopy associated to pruning of trees present within the protection strip as to meet the electric regulation.

This impact is classified as negative as there would be a risk of decrease in the vegetation coverage thus altering the condition currently present in the area; recoverable as long a pruning procedure is considered, procedure that will reduce the foliage in trees aiming to a better development of the tress; direct and with low magnitude as the restriction strip considers a total surface area of less than 60ha, from which pruning to an even smaller surface area is required considering the areas without vegetation or specimens with height lower than the limit provided by the electric regulation.

In synthesis this impact has been evaluated as MINOR NEGATIVE; however it includes the measures of environmental management shown in Table 4, Section 6 in this Executive Summary.

5.3 Land Fauna

IF1: Alteration of Habitat quality

Based on the results presented and the characteristics of the Project a conclusion is that the activities to be conducted during the construction phase will have an impact low in magnitude for vertebrate fauna directly affected as the effective altered surface area does not exceed 0.9ha in total; irrecoverable as these areas will not return to their natural condition and permanent in time. The group with greater risk are reptiles, all considered under threat and with low mobility

Based on the information already mentioned, this impact is evaluated as MINOR NEGATIVE. However, in order to mitigate the loss in the areas directly affected, Table 4 under Section 6 in the present Executive Summary of this Executive Summary shows the respective measures of environmental management.

5.4 Landscape

IP1: Alteration of the Visual Quality of the Landscape

Disturbance or alteration of landscape quality is an impact defined by the modification of some of its components, that is, morphology, wildlife, water, anthropic action, scenic background and singularity or rarity. Should any of these components is affected; the visual quality of the landscape analyzed will directly decrease.

Based on the above, impact IP1 will have a negative, irrecoverable, permanent in character and with low magnitude both for UP1 as well as for UP2, as the area of location has anthropic alterations and its landscape class is III. Consequently the impact is evaluated as MINOR NEGATIVE.

On the other hand, in the case of UP3, this impact is classified as negative, irrecoverable, permanent and medium in magnitude as while the area is altered at the time of starting the works of the Project, the landscape class is II, wherein the development of the activities is much more restrictive when compared with other units analyzed. Therefore the impact is evaluated as MITIGABLE NEGATIVE and will be subject to environmental management. The respective measures are shown in Table 4 under Section 6 in the present Executive Summary.

6 ENVIRONMENTAL MANAGEMENT PLAN

6.6.1 Plan of Mitigation, Reparation or Restoration and/or Compensation Measures

The main objective of the Environmental Management Plan is to prevent, correct or compensate for the adverse effects as well as to optimize the positive effects caused on the elements of the physical, biotic, human, and built medium by the execution of the Project “Electric Transmission Lines Maitenes S/E – Alfalfal S/E and Alfalfal II power plant – Alfalfal S/E” by applying technical-environmental measures and complying the current environmental regulations in the country.

This objective will be reached based on the following specific objectives:

- Propose a set of measures to mitigate, repair or compensate for the significant adverse effects on the environment that might result in the execution of the Project.
- Arrange actions to face situations of risk and environmental accidents during the execution of the Project, during its phases of construction and operation.
- Establish guidelines to respond in a timely and fast manner in the event of any contingency that might occur while developing the activities of the Project.

Based on the results of the evaluation of these significant adverse effects of the Project, below are established the following measures to mitigate, repair, restore and/or compensate:

Table 4 Measures to mitigate, repair or restore and/or compensate proposed for the Project

PHASE	IMPACT	MEASURE
COMPONENT: Air Quality		
Construction	ICA1: Local, temporal and intermittent deterioration of air quality	<p>The following measures will be implemented as to mitigate the impact ICA1:</p> <ul style="list-style-type: none"> • Trucks transporting material outside the work faces will be covered with tarpaulins to avoid spillage and material from falling. • An appropriate maintenance will be conducted to equipment, vehicles and machinery (in specialized shops) as to minimize atmospheric emissions. • Should stock of fine material is done in the area of the Project, these piles will be covered with plastic or textile until further reuse at the same place.
COMPONENT: Noise		
Construction	IR1: Noise generation on subjects near the Project	<p>The following measures will be implemented as to mitigate the impact IR1 associated to measuring point A:</p> <ul style="list-style-type: none"> • Use of mobile fences which will be located at the work face particularly surrounding mixing equipment and mixer trucks, as well as in specific material as cut of material. These barriers will have a minimum height of 2m and a minimum density of 10 kg/m², as for instance OSB wood with 15mm thick (see Annex 7 of EIA). • Unnecessary traffic of heavy machinery and in general installation of any source of noise next to nearby facilities will be avoided. • The respective maintenance activities will be conducted to the equipment as to keep them in conditions similar to their new conditions. • A correct usage of equipment using noise control systems by default for example, not opening gates of compressors or of any other machinery with a sound proof cabin. • Number of duration of idle equipment at the site will be limited; especially the noise generated by truck engines while waiting. • All equipment used in the construction site will have exhaust systems and mufflers that have been recommended by the manufacturer to keep low the associated noise. • Use of horns will be prohibited in the work site. Therefore the operator of the truck will

PHASE	IMPACT	MEASURE
		foundations, the time they will last and hours to be dedicated to Point A.
COMPONENT: Flora and		
Construction / Operation	IFV1: Decrease in tree foliage coverage	<p>Below are the environmental management measures considered for IFV1 impact:</p> <ul style="list-style-type: none"> • Educate the workers of the Project on the need of knowing and protecting the existing flora and vegetation present in the place. • Forbid workers from cutting and collecting wood. • Additionally this Project will be part of the program to disseminate the actions of environmental protection of PHAM consisting of placing road signs of the species subject of conservation present in the area and information of the prohibition to cut trees. These
COMPONENT: Vertebrate fauna		
Construction	IF1: Alteration of Habitat quality	<p>Below are the environmental management measures considered for IF1:</p> <ul style="list-style-type: none"> • Conduct a rescue of reptile specimens and micro mammals as to relocate them to nearby areas, outside of the area of direct influence of the Project. • The workers of the Project will be trained (through brochures and speech) as to create awareness and procedures to protect the fauna as well as restrictions about pursuing, driving away and hunting. Contractors will keep an up to date record of the training activities and the participants per camp or work face. • This Project will be part of the program to disseminate the actions of environmental protection of PHAM consisting of placing road signs of the species subject of conservation present in the area and information of the prohibition to cut trees. These
COMPONENT:		
Construction	IP1: Alteration of the Visual Quality of the Landscape	<p>As a compensation measure to impact IP1 for UP3 (Estero Aucayes), the following is considered:</p> <ul style="list-style-type: none"> • The future construction of a landscape bay in the access road to Alfalfal II power plant is considered, near the area of the ancillary forebay of Maitenes power plant where is possible to enjoy panoramic view of the valley.

Source: In-house preparation

PROJECT “ELECTRIC TRANSMISSION LINES
MAITENES S/E – ALFALFAL S/E, AND
ALFALFAL II POWER PLANT - ALFALFAL S/E”

6.2 Accident Control and Risk Prevention Plan

As stated under Title VI of the SEIA Regulation the risk prevention and accident control measures are aimed to prevent the occurrence of unfavorable events in the population or the environment.

Also, accident control measures are aimed at allowing an effective intervention in events that might alter the normal development of a project or activity as they might cause damages to life, health or the environment.

From this point of view, the Accident control and Risk prevention Plan targets the contractor as part of the works in the Project will be outsourced to third parties. This document will govern all contractors for works and/or services that AES Gener S.A. conduct with third parties in order to protect the physical integrity of people rendering services at its facilities as well as to prevent risks of accidents that compromise human resources, natural resources, and Company resources. Annex 3 of the EIA shows details of this document mainly consisting of:

- General Provisions.
- Responsibility in Risk Prevention.
- Safety Regulations.
- Personal Protection Equipment.
- Prevention and Prohibition Signaling.
- Risk Detection Methodology.
- Risk Identification and Specific Prevention Measures.

On its part, AES Gener S.A. also has in place an Accident Control and Risk Prevention Plan associated to the construction and maintenance of overhead lines as well as a procedure for working with voltage and vegetation management. Additionally Annex 3 of EIA includes the emergency plans for handling spillage within the facilities of Cordillera Complex which include the sub-stations Maitenes and Alfalfal. This Plan will be in force during the phase of operation of the Project.

7 ENVIRONMENTAL MONITORING PLAN

The Environmental Monitoring Plan is shown in the table below:

Table 5 Environmental Monitoring Plan

PHASE	IMPACT/ PARAMETER TO MONITOR	POINT OF CONTROL	METHOD	FREQUENCY OF MONITORING	ENFORCING AGENCY
COMPONENT: Noise					
Construction.	IR1: Noise generation on subjects near the Project.	Point A.	Noise level measurements as per S.D. N° 146/97	Monthly while the work face is nearby that place.	Health Authorities, Metropolitan Region.
COMPONENT: Geology and Geo-morphology					
Construction.	No impact associated. Land/soil will be monitored as to have it in conditions similar to the original once the	Around foundations of towers.	Visual inspection.	One time once the construction phase is completed. A report will be submitted to SAG with the final result of	SAG, Metropolitan Region.
COMPONENT: Flora and					
Construction.	No impact associated. Should specimens are relocated, their health status will be monitored as well as color, turgescence and	In the area of relocation of specimens, in the surrounding of their	Visual inspection.	On months 1, 6, 12 and 24 after relocation. A report will be submitted to CONAF with the final result of the	CONAF, Metropolitan Region.
COMPONENT: Vertebrate fauna					
Construction	IF1: Alteration of Habitat quality. Status of specimens rescued and relocated	Relocation sites.	Visual inspection.	On months 1, 2 and 3 once rescued and relocated. After the third monitoring activity, this measure will be jointly evaluated with the authorities. A report will be	SAG, Metropolitan Region.

PHASE	IMPACT/ PARAMETER TO	POINT OF CONTRO	METHOD	FREQUENCY OF	ENFORCING AGENCY
COMPONENT: Archaeological and Cultural Heritage					
Construction	No impact associated. The potential presence of other archeological findings under the surface that	Construction Area of Foundations.	Visual inspection.	During all the earth work (excavation) activities associated to the construction of foundations.	Council of National Monuments
COMPONENT:					
Construction	IP1: Alteration of the Visual Quality of the Landscape	Place identified for the construction of the bay terrace	Technical inspection of bay design. Then the construction site will be visited to see the final result	Report indicating the bay design, prior starting the operation phase of the Project with all esthetic and environmental criteria to consider. Report of results of the terrace bay built.	SERNATUR - Municipality of San José de Maipo

Source: In-house preparation

8 CITIZEN PARTICIPATION

The bidder is willing to collaborate in all activities of citizen participation that CONAMA of the Metropolitan Region considers appropriate. Thus AES Gener S.A. will contribute with anything possible to foster and generate a transparent atmosphere with regard to the Project as well as in terms of information to the community as to facilitate the participation of the community with the greater amount of elements.