KAS
INGENIERIA

ENVIRONMENTAL IMPACT DECLARATION

Project

Photovoltaic Solar Power Plant Atacama 250 MW

February 2011

Executive Summary

Atacama Solar is created in the context of diversification of the energy matrix in Chile. It is made up of national and foreign investors who taking advantage of the great experience and development in Spain in this area, decided to carry out a power generation project, based on solar energy captured by photovoltaic panels, which derives to a substation and from there, to Northern Interconnected System (SING).

An area located in the towns of Pica and Pozo Almonte, in the region of Tarapacá has been chosen to develop the project because of the best levels of solar radiation in the world.

It will be developed in stages, planning to construct the project in a total of 5 years to complete 250 Mw. The plant will occupy an area of 1,000 ha.

The project includes the construction of a transmission line of 40 km and 220 kV voltages, which will connect the Sub Station project with the SING in the Sub Station Lagunas.

The first stage of exploration or preliminary investigation, is what we have called Project PMGD 2.95 Mw, which will occupy a square area of 1000 x 1000 meters at its edges (100 hectares), meeting at one of the edges of the general area project.

The project aims to generate electricity from solar energy. Thereby enhancing the protection of the environment and sustainable development of the commune and making it a new tourism center in the area. Moreover, the project aims to strengthen the current trend and national development policy directed towards the generation of non -conventional renewable energy (NCRE) which exploits what are considered renewable resources.

Among the elements that justify the location of this project, we can emphasize that it is in the north of the country, where there is one of the highest levels of radiation in the world, specifically between the regions of Arica and Parinacota and Coquimbo.

Moreover, the area where the project is emplaced is characterized as a total desert, almost flat, with no vegetation and with no presence of human activities, nor productive, nor cultural. Therefore, it is a suitable place for an effective and productive use in line with the new clean energies.

Content

ATTACHMENTS

Introduction

Atacama Solar S. A, is developing the project "Atacama Solar PV Power Plant, 250 MW" located in the town of Pica and Pozo Almonte, Tarapaca region.

In compliance with the present environmental legislation, Atacama Solar has developed this Declaration, taking into account the national legislation and in its absence; foreign reference regulations issued in Regulation of Environmental Impact Evaluation System.

General considerations

The project presented for process and various studies that are part of it, are intellectual property of Solar Atacama and may not be used by third people without written authorization of Atacama Solar S.A. Consequently, total or partial reproduction of this Environmental Impact Declaration not used to inform about this project, is prohibited.

1 GENERAL BACKGROUND

1.1 Holder background

Name: Atacama Solar S.A.

Trade Name: Atacama Solar

Rut 76055134-1

Company description and its business: A company dedicated to power generation based on photovoltaic panels.

Constitution: The company was incorporated under the name of "Atacama Solar S.A.", by deed dated April, 13th, 2009, executed before Notary of Santiago Mr. René Benavente Cash, with the repertoire No. 9,397.

Address: City of Santiago, commune of the same name, Metropolitan Region, notwithstanding that can establish offices, branches, agencies or branches in other places inside and outside the country. Its head office is located at Marchant Pereira No. 221, 12th floor, commune Providencia, Chile.

Validity and Duration: The duration is indefinite.

Purpose: The company aims to make by its own or by others, independently or in association with others who are natural, legal, public or private entities, in or out of the Republic of Chile, the following activities: research, planning, development, construction and starting up power plants, for the production, distribution, intermediation, export, import, sale and leasing of electricity and all kinds of energies.

The company may constitute all types of personal and real rights on all kinds of implements for the development, marketing, export, import of electrical energy, including; plates and panels, sunroofs, solar chimneys, etc., with domestic and foreign firms, even assuming their representation. Developing this project, the company may develop engineering projects and run and develop them. It may represent foreign companies related to the energy sector with the authorization to sign relevant contracts. It may sell, maintain and repair components, equipment, accessories and spare electrical parts. It may sell, buy, lease and constitute all kinds of personal and real rights on different types of land in Chile or abroad. In general, it may

develop all kinds of trade related to electricity and any other activity related to the previous named or with the acceptance of the board of directors, including the development and establishment of legal persons linked to this purpose deemed necessary for the development of trade, in the sole opinion of the board.

Shareholders: Shareholders of the company are: i) Don Rodrigo Canovas Silva, owner of 575,000 shares (57.5% of the capital stock) and ii) Investments WyU S.A., owner of 425,000 shares (42.5% of capital stock).

Administration: The Company is managed by a board of directors composed of 3 reappointed members, who may or may not be shareholders. The board will last for a period of up to three years, after which it must be renewed completely. The first board of directors will not receive payment. The remuneration of the following board of directors is up to the shareholders.

Directors: On January 31st, 2011, the designated directors of the company were; Mr. John Walker Prieto (Chairman), Rodrigo Canovas (Executive Director – General manager) and Pablo Canovas (Director), all powers of the current General Manager ratified to date.

Legal representative: Acts as legal representative of the company, its Executive Manager Mr. Rodrigo Canovas Silva, Chilean, single, identity card No. 7996188-k Marchant Pereira 221, 12th floor, Providencia, Santiago, Chile.

Modifications: The company hasn't changed.

1.2 Address and other information of the company

Holder:
Atacama Solar S.A.
Marchant Pereira 221 12 th Providencia,
Santiago, Chile.
Contact: Rodrigo Cánovas
E-mail : r.canovas@atacamasolar.cl
Telephone: + 56-02-68310760

Consultants:
KAS Ingeniería S.A.,
Brown Norte 694, Ñuñoa
Santiago, Chile
Authors of Declaration of Environment Impact,
Substation Electric Engineering,
Engineering of high power installment.
Contact: María Pía Bravo
E-mail: kas@kasing.cl,
Consultant tel: +56-02-2232346.

2 DESCRIPTION OF THE PROJECT

The project will involve; building, installment, operation and maintenance of a 250 MW Solar Plant and substations of 23 kV and 220 kV and their respective power lines.

Through this Declaration the project accepts Environmental Impact Evaluation system according to current regulations.

Law 19.300 on General Environmental Bases (LGBMA), amended by Law 20,417 created by the Ministry, the Environmental Evaluation Service and the Superintendence of Environment, provides in its Article 10 paragraphs b and c as follows:

Article 10. - The projects or activities likely to cause environmental impact in any of its phases, which will be subject to the system of environmental impact evaluation are as follows:

b) Power transmission lines and its high voltage substations.

c) Energy station generators with power greater than 3 MW.

p) Execution of work, programs or activities in national parks, national reserves, natural monuments, reserves of wilderness areas, wildlife sanctuaries, marine parks, and marine reserves or in any other areas under official protection, in case the respective legislation permits it.

The Regulation System of Environmental Impact Evaluation, S.D. 95/01, defines the following:

Article 3. The projects or activities likely to cause environmental impact, in any of its phases, which will be subject to the system of environmental impact evaluation are as follows:

b) High voltage power transmission lines and their substations.

High voltage transmission lines conduct electricity with a higher voltage twenty kilovolts (23 kV).

Also, high voltage substation transmission lines of electricity are related to one or more electric energy transport lines and have the purpose of maintaining the voltage at the transport stage.

c) Central generators of energy greater than 3 MW.

p) Execution of works, programs or activities in national parks, national reserves, natural monuments, reserves wilderness areas, wildlife sanctuaries, marine parks, marine reserves or any other areas located under official protection when the respective legislation permits.

The Solar Power plant consists of installing 2,889,000 solar panels, which will be placed:

· 10,000 fixed structures of 21º of inclination 118.8 m long and 3 m wide with 2,700,000 photovoltaic modules.

· 500 fixed structures 21º of inclination 95.6 m long and 3 m wide with 108,000 photovoltaic modules.

· 500 fixed structures 21º of inclination 71.27 m long and 3 m wide with 81,000 photovoltaic modules

Each of these structures constitute a "Photovoltaic Module or table ".

The power plant will have a total nominal output of 250 MW. The Solar Plant will consist of 250 photovoltaic generators. Each generator consists of a transformation center of 1250 kVA, two inverters 500 kW, 40 installed fixed structures 21º inclination, 118.8 m long and 3 m wide with 10.80 0 photovoltaic modules, 2 fixed structures of 21º of inclination, 95.6 m long and 3 m wide with 432 photovoltaic modules and 2 fixed structures of 21º of inclination, 71.27 m long and 3 m wide with 324 photovoltaic modules.

2.1 Project development

An area located in the towns of Pica and Pozo Almonte in Tarapacá region has been chosen for the development of the project.

It is important to mention that by ORD. GAMB No. 511, June, 2008, the Ministry of Domestic Goods, officially instructed " any request or manifestation of interest on public lands for the development of energy generation projects have to consider necessarily a stage of prospecting work or prior research to start up, will be processed with a leasing figure according to what is established in articles 66 and next ones, Decree No. 1939 of 1977".

Therefore in November, 24, 2009, an application for lease of public land was presented and answered affirmatively, materializing the lease contract in January 9th, 2010.

The project includes 3 stages:

2.2 Project Objective

The project aims to generate electricity from solar energy. Thereby enhancing the protection of the environment and sustainable development of these communes, besides providing a new tourist center in the area. Moreover, the project aims to strengthen the current trend and national sustainable development policy to generate energy with non-conventional renewable energy (NCRE) taking advantage of resources considered renewable and with minimum generation contaminants of any kind.

It is important to mention that the area of the project site has the highest levels of global solar radiation which makes it unique for the installation of this type of innovation projects, presenting these communes the best multiuse of clean energy generation through solar energy worldwide.

The project aims to promote the use of renewable resources of the area which produces clean energy, thereby helping to reduce power generated by current sources of conventional energy pollutants.

The project will benefit from market carbon credits due to their status of Unconventional Renewable Energy.

2.3 Location

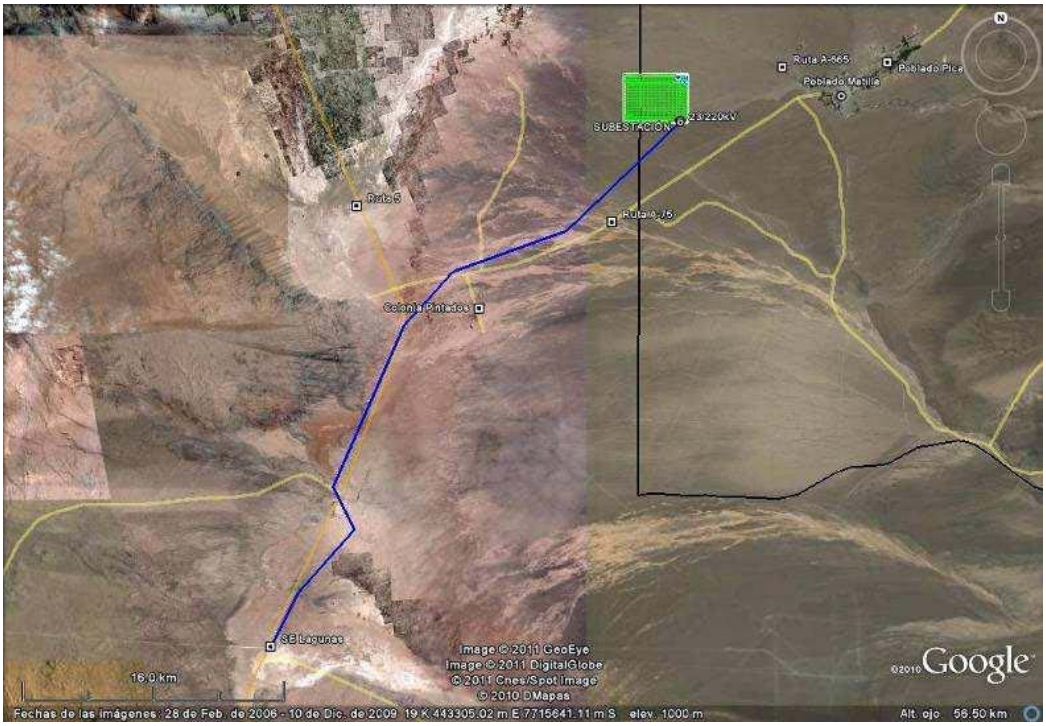
The study area of the Atacama Solar Power Plant is located on the border of the towns of Pica and Pozo Almonte, Province of Tamarugal, Tarapaca Region, at an average altitude of 1030 mm. The other one is at an average distance of 8 km from the town of Matilla, closest to the project, 12 km from Pica capital of the commune, and 42 km from the town of Pozo Almonte, capital of the province.

The following table shows the UTM coordinates (Datum WGS 84, Zone 19) of the vertices of the project area.

Table Nº1: Location of the project

	Stage 3 MW		Stage 250 MW	
VERTICES	**EAST**	**NORTH**	**EAST**	**NORTH**
A	452857,63	7733498,91	449386,08	7733309,11
B	453779,63	7733112,56	449368,83	7730362,20
C	453390,83	7732191,33	453306,02	7730356,65
D	452468,53	7732577,71	453301,99	7733314,99

Figure Nº1: Site project zone (in green) and electric route and power lines (blue line).



2.4 Solar power plant design

The Atacama Solar plant will have an installed rated power of 250 MW distributed in 2,889,000 photovoltaic solar panels.

2.4.1 Photovoltaic Panels

Photovoltaic panels have a length of 1300 mm and a width of 1.100 mm. Gadir a- SI model .90 of the brand GADIR SOLAR (or any other of similar characteristics and quality will be used in the market). Each panel will have a maximum power of 90 Wp. They support on metal models as shown in the following figure:

Figure Nº 2

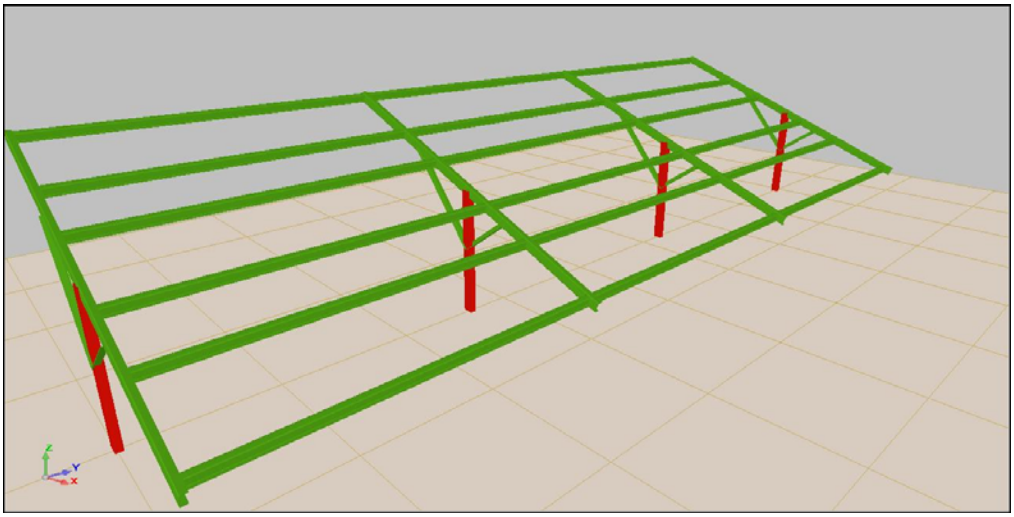


Figure Nº 3

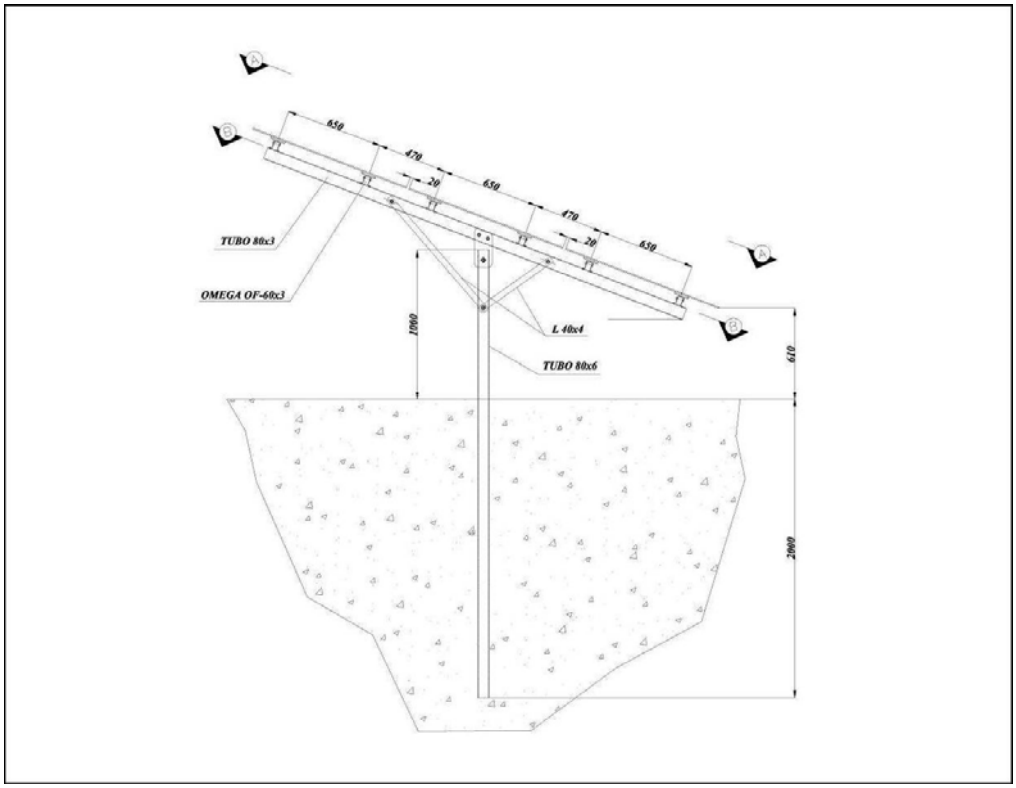


Figure Nº 4

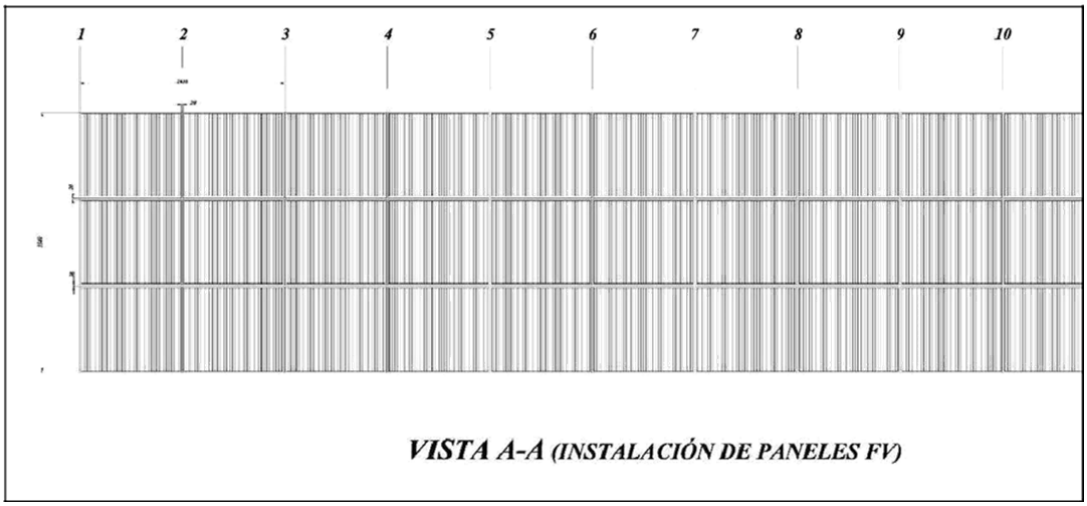
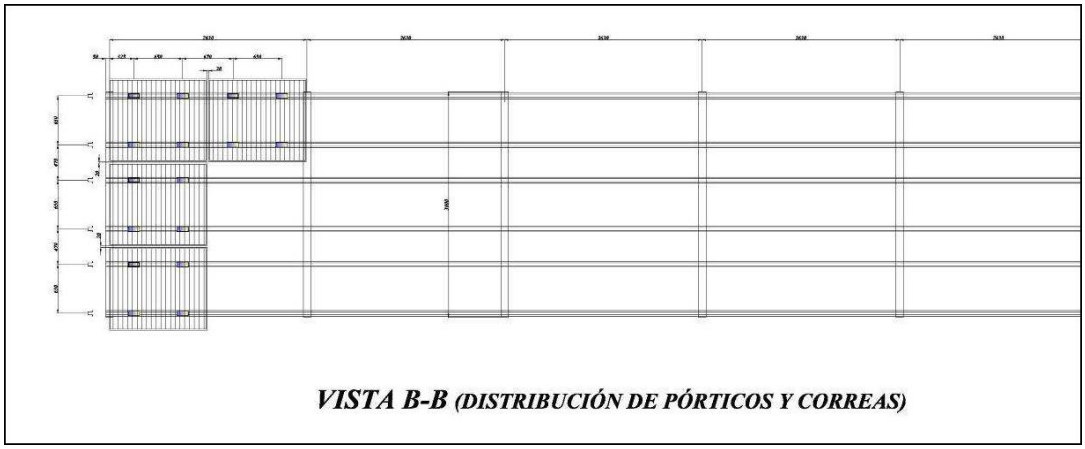


Figure Nº 5



The distance between pillars: 2.63 meters.

The distance between belts: 0.65 meters.

Every two pillars, six panels, two lengthwise (2.63 meters) and three width (3 meters) were placed.

The pillars of the structure will be buried in the ground, two meters deep and one meter separated from the ground surface.

To determine deepness, testing of the land took place exploring and analyzing its results.

Figure Nº 6: Example of photovoltaic panels' placement

2.4.2 Inverter

Inverters expected to be installed will be Sunny Central 500HE -11 models, manufactured by SMA (or another manufacturer that meets international standards) or other similar characteristics.

The inverter will also have the following functions:

· Tracking the maximum power point MPPT (Maximum Power Point Tracker) of photovoltaic branches.

·Automatic interconnection switch for automatic connection-disconnection of the photovoltaic installation in case of voltage loss or network frequency, anti – island protection.

Minimum and maximum frequency (51 and 49 Hz, respectively) and maximum and minimum voltage (1.1 and 0.85 Um, respectively) interconnection protection.

The inverter will automatically disconnect from the network, in case the output voltage or frequency are out of range, it will connect automatically once the value of the voltage or frequency is restored.

· At night, the inverter will be in stand-by or waiting for radiation conditions that makes the input power modules exceed the minimum power limit when it will connect automatically to provide electric current to the network.

The incorporation of a galvanic isolation AC transformer will not be necessary since an inverter and transformer are integrated in the medium voltage station.

2.4.3 Installation of constructions

The constructions to be installed in the photovoltaic plant, are the Medium Voltage Stations, Transformation Centers of auxiliary services PFU -4 (CT SSAA), Electrical Substation (living cells , control room and a transformer area) , office or control unit and storage area for building material.

The installation of these prefabricated buildings will be made, using the same crane used for mounting photovoltaic panels, mounting each building on the previously built foundations. Similarly, if adverse wind conditions occur, a higher tonnage crane will be used.

2.4.4 Control room and electrical substation

The project includes installation of two electrical substations (SS /E) of a voltage of 23 [kV] for the first phase of the project and another 220 [kV] for the rest of the stages.

2.4.4.1 Electrical Substation 23 kV

The S / E 23 [kV] , shall be constituted with one bar , one (1) Power Transformer of 3.5 MVA power with a transformation ratio of 23 / 0.4 [kV], DYN1 connection.

In addition one (1) installation of panels will be incorporated for aerial transmission line connecting the Substation with Feeder PICA, owned by ELIQSA that will permit the evacuation of energy generated by the Solar Power Plant

The power transformer has internationally proven traditional technologies that provide security and reliability for people and the environment. The insulating and cooling element will be mineral oil which is part of the existing traditional technology, whose characteristics are appropriately controlled during operation or reuse. In addition, the transformer will have a pool containing oil capable of supporting the entire volume of oil against any spills.

2.4.4.1.1 Power Transformer

It will be a three-phase transformer 3.5 MVA with 23 / 0.4 [kV] power. The oil transformer meets ASTM D - 3487 and does not contain PCBs. The oil preservation system works with a sealed tank to protect it from the atmosphere.

Each bay line consists of:

i. One (1) power switch
ii. Two 2) Grounding disconnector
iii. Three(3) Electric current transformers
iv. Three (3) Power transformers
v. Three (3) lightning rod

Each transformer bay consists:

One (1) disconnector with grounding
One (1) Power interrupter
Three (3) lightning rod
One (1) Power transformer 220/23 [kV]
One (1) Transformer of SS/AA 23/0, 4 [kV]

For purposes of registration and measurement of energy, each bay will have measuring equipment as electrical current transformers and potential with internal oil insulation and external ceramic. In addition, maneuver equipment like power disconnectors and switches with internal gas insulation SF6 (sulfur hexafluoride).

Power switches, some in medium voltage to be used in the substation, contain sulfur hexafluoride (SF6). The SF6 gas used in these devices acts as an electrical insulator and is used to extinguish the electrical arc produced under the opening condition of fault or charge electrical current. The general characteristics of this gas are as follows:

-It is colorless, odorless, nonflammable and nontoxic.

-Chemically stable under normal conditions
-Excellent dielectric properties.

The amount of gas per electrical equipment is very low. For example, in each switch of 220 [kV] approximately 5 kgs is used and in medium voltage switches, about 1 kilo. Compared to other insulating elements which can be used for the same function, such as oil, this represents an approximate ratio of 100 times lower. Also, the tanks that contain this product have mechanical properties that meet international standards on many forces. This causes that gas SF6 application in power electrical equipment does not show risk for any environment conditions.

Power transformers will have traditional technologies tested internationally that provide security and reliability for people and the environment. The insulating and cooling element will be mineral oil that will form part of the existing traditional technology whose characteristics are appropriately controlled during its functioning or reuse.

In addition, the transformer will have built a pool containing oil capable of supporting the entire volume of this insulator against any spills.

The switchgear will have the support of a structure of galvanized steel and built on a concrete foundation. The ground of the substation will be covered with gravel as an insulator for personnel walking around this place.

The existent electric control room will be modified to locate metal cabinets that will contain equipment and instruments for control, protection and measurement bay panels.

2.4.4.2.1 Interconnection System

The interconnection of the new Atacama Solar SING substation will be made through a line that will interconnect to the S / E Lagunas

Moreover, the Atacama Solar substation will be constituted additionally of other line bays of 23 [kV], which will aim to receive energy from photovoltaic cells.

The transformers will be three-phase of power of 290 MVA, 220/23 [kV]. The oil transformer meets ASTM D – 3487 specifications and does not contain PCBs. Oil preservation system operates with a sealed oil tank to protect it from the atmosphere.

2.4.4.2.3 Auxiliary Services Transformers

It is a three-phase power transformer of 100 [kVA] 23 / 0.4 [kV]. The oil in the transformer meets ASTM D - 3487 specifications and contains PCBs.

To support the auxiliary services, the substation will have a 380 Volt genset power plant and a power generation 100 kVA, whose source of ignition and combustion will be diesel oil. The fuel storage tank will have a pool in case of spill which will be adequate to sustain the total fuel in case it leaks.

2.4.5 High voltage lines

2.4.5.1 Air Line 23 [kV]

Airline Connection to SD is a conductor AAAC Ames, 77.47 MCM 108.2 [kg / km] with an electric current capacity of 0.191 [kA] at 75 ° C conductor temperature, 25 ° C environment temperature.

2.4.5.2 Air Line 220 [kV]

The voltage transmission line of 2x220 KV will have 40 km long, it runs from the substation Atacama Solar west to the height of Pintados along the road that connects the town of Matilla with Route 5 north, from there goes to the south to the Lagunas Substation, where energy will be delivered to the interconnected system Norte Grande (see more detail of the Transmission Line in Annex No. 6).

Table Nº 2 Geographical location coordinates of structures (DATUM WGS 84, Zone 19)

Nº Vertice	**Nº STRUCTURE**	**EAST**	**NORTH**
V1	1,00	451.702,65	7.729.184,29
	2,00	451.423,47	7.728.897,83
	3,00	451.144,29	7.728.611,38
	4,00	450.865,11	7.728.324,92
	5,00	450.585,93	7.728.038,46
	6,00	450.306,74	7.727.752,01
	7,00	450.027,56	7.727.465,55
	8,00	449.748,38	7.727.179,09
	9,00	449.469,20	7.726.892,64
	10,00	449.190,01	7.726.606,18
	11,00	448.910,83	7.726.319,72
	12,00	448.631,65	7.726.033,27
	13,00	448.352,47	7.725.746,81
	14,00	448.073,29	7.725.460,35
	15,00	447.794,10	7.725.173,90
	16,00	447.514,92	7.724.887,44
	17,00	447.235,74	7.724.600,98
	18,00	446.956,56	7.724.314,53
	19,00	446.677,38	7.724.028,07
	20,00	446.398,19	7.723.741,61
	21,00	446.081,63	7.723.416,80
	22,00	446.398,19	7.723.741,61
	23,00	446.081,63	7.723.416,80
V2	24,00	446.067,21	7.723.408,14
	25,00	445.578,84	7.723.263,83
	26,00	445.195,23	7.723.150,48
	27,00	444.811,63	7.723.037,13
	28,00	444.428,03	7.722.923,78
	29,00	444.044,42	7.722.810,43
	30,00	443.660,82	7.722.697,08
	31,00	443.277,21	7.722.583,73
	32,00	442.893,61	7.722.470,39
	33,00	442.510,01	7.722.357,04

	34,00	442.126,40	7.722.243,69
	35,00	441.742,80	7.722.130,34
	36,00	441.359,19	7.722.016,99
	37,00	440.975,59	7.721.903,64
	38,00	440.591,99	7.721.790,29
V3	39,00	440.208,38	7.721.676,94
	40,00	439.839,14	7.721.523,13
	41,00	439.469,90	7.721.369,31
	42,00	439.100,65	7.721.215,50
V4	43,00	438.633,97	7.721.021,10
	44,00	438.314,04	7.720.781,00
	45,00	437.994,11	7.720.540,91
	46,00	437.674,18	7.720.300,82
	47,00	437.354,25	7.720.060,73
V5	48,00	436.840,60	7.719.675,27
	49,00	436.675,46	7.719.310,95
	50,00	436.510,32	7.718.946,63
	51,00	436.345,18	7.718.582,31
	52,00	436.180,04	7.718.218,00
	53,00	436.014,89	7.717.853,68
	54,00	435.849,75	7.717.489,36
	55,00	435.684,61	7.717.125,04
	56,00	435.519,47	7.716.760,72
	57,00	435.354,32	7.716.396,40
	58,00	435.189,18	7.716.032,08
	59,00	435.024,04	7.715.667,77
	60,00	434.858,90	7.715.303,45
	61,00	434.693,75	7.714.939,13
	62,00	434.528,61	7.714.574,81
	63,00	434.363,47	7.714.210,49
	64,00	434.198,33	7.713.846,17
	65,00	434.033,19	7.713.481,85
	66,00	433.868,04	7.713.117,54
	67,00	433.702,90	7.712.753,22
	68,00	433.537,76	7.712.388,90
	69,00	433.372,62	7.712.024,58
	70,00	433.207,47	7.711.660,26
	71,00	433.042,33	7.711.295,94
	72,00	432.877,19	7.710.931,62
	73,00	432.712,05	7.710.567,31
	74,00	432.546,90	7.710.202,99
	75,00	432.381,76	7.709.838,67

	76,00	432.216,62	7.709.474,35
	77,00	432.051,48	7.709.110,03
	78,00	431.886,34	7.708.745,71
	79,00	431.721,19	7.708.381,39
V6	80,00	431.464,36	7.707.814,80
	81,00	431.645,93	7.707.458,36
	82,00	431.827,46	7.707.101,92
	83,00	432.009,00	7.706.745,49
	84,00	432.190,53	7.706.389,06
V7	85,00	432.372,08	7.706.032,66
	86,00	432.158,49	7.705.694,46
	87,00	431.944,90	7.705.356,25
	88,00	431.731,31	7.705.018,05
	89,00	431.517,72	7.704.679,85
	90,00	431.304,13	7.704.341,65
	91,00	431.090,54	7.704.003,45
	92,00	430.876,95	7.703.665,25
	93,00	430.663,37	7.703.327,05
	94,00	430.449,78	7.702.988,85
	95,00	430.236,19	7.702.650,65
	96,00	430.022,60	7.702.312,45
V8	97,00	429.756,41	7.701.890,97
	98,00	429.581,86	7.701.531,06
	99,00	429.407,30	7.701.171,17
	100,00	429.232,75	7.700.811,26
	101,00	429.058,19	7.700.451,36
	102,00	428.883,63	7.700.091,46
	103,00	428.709,08	7.699.731,55
	104,00	428.534,52	7.699.371,65
	105,00	428.359,96	7.699.011,74
V9	106,00	428.177,28	7.698.635,08

2.5 Project basis, purpose and benefits

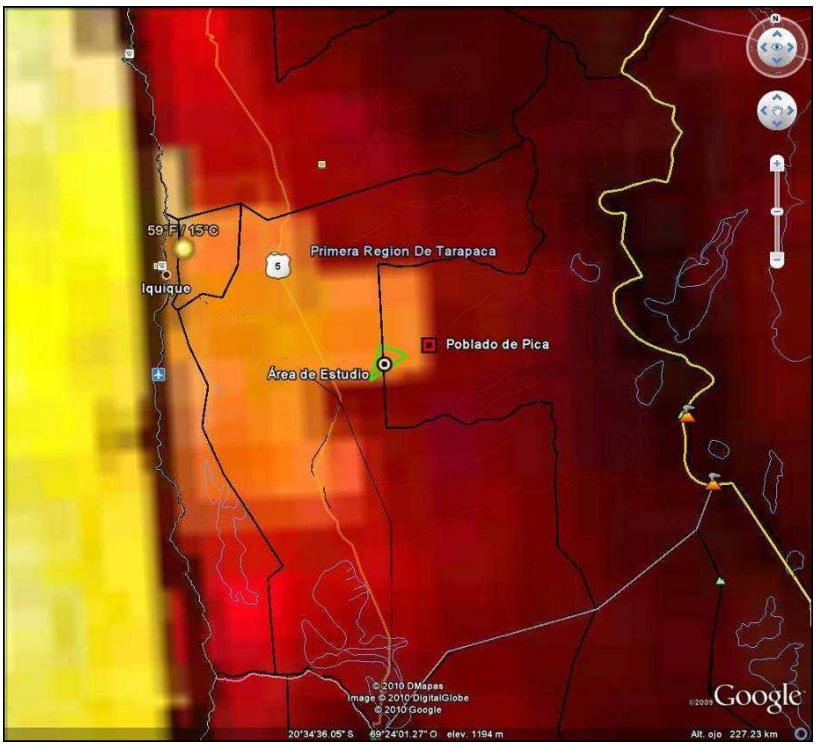
Although our country has suffered from energy crises in recent decades, it produces the future demand of energy resources, specifically electricity, thus ensuring the supply according to the economic growth that the country hopes to achieve and eventually become a developed country.

At a government level the purpose is to diversify the energy matrix to reduce dependence on fossil resources arises. Thus in recent years, strategic guidelines as how the country wants to generate its electricity have been created, resulting in the concept of Renewable Nonconventional Energy which correspond to those that use renewable resources with low impact on the environment.

Example of this need is the entry into force in April, 2008 of Law 20.257, which introduces amendments to the General Electricity Services Law Regarding Power Generation with Renewable Unconventional Energy, it establishes a series of economic benefits for this type of generation, reducing barriers for such projects.

In regard to solar energy, although if it is known by everyone that Northern Chile has a world-class resource and almost unique in the world, we believe it is worth to show recent information obtained by the Department of Geophysics of the University of Chile, which confirms this fact. The study "High resolution modeling for exploring non-conventional renewable energy in northern Chile" (commissioned by the CNE), gets reference information of the wind and solar resources through a modeling of the behavior of the atmosphere in the regions of Arica and Parinacota, Tarapacá and Antofagasta, that is, in the area covered by the Interconnected System of Norte Grande (SING). The results of this study clearly indicated that the northern part of the country has one of the highest levels of radiation in the world, specifically between the Region of Arica (now regions of Arica and Parinacota and Tarapaca), Antofagasta and Coquimbo.

Figure No 7: Project location on image showing the levels of radiation, where the red color represents the largest solar radiation.



2.6 Nearby populations

The area where the project is directly located is characterized by being now totally depopulated and without no anthropic use. The property and the current administration belongs to the Estate of Chile through the Ministry of National Assets.

However, at an average distance of about 5 km to the east of the project area, appears a population of approximately 20 houses called "Colonia Pintados" owned by the commune of Pozo Almonte, at an average distance of 15 km from the project area.

Table Nº 3: chart of project area distance to the nearby population

Name **Location**	**Distance** **(Km.)**	**Commune**
Matilla	5	Pica
Pica	9	Pica
Colonia Pintados	15	Pozo Almonte

2.7 Resources, Protected Areas and National Monuments

Law 17,288 of National Monuments states that all assets of the archaeological heritage are monuments by Law. Still, there are some that have a declaratory as historical monuments.

Notably, none of these monuments, whether natural or historical will be affected by the works of construction of projected solar panels because all of them are very far from the construction sites.

Below, the list of these sites of historical, heritage and cultural interest corresponding to the communes of Pozo Almonte and Pica, communes where the project is nestled.

Table Nº 4: Historic Monuments

Nº	**Name**	**Decree Nº**	**Date**
1	**Church and bell tower** **Pueblo de Matilla**. commune of Pica.	D.S. Nº 5058	06/07/1951
2	**Saltpeter Office of Santa Laura and constructions** commune of Pozo Almonte. Tortas de Ripio of the Saltpeter Office of Santa Laura Commune of Pozo Almonte.	D.S. Nº 320 D.S. Nº 536	16/01/1970 07/11/1989
3	**Saltpeter Office of humberstone and** constructions. Commune of Pozo Almonte. Tortas de Ripio of the Saltpeter Office of Humberstone. Commune of Pozo Almonte.	D.S. Nº 320	16/01/1970

	Enlarge limits.	D.S. Nº 536 D.E. Nº 859	7/11/1989 11/08/97
4	**Pica church**. Commune of Pica.	D.S. Nº 745	05/10/1977
5	**Saltpeter Office Iris** (includes: Administration house, Chapel and kiosk) Commune of Pica	D.S. Nº 706	08/10/1990

Table Nº 5: Typical areas.

Nº	**Name**	**Decree Nº**	**Date**
1	**Pueblo de La Tirana**. Commune of Pozo Almonte.	D.S. Nº 1752	26/07/1971

Table Nº 6: Archaeologic heritage

Nº	**Name**	Decree Nº	Date
1	**Geoglyphs from Pintados**. Commune of Pozo Almonte.	D.S. Nº 5591	31/05/1969

Table Nº 7: Wilderness areas protected by the nation (SNASPE).

Nº	**Name**	Deccree Nº	Date
1	National Reserve **Pampa del Tamarugal**, Communes of Pozo Almonte y Huara.	D.S. Nº 207	11/04/1988
2	National Park **Salar del Huasco.**	D.S. Nº 7	02/02/2010

2.7.1 Cultural Historical background and bibliography review

In Annex No. 4 Archaeological Baseline Report delivers historical and cultural background of the project site.

2.7.2 Archaeological Heritage

In order to know with anticipation the possible archaeological heritage that could be committed in the area of the Project site, an archaeological survey was conducted in the influence area by Mr. Marco Sanchez. (Archeologist, anthropologist, Annex No. 4 report attached).

2.7.2.1 Methodology

Archaeological research was carried out by an ocular inspection and visual walkthrough to determine cultural identifiable and observable remains exclusively on the surface by means of examination and observation of exposed sediments , excavations for

sand and gravel extraction, roads, tracks, trails, flat expanses of land, occasional watercourses among others.

Satellite images to identify milestones in the plane were used, and available bibliographic record.

As part of the characterization of the cultural heritage of the area, the following methodological actions were carried out:

a) Bibliography review. This considered the review of published and unpublished material from archaeological research traditional and nontraditional and archaeological reports within the framework of SEIA.

b) Review MOP cadaster and payroll of declared national monuments.

c) Field area inspection in the project site, using parallel transects every 50 m. NS and EW.

d) Digital photo record.

e) Registration landmarks in the field and use of coordinates in WGS 84 DATUM.

2.7.2.2 Background

a) The archaeological inspection is intended to determine the presence or not within the area of direct or indirect project influence, the heritage cultural component or national monument, in its archaeological category (Art . 11 letter of Law No. 19.300) .

b) For a global analysis of the project, under the archaeological point of view, the area of intervention was entirely tracked without finding cultural evidence of archaeological character of either prehistoric, historical or paleontological origin.

See archaeology report in annex Nº 4.

2.7.2.3 Conclusion

Though in the visual inspection no evidence of archaeological nature was found, if ruins and archaeological remains are discovered during any excavation regardless the cause, it shall be immediately reported to the holder, the Provincial Governor and the Council of national monuments.

Once found a discovery, the works related to the same area will be immediately paralyzed.

An archaeologist will inspect the finding and issue a report to be submitted to the competent authority.

2.8 Cultural and folklore events

SERNATUR website that collects information about different types of events(www.sernatur.cl) craft , artistic, scientific , civic, commercial , cultural, sports , folklore , gastronomy , business, recreational , religious , technological, traditional , tourism and others was revised, concluding that religious holidays for Pica and surroundings are recorded . As a reference the following are indicated:

Table Nº 8: Religious festivities of the communes of Pozo Almonte and Pica.

Name	Location	Date	Description
Epiphany	Pica	January 6	The image of baby Jesus is taken out on shoulders around town. During these festivities, dancers that belong to different brotherhoods compete with their typical dresses and with their northern dances.
Festivity of La Tirana	La Tirana, Pozo Amonte commune	July 16	The sanctuary is located in front of a big site where thousands of devoted people gather in the festivities to honor the Virgin of Triana
Festivity of Saint Andrews	Pica	November 20 al 30	Festivity where the people of Pica honor Saint Andrew brother of Saint Peter. The party is spiritually celebrated in November 30 th with a Novena that starts with a solemn procession to the church in November 20 th.
Festivity of Saint Antonio of Matilla	Matilla	June 12 and 13	In June 12, after greeting the saint, out of the church while the band plays dancing rhythms and the people dance typical dances from the north, punch and hot chocolate are offered.

None of the above events are recorded within the project site area

2.9 Landscape and Tourist values

The "Atacama Solar Power plant 250 Mw" project affects positively local tourism values, as it will bring to the community of Pica, the world's largest Photovoltaic Solar Power Plant, which attracts not only domestic tourists but also foreigners interested in non-conventional renewable energies.

2.9.1 Tourist values

The Project is located in the area of national interest (ZOIT) Pica - Salar del Huasco (Res Ex No. 1248-1205 SERNATUR). As provided in Decree Law No. 1,224 of 1975, this project will increase the interest in this area.

The following, highlights some aspects of consulted documents:

a) "Mapping important sightseeing attractions of Chile" (SERNATUR 1997)

b) "List of areas with tourism value for the Environmental Impact Evaluation System" (SERNATUR, Planning Department)

c) Tourist interest routes (SERNATUR, 2008)

2.9.2 Landscape values

2.9.2.1 Landscape elements

Natural: The project area is characterized by an extensive gentle sloping plain, with total absence of vegetation kilometers away, thus it appears as an almost totally and absolutely flat area, since the vast extension of this area does not show the slight tilt it has, to the East.

Human: In this area of the Region of Tarapacá the human element in the landscape is concentrated only around those places where the resident population is, and on the routes in that direction.

2.9.2.2

The intervention area of the project, can be viewed from a few angles due to the plain conditions of the whole area. It can only be seen from great distances mostly, from the highest area surrounding the towns of Pica and Matilla, giving it a striking human element so different of what you see in that area and those of great tourist attractions.
From other areas, closer to the Project and lower, it will be possible to see part of it, from the public roads that connect Pica and Mantilla with the rest of the region (RoutsA-75 and A 665.)

2.9.2.3 Conclusions

Taking into account the previous evaluation of the above factors, the study area is characterized to be an absolute desert with total lack of human or natural elements in the nearby landscape, so in this sense, this project does not damage at all, on the contrary, it would add a very attractive human element to the area becoming a landmark of modern technologies in pursuit of power generation environmentally clean, which is finally a contribution to the anthropic landscape and tourism zone.

It does not obstruct the access to environmental resources or elements of the areas with scenic or tourist value.

2.10 Flora and fauna

2.10.1 Flora report

2.10.1.1 Methodology

The methodology of preparation of this study was based on the review of recorded bibliography available for the project site area and conducting a campaign field in the study area.

The bibliography review, considered the following sources:

- Biodiversity of Chile. Heritage and challenges. CONAMA. 2006

- Bioclimatic and vegetation synopsis of Chile. Luebert, F. and P. Pliscoff. 2006. Editorial Universitaria. Santiago, Chile

- Red Book of Terrestrial Flora of Chile. CONAF, 1989. Santiago, Chile

- Gajardo, R. 1994. The Natural Vegetation of Chile. Classification and Geographical Distribution. Editorial Universitaria, Santiago, Chile. 165p

2.10.1.2 General features of the northern landscape

It corresponds to the area dominated by the tropical bio climate, it is divided into two large sectors; coastal and inland areas and pre Andes and (altiplano). The coastal and inland area is characterized by the virtual absence of rainfall, being more scarce and sporadic to the west, vegetation becomes less dense and becomes totally absent is what is known as an absolute desert, as the vegetation, other forms of life are practically nonexistent. This zone extends along the coast and inland from the far north to latitude 25 ° S where it reaches its highest expression and penetrates at higher altitudes.

The pre Andean areas show a very open vegetation with low desert shrubbery, the inner area (pampa) is interrupted by formations of thorny forests and bushes and some coastal areas desert shrubbery strongly conditioned with the influence of fog.

In the Andean region, rainfall has a tropical origin and occur in summer, producing a more abundant vegetation than in the lowland areas, composed of shrubs and grass. Its composition and structure varies with the altitude according to the decreasing temperature. Rainfall decreases westwards and southwards reaching minimum values marking the transition to winter rainfall characterized by the north central (mediterranean) region. This area (altiplano) has also a great diversity of fauna with a large number of species of birds and mammals.

Regarding the threats in this area for the conservation of biodiversity, it is basically overgrazing goats, both in the coast and in the highland. Activities related to mining produce a high impact in the areas because of these types of projects. Since it is a desert, the lack of water is a constant threat. Being a desert, the lack of water is a constant threat for both human settlements and ecosystems, especially those related to waterways (Pliscoff and Fuentes, 2008).

Land vegetation

Vegetation was evaluated by defining homogeneous units within the study area, depending on the structural characteristics and the dominant species in them. The demarcation of these units was carried out by photo-interpretation of homogeneous units in texture and color, with satellite photo Quickbird II (available in Google Earth , February and November 2006) , according to the methodology of "Charter of Occupation of Land " (COT) , developed by the Phytoecological school Louis Emberger (ECE / CNRS) , Montpellier, France, which was adapted to the ecological conditions of Chile by Etienne and Contreras (1981) and Etienne Prado (1982), following the evaluation scheme shown below:

Table Nº9: For the study area, considered biological types are:

Woody	Trees
Woody medium	Shrubs
Woody low	Trees in first stage of growth (forest plantations)
Herbaceous	Permanent and yearly herbs

Table Nº 10: The coverage of vegetation was defined with the following scale:

Coverage	
Density	Coverage (%)
Very scarce	1-5
Scarce	5-10
Very clear	10-25
Clear	25-50
Sparse	50-75
Thick	75-90
Very dense	90-100

Besides, it shows the artificial degree for each UHV (Homogeneous Vegetation Unit) as forest plantations and agricultural crops.

Land flora

To estimate the richness of the flora in the study area, a tour was carried out throughout the influence area of the project (5.542 hectare areas) and a route along the transmission line (13 km, Figure 1), this was possible because the vegetation in the area is very sparse. Plant species were detected by simple visual inspection.

2.10.1.3 Study sector

Table Nº11: Sampling site.

Station	EAST	NORTH
1	452959	7732945
2	453651	7730476
3	439395	7722401
4	435160	7718246
5	432822	7711173
6	432009	7704501
7	428293	7698199

DATUM: WGS 84, HUSO 19.

2.10.1.4 Results

Because of the almost non- existent vegetation in the project site area, it was not possible to define homogeneous units of vegetation and therefore, define the coverage and degree of the artificialization.

Vegetation

From the perspective of vegetation formations, the study area corresponds to the desert region that extends from region I to IV (Limarí River). The study area is inserted into the sub - region called absolute desert. This sub - region corresponds to the part of the desert where there is hardly rainfall so water supply is local, coming from groundwater.

It qualifies as an absolute desert because plant life is almost null and restricted to very specific conditions. According to Gajardo (1994), within the sub region of the absolute desert, six vegetation formations are recognized from which two correspond to the study site:

Inland desert Tamarugal desert

Flora

The richness of the Flora in the study area is composed only by retamilla (Caesalpinia aphylla, Figure 8) and mesquite (Prosopis mesquite, Figure 9), both endemic and belonging to the family Fabaceae (Table 11). The founded specimens are located further than 100 meters from the route of the proposed transmission line distance.

Table Nº 12: List of species in the study area.

Specie	**Family**	**Common Name**	Growth form	**Origin**	**State of conservation**
Caesalpinia aphylla	Fabaceae	Retamilla	Shrub	Endemic	No background
Prosopis tamarugo	Fabaceae	Tamarugo	Tree	Endemic	Vulnerable

Caesalpinia aphylla

A shrub of up to 2 m high, with many branches and green stems, no leaves or few leaves, compound bipinnatus, 2-3 pairs of leaflets. Clusters of 1.5-2.5 cm long. Green calyx , grainy , 5 -lobed reddish border; corolla with 5 yellow petals, much longer than the calyx , the top one with marked basal red spot and soft red lines to the distal end . The fruit is a reddish- brown ovoid vegetable, pubescent - glandulose, with one or two seeds inside, matures from September to May.

Figure No. 8: Images of Caesalpinia aphylla, present in the study area.

This species grows in the region of Tarapaca (I), closer to the pampa Tamarugal (The Huaica, Pintadosand Llamara salt flats) locations. Possibly phreatophytic; more frequent in sectors where alluvium from the highest parts are observed.

Prosopis tamarugo

It is a tree up to 18 m. height; the trunk up to 150 cm basal diameter; dark color bark, with irregular longitudinal fissures; the branch is strong, circuitous and plentiful; twigs are flexuous with thorns in pairs that reach 6 cm.long.alternate leaves composed with a pair of pinnae 3-4 cm long, each with 10 to 15 pairs of linear, acute or obtuse leaaflets, 4-8 mm long. Hermaphrodite flowers in glomeruli elongated pendulous, solitary; chalice with five sepals; hardly apparent corolla, flared with five petals welded together almost to the edge; androceo with ten stamens with colorful filaments, yellow; gineceo with monocarpelar ovary. The fruit is a hard legume, acuminat, cylindrical and curved legume about 5 cm. long, passing from green to pale yellow with ripeness, has up to ten seeds inside.

Endemic specie of the Tarapaca Region (I). It grows naturally in the towns of La Huayca and the salt flat of Llamara. It has been widely planted in the pampa Tamarugal (now declared a national reserve). There is also an extensive plantation near Toconao within the Region of Antofagasta. Phreatophyte tree, with an enormous capacity to extract water from deep aquifers. It is considered a forage tree for the important nutritional value of its fruit. The wood is hard and resistant, so it has been used in buildings. It can be planted as an ornamental tree in dry and warm areas and in well-lit places.

Figura Nº 9: Individuos de *Prosopis tamarugo* presentes en el área de estudio.

2.10.1.5 Conclusiones

- Only two species were found in the area of influence of the project. Both species are endemic in Chile, and one is confined to the region of Tarapaca (Prosopis tamarugo) and vulnerable conservation category

- The floors of vegetation related with the study are tropical inland deserst with sparse vegetation and thorny tropical inland forest and both; Proposis tamarugo and Pluchea absinthioides.

Descriptions coincide partially with what was found in the research carried out in the site.

- Although the layout of the project is inserted in the Pampa National Reserve of Tamarugal, the described species were not affected, so there is no need to cut or relocate specimens. Thus, it is concluded that the project's impact on vegetation is not significant.

More information in Annex No. 2 Flora report.

2.10.2 Fauna report

2.10.2.1 Methodology

Works included in situ, a timely study on vertebrate fauna in different land vegetation environments which was complemented with background information regarding the conservation status listed in the Red Book of Terrestrial Vertebrates of Chile (Glade, 1993), the protection criteria under Article 3 of Law of Fish and Game (SAG , 2009) and Supreme Decree No. 51/08, of CONAMA.

A monitoring program was conducted. The counting or viewing of vertebrate wildlife in the study area allowed to visualize and identify areas for nesting, feeding and displacement.

There is a description for each of the types of vertebrate, ecological parameters of specific richness, species diversity through the index of Shanonn and taxonomic similarity Jaccard index (Sofware Biodiversity Pro.).

Reptiles

Direct observations of specimens across the range of impact were made. The captured ones were determined up to a taxonomic level of species and released in the same place. The similarity of species through the Jaccard index and species richness was described.

Birds

Direct observation using 7x35 binoculars, listening to songs and / or cries and detection and identification of feathers and pellets.

With the final purpose of determining the abundance of bird species and due to the possible characteristics of the land in each of the environments for fauna, a survey was carried out (hearing) in approximately 70 mm.radius during five minutes per day. A sampling survey was carried out through direct counting.

Micromammals

A sampling of rodents was performed through a squared grid with Sherman traps, arranged every 10 meters in the most representative vegetation formations. The traps were found active throughout the whole study period and revised at dawn. This applied for no fossorial mammals.

Mammals

For big mammals, a visual observation of specimens was carried out; detection and identification of footprints, feces and burrow. Community description involved an analysis of taxonomic similarity, species richness and diversity. The abundance estimate was based on counting piles of feces, also traces traps, cleaning technique involving a known area, sift the material and put a bait. Transiting through the area allowed the recognition of species by the imprint of their footsteps.

Study area

It has been determined to work in the project influence area by an east-west matrix. In this context, seven areas of work are recognized; station 1- 2- 3- 4- 5-6-7 (see stations in annex flora 2.10.1.3), who consider the power plant and the transmission line.

2.10.2.2 Results

Vertebrate fauna

The study allowed to register a total of five species (Table 12). From the totality, one corresponds to reptiles (20 %), three; birds (60 %) and mammals (20 %).

On the other side you can see that the reptiles presented an order (Squamata) and a family (Tropiduridae).

Meanwhile birds submitted a total of three orders (Falconiformes, Ciconiiformes and Passeriformes) and three families (Accipitridae, Cathartidae and Hirundinidae)

Finally, mammals had an order (Carnivore) and family (Canidae).

Figure Nº. 10: Variety of vertebrate species. It is observed that birds present a taxonomic dominance in the project area.

Table No. 13: List of vertebrate species recorded in the area of project implementation. Quantity is also indicated.

REPTILES

Order	Family	Scientific name	Vernacular Name	Est. 1	Est. 2	Est. 3	Est. 4	Est. 5	Est. 6
SQUAMATA	TROPIDURIDAE	*Microlophus atacamensis*	Corridor de Atacama	0	0	0	0	0	0

BIRDS

ORDER	Family	Scientific name	Vernacular name	Est. 1	Est.2	Est.3	Est. 4	Est.5	Est. 6
CICONIIFORMS	CATHARTIDAE	*Cathartes aura*	Jote de red head	0	0	0	0	0	0
PASSERIFORMS	HIRUNDINIDAE	*Tachycineta meyeni*	Chilean swallow	2	0	0	0	0	0
FALCONIFORMS	ACCIPITRIDAE	*Buteo polyosoma*	harrier	1	0	0	0	0	0

MAMMALS

ORDER	Family	Scientific name	Vernacular name	Est. 1	Est.2	Est.3	Est. 4	Est.5	Est. 6
CARNIVORE	CANIDAE	*Lycalopex griseus*	Fox Chilla	0	0	0	0	0	0

Conservation criteria

B: Species listed as beneficial for agriculture and forestry activity.
S: Cataloged species with low population densities.
E: Species listed as beneficial for maintaining the ecosystem balance.
Q: Endangered species.
V: Vulnerable species.
R: Rare species.

F: Safe species
I: Inadequately known species.

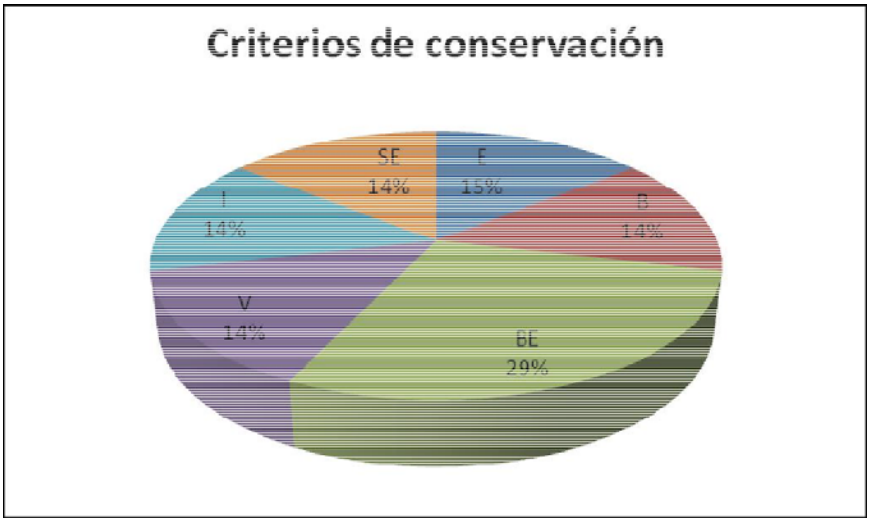
Conservation condition

According to the Red Book of Terrestrial Vertebrates of Chile (Glade, 1993) the criteria for protection under Article 3 of the Law of Fish and Game (SAG , 2009) and Supreme Decree No. 51/08 of the CONAMA, of the five species identified during the field campaign, 40% (2 species) are in some state of conservation.

Vulnerables: Reptiles *Microlophus atacamensis*
Inadequately known: Mammal *Lycalopex culpaeus*

On the other hand we see that from the totality of species, 100 % are beneficial to the agricultural and forestry activity and beneficial for maintaining the ecosystem balance.

Figure Nº. 11: conservation criteria.



B: Species listed as beneficial for agriculture and forestry activity.
S: Cataloged species with low population densities.
E: Species listed as beneficial for maintaining the ecosystem balance.
Q: Endangered species.
V: Vulnerable species.
R: Rare species.
F: Safe species.
I: Inadequately known species.

2.10.2.3 CONCLUSION

With seven work stations, only three register vertebrate fauna.

· The study allowed to register a total of five species, one corresponding to reptiles (20 %), three birds (60 %) and mammals (20 %) .

· Of the five species identified during the field campaign, 40% (2 species) are in some state of conservation, vulnerable; microlophus atacamensis and inadequately known; Lycalopex culpaeous.

· Microlophus atacamensis and Lycalopex were only recorded in stations corresponding to the route of transmission line. It should be noted that individuals of those species were observed in the outer limit of the paths. However it is advisable to apply a bailout or mitigation program for the proximity or potential shift to the place where the work is applied.

2.11Biologic diversity

The project will not affect significantly biological diversity of the influence area, direct or indirectly and the ability to regenerate it.

The term diversity, often used in studies of community ecology (species diversity) has different meanings: variety , dissimilarity , difference ; abundance of different things ; difference within the unit; number of different species coinciding at some point, or under the same condition ; absolute number of different species in the community ; measure of number of species and its relative abundancies in a community.

Also the concept of biological diversity, or biodiversity, refers today to the relative or absolute abundance of the species in certain ecosystems, global biogeographical graphic areas, etc. considering or not its permanence and changes in time.

Various theories relate diversity with the response of systems: if greater diversity more response capacity what probably results in a greater stability of biological systems and greater permanence in time. The importance of ecological diversity has set the criteria of environmental conservation.

Since the "Convention on Biological Diversity" signed on June, 5, 1992 in Rio de Janeiro in the conference of the United Nations on Environment and Development (UNCED), the promulgation of LGBMA at a national level and the Regulation of SEIA, biological diversity started to be an important factor to consider in the environmental impact evaluations.

In 2002, the United Nations Program for Development (UNDP), with CONAMA, worked on creating the project National Strategy and Action Plan on Biodiversity. A methodology for preparing a charter containing zones of "High Environmental Value ", was developed.

2.12 Soil quality

Given the project's characteristics, the ground will not be affected significantly in loss or degradation because of erosion, compaction or pollution.

2.13 Definition of its parts, actions and physical works

Power plant structures are relatively easy to transport from their place of manufacture and assembly, it is relatively easy.
For this, during the construction stage, it is expected that the staff related to the works, shall not exceed 80 people; 40 estimated to be hired in the area (road skilled labor), forty technicians and other specialized workers hired in Iquique and throughout the country.
Accommodation and feeding will be in Pica and Matilla because of its proximity and existing facilities.

The distances to these towns are of 7 and 9 kilometers, respectively.

There is no traffic impact on roads, nor does it produce significant impact on the quality or quantity of resources.
Nor does it affect the life systems and customs in future human groups.

2.13.1.1 Stages

-Gathering information

Topography and preliminary alternative routes and location of the power plant.
Study and negotiation of legal rights and concessions.
Preparation of the Declaration of Environmental Impact Project

Construction. Installation of photovoltaic panels, inverters and power plant equipment
Substation construction
Power lines installation
Laying and annealing of the conductor
Power plant connection SING

A. Operation

· Entry into service.

· Maintenance, considering preventive type actions; programed corrective and corrective due to failures.

B. Abandonment

· Abandonment is not expected but replacing technologies. But if it occurs, the removal of all structures of the power plant is considered and restoring the project to the initial condition.

2.14 Area comprised by the project, including its works and / or related actions.

The surface comprising the project is determined by its direct influence area. The area of influence is defined as the area where potential direct impacts on all environmental components are identified.

The total project area is 2,200 hectares, of which 1,000 hectares belong to the power plant and 1,200 hectares to the transmission line with a longitude of 40 km, with a strip of easement of 15 m per side.

2.15 Estimated amount of investment

The project involves an estimated investment of US $ 773.000.000.- from which MUS $ 750 are from the power plant generator, MUS $ 12 to the high voltage line and MUS $ 11 to the substation.

2.16 Project duration

The lifespan of this project has been set at 30 years. Although it is expected to be longer depending on improvements or repairs of the materials used.

From this point of view, the most delicate, are the metal profiles to be used. It is determined to galvanize them with heat, thickening them according to what they will be subject to.

2.17 Programed activities schedule

Table Nº 14:Schedule according to the stages of the project construction

FASE	MW	2011				2012				2013				2014			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
EXPERIMENTAL	1																
PHASE MW	3																
PHASE 246 MW	46																
	50																
	50																
	50																
	50																

2.18 Labor used at each stage of the project

Table Nº 15: Average labor estimated for the project

PHASE				MAX.
	AVERAGE LABOR			LABOR
Construction		80		100
Operation		8		12
Abandonment		30		36

3. PRINCIPAL EMISSIONS, DISCHARGES AND WASTE PROJECT

3.1 Emissions to the atmosphere

Through this project, including its works and / or related actions, harmful gases to human health and vegetation or wildlife will not be emitted.

Harmful emissions are those mainly composed of sulfur, carbon and nitrogen oxide, hydrocarbons and heavy metals. These components are not part of the construction materials of this project in question, nor will they be produced from them. During the construction phase, reduced particles emissions in suspension will be produced and will be managed by wetting roads and areas where there is transit.

Table 16 shows the total particle emissions of respirable size (PM10); carbon monoxide (CO), nitrogen oxides (NOx) and hydrocarbons estimated for the construction phase of the project (see details).

Table Nº 16: Atmospheric emissions, estimated for the construction stage.

	Emissions (kg)			
Activity	**HC**	**CO**	**NOx**	**MP**
Emission by combustion of machinery	121	726	2931	112
Emission by combustion of vehicles	145	274	1229	92
Total (kg)	**266**	**1000**	**4160**	**204**

3.2 Ozone generation

Ozone (O3) is a highly reactive form of oxygen that occurs naturally in the stratosphere (atmospheric layer between 11 and 16 kilometers above the surface of the earth). Provides to the earth a protective shield against harmful effects on human health and the environment from ultraviolet radiation. It quickly recombines to O2.

In good weather conditions, no ozone is produced. Ozone formation occurs under certain weather conditions that causes crown in high-voltage line conductors. However, since ozone is a very unstable gas, it rapidly decomposes into harmless oxygen compounds in the air and biological effects should not be expected.

According to research, concentrations of 0.5 parts per 100 million under a line under the most unfavorable conditions and 10 times lower than in normal conditions have been determined. The concentration of ozone found under high voltage lines is then, 20 times lower than the allowed by regulations, and in any case, much lower than in a treatment cabin by ultraviolet radiation, or close to "ozonizers" sold as air purifiers.

No significant adverse impact on ozone produced by transmission lines has been expected. In this regard, the World Health Organization declared in a descriptive note published in November, 1998 that "None of these effects [due to the crown effect] is important enough to affect health."

For more information see Annex No. 6 Electron magnetic fields.

3.3 Noise emissions

In order to comply with the provisions of Supreme Decree No. 146 of MINSEGPRES establishing permissible maximum sound pressure levels corrected and technical criteria to evaluate and rate the emission of noise pollution from stationary sources to the community, a noise baseline is carried out in the area of influence of the project, it aims to:

- Establish noise baselines in the project area.
- Determine variations in the levels of existing noise produced by the construction and development of the Photovoltaic Power Plant and its attached infrastructure.

3.3.1 Methodology

Noise Base Line (LBR) can be created by measuring levels of Equivalent Continuous Sound Pressure (NPSeq) that exist in a given sector, before a new sound source modifies it. It can commonly be associated with background noise, that is, all activities that produce noise except those which in this case, are to be evaluated. For this particular work, a total of four representative sectors A, B , C and D corresponding to nearby areas of the project site and where Noise Base Line was measured.

To evaluate the background noise level, a measurement point was chosen at a height of 1.3 meters above the ground and 4 meters from any reflective surface. As established in the D. S No. 146/97 and only to establish the type of noise to be measured, variations of Instant Sound Pressure Level shown on the screen for one minute; the instrument used. Once you identified the type of noise as stable, fluctuating or of unexpected characteristics, the Sound Pressure Level Equivalent Continuous NPSeq was measured continuously, until a stable reading is achieved in the instrument, registering the value of NPSeq every 5 minutes. Stable reading means, when the arithmetic difference between two consecutive records, is less than or equal to 2 dBA. Finally, the value of NPSeq to consider will be the last of the registered levels. This procedure was performed for a period of no longer than 30 minutes.

Figure Nº 12: Monitoring places noise component

As for its characteristics, the LBR in each evaluated sector, measured in dB (A), and its soundscape expressed in the diversity of anthropogenic and natural sounds, is strongly influenced by sound of an aerodynamic type, product of constant prevailing winds in the area. There are intense periods from noon until approximately 18:00 hrs. (produced because of temperature increase) where a large fluctuation of Equivalent Sound Pressure Level due to the prevailing winds, masking any other sound that could be produced; but also during very calm hours when only a light breeze circulates and a much smaller and almost constant are

registered in the obtained records. It is under this condition, that appear sounds caused by vehicular flow on Route 5 North (especially heavy trucks) and sounds of natural origin generated by the existing avifauna in the geographical area, basically where flora, fauna, and water for its subsistence (Colonia Pintados).

Noise emissions during the construction phase of the Photovoltaic Power plant

The following activities are carried out in every phase:

Installation of chores.
Preparation of the surface.
Channeling
Interior network trucks

Construction of foundations and bases.
Perimeter fence.

Installation of the panels.
Installation of buildings.
Substation construction.
High voltage laying

The details of each of these activities can be found in Annex No. 7.

3.3.2 Conclusion

As for its characteristics, the LBR in each evaluated sector, measured in dB (A), and its soundscape, expressed in the diversity of anthropogenic and natural sounds, is strongly influenced by noise airfoil type product of wind regime prevailing in the area.

There are intense periods from noon until approximately 18:00 hrs. (product of temperature increase) where a large fluctuation Equivalent Sound Pressure Level product of prevailing winds , masking any other sound that could be produced but also very calm hours where only a light breeze circulates and a much lesser and flat one is recorded.

It is under this condition, when these sounds appear originated by vehicular flow on Route 5 North (especially heavy trucks) and sounds of natural origin generated by the existing avifauna in the geographical area, basically where flora, fauna exist for its subsistence (Colonia Pintados)

For this project in particular, where the receptors are likely to be affected by the construction and operation of the Atacama Photovoltaic Solar Power Plant and its complementary infrastructure are deployed in properties that do not have territorial planning instruments to regulate land use, the regulation of Emission Standard Annoying Noises generated by Fixed Sources (DS No. 146/97 of MINSE GPRES)determines that Fixed Sound Pressure Levels (NPC), which are obtained from the emission of a fixed source emitting noise, measured at the place where the receiver is, shall not exceed in more than 10 dB (A) both daytime and night background noise level .

· Regarding the operation of the LT, under conditions of high humidity
(rain) and / or low cloud there could be a possible perception of an electrical phenomenon called crown effect , which is manifested , among other ways, by the generation of Audible Noise which for this particular case will reach maximum sound pressure levels equal to 55.1 dB (a) at 1 m of electrical conductors. Civil works from other parts of the project will not produce any noise impact on evaluated receptors.

· The operational phase of this project will be held in both daytime and night and its energy contribution , under conditions of bad and good weather as well as the operation of the ventilation system of transformers S / E, shall not imply an increase in the level of noise with day and night record, on the evaluated sectors.

· From the acoustic point of view, this project does not produce permanent environmental impact on surrounding populations since the levels of noise that will be generated by all parties of the project during its lifetime, and projected on evaluated receptors, will always be less than the maximum allowed by the applicable legislation (DS No. 146/97 of MINSEGPRES). Regarding its construction control measures implementation, a timely report to the community of sound events of greater impact, as well as monitoring and evaluation of the implemented measures will allow to minimize the temporary inconvenience that may cause.

From the acoustic point of view, this project does not produce environmental impact.

3.4 Discharges of liquid effluents

Through this project, including its works and /or related actions, no liquid effluents will be produced.

During the construction of the solar power plant, water supply for the consumption of workers, will be provided by a hermetically closed container, transported from nearby commercial stores to the work place.

Atacama Solar S.A. through its contractor will install chemical toilets which have proper maintenance regulations as stipulated in their use.

During the operation phase, the power plant will have available bathrooms in the substation.

3.5 Solid waste

Through this project, including its works and / or associated actions, other solid wastes will be generated and are detailed below:

Domestic waste: Generated household waste will be stored temporarily in containers marked as "Domestic Waste", which will be removed periodically by contractors and sent to authorized places for disposal sites.

Industrial non-hazardous waste: wood residues produced on ground, on warehouses or other areas, will be selected according to their reusability. Wood that can be reused will be collected orderly and packaged for later use. The rest will be taken to a working installation from where it will be removed by an authorized company and arranged in an authorized waste dump. As for what remains of iron, what is considered as recyclable, will be deposited in containers in the working installation to be afterwards deposited and delivered to an authorized and certified company committed in the recycling of iron or final disposals.

Hazardous waste: These will be stored and transferred to final disposal in accordance with current health legislation S.D. 148/03 "Sanitary Regulations on Hazardous Waste Management". The place for temporary storage of this waste will comply with all requirements of Title IV of S.D. 148/03.

Any use of additional fuel is not considered for machinery backhoes type, boom trucks or other vehicles loaded in due stations. So within the work area there will be no fuel storage.

3.6 Energy generation

Through this project, including its works and / or related actions, there will be no additional generated power, produced by the power plant generator.

3.6.1 Effects of electromagnetic fields on humans

The possible physiological effect caused on humans, justifies the attention that has been put on this issue in recent years, given the densification of high voltage lines in populated areas. In this case we speak of "electromagnetic risk."

The related magnetic field penetrates easily in constructions or tissues and it is difficult to screen. By contrast, the electric field is easily shielded by conductive objects and has no ability to penetrate buildings or organic tissue. Since the electric field does not penetrate in the body, it is assumed that any biological effect, product of prolonged exposure is caused by the magnetic component or electric fields and currents that this magnetic field induces in the body.

The two approaches used in research on the topic are, epidemiological and laboratory studies.

Epidemiological studies observe the occurrence of diseases in human populations and are used to obtain and test ideas about the origin of the disease in relation to the characteristics and environment of the studied population.

Studies of animals in laboratory are often carried out since under laboratory conditions, good control of exposure can be maintained.

According to analysis a large number of publications (I EE, 1995; Moulder , 1996; Perry , 1994; Randa et al, 1995; Cartensen , 1995; Foster et al, 1997; Moulder et al, 1995) , the conclusions made by oncologists is that the evidence suggests that electromagnetic frequency fields are not genetoxics (initiators of cancer). Other extensive investigations have been conducted to a possible epigenetic activity (promoter of cancer) of these fields, including skin, chest, liver and types of lymphoma. Fields from less than 1 mT to about 1,000 mT have been used.

Publications in this respect are not conclusive and lead to contradictory conclusions, estimating that the electromagnetic fields of industrial frequency do not seem to have epigenetic activity and the few studies that have shown some evidence of this activity, have used field strengths far superior to those found in normal environments.

It has been suggested that these fields, could suppress the production of melatonin (a hormone produced by the pineal gland in the brain) and that it would have a cancer preventive activity. None of the affirmations can be corroborated with conclusive research.

It has also been suggested that these fields could be co-promoters, that is, they could enhance the activity of other promoters but not have their own promotional activity. However, studies published on the subject have shown no evidence of this activity.

Moreover, as a result of many studies, it has been founded that the effect on cardiac stimulators (pacemakers) very sensitive, and implanted in the abdominal region, could malfunction in higher fields to 3 kV / m, values found only inside substations or under lines of over 220 kV.

3.6.2 Conclusion

The maximum values of electric field are in the security strip and on the edge of the strip (15 m from the axis line approx.), the values are lower than 2520 V / m in the case of single circuit line, and 4500 V / m in the case of double circuit line. These values are below the maximum value internationally established and tolerable to the maximum for public in general and permanently, that is 5,000 V / m and therefore represent no risk for people.

· The magnitude of the maximum magnetic field on one meter above the ground, around 220 kV operating with rated current of 656 Amperes balanced in a permanent regime is 4.4 micro Tesla, being below the limit of 100 micro Tesla considered internationally safe for people. The maximum value for the line is also presented inside the easement strip, reducing noticeably towards the edge, without surpassing 2.9 micro Tesla, in the case of single circuit line and 1.2 micro Tesla in the case of double circuit line, it does not represent any risk to people.

· The maximum frequency radio noise estimated in dry weather conditions is 45.66 dB / 1 mV / m for single circuit line and 40.91 dB / 1 mV / m for double circuit line. These values are under the value 53 dB / 1 mV / m proposed as the tolerable limit for the voltage line level.

· The acoustic noise, also under normal conditions, is 39.78 dB / 1 mV / m for single circuit line and 44.70 dB / 1 mV / m for double circuit line. These values are below 51 dB (A) recommended internationally.

4 BACKGROUND TO EVALUATE WHEN THE PROJECT DOES NOT REQUIRE TO PRESENT AN ENVIRONMENTAL IMPACT STUDY

In the next section, the background that allows to evaluate the non-requirement of Environmental Impact Assessment EIA in the “Atacama Solar PV Power Plant 250 MW " is delivered.

Environmental General Bases in Law 19.300 and modifications established in Law 20,417, state that all projects likely to produce changes in the environment, listed in article 10, should thereof, undergo an environmental evaluation excepting those projects that present some of the characteristics indicated in article 11, in which case, they must enter the Environmental Impact Evaluation System (SEIA) through an Environmental Impact Evaluation (EIA).

The holder of the project presents an Environmental Impact Declaration because his project does not produce or have any of the effects, characteristics or circumstances referred to in Article 11 of the Law and in the following Articles of Title II of the Regulation.

Article 5. The holder shall submit an Environmental Impact Study if his project or activity generates or presents risk to the health of the population, due to the quantity and quality of effluents, emissions or waste generated or produced.

In order to evaluate if whether it produces or presents the risk referred in the preceding paragraph, it shall be considered:

a) Current primary regulations are established on environmental quality regulations and emissions. In the absence of such regulations, the current ones, signaled in Article 7 of this regulation will be used as a reference;

The holder of the project meets national regulations and in their absence, he considers foreign ones.

b) The composition, danger, quantity and concentration of liquid effluents and emissions to the atmosphere;

Through this project, including its works and / or related actions, no liquid effluent discharges will be produced and there will be no emissions of harmful gases to human health (Liquid Effluents: see section No. 3.3 Emissions to the atmosphere (see section 3.1).

To prevent the production of particulate matter, the following measures will be taken:

During construction

a) Humidify work areas with greater dust emission, including internal roads and access to the workplace.
b) All those sources that produce particulate matter emissions will be humidified or covered;
c) Stockpiles of rubble will be covered and removed from the place in the shortest possible time;
d) The distance of material discharge will be minimized;
e) If necessary, washing the wheels of vehicles before leaving the work place, will be carried out.

During transport (rubble)

a) The rubble transport vehicles shall be closed and its cargo will remain covered maintaining a minimum distance of 10 centimeters between the cargo surface and cover;
c) The frequency, duration and location of discharges of liquid effluents and emissions;

Through this project, including its works and / or related actions, no liquid effluent discharges will be produced and harmful gases will not be emitted to human health (Liquid Effluents: see section No. 3.3 Emissions to the atmosphere. No. see section 3.1).

In relation to liquid effluents during the construction stage, only those corresponding to the domestic type will be produced and on a daily basis during the period of duration of the construction. In work places, chemical toilets will be installed and will comply with the instructions set out in Articles 23 and 24 of S.D. 594/2000; the discharge will be handled by an authorized company.

The emissions to the atmosphere are mainly produced during the day on the work places and roads on the project area, for various periods of time depending on the activities.

As for liquid effluents, they will be produced only during the construction phase.

During the project operation, liquid waste production and emissions are not previewed.

d) Composition, dangerousness and quantity of solid waste;

Through this project, including its works and / or related actions, solid waste is produced (see section No. 3.4) but it does not correspond to significant amounts.

During the construction stage phase, both residential and industrial solid waste will be produced.

Household waste: an average of 50 kg / day of waste production is estimated.

Non-hazardous industrial waste: waste production is basically scrap wood, packing engineering and iron, estimating a volume of 1 m3 / day.

Hazardous waste: the production of waste like lubricants, remains of oils and fats, estimated in a maximum of 20 liters per month is expected.

During the operation stage, solid waste will be minimal and will consist only of household waste type.

e) Frequency, duration and place of solid waste management.

Through this project, including its works and / or related actions, solid waste (see section No. 3.4) will be produced.

As the above, in the working area installation, temporary storage of solid waste will be available. Waste will be taken from the working areas to the salvage zone in the work facility. It will be collected in these areas where they will be classified by type and quality.

Waste that is received is regularly transported from the working installation for further treatment and / or recycling by specialized companies with the respective authorizations.

Domestic waste: household waste will be stored temporarily in containers marked as "Domestic Waste", which will be removed periodically by contractors and sent to authorized sites for its final disposal.

Non-hazardous industrial waste: wood waste produced on the ground, warehouses or other areas will be selected according to their reusability. The wood that can be reused will be collected in an orderly way and packaged for later use in work. The rest, will be taken to salvage area installation work sites, where it will be removed by an authorized company and arranged for this purpose in an authorized waste dump. Regarding the remains of iron, those that are considered as recyclable shall be deposited in containers in the installation area before being delivered to an authorized and certified company engaged in the recycling of iron or its final disposal in authorized places.

Hazardous waste: These will be stored and transferred to final disposition in accordance with current health legislation S.D. 148/03 "Sanitary Regulations on Hazardous Waste Management". The transitory place for storage of this waste will comply with all the requirements of title IV s of S.D. 148/03.

f) The difference between the estimated levels of noise limitation during a project or activity and the representative noise level and characteristic of the environment where there is permanent human population;

Through this project, including its works and / or related actions, no noise above established levels in the current regulations is established (see section No. 3.2).

During the construction phase, noise emissions will be produced because of the work carried out in the area, but these will be minimal. Enablement of roads, moving equipment, trucks and vans traffic, etc. will be considered. Construction will take place during daytime (see Annex No.7).

If necessary, for workers exposed to high sound pressure levels, these will have the appropriate safety equipment such as hearing protectors, all of them, to protect the health of staff and to meet the requirements of S.D. No. 594/00.

g) Forms of energy, radiation or vibrations generated by the project or activity; Y
Through this project, including its works and / or related actions, no harmful forms of energy for the population´s health will be produced (see section No. 3.5).

The maximum values of electric fields are in the security zone, and on the edge of the strip (15 m from the axis line approx.), the values are lower than 2520 V / m in the case of the simple circuit line, and 4500 V / m in the case of double circuit line. These values are below the maximum value internationally established permanently for general public, which is 5,000 V / m and therefore represent no risk for humans.

The maximum magnitude of the magnetic field exists one meter high above the ground around the 220 kV line operating with rated current of 656 amperes balanced steady state, is

4.4 micro Tesla, being below the limit of 100 micro Tesla internationally considered safe for humans.

The maximum value for the line is also within the easement strip, reducing noticeably towards the edge where no more than 2.9 micro Tesla, in the case of single circuit line and 1.2 micro Tesla in the case of double circuit line, not representing any risk for humans.

The noise of maximum radio frequency estimated in dry weather conditions is 45.66 dB / 1 V / m for line single circuit, and 40.91 dB / 1 V / m for double circuit line. These values are below value 53 dB / 1 V / m proposed as tolerable limit for the line voltage level.

Acoustic noise, also under normal conditions is 39.78 dB / 1 V / m for single line circuit, and 44.70 dB / 1 V / m for double circuit line. These values are below 51 dB (A) recommended internationally.

It is also important to note that under the easement strip, there will be no type of structure nor housing rooms.

h) The effects of combination and / or interaction with known pollutants emitted or produced by the project or activity.

The project does not produce pollutants that when in combination or interaction with each other cause risk to the health of the population.

Article 6. The holder shall submit an Environmental Impact Study if the project or activity produce or present significant adverse effects on the quantity and quality of renewable natural resources, including soil, water and air.

In order to evaluate whether significant adverse effects have been produced or are present in what is referred in the preceding paragraph, it shall be considered:

a) Current secondary regulations of environmental quality and emission. In the absence of such regulations, as a reference, the current ones will be used in the Nation's list in Article 7 of this Regulation;

The holder of the project complies with national regulations and in the absence of them he will consider foreign regulations.

b) Composition, danger, quantity and concentration of liquid effluents and emissions into the atmosphere;

Through this project, including its works and / or related actions, no significant adverse effects will be produced due to the relation between emissions of pollutants produced and environmental quality of natural renewable resources.

The only liquid effluent produced by the project are of domestic type. For the construction phase, there will be chemical toilets, which will comply with S.D. 594/00. These will be installed, maintained and removed by an authorized company to perform such activities.

During the operation stage, no liquid waste will be emitted.

Atmospheric emissions produced during the construction phase are mainly composed of particulate material correspondent to particles which are considered harmless to human health, these particles are between 10 and 40 microns of size. These emissions are related to the transit of vehicles, drilling and loading and unloading of materials in case they occur.

For the control of air emissions, measures will be taken, such as wetting dirt roads where project vehicles and machinery transit. Bishofite application will be considered if the water resource is scarce.

In the case of material transportation, the cargo area of the truck will be covered with a tarp to prevent the spread of dust in the air and to prevent the fall of larger solid material on the roads.

During the operation phase, emissions to the atmosphere are not expected.

According to the above mentioned, and with measures taken , no RILE (industrial liquid waste) nor atmospheric emissions, which could produce significant adverse effects on the quantity and quality of renewable natural resources , including soil , water and air are expected .

c) Frequency, duration and location of liquid effluents discharges and emissions to the atmosphere;

Through this project, including its works and / or related actions, no liquid effluent discharges will be produced and no gases will be emitted with significant adverse effects on the quantity and quality of renewable natural resources.

d) Composition, danger and quantity of solid waste;
Through this project, including its works and / or related actions, solid waste will be produced (see section No. 3.4) but, these will not produce negative effects on natural resources.

During the construction phase of both residential and industrial and household solid waste will be produced.

Domestic waste: an average of production of 50 kg / day of this waste is estimated.

Industrial non-hazardous waste: Waste production basically scrap wood, packing material and iron, in a volume of 1 m3 / day is expected.

Hazardous waste: Waste production as lubricants, oils and fats remains estimated at a maximum of 20 liters per month approximately, is expected.

During the operation of the project the production of solid waste which affects the quantity and quality of renewable natural resources is not expected.

e) Frequency, duration and place of solid waste management;

Through this project, including works and / or related actions, solid waste will be produced (see section No. 3.4) and will not affect the quantity and quality of renewable natural resources.

f) The difference between noise emission levels in the project or activity and the background noise level representative and characteristic of the environment where native wildlife related to important habitats for nesting, breeding or feeding are concentrated.

Through this project, including works and / or related actions, no noise is above the levels established by the current regulations nor will they affect places where native fauna of significant habitats for nesting, breeding or feeding are.

An evaluation on fauna, present in the area of the project site has been carried out.

Fauna has been revised, verifying the presence / absence of native species and / or belonging to some conservation category.

A baseline study of the project's fauna area was carried out (see Annex No. 3) concluding that:

From the seven working stations, 3, 6 and 7 only in three vertebrate fauna was recorded; none of these is located directly in the area of influence of the project.

g) Forms of energy, radiation or vibrations produced by the project or activity;

Through this project, including its works and / or related actions, no harmful energy that can affect native fauna related to habitats of relevance for nesting, breeding or feeding (see section No. 3.5) will be produced.

The maximum values of electric field are in the security zone, in the edge of the strip (15 m from the axis line), the values are lower than 2520 V / m in the case of the simple line circuit and 4500 V / m in the case of double circuit line. These values are below the maximum value allowed internationally and permanently for public in general, which is 5,000 V / m and therefore represent no risk to humans.

The magnitude of maximum magnetic field one meter high above the ground around the line of 220 kV operating with rated current of 656 Amperes balanced steady state, is 4.4 micro Tesla, being below the limit of 100 micro Tesla internationally considered as safe for humans. The maximum value for the line is also presented within the easement strip , reducing noticeably towards the edge, where no more than 2.9 micro Tesla, in the case of single circuit line and 1.2 micro Tesla the case of double circuit line and do not represent any risk for humans.

Maximum radio frequency sound estimated with conditions of dry weather is 45.66 dB / 1 V / m for single line circuit, and 40.91 dB / 1 V / m for double circuit line. These values are under value 53 dB / 1 V / m proposed as the tolerable limit for the line voltage level.

The acoustic sound is also under standard conditions is 39.78 dB / 1 V / m for single line circuit and 44.70 dB / 1 V / m for double circuit line . These values are below 51 dB (A) recommended internationally.

It is also important to note that under the easement strip, there will be no type of structure nor inhabited homes.

h) The effects of combination and / or interaction with known pollutants emitted and / or produced by the project or activity;

The project does not produce pollutants that when combining or interacting with each other, cause significant adverse effects on the quantity and quality of renewable natural resources , including soil, water and air.

i) The relationship between emissions of pollutants produced by the project or activity and environmental quality of renewable natural resources.

The project does not produce pollutants which when combined or interacted with each other cause significant adverse effects on the quantity and quality of renewable natural resources, including soil, water and air.

j) The capacity of dilution, dispersion, auto depuration, assimilation and regeneration of renewable natural resources in the area of influence of the project.

Through this project, including its works and / or related actions, no significant adverse effects on the quality of renewable natural resources will be produced, considering; the capacity of dilution, dispersion, self-purification, assimilation and regeneration.

k) The amount and surface of native vegetation and / or exploited, and their form of intervention and / or exploitation;

Through this project including its works and / or related actions, non-native vegetation intervene.

In December, 2010 an evaluation of the vegetation was carried out in the project site area.

Vegetation has been checked over mainly trees and shrubs, verifying the presence / absence of native species and / or belonging to a category of conservation. The possible presence of significant vegetation associations has been evaluated.

As established in Annex No. 2, the project area site and its surroundings corresponds to a desert area with scarce presence of vegetation, according to baseline flora species there are only two species: Pluchea absinthioides and Prosopis mesquite, the last is in a vulnerable state of conservation. In the project site area there is no presence of this tree and the layout of power lines was designed to avoid all of these species.

l) The amount of wildlife intervened and / or exploited and their form of intervention and / or exploitation;
This project, including its works and / or related actions, does not consider the extraction, exploitation, alteration or management of wildlife species.

The species of wildlife found in the study area are not in the direct area of influence of the project (see Annex No. 3 baseline fauna) yet a wildlife rescue will be conducted to prevent damage.

The objective of the rescue, is the reptile species Microlophus atacamensis, who is in a vulnerable state of conservation, and though its density was low at the time of the baseline survey, its status is important because of the vulnerable condition in the project analysis.

The rescue methodology is in Annex Nº 9.

In addition, the presence of the specie *Lycalopex culpaeus was recognized and* shows its conservation state, as inadequately known, this specie shows greater mobility, so a rescue is not necessary.

As for the birds, there are three species, none of them show conservation state and nesting sites are not found in the influence area.

m)Condition of species of flora or fauna to extract, exploit, alter or handle as indicated in the national lists of endangered , vulnerable, rare or insufficiently known species ;

This project, includes its works and / or related actions, does not consider the extraction, exploitation, alteration or management of species of flora and fauna that are in any of the following categories of conservation: endangered, vulnerable, rare or insufficiently known (Annexes No. 2 and No. 3).

Annex No. 2 of permanence concluded that even though the layout of the project is inserted in the Pampa aquifers, National Reserve Tamarugal, none of the species described, seem to be affected with the development of the project, so there is no need to stop or relocate any of them. Thus it is concluded that the project's impact on vegetation is not significant.

n) Volume, flow rate and / or surface according to water resources to intervene and / or exploit:

N.1.Meadows and / or wetlands located in Regions I and II, which may be affected by the rise or fall in groundwater levels;

While this project is located in the Region 1 of Tarapacá, it is at a distance of at least 50 linear km. from the meadows and nearby highland wetlands. In addition, due to the characteristics of the project, photovoltaic panels will not affect the possible groundwater that may be in the area, which will only reach a depth of 2 mts.

N.2. Areas or wetland areas that may be affected by the rise or fall of groundwater or superficial waters levels;

Through this project, including its works and / or related actions, water resources do not intervene in areas or wetland areas that could be affected by the rise or decline of groundwater and surface water levels; bodies of groundwater containing mineral waters and / or fossils; and / or lakes or lagoons that produce level fluctuations since there are no such ecosystems in this study area.

N.3. Groundwater bodies containing ancient waters and / or fossils;

The project, by its very nature, does not intend to intervene and / or exploit groundwater bodies containing mineral water and / or fossils.

N.4 Basin or sub-basin transferred to one another; or

Through this project, including its works and / or related actions, water resources of a basin or sub-basin will not be exploited or transferred to another one.

N.5. Lakes or lagoons where level fluctuations are produced;

The project does not intend to intervene and / or exploit lakes or lagoons that produce level fluctuations.

ñ) Changes that might produce on other natural and / or artificial elements of the environment, the introduction within the country of any flora and fauna species; as the introduction or use within the country of genetically modified organisms by other similar techniques;

Through this project, including its works and / or related actions, any species of flora or fauna, or organism or genetically modified using similar techniques will not enter in the country.

o) Ground surface susceptible to be lost or degraded by erosion, compaction or pollution;

Given the characteristics of the project, the ground will not be affected significantly because of the loss or degradation effects of erosion, compaction or pollution.

Given the conditions of the ground and the type of project, there is no significant impact on the ground due to the installation of the foundations of photovoltaic panels, since the type of ground in the area of direct influence of the study is sandy, product of sedimentary deposits of the quaternary period which are associated with saline coastal surfaces caused by old water tanks present in the area, so these will not be affected.

The intervention on soil resources is specific so effects on soil resources by erosion, compaction and contamination are not expected.

p) Biodiversity present in the influence area of the project or activity and its regeneration capacity.

The project does not affect the biodiversity of the area of influence, direct or indirectly, and does not affect the ability to regenerate it.

Article 7. The environmental quality and emissions regulations to be used as a reference to evaluate whether risk referred to in subparagraph is produced or appears is indicated in letter a) and adverse effects referred to in letter b), both of Article 11 of the Law will be those current in the following countries: Federal Republic of Germany, Argentina, Australia, Federative Republic of Brazil, Confederation of Canada, Kingdom of Spain, United Mexican States, United States, New Zealand, Kingdom of the Netherlands, Republic of Italy, Japan, Kingdom of Sweden and Swiss Confederation. To use reference regulations, that country having similarity in their environmental components with local and/or national situation will be prioritized.

Does not apply

Article 8. The holder must submit an Environmental Impact Study if his project or activity produces resettlement of human communities or significant alteration of the life systems and customs of human groups.

In order to evaluate whether the project or activity causes the resettlement of human communities, the displacement and relocation of human groups living in the influence area of the project or activity, will be considered, including its works and / or related actions.

Human communities or human groups shall be understood as any group of people who share a territory interacting constantly giving origin to a living system; social, economic, and cultural, which eventually tend to produce traditions, community interests and feelings of attachment. In addition, in order to evaluate whether the project or activity produces significant alteration of the life systems and customs of human groups, it will be considered the change in the life system:

a) Geographic dimension, namely the distribution of human groups in the territory and the spatial structure of their relations, considering the density and spatial distribution of the population; the land dimensions and land tenure; and communication and transport flows;

The project will not produce changes in the distribution of human groups in the territory and the spatial structure of their relations, considering the density and spatial distribution of the population, since the highest percentage of workers is estimated to come from the region and a smaller group, especially supervisors and specialists, will come from other parts of the country. In addition, staff accommodation is in the villages around the working place (Pica and Matilla), without the need of building a campsite.

No alteration will be produced because of the dimension of the land and land tenure since these belong to Chile, through the Ministry of National Assets. The project uses them and these have no human use of any kind.

Finally no flow of communication and transport will be altered since the volumes of personnel and material to move are small. In addition, the transport of personnel to and from the place where they stay, is by a fleet of minibuses without having to do with local transportation.

b) Demographic dimension, is the structure of the local population by age, sex, branch of activity, occupational category and migration status, considering the rural urban structure; the structure according to the branch of economic activity and occupational category; the economically active population; age and sex structure; schooling and education level; and migration;

The project will not produce changes in the structure of local populations by age , sex , branch of activity , occupational category and migration status , considering the rural urban structure ; the structure according to the branch of economic activity and occupational category ; the economically active population ; age structure and sex; schooling and education level ; and migration. Because it has been estimated that the highest percentage of workers come from the region and the smaller group, especially supervisors and specialists come from other parts of the country. In addition staff accommodation will be in small villages close to the workplace, without building a campsite.

c) Anthropological dimension, considering the ethnic characteristics; and manifestations of culture, such as religious ceremonies, pilgrimages, processions, celebrations, festivals, tournaments, fairs and markets; This project, including its works and / or related actions, will not affect the performance of religious ceremonies and other manifestations of their own culture and folklore of the village, community or group (see section 2.8).

d) Socio- economic dimension, considering employment or unemployment and the presence of productive activities dependent on the extraction; of natural resources by the human group, individually or in partnership; or

This project, including its works and / or related actions, does not anticipate the removal and relocation of people.

This project, including its works and / or related actions does not affect the access of the population to goods, equipment and services

Article 9. The holder shall submit an Environmental Impact Study if his project or activity is located next to population, resources and protected areas likely to be affected and the environmental value of the territory where the project will be located.

In order to evaluate whether the project or activity is located near the population, resources or protected areas likely to be affected, will be considered:

a) The magnitude or duration of the intervention or location of the project or activity in or around areas where the population live protected, by special laws.

This project, including its works and / or related actions does not consider the presence of people, communities or groups of people protected by special laws.

The groups protected by special laws correspond to ethnic groups. The following table shows the population by ethnicity and total in Pica, according to the 2002 census (National Statistics Institute).

Table Nº 17: Percentage of the population correspondent to ethnicities in Pica commune.

Ethnicities	**%**
Atacameño	0,62
Aymara	20,9
Colla	0,1
Mapuche	1,38
Quechua	0,65
None of the above	76,37
Total	100

With the above, the Diaguita ethnicity is incorporated with the law 20.117 recognizing and introducing it in the Indian Act as an indigenous people (07-09-2006).

Jiwasa Oraje is recognized as an Area of Indigenous Development (ADI) near the location of the project area with all project development installations outside out of it.

See Map in Annex No. 11. These groups will not be affected by the project.

b) The magnitude or length of time of the intervention or location of the project or activity in or around areas where there are officially protected resorts; or

The project is not located close to any resort area and / or National Monument (see Annex No. 4).

c) The magnitude or duration of the intervention or location of the project or activity in or around protected areas or placed under official protection.

The design line layout was designed to avoid any adverse effect on Prosopis tamarugo species, the plant species that is protected in this area or any other protected item within the reserve.

Therefore, even though part of the power lines are located in a protected area for an indefinite time, activities or material works in that area, according to the magnitude or duration of the placement or intervention, will not affect that is, infringe the objectives for the purpose.

The power plant Atacama is not located inside the National Reserve Pampa Tamarugal, only part of the route of the transmission line passes through within its boundaries.

Article 10. The central operator shall submit an Environmental Impact Study if the project or activity, produces important changes in magnitude or duration terms of the zone's landscape value.

In order to evaluate whether the project or activity, at any stage, produces or presents a significant change in terms of magnitude or duration of the landscape or tourism value of an area, it shall be considered :

a) The duration or the magnitude in which the visibility is obstructed to the areas with landscape value;

This project, including its works and / or related actions, does not consider the;

Obstruction of visibility areas with landscaped and / or tourist value, and / or a declared area or national interest tourist site, pursuant to Decree Law No. 1,224 of 1975.

The project is located on a plain so it will not cause obstruction of visibility of the desert, oasis, salt lake, creeks and plateau.

b) The duration or the magnitude in which resources or elements of the environment of the areas with landscape and tourist's value, change;

While the project causes a change in the landscape, does not change its natural forms, for example, overlooking the lines on rolling hills or overlooking the expanded desert, which are the main components of the landscape in that area (See Annex No. 5). It modifies much less the characteristics of the oasis.

The project will not affect local customs and traditions.

The project by itself gives tourist value in the area, forming a technological project to produce electricity through a renewable resource (solar) , thus representing sustainable development and environmental care, qualities which the commune seeks to develop (PLADECO Pica, 2008)

c) The duration or the magnitude of obstruction of resources or elements of the environment in areas with landscape or tourist value; or

Through this project, including its works and / or related actions, an obstruction of access to resources or elements of the environment in areas with scenic or tourist value will not be produced.

d) The intervention or project site or activity in a declared area or center of national tourist interest area as provided in Decree Law No. 1,224 of 1975.

The project will be located within the area of tourist interest Pica- Salar in Huasco, but as mentioned in previous paragraphs the project will not obstruct the view of ZOIT characteristics (oasis, plateau, among others), nor produce a negative effect on local customs and traditions, nor obstruct access to this area. According to the characteristics presented by ZOIT Pica-Salar from Huasco, the project will not alter paleontological resources or affect the archaeological, historical and cultural heritage. It will not alter water and hot springs, nor the Salar from Huasco, much less the biodiversity.

In relation to the landscape, while the project is located within a ZOIT that is characterized by its natural value, the project represents an example of sustainable development, where its greatest virtue is the minimal damage that this type of project causes on nature.

Therefore it will be a center of interest for the whole area and region.

Article 11. The operator shall submit an Environmental Impact Study if the project or activity causes or presents a change in monuments, sites with anthropological , archaeological, historical value and in general if it belongs to the cultural heritage.

In order to evaluate whether the project or activity, in relation to its area of influence, causes changes in monuments, sites with anthropological, archaeological, historical value and in general, those that belong to the cultural heritage, it shall be considered :

a) Proximity to a National Monument those defined by Law 17,288;

This project, including its works and / or related actions, not close to a National Monument defined by Law 17,288

In an archaeological baseline report (see Annex No. 4) 7 Historical Monuments are recorded, five for the Pica comune: the church and belltower of Matilla, saltpeter office Iris, church of Pica, Lagar of Matilla and Pica Hospital and two for the commune of Pozo Almonte: Santa Laura saltpeter and buildings and Tortas of Ripio, Humberstone saltpeter office and buildings and Tortas of Ripio.

The nearest monument to the location of the Project is more than 3 km away (Matilla) so it will not be affected.

Monument defined by Law 17,288 , or the modification , damage in buildings , places or sites for their constructive characteristics , due to their age, for their scientific value, its context or history or for their uniqueness , belong to the cultural heritage ,since no remains or archaeological remains were found in the project area (see Annex No. 4).

If ruins or archaeological remains are discovered in any excavation, regardless the cause, it shall be immediately reported to the holder, the Provincial Governor and the National Monuments Council.

Works will be stopped in the area where a discovery occurs, fulan archaeologist will examine it and will emit a report to be submitted to the competent authority.

c) The extent to which modified or permanently impair buildings , places or sites for their constructive characteristics, their antiquity, their scientific value, historical context or for their uniqueness belong to the cultural heritage; or

This project, including its works and / or related actions, does not consider the removal, destruction, excavation, removal, damage or modification of a monument defined by Law 17.288, or modification, damaging of buildings, places or sites with constructive characteristics, due to their antiquity, scientific value, its context or history or for their uniqueness, are cultural heritage, since no remains or archaeological remains were founded in the project area. (See Annex No. 4).

d) Proximity to places or sites where cultural manifestations of their own or folklore of some village, community or group.

This project, including its works and / or related actions will not affect the performance of religious ceremonies and other manifestations of their own culture and folklore of the village, community or group (see section No. 2.8).

5 BACKGROUND TO EVALUATE FULFILLMENT OF CURRENT ENVIRONMENTAL LEGISLATION

Based on Law 19.300, on General Environment (LBGMA) and amendments by Law 20.417 which, " created by the Ministry, the Environmental Evaluation Service and the Superintendence of Environment and Supreme Decree No. 30 / 97 and DS modification 95/2002 of the Secretary General Ministry of the Presidency and System Environmental Impact Evaluation Regulation (Reg . SEIA).

According to decrees of the regulation bodies mentioned above, the project consisting of a central generator of 250 MW based on solar panels, is both, expressly described in Article 10 letter c) of the legal text; as in article 3 letter c) regulatory text are obliged to be submitted to the system of environmental impact evaluation managed by the Environmental Evaluation Service of the Region of Tarapaca.

5.1 Applicable regulations to the project and its fulfillment form

Then, a table of regulations applicable to the project in a first instance by the general ones and afterwards according to the ministry that issues them.

REGULATES	Environment
STAGE	All
REGULATION	Decree 100
NAME	Sets the combined, coordinated and systematized text of the Political Constitution of the Republic
DATE OF PUBLICATION	September 22nd, 2005.
AUTHORITY THAT	Ministry of Interior

RELEASES	
AREA OF APPLICATION	National
RELATION WITH THE PROJECT	**Art. Nº 9**, **Nº 8:** The right to live in a free polluted environment**.** It is a country's duty to ensure rights will not change and to look for the preservation of nature. The law shall establish specific restrictions of determined rights or liberties to protect the environment.
FULFILLMENT	Fulfillment of the whole environmental regulation.

5.1.1 Legislation General Character

Table Nº 18

	Applicable to this project.
INQUIRY	-Public bodies.

Table Nº 19

REGULATES	Environment
STAGE	All
REGULATION	Law 19.300 and its modifications
NAME	Environment General Basis. Modified by Law 20.417 created by the ministry, Environmental Evaluation Service and the Environment Superintendence
DATE OF PUBLICATION	March, 9 th, 1994.
AUTHORITY THAT RELEASES	Minisitry General Secretariat of the Presidency
AREA OF APPLICATION	National
RELATION WITH THE PROJECT	According to Article 10 of the Law , in its letters b , c and p: Item No. 10: The projects or activities likely to cause environmental impact, in any of its phases, that have to undergo environmental impact evaluation, are the following: • Power transmission lines and high voltage substations. • Central power generators more than 3 MW. • Implementation of projects, programs or activities in national power plants, national reserves, natural monuments, wildernesses reserves, nature sanctuaries, marine parks, marine reserves or any other areas placed under official protection when the respective legislation allows it. **Art. Nº 11**: Projects or activities numbered in this previous article require the preparation of an Environmental Impact Study if they cause or have at least one of the following effects, characteristics or circumstances: a) Health risk population, due to the quantity and quality of effluents, waste or emissions; b) Significant adverse effects on the quantity and quality of renewable natural resources, including soil, water and air; c) Resettlement of human communities, or significant changes of life systems and customs of human groups; d) Location in/ or near towns, resources and protected areas, priority conservation sites, protected wetlands and glaciers , may be

	affected, and environmental value of the territory where it will be located; e) Significant change in terms of magnitude or duration, of the landscape or tourism value of an area, and f) Alteration of monuments, sites with anthropological, archaeological, historical value and in general, that belong to the cultural heritage. For adverse effects referred to in point b), It shall be considered what is established in the environmental quality and emissions current regulations. In the absence of such regulations, reference of other countries will be considered.
FULFILLMENT	The holder of this project fulfills what is established in the Law entering into the Evaluation System of Environmental Impact, discarding the need of a previous Environmental Impact Study, previous analysis of article 11 (see chapter Nº 4) .
INQUIRY	Environmental Evaluation Study

Table Nº 20

REGULATES	Environment
STAGES	All
REGULATIONS	Supreme decree Nº 95
NAME	Environmental Impact Evaluation System Regulation
DATE OF **PUBLICATION**	December, 7th , 2002
AUTHORITY THAT RELEASES	MINISTRY GENERAL SECRETARTIAT OF THE PRESIDENCY
AREA OF APPLICATION	National
RELATION WITH THE PROJECT	According to article 3 of the Law , in its letters, b, c and p: **Art. Nº 3**: The projects or activities likely to produce an environmental impact b) Transmission high voltage electric lines and its substations. Transmission high voltage electric lines are those that conduct electric energy with a voltage of more than (23 kV). High-voltage electric transmission line substations are those related to one or more transmission transport lines, having to maintain voltage at a transport level. c) Power generators with power, higher than 3 MW p) Implementation of projects , programs or activities in national parks, national reserves, natural monuments, wilderness reservation areas, wildlife sanctuaries, marine parks ,marine reserves or in any other areas under official protection in cases where the respective legislation allows it.
FULFILLMENT	The holder of the project fulfills what is established in the regulation entering in the Environmental Impact Evaluation System as an Environmental Impact Declaration according to was is established in title II and its articles because it's a project of energy generation of

	more than 3 MW with a substation and high voltage transmission line.
INQUIRY	Environmental Evaluation Service

5.1.2 Specific Character Legislation

Table Nº 21

REGULATES	Solid wastes, sanitation and security in the work place and discharge of wastewaters and industrial and mining waste.
STAGE	All
REGULATION	DFL N° 725/67
NAME	Health Code
PUBLICATION DATE	January, 30th, 1968
AUTHORITY THAT RELEASES	Health Ministry
AREA OF APPLICATION	National
RELATION WITH THE PROJECT	According to what is stipulated in **Title II, of SANITATION AND ENVIRONMENTAL SECURITY, Parragraph I, OF WATERS AND ITS SANITARY USES:**
	Art. 73: Prohibits the discharge of sewage and industrial or mining waste in rivers, lakes or any other source or body of water that provides potable water to any population for irrigation or bathing places without first proceeding to purifying it, as stated in the regulations [extract]. According to what is stipulated in **Title II, of SANITATION AND ENVIRONMENTAL SECURITY Parragraph III, OF WASTES AND GARBAGE:** Art. 80: It corresponds to the National Health Service to authorize the installation and monitor the operation in any place for accumulation, selection, industrialization, trade or final provision of garbage and waste of any kind. In granting this authorization, the National Health Service determines the sanitary conditions and safety that should be accomplished to avoid discomfort or danger to health community or working people on these tasks. Art. 81: Vehicles and transportation systems of materials that according to National Health Service, may be a hazard or annoyance to the population and those of garbage and waste transportation of any kind, must meet the requirements set by such service, which will also perform health surveillance on them.

FULFILLMENT	According to what is stipulated in Title III, OF SANITATION AND SECURITY OF WORKPLACES: Art. 82: Regulations include rules such as those relating to: a) Sanitary and security conditions that workplaces, equipment, machinery, installations, materials and any other element should meet to protect efficiently; life, health, and wellness of the workers and employees and of the population in general. b) Sanitary and security protection measures that should be adopted in the processing and handling of produced and used substances in places where human work is performed; c) Sanitary and security conditions that personnel protection equipment should meet and the obligation to use them. As a fulfillment measure, the contractor shall install chemical bathrooms in the workplace with due authorization by respective Sanitary SEREMI. All household waste will be stored in properly labeled containers removed and transported for final disposal in landfill. Non-hazardous industrial waste that may be produced in the construction stage will be stored in an authorized place for this purpose called rescue area, from where they will be removed by persons or companies duly authorized. Some of these will be taken to a storehouse and other places for final disposal duly authorized. Workplaces must be kept clean of waste and odors that affect workers' health or may put in risk the security of the workers. The holder will demand and supervise the contractor for the personal protection for all workers
INQUIRY	SEREMI Health

Table Nº 22

REGULATES	Basic sanitary and environment conditions in the workplace
STAGES	All
REGULATIONS	D.S. Nº 594, and its modifications
NAME	Regulation on Sanitary and environmental basic conditions in workplaces.
PUBLICATION DATE	April, 29th , 2000

AUTHORITY THAT RELEASES	HEALTH MINISTRY
ÁREA OF APPLICATION	National
RELATION WITH	General, sanitary and environmental conditions that every workplace should have, are considered in this regulatory body. On sanitary conditions, the regulation establishes, regulations on provision of potable water, disposal of liquid and solid industrial waste, sanitary facilities, evacuation of wastewaters and wardrobe and dining hall
FULFILLMENT	What is disposed in the Regulation on Sanitary and Environmental Conditions in workplaces will be strictly accomplished as indicated below: Liquid and Industrial Waste Regulation: According to what is established in articles from 16º to 20º solid waste of household character will be taken to landfills or sanitary wells duly authorized. The disposition and treatment of solid industrial waste will be carried out by a company duly authorized and suitable by SEREMI for health, accredited by presenting the pertinent background to the sanitary authority. As a measure of compliance of **articles 21º through 26º**, the contractor will be asked to install chemical baths in the workplace with the due authorization of SEREMI of preventive health. For maintaining chemical baths, an authorized company will be hired. Chemical toilets will be installed at no more than 75 m distance of active work fronts and the number will be 1 to 10 workers separating them by sex, if it is the case. After the construction, the holder shall ask the contractor to recondition sanitarily the chemical bath site to avoid the proliferation of vectors, odors, environmental pollution and the possibility of accidents caused by the installation. Chemical agents: Project activities do not include the use of any of the chemicals prohibited under article 65º of the regulation, or increasing any environmental concentrations of chemicals listed in Articles 61 ° and 66 ° of the same health code.

	Physical agents: Noise: Project activities within the regulations on occupational noise exposure; stable , fluctuating and impulsive established in Articles 70 to 82 of the regulation. Workers who are exposed, will use the security elements (hearing protection, hearing aids, etc.) recommended for this type of work. Vibrations: Project activities comply with Articles 83 ° to 94 °of the regulation concerning the limits of oscillatory vibration. Illumination : Project activities will be carried in preference with natural light, in accordance with Article 103 ° of the regulation. Water supply : It is obtained from public network and water containers that will be transported to the workplace in volumes specified in the regulation; 123rd and 124th articles . Solar radiation: Applies necessary measures to effectively protect the workers when exposure to ultraviolet radiation. According to the internal regulation of the company, elements of protection will be used.
INQUIRY	-SEREMI for Health

Table Nº 23

REGULATES	Potable water service
STAGES	All
REGULATION	D.S. Nº 735
NAME	Water service regulation for human consumption; Abolishes decree Nº 1132, May,3rd, 952
PUBLICATION DATE	December ,19th,1969
AUTHORITY THAT RELEASES	HEALTH MINISTRY
AREA OF APPLICATIO N	National
RELATION WITH THE PROJECT	**Art. Nº 1: All potable water service has to provide good quality water** and enough to satisfactory provide it to the needed population, ensuring the continuity of the water supply and against interruptions caused by failures in the installations or exploitation.
FULFILLMENT	The project will achieve the parameters established in N.Ch.Of 409/87, providing bottled water to the workers providers duly authorized.
INQUIRY	-SEREMI for Health

Table Nº 24

REGULATES	Atmospheric emissions and air quality
STAGES	All
REGULATION	D.S. Nº 144
NAME	Establishes regulations to avoid emissions or atmospheric pollutants of any nature
PUBLICATION DATE	May, 18th,1961
AUTHORITY THAT RELEASES	MINISTRY OF HEALTH
ÁREA OF APPLICATION	National
RELATION WITH THE PROJECT	**Art. 1**: Gases, vapors, fumes, emissions or pollutants of any nature, produced in any industrial or workplace establishment should be captured or removed totally not causing danger nor damage or inconvenience to the neighborhood. **Art. 7**: Circulation of all motorized vehicles that emit visible fume by exhaust pipe.
FULFILLMENT	The holder will fulfill all the conditions and established decree requirements, adopting measures that avoid the runoff of materials and the scattering of dust. The project will produce combustion gases and leak of dust only temporarily during the construction, as a consequence of trucks and machinery on unpaved roads and the movement of the ground produced in the established place of each structure. Transit of vehicles by unpaved roads will be at no more tan 30 km/h and the roads will wetted frequently. Transport of materials will be carried out in the loading sheer.
INQUIRY	-SEREMI for health

Table Nº 25

REGULATES	Management of dangerous waste
STAGE	Construction stage

REGULATION	D.S. Nº 148
NAME	Sanitary regulation on dangerous waste management
PUBLICATION DATE	June,12th, 2003
AUTHORITY THAT RELEASES	MINISTRY OF HEALTH
AREA OF APPLICATION	National
RELATION WITH THE PROJECT	Project construction stage will be under regulation. As follows article 6 is noted: **Art. 6**: During the management of dangerous waste with management of dangerous waste, necessary precautions to prevent its inflammation or reaction, among them their separation and protection in front of any risk source capable to cause such effects. In addition, during the different stages of management of such wastes all the necessary measures to prevent leaking, discharges or emissions of dangerous substances for the environment.
FULFILLMENT	All precautions will be taken to avoid accident caused by bad management and the use of EPP. Dangerous wastes produced by the project will be stored and moved according to final decree according to in force "Sanitary regulation" on management of dangerous wastes" (see annex 3.5) transportation and D.S. 148/03 "Sanitary Regulation on Management of hazardous waste" (See annex 3.5). Transport and final disposition will be carried out by a qualified company.
INQUIRY	-SEREMI for Health

Table Nº 26

REGULATES	Noises
STAGE	All
REGULATION	D.S. Nº 146
NAME	Establishes Regulation of emissions of annoying noises produced by determined sources
PUBLICATION DATE	April,27th, 1998
AUTHORITY THAT RELEASES	MINISTRY GENERAL SECRETARY OF THE PRESIDENCY

AREA OF APPLICATION	National
RELATION WITH THE PROJECT	This supreme decree establishes the maximum allowed levels of corrected sound pressure and the technical criteria to evaluate and qualify the emission of annoying noise produced by determined sources to the community, such as industrial, commercial, recreational,,artistic and other activities. The application of this regulation should be considered in all projects because of its possible effects on human health.

FULFILLMENT	Relevant technical literature indicates that noise levels around power lines related to the project, have no harmful consequences for human health. As for the power plant, it will not produce noise emissions and in the case that during the stage of construction it reaches high level the workers will count with safety elements. As for the nearby population, a preliminary evaluation was conducted (see section No. 3.3 or Annex No. 7) determining that it will not be affected since the level of noise emissions will fulfill this decree.
INQUIRY	-SEREMI for Health

Table Nº 27

REGULATES	Transportation of materials.
STAGES	Construction stage
REGULATION	D.S. Nº 75
NAME	Establishes conditions for transportation of indicated load
PUBLICATION DATE	July, 7th,1987
AUTHORITY THAT RELEASES	MINISTRY OF TRANSPORT AND TELECOMUNICATIONS
AREA OF APPLICATION	National
RELATION WITH THE PROJECT	**Art. Nº 1**: In cargo vehicles no load is allowed to be on the car roof nor transported if it exceeds the width of the bodywork. Load should not exceed the front end in motorized vehicles motorized or the head of draught animals –in the case of animal drawn vehicles. On the back, the load should not drag or excel from the end of the vehicle more than 2 meters. When it excels more than 0.50 m., it must take at the end of the load, a red light and at night a flag of the same color This flag will be of fabric or plastic material of 0.50 m. Long by 0.40 wide, placed in a proper way and tied to the end of the load. When the objects in the load, have great length, they should be strongly fixed to one another and to the vehicle, so that the oscillations of movement will prevent them to excel on the laterals. Art. Nº. 2.: Vehicles transporting waste, sand, gravel, soil or other materials , whether solid, or liquid, which may slip and fall to the ground , they shall be constructed so it does not happen for any cause. In urban areas, transportation of materials that produce dust such as debris,

	cement, plaster , etc. must be carried out always fully and effectively covering materials with tarps or plastics of suitable dimensions, or other system that prevents its dispersion to the air. Art. No. 5: The cargo of a vehicle and fastening elements and protection such as strings, chains and canvas covers should be accommodated in such a way that they do not cover any of the exterior vehicle lights. Art No.7. The vehicles carrying containers should be provided with special fasteners; fixed or removable to immobilize the container bottom corners. The containers should not extend beyond the front and the back of the vehicle that transports them and must rely only on their corners or reinforced area structures of the base. Before starting the transport operation, the effectiveness of the fasteners must be verified. No. 9: Established as a condition of safety, 90kilometers per hour maximum speed limit in rural areas for the circulation of motor vehicles for the freight gross vehicle weight exceeding 3,500 kilograms.
FULFILLMENT	When transporting materials, the holder shall comply with all the conditions and requirements of this decree, which regarding the dimensions of the load, adequate fastening and adopted measures to stop the run off of materials and avoid the dispersion of dust. The trucks carrying the project's construction materials and waste, will be enabled to prevent leaking and falls of the material. A level of cargo of up to 10 cm lower of the hopper edge will remain. Transportation of the materials that produce dust will be carried out with the Hopper edge covered with canvas to stop the dispersion of dust and to prevent the run off of solid and liquid materials.
INQUIRY	-Ministry of Transportation and Telecommunication -Police from Chile

Table Nº 28

REGULATES	Transportation of dangerous cargo
STAGE	Construction stage
REGULATION	D.S. Nº 298
NAME	Transportation that regulates dangerous cargo through streets and roads
PUBLICATION DATE	February, 11th, 1995
AUTHORITY THAT RELEASES	MINISTRY OF TRANSPORTATION AND TELECOMUNICATIONS
AREA OF APPLICATIO N DE	National

FULFILLMENT	The project does not consider the use of dangerous substances in defined terms of the signaled regulation
INQUIRY	-Regional roadways office -Police form Chile -Tax inspectors -Municipalities

Table Nº 29

REGULATES	Emissions to the atmosphere and air quality
STAGE	Construction stage
REGULATION	D.S. Nº 55
NAME	Establishes motorized heavy vehicles applicable emission regulations
PUBLICATION DATE	April, 16, 1994
AUTHORITY THAT RELEASES	MINISTRY OF TRANSPORTATION AND TELECOMUNICATIONS
AREA OF APPLICATION	National
RELATION WITH THE PROJECT	Item No. 2: The heavy motor vehicles whose first registration in the National Registry of Motorized Vehicles Civil Registry and Identification September,1, 1994, will be able to circulate only in the metropolitan region in the continental territory of region V and in regions IV , VI , VII , VIII , IX and X , if they are mechanically capable to fulfill with emission regulations stated in referred to in Article 4 ; to comply when

	It corresponds with the referred emission regulations in article 8 bis and if; when having their technical revisions it is accredited that they are in suitable conditions to circulate. Heavy motorized vehicles in situations as referred to in following article 9, are exempt to comply with what is signaled in the previous section
FULFILLMENT	The holder accepts voluntarily this regulation. Since the project is not located in a region influenced by this regulation, it is necessary to comply with minimum parameters of maintenance of the motorized vehicles that will be used. Contractors and subcontractors involved in the construction stage; trucks and machinery, will be required to comply with the maximum limits of emissions. It will be required that all vehicles have technical revision up to date. Circulation of vehicles through un paved roads are allowed to transit 30 km / h and roads will be wetted frequently.
INQUIRY	Inquiry Department Transportation Undersecretary

Table Nº 30

REGULATES	Cultural Resources
STAGE	Construction stage
REGULATION	Law 17.288
NAME	Regulates National Monuments
PUBLICATION DATE	February, 4th,1970
AUTHORITY THAT RELEASES	MINISTRY OF EDUCATION
AREA OF APPLICATIO N	National
RELATION WITH	No. Art. 9: Historic monuments are places, ruins, buildings and objects of public, municipal or private property for its quality and historical or artistic interest or antiquity, declared by supreme decree, issued upon request and council agreement. Item No. 26: Any natural or legal person who do excavations at any point of the national territory with any purpose and find; ruins, fields, parts or objects with historical, anthropological, archaeological or paleontological character, is obliged to report immediately the finding and to the

THE PROJECT	provincial Governor, who will order the police take responsibility of its surveillance until Council gets in charge of it.Violation of this article shall be punished with a fine of five hundred monthly tax units without prejudice to the joint and several liability of entrepreneur or

FULFILLMENT INQUIRY	contractors in charge of the works, for damages that come from non-fulfillment duty to report the finding. Art.N1º 27:Parts or objects referred to in the preceding article will be distributed by the council according to what is determined by the regulation. With the discovery of archaeological ruins or during any excavation, regardless the reason, it will be immediately informed to the holder, the provincial Governor and the National Monuments Council. Once produced a finding, the works of its area will be stopped. An archaeologist will inspect the finding and emit a report to the competent authority. -National Monuments' Council -Police from Chile.

Table Nº 31

REGULATES	Cultural resources
STAGE	Construction stage
REGULATION	D.S. Nº 484
NAME	Regulation of excavations and / or archaeological, Anthropological and Paleontological surveys .
PUBLICATION DATE	April, 2nd, 1991
AUTHORITY THAT RELEASES	MINISTRY OF EDUCATION
AREA OF **APPLICATION**	National
RELATION WITH THE PROJECT	Art.Nº. 2: For corresponding licenses and authorizations, shall apply; a) Survey: The study of the surface location to discover one or more archaeological anthropological or paleontological sites can include boreholes and/or collection of surface material. [extract] Art. No. 20: The term "salvage operations", for purposes of this regulation, urgent recovery data or archaeological, anthropological or paleontological species threatened by imminent loss. Curators and museum directors recognized by the National Monuments Council, archaeologists, anthropologists or professional paleontologists, as appropriate and members of the Chilean Society of Archaeology will

	be authorized to carry out salvage work. These people are obliged to inform the Council of its intervention and where these objects will be taken to, as soon as they can. In case the salvage workers presume of the existence of a great importance finding, archaeologists must immediately inform the Council of National Monuments in order to take measures necessary measures. Art .Nº. 23: Natural or legal persons carrying out surveys and / or excavations anywhere in the national territory finding with any purpose, ruins, deposits, pieces or objects of archaeological , anthropological or paleontological, value, are obliged to immediately report the discovery to the provincial Governor who will order the police, to take on responsibility for their surveillance until the National Monuments Council takes charge of it. The objects or species founded will be distributed as determined in Article 21 of this regulation.
FULFILLMENT	In case of an archaeological or paleontological finding, works in the sector will be stopped, informing immediately and in a written message to the Council National Monuments to determine the procedures to be followed, to determine the procedures and implementation the holder, should carry out.
INQUIRY	-National Monuments Council -Police from Chile

Table Nº 32

REGULATES	Pest control
STAGES	Construction stage
REGULATIONS	Law 19.283
NAME	Establishes regulations on agriculture and livestock service and abolishes Law Nº 16.640 and other decrees
PUBLICATION DATE	January, 7th,1987
AUTHORITY THAT RELEASES	MINISTRY OF AGRICULTURE
AREA OF APPLICATION	National
RELATION WITH THE PROJECT	Art. Nº. 4: In the exercise of powers, relating to sanitary issues indicated in the previous article, the national executive may propose the Ministry of Agriculture to officially authorized the entrance in the country, of forestry and agricultural goods and for products in transit; fix routes, special measures for packing and transportation; periods or deadlines for transfer and maximum stay in the country of such goods; provide treatment to ensure the destruction or safety of agents that cause diseases or pests and, in general any other required tending control measure to prevent the introduction and spread of pests in the country and diseases that affect animals or plants.

FULFILLMENT	In case the equipment and/or machinery comes from other countries and packed with wood, it will be notified to the SAG office with 10 days in advance indicating to the port; its entrance. In case materials of the project, are in the storehouse, relevant documents will be delivered to the SAG duly endorsed when entering in the country.
INQUIRY	Regional Office of Agricultural and Livestock Service

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