Cielos de Tarapacá

Chapter 4

Environmental impact Assessment

EIA Cielos DE TARAPACÁ

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Chapter 4

Environmental impact Assessment

EIA Photovoltaic Park Cielos de Tarapacá

Content

CHAPTER 4. ENVIRONMENTAL IMPACT ASSESSMENT

4.1 INTRODUCTION

This chapter contains the identification, description, evaluation and ranking of the environmental impacts of the "Cielos de Tarapacá" project, for Stages of construction, operation and/or Closing.

The evaluation of the environmental impacts of the project was materialized using the criteria defined in the Law on General Environmental Bases (Law n ° 19.300/94) and the regulation of the Environmental Impact Assessment System (regulation of the SEIA, whose Last modified and recast text are contained in Supreme Decree No. 40/12 of the Ministry of the Environment (MMA). Specifically, the impact assessment is consistent with the provisions of article 18 (f)) of the SEIA regulation.

It has been considered in this evaluation the antecedents and information indicated in the chapters of description of the project, Applicable environmental regulations and line Of Environmental basis of the project.

4.2 METHODOLOGICAL ASPECTS

4.2.1 Analysis Phases

In general terms, the methodology used to evaluate environmental impacts in this EIA has been to apply the following phases of project-Environment Integration analysis:

- Preparation of checklists.
- Development of impact matrices.
- Impact assessment.
- Hierarchy of impacts.

The above, considering the stages of construction, operation and closure Independently, for each work or task of the project. The identification of the works or tasks of the project considers the differentiation between those of permanent or definitive character (that are part or constitute the object of the project) and the temporary or provisional ones (that form a complement or support to the works or Definitive tasks).

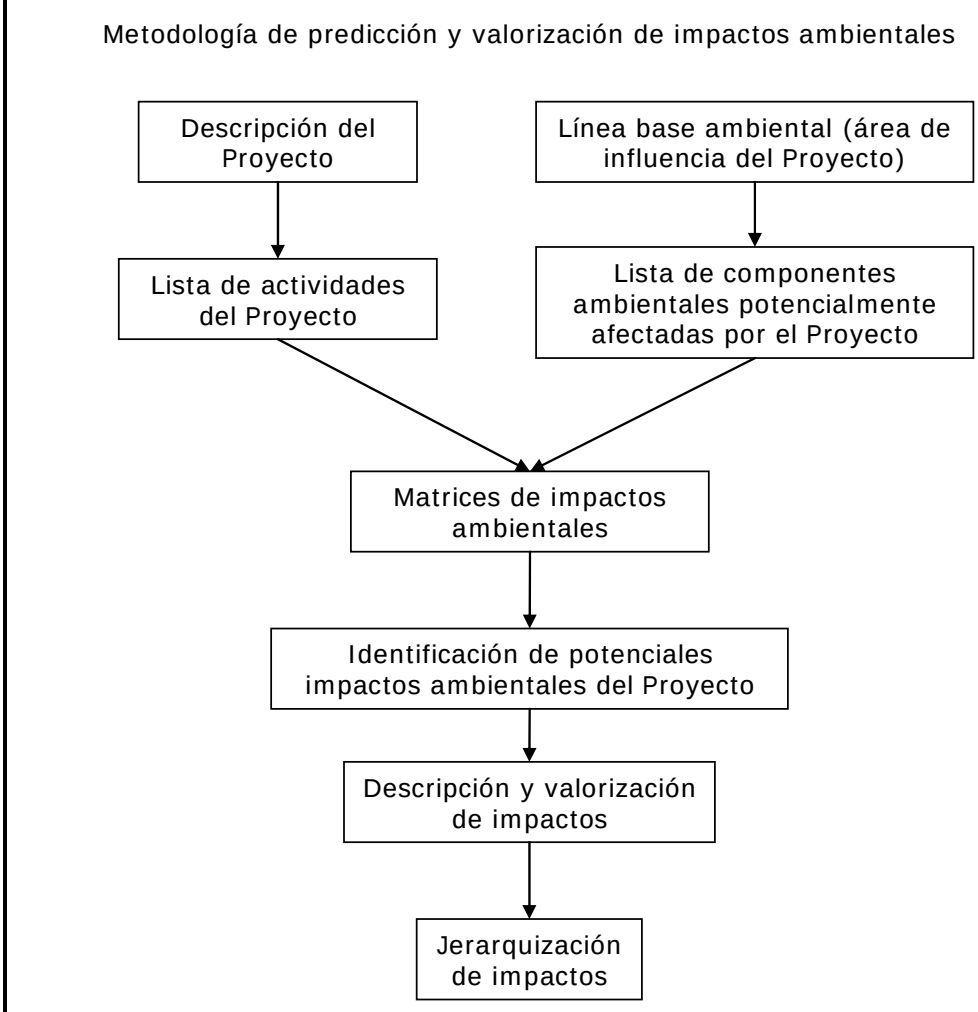
Then you Summarizes and graphically illustrates the methodology for identifying and evaluating impacts above. In addition, the following points provide the scope of each of the phases of analysis that make up this methodology.

Box 4.2-1: Methodology for the identification and assessment of environmental impacts

Analysis Phases	Reach	Results
Preparation of checklists	List of project activities (from the project description chapter)	Identification of potential environmental impacts of the project.
	List of environmental components potentially affected by the project (from the environmental baseline chapter of the project).	
Development of impact matrices	Cross-information between project activities and potentially affected environmental components (from previously prepared list information).	
Impact assessment	Impact assessment (based on matrix methodology of Leopold Modified).	Description and valuation of environmental impacts of the project. Where applicable, the description of the impacts indicates temporality of the same, considered for this the development schedule of the project (according to years of implementation of the project). In this way, it must also be recognized the existence of cumulative impacts related to works or tasks previously carried out in the Area of influence of

Box 4.2-1: Methodology for the identification and assessment of environmental impacts		
Analysis Phases	**Reach**	**Results**
		the project, for the respective environmental component evaluated.
Ranking of impacts	Determination of the importance of the impacts identified according to their valuation results.	List of impacts ordered by importance.
		Identification of significant environmental impacts.

Figure 4.2-1: Methodology for the identification and assessment of environmental impacts



The following headings describes each of the phases listed above.

4.2.2 Preparation of checklists

To begin with the impact assessment, the methodology called *Simple Checklist*. This corresponds to a list that gives account of the activities and actions of the project feasible to cause some environmental impact, in its stages of Construction, Operation and Closure, if applicable. In parallel, another list was drawn up indicating the environmental components feasible to be affected.

From the crossroads of both lists (activities-project actions versus environmental components) we obtain the identification of the potential environmental impacts of the project.

The description of each of these lists is given below:

4.2.2.1 Checklist of project activities

On the basis of a detailed analysis of the engineering of the project, the activities or actions are determined (for the stages of construction, operation and, if applicable, Closure) feasible to produce environmental effects.

4.2.2.2 Environmental Component Checklist

Environmental components of the project's influence area are considered (line Of Environmental basis), which will or could be affected by the works, actions and/or activities of the same. It should be noted that those components of the environment that will not be impacted by the project are not considered in this checklist.

4.2.3 Elaboration of impact assessment matrices

Although the checklists allow for a thorough identification of the elements that constitute the evaluation, it is necessary to integrate them with the purpose of having a vision regarding their interrelations. To do this, it is necessary to consider the development of matrices that relate the works or actions of the project with the potentially affected environmental components.

4.2.4 Impact enhancement

The evaluation of the environmental impacts of the project is carried out using type impact assessment matrices Leopold Modified. In addition to the relevance of the affected environmental component, the methodology considers the character and magnitude of impacts (where the magnitude of the impacts is the function of the probability of occurrence, extension, intensity, duration, synergy/accumulation and Reversibility of the same).

The Matrix of Leopold It consists of a list of activities or actions that can cause environmental impacts. According to this methodology, it is necessary to establish the relevance of the affected environmental components and the character and magnitude of the impacts.[12]

This methodology has been used in most of the studies of environmental impact, submitted to the SEIA.

In summary, the following mathematical expression is used to perform the numerical valuation of the impacts:

Impact Total (IT) = C * VA * M

Where:

C: Impact character (+/-1)

[1] Espinoza, G., Pisani, P. y Contreras, L. 1994. Manual de Evaluación de Impacto Ambiental: Conceptos y Antecedentes Básicos. CONAMA. Santiago
[2] Glasson, J., Therivel, R. y Chadwick, A. 1994. Environmental Impact Assessment. UCL Press, London

Going: relevance or environmental value of the component (range 0 – 10)
M: Magnitude of impact (range 0-10)

and whereas:

$$M = P * (E + I + D + S + R)$$

Where:

Q: Probability of impact occurrence (range 0-1)
E: Extension (range 0-3)
I: Intensity (range 0-3)
D: Duration (range 0-2)
S: Synergy and/or accumulation (0 – 1)
R: Reversibility (range 0-1)

Thus, the total impact (IT) can fluctuate in the range between zero (0) and +/- 100.

Then you write in greater detail each one of the parameters mentioned above, as well as the associated criteria and ranges of their values.

4.2.5 Relevance of environmental components

The relevance of the environmental components is qualified according to the environmental value (VA) of each component potentially affected by the different works and activities of the project. This qualification of the environmental components is done according to their current state or line condition Of basis, considering the following criteria (as they apply):

- Relevance for other components and for the global environment.
- Representativeness at local and regional level.
- Abundance.
- Current state or quality.

- Relevance of the effect or environmental impact in comparison with the applicable standard (s) (if any)[3].

A scale of 1 to 10 (from minor to major relevance) and the values are assigned according to expert judgement. For the above, the criteria described in the **Box 4.2-2**.

Box 4.2-2: Relevance of environmental components		
Relevance of the environmental component	**Description**	**Scale**
Low	The environmental component has low basal quality and/or is not relevant to the other components and/or is very abundant.	1 – 3
Moderate	The component has a high basal quality, but is not relevant to the other environmental components and/or is relatively abundant.	4 – 5
High	The component has a low basal quality, however it is relevant to the other environmental components and/or is relatively scarce.	6 – 7
Extreme	The environmental component has a high basal quality, is relevant for the other components and/or is relatively scarce.	8 – 10

4.2.5.1 Impact character (C)

This aspect indicates whether an impact is beneficial, harmful or neutral to the impact-receiving environmental component. Qualifies as:

Box 4.2-3: Nature of environmental impacts		
Impact character	**Description**	**Symbology**
Positive	The impact that an improvement or recovery of the basal condition implies, there being an effect Beneficial in the environment by the action or activity evaluated.	+
Negative	The impact of a deterioration of the basal	–

3 Siempre considerando el cabal cumplimiento de la respectiva norma o estándar ambiental que sea aplicable.

Box 4.2-3: Nature of environmental impacts		
Impact character	**Description**	**Symbology**
	condition, generating an adverse effect on the environment, derived from the action or activity evaluated.	

4.2.5.2 Impact magnitude (M)

The magnitude of the impact (M) is established from a set of criteria (characteristics and qualities) that consider the probability of occurrence of the impact (P), its geographical extension (E), intensity (I), Duration (D), Synergy/Accumulation (S) and Reversibility (R). Each one of these criteria is qualified according to the individual numerical scales indicated below. The magnitude of the impact is determined by the multiplication of the probability of occurrence by the sum of the rest of the criteria, based on the following formula:

$$M = P * (E+I+D+S+R)$$

The definition of the criteria and their respective qualification scales are as follows:

4.2.5.3 Probability of occurrence (P)

This criterion indicates the probability of some effect in the environment because of an action or source of impact. Qualifies as:

Box 4.2-4: Probability of occurrence of environmental impacts		
Probability of impact occurrence	**Description**	**Scale (probability in both one)**
Minimum	When there is very little expectation of an impact During the lifetime of the project.	< 0.1
Low	When there are relatively low expectations that an impact will be manifested.	0.1-0,29
Moderate	When there are	0.3-0,59

Box 4.2-4: Probability of occurrence of environmental impacts		
Probability of impact occurrence	**Description**	**Scale (probability in both one)**
	intermediate expectations that an impact will be manifested.	
High	When there is high expectations that an impact will be manifested.	0.6-0,89
Extreme	When there is very high expectations that an impact will be manifested.	0.9-1

4.2.5.4 Extension (E)

This criterion indicates the spatial distribution or coverage of the impact. Qualifies as:

Box 4.2-5: Extension of environmental impacts		
Impact extension	**Description**	**Scale**
Local	When the impact is manifested in the sector where the source is located and in its immediate environment, if the source is punctual or small-scale.	0
Communal	When the impact is manifested in a broader environment of the source, covering communal levels.	1
Provincial	When the impact is manifested covering a provincial dimension.	2
Regional	When the impact is manifested covering a regional dimension.	3

4.2.5.5 Intensity (I)

This criterion reflects the degree of alteration of an environmental variable. It is classified as:

Box 4.2-6: Intensity of environmental impacts		
Impact intensity (*)	**Description**	**Scale**
Minimum	When the degree of alteration is small and it can be considered that the basal condition is maintained.	0
Low	When the degree of alteration implies	1

Box 4.2-6: Intensity of environmental impacts		
Impact intensity (*)	**Description**	**Scale**
	noticeable changes, but not significant in relation to the basal condition.	
Moderate	When the degree of alteration implies significant changes in relation to the basal condition, but within acceptable ranges.	2
High	When the degree of alteration in relation to the basal condition is significant and, in some cases, it may be considered unacceptable.	3

(*) For those variables contemplated in the norms and standards of environmental quality in force, the intensity is qualified according to the relevance of the effect or impact in comparison with the corresponding standard or reference value applicable.

4.2.5.6 Duration (D)

This criterion indicates the time or duration of the impact manifestation. Qualifies as:

Box 4.2-7: Duration of environmental effects or impacts		
Impact duration	**Description**	**Scale**
Temporary	Impact that is manifested only while the action that generates it lasts, being this impact of short duration (up to 2 years).	0
Medium term	Impact that is manifested in a range of 2 to Five years.	1
Long-term	Impact that is permanently manifested for more than 5 years.	2

4.2.5.7 Synergy and/or accumulation (S)

This criterion indicates whether the impact is synergistic and/or cumulative with other impacts. Qualifies as:

Box 4.2-8: Synergy and/or accumulation of environmental impacts		
Impact reversibility	**Description**	**Scale**
Not synergistic and/or	There is No synergy or empowerment between the impacts analyzed.	0

Box 4.2-8: Synergy and/or accumulation of environmental impacts		
Impact reversibility	**Description**	**Scale**
cumulative		
Synergistic and/or cumulative	There are synergies or empowerment between the impacts analyzed.	1

4.2.5.8 Reversibility (R)

This criterion indicates the possibility that the affected environmental component will recover its basal condition. Qualifies as:

Box 4.2-9: Reversibility of environmental impacts		
Impact reversibility	**Description**	**Scale**
Reversible	When after a certain time the impact is reversed naturally after the end of the action of the source that generates it or that can be reversed by corrective actions.	0
Irreversible	An impact that is not reversed naturally after the action that generates it, and which cannot be reversed by corrective actions.	1

4.2.5.9 Total Impact (IT)

The Total impact (IT) on each component is calculated as the product between the relevance (VA) of the affected environmental component and the magnitude (M) of the impact. This total impact varies between 0 and 100 and is qualified as follows:

Box 4.2-10: Total Impact assessment	
Total impact	**Scale**
Non-significant	0 – 20
Slightly significant	21 – 40
Moderately significant	41 – 60
Significant	61 – 100

4.2.6 Ranking of impacts

From the analysis of the results obtained in the previous point, the impacts are ordered in a decreasing form (according to the calculated value for the total impact) and the significant impacts are identified (weighting equal to or greater than 61).

From this analysis it is possible to focus efforts on reducing the negative effects of the project on the environment, in the respective chapter containing the respective plan or environmental management Program (which defines mitigation, repair and/o Impact compensation).

4.2.7 How the methodology is applied

4.2.7.1 Link to the project

The methodology described above has been applied to achieve proper identification and assessment of all environmental impacts generated by the project. The application of the methodology allowed to evaluate the impacts-in transversal form-for all the installations associated to the project, considering the stages of construction, operation and Closure.

Impact assessment was performed for each environmental component described in the AM baseline of the Project (Chapter 3 of this EIA), in this case, Sorted by affected means (physical, Terrestrial ecosystems, human, etc.).

In summary form, the application of the methodology of evaluation of impacts slogan, basically, the development of the following key steps in sequential form:

Step 1: Overview of the impacts associated with the component.
Step 2: Name of impacts.
Step 3: Description and foundation of impacts.
Step 4: Assessment and qualification of impacts.
Step 5: Summary of areas affected by assessed impacts.

Each one of these steps is detailed in the following section:

4.2.7.2 Development of key steps in the methodology

The following are the objectives and scope of the implementation steps of the methodology:

4.2.7.2.1 Step 1: Overview of the impacts associated with the component

For each environmental component evaluated, the impact assessment is carried out for each stage of the project: a) construction stage; B. Operation Stage; and, c) stage of Closing.

Within each stage, a general description is made of the expected impacts or effects on the component (including the identification of the respective variables that would be affected), following the constructive and operational sequence of the Project-related installations (according to the project execution schedule).

As part of the description of the impacts, the affected areas and/or populations are indicated (depending on the evaluated component), the implications of the impacts or effects, their duration, the degree of reversibility, etc.
As far as possible, a summary table of the areas and/or population of the component affected by the impact described is also included, and its comparison with reference values.

The description of the impacts is complemented with figures and images of the affected areas, of each component under evaluation.

4.2.7.2.2 Step 2: Name of the impacts

At the end of the general description of impacts in the environmental component analyzed, the specific environmental impacts to be assessed (specific impacts associated with the project) will be named.

The name of the impacts will indicate the expected effect on the evaluated component, the affected component and the stage of the project in which the alteration would manifest. The name of the impacts will be generic and will not mention the specific work or installation of the project that originates it.
Along with the name, in parentheses the code of the impact is indicated, according to the following codification: XX-YYY-ZZZ-NN. Where:

XX: Represents the affected medium: Physical medium (MF); Terrestrial ecosystems (ET); Human medium (MH); Medium built (MC); Use of the Territory (UT); Patrimonial cultural (PC); Landscape (PA), Tourism (TUR); Protected areas and priority conservation sites (APS)

YYY: Corresponds to the Evaluated component: Climate and Meteorology (CYM); Geology (GEO); Geomorphology (GEF); Edaphology (EDA); Hydrology (HID); Water quality and sediments (CAG); Hydrogeology (HIG); Noise and Vibration (RYV); Air quality (CAI); Terrestrial flora and vegetation (FVT); Terrestrial fauna (FFT); Demographic dimension (DDE); Geographical dimension (DGE); Anthropological dimension (DAN); Socio-economic dimension (DSE); Basic Social Welfare Dimension (DBS); Land use (USU); Instruments of Territorial Planning (IPT); Areas Identification of protected areas and biodiversity (APR); Historical heritage (PHI); Archaeological Heritage (PAR); Religious heritage (PRE); Landscape (PAI).

ZZZ: Indicates the project stage: construction (with); Operation (OPE); Closing (ABA).

NN: Numerical sequence of the impacts in the respective component: 01, 02, 03, etc.

4.2.7.2.3 Step 3: Description and foundation of impacts

Each of the above-mentioned environmental impacts is described and assessed. The description and evaluation of the impacts is made by previously indicating the name of the impact in title format, this is:

- Impact XX-YYY-ZZZ-NN: Impact name

The following is a detailed description of the impact analyzed, clearly indicating the expected effects, the works and/or tasks and the specific activities that generate it, the periods of occurrence, the geographical extension and/or population involved, etc.

As part of the impact assessment, the methodologies used for quantification, results of mathematical or statistical models, bibliographic antecedents, etc. are indicated or quoted. In summary, all information and/or backgrounds that adequately support the impact (including baseline information).

The impact evaluation is carried out-transversally-for all the installations associated with the project, strictly following the constructive and start-up sequence (according to project activities schedule).

The impact assessment also considers, as appropriate, the temporality of the works and/or Tasks of the project (i.e. the specific periods when the impact is manifested), recognizing the cumulative and synergistic impacts (or Antagonistic) that could exist on each component.

4.2.7.2.4 Step 4: Impact Assessment and qualification

At the end of the description of each impact, it performs its numerical valuation, using the mathematical expression indicated in the section 4.2.4.

Then, for each impact evaluated in the component, a summary table is presented with the individual assessment of the impact associated with each of the project's installations.

Following the table, we include an analysis and discussion of each of the values assigned to the various parameters that are part of mathematical expression of impact valuation.

4.2.7.2.5 Step 5: Summary of areas affected by assessed impacts

As far as possible, at the end of the evaluation of each impact, the summary of the affected areas is presented for each impact assessed.

4.3 IDENTIFICATION OF POTENTIAL ENVIRONMENTAL IMPACTS

4.3.1 Works of the project

Taking As a basis the description of the project, Chapter 1 of this EIA is Identify The works and tasks associated with the project, differentiating between definitive works and provisional works.

The following table summarizes the works to be done.

Table 1. Facilities-Works of the Project
Installation-Works
Main works
- Photovoltaic Park - Elevator Substation (E) - Disconnecting substation SES - High Voltage line (LAT) - Park Control and Operation Centers
Works Permanent complementary
- Roads (internal and external) - Surveillance booth - Monitoring and data acquisition control system - Weather Station - Lighting system - Perimeter fencing of the photovoltaic park
Temporary complementary works
- Slaughter facilities

Source: Own Elaboration.

4.3.2 Project activities

Based on the above information, in addition to the project description, the activities associated with the construction stage of the works and tasks were identified (ordered according to works or definitive and temporary tasks). In strict rigor they correspond to the activities relevant from the environmental point of view, that is to say, that their execution can affect one or more environmental components of the area of influence of the project.

Below is Indicate the activities associated with thes stages of Project.

Table 2. Activities of the project
Construction stage
Hiring Of Hand Of Work Temporary
Preparation Of Ground
Transport Of Materials Inputs Waste And Personal
Installation Task Camp Bodegas de Collection Storage Of Waste Pond Of Fuel And Fronts Of Work
Movements Of Earth
Construction and improvement of access roads
Installation of the perimeter fence of the photovoltaic park
Preparation of Bischofita
Mounting of support structure and solar panels
Underground pipeline
Cleaning trucks Mixer
Construction of electric Forklift substation
Electrical disconnecting substation Construction
Construction of air-laying and servitude
Construction Of Buildings (Control room and building operations)
Construction Lat
Tests And Put In Service Of The Central
System Of Supply Of Water Drinking
Management Of Waste Liquids
Management Of Waste Solid
Management Sludge Pesetas
Removal Of Facilities For The Tasks And Cleaning
Operation Stage
Hiring Of Hand Of Work
Operation Photovoltaic Park
Transmission Of Energy Electric
Transport Of Inputs Waste And Personal
Maintenance Of Photovoltaic Park
Maintenance Lte
Management Of Waste Solid
Management Of Waste Liquids
Stage of Closing (*)
Hiring Of Hand Of Work Temporary
Installation Of Task
Transfer Of Waste Materials And Personal
Disarmament And Removal Of The Structures PFV
Cleaning In The Area Of The Structures And Removal Of Facilities Of Task
Management Of Waste Solid
Management Of Waste Liquids

(*)In the event that the project is to be closed, it is considered to present to the appropriate authority a plan of Closing And closing of the works, with at least three years in advance, according to Current

legislation and technological advances available at that time. Also, in the eventuality that, during the construction of the project, it is decided not to go ahead with the execution of the project for reasons of force majeure, the company contemplates to present a plan of abandonment and closing of the works developed at that date, with a Six months in advance, also in accordance with current legislation and technological advances available at that time.

4.3.3 Potentially affected environmental components

Starting from the line Of Am Baseline of the project Chapter 3 Of the present EIA, where the respective areas of influence of the project are characterized, were identified the environmental components that will be or could be affected by the activities of the same one, in its different stages of development (activities Described in the above points). In The table Following are indicated such components, as well as the possible expected effects of project activities.

Table 3. Potentially affected environmental components

Middle	Environmental component
Physical environment	Climate and weather
	Geology
	Geomorphology
	Edaphology
	Hydrology and hydrography
	Noise and vibration
	Air quality
	Electromagnetic fields
Terrestrial ecosystems	Flora and terrestrial vegetation
	Terrestrial Fauna
Human environment	Geographic dimension
	Demographic dimension
	Anthropological Dimension
	Socio-economic dimension
	Basic Social Welfare dimension
Land use, territorial planning and protected areas	Land use
	Territorial planning
	Protected areas
Cultural heritage	National Monuments with Declaration
	Historical heritage
	Archaeological heritage
	Joint-Archaeological heritage
	Paleontological Heritage
	Religious heritage
Landscape	Landscape
Tourism	Tourism

4.3.4 Matrix of environmental impacts

Identification of the potential environmental impacts of the project was carried out through cross-information analysis; On the one hand, the list of works, tasks and/or activities of the project generated from the chapter of description of the project (Chapter 1 of this EIA); And, on the other, the detailed description of the environmental components of each medium described and analyzed in the chapter of Line Of Environmental Base (Chapter 3 of this EIA).

The following tables summarize the results of the identification of environmental impacts in the physical and biotic media, the human environment, Land use, planning terriorial and protected areas, cultural heritage and Landscape, respectively.

Table 4. Summary of environmental impact matrices (cross between project activities and potentially affected environmental components)

		Physical environment							Terrestrial EOSISTEMAS		Human environment		Use of the Territory			Protected areas	CULTURAL Heritage	Landscape	
	Activities	Climate and weather	Geology	Geomorphology	Edaphology	Hydrology	Noise and vibration	Air quality	Vegetation and terrestrial flora	Terrestrial Fauna	Geographic, demographic, anthropological, socioeconomic and social welfare dimensions		Use of soil	Territorial planning	Infrastructure	Protected areas	MN, historical patrimony. Archaeological Antroarqueoóligico, paleontological and religious	Landscape	
Stage Construction																			
	Preparation Of Ground																	X	
	Transport Of Materials Inputs Waste And Personal																		
	Installation Task Camp Bodegas de Collection Storage Of Waste Pond Of Fuel And Fronts Of Work																	X	
	Movements Of Earth																X	X	
	Construction and improvement of access roads															X		X	
	Installation of the perimeter fence of the photovoltaic park																	X	
	Preparation of Bischofita																		
	Mounting of support structure and solar panels																	X	
	Underground pipeline																		
	Cleaning trucks Mixer																		
	Construction of electric Forklift substation																	X	
	Electrical disconnecting substation Construction																	X	

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		Physical environment							Terrestrial EOSISTEMAS		Human environment			Use of the Territory			Protected areas	CULTURAL Heritage	Landscape
	Activities	Climate and weather	Geology	Geomorphology	Edaphology	Hydrology	Noise and vibration	Air quality	Vegetation and terrestrial flora	Terrestrial Fauna	Geographic, demographic, anthropological, socioeconomic and social welfare dimensions			Use of soil	Territorial planning	Infrastructure	Protected areas	MN, historical patrimony. Archaeological Antroarqueoóligico, paleontological and religious	Landscape
	Construction of air-laying and servitude																		X
	Construction Of Buildings (Control room and building operations)																		X
	Construction Lat																X		X
	Tests And Put In Service Of The Central																		
	System Of Supply Of Water Drinking																		
	Management Of Waste Liquids																		
	Management Of Waste Solid																		
	Management Sludge Pesetas																		
	Removal Of Facilities For The Tasks And Cleaning																		
Stage operation																			
	Hiring Of Hand Of Work																		
	Operation Photovoltaic Park																		X
	Transmission Of Energy Electric																		X
	Transport Of Inputs Waste And Personal																		
	Maintenance Of Photovoltaic Park																		
	Maintenance Lte																		
	Management Of Waste Solid																		
	Management Of Waste Liquids																		

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Closing stage																		
	Hiring Of Hand Of Work Temporary																	
	Installation Of Task																	
	Transfer Of Waste Materials And Personal																	
	Disarmament And Removal Of The Structures PFV																	
	Cleaning In The Area Of The Structures And Removal Of Facilities Of Task																	X
	Management Of Waste Solid																	
	Management Of Waste Liquids																	

4.4 IMPACT ASSESSMENT

4.4.1 Middle Physical

In the following section the results of the identification, description and valuation of the potential environmental impacts of the project on the components of the physical environment are delivered.

On the impact analysis, on the components of the physical environment Climate and meteorology, geomorphology, geology, Hydrography and Edaphology, I do not know Foresees the occurrence of effects produced by the project since the associated works do not consider the intervention of These Components.

4.4.1.1 Climate and weather

For This Component is not expected The occurrence of impacts Since the implementation of the project does not affect the climatic and meteorological characteristics of the study area.

4.4.1.1.1 Stage of construction

During the Stage of construction of the project and its associated works, no impacts are foreseen that are translated in the modification of the local climatic conditions within the area of influence of the climate component.

4.4.1.1.2 Stage of operation

During the Stage of operation of the project and its associated facilities, no impacts are foreseen that are translated in the modification of the local climatic conditions within the area of influence of the climate component.

4.4.1.1.3 Stage Of Closing

The stage of Closing Of the project does not envisage activities that could cause impacts on the climate and meteorology component. So no impacts are anticipated for this Stage.

4.4.1.1.4 Cartography

Cartography of environmental impacts is not provided for this component.

4.4.1.1.5 Bibliography

does not apply.

4.4.1.2 Geomorphology

This component does not foresee the occurrence of impacts because the works associated with the project do not affect the Geofoams of the area of Site.

4.4.1.2.1 Stage of construction

During the Stage Construction of the project and its associated works, no impacts are foreseen to be translated into the modification of the Geofoams Premises within the Árof component influence.

4.4.1.2.2 Stage of operation

During the Stage Of Operation of the project and its associated works, do not envisage impacts that are translated in the modification of the Geofoams Premises within the Árof component influence.

4.4.1.2.3 Stage Of Closing

The stage of Closing Of the project does not include activities that could cause impacts on the component Geomorphologic POr what is not expected impacts for this Stage.

4.4.1.2.4 Cartography

Cartography of environmental impacts is not provided for this component.

4.4.1.2.5 Bibliography

does not apply.

4.4.1.3 Geology

This component does not foresee the occurrence of impacts because the works associated with the project do not Affect The geological characteristics of the site area.

4.4.1.3.1 Stage of construction

During the Stage Construction of the project and its associated works, no impacts are anticipated to be induce in the modification of the geology Local within the Árof component influence.

4.4.1.3.2 Stage of operation

During the Stage Operation of the project and its associated facilities, no impacts are foreseen that are translated into the modification of the conditions Geological Within the area of influence of the component.

4.4.1.3.3 Stage Of Closing

The stage of Closing Of the project does not include activities that could cause impacts on the component Geology. So no impacts are anticipated for this Stage.

4.4.1.3.4 Cartography

Cartography of environmental impacts is not provided for this component.

4.4.1.3.5 Bibliography

does not apply.

4.4.1.4 Hydrography

This component does not foresee the occurrence of impacts because the works associated with the project do not affect the geological characteristics of the site area.

4.4.1.4.1 Stage of construction

During the Stage Construction of the project and its associated works, no impacts are foreseen that are translated in the modification of the conditions Hydrographic Premises within the Árof component influence.

4.4.1.4.2 Stage of operation

During the Stage Operation of the project and its associated facilities, no impacts are foreseen that will translate into the modification of the Conditions Hydrographic Premises within the Árof component influence.

4.4.1.4.3 Stage Of Closing

The stage of Closing Of the project does not include activities that could cause impacts on the component Hydrography. So no impacts are anticipated for this Stage.

4.4.1.4.4 Cartography

Cartography of environmental impacts is not provided for this component.

4.4.1.4.5 Bibliography

does not apply.

4.4.1.5 Edaphology

According to the line Of Edaphology basis of the present EIA, En the area of Influence of the project, the ground resource Proper Is Nonexistent, as this area is located in the so-called Absolute Desert (Gajardo 1994, Luebert and Pliscoff 2006, Zizka 1992), where the conditions of extreme aridity, with no rainfall, dryness and a marked thermal amplitude, make the presence of fauna and vegetation extremely difficult, and consequently Soil evolution or development is non-existent, i.e. it qualifies as a succession of layers of sediments.

This soil has no evolution of horizons or content of organic matter, Is Dand coarse texture, High saline content and excessive drainage. Presents successive The most, observed in the following order from the surface: Chusca, sediments, cemented crust and sediments up to 100 cm. The surface is covered by stony pavement, formed by angular lithic fragments, which can cover up to 80% of the surface.

Therefore, in consideration of the characteristics of the soil present in the area, which corresponds rather to physical and chemical processes product of the extreme rigorousness of the desert, where the biological processes in the Soil genesis are almost null, these soils would correspond to class VIII, which indicates that they are soils without value Agricultural, livestock or forestry. This is because under a pedagogical point of view, there would be no proper soils, because of the already described condition of extreme aridity and the presence of high levels of salts and nitrates.

For all the above, no potential impacts of the project on the soil natural resource are identified.

4.4.1.5.1 Stage of construction

During the Stage Construction of the project and its associated works, no impacts are foreseen that are translated in the modification of the conditions Soil Premises within the Árof component influence.

4.4.1.5.2 Stage of operation

During the Stage Operation of the project and its associated facilities, no impacts are foreseen that are translated into the modification of the conditions Soil Premises within the Árof component influence.

4.4.1.5.3 Stage of closing

The stage of Closing Of the project does not include activities that could cause impacts on the component Edaphology. So no impacts are anticipated for this Stage.

4.4.1.5.4 Cartography

Cartography of environmental impacts is not provided for this component.

4.4.1.5.5 Bibliography

does not apply.

4.4.1.6 Air quality

For this component is foreseen the occurrence of non-significant impacts because the works associated with the project.

4.4.1.6.1 Construction stage

During the Stage of construction of the Project and its associated works Impacts are anticipated Not significant because they are of a certain duration Inside the Árof component influence.

4.4.1.6.2 Operation Stage

During the Stage Operation of the project and its associated facilities Impacts are anticipated Not significant because they are of a certain duration Inside the Árof component influence.

4.4.1.6.3 Closing stage

During the Stage Of Closing of the project and its associated facilities Impacts are anticipated Not significant because they are of a certain duration Inside the ÁrComponent Influence EA.

4.4.1.6.4 Cartography

Cartography of environmental impacts is not provided for this component.

4.4.1.6.5 Bibliography

does not apply.

4.4.1.7 Noise

For this component is foreseen the occurrence of non-significant impacts because the works associated with the project.

4.4.1.7.1 Construction stage

During the Stage of construction of the Project and its associated works Impacts are anticipated Not significant because they are of a certain duration Inside the ÁrComponent Influence EA And In no case shall the maximum permissible limits be exceeded.

4.4.1.7.2 Operation Stage

During the Stage Operation of the project and its associated facilities Impacts are anticipated Not significant because In no case will it be exceeded The maximum limits allowed Inside the Árof component influence.

4.4.1.7.3 Closing stage

During the Stage Of Closing of the project and its associated facilities Impacts are anticipated Not significant because they are of a certain duration Inside the ÁrEA of influence of the component and in no case will exceed the permissible maximum limits.

4.4.1.7.4 Cartography

Cartography of environmental impacts is not provided for this component.

4.4.1.7.5 Bibliography

does not apply.

4.4.1.8 Electromagnetic fields

For this component is foreseen the occurrence of non-significant impacts because the works associated with the project.

4.4.1.8.1 Construction stage

During the Stage of construction of the Project and its associated works No Impacts are foreseen within the Árof component influence.

4.4.1.8.2 Operation Stage

During the Stage Operation of the project and its associated facilities Impacts are anticipated Not significant because in no case will the maximum permissible limits be exceeded Inside the Árof component influence.

4.4.1.8.3 Closing stage

During the Stage Of Closing of the project and its associated facilities No Impacts are foreseen within the Árof component influence.

4.4.1.8.4 Cartography

Cartography of environmental impacts is not provided for this component.

4.4.1.8.5 Bibliography

does not apply.

4.4.2 Terrestrial ecosystems

In the following section the results of the identification, description and valuation of the potential environmental impacts of the project on the components of Terrestrial ecosystems.

4.4.2.1 Flora and terrestrial vegetation

In the following section the results of the identification, description and valuation of the potential environmental impacts of the project on the component flora and terrestrial vegetation are delivered.

The baseline of this environmental component It describes the presence of only a homogeneous unit of vegetation with some kind of vascular flora. This unit identified as "Pajonal de *Baccharis Juncea*" It has a very small area (350 m²), and is located in the easement defined for The installation of the electric transmission line, at a distance of 15 m from The nearest tower, so it would not be affected by the construction of this structure. In turn, the project envisages the construction of an access road, parallel to the band of servitude projected for the transmission line, whose design and construction will be carried out avoiding the intervention of the unit of identified vegetation.

4.4.2.1.1 Stage of construction

The Stage Of Construction Of the project does not envisage activities that could cause impacts on the flora and terrestrial vegetation component.

4.4.2.1.2 Stage of operation

The Stage of operation of the Project does not contemplate activities that could cause impacts on the component Flora and terrestrial vegetation.

4.4.2.1.3 Stage Of Closing

In the event that the project ends with its stage of operation, during the Stage Of Closing No impacts are foreseen on the flora and terrestrial vegetation component.

4.4.2.1.4 Cartography

Cartography of environmental impacts is not provided for this component.

4.4.2.1.5 Bibliography

does not apply.

4.4.2.2 Fauna Terrestrial

In the project area three native wild species were recorded and a Micromammal Introduced. On the other hand, the observed abundances were low, as presented in the following table.

Table 5. Total abundance (number of individuals) recorded in each field campaign.

Scientific name	Common name	April 2014	September 2014
Cathartes Aura	Red-headed Jote		5
Ground Rufivertex	Reddish-naped Sleepyhead	1	4
Rattus Sp.	Rat	2	
Lycalopex Sp.	Zorro squeals or blames		Q

P = Presence
Source: Fauna Baseline.

Just a species, corresponding to Zorro (*Lycalopex Sp.*), is classified in a conservation category according to the current legislation. This is classified as a kind of minor concern according to DS N ° 33/2012 MMA, thus, this species is not currently threatened (DS N ° 29/2011 MMA[4]).

On the other hand, the area of the project corresponds mainly to the absolute desert, does not present large variations in the relief, the texture of the soil varies from sandy-stony to saline crust (see Fauna baseline), in addition the only vegetational formation identified corresponds to a *Baccharis Juncea* Of a few meters of extension and that will not be intervened. Thus, the area of the project does not present habitats relevant to the presence of terrestrial fauna.

4.4.2.2.1 Stage of construction

Given the background data collected during the baseline study, during the Stage Construction of the project no effects are expected on the native fauna because in the area, low wealth and abundances were recorded, the species registered are not threatened, and no native species of low mobility were registered. In addition, the project area does not register appropriate habitats for wildlife development. In a particular way, the potential effect of

[4] Artículo 12.- Una especie se considerará "Preocupación Menor" cuando, habiendo sido evaluada, no cumple ninguno de los criterios que definen las categorías de En Peligro Crítico, En Peligro, Vulnerable o Casi Amenazada. Se incluyen en esta categoría especies abundantes y de amplia distribución, y que por lo tanto pueden ser identificadas como de preocupación menor. Para fines de comunicación, difusión y anotación científica podrá usarse también la sigla "LC".

noise in the Stage of construction, due to the absence of individuals of fauna observed directly or of habitats suitable for their subsistence, in the area of the photovoltaic park.

Therefore, under the previous background, no impacts are identified Environmental For this component During the Stage of construction of the project.

4.4.2.2.2 Stage of operation

With regard to the species of fauna present in the area and its possible interaction with the works associated with the operation of the project, the crosses of the towers of LAT are not present risk of electrocution or nesting of birds (see project description)[5].

EL Guard Cable will be visible to birds, eliminating the risk of collision. On the other hand, on the crossings of the poles of the Line of Mt, To be installed inside the photovoltaic park, elements will be installed *Antihanger* To prevent the electrocution of birds.

In addition, the photovoltaic Park Luminaire will comply with the DS N º 686/98 MINECON, therefore will not present risk for potential nocturnal migratory birds.

Thus, no impacts are identified Environmental For this component During the Stage of operation of the project.

4.4.2.2.3 Stage of closing

No impacts are identified Environmental For this component During the Stage Of Closing of the project.

4.4.3 Cultural Heritage

In the framework of this study, the results of the identification, description and evaluation of the potential environmental impacts of the project on the Cultural Heritage component are realized. According to the conceptual framework defined in that study, this Component contemplates all the material cultural manifestations present within the Area of Influence (Ai) Of

[5] La distancia entre elementos conductores es segura, y se contará con la instalación de elementos *antipercha*.

Project Cielos de Tarapacá.

Notwithstanding the foregoing, for the identification of impacts it is deemed appropriate to consider differentially these impacts, by virtue of the magnitude and the general cultural allocation of each patrimonial element identified. In this way, this chapter identifies the impacts for the patrimonial elements defined as historical sites and archaeological sites as well as for those defined as isolated historical findings and isolated archaeological finds And finally for the historical linear traits.

It is estimated that all the impacts associated with this component would be generated During the construction phase of the project works. This situation is because the patrimonial elements are located mainly in the soil or subsoil of the project area, where they will be carried out activities of removal and intervention of Earth, which could generate effects on some element existing in that Area.

The results of the line Of Base account for the presence of 85 patrimonial elements, Of The which 84 They would be placed within the AID, so the latter would be affected by the project Cielos de Tarapacá.

4.4.3.1 Historical heritage

The patrimonial elements of historical data recorded in the area of influence of the project Cielos de Tarapacá Corresp Waves to sites (mainly dispersions of historical materials) and Isolated findings (cans, bottles and housings of mules) associated with linear traits (wagon tracks, trails, troop footprints, railway and telegraph lines), Placed on the inspected surface. It is estimated that the environmental impacts identified for this component will occur during the construction phase of the project. This is due to the fact that during this stage the site of all the physical works of the project will be carried out, which include, among other activities, the intervention and removal of soil, both superficially and under it.

Consideration of these elements and putting them into value of them, gives account of how the communities of Pica and its surroundings Historically defined and symbolized the space Associated with the nitrate activities of the early twentieth century, In which it is desenvOrLvHadN. Productive

economic activities linked to slaughter Extraction of nitrate And then to mining, They denote a regional identity assumed generation after generation, in which the material vestiges relieved speak of a recent past founded on activities that transcend through generations.

Among the patrimonial elements registered within the AID, were identified 10 Historical isolated Lazgos – HA02, HA03, HA04, HA05, HA06, HA07, HA09, HA10, HA01/lat and HA02/lat-, which are discreetly placed in the space and are mostly associated with linear traits. These elements correspond to Dispersions of historical remains, demarcation milestones And Mules ' housings respectively, whose origin It is associated with the nitrate activities developed in the area. Within the historical sites registered in the AID, 5 sets of remains are recorded Historical (SH01, SH02, Sh03 Sh04 and SH05 As well as 4 sites with occupation Bicomponent Pre-Hispanic and historical, i.e. sets of pre-Hispanic historical and lithic materials (SA01/lat, SA02/lat, SA03/lat and SA05/lat) And 59 Linear Traits (RL01, RL02, RL03, RL04, RL05, RL06, RL07A, RL07B, RL08, RL09, RL10, RL11, RL12, RL13, RL14, RL15, RL16, RL17, RL18, RL19, RL20, RL21, RL22, RL23, RL24, RL25, RL26, RL27, RL28, RL29, RL29B, RL30, RL31, RL32, RL33, RL34, RL35, RL36, RL37, RL38, RL39, RL40, RL41, RL42, RL43, RL44, RL45, RL46, RL47, RL48, RL49, RL50, RL51, RL52, RL001/lat, RL002/lat, RL003/lat, RL004/lat and RL005/lat) corresponding to simple trails, wagon tracks and Troop, two PorciOnes of LineS IronS OldS (RL001/lat and RL005/lat) and a Point Telegraphic (RL004/LAT).

All these elements account for the use of space by human communities that precede the present. For the case of isolated findings and sites, its positioning and sizing characteristics, allow to apply measures of Compensation Through its collection, prior to the beginning of the works associated with the project. Similarly, for linear traits, it is possible to apply compensation measures through its exhaustive registration. The Features Location and size They are considered within the evaluation of the possible impacts that the project could generate on these patrimonial elements.

The following is the identification, description and evaluation of the potential environmental impacts for the historical component of the Cultural heritage

recorded in the area of influence of the project Cielos de Tarapacá.

4.4.3.1.1 Construction stage

According to the areas studied and the associated project (Photovoltaic plant and High voltage line), during the construction phase will be carried out tasks associated to the surface and ground intervention, place where the sites are located, The Isolated findings and linear traits Historical.

Consequently, the impacts that are foreseen on the sites, isolated findings and linear traits Historical during the construction phase are the following:

- Affectation on the elements that define each historical site, by the effects of the activities of intervention and/or direct removal of the ground, by tasks associated to excavations, step of machinery, of people and vehicles.

- Affectation and/or loss of the remains that define each historical isolated finding, by the effects of the activities of direct removal of the ground, by tasks associated to step of machinery, of people and vehicles.

- Affecting historical linear traits, for the purposes of direct soil removal activities, for tasks associated with machinery, people and vehicles.

The following describes the impacts identified on the sites, isolated findings and linear traits Historical.

PC-PHI-CON-01 Impact: Affecting the elements that define each site, isolated finding or linear trait Historical

With respect to the PC-PHI-CON-01 impact, it is estimated that the tasks associated with earth movements (Repair Of Ground, Movements Of Earth, Canalization sUbterránea), along with construction waste management activities, excavation surpluses, waste collection and civil works (Instalthe perimeter fence of the photovoltaic park, Construction of slaughter facilities, Camp, Buildings, electrical substations, Bodegas de Collection Pond Of Fuel MStructure Ontajes Of Support and Solar panels, construction of aerial laying, servitude and LAT, as well as the Improvement of accesses and

internal roads) will imply the direct intervention of the ground where the historical patrimonial elements are located

The removal of the soil, the passage of machinery associated with the tasks, the passage of personnel and of transport will generate effects like: breaking of The structures that make up each historical site and linear trait, as well as eventual displacements of the parts Historical and consequently the loss of them.

LYou 78 Sites, isolated findings and linear traits Historical sites in the area of influence are located within the AID, with exception of SH04/LAT (see エラー! 参照元が見つかりません。 And **Photographic Annex**), so they would be affected by the activities of the project.

Box 4.4.3-1: Sites, Isolated findings and historical linear traits Registered in the area of influence of the Cielos de Tarapacá project.

Name	Adscription Cultural	UTM coordinates (Datum WGS 84)			Associated work	Area of Influence	
		Spindle	N M	E M		AID	Aii
HA02	Historical	19	7.706.496	440.617	Photovoltaic plant	X	
HA03	Historical	19	7.706.401	440.691	Photovoltaic plant	X	
HA04	Historical	19	7.707.966	440.127	Photovoltaic plant	X	
HA05	Historical	19	7.706.434	441.626	Photovoltaic plant	X	
HA06	Historical	19	7.708.123	441.217	Photovoltaic plant	X	
HA07	Historical	19	7.710.541	441.631	Photovoltaic plant	X	
HA09	Historical	19	7.707.405	443.315	Photovoltaic plant	X	
HA10	Historical	19	7.707.433	443.387	Photovoltaic plant	X	
RL01	Historical	19	7.711.256	443.717	Photovoltaic plant	X	
RL02	Historical	19	7.711.240	443.567	Photovoltaic plant	X	
RL03	Historical	19	7.708.287	443.579	Photovoltaic plant	X	
RL04	Historical	19	7.710.724	442.905	Photovoltaic plant	X	
RL05	Historical	19	7,701,037	443.245	Photovoltaic plant	X	
RL06	Historical	19	7,701,018	443.375	Photovoltaic plant	X	
RL07A	Historical	19	7.707.615	443.520	Photovoltaic plant	X	
RL07B	Historical	19	7.708.264	443.754	Photovoltaic plant	X	

Box 4.4.3-1: Sites, Isolated findings and historical linear traits Registered in the area of influence of the Cielos de Tarapacá project.

Name	Adscription Cultural	UTM coordinates (Datum WGS 84)			Associated work	Area of Influence	
		Spindle	N M	E M		AID	Aii
RL08	Historical	19	7.710.125	442.575	Photovoltaic plant	X	
RL09	Historical	19	7.706.618	441.229	Photovoltaic plant	X	
RL10	Historical	19	7.709.291	442.927	Photovoltaic plant	X	
RL11	Historical	19	7.709.226	442.551	Photovoltaic plant	X	
RL12	Historical	19	7.707.330	442.701	Photovoltaic plant	X	
RL13	Historical	19	7.707.783	442.152	Photovoltaic plant	X	
RL14	Historical	19	7.707.843	442.101	Photovoltaic plant	X	
RL15	Historical	19	7.707.235	442.178	Photovoltaic plant	X	
RL16	Historical	19	7.706.635	442.778	Photovoltaic plant	X	
RL17	Historical	19	7.711.042	442.228	Photovoltaic plant	X	
RL18	Historical	19	7.709.396	442.176	Photovoltaic plant	X	
RL19	Historical	19	7.706.728	442.994	Photovoltaic plant	X	
RL20	Historical	19	7.707.929	442.728	Photovoltaic plant	X	
RL21	Historical	19	7.710.138	442.127	Photovoltaic plant	X	
RL22	Historical	19	7.708.274	442.078	Photovoltaic plant	X	
RL23	Historical	19	7.708.118	441.682	Photovoltaic plant	X	
RL24	Historical	19	7.708.144	441.615	Photovoltaic plant	X	
RL25	Historical	19	7.708.276	441.632	Photovoltaic plant	X	
RL26	Historical	19	7.708.380	441.639	Photovoltaic plant	X	
RL27	Historical	19	7.708.638	441.603	Photovoltaic plant	X	
RL28	Historical	19	7,701,018	441.438	Photovoltaic plant	X	
RL29	Historical	19	7.709.294	441.074	Photovoltaic plant	X	
RL29B	Historical	19	7.706.830	441.376	Photovoltaic plant	X	
RL30	Historical	19	7.706.506	440.966	Photovoltaic plant	X	
RL31	Historical	19	7.706.429	440.678	Photovoltaic plant	X	
RL32	Historical	19	7.706.047	440.824	Photovoltaic plant	X	
RL33	Historical	19	7.708.934	442.096	Photovoltaic plant	X	

Box 4.4.3-1: Sites, Isolated findings and historical linear traits Registered in the area of influence of the Cielos de Tarapacá project.

Name	Adscription Cultural	UTM coordinates (Datum WGS 84)			Associated work	Area of Influence	
		Spindle	N M	E M		AID	Aii
RL34	Historical	19	7.707.606	441.527	Photovoltaic plant	X	
RL35	Historical	19	7.707.755	441.576	Photovoltaic plant	X	
RL36	Historical	19	7.707.904	440.991	Photovoltaic plant	X	
RL37	Historical	19	7.706.434	441.626	Photovoltaic plant	X	
RL38	Historical	19	7.706.333	441.12v	Photovoltaic plant	X	
RL39	Historical	19	7.706.460	441.199	Photovoltaic plant	X	
RL40	Historical	19	7.706.662	440.975	Photovoltaic plant	X	
RL41	Historical	19	7.705.663	440.696	Photovoltaic plant	X	
RL42	Historical	19	7.707.273	440.527	Photovoltaic plant	X	
RL43	Historical	19	7.710.175	441.622	Photovoltaic plant	X	
RL44	Historical	19	7.710.023	441.631	Photovoltaic plant	X	
RL45	Historical	19	7.706.497	440.579	Photovoltaic plant	X	
RL46	Historical	19	7.706.478	440.521	Photovoltaic plant	X	
RL47	Historical	19	7.706.434	440.535	Photovoltaic plant	X	
RL48	Historical	19	7.706.334	440.574	Photovoltaic plant	X	
RL49	Historical	19	7.705.894	440.545	Photovoltaic plant	X	
RL50	Historical	19	7.705.868	440.530	Photovoltaic plant	X	
RL51	Historical	19	7.709.262	440.949	Photovoltaic plant	X	
RL52	Historical	19	7.707.772	442.740	Photovoltaic plant	X	
SA01/LAT	Pre-Hispanic history	19	7.703.320	429.921	Lat	X	
SH01/LAT	Historical	19	7.702.969	429.737	Lat	X	
SH02/LAT	Historical	19	7.702.790	429.693	Lat	X	
SA02/LAT	Pre-Hispanic history	19	7.702.655	429.594	Lat	X	
SA03/LAT	Pre-Hispanic history	19	7.702.523	429.547	Lat	X	
SA05/Lat	Pre-Hispanic history	19	7.702.263	429.393	Lat	X	
SH03/LAT	Historical	19	7.702.091	429.325	Lat	X	
SH04/LAT	Historical	19	7.701.740	429.123	Lat		X
SH05/LAT	Historical	19	7.701.597	429.070	Lat	X	
Has01/LAT	Historical	19	7.708.255	439.761	Lat	X	
HA02/LAT	Historical	19	7.706.514	435.868	Lat	X	
RL001/LAT	Historical	19	7,707,747	438,930	Lat	X	

Box 4.4.3-1: Sites, Isolated findings and historical linear traits Registered in the area of influence of the Cielos de Tarapacá project.							
Name	Adscription Cultural	UTM coordinates (Datum WGS 84)			Associated work	Area of Influence	
		Spin dle	N M	E M		AID	Aii
RL002/LAT	Historical	19	7,707,838	439,124	Lat	X	
RL003/LAT	Historical	19	7,707,942	439,160	Lat	X	
RL004/LAT	Historical	19	7,705,984	433,369	Lat	X	
RL005/LAT	Historical	19	7,698,610	427,438	Lat	X	

On the other hand, it is clarified that the site SH04/LAT located in the area of indirect influence of the project will be fenced and protected by special signage, so as not to be unintentionally affected by the same.

Then in the **Box 4.4.3-1**, This impact assessment is presented, clarifying that for the 4 sites with occupation Bicomponent Historical and pre-Hispanic, the historical component is evaluated in this process:

Box 4.4.3-1: Impact PC-PHI-CON-01: Afectación Partial or total sites, isolated findings and linear traits The effects of the land removal activities where they are located.												
Origin and characteristics of the impacts			Rating Impacts (*)									
Works/Activity	Impact Place	Impact period	Indicators									Value
			C	Q	E	I	D	S	R	M	Going	IT
Land movement by construction of works	Photovoltaic plant, roads, servitude, LAT.	Construction stage	-	1	3	3	2	1	1	10	5	-50

(*) Character (Ca): +/-1; Probability (P): 0-1; Extension (E): 0-3; Intensity (I): 0-3; Duration (D): 0-2; Synergy/Accumulation (S): 0-1; Reversibility (R): 0-1; Magnitude (M): 0-10; Component Relevance (VA): 0-10; Total Impact (IT): 0 +/-100

The values presented in the **Box 4.4.3-1** They are estimated by virtue of the following aspects.

- The character (C) of these impacts is negative because it implies the affectation of historical remains that correspond to non-renewable cultural resources, recognized by the Law of national Monuments.

- The probability (P) of occurrence of these impacts is defined according to their location within the area where the works will be developed. The 78 sites are within the project's area of influence and will therefore be exposed to works involving land movement, machinery transit and personnel. Within this framework, a high probability (1) is estimated for sites, isolated findings and historical linear traits.

- The impact Extension (E) covers the historical sites located within the area of influence of the Cielos de Tarapacá project, considering them as discrete units. However, the interpretation of these elements is accompanied by the interrelation of these spaces with those that are outside the area of direct influence of the project, forming part of a historical context, so for the sites, finds Isolated and historical linear traits are assigned value 1 considering that it has a communal scope.

- The intensity (I) of the impacts was rated as high (value 3) for the sites, isolated findings and historical linear traits, since this is a radical alteration of the base conditions of the historical patrimony of the project area, that is to say, loss or Destruction of the constituent or structural elements of the sites, isolated findings and historical linear traits.

- The duration (D) of the impacts was rated as long-term (value 2) for the historical elements, as it implies the affectation of the sites, isolated findings and historical linear traits. If the impact occurs, its duration is more than 5 years.
- The synergy or accumulation (S) of the impacts is rated with value 1, as there is power between the impacts for the sites, isolated findings

and historical linear traits.

- The reversibility (R) of the impact was qualified as Irreversible (value 1) for the works of removal and general intervention of the soil, in attention to the nature of the same. This applies to the 78 historical sites because they are elements that are on the ground, and once affected by the intervention of the soil, it will not be possible to recover them in any way because they are elements defined as unique and unrepeatable.

- As for the relevance (VA) of the environmental component, its qualification was made considering its condition of recurring patrimonial element, presenting high basal quality, abundant, although it is not relevant for other environmental components. Its impact is moderate when placed on a surface that has a low alteration due to the effect of vehicular transit, which would have intervened in its current location. Within this framework it was qualified with 5 For sites, isolated findings and historical linear traits.

The Total impact is The product between the character (C), the relevance (VA) of the affected environmental component and the magnitude (M) of the impact. In the case of sites of historical character the result will be50.

4.4.3.1.2 Operation Stage

No impacts on the historical Cultural Heritage component are identified during this phase.

4.4.3.1.3 Abandonment Stage

No impacts on the historical Cultural Heritage component are identified during this phase.

4.4.3.1.4 Cartography

Associated cartography is presented in the **Annex 10.1**

4.4.3.1.5 Bibliography

Espinoza, G., Pisani, P. and Contreras, L. 1994. Environmental Impact Assessment Handbook: Basic concepts and background. Conama. Santiago.

Glasson, J., Therivel, R. and Chadwick, A. 1994. Environmental Impact Assessment. UCL Press, London.

4.4.3.2 Archaeological heritage

The archaeological sites correspond in most cases to deposits of cultural material placed discreetly under the surface, recognizing, sometimes, by remains that are detected on the surface when the conditions of visibility and Obstrusividad They allow it (Gallardo and Cornejo, 1986). In other cases, they are placed in the subsoil without surface evidence and are only detected if the soil is intervened.

The isolated archaeological findings on their part, correspond to cultural remains as ceramics, lithics, which are distributed discreetly in space, without being part of cultural deposits or directly associated with other cultural evidence. Generally it is a piece of ceramic or a lithic, or small concentrations of no more than 5 pieces within 20 m² (Situs, 2010), whose origin is not clear because of this condition of *"Isolated".* Despite this condition, its patrimonial value is not dismissed because it still belongs to the category of "archaeological remainder", which in rigor, accounts for human activities of the past and therefore is part of cultural evidence.

The archaeological sites registered in the area of influence of the Cielos de Tarapacá project correspond to the dispersion of cultural remains (mainly lytic carving events) on the inspected surface-SA01, SA02, SA03, SA04 and SA04/LAT - Highlight Waste Size as Andesite and slices sheets and Exceptionally silica. In the same frame, 4 sites were identified Foam - (SA01/lat, SA02/lat, SA03/lat and SA05/lat)- With evidence of both pre-Hispanic occupation Lithic As historical. These evidences give an account of initial phases of lithic roughing, reflecting local procurement tasks.

On the other hand, archaeological isolated findings HA01 and HA08 They are located within larger areas where there are major sites or account for the use of space by human communities that precede the current ones.

The location and size characteristics of the isolated findings and

archeological Sites Registered in the project Cielos de Tarapacá, they allow to apply measures of Compensation Prior to the beginning of the works associated with the project. The Features of location and dimensions of these elements They are considered within the evaluation of the possible impacts that the project could generate on These patrimonial elements.

According to these characteristics, it is estimated that the environmental impacts identified for this component will occur during the construction phase of the project. This is due to the fact that during this stage the site of all the physical works of the project will be carried out, which include, among other activities, the intervention and removal of soil, both superficially and under it.

The following is the identification, description and evaluation of the potential environmental impacts for the archaeological component of the Cultural heritage recorded in the area of influence of the project Cielos de Tarapacá.

4.4.3.2.1 Construction stage

According to the areas studied and the characteristics of the project (groups, plants, roads and associated works), during the construction stage will be carried out tasks associated to the removal of surface and soil, place where the sites and findings are located Archaeological. Consequently, the impacts that are foreseen on the sites and archaeological finds during the construction phase are the following:

- Affectation and/or loss of the elements that define each archaeological site, by effects of the activities of direct removal of the ground, directly affecting the archaeological remains by tasks associated to excavations and passage of machinery, of people and Vehicles.

- Affectation and/or loss of the elements that define each archaeological isolated finding, by effects of the activities of direct removal of the soil, affecting the archaeological remains of surface by tasks associated to excavations and passage of machinery, of People and vehicles.

The following describes the impacts identified on sites and archaeological

isolated findings:

PC-PAR-CON-01 Impact: Affectation and/or loss of the elements that define each site or archaeological isolated finding

PC-PAR-CON-01 Impact It is estimated that tasks associated with Earth movements (land preparation, earth movements, underground canalization), along with construction waste management activities, excavation surpluses, waste collection and civil works (Installation of the perimeter fence of the photovoltaic park, construction of slaughter facilities, camp, buildings, electrical substations, warehouses, fuel tank, mounting of support structures and solar panels, construction of Aerial laying, servitude and LAT, as well as the improvement of accesses and roads interiors) will involve the direct intervention of the soil where the patrimonial elements are located Archaeological.

Archaeological sites are national monuments by the Ministry of the Law and so much cannot be affected, Condition which is considered In the context of the evaluation of possible impacts.

The removal of the soil, the passage of machinery associated with the tasks, the passage of personnel and of transport will generate effects like: intervention of the surface, breaking of the pieces that compose each site, as well as Eventual displacement of the parts and consequently the loss of the pieces.

Of the 11 sites and isolated archaeological finds located in the area of influence of the project, were recorded 9 That will be affected by the activities described, as described in the following table (see **Box 4.4.3-** And **Photographic Annex**).

Box 4.4.3-3: Archaeological sites and isolated finds registered in the area of influence of the Cielos de Tarapacá project.

Name	Adscription Cultural	UTM coordinates (Datum WGS 84)			Associated work	Area of Influence	
		Spin dle	N M	E M		AID	Aii
SA01	Prehispanic	19	7.709.346	441.132	Photovoltaic plant	X	

Box 4.4.3-3: Archaeological sites and isolated finds registered in the area of influence of the Cielos de Tarapacá project.							
Name	**Adscription Cultural**	**UTM coordinates (Datum WGS 84)**			**Associated work**	**Area of Influence**	
		Spindle	**N M**	**E M**		**AID**	**Aii**
SA02	Prehispanic	19	7.709.559	441.300	Photovoltaic plant	X	
SA03	Prehispanic	19	7.710.964	442.381	Photovoltaic plant	X	
SA04	Prehispanic	19	7.709.926	442.247	Photovoltaic plant	X	
HA01	Prehispanic	19	7.705.557	440.436	Photovoltaic plant		X
HA08	Prehispanic	19	7.710.196	442.288	Photovoltaic plant	X	
SA01/LAT	Prehispanic Historical	19	7.703.320	429.921	Lat	X	
SA02/LAT	Prehispanic Historical	19	7.702.655	429.594	Lat	X	
SA03/LAT	Prehispanic Historical	19	7.702.523	429.547	Lat	X	
SA04/LAT	Prehispanic	19	7.702.448	429.451	Lat		X
SA05/Lat	Prehispanic Historical	19	7.702.263	429.393	Lat	X	

It is estimated that the PC-PAR-CON-01 impact will affect To the archaeological isolated find and to the 8 sites registered within the AID. According to baseline and preliminary description of These Elements, it is estimated that they would correspond to sites Surface.

On the other hand, it is clarified that the sites HA01 and SA04/LAT located in the area of indirect influence of the project will be fenced and protected by special signage, so as not to be unintentionally affected by the same.

Then in the **Box 4.4.3-**, the evaluation of this impact is presented Clarifying that for the 4 sites Foam Pre-Hispanic and historical, the pre-Hispanic component is evaluated in this process:

Box 4.4.3-4: Impact PC-PAR-CON-01: Partial or total involvement of sites and isolated findings By the effects of land removal activities where they are located.												
Origin and characteristics of the impacts			Rating Impacts (*)									
Works/Activity	Impact Place	Impact period	Indicators								Going	Value
			C	Q	E	I	D	S	R	M		IT
Land movement by construction of works	Photovoltaic plant, roads, servitude, LAT.	Construction stage	-	1	3	3	2	1	1	10	8	-80

(*) Character (Ca): +/-1; Probability (P): 0-1; Extension (E): 0-3; Intensity (I): 0-3; Duration (D): 0-2; Synergy/Accumulation (S): 0-1; Reversibility (R): 0-1; Magnitude (M): 0-10; Component Relevance (VA): 0-10; Total Impact (IT): 0 +/-100

The values presented in the **Box 4.4.3-** They are estimated by virtue of the following aspects:

- The character (C) of this impact is negative because it implies the affectation of archaeological remains that correspond to non-renewable cultural resources, recognized in the law 17,288 of national monuments and defined as national monuments.

- The probability (P) of occurrence of this impact is defined according to its location within the area where the works will be developed. The isolated finding and the 10 archaeological sites are within the AID and will therefore be exposed to the works involving Earth movement, as well as the transit of machinery and personnel. Within this framework, a high probability is estimated (1).

- The impact Extension (E) covers archaeological sites located within the area of influence of the Cielos de Tarapacá project, considering them as circumscribed units within it. The interpretation of these elements is accompanied by the interrelation that these spaces have with those that are outside the area of direct influence of the project, so it is considered of communal scope. You are assigned value 3.

- The intensity (I) of impact was qualified as high (value 3) for the isolated finding and archaeological sites, because it is a radical alteration of the basal conditions of the archaeological heritage of the project area, ie, loss and/or impact of the constituent or structural elements of the sites.

- The duration (D) of the impact was qualified as long-term (value 2) for the isolated finding and archaeological sites, as it implies the affectation of the same ones. If the impact occurs, its duration is More than 5 years.

- The synergy or accumulation (S) of the impact is qualified with value 1, when there is empowerment between the impacts for the isolated finding and the pre-Hispanic sites.

- The reversibility (R) of the impact was qualified as Irreversible (value 1) for the works of removal and general intervention of the soil, in attention to the nature of the same. This applies to the isolated finding and all the archaeological sites, as they are elements that are on the ground, and once affected by the intervention of the soil, it will not be possible to recover them in any way because they are defined elements as unique and Unrepeatable.

- As for the relevance (VA) of the environmental component, its qualification was made considering its condition of non-renewable patrimonial element and potential of unprecedented archaeological information for the area. Within this framework it qualified itself with 8.

The Total impact is the product between the character (C), the relevance (VA) of the affected environmental component and the magnitude (M) of the impact. As exposed, the total impact on the isolated Find and The Sites Archaeological Will be de-80.

4.4.3.2.2 Operation Stage

No impacts on the archaeological Cultural heritage component are identified during this phase.

4.4.3.2.3 Abandonment Stage

No impacts are identified on the component archaeological cultural heritage during swindle.

4.4.3.2.4 Cartography

Associated cartography is presented in the Annex 10.1

4.4.3.2.5 Bibliography

Espinoza, G., Pisani, P. and Contreras, L. 1994. Environmental Impact Assessment Handbook: Basic concepts and background. Conama. Santiago.

Glasson, J., Therivel, R. and Chadwick, A. 1994. Environmental Impact Assessment. UCL Press, London.

4.4.4 Landscape

The project area is located within the boundaries of Pozo Almonte commune, in the province of Tamarugal, Región de Tarapacá. Geomorphologically, the evaluated area is located in the northern region of the desert Pampas and Cordilleranas Prealtiplánicas, in the unit Morfoestructural, Pampa del Tamarugal (Börgel, 1983). From the biogeographical point of view (Gajardo, 1994), the area of the project is located, according to potential classification of vegetation, in the desert region of the Pacific, in the desert formations of the tamarugal and inner desert.

The regional landscape where the evaluated area is located, corresponds to a mosaic dominated by a desert matrix with almost horizontal relief, which is combined with specific human settlements, productive activities-mainly mining-and value sites Heritage. In general, the regional landscape is home to great transformations of its original attributes.

The local landscape, presents almost null variations of relief, is developed in a large desert area, which limits with patches of rectilinear forms of plantations of Tamarugo, belonging to the National reserve Pampa del Tamarugal. The evaluated area comprises sectors of little and high alteration human historical and current.

4.4.4.1.1 Stage of construction

During the construction phase of the project and its associated works, there are projected impacts that translate into: modification of the aesthetic attributes of the landscape, visual intrusion in the landscape of new artificial elements (works of the project), partial blockade of Views by incorporation of new elements and recovery of aesthetic attributes of the landscape within the area of influence.

Thus, it can be indicated that the impacts of the project on the landscape component correspond to:

- Modification of aesthetic attributes of the landscape
- Visual intrusion
- Partial blocking of views
- Recovering aesthetic attributes

Below, these impacts are detailed.

Impact PA-PAI-CON-01: Modification of aesthetic attributes of the landscape, by the works and/or activities of the project.

The introduction of new elements in the landscape determines a change in the aesthetic attributes of the scene. This generates a decrease in the naturalness of the area, which implies an increase in artificiality, that is to say a transformation of the visual character of the landscape.

This impact implies a change in the perception of the landscape by potential observers, which is given by the occurrence of changes in visual attributes, including the incorporation of new chromatic varieties, transformation in The shapes, lines, textures and contrasts in the landscape.

This translates into chromatic alterations due to the incorporation of new colors and reflections in the scene, like Gray and white. Also in Changes in the landscape forms, due to the incorporation of new rectilinear forms, which are

characteristics of areas under human intervention. This contributes to a greater contrast between the elements in the landscape.

These changes can be perceived by potential observers, which would focus specifically on the main routes that give access to the project (Route 5 and Camino a Quebrada Blanca).

Impact PA-PAI-CON-01-Modification of aesthetic attributes of the landscape, by the works and/or activities of the project.												
Origin and characteristics of the impacts			**Rating Impacts (*)**									
			Indicators									**Value**
Works/Activity	**Place of impact**	**Impact period**	**C**	**Q**	**E**	**I**	**D**	**S**	**R**	**M**	**Going**	**IT**
Preparation of the Terrain	Photovoltaic plant/Tracing LAT	Construction	-1	0.2	0	1	0	0	0	0.2	2	-0.4
Earth Movements	Photovoltaic plant/Tracing LAT	Construction	-1	0.2	0	1	0	0	0	0.2	2	-0.4
Construction and improvement of access roads	Access roads (Easement LAT)	Construction	-1	0.3	1	1	2	1	0	1.5	2	-3
Mounting of support structure and solar panels	Photovoltaic plant	Construction	-1	0.5	1	2	2	1	0	3	2	-6

(*) Character (Ca): +/-1; Probability (P): 0-1; Extension (E): 0-3; Intensity (I): 0-3; Duration (D): 0-2; Synergy/Accumulation (S): 0-1; Reversibility (R): 0-1; Magnitude (M): 0-10; Component Relevance (VA): 0-10; Total Impact (IT): 0 +/-100

According to the previous evaluation, one has the four activities evaluated have a negative impact, mainly due to the incorporation of new elements in the landscape, that cause that there is a deterioration with the basal condition of the landscape.

- In relation to the probability of occurrence of the impact (P), it is obtained that the preparation of the ground and the earth movements include low expectations of manifestation (0.2), due to the nature of these activities. In contrast to the construction-improvement of roads (0.3) and mounts of support structures and solar panels (0.5), it is assumed a moderate probability because there are intermediate expectations that the impact is manifested, especially by the Scope of the activities.

- The impact extension (E) for the project activities is divided into local and communal areas. For land preparation activities and ground movements, a local extension (0) is presumed and for the mounting activities of support structures and solar panels, it is evaluated with a communal extension of the impact (1), because they include works of greater More extensively involving greater visual range.

- The intensity of the impact (I) varies according to the works and activities. This is low for land preparation works, land movements, construction and road Improvement (1), in contrast for the assembly of structures and support of solar panels This is moderate (2), because there are significant changes in the condition Basal, however, these are within acceptable ranges, due to the characteristics of the landscape.

- Impact Duration (D) is considered within two categories, as temporary (0) for ground preparation activities and Earth movements, i.e. they have a duration of up to 2 years and; As long-term (2) for the construction, improvement of roads and assembly of support structures

and solar panels, which include permanent works (more than 5 years of impact manifestation).

- Due to the different characteristics of the activities of the project is that they differ: two of them without synergistic effects (s = 0) and two of them with presence of synergistic effects (s = 1), which translates into the existence of empowerment between the impacts Analyzed, in this case, on the construction of roads and the assembly of the structures of solar panels.

- As for the reversibility (R) of the impact, it is considered reversible (0).

- The relevance of the environmental component or environmental value (VA) is considered low (value 2), since the landscape component presents a low basal quality, is not relevant to other components and at the same time, is presented as common within the region, IE is a resource Abundant.

ImpactPAI-CON-02: Intrusion into the landscape of new artificial elements.

This type of impact includes the incorporation into the landscape of new elements of anthropic character, which are contributed by the project. These in general tend to have a certain dominance in the landscape and concentrate part of the attention of the observers. This will vary according to the work and/or activity of the project, due to its proportion in size, proximity to the routes where observers are concentrated and to the structural characteristics of the project.

Specifically for this impact, it is included that the intrusion of new elements decreases – to some extent – visual access to the visual attributes of the landscape, in addition to providing regularity to the aesthetic attributes (as rectilinear forms).

Impact PA-PAI-CON-02-intrusion into the landscape of new artificial elements.													
Origin and characteristics of the impacts			**Rating Impacts (*)**										
Works/Activity	**Impact Place**	**Impact period**	**Indicators**									**Value**	
			C	**Q**	**E**	**I**	**D**	**S**	**R**	**M**	**Going**	**IT**	
Installation slaughter, camp, warehouses, waste storage, fuel tank, and work fronts	Photovoltaic Park	Construction	-1	0.2	0	1	1	1	0	0.6	2	-1.2	
Installation of the perimeter fence of the photovoltaic park	Photovoltaic Park	Construction	-1	0.5	1	2	2	1	0	3	2	-6	
Mounting of support structure and solar panels	Photovoltaic Park	Construction	-1	0.5	1	2	2	1	0	3	2	-6	
Construction of electric Forklift substation	Electric Substation Forklift	Construction	-1	0.2	0	1	2	1	0	0.8	2	-1.6	
Electrical disconnecting substation Construction	Electrical disconnecting substation	Construction	-1	0.2	0	1	2	1	0	0.8	2	-1.6	
Construction of air-laying and servitude	Tracing LAT	Construction	-1	0.3	1	1	2	1	0	1.5	2	-3	
Construction of buildings (Control room and building operations)	Photovoltaic Park	Construction	-1	0.2	0	1	2	1	0	0.8	2	-1.6	
Construction LAT	Tracing LAT	Construction	-1	0.6	1	2	2	1	0	3.6	2	-7.2	

(*) Character (Ca): +/-1; Probability (P): 0-1; Extension (E): 0-3; Intensity (I): 0-3; Duration (D): 0-2; Synergy/Accumulation (S): 0-1; Reversibility (R): 0-1; Magnitude (M): 0-10; Component Relevance (VA): 0-10; Total Impact (IT): 0 +/-100

According to the foregoing, it has to be in its entirety the activities comprise an impact of character (C) negative (-1), since the intrusion of new elements by the project in the landscape, imply a modification of the aesthetic attributes.

- The probability of occurrence (P) of the impact by the activities, varies from low to high (0.2 to 0.6). Noteworthy are the activities: installation of perimeter fence, assembly of solar panel structures, construction of electrical substations, aerial laying, servitude, buildings and LAT, which include values from 0.5 to 0.6, ie there are expectations From intermediate to high that the impact is manifested. This is due to the incorporation of structures-which in general-are of great magnitude, which implies artificiality of the landscape.

- The extension of the impact (E) varies according to the type of work and activity, differentiating a local scope (0), those works of lesser extent and with smaller structures and; A communal reach (1) Those of larger size (e.g. Which involve more powerful visual instruction.

- The intensity of the impact (I) varies from low to moderate, depending on the activities of the project. In general the activities that are of greater extension like the LAT and the photovoltaic Park, include a degree of alteration that implies significant noticeable changes within the basal condition of landscape (i = 2), however these variations fluctuate between ranges Acceptable. At the same time, those activities that comprise a lower surface determine a low impact intensity (I = 1).

- For the most part, the activities present a long-term impact duration (D) (2), since these works and activities will be presented during the life of the project. Only the activity of facilities of operations, camps etc., has a temporal duration (0).

- Based on the characteristics of the project, it is considered that all the

activities and works imply synergies (1), since they facilitate the accumulation of effects, which include the incorporation of different elements in the landscape.

- The impact on evaluation is considered reversible (R) in the works and activities required by the project.

- The relevance of the environmental component or environmental value (VA) is considered low (value 2), since the landscape component presents a low basal quality, is not relevant to other components and at the same time, is presented as common within the region, IE is a resource Abundant.

Impact PA-PAI-CON-03: Partial Blocking of landscape views.

This impact describes the presence of a certain part or work of the project, which partially obstructs visual access to the local landscape, which implies a loss of visibility. This impact is necessarily focused on the construction of the project's works, which would imply the lifting of physical visual barriers, which would partially hinder the views to the local landscape and its aesthetic attributes.

The blocking of the views is relevant to the potential observers, who would concentrate specifically on the main routes that give access to the project (Route 5 and Camino a Quebrada Blanca).

This impact at the same time, is conditioned by the dimensions of the works (surface), the structural characteristics (like height and materials) and the duration of the obstruction of the views.

Impact PA-PAI-CON-03 partial blocking of landscape views.												
Origin and characteristics of the impacts			Rating Impacts (*)									
Works/Activity	Impact Place	Impact period	Indicators									Value
			C	Q	E	I	D	S	R	M	Going	IT
Construction of electric Forklift substation	Electric Substation Forklift	Construction	-1	0.6	0	2	2	1	0	3	2	-6
Electrical disconnecting substation Construction	Electrical disconnecting substation	Construction	-1	0.6	0	2	2	1	0	3	2	-6
Construction of air-laying and servitude	Tracing LAT	Construction	-1	0.1	1	1	2	1	0	0.5	2	-1
Construction LAT	Tracing LAT	Construction	-1	0.8	1	2	2	1	0	4.8	2	-9.6

(*) Character (Ca): +/-1; Probability (P): 0-1; Extension (E): 0-3; Intensity (I): 0-3; Duration (D): 0-2; Synergy/Accumulation (S): 0-1; Reversibility (R): 0-1; Magnitude (M): 0-10; Component Relevance (VA): 0-10; Total Impact (IT): 0 +/-100

According to the table above, it is understood that the impact has a negative character on the activities and/or works described, which implies a decrease in the visual access to the landscape in the project area.

- The probability of occurrence (P) of the impact assessed is from low to high (values from 0.1 to 0.8), incurring the highest values, those activities involving the construction of works of greater volume and solidity.

- The extension of the impact (E) is local and communal (values 0 and 1), this is differentiated according to the territorial scope of the works.

- The intensity of the impact (I) varies from low to moderate (values 1 to 2), mainly due to the changes in the basal condition of the landscape. However, these can be significant and not significant, depending on the type of structures of the works evaluated.

- The duration of the impact (D) for all works of the project is in the long term (value 2) because the impact is permanently manifested for more than 5 years (useful life of the project).

- All works and activities include synergistic effects (value 1), as they imply accumulation of new elements in the landscape.

- The impact on evaluation is considered reversible (R) (value 0), since this could be reversed, by means of concrete actions, once the project is completed.

- The relevance of the environmental component or environmental value (VA) is considered low (value 2), since the landscape component presents a low basal quality, is not relevant to other components and at the same time, is presented as common within the region, IE is a resource Abundant.

Impact PA-PAI-CON-04: Recovering aesthetic attributes.

This impact describes the possibility of recovering the aesthetic attributes lost or modified by the construction of slaughter facilities, camps etc., this once the construction stage of the project is over. The foregoing implies a partial recovery of the original characteristics, such as shape, texture, chromatic variety, among other attributes. With this impact it is possible to decrease – to some extent-the artificiality of the local landscape.

Impact PA-PAI-CON-04 Recovery of aesthetic attributes.													
Origin and characteristics of the impacts			Rating Impacts (*)										
Works/Activity	Impact Place	Impact period	Indicators										Value
			C	Q	E	I	D	S	R	M	Going		IT
Removal of facilities for operations and cleaning.	Photovoltaic Park	Construction	+1	1	0	1	2	0	0	3	2		+6

(*) Character (Ca): +/-1; Probability (P): 0-1; Extension (E): 0-3; Intensity (I): 0-3; Duration (D): 0-2; Synergy/Accumulation (S): 0-1; Reversibility (R): 0-1; Magnitude (M): 0-10; Component Relevance (VA): 0-10; Total Impact (IT): 0 +/-100

According to the above, the impact has a positive (C) character (+ 1), Since the removal of certain installations in the construction stage implies a recovery of aesthetic attributes.

- The probability of extreme occurrence (P), since there are very high expectations of its occurrence.
- The impact extension (E) is at the local level (0), since its extension is rather reduced to the areas where the slaughter and cleaning facilities are projected.
- The intensity of the impact (I) is low (1) Since, despite the occurrence of noticeable changes, these will not be significant at the landscape level.
- The duration of the impact (D) is long-term (value 2), because the impact is permanently manifested for more than 5 years.
- Due to the characteristics of the activity, they are not considered synergistic effects (S = 0).
- The impact on evaluation is considered reversible (R) (value 0) because it can change in the long term.
- The relevance of the environmental component or environmental value (VA) is considered low (value 2), since the landscape component presents a low basal quality, is not relevant to other components and at the same time, is presented as common within the region, IE is a resource Abundant.

4.4.4.1.2 Operation Stage

During the project's operation phase, only one type of impact is foreseen. Which translates into visual intrusion into the landscape, by the operation of the photovoltaic park and the transmission line.

Thus, it can be indicated that the impact of the project on the landscape component corresponds to:

- Visual intrusion

This impact is detailed below.

Impact PA-PAI-OPE-01: Intrusion into the landscape of new artificial elements.

The impact Visual intrusion It includes the operation of the transmission line and the photovoltaic park in the local landscape. These works, correspond to elements of anthropic character, which relieve some artificiality to the scene. These generally imply a certain dominance in the desert landscape and will concentrate – to some extent-visual attention of the observers.

Specifically for this impact, it is included that the intrusion of new elements decreases – to some extent – visual access to the visual attributes of the landscape, in addition to providing regularity and new chromatic tones to the aesthetic attributes.

Impact PA-PAI-OPE-01 -Intrusion into the landscape of new artificial elements.												
Origin and characteristics of the impacts			Rating Impacts (*)									
Works/Activity	Impact Place	Impact period	Indicators									Value
			C	Q	E	I	D	S	R	M	Going	IT
Operation Photovoltaic Park	Photovoltaic Park	Operation	-1	0.8	1	2	2	1	0	4.8	2	-9.6
Electric power transmission	Tracing LAT	Operation	-1	1	1	2	2	1	0	6	2	-12

(*) Character (Ca): +/-1; Probability (P): 0-1; Extension (E): 0-3; Intensity (I): 0-3; Duration (D): 0-2; Synergy/Accumulation (S): 0-1; Reversibility (R): 0-1; Magnitude (M): 0-10; Component Relevance (VA): 0-10; Total Impact (IT): 0 +/-100

According to the above, the impact has a negative (C) character (-1), Since the operation of the works of the project implies the intrusion of elements of anthropic origin in the landscape.

- The probability of occurrence (P) of the impact is high to extreme, since there are very high expectations about its occurrence, especially because of the dimensions and characteristics of the structures of the photovoltaic plant and the transmission line.

- The extension of the impact (E) is at communal level (1), mainly due to its extension and arrival to potential observers who travel through public routes of greater territorial scope.

- The intensity of the impact (I) is moderate (2) because they include noticeable and significant changes in the landscape. However, these do not alter the basal condition and the quality of the same.

- The duration of the impact (D) is long-term (value 2), because the impact is permanently manifested throughout the project's lifetime.

- Due to the characteristics of the activity, if they are considered cumulative effects (S), because it includes the operation of two different activities, which imply a summation of new elements in the landscape.

- The impact on evaluation is considered reversible (R) (value 0), since this could be reversed, by means of concrete actions, once the project is completed.

- The relevance of the environmental component or environmental value (VA) is considered low (value 2), since the landscape component presents a low basal quality, is not relevant to other components and at the same time, is presented as common within the region, IE is a resource Abundant.

4.4.4.1.3 Closing stage

During the closing phase of the project, two types of impacts are envisaged. These involve visual intrusion into the landscape, by the operation of operations facilities and improvement of aesthetic attributes, due to the closure, removal and cleaning of the photovoltaic structures.

Thus, it can be indicated that the impacts of the project on the landscape component correspond to:

- Visual intrusion
- Recovering aesthetic attributes

The following are the impacts:

Impact PA-PAI-CIE-01: Intrusion into the landscape of new artificial elements.

It refers to the incorporation of new slaughter facilities in the project closing plan, which implies, the insertion of new artificial elements in the scene that are added to those already existing during the operation stage.

In general this activity is of a punctual nature, therefore it would not imply dominance in the landscape.

Impact PA-PAI-CIE-01 -Intrusion into the landscape of new artificial elements.												
Origin and characteristics of the impacts			Rating Impacts (*)									
Works/Activity	Impact Place	Impact period	Indicators									Value
			C	Q	E	I	D	S	R	M	Going	IT
Slaughter Installation	Photovoltaic Park	Closing	-1	0.2	0	1	0	0	0	0.2	2	-0.2

(*) Character (Ca): +/-1; Probability (P): 0-1; Extension (E): 0-3; Intensity (I): 0-3; Duration (D): 0-2; Synergy/Accumulation (S): 0-1; Reversibility (R): 0-1; Magnitude (M): 0-10; Component Relevance (VA): 0-10; Total Impact (IT): 0 +/-100

According to the previous evaluation, the evaluated impact has a negative character (-1), because it incorporates a new artificial element to the landscape, causing the basal condition to be transformed.

- In relation to the probability of occurrence of the impact (P), a low probability assessment (0.2) is obtained, because there are low expectations of it being manifested.
- The impact extension (E) for the slaughter plant is local (0), because it comprises a small and punctual impact surface.
- The impact intensity (I) is low for land preparation works, because it includes noticeable changes in the landscape, but not significant.
- The duration of the impact (D) is temporary, because it implies a duration of no more than 2 years and only by the closing stage.
- Due to the characteristics of the activity, no cumulative effects are considered (S = 0).
- As for the reversibility (R) of the impact, it is considered reversible (0).
- The relevance of the environmental component or environmental value (VA) is considered low (value 2), since the landscape component presents a low basal quality, is not relevant to other components and at the same time, is presented as common within the region, IE is a resource Abundant.

As described above, the total impact of the evaluated activity is considered: *Non-significant*, corresponding to-0.2.

Impact PA-PAI-CIE-02: Recovering aesthetic attributes.

This impact includes the possibility of recovering the aesthetic attributes lost with the start-up of the project, due to the activities of disarmament, removal

and cleaning of the structures of the photovoltaic park. This will allow to generate a partial recovery of the original characteristics, such as shape, texture, chromatic variety, among other attributes. With this impact it is possible to decrease – to some extent-the artificiality absorbed by the local landscape with the implementation of the project.

Impact PA-PAI-CIE-01 -Intrusion into the landscape of new artificial elements.												
Origin and characteristics of the impacts			Rating Impacts (*)									
Works/Activity	Impact Place	Impact period	Indicators									Value
			C	Q	E	I	D	S	R	M	Going	IT
Disarmament and removal of the structures of the PFV	Photovoltaic Park	Closing	+1	1	1	2	2	0	0	5	2	+10
Removal of facilities for slaughter and cleaning.	Photovoltaic Park	Closing	+1	1	1	2	2	0	0	5	2	+10

(*) Character (Ca): +/-1; Probability (P): 0-1; Extension (E): 0-3; Intensity (I): 0-3; Duration (D): 0-2; Synergy/Accumulation (S): 0-1; Reversibility (R): 0-1; Magnitude (M): 0-10; Component Relevance (VA): 0-10; Total Impact (IT): 0 +/-100

According to the above, the impact has a positive (C) character (+ 1), Since the removal of certain installations at the closing stage implies a recovery of lost aesthetic attributes.

- The probability of occurrence (P) is extreme, as there are very high expectations of its occurrence.
- The extension of the impact (E) is at communal level (1), since its extension has an important territorial scope.
- The intensity of the impact (I) is moderate (2) since noticeable and significant changes in the landscape would occur.
- The duration of the impact (D) is long-term (value 2), because the impact is permanently manifested for more than 5 years.
- Due to the characteristics of the activity, they are not considered synergistic effects (S = 0).
- The impact on evaluation is considered reversible (R) (value 0) because it can change in the long term.
- The relevance of the environmental component or environmental value (VA) is considered low (value 2), since the landscape component presents a low basal quality, is not relevant to other components and at the same time, is presented as common within the region, IE is a resource Abundant.

4.4.5 Protected areas And Priority conservation Sites

4.4.5.1 Protected areas

The environmental impact identified for the protected areas component will be verified during the construction stage and is directly related to the introduction of artificial elements and/or Anthropic origin within a national reserve.

The effect will be manifested during the construction stage where it is evaluated, without prejudice to this, during the operation and closing stages, this impact will not present variations.

Impact AAPP-AAPP-CON-01: Introduction of artificial elements and/Or Anthropic origin within a national reserve.

The development of the project will require the construction and improvement of access roads and the construction of a high voltage line (LAT). Those that will have as consequence, to introduce in a sector of the National reserve Pampa del Tamarugal, artificial elements of anthropic origin. It is worth saying roads and structures (towers) and drivers that make up the LAT.

Without prejudice to the foregoing and as indicated, the sectors of the reserve, involved, correspond to areas without Vegetation and salt and other land without vegetation, where there is no presence of Tamarugos.

The following is the identification, description and evaluation of the impact: Introduction of artificial elements and/or Anthropic origin within a national reserve.

Impact AAPP-AAPP-CON-01 introduction of artificial elements and/or Anthropic origin within a national reserve												
Origin and characteristics of the impacts			Rating Impacts (*)									
Works	Impact Place	Impact period	Indicators									Value
			C	Q	E	I	D	S	R	M	Going	IT
Construction and improvement of access roads	Girdle of servitude LAT and access roads to improve	Construction	-	0.1	0	0	2	0	0	0.2	4	-0.8
Construction LAT	Girdle of bondage LAT	Construction	-	0.8	0	1	2	0	0	2.4	4	-9.6

(*) Character (Ca): +/-1; Probability (P): 0-1; Extension (E): 0-3; Intensity (I): 0-3; Duration (D): 0-2; Synergy/Accumulation (S): 0-1; Reversibility (R): 0-1; Magnitude (M): 0-10; Component Relevance (VA): 0-10; Total Impact (IT): 0 +/-100

The values listed in the preceding table are based on the following considerations:

- The character (C) of the impact is negative for all cases, since the introduction of artificial elements in a national reserve, implies the detriment of its basal condition.

- The probability (P) of occurrence occurs low and high, with values of 0.1 and 0.8 respectively. For all cases of construction and improvement of roads and construction the LAT.

- In both cases the extension (E) is local (value 0), given that they correspond to interventions that occupy – proportionately – a scarce surface.

- The intensity (I) of the impact ranged between minimum and low (values 0 and 1), since the introduction of these artificial elements in the reserve, does not imply a significant change in relation to the basal condition, permanently reducing the productive capacity of the sector.

- In both cases and by the nature of the works evaluated, the duration (D) of the impact is in the long term (value 2) because when it is permanent works, it manifests persistently for more than 5 years.

- This impact does not present synergy and/or accumulation (S) between the impacts analyzed in the study (value 0).

- The reversibility (R) of the impact was rated as reversible (value 0).

- In the allocation of the environmental value (VA) of each sector concerned, abundance, representativeness at local and regional level, current quality, relevance for other components and for the local environment was considered. In relation to the assigned one, it was qualified as moderate (value 4) for the territories of the reserve which are involved in this impact.

4.4.5.1.1 Operation Stage

No impact on protected areas is foreseen during the project's operation phase. The manifestation of the impacts will occur in the constriction stage, so they were already evaluated.

4.4.5.1.2 Closing stage

No impact on protected areas is foreseen during the closing phase of the project. The manifestation of the impacts will occur in the constriction stage, so they were already evaluated.

4.4.5.2 Priority conservation Sites

In the following section the results of the identification, description and valuation of the potential environmental impacts of the project on priority sites for conservation are given.

After the analysis of baseline results for projected works and considering that the activities that contemplate the construction, operation and closure of the project and its relationship with the priority sites for conservation. No impacts were identified on these areas, to be found – the closest-, to more than 52 and 59 kilometres of the project (Punta Patache and Bahía Chipana, respectively).

4.4.5.2.1 Construction stage

No impacts are foreseen on priority sites for conservation during the construction phase of the project.

4.4.5.2.2 Operation Stage

No impact is foreseen on priority conservation sites during the project's operation phase.

4.4.5.2.3 Closing stage

No impact on priority conservation sites is foreseen during the project's closing phase.

4.4.5.2.4 Cartography

Cartography of environmental impacts is not provided for this component.

4.4.5.2.5 Bibliography

does not apply.

4.4.6 Tourism

4.4.6.1 Tourism

In the following section the results of the identification, description and valuation of the potential environmental impacts of the project on the tourism component are delivered.

After the analysis of baseline results for projected works, and considering that the activities that contemplate the construction, operation and closure of the project and its relation with the areas of national tourist interest, areas of tourist interest and circuits and tourist attractions. No impacts on tourism were identified in any of the stages of the project, as detailed below.

4.4.6.1.1 Stage of construction

No Impact expected On tourism during the Stage Of Construction of the project.

4.4.6.1.2 Stage of operation

No Impact expected On tourism during the Stage Of Operation of the project.

4.4.6.1.3 Stage of closing

No Impact expected On tourism during the Stage Of Closing of the project.

4.4.6.1.4 Cartography

Cartography of environmental impacts is not provided for this component.

4.4.6.1.5 Bibliography

does not apply.

4.4.7 Uses of the Territory and its relation with the territorial planning.

In the following section the results of the identification, description and valuation of the potential environmental impacts of the project on the uses of the Territory and its relation with the territorial planning are given.

After the analysis of baseline results for projected works and considering that the activities that contemplate the construction, operation and closure of the project and its relation with the uses of the Territory and its relation with the planning Territorial in the area of influence of the project; No impacts were identified on these variables. This, on the basis of the non-existence of territorial planning instruments (regulations) that indicate land uses for the territories involved and the current land uses where the project is planned to materialize, the EU corresponds to areas without vegetation and salt and other land without vegetation.

4.4.7.1.1 Construction stage

No impacts are foreseen on the uses of the Territory and its relation with the territorial planning, during the construction phase of the project.

4.4.7.1.2 Operation Stage

No impact is foreseen on the uses of the Territory and its relation with the territorial planning, during the phase of operation of the project.

4.4.7.1.3 Closing stage

No impact is foreseen on the uses of the Territory and its relation with the territorial planning, during the closing phase of the project.

4.4.7.1.4 Cartography

Cartography of environmental impacts is not provided for this component.

4.4.7.1.5 Bibliography

does not apply.

4.4.8 Human environment

In the case of the human Exist Significant alteration of the Systems of life and customs, as stipulated in the regulation of the system of evaluation of current impact, DS N ° 40 of the year 2013, in its article 7 to know:

With respect to (a)), characterization and terrain showed that there is no intervention, use or restriction on the access of natural resources used as an economic sustenance of the group or for any other traditional use, such as medicinal, spiritual use or Cultural. This is because there are no natural resources in the project area, and the project will not interfere with access to resources in areas surrounding the population or elsewhere.

In respect of the letter B), the characterization and the terrain showed that there is no obstruction or restriction to the free movement, connectivity or the significant increase of the displacement times. In this sense, the works of the project do not use routes that are currently transited by the community within the area of influence, with the exception of Route 5, whose effect is marginal.

With respect to subparagraph (c)), the characterization and the terrain showed that there is no alteration to the access or quality of goods, equipment, services or basic infrastructure. This is because in the area of the project there are no such goods, equipment, services or infrastructure, and because in the area of influence, are obtained in the same locality, or move along Route 5 to the north to obtain it , either to the city of Pozo Almonte or Iquique. In this way, there is no affectation, because the increase in traffic by Route 5 is marginal.

In respect of the letter D) characterization and terrain showed that it is not difficult or impeding the exercise or the manifestation of traditions, culture or community interests, which can affect the feelings of rootedness or the social cohesion of the group. Although in project will be found traces troop that could affect this identity, feeling of rooting or social cohesion of the group, currently there are not observed activities related to the promotion or protection of these traces troop, as well as Nor were social associations observed in favor of them. In the interviews was not mentioned emphasized its existence, nor was it particularly valued when mentioning them. In this way, the importance of those traces lies more in their archaeological significance than in the identity of the current group.

4.4.8.1 Geographic dimension

4.4.8.1.1 Construction stage

The Stage Of Construction Of the project does not contemplate activities that PUDIeran cause impacts on this component.

4.4.8.1.2 Operation Stage

The Stage of operation of the Project does not contemplate activities that could cause impacts on This component.

4.4.8.1.3 Closing stage

In the event that the project ends with its stage of operation, there are no impacts on this component during the closing phase.

4.4.8.1.4 Cartography

Cartography of environmental impacts is not provided for this component.

4.4.8.1.5 Bibliography

does not apply.

4.4.8.2 Demographic dimension

4.4.8.2.1 Construction stage

The Stage Of Construction Of the project does not contemplate activities that PUDIeran cause impacts on this component.

4.4.8.2.2 Operation Stage

The Stage of operation of the Project does not contemplate activities that could cause impacts on This component.

4.4.8.2.3 Closing stage

In the event that the project ends with its stage of operation, there are no impacts on this component during the closing phase.

4.4.8.2.4 Cartography

Cartography of environmental impacts is not provided for this component.

4.4.8.2.5 Bibliography

does not apply.

4.4.8.3 Anthropological Dimension

4.4.8.3.1 Construction stage

The Stage Of Construction Of the project does not contemplate activities that PUDIeran cause impacts on this component.

4.4.8.3.2 Operation Stage

The Stage of operation of the Project does not contemplate activities that could cause impacts on This component.

4.4.8.3.3 Closing stage

In the event that the project ends with its stage of operation, there are no impacts on this component during the closing phase.

4.4.8.3.4 Cartography

Cartography of environmental impacts is not provided for this component.

4.4.8.3.5 Bibliography

does not apply.

4.4.8.4 Socio-economic dimension

4.4.8.4.1 Construction stage

The Stage Of Construction Of the project does not contemplate activities that PUDIeran cause impacts on this component.

4.4.8.4.2 Operation Stage

The Stage of operation of the Project does not contemplate activities that could cause impacts on This component.

4.4.8.4.3 Closing stage

In the event that the project ends with its stage of operation, there are no impacts on this component during the closing phase.

4.4.8.4.4 Cartography

Cartography of environmental impacts is not provided for this component.

4.4.8.4.5 Bibliography

does not apply.

4.4.8.5 Welfare dimension

4.4.8.5.1 Construction stage

The Stage Of Construction Of the project does not contemplate activities that PUDIeran cause impacts on this component.

4.4.8.5.2 Operation Stage

The Stage of operation of the Project does not contemplate activities that could cause impacts on This component.

4.4.8.5.3 Closing stage

In the event that the project ends with its stage of operation, there are no impacts on this component during the closing phase.

4.4.8.5.4 Cartography

Cartography of environmental impacts is not provided for this component.

4.4.8.5.5 Bibliography

does not apply.

4.5 RANKING OF IMPACTS

4.5.1 General aspects

From the impact assessment carried out in the previous headings of this chapter, a summary of the potential environmental impacts of the project was prepared, which includes the impacts identified for each environmental component, indicating its level of Assessment according to the Stage of the project in which the impact is manifested.

Also, according to the methodology described above, the significant environmental impacts of the project were identified (total impact weighting equal to or greater than 61). For which they were ordered in decreasing form, according to the medium of which each component is part.

4.5.2 Environmental impacts identified

The following table shows the environmental impacts identified for all the environmental components evaluated, both in the construction and operation stages of the project. In the stage of Closing Of the project no impacts were identified.

In the indicated table, the level of valuation of each one of the identified impacts is highlighted in colors. It is important to mention that the valuation of impacts shown in the following table corresponds to the maximum valuation given for the impact on some work and/or task of the project.

Table 4.5-1: Summary environmental impacts of the project

Environmental component	Code	Environmental impact	Impact Assessment *		
			Construction	Operation	Closing
Physical environment					
Climate and weather	No impacts were identified for this environmental component				
Geology	No impacts were identified for this environmental component				
Geomorphology	No impacts were identified for this environmental component				
Hydrography	No impacts were identified for this environmental component				
Edaphology	No impacts were identified for this environmental component				
Noise and vibration	No impacts were identified for this environmental component				

Table 4.5-1: Summary environmental impacts of the project					
Environmental component	Code	Environmental impact	Impact Assessment *		
			Construction	Operation	Closing
Air quality	No impacts were identified for this environmental component				
Electromagnetic fields	No impacts were identified for this environmental component				
Terrestrial ecosystems					
Flora and vegetation	No impacts were identified for this environmental component				
Terrestrial Fauna	No impacts were identified for this environmental component				
Human and Built Environment					
Geographic dimension	No impacts were identified for this environmental component				
Socio-economic dimension	No impacts were identified for this environmental component				
Geographic dimension	No impacts were identified for this environmental component				
Socio-economic dimension	No impacts were identified for this environmental component				
Social Welfare dimension	No impacts were identified for this environmental component				
Use of the Territory and its relationship with Territorial planning					
Use of the Territory and its relationship with Territorial planning	No impacts were identified for this environmental component				
Protected areas and priority sites					
Protected areas	AAPP-AAPP-CON-01	Introduction of artificial elements and/or Anthropic origin within a national reserve	Non-significant	does not apply	does not apply
Cultural heritage					

Table 4.5-1: Summary environmental impacts of the project					
Environmental component	Code	Environmental impact	Impact Assessment *		
			Construction	Operation	Closing
Historical heritage	PC-PHI-CON-01	Affecting the elements that define each	Moderately significant	does not apply	does not apply
Archaeological heritage	PC-PAR-CON-01	Affectation and/or loss of the elements that define each	Significant	does not apply	does not apply
Landscape					
Landscape	PA-PAI-CON-01	Modification of aesthetic attributes of the landscape, by the works and/or activities of the project.	Non-significant	does not apply	does not apply
	PA-PAI-CON-02	Intrusion into the landscape of new artificial elements.	No Significant	does not apply	does not apply
	PA-PAI-CON-03	Partial blocking of landscape views	Non-significant	does not apply	does not apply
	PA-PAI-CON-04	Recovering aesthetic attributes	Non-significant	does not apply	does not apply
	PA-PAI-OPE-01	Intrusion into the landscape of new artificial elements	does not apply	Non-significant	does not apply

Table 4.5-1: Summary environmental impacts of the project					
Environmental component	Code	Environmental impact	Impact Assessment *		
			Construction	Operation	Closing
	PA-PAI-CIE-01	Intrusion into the landscape of new artificial elements	does not apply	does not apply	Non-significant
Tourist attractions	No impacts were identified for this environmental component				

* Impact Assessment: Corresponds to the maximum valuation given for the impact on any work and/or task of the project

Positive	Non-significant	Slightly significant	Moderately significant	Significant
Negative	Non-significant	Slightly significant	Moderately significant	Significant

4.5.3 Significant environmental impacts

The table below summarizes the significant environmental impacts of the project, for each of the evaluated environmental components, in the stages of construction and operation. Significant impacts are ordered by means of physical, Terrestrial ecosystems, human, etc.) In descending order.

Box 4.5-1: Summary significant environmental impacts of the Project			
Environmental component	Code	Environmental impact	Impact Value (*)
Cultural heritage			
Archaeological heritage	PC-PAR-CON-01	Affectation and/or loss of the elements that define each archaeological site	-80

(*) It corresponds to the maximum valuation by activity, work and/or task of the project.