



Espejo
de Tarapacá



Cielos
de Tarapacá

Environmental and Social Management Framework

Espejo de Tarapacá Project

Espejo de Tarapacá Pumped Storage Hydro Plant

&

Cielos de Tarapacá Photovoltaic Solar Plant

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Introduction

The Environmental and Social Management Framework (ESMF) consists of an operative document that contains, first a description of the environmental and social context in which the Project will be executed and the associated potential risks and impacts, and second, a plan to comply with the IFC Performance Standards in accordance with the risks of identified potential impacts. The ESMF has been prepared within the framework of compliance with national regulations and community involvement for successful execution of the objectives and agreements from the stakeholder engagement process.

A. Environmental and Social Context

This chapter responds to the requirement established in article 18 letter f) of DS 40/12 MMA, Regulation of the Environmental Impact Assessment System (SEIA, based on its initials in Spanish). In this sense, the environmental impacts generated by the Espejo de Tarapacá Project are identified, described, evaluated and hierarchized. The methodological framework for evaluation of environmental and social impacts is first presented. The evaluation is then analyzed and detailed, beginning with assessment of the environmental factors for each component. Finally, the environmental and social impacts are identified, qualified and ranked.

1. Project Overview

The Espejo de Tarapacá Project (EdT or the Project) is an innovative and unique large scale power project which combines Chile's natural resources with proven generation technology in order to provide clean renewable energy supply 24 hours a day, seven days a week (24/7). The Project is comprised of two commercially integrated power plants¹: (i) the 300 MW Espejo de Tarapacá pumped storage hydroelectric (PSH) plant using the Pacific Ocean as its lower reservoir and an existing natural concavity as its upper reservoir, and (ii) the Cielos de Tarapacá 561 MW-AC photovoltaic solar (PV) plant with single axis tracking. Figure 1 below shows the geographic location of the two plants, both of which are located in northern Chile in the Tarapacá Region.

¹ The PSH and PV plants will each be connected to the national grid and not physically connected to one another (approximately 80 km distance between two plants).

Figure 1: PSH and PV Plant Locations



The Project will be located in the desert in northern Chile² where currently, despite being among the most privileged places on earth for the development of solar energy, more than 87% of the electricity generated comes from thermoelectric sources. In fact, this area possesses some of the best solar irradiation levels in the world (average capacity factors in excess of ~35%), and is also relatively flat and sparsely populated. According a 2014 report by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and the Chilean Ministry of Energy, the PV solar potential in this area exceeds 1.4 million MW of installed capacity. The existing installed solar capacity of around 633 MW in this area represents less than 0.1% of the total potential.

The Project resolves the intermittency problem inherent to solar technology by effectively combining Chile's abundant sunlight and seawater resources to ensure electricity availability 24/7. It will set a precedent by providing a renewable baseload solution at a price competitive with thermal technologies, within the context of an electricity grid heavily reliant on high emission electricity sources (~54% fossil fuel based) and variable hydropower (~30% hydroelectric). The Project is also aligned to meet Chile's target of 70% capacity from non-conventional renewable power generation by 2050 and future plans of grid decarbonization by offering a viable replacement to thermal technology.

Additionally, the Project's innovative seawater pumped-storage hydroelectric design can be replicated in geographic locations with suitable topography both in Chile and around the globe, resolving the problem of intermittency by integrating PSH with other renewable technologies and thereby helping mitigate climate change with the provision of 100% renewable 24/7 electricity supply. In 2013, Valhalla³ together with researchers from

² The Project is located in Chile's ex-Greater Northern Electric Grid, which includes the regions of Arica/Parinacota, Tarapacá and Antofagasta.

³ Energia Valhalla SpA owns 100% of the PSH plant Energía de Tarapacá SpA and PV solar plant Cielos de Tarapacá.

Stanford University completed an extensive study which identified the natural concavities found along the coasts of Chile, Peru and Mexico.⁴

The Project has cross-cutting impact potential as it provides both climate change mitigation and adaptation. The Project will help Chile comply with commitments in the Paris Agreement and is fully aligned with the 2030 Agenda of the United Nations Sustainable Development Goals (SDGs), supporting at least eight SDGs at national, regional and local levels. Through the production of 100% renewable energy, EdT will mitigate global greenhouse gas emissions. The Project will also directly contribute to the creation of adaptation actions and more resilient communities in three of these sectors that are currently experiencing the effects of climate change: energy, water resources and fishing and aquaculture.

Chile has a comprehensive environmental assessment system, which considers the evaluation of risks and impacts, associated with issues addressed by the performance standards of the IFC and in which community engagement is critical. In fact, a formal process for citizen participation is required within the Environmental Impact Assessment process in which compulsory and binding informative community meetings are led by the regulator. In the case of EdT, and as detailed in the *Community Engagement* Section below, in addition to fully complying with the community participation obligations required by the SEIA, the Project conducted early and extensive community engagement with the surrounding communities, executing voluntary coordination agreements with various community organizations.

Both projects, the PSH and the PV, were unanimously granted the respective environmental permits, which are denominated Environmental Qualification Resolutions or RCAs (*Resolución de Calificación Ambiental*), without complaints or objections from the community or other parties. The process for obtaining the permits requires compliance with a series of stages including development of Environmental Impact Assessments (EIAs) in accordance with the technical requirements established in existing regulations. It is important to note that the EIAs and all related information is publicly available on the website from the Environmental Evaluation Service (*Servicio de Evaluación Ambiental* or SEA) for both the Espejo de Tarapacá⁵ and Cielos de Tarapacá⁶ projects. This information includes all the documentation from the environmental permitting process, including the original EIAs, modifications and clarifications, public participation process, RCA, and notices and letters from the SEA and other Public Service Agencies.

2. Project Description

The integrated Espejo de Tarapacá Project comprised of the PSH and PV projects is described as follows:

i) Pumped Storage Hydro Project

⁴ Charles Barnhart, Reid Parsons and Sally Benson, Energy Storage Potential Estimates Using GIS-Based Topographic Analysis, Stanford University's Global Climate and Energy Project.

⁵ http://seia.sea.gob.cl/expediente/expedientesEvaluacion.php?modo=ficha&id_expediente=2129687968

⁶ http://seia.sea.gob.cl/expediente/expedientesEvaluacion.php?modo=ficha&id_expediente=2130127816

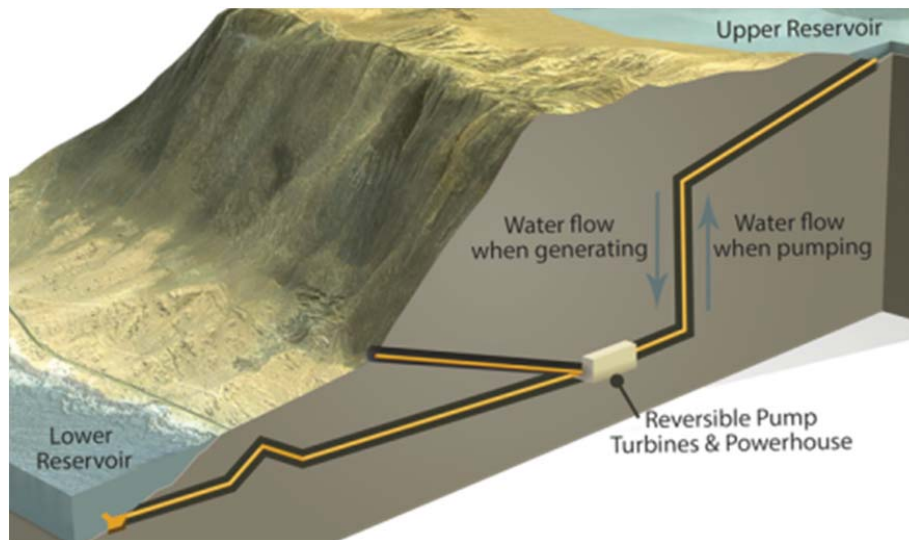
The Espejo de Tarapacá PSH plant which utilizes seawater will be located in the municipalities of Iquique and Pozo Almonte, province of Iquique, Tarapacá Region, approximately 100 km south of the city of Iquique. The nearest towns are Caleta Río Seco, located next to a Project road and 14 km further south, Caleta San Marcos, located approximately 750 m from the Project. All of the PSH plant works are located in the Iquique district and a portion of the associated transmission line is located in the Pozo Almonte district.

The Project consists of the installation and operation of a reversible hydroelectric power plant, that is, the same turbine operates as a pump in one direction of water circulation, and as a generator in the other direction, providing both pumping and generation modes, respectively. Additionally, regardless of the mode of operation in which the plant is operating, the same works will be used for channeling water, specifically the same underground and subsea works. The installed capacity of the PSH plant is 300 MW which is comprised of three reversible Francis-type hydraulic turbines of 100 MW each which are located in an underground powerhouse.

The PSH plant is expected to pump seawater during the day or during sun-hours, when the PV plants installed in northern Chile are producing energy and therefore the system has excess available energy supply and relatively low prices⁷. During sun-hours, the equipment pumps water from the ocean to the upper reservoir, made of natural concavities on top of the coastal cliff, and at night, during dark-hours, the equipment generates electricity with the water stored in the reservoir, which is released and returned to the ocean. There will be a single underground bi-directional water conduction system comprised of the ocean intake and tunnels, which will be used for the water flow in both pumping and generating modes. The water will be pumped and carried from the ocean through a tunnel and deposited in the reservoir. The reservoir will be lined with a bituminous membrane and the seawater reservoir will have a maximum surface of approximately 375 ha, at an approximate height of 600 meters above sea-level. The following diagram in Figure 2 shows the reversible operation, pumping and generating modes, of the plant.

Figure 2: Reversible (Pumping and Generating) PSH Plant Operation

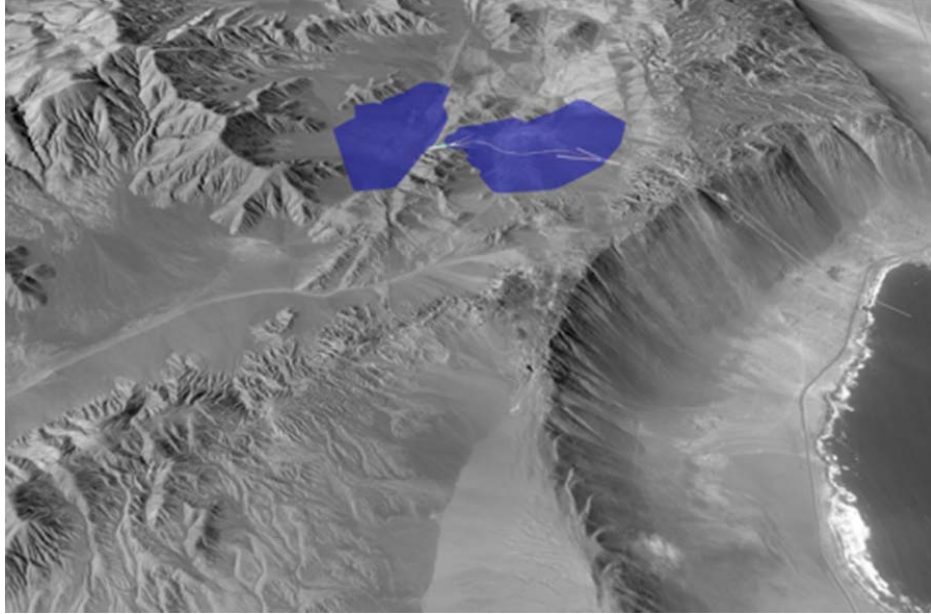
⁷ As a result of the availability of solar renewable variable generation during the day, less non-variable generation is needed and prices are lower. When the solar capacity is no longer available, in mid to late evening, the need for non-variable generation increases sharply. This phenomenon occurs in areas with strong irradiation and significant installed solar capacity and can be shown graphically in a “duck curve”. For more information, please see: <https://www.vox.com/2018/5/9/17336330/duck-curve-solar-energy-supply-demand-problem-caiso-nrel>



The site geography presents ideal conditions for the construction and operation of a PSH plant, given its unique characteristics with a steep cliff and natural concavity within a short distance of the shoreline, thereby allowing the Project to minimize capital costs. The Pacific Ocean serves as the lower reservoir, providing an abundant and non-volatile water supply. A natural concavity located on the surface of a steep coastal cliff, only 3 km from the seawater intake point, serves as the upper (storage) reservoir. Additionally, the natural elevation of the cliff, approximately 600 m.a.s.l. at the location of the upper reservoir, provides the significant height differential required for hydroelectric generation.

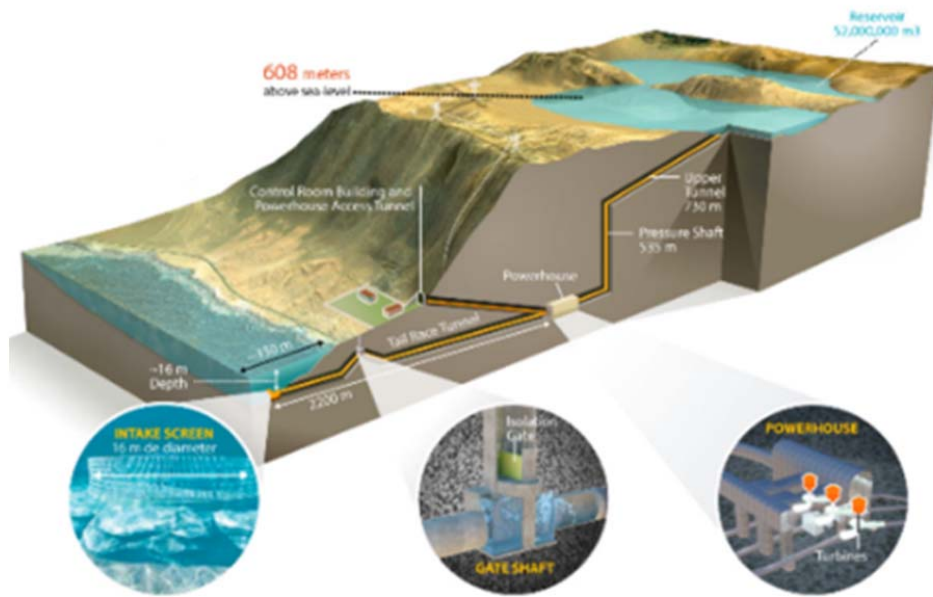
The Project's upper reservoir is comprised of the natural concavity located on the top of the cliff which encompasses a total land area of 375 hectares and has volume and energy storage capacity of 52 MM cubic meters and 83 GWh, respectively. The shaded area in Figure 3 below shows the location of the upper reservoir, which is comprised of two bodies of water, an eastern and western reservoir which will be interconnected via a canal. The white line indicates the PSH plant's waterways including the seawater intake and associated tunnels to the reservoir. Both the eastern and western reservoirs will be surrounded by a dike with average height of 3 m and completely lined with an impervious geomembrane made of a highly resistant bituminous material to prevent filtration. A separation dike will also be constructed in the western reservoir to allow for partial filling and use.

Figure 3: PSH Plant Upper Reservoir



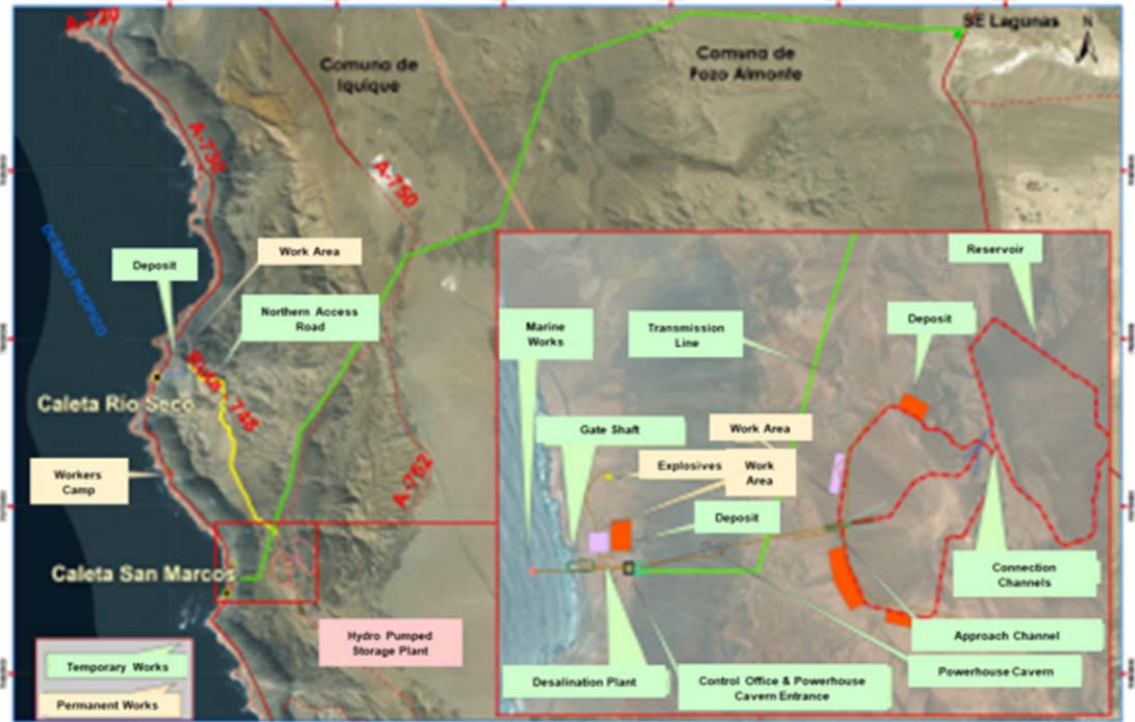
The principal components of the PSH plant include: (i) three 100 MW Francis-type reversible turbines, along with 115 MVA transformers, (ii) a 350 m subsea tunnel that ends in a sea piercing system with an intake point at a depth of approximately 16 m, (iii) a 2,200 m underground water discharge tunnel, (iv) an 1,080 m access tunnel, (v) an 730 m headrace tunnel, (vi) a vertical steel lined pressure shaft with a height of 535 m, (vii) a 110 m surge shaft at the top of the pressure shaft, (viii) a 150 m surge chamber located downstream of the power cavern, (ix) a 220 kV GIS substation, and (x) above-ground buildings which include a control room, plant office, warehouse and desalinization plant (to provide water for PSH plant construction and operations, as well as to the community). The PSH plant installations will also include a 65 km transmission line from the PSH plant to the Lagunas substation. Figure 4 below shows the overall layout of the PSH plant. It should be noted that the turbines and substation will be installed in the underground powerhouse cavern approximately 45 m below sea level and all waterways will also be underground. The combined length of all tunneling totals approximately 5.5 km.

Figure 4: PSH Plant Layout



Production from the PSH plant will be transported from the plant through a 65 km 220 kV high voltage electrical transmission line and injected at the existing Lagunas substation to the National Interconnected System (SEN). Figure 5 below details the location of the PSH plant's activities. The green line in the diagram represents the 65 km transmission line.

Figure 5: PSH Plant Location



ii) Photovoltaic Solar Park Project

The Cielos de Tarapacá PV plant will be located 75 km southeast of the city of Iquique, municipality of Pozo Almonte, El Tamarugal Province, Tarapacá Region. The PV plant is comprised of a solar park with installed capacity of up to 561 MW-AC PV which will be constructed in three phases. The solar plant equipment will consist of solar panels, inverters, underground and aerial cables, in addition to meteorological stations, a control room, O&M office and warehouse. The PV plant will utilize a single-axis tracking system in order to maximize energy output by tilting the panels to follow the sun throughout the day from east to west. The PV park installations also include a 220 kV step-up substation and 18 km transmission line from the site to the Lagunas substation.

Figure 6 below details the location of the PV plant.

Figure 6: PV Plant Location



3. Area of Influence and Baseline Description

This section describes the socio-environmental context in which the PSH and PV projects will be developed, specifically, the characteristics of the marine and terrestrial physical environment, human environment, cultural heritage, landscape and scenic resources, protected areas and priority sites and tourist attractions, considering the particularities of the components of the Project.

The area of influence and the baseline for the most relevant components of the socio-environmental are briefly discussed. Based on the information included in the EIAs for the Espejo de Tarapacá PSH plant and Cielos de Tarapacá PV park, both located in the Tarapacá Region in Chile, which were submitted in 2014 and 2015, respectively, the components listed below could potentially be impacted by the Project.

i) **Baseline: Espejo de Tarapacá Project – Pumped Storage Hydro Plant Component**

Component	Area of influence	Brief Description of Baseline
Air Quality	Area that includes Caleta San Marcos and Caleta Río Seco and the Tenardita Mine.	None of the sectors in which the Project will be located is in areas declared latent or saturated by any pollutant (including dust and fine particles).
Noise and Vibrations	4 km radius from the transmitter source. Within this radius are sensitive receptors (Caleta San Marcos and Caleta Río Seco and the Tenardita Mine).	The main sources of noise detected at the time of measurements correspond to the noise produced by the interaction between the wind, vehicular traffic on Route 1 and the breaking of waves. The values obtained vary between 36 and 52 [dB (A)] for the day period and between 29 and 54 [dB (A)] for the night period. On the other hand, it can be determined that the vibration records obtained for all the evaluation points are below the perception threshold defined in the regulations FTAVA-90-1003-06 which is 65 [VdB].
Soil	50 meters area around the Project works	The identified soils presented a development of null to scarce, with predominance of coarse materials, sandy textures and without presence of roots, or high erosion, many with presence of desert pavement; thin in depth; with the presence of sediments, high in gravel and stones and excessive drainage.
Marine Water and Sediment Quality	It will correspond to the maximum area determined by the dispersion limits of the thermal, saline and suspended solids pen on both the surface and the seabed.	A dynamic behavior of the vertical structure of the water column is revealed where the presence of the mixture layer and possible stratifications are modulated by the action of important physical forces or forcing agents such as wind and predominant swell, which preferentially come from of the S-SW and W-SW, respectively. The salinity is shown almost homohaline, except for the autumn season when this superficial range fluctuated widely between 34.4 and 35.1 psu, and then decreased in gradient. The dissolved oxygen (DO) presents a significant oxygenation at the surface level, which then undergoes a sharp decrease as a function of depth up to 10-15 m (0% saturation). The levels of chlorophyll recorded in spring were indicative of a high water body productivity and were significantly higher than those obtained in summer. Quality of water is good. With regard to sediments, in the majority of the measurement stations and at the various depths analyzed, the results were the following: sediment particles (<0.1 ml/L) and suspended particles (<5.0 mg/L).

Hydrology	Watersheds corresponding to the Project components	The area is characterized by aridity, with high temperatures, low levels of rain and considerable evaporation rates. In relation to the hydrological characteristics of the study area, the absence of permanent watercourses stands out. The principal sub-basin is the Pampa de las Zorras y Salar Grande.
Hydrogeology	Project areas	The common characteristic is a low (Salar Grande and Pampa del Tamarugal) or null (underground corresponding to Jurassic-Cretaceous formations of plutonic and hypabyssal rocks composed of intrusive granite and impermeable basement, coast and part of the plateau) permeability, related to hydrological characteristics, the absence of permanent watercourses, and the climatological characteristics of high temperatures and low rainfall, which make this sector identified as very arid and desert. In the Project area there are no identified aquifers, which is a product of geological conditions or the absence of recharge in areas with low permeability and certain characteristics for underground storage.
Electromagnetic Fields	20 m each side of the line (total 40 m), defined mainly by the behavior of the electric field. In the case of radio interference, an area of influence of 10 meters on each side of the medium-voltage line is defined	Values measured in all locations are lower than regulatory limits and do not pose a health risk.
Geology and Geomorphology	50 meters area around the Project works	Underground Works Sector: The geomorphological units present in this sector are from west to east, Coastal Plains and Coastal Cliff. Surface Works Sector Costa: The geomorphological unit corresponds to the Litoral Plain. Plateau Sector: The geomorphological unit present in this sector is the Cordillera de la Costa.
Flora and Terrestrial Vegetation	Covers the areas of installation of works and development of Project activities	It is determined that there is a total absence of vegetation, corresponding to the definition of absolute desert. Special interest was placed on the search for oasis of fog and tilandsias, with no field evidence suggesting the presence of either.

Wildlife	Covers an area including a buffer of 500 meters around the Project works	Two main habitat types were identified for fauna: absolute desert and the coast. The majority of the species were found in the coastal sector. A total of 24 species were identified; birds were the most abundant and lizards were also found. Nine of the species present some category of conservation according to the current national legislation. Among them, the species <i>Phyllodactylus gerrhopygus</i> , <i>Phalacrocorax bouganvillii</i> , <i>Pelecanoides garnotii</i> and <i>Leucophaeus modestus</i> present categories that explicitly reflect a degree of threat. A site of interest was also recorded, corresponding to a presumed nesting area of the <i>oceanodroma markhami</i> (sea swallow) on a section of the North Access Road. Complementary information was presented in EIA Adenda 1 which included a report on the <i>oceanodroma markhami</i> requested by the Agriculture and Livestock Service, which analyzed the reproduction of this species within the Project area and implementation of two field campaigns. The presence of this potential habitat was not confirmed following the field campaigns.
Biological Oceanography	It will correspond to the maximum area determined by the dispersion limits of the thermal, saline and suspended solids pen on both the surface and the seabed.	The results of the baseline study indicate that the intertidal hard bottom Epibiota, as well as that of soft bottoms (sand) is consistent with conditions and ranges described in the bibliographic literature for this region. For the subtidal fundus epibiot, 6 different communities were identified, composed of 113 taxa. The specific richness registered in all the communities are superior to other places of ecological importance of the Chilean coast. Ichthyofauna: a total record of 17 taxa was obtained, where the most abundant were the bilagay (<i>Cheilodactylus variegatus</i>), the burrito (<i>Chromis crusma</i>) and the cabinza (<i>Isacia conceptionis</i>). Within the subtidal Macrofauna of sedimentary bottoms, there are local conditions of severe disturbance not attributable to anthropic action. During the campaigns of coastal vertebrates, 22 species were identified, some of them with conservation problems. The dominant phytoplankton taxa corresponded to <i>Chaetoceros</i> spp. and <i>Eucampia</i> sp. The diversity of zooplankton in the study area (eg species richness) was comparatively lower than in similar coastal areas of northern Chile.
Archaeology	Installation area of the Project works and for the linear works a buffer of at least 30 meters on each side	23 points of archaeological interest were identified which included: i) three traces of indeterminate record with no associated diagnostic material, probably historical, ii) a lithic set of average density identified as pre-Hispanic, and iii) four structures / milestones of subactual or indeterminate data, a historical graveyard of the nitrate era and platforms and track imprints from the old railroad. The remaining points correspond to landfills or accumulations of historical-subactual material, including the discovery of historical bottles and an accumulation of ore. No historical, anthropological or typical monuments are registered. The findings were distributed in the campsite (located in the coastal section), and in parts of the transmission line. During the evaluation process, additional field work was done, clarifying the distance of the findings from the Project, which in some cases was over 100 m and therefore outside of the area of influence.
Underwater Archaeology	Installation area for the intake and discharge works of the Project in	The research carried out concludes that no indicators of relevant findings were found for this component

	the submarine sector	
Paleontology	Determined by a buffer of 50 m around the Project works	<p>The presence of coastal deposits of fossiliferous material of the Holocene period, was detected in the camp area, in the coastal end of the access road and in specific points in the reservoir sector. These areas are characterized by strata with quaternary coquina in all areas (very abundant remains of potential future fossil invertebrates (in the fossilization process with different preservation qualities), in which the presence of bivalve and gastropod remains was observed.</p> <p>A complementary study was included in EIA Adenda 2 which evaluated the geological origin of the substrate in order to improve the focus on places with real fossil potential and discard areas with no potential. Remains of quaternary terrestrial gastropods of Gravas de Alta Hospicio were found on two levels. Additionally, the presence of fossil remains of Mesozoic marine invertebrates (corals and bivalves) was detected, over 100 m from the works.</p>
Landscape	Geographical space delimited by the visual basins of the potential observers of the Project	The character of the landscape is determined by the dominance of the abiotic attributes, specifically the geomorphological and soil elements. The landscape forms are stable and persistent so that there is no great singularity of landscape attributes. Anthropoc interventions are minimal, being mainly roads, power lines, substation and some villages, so the landscape retains its naturalness. The conditions of visibility vary enormously between the coastal sector and pampas sector.
Protected Areas	Sector where the Project works will be located within the boundaries of the identified protected area, the Pampa del Tamarugal National Reserve, where the Project transmission line will be connected to the Lagunas substation, which is located inside the Reserve in a non-vegetated area. The works include two structures and 400 m of transmission line.	The closest protected area corresponds to the Pampa del Tamarugal National Reserve, specifically in the Lagunas Substation sector which is located inside the Reserve. This reserve is a national plantation initiative to recover a deforested area in a desert environment and it has a surface area of 134,000 ha. The main importance of this Reserve is the presence of the Tamarugo tree which develops in an extremely arid environment feeding on groundwater.

Landuse	Covers an area including a buffer of 50 meters around the Project works	Within the evaluated area, 97% of the land area is unused, corresponding to a desert area without vegetation and with little to no anthropogenic development. The use of the remaining 3% of the surface area includes mainly residential use (houses in San Marcos and Río Seco), public areas corresponding to the road infrastructure (Route 5, Route 1, via A-750, A-752 and A-770), sanitary infrastructure (drinking water tanks) and energy infrastructure (electric transmission line and Lagunas substation) and finally cultural areas (ruins of the Bellavista saltpeter office transportation system and salt pools in Río Seco).
Tourism	Río Seco Cove and San Marcos Cove, both small fishing communities, correspond to the main tourist attractions of the area, while the main routes are Route 1, along the coast, and Route 5, inland	The tourist services that are developed in the region focus on the city of Iquique, the Humberstone and Santa Laura saltpeter mines, the Pica oasis, the Mamiña hot springs, the Altiplano salt flats and the Isluga Volcano National Park, all outside of the area of influence of the Project. In the Coastal sector, two tourist attractions are identified: San Marcos and Río Seco coves, although there are no tours or standard services since there are no sanitary permits due to lack of an authorized drinking water supply. In the Pampa Sector, the Pampa del Tamarugal Reserve is identified in the Lagunas Substation sector.
Economic and Productive Activities	San Marcos Cove	The major economic activities in the region are mining and fishing. Trade and services represent the tertiary activities with the highest incidence. Fishing in the region is both industrial and artisanal. San Marcos Cove located near the Project area is dedicated to the artisanal extraction of fish as well as mollusks and kelp. This cove also has two AMERB (Areas of Management and Exploitation of Benthic Resources) for the production and extraction of mollusks and kelp and an aquaculture concession. Of these, only one of the AMERBs is active and there is no aquaculture development in the Chomache Bay sector.
Infrastructure and Equipment	Those sections or sectors that will be intercepted by the Project and/or may affect vehicular flow. In this case, the area of influence of the Project is defined by the localities of San Marcos and Río Seco, the	The basic infrastructure and equipment is concentrated in the sectors of San Marcos, Río Seco and the Lagunas Substation. The main road infrastructure corresponds to Route 5 and Route 1, both national highways which are paved. The energy infrastructure is provided by the Lagunas Substation plus some electric transmission lines. Both the infrastructure and the equipment present in the area is rural, providing basic services for the population of San Marcos and Río Seco. Drinking water is delivered by tank trucks which come from Iquique.

	Lagunas Substation and Routes 5 and 1	
Human Settlements (pampa and plateau sector)	Sectors adjacent to Project works and activities, and development of economic activities and infrastructure	No human groups are identified, only economic activities linked to mining and transportation.
Human Settlements (coastal sector)	Sectors adjacent to Project works and activities, and development of economic activities and infrastructure	The coves of San Marcos and Río Seco are rural populated villages. They have access to public roads and regular public transportation, twice a day. There are squatter type dwellings and others which have been regularized. The large majority of the inhabitants live off of some activity linked to the sea (fishing, shellfish, and kelp gathering). Several social organizations are identified. A few indigenous individuals of different ethnicities were identified in San Marcos, which originated from different regions and without ancestral or cultural relations.

The figures below show the PSH plant site layout and photos of the reservoir site and Caleta San Marcos community.

Espejo de Tarapacá General Layout



Espejo de Tarapacá Reservoir Site



Caleta San Marcos View from Ocean



Caleta San Marcos Village



ii) Baseline: Cielos de Tarapacá Project – Photovoltaic Solar Plant Component

Component	Area of influence	Brief Description of Baseline
Climate and Meteorology	Project and surrounding area	The study area is located in the climatic subtype Normal Desert Climate, with average temperatures between 11 ° C and 18 ° C, with a considerable daily thermal variance and precipitation levels which do not exceed 0.0 mm in several months of the year, with an annual average of 1.3 mm. This, added to the scarce influence of masses of water coming from the coast, together with the absence of orographic rainfall, establishes the arid conditions in the area. Relative humidity undergoes important variations during the day and night, fluctuating between 10% and 30%, reaching 90% during the early morning hours. Wind also changes significantly between summer and winter months, from 4.2 m / s in summer and descending notoriously to 3 m / s during the winter period.
Air Quality	Project and surrounding area	Based on the records of the air quality monitoring stations Nueva Victoria, Victoria and Pozo Almonte, the average daily of the monitoring campaigns from 2003 to 2012 would be of the order of 28.3 µg / m ³ N, which would not exceed the regulated limit established as a primary air quality standard of 150 µg / m ³ N for MP10. Regarding particulate material MP2.5, although no monitoring data is recorded close to the project, the particulate material MP10 can be distinguished into a coarse fraction and a fine fraction, where the latter considers the particles smaller or equal to 2.5 microns called MP2.5 (N ° 59/1998), for which this compound would be represented by the records of the monitoring campaigns for MP10. Since approval of the project, there is only one new project with an environmental permit approved in the SEIA and 2 projects being processed which are close to the Cielos de Tarapacá project, but are located outside of the area of influence. Although they could potentially modify the baseline of Air Quality, given the characteristics of the projects (all of them are 9 MW photovoltaic plants), the impact would not be considerable enough to generate distinct impacts on air quality, other than those already evaluated.
Geology	Determined based on the location of the project works, the access road and the high voltage transmission line route	The geological units present in the Project area consist of Miocene-Quaternary (MQs), Upper Miocene-Pliocene (MP1c) and Pleistocene-Holocene (Qa), which correspond to successive sequences of a sedimentary and depository nature caused by the accumulation of materials in the sector, mainly generating strata and sand fills that make up extensive plains. The origin of the detected materials corresponds, in a general way, to deposits produced by the dragging of matter either by fluvial or lacustrine cause.
Geomorphology	Determined based on the location of the project works, the access road	The Project area is located on a regional scale in the Pampa del Tamarugal area, while on a local scale the geoforms on which it is based correspond to sedimentation glaciais and the Bellavista salt flats. In general terms, it should be noted that the terrain is homogeneous from a structural point of view

	and the high voltage transmission line route	since most of the Project area is made up of low gradient slopes with low erosion patterns.
Hydrology	Determined based on the location of the project works, the access road and the high voltage transmission line route	In the area under analysis, the dominant basins are of the Andean and pre-Andean type, with an endorheic character. In turn, the characteristic of these watercourses is that their regimes are sporadic and intermittent caused by rainfall in summer months due to the influence of the altiplanic winter generating the recharge of rivers and enabling the formation of surface runoffs. The main basin corresponds to the Pampa del Tamarugal, whose sub-basin and sub-sub-basin have the same name. The closest ravines are the Tarapacá Ravine, more than 2 km south of the Project area, and Los Tambos Ravine, more than 5 km north of it.
Edaphology	Determined based on the location of the project works, the access road and the high voltage transmission line route	The soil resource existing in the Project area is characterized in general soil that has limited changes in parental material due to low climatic intensity and remaining dry for long periods of years with very low vegetation cover. In addition, alluvial-colluvial deposits cover the surface, product of processes of deflation and wind corrosion, forming a stony pavement, constituted mainly by angular lithic fragments. It has fairly homogeneous soil characteristics, with a very narrow range of variation in its physical and morphological properties. The evolution or edaphological development is incipient and even non-existent, qualifying as a succession of layers of sediments, categorized as class VIII soil of use capacity, which indicates that the soil has no agricultural, livestock or forestry value, and its use is limited to wildlife, recreation or protection of hydrographic basins.
Natural Hazards	Project area	The analysis indicates that there is no risk of mass movements due to the existence of moderate to low slopes, added to conditions of mainly flat morphology and almost non-existent rainfall, which indicates the low probability of occurrences of this nature. Volcanic risk is also considered of low probability, based on the location of the Project and the inactivity recorded in the sector. The probability of seismic risk due to tectonic plates is higher, however the distance in relation to the coastline reduces the associated risk. In addition, the absence of geological faults in the project area results in low probability of seismic events from this origin.
Noise	Project and surrounding area	The main sources of noise detected at the time of the measurements correspond to vehicular traffic on Route 5 and noise produced by wind interaction. In function of the values obtained in the baseline studies, the maximum levels vary between 55 and 64 [dB(A)] for daytime and between 47 and 50 [dB(A)] for night-time.
Electromagnetic Fields	Project area	In the project area, the only existing transmission lines are located close to the Route 5 Highway and Lagunas Substation, which comply with current regulations.
Flora and Vegetation	Project area	In the Project area, two vegetation units were recognized, which correspond to: Pajonal de Baccharis juncea and No vegetation, the latter being the unit that covers almost the entire area of influence of the Project with 99.998%. Only one species (Baccharis juncea) of vascular flora native to Chile was identified during the trips

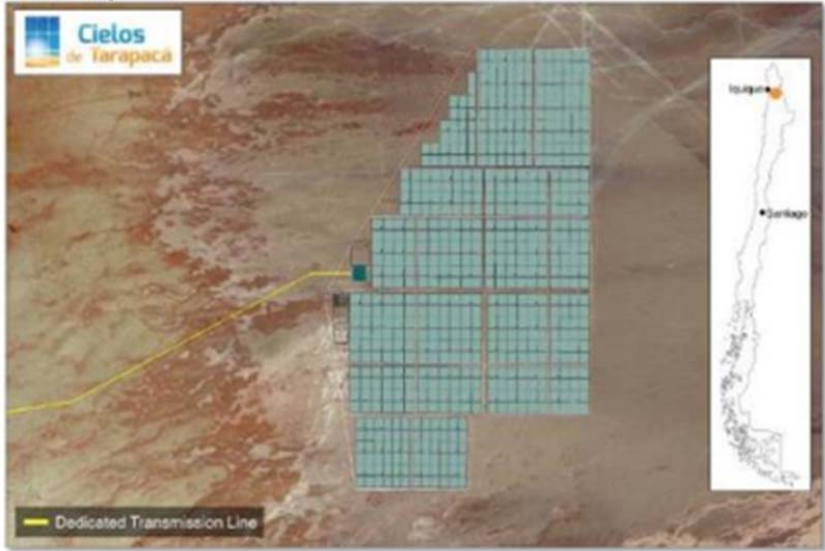
		<p>made in the area of influence of the Project.</p> <p>No conservation category is identified for this. In addition, intervention of the Pajonal de Baccahrís juncea is not subject to any of the regulations established by any current environmental regulations.</p>
Wildlife	Project area	<p>The results found in the baseline study are consistent with what is described in the literature, since the Project area corresponds to an absolute desert area with little presence of fauna. As for the origin and endemism of the species, three species are native to Chile, however, none of these species is endemic to Chile. In terms of conservation status, out of the four species registered in the study area, only one species has a national conservation category of low concern and is a Fox species (<i>Lycalopex</i> sp.) which was identified through footprints. This <i>Lycalopex</i> could be <i>griseus</i> or <i>cupuleus</i>. The other mammal species identified was <i>Rattus</i> sp. through skeletal rests, and could be <i>norvergicus</i> or <i>rattus</i>, both introduced not endemic. In the area of influence of the Project, four species of terrestrial vertebrates were recorded, corresponding to two species of birds and two species of mammals, with low or no conservation concern.</p> <p>With respect to abundance, low species abundances were recorded in the Project area. In this sense, the most abundant taxonomic class was birds, of which 9 individuals corresponding to two species of birds and <i>Cathartes aura</i> (Red-necked Dormilona and Red-headed Jote) were recorded in only one sampling station, without endangered classification at local level.</p>
Human Environment	Project and surrounding area	<p>As there are no human settlements in the footprint area of the Project, the area of influence was defined according to the possible impacts on the cultural and identity roots of human settlements located close to the Project. These human settlements correspond to the towns of Victoria and Colonia de Pintados, which are located approximately 8.5 km and 9 km, respectively, from the Project.</p> <p>Colonia de Pintados has an elementary school, shops, a main church and entertainment, such as a swimming pool and children's playground. It has a transportation system that passes three times a week providing transportations to Pozo Almonte and Pica and also has access to water and electricity, but no sewage. Economic activity in Colonia de Pintados is oriented towards the production of fruit and vegetables for localities in the north and livestock for self-consumption. There are some indigenous people in Colonia de Pintados who do not maintain traditional activities linked to ethnic groups in a collective manner.</p> <p>Victoria is a small town adjacent to Route 5, located on the southern boundary of the district of Pozo Almonte, originally inhabited by people who previously belonged to the Victoria saltpeter activity. Economic activity in this locality focuses on the delivery of food, lodging, and fuel services to the workers of companies that operate in the zone, principally mining companies.</p>
Cultural Heritage	Project area	<p>The area where the Project will be located, corresponds to a semi-plane terrain, associated with bounded depressions and small natural mounds, interspersed with thin layers of salt with abundant chusca (moon dust). The results of the baseline archaeological study identified 85 cultural elements, between pre-Hispanic (n = 11) and historical (n = 74), which detected in the two macro-sectors of the project, represented operationally by the photovoltaic plant and high voltage transmission line. A subset of the elements collected was sent to the Iquique Regional Historical Museum.</p>

		<p>In the PV plant area, the historical evidence corresponds to eight isolated findings and 54 linear features. The isolated findings are represented by remains of historical rubbish, represented essentially by metal containers adapted for cooking, bottle fragments, and carcasses of domestic animals. These contexts are associated with linear features, with traces of the passage of wagons, paths related to pedestrian traffic, and cattle driver tracks, linked to the transfer of livestock.</p> <p>In the transmission line area, Pre-Hispanic and historical evidence was recorded. The first correspond to lithic dispersions, predominantly of andesite waste, represented by flakes, a projectile tip fragment and a possible scraper. In four of these elements, historical evidence is also recorded, thus marking a two-component condition. The historical evidence corresponds to five sites, two isolated findings and five linear features. The first corresponds to historical remains from productive and domestic activities, probably associated with nitrate offices. Within the linear features are traces of cart, rail and telegraph lines, which would also be associated with nitrate activity.</p>
Landscape and Scenic Resources	Geographical space delimited by the visual basins of the potential observers of the Project	The local landscape is a desert landscape matrix characterized by vast areas without landuse activity, combined with certain distant areas of human settlements (for example, the oasis of Pica-Matilla), mining activities (exploitation of caliche), road and electric transmission infrastructure and sectors of cultural and natural value (historic saltpeter offices, natural reserves and archaeological sites). The landscape presents a low visual quality principally due to the following conditions: presence of low slopes; moderate chromatic contrast; absence of distinguishing singularities.
Protected Areas and Priority Sites	Sector where the Project works will be located within the boundaries of the identified protected area, the Pampa del Tamarugal National Reserve, where the Project transmission line will be connected to the Lagunas substation, which is located inside the Reserve in a non-vegetated area.	<p>The photovoltaic plant is located immediately adjacent to the eastern limit of the Pampa del Tamarugal National Reserve, a locally protected area for conservation. The Project's high voltage line also crosses the Reserve in a sector where the soil corresponds to salt flats. In Adenda 1, based on comments received from the environmental authority requesting modifications in the transmission line route and construction of an internal road that separates the solar park from the Reserve to limit potential impacts, the Project presented the requested modifications in Adenda 1, which were later approved.</p> <p>The nearest locally designated biodiversity priority site is located 52 km away and corresponds to the "Punta Patache" coastal site.</p>
Tourist Attractions	Project and surrounding area	The Project area is located within the Priority Tourist Area (ATP) "Salitreras y Oasis de Tarapacá", which does not include an official protection area, but does correspond to an area with homogeneous characteristics, inasmuch as it is considered as a zone within the Pampa del

		<p>Tamarugal that in the past housed human settlements dedicated to mining, specifically saltpeter extraction, generating a previous urban industrial complex in this region of the country. The district territory of Pozo Almonte presents tourist attractions related mainly to the natural and scenic resources (Salt Flats), historical (Painted Geoglyphs) and cultural heritage (Saltpeter Offices). Two regional tourist attractions are located close to the Project area; the agricultural oasis Colonia de Pintados and the Bellavista Salt Flats located more than 2.2 km north of the Project.</p>
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The figures below show the PV plant layout and site photo.

**Cielos de Tarapacá Site Layout
Station)**



**Cielos de Tarapacá Site Photo (Monitoring
Station)**



B. Environmental and Social Management System (ESMS)

The ESMS is a dynamic and continuous process initiated and supported by management, and involves engagement between all the Project stakeholders, (including local communities close to the Project). Drawing on the elements of the established business management process of "plan, do, check, and act," the ESMS entails a methodological approach to managing environmental and social risks, in structured and ongoing manner. A good ESMS appropriate to the nature and scale of a project will promote sound and sustainable environmental and social performance, and can lead to improved financial, social, and environmental outcomes.

This document summarizes the activities, measures and plans to be carried out for the implementation of social and environmental safeguards for the two plant components of the Project, as a commitment to compliance with the Green Climate Fund's standards in accordance with the eight performance standards (PS) set forth by the International Finance Corporation⁸ (IFC) and the national E&S regulatory framework. In this sense, the ESMS is presented as a commitment by Project management for implementation of the policies within the proposed timeline, as well as the procedures and plans necessary for ensuring environmental and social safeguards.

The table below summarizes the social and environmental performance standards considered for the development of the risk management system.

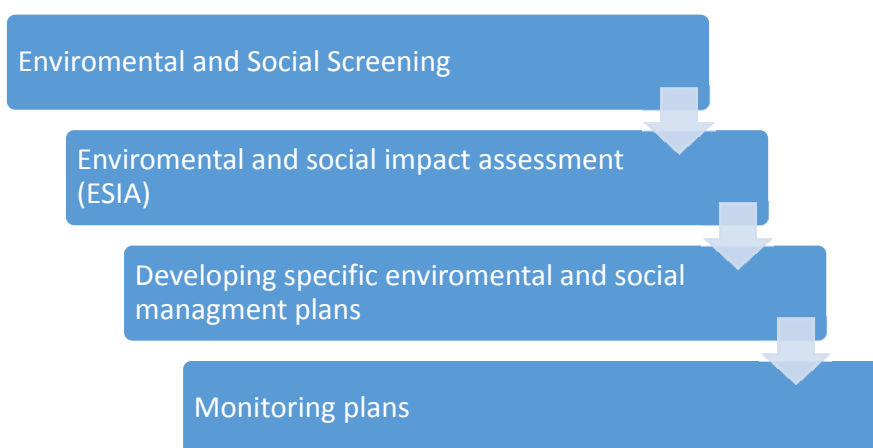
IFC Performance Standards (PS)
Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
Performance Standard 2: Labor and Working Conditions
Performance Standard 3: Resource Efficiency and Pollution Prevention
Performance Standard 4: Community Health, Safety, and Security
Performance Standard 5: Land Acquisition and Involuntary Resettlement
Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
Performance Standard 7: Indigenous Peoples
Performance Standard 8: Cultural Heritage

In addition, the ESMS establishes that to ensure compliance of its measures and plans, the Project will continue to include the Environmental & Social Management Unit (ESMU) within management's organizational structure. This unit has had a high incidence level within the organization and is linked to the direction of the Project in order to report and be part of decision-making regarding conservation mechanisms, resource protection, environmental planning and community engagement. In addition, Project management and the ESMU will continue to coordinate with the competent environmental authorities in the region.

⁸ Performance Standards (PS) on Environmental and Social Sustainability, https://www.ifc.org/wps/wcm/connect/c8f524004a73daeca09afdf998895a12/IFC_Performance_Standards.pdf?MOD=AJPERES

1. Objective

The objective of the ESMS is to ensure compliance with environmental and social safeguards in all stages of the Project. This will require the application of a set of methodological steps or best practices, starting with pre-evaluation of environmental and social risks and implementation of monitoring plans, in order to achieve compliance with both the national regulatory framework and IFC's performance standards. The overall process is described in a flowchart below.



The following sections describe what needs to be done in terms of environmental and social management at each stage of the overall lifecycle: Project identification, preparation, appraisal, implementation, and completion.

2. Environmental and Social Screening and Scoping

IFC PS 1 establishes the importance of managing environmental and social performance throughout the life of a project. As a result, the first key element in implementing an effective ESMS is identification of risks.

Prior to the risk identification process, the ESMS requires a pre-evaluation or screening of the project for environmental and social potential impacts, including climate change adaptation and mitigation measures, and the vulnerability of populations and their livelihoods, to determine the specific type and level of environmental and social assessment required.

The social and environmental pre-evaluation for the Project, has been developed considering the nature and scale of the potential risks. In this sense, it has been determined that the risk category will be proportional to the:

- a) Nature, scale and location of the Project;
- b) Environmental and social risks; and
- c) Sensitivity of receiving environments and communities.

In Chile, a robust regulatory framework exists with regard to identification and management of social and environmental risks. Law 19,300 of the General Environment Rules (LBGMA, based on its initials in Spanish), establishes that the projects or activities indicated therein, and specified in the Regulation, may only be executed or modified after evaluation of their social and environmental impact. In addition, the law establishes that the environmental character of all permits or declarations issued in the country should be analyzed and resolved through the SEIA. It should be noted that the Equator Principles deems Chile to have robust environmental and social governance, legislation systems and institutional capacity designed to protect its people and the natural environment.⁹

The SEIA represents the main instrument for preventing social and environmental deterioration. The SEIA works as a technical evaluator which verifies the inclusion of the environmental and social dimension in the design and execution of the projects and activities carried out in the country. The SEIA evaluates and certifies initiatives, both from the public sector and private sector, verifying that they comply with the applicable environmental requirements.

The following table summarizes the projects that must be submitted to the SEIA, in accordance with Article 3 of the Regulation:

Letter	Description
a)	Aqueducts, reservoirs or dams and siphons that must be subject to the authorization established in article 294 of the Water Code. Dams, drainage, desiccation, dredging, defenses or alteration, significant, of bodies or natural water courses
b)	High voltage electrical transmission lines and their substations.
c)	Power generation plants greater than 3 MW.
d)	Nuclear reactors and facilities and related facilities.
e)	Airports, bus terminals, trucks and railways, railways, service stations, highways and public roads that may affect protected areas.
f)	Ports, navigation routes, shipyards and maritime terminals.
g)	Urban or tourism development projects, in areas not included in any of the plans referred to in the bill
h)	Regional plans for urban development, intercommunal plans, communal regulatory plans and sectional plans
i)	Mining development projects, including coal, oil and gas projects, including prospecting, exploitation, processing plants and disposal of waste and sterile. Industrial extraction of aggregates, peat or clay
j)	Oil pipelines, gas pipelines, mining pipelines or other similar
k)	Manufacturing facilities, such as metallurgical, chemical, textile, production of materials for construction, equipment and metal products and tanneries, industrial dimensions
l)	Agro-industries, slaughterhouses, nurseries and stables for breeding, dairy and fattening of animals, of industrial dimensions.

⁹ <https://equator-principles.com/designated-countries/#>

m)	Forestry development or exploitation projects in fragile soils, in lands covered with native forest, pulp industries, pulp and paper, chippers, wood processing plants and sawmills, all of industrial dimensions
n)	Projects of intensive exploitation, cultivation, and processing of hydro biological resources.
o)	Environmental sanitation projects, such as sewage and potable water systems, treatment plants for water or solid waste from homes, sanitary landfills, underwater outfalls, treatment systems and disposal of liquid or solid industrial waste.
p)	Execution of works, programs or activities in national parks, national reserves, natural monuments, reserves of virgin areas, sanctuaries of nature, marine parks, and marine reserves or in any other area placed under official protection, in cases in which the respective legislation allows Item.
q)	Massive application of chemical products in urban areas or rural areas near population centers or courses or bodies of water that may be affected.
r)	Hunting grounds
s)	Works that are granted to build and exploit the subsoil of national public goods

In accordance with the regulatory framework, if the project or activity needs to be submitted to the SEIA (as identified in the list in Article 3 above), or if it voluntarily decides to do so, the owner of said project or activity must submit an Environmental Impact Statement (DIA based on its initials in Spanish) or an EIA to the authority. An EIA is a much more robust analysis and report and it requires a detailed social and environmental assessment.

In this case, the screening for the Project determined that both projects would be required enter the SEIA based on: Law N°19.300, Article 8 and 10 letters b) high voltage electrical transmission lines and their substations, c) power generating plants greater than 3 MW and p), and Supreme Decree N° 40/2012 of the Ministry of the Environment, Article 3 letters b), c) and p) execution of works, programs or activities in or near national reserves. In addition, it was determined that the provisions of the LBGMA Article 6, letter b) of the SEIA Regulation also apply, since the Project could generate or present effects, characteristics or circumstances that could result in significant adverse effects on the quantity and quality of renewable natural resources, including soil, water and air.

Based on the screening process for the Project, the scope of the environmental studies and timeframe required for obtaining the regulatory approvals was identified. In order to fully and thoroughly comply with the national requirements, both plant projects elected to develop EIAs, with the objective of identifying and categorizing social and environmental risks that would allow for the design and development of plans and measures for control, mitigation or compensation of risks as applicable in each case. The submission and compliance with the EIA process allowed the Project to obtain environmental permits denominated RCAs for each plant component. The RCAs are administrative tools which authorize the execution of the projects as long as they fulfil the specific technical requirements and continuous monitoring processes required.

3. Environmental Impact Assessments (EIAs)

In accordance with the previous stage, in Chile, the EIA is the tool required to ensure that environmental and social aspects are considered during decision making by influencing the design to avoid/minimize, and where unavoidable mitigate the residual adverse impacts and/or enhance positive impacts. It also provides a platform for receiving feedback from stakeholders including the directly affected population for potential improvement of design.

Equivalency has been established between the performance standards, to be specific, Operational Safeguard 1: Environmental and social assessment, with those of the national Chilean regulation. The required contents for the EIA are established in Chile's General Environmental Rules, Law 19,300, and its technical regulation, Supreme Decree No 40. The minimum content required is summarized below.

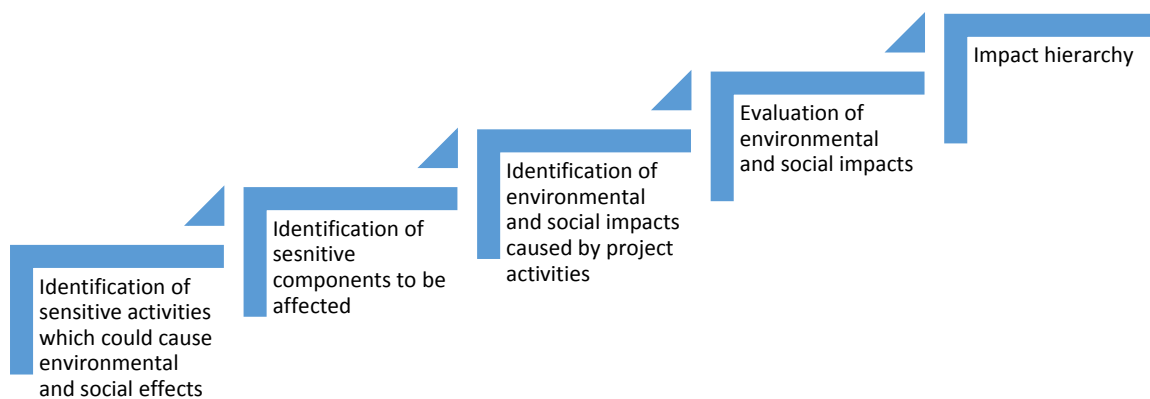
Letter	Description
a)	An index that lists the chapters, tables, figures, plans, cartography and annexes of the EIA
b)	A summary of the EIA of less than 30 pages and that contains the basic background of letters c), d), e), f), g), h) if applicable, i), j), k), l) and m) of the present article.
c)	A description of the project or activity (ex. identification of the owner and its parent company, general background)
d)	The determination and justification of the area of influence of the project or activity, including a general description of it. The area of influence will be defined and justified for each affected element of the environment, taking into consideration the potentially significant environmental impacts on them, as well as the geographical space in which the parts, works and / or actions of the project activity are located.
e)	The baseline, which must describe in detail the area of the influence of the project or activity, in order to proceed to the evaluation of the elements of the environment. (ex. physical environment, terrestrial ecosystems).
f)	A prediction and evaluation of the environmental impact of the project or activity.
g)	A detailed description of those effects, characteristics or circumstances of Article 11 of the Law that give rise to the need to prepare an EIA
h)	When the project or activity must submit an EIA for generating a risk to the health of the population referred to in letter a) of Article 11 of the Law, and there is no Primary Quality or Emission Standard in Chile or in the Reference States indicated in Article 11 of this Regulation, the proponent must consider a specific chapter regarding the potential risks that the project or activity could generate in the health of the people.
i)	A Mitigation, Repair and Compensation Measures Plan that will describe and justify the measures that will be taken to eliminate, minimize, repair, restore or compensate the adverse environmental effects of the project or activity described in letter g) of this article.
j)	A Contingency and Emergency Prevention Plan associated with the eventual risk or contingency situations identified.
k)	A Monitoring Plan for the relevant Environmental Variables.
l)	The compliance plan of the applicable environmental legislation.
m)	The description of the content of those voluntary environmental commitments, that the owner of the project or activity contemplates carrying out, with the precise indication of the place and time they will be verified, as well as compliance indicators, if applicable
n)	A record in which are summarized, for each phase of the project or activity, the contents referred to in letters c), f), g), i), j), k), l) and m) of this article.
o)	The description of the actions carried out prior to the presentation of the EIA.
p)	An appendix of the EIA that will include, as appropriate, all the documented information that will support the understanding of the Study.

The next step requires development of the EIA in accordance with the results of screening and pre-evaluation of the Project and based on the EIA requirements previously described.

In this sense, as mentioned above the Project individually submitted EIAs to the SEIA for the PSH and PV plants with the objective of identifying and categorizing the main social and environmental risks present throughout the projects lifecycles.

4. Impacts of the Espejo de Tarapacá Project

The EIA is carried out through a sequence of methodological steps that allow for identification of social and environmental generated impacts which are then ranked, as described in the flowchart below.



For the Project, the impacts associated with the physical environment, biotic environment, cultural heritage, landscape, protected areas and priority sites, and human environment have been evaluated, for which the assessment has identified and prioritized those considered highly significant. Based on this evaluation of social and environmental impacts, it was determined that the Project would generate "significant" negative impacts associated with the components of terrestrial fauna, and archaeological and paleontological heritage as outlined in the table below. It is important to note that the evaluation determined that the Project does not have cumulative and/or synergistic effects with analyzed activities in the area, given the characteristics in terms of emissions and residues and the distances from the Project.

The table below summarizes the significant residual impacts after the application of avoidance and reduction measures to the impacts identified in the respective EIA during the evaluation phase. It should be noted that mitigation, monitoring and compensation measures have been specified and approved for these impacts as part of the EIA processes as explained in more detail in Sections 8, 9 and 12 of this document.

i) Significant Impacts: Espejo de Tarapacá Project – Pumped Storage Hydro Plant Component

Social Environmental factor	Project stage	Impact	Description
<p>Nesting Area of <i>Oceanodroma Markhami</i> (sea swallow)</p>	<p>Construction</p>	<p>Negative Significant: Impact of nesting area</p>	<p>During the original EIA evaluation process, a presumed nesting area of the <i>oceanodroma markhami</i> (sea swallow) was identified in a coastal section of the northern access road. This species is present along the Humboldt Current on the coasts between Mexico and Chile. At a national level in Chile, this swallow is ranked as “data deficient”. The finding was originally interpreted as negative and significant due to the fragility of the species and the general importance of nesting places.</p> <p>Nevertheless, in response to the specific baseline study requested by the environment authority, complementary information was presented by The Project in EIA Adenda 1, including a report on the <i>oceanodroma markhami</i> which analyzed the reproduction of this species within the Project area with the performance of 2 field campaigns.</p> <p>It was determined that the original findings were misleading and the inexistence of an <i>oceanodroma markhami</i> nesting area was confirmed, both on the northern access road and in other Project areas. As a result, this impact was discarded during the EIA evaluation process.</p> <p>The Project voluntarily offered to perform a preventive field inspection prior to construction of the specific section of the access road to re-confirm the absence of the <i>oceanodroma markhami</i> in Project sectors.</p>

<p>Supply and Demand of Basic Services</p>	<p>Operation</p>	<p>Positive Significant: Impact on basic services present in the area of influence</p>	<p>The analysis of the potential impact on the supply and demand of basic services was made in the area of influence of the Project, corresponding to the Coastal sector villages of San Marcos Cove and Río Seco Cove. In the construction stage, the actions of the Project that could cause impacts are the hiring of temporary labor, installation of work and camps, transport of materials, and construction and improvement of access roads. In the construction stage, the impact was determined to be of low significance since the services for the construction workers will be provided by different suppliers, to intentionally avoid interfering with existing services.</p> <p>During the operation phase, the activities that may generate the impact include the maintenance of roads and the operation of the PSH plant. However, this stage will require significantly less of workers.</p> <p>Given that the community agreement executed with San Marcos requires the Project to supply the village with drinking water from its desalinization plant, the impact on basic services was determine be positive and significant. The supply of water will start during the construction phase and continue throughout the operational phase. It should be noted that after the EIA was submitted and the RCA was approved, the Project also entered into a community agreement for the supply of drinking water from the Project's desalination plant to the Río Seco Rural Water Council which will also will start during the construction phase and continue throughout the operational phase.</p>
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<p>Paleontological Heritage</p>	<p>Construction</p>	<p>Negative Significant: Impact of partial intervention of fossil levels</p>	<p>Given that the Law of National Monuments (Law 17,288) protects fossils and places where they are found and that their affectation is irreversible, the environmental assessment of this factor was determined as high. However, none of the fossiliferous geological units are exclusive of the recognized sites in the Project's area of influence.</p> <p>During the construction phase, all the effects are caused by the activities related to the intervention of the surface (removal of earth or surface construction) in clearly identified coastal sectors. Additional studies and geological analysis developed during the evaluation process discarded fossil potential at depth (excavations) in the Project area.</p> <p>The coastal sites contain fossiliferous material of the Holocene period visible on the surface, and will be intervened directly by works related to land preparation for Project roads and the camp site. However, most of the fossiliferous levels that appear in these sites are of great extension on the coastline of northern Chile and it has been corroborated that the works do not affect the totality of the outcrops of these fossiliferous materials which are also found along kilometers from the area of influence of the Project.</p>
<p>Archaeological Heritage</p>	<p>Construction</p>	<p>Negative Significant: Impact of intervention of archaeological sites</p>	<p>This impact is related to intervention in isolated findings, linear tracks and one site during construction activities of the Project. This impact has been assessed as negative and significant, given that in accordance with Chilean law, all archaeological findings are determined to be significant regardless of their quality and quantity.</p>
<p>Species of Fauna in Conservation Category</p>	<p>Construction</p>	<p>Negative Significant: Impact of loss of specimens of the reptile group</p>	<p>The loss of individuals lizard specimens of <i>liolaemus stolzmanni</i> (IUCN status endangered) and <i>phyllodactylus gerrhopygus</i> (IUCN status least concern) could occur during the construction phase, due to Project activities that involve land preparation, transfer, construction and assembly of structures and removal of facilities. Additionally, potential losses could occur during the operation phase, due to the transit of vehicles intended for maintenance and transportation of personnel and during the closing phase due to Project activities that involve the movement of land and removal of facilities.</p> <p>This impact has been evaluated as negative and significant for the construction phase, specifically in initial soil preparation and movement activities, while for the operation and closure phases, the impact has been evaluated as negative and of low significance given the minor intensity of the activities to be carried on the ground.</p>

ii) Significant Impacts: Cielos de Tarapacá Project – Photovoltaic Solar Plant Component

Social Environmental factor	Project stage	Impact	Description
Archaeological Heritage	Construction	Negative Significant: Impact of intervention and/or loss of elements that define each archaeological site	This impact is related to affectation or loss of elements from archaeological sites or isolated archaeological findings during the construction period as a result surface removal and soil preparation works due to excavation and the transit of machinery, people and vehicles. This impact has been assessed as negative and significant, given that in accordance with Chilean law, all archaeological findings are determined to be significant regardless of their quality and quantity.

5. Determination of EIA Impacts

Conclusion of the impact analysis for both plants, confirmed the need to submit EIAs (as opposed to DIAs) to the SEIA. With regard to the PSH plant component, key issues related to in letter b) of Article 3 of Law 19,300 due to potential intervention in of nesting sites of the sea swallow and loss of specimens from the reptile group. In addition, letter f) of Article 11 of the LBGMA and Article 10, literal a) of the SEIA Regulation were also determined to be important, considering that construction of the PSH plant will generate intervention in archaeological sites in the Coastal and Plateau sectors. However, as mentioned above, the potential impact on the sea swallow was discarded after additional studies and field campaigns requested by the environmental authorities were conducted during the evaluation process.

With regard to the PV plant component, upon conclusion of the analysis, the decision to submit an EIA was confirmed based in part on Article 10 of Law 19,300 and Law 20,417 and Article 3 of Law 19,300 related to generation plants of greater than 3 MW. This decision also considered literal b) of Article 10 of Law 19,300 and Article 3 of D.S. 40/2013 MMA, given that the PV plant includes high voltage electrical transmission lines and substations.

Finally, considering that the development of both components of the Project will require the construction and improvement of access roads and construction of a high voltage transmission line and that such works will introduce elements of anthropic origin, including roads and structures (towers) in a portion of the Pampa del Tamarugal National Reserve, it was confirmed that the Project also needs to appropriately consider and address letter p) of Article 3 of Law 19,300 which relates to execution of works, programs or activities in national parks, national reserves, natural monuments, reserves of virgin areas, sanctuaries of nature, marine parks, marine reserves or in any other areas placed under official protection.

6. Environmental Qualification Resolution (RCA)

In accordance with the procedures established by Law 19,300, after an EIA is submitted to the SEIA, the authority evaluates the study to verify the application of the correct methodology, as well as the appropriateness and completeness of the proposed measures with respect to the impacts identified. The SEIA's decision with regard to the EIA may be positive or negative and is communicated upon conclusion of the process by an Environmental Qualification Resolution or RCA.

The PSH and PV components of the Project were both granted favorable RCAs under exempt resolutions No 00082¹⁰ and 00005¹¹, respectively. The environmental permits for both plants were unanimously approved by authorities without objection from any stakeholders. In addition, the RCAs certify that the Project complies with applicable environmental regulations. Given that all the significant impacts identified in the EIAs were addressed appropriately, as certified by the RCAs, and that these impacts are of a

¹⁰ http://seia.sea.gob.cl/archivos/2015/12/11/RCA_completa.pdf

¹¹ http://seia.sea.gob.cl/archivos/2016/02/05/RCA_05_CdT.pdf

reversible nature with the application of the approved mitigation and/or compensation measures, the Project is expected to be categorized as a Category A or B project based on the GCF definition for Category A and B project risk, which specifies:

“...Category B. Activities with potential limited adverse environmental and/or social risks and impacts that individually or cumulatively, are few, generally site-specific, largely reversible, and readily addressed through mitigation measure...”

7. Community Engagement

As mentioned above, Chilean SEIA regulations require implementation of a mandatory public participation process as part of all EIA processes. This process is organized by the SEA and anyone from the public can present questions or observations, at the SEA's office, on the SEA's web page or during the scheduled public meetings. At the public meetings, the project company makes a descriptive presentation of the Project and its environmental consultant presents the EIA. The questions from the public related to the Project and the environmental components detailed in the regulation are received by the SEA and the Project has to answer each question in a formal document which is registered in the EIA process. The answers are publicly available at the SEA's office and published on its website. Participation in this process enables any person to present an administrative appeal requesting consideration of specific issues and questions in the final approval conditions for the environmental permit. The Project fully complied with the mandatory public participation processes within the EIAs for both plant components. As summarized below, the Project's community engagement activities, particularly for the PSH plant which is located close to the San Marcos Cove, extend beyond the legal EIA process requirements.

The Project has prioritized the establishment of an early and transparent relationship with the local community. The Project's PSH plant is located approximately 100 km south of Iquique, adjacent to the San Marcos fishing village with a population of around 300 inhabitants. Most of the economic activities in the village are related to the ocean, primarily fishing, and as a result, the community's principal concern relates to a potential impact from the Project on their livelihood. Interaction with the San Marcos community was initiated in 2012, approximately 2 years prior to submission of the environmental permit for the PSH plant, in order to address community concerns in early development.

In 2012, initial contact with community representatives from San Marcos was made by Valhalla's founders, who explained the Project and expressed their desire to establish an open dialogue with the community and involve them throughout project development, by identifying and addressing concerns and finding opportunities for mutual collaboration. Valhalla also engaged external local and international advisors to assist in the community engagement process, including the Consensus Building Institute, in order to help design and facilitate a collaborative and interactive process. In early 2013, three open meetings were held with the community and a separate meeting was conducted with the local fisherman's union. During these meetings the team presented the Project and listened to the concerns of community members. In October 2013, the team organized face to face visits to every house in San Marcos in order to introduce the Project on a more personal level.

Upon commencement of the environmental studies, Valhalla established and implemented a formal work methodology with San Marcos, which included joint working table sessions (*mesas de trabajo*). One of the outcomes of these sessions was the creation of a special commission focused on addressing issues related to ocean studies and impacts. By August 2014, more than 20 meetings had been held resulting in a series of measures taken by the Project development team, including improved communication lines with community representatives, joint visits to existing power plants, and the hiring of a special technical consultant and attorney to support the community with its analysis of the EIA and eventual negotiation of the collaboration agreements.

In March 2015, individual collaboration agreements were executed with the Neighborhood Council (*Junta de Vecinos*) and the Fishermen's Union of San Marcos (*Sindicato de Pescadores*) to govern the interaction with the community during development, construction and operation of the Project. In April 2016, the Company signed similar agreements with the Kelp Gatherers' Union (*algueros*) and in October 2016, with three community organizations from Caleta Rio Seco, a second fishing village located close to some of the PSH plant's minor works (access road). As explained previously, one of the significant positive impacts of the Project on local basic services is the future supply of drinking water from its desalinization plant to San Marcos and Rio Seco as agreed in the community agreements executed with organizations from both villages.

The agreement with the San Marcos organizations specifically addresses one of the community's principal concerns, potential damage to the ocean caused by the Project which could affect their livelihood. The agreement establishes that in the event that the Project is sanctioned for damage to the marine ecosystem by environmental authorities, the Project will be required to pay for experts to evaluate and determine the potential damage and associated compensation in an arbitration proceeding. The experts would be selected jointly by the community and the Project.

The Project's commitment to establishing a sustainable, transparent and mutually collaborative relationship with the community has helped build a trustworthy relationship which was fundamental in addressing difficult issues and reaching constructive agreements. The Project continues to actively participate in the community. More detailed information on the Project's community engagement process in San Marcos, including a historical report and video documental process by the Consensus Building Institute has been included in the Gender Action Plan which is included as an Annex to the Project's Funding Proposal presented to the Green Climate Fund.

With regard to community engagement surrounding the PV plant site, Valhalla initiated contact with the communities in the site area in August 2014, approximately six months prior to submission of the EIA for the PV plant. The closest communities are over 8 km from the Project site. The agricultural village, Colonia de Pintados, is located approximately 9 km north of the site and Victoria, a small settlement, is approximately 8.5 km west of the site. Meetings with both communities were held prior the presentation of the EIA, in addition to the community participation meetings held later as part of the EIA process. Despite the distance between the site and the communities, the Project will also explore ways to support local development in these communities, which are particularly interested in taking advantage of potential opportunities during the construction period.

8. Significant Impact Mitigation Measures Action Plan

The table below summarizes the key mitigation measures approved in the RCAs for the significant social and environmental impacts identified during the evaluation period. Other impacts of lesser significance that also require mitigation measures in accordance with local regulations in Chile which are detailed in Sections 9 and 12 below. A comparative analysis of the operational safeguards in accordance with Chilean environmental regulations is also presented in the Section 11 of this ESMF.

i) Mitigation Measures Action Plan: Espejo de Tarapacá Project – Pumped Storage Hydro Plant Component

Impact	Mitigation Measures
Affectation of the nesting area of <i>Oceanodroma markhami</i>	This impact was discarded during the EIA evaluation process with additional field campaigns which confirmed that there is no <i>Oceanodroma markhami</i> nesting area in the north access road area, nor in any of the other Project sectors. The Project will voluntarily monitor its intervention by performing preventive field inspection and micro-routing prior to construction of the specific section of the access road to re-confirm the absence of <i>Oceanodroma markhami</i> in the Project sectors.
Reduction of species from the reptile group	<p>Rescue and relocation plan for the species <i>Liolaemus stolzmanni</i> and <i>Phyllodactylus gerrhopygus</i>, moving them from the reservoir area to an area not intervened by the Project in order to avoid reduction and deterioration of the species. The plan will be implemented by area prior to the start of construction in each area.</p> <p>The Project must apply for a capture permit with the applicable agency.</p> <p>The Project is required to notify authorities prior to starting the rescue and relocation plan.</p>
Intervention of archeological material	<p>Archeological findings will be identified with signs. Vertical signs will be installed which provide information about the finding, including identification and a warning about its legal protection.</p> <p>The Archeological Management Plan includes:</p> <ol style="list-style-type: none"> 1) Site on Camp; rescue and analysis of scattered materials, before construction. 2) Site on Camp, the isolation of any area identified as more sensitive and no intervention at all. 3) Other isolated findings: rescue and analysis 4) Lineal tracks: topography and description of the track 1 km further, on each end of the area to be intervened. <p>The rescue of findings will be implemented by specialists and the material will be delivered to the regional museum, in accordance with the decision of the Council of National Monuments (CMN).</p> <p>Permanent archeological monitoring, an archeological</p>

	specialist will be available during the entire construction phase of the Project.
	Training in the care of cultural heritage through induction and educational talks on the archaeological findings present in the Project area and their due protection, to all those who enter the work areas for the first time.
Intervention of paleontological material	The paleontological rescue plan will be carried out before the start of the execution of the construction works, including the collection of significant samples by specialists, with the respective geographical and stratigraphic positioning, curing of the paleontological samples collected in the laboratory, preparation of a catalogue of samples and their addition to the collection or museum indicated by the CMN.
	Training in the care of cultural heritage through induction and educational talks to promote the valuation of paleontological heritage to all those who enter the work areas for the first time.

ii) **Mitigation Measures Action Plan: Cielos de Tarapacá Project – Photovoltaic Solar Component**

Impact	Mitigation Measures
Intervention of archeological material	Prior to start of construction, team of archeologists and surveyors will perform survey of area registering conditions and elements with photos and videos
	Archeological findings will be collected and analyzed, identifying location coordinates and protecting the area from intervention with signs. Collection of findings will be implemented by specialists and the material will be delivered to the regional museum, in accordance with the decision of the Council of National Monuments (CMN).
	Training in the care of cultural heritage through induction and educational talks on the archaeological findings present in the Project area and their due protection, to all those who enter the work areas for the first time.

9. Voluntary Measures: Monitoring of Relevant Variables

The Project proposed voluntary measures aimed at monitoring the evolution of relevant environmental variables, which, without being declared significant, warrant follow-up in order to verify that they evolve as expected. In the case of the PSH plant component, these largely correspond to the marine environment variables listed below which will be monitored during both construction and operation phases. The PSH plant also proposed monitoring of water quality in the reservoir and the meteorological conditions of the sites.

- Water quality component: Construction and operation stages;
- Component quality of subtidal sediment: Construction stage;
- Component quality of intertidal sediment: Construction stage;
- Benthic communities: Construction and operation stages;
- Planktonic communities: Construction phase;

- Water quality for verification of dispersion model (T and OD): Operation stage;
- Water quality for verification of dispersion model (current direction): Operation stage;
- Sub-surface sediment quality: Operation stage;
- Intertidal sediment quality: Operation stage.

The following tables summarize the voluntary measures that were proposed by each project and which were incorporated in their respective RCAs, making compliance with these measures obligatory.

i) **Voluntary Monitoring Measures: Espejo de Tarapacá Project – Pumped Storage Hydro Plant Component**

Environmental Issue	Commitment	Implementation Method	Reporting Requirement
Technical Support on Marine Issues for the Community	The Project will fund the cost of a marine consultant to assist the community with review and understanding of the environmental marine studies presented by the Project. The marine expert will be independently selected by the community.	The Project will pay for the cost of the consultant during the entire evaluation period up to 30 days following the issuance of the permit or RCA.	Final one-time report to be prepared after issuance of RCA
Participatory Monitoring	All marine studies and monitoring performed and related results will be communicated to community during all stages of the Project.	Notice of the performance of any of study or monitoring activities will be provided to the legal representatives of these organizations, in written form, at least 5 days in advance.	Reports will be made available to the community within 15 days of the receipt of the results by the Project. Quarterly reports with the notices and study results will be provided to the legal representatives of the community organizations.
Impact on Birds from High Voltage Transmission Line	Installation of anti-collision bird markers that can be seen at night on the high voltage transmission line and installation of aeronautical diverters in the area where collisions are deemed more probable	The Project will evaluate the effectiveness of these measures during the 1 st three years of operation of the transmission line	Annual reports to be prepared
Impact on Birds from Electric Conductors on Transmission Line	Installation of protection covers on transmission line posts in order to prevent electrocution of birds	The Project will inspect the protective covers on a quarterly basis	Bi-annual reports to be prepared
Reduction in Nighttime Lighting	The Project will avoid the use of nighttime lighting which would illuminate the sky in the entire Project area, and in	The Project will take photos of the area once the required lighting has been	One-time report with photographic evidence to be prepared

	particular of bird flight path areas	installed	
Workers Training Induction	All Project workers will receive training induction related to the environment including flora and fauna, environmental compliance requirements and induction test evaluations.	All workers will receive the environmental induction training when they initiate employment with the Project	Project will maintain records of the induction sessions which will be available for review by the authority
Nesting of Oceanodroma markhami, Visual survey to Confirm Route Prior Start of Construction of North Access Road	Project to conduct visual survey along the route selected for construction of the northern access road in the Rio Seco area (area with potential Oceanodroma markhami presence) prior to initiation of construction	Photos registering the survey will be taken	Specialist will prepare a one-time report upon conclusion of the survey
Controlled Intervention in Areas with <i>Microlophus theresioides</i>	Project to carefully and progressively initiate works in sectors with presence of this reptile. Natural materials removed (rocks, branches, etc.) will be transferred to close area without intervention in order to induce movement and improve habitat.	Controlled intervention to be initiated and completed no more than 3 days prior to initiation of works and must be supervised by qualified specialist.	Specialist will prepare a one-time report upon conclusion of activities
Wetting of dry material from concrete plant	Project will apply humidity to soil and dry materials used by concrete plants in order to limit particulate emissions in the air	Project to implement measure throughout construction	Project will maintain records of wetting procedure which will be available for review by the authority
Working Group Discussions	Working group discussions will be held in Caleta San Marcos to provide information about the Project and maintain open and transparent dialogue with the community	Community meetings to be held at least every six months during the construction phase	Project will maintain minutes of meetings which will be available for review by the authority
Desalination Plant Infrastructure	Project to construct desalination plant infrastructure which will deliver and sell at cost up to 50 m ³ /day of desalinated water in Caleta San Marcos. In accordance with other community agreements, Project will also deliver and sell at cost up to 25 m ³ /day in Caleta Rio Seco and supply free of charge up to 15/m ³ to the San Marcos Fisherman's Union for use in the	Delivery of the desalinated water will take place within 3 months following the completion of the construction of the desalination plant, provided the communities have the necessary infrastructure for delivery	Project to notify the community organizations of availability of water for delivery. Notices will be available for review by the authority

	processing of sea products by the union.		
Installation of Tourist Lookouts	Project will install two tourist lookout points, one overlooking the reservoir and the other in the north access road sector overlooking the sea	Lookout points will be installed within one year of receiving required permits from District of Iquique and the Regional Tourism Agency.	Photographic registry of lookouts will be sent to relevant authorities
Installation of Informative Signs for Archeological Findings	Project will install informative signs in areas when archeological findings have been located	Signs will be installed during the 1 st six months of operation	Photographic registry to be prepared once complete
Training and Education of Paleontological Findings	Paleontologist will provide induction and educational talks to workers; photographic registration of fossils found by Project; preparation of educational materials with paleontological information found by Project which is to be distribution to local public high schools.	Induction talks by paleontologist to be held every 6 months during construction	Registry of inductions talks to be maintained and available for review by the authority, delivery of educational and photographic materials to be documented and available for review by the authority

ii) **Voluntary Monitoring Measures: Cielos de Tarapacá Project – Photovoltaic Solar Plant Component**

Environmental Issue	Commitment	Implementation Method	Reporting Requirement
Impact on Birds	Systematic registration of bird findings in the Project area, including live, dead and affected specimens, in order to analyze results of installation of anti-collision mechanisms on transmission line and ensure veterinary treatment of any affected specimens	Specialist will survey the Project area two times per month during the 1 st year of operation	Quarterly reports to be prepared
Cultural Heritage	If interest by community is confirmed ¹² , social science professional will prepare historic report on the locality of Victoria	Preparation of one-time historic report	Report to be delivered to community

¹² It should be noted that in accordance with the voluntary commitment, given less than 8 people in the community expressed interest in the historic report after the terms of reference for the report were provided, the report was not prepared

10. Contingencies and Emergencies Prevention Plan

The Contingency and Emergency Prevention Plan is presented in a specific chapter of each EIA and identifies potential natural and anthropogenic risks and describes the prevention and management system to be implemented. In the case of the PSH plant component, the contingency and emergency prevention plan identifies as potential natural hazards mudflows and avalanches, landslides and rockslides, tsunamis, earthquakes and waves. Additionally, the plan also identifies the potential anthropogenic risks of: fuel, lubricant or dangerous substance spills in the sea, fuel, lubricant or dangerous substance spills on land, fire in the work area, traffic accidents, use of equipment and heavy machinery, use of transport, storage and handling of explosives, earthmoving, dismantling of equipment and immersion risks.

The PSH plant EIA also proposes a contingency plan in the event of an increase in temperature of the discharge from the reservoir. The operation is expected to discharge mainly during the night-time hours and with a temperature differential under 3°C. The objective of contingency management is to protect the marine environment in the event that the discharge temperature differential is maintained over time and could fall in exceptional cases. For its implementation, it has been determined that the triggering limits are over 6°C in the field near the surface and 4.5°C on the surface at 75 m from the discharge point in the direction of AMERB B, the fishermen's areas of management for benthic resources. In this case, the production capacity of the power plant in generation mode will be limited in order to stabilize the temperatures measured in the sea within the accepted limits.

In the case of the PV solar plant, the contingency and emergency prevention plan identifies landslides and earthquakes as potential natural hazards. The plan also identifies potential anthropogenic risks of fuel, lubricant or dangerous substance spills on land, fire in the work area, traffic accidents, use of equipment and heavy machinery, and dismantling of equipment. In addition, the PV plant's EIA establishes a special protocol that will be implemented in the event of any incidents with wildlife in the new tamarugo tree plantation sector of Pampa del Tamarugal National Reserve.

It should be noted that the contingency and emergency prevention plans, specifically define the operational and/or management measures that will be applied for handling of the potential situations in order to avoid impacts on the environment, people and equipment and facilities. The emergency plans also establish the responsibilities, actions and procedures, in addition to the registration and communications systems that will be implemented in case of an emergency in the plants.

11. Regulatory Framework and IFC Performance Standards

The Project will comply with all IFC performance standards, and as indicated in the RCAs, other less significant impacts will also be addressed as required by the national regulatory framework. In this sense, a comparison is made between the existing socio-environmental norms in Chile and the IFC's performance standards, with the aim of identifying the measures and actions related to the potential impacts identified and the nature of the Project.

Considering that Chile currently has a regulatory framework that strengthens and subscribes to the principal international agreements, it is estimated that compliance with the performance standards for social and environmental safeguards will be addressed through compliance with the national regulatory framework as indicated in the table below.

PS 1: Assessment and Management of Environmental and Social Risks and Impacts

The regulations associated with the SEIA, including its technical regulations, the development of EIAs and required approvals will all serve as safeguards.

National Regulation	Compliance
<p>Law N° 19,300 General Environment Rules</p>	<p>The Project Owner complies with the requirements of Law N° 19,300, by submitting the EIA through this EIAS. At the same time, submission to the EIAS has the purpose of evaluating its impact prior to execution, as provided in Article 8. Regarding the compliance indicator, the latter will be the Environmental Qualification Resolution (RCA) for the Project, as stipulated in the RCA, which will allow authorities to ensure the right to live in a pollution-free environment is not affected.</p>
<p>Supreme Decree N° 40/12 MMA, Regulation of the Environmental Impact Assessment System</p>	<p>In accordance with the Project work categories and specifications, it is mandatory that the Project be submitted to the SEIA. In addition, it should be noted that the effects of prediction and evaluation, in accordance with the provisions of Articles 6-10 of the regulations, an EIA must be prepared. The EIA presented by the Project includes proposed mitigation measures as described in Article 97 and subsequent articles. The Project prepared a thorough environmental evaluation for qualification by the SEIA, in order to obtain a favorable RCA. Complementing this, application of the socio-environmental risk management plan is proposed as a measure of controlling and monitoring the actions described in the EIA.</p>
<p>Resolution N° 1518/13 SMA. It requires information to the holders of projects that have favorable RCA; instructing the form and manner of presentation.</p>	<p>Favorable RCAs are publicly available on the authority's website: http://snifa.sma.gob.cl/SistemaRCA within 15 working days after of notification of the resolution.</p>
<p>Resolution N° 844/12 SMA, Dictates and Instructs General standards on the remission of the conditions, commitments and measures established in the resolutions of the RCA.</p>	<p>The compliance indicator, understood as a means of verification, is constituted by the record that established the platform provided for such purposes by the Superintendence of the Environment (SMA).</p>

PS 2: Labour and Working Conditions

To comply with this PS, compliance with work and complementary regulations is mandatory, considering that the Project will perform all activities within the Chilean territory.

National Regulation	Compliance
Labour Code Book 1: Of the work contract	Establishes that all labor relations between employers and workers are regulated by this code and by its complementary laws and also recognizes the social function of the work and the freedom of people in hiring and performing lawful work. These regulations include explicit requirements associated with the work of minors, non-discrimination and promotion of gender equity.
Labour Code Book 2: Of the workers protection	Establishes that the employer is obligated to take all necessary measures to effectively protect the life and health of workers, informing them of the possible risks and maintaining the proper conditions of hygiene and safety, as well as the necessary safeguards to prevent accidents and occupational diseases.
Labour Code Book 3: Of the union organizations	Recognizes the legal right of workers of the private sector and state companies, to establish, without prior authorization, trade union organizations that they deem convenient, with the only condition of subjecting these organizations to law and related statutes.
Sanitary Code Book 3: Of hygiene and security of the environment and work places	Establishes the responsibility of the National Health Service to ensure that all factors, elements or agents of the environment that affect health, safety and welfare of inhabitants are eliminated or controlled in accordance with the provisions of this code and related regulations.
Basic Environmental And Sanitary Conditions For Workers (Decree 594)	Establishes the basic sanitary and environmental conditions that must be met by any place of work, without prejudice to the specific regulations that have been issued or dictated for those tasks that require special conditions. It also establishes the permissible limits of environmental exposure to chemical agents and physical agents, and those limits of biological tolerance for workers exposed to occupational risk.
Regulation on prevention of professional risks	Establishes the rules that govern the application of Title VII, on Prevention of Occupational Risks and of the other provisions on the same matter contained in Law No. 16,744, on social insurance against the risks of occupational accidents and diseases. Likewise, it establishes norms for the application of Article 171 of the Labour Code.
Measures against discrimination	Establishes a judicial mechanism for legal restoration whenever an act of arbitrary discrimination is committed.
Promulgation of the ILO convention 182 prohibition of child labor forms and immediate actions for their elimination	Any Member that ratifies this Convention shall take immediate and effective measures to achieve the prohibition and elimination of the worst forms of child labor as a matter of urgency.

PS 3: Resource Efficiency and Pollution Prevention

There is a large compendium of regulations for the control of quality standards for environmental variables, such as air, soil, water, waste management among others, as mandatory compliance in distinct project stages. The table below summarizes the main standards that serve as a measure to assure the safeguarding of social and environmental aspects of the Project.

National Regulation	Compliance
DS N° 144/61 MINSAL, establishes norms to avoid atmospheric pollutants or	The Project has incorporated in its design emission control measures, which allow it to adequately mitigate resulting construction and operation impacts. The particulate material emitted during the construction phase will be mitigated through watering of roads, mixing processes and material transfer. The bodies of the trucks will be sealed to prevent falling material. Atmospheric emissions that are

emanations of any nature	<p>generated in combustion engines will be minimized with rigorous maintenance of the equipment.</p> <p>During the operating stage of the Project, atmospheric will correspond to gases resulting from the circulation of vehicles and will be mitigated with restricted travel speeds.</p>
DS N° 20/13 MMA, Establishes Primary Quality Standard for breathable particulate material MP-10, particularly the values that define emergency situations	<p>The Project has incorporated in its design, emission control measures which allow it to adequately mitigate resulting construction and operation impacts. The watering of roads is considered throughout construction. Likewise, engines and machinery will be reviewed and adjusted periodically to minimize emissions generated by incomplete and inefficient combustion.</p>
DS N° 12/11 MMA, Primary Environmental Quality Standard for breathable fine particulate material MP 2.5	<p>The Project has incorporated in its design, emission control measures which allow it to adequately mitigate resulting construction and operation impacts. The watering of roads is considered throughout construction. Likewise, engines and machinery will be reviewed and adjusted periodically to minimize emissions generated by incomplete and inefficient combustion.</p>
DS N° 594 / 00 MINSAL, Regulation on basic sanitary and environmental conditions in workplaces	<p>Through contractual clauses, the supplier of sanitary facilities will be responsible for carrying out all the necessary procedures to guarantee the sanitary standards in the area where they are located.</p> <p>Regarding the sewage water treatment plant, the EIA specifies the background for the granting of the Environmental Sectorial Permission (ESP) 138, which describes the technical-environmental characteristics of wastewater management and the operation of the plants. The sectoral permit will proceed before the Regional Ministerial Secretariat (SEREMI based on its initials in Spanish) of Health.</p>
DS N° 90/00 SEGPRES, Emission Standard for the regulation of pollutants associated with discharge of liquid waste to marine and continental surface water	<p>The discharge of water from the desalination plant will take place outside the coastal protection zone, thus applying the maximum concentration limits established for the standards under analysis. The Project's environmental monitoring plan provides for monitoring measures which will allows its reporting and compliance to demonstrate on-site compliance.</p>
NCh N° 409/1 Of 2005 of the INN Chilean drinking water standard	<p>Since drinking water is acquired from third parties during the construction phase, it will be purchased from entities that have a valid authorization resolution and have available registration from the supervising authority. The drinking water produced in the Project's desalination plant will have the indicated quality.</p>
DS N° 4/09 SEGPRES, Regulation for the management of sludge from sewage treatment plants	<p>The engineering project for the sewage water treatment plant will be approved by the corresponding health authority, as required by Article 9 of the regulations.</p> <p>The sludge generated in the treatment plant will be periodically removed by a third party that has express sanitary authorization for this purpose. Through contractual conditions, the Project will require the contractor to comply with these regulations. In addition, there will be a registry that certifies the removal of the sludge and its frequency and registration will be available to the supervising authority.</p>
DFL N° 725/61 Health Code / DS No. 594/00 MINSAL, Regulation on basic health and environmental conditions in workplaces	<p>The storage of non-hazardous industrial waste will only be carried out in a salvage yard, which corresponds to a special conditioned area (area with compacted and fenced land) in the Project facilities. Such waste that is generated in work fronts will be transported daily to such salvage yards, that will maintain the technical and formal requirements indicated in ESP 140.</p> <p>The hazardous waste generated in the construction stage will be stored in accordance with the provisions of DS N° 148/2003, in a storage warehouse specially conditioned for such purposes in accordance with the technical and environmental requirements of PAS 142.</p> <p>Prior to the start of activities, a declaration will be submitted to the Health Authority</p>

	stating the quantity and quality of industrial waste generated, clearly differentiating hazardous industrial waste.
DS N° 148 / 03 MINSAL, Health Regulations on hazardous waste management	The hazardous waste generated in the construction phase will be stored in warehouses located in the waste management areas of the Project facilities for which ESP 142 is requested, whose technical and formal contents are presented in the respective chapter. These warehouses will comply with the design measures and requirements contained in Title IV (articles 29 et seq.) of the regulation in question. They will have the required informative signs in accordance with Chilean Standard NCh 2.190 Of 93

PS 4: Community Health, Safety, and Security

The main measures to safeguard the health and safety of the communities are associated with the handling of dangerous substances during all stages of the Project, as well as the use of security personnel to safeguard the Project's works and assets. These safeguards include decontamination plans and quality standards for atmospheric emissions and odors among others.

National Regulation	Compliance
DS N° 160/09 MINECON, Regulation of security for the facilities and operations of production and refining, transportation, storage, distribution and supply of liquid fuels	The pond will comply with the design, construction and operating requirements of Title IV of this Regulation. In addition, the owner will proceed with the registration and certification in accordance with the technical requirements set by the Superintendence of Electricity and Fuel in Res. N° 1146-2008. Finally, in the event of an accident, the Superintendence and the environmental authority will be duly informed in accordance with the rules and procedure of Articles 32 and related articles.
DFL N° 850/98 MOP, establishes the consolidated, coordinated and systematized text of Law No. 15,840, of 1964, Organic of the Ministry of Public Works, and of DFL No. 206, of 1960, Law of Roads	The dispatch guides of the cargo that will be transported will be maintained for cargo load control, indicating the trip, date and time, and the associated truck indicating its license plate. In the case that the transport of overweight and/or over-dimensioned equipment is required, the owner will request the corresponding authorizations from the Regional Road Authority. If the transport is required by third parties, said authorization will be required by the contractor. In cases when the crossing or access to public roads is required, the owner will request authorization from Road Authority, in accordance with Articles 40 and 42.
Rules Of Operation Of Private Guards	The operation of private security guards is authorized. These guards will have the sole and exclusive objective of protection and internal security of buildings, housing complexes, facilities, premises, plants or other establishments. This objective will be extended both to persons who are in such places, either as workers of the entity in question and in transit in it, as well as to property belonging to others, which are within the scope of the agreement area or precinct thereof. The service of private security guards of an entity constitutes its security office.

PS 5: Land Acquisition and Involuntary Resettlement

In accordance with the RCA, the Project does not generate significant impacts on the life systems of human groups based on the background and modelling presented during the evaluation process. The evaluation process included determination, as well as application of mitigation measures to avoid of potential impacts. The evaluation concluded that the Project will not affect the resources used by human groups. Various monitoring measures will also be implemented in order to verify that the Project does not impact the livelihood on human groups throughout construction and operation.

PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

In accordance with the nature of the Project, the regulations associated with the protection of the marine environment, marine and terrestrial fauna, and protected species and sites are considered as environmental safeguards. These are summarized in the table below.

National Regulation	Compliance
<p>Article 11 of Law N° 19,300 General Environment Rules</p>	<p>In determining the need to submit an EIA, the Project was required to evaluate whether either plant component would generate or present the following effects, characteristics or circumstances: a) Risk to the health of the population due to quantity or quality of effluents, emissions or residue; b) Adverse significant effects over the quantity or quality of renewable natural resources, including soil, water and air; c) Resettlement of human communities or significant alteration in life systems and customs of human groups; d) Location in or close to protected populations, resources and areas, priority sites for the conservation, protected wetlands and glaciers, which could be affected, as well as the environmental value of the land in which it will be situated; e) Significant alteration in magnitude or duration of the landscape or touristic value of the area; f) Alternation of monuments, sites with anthropological, archaeological, historic, and cultural value in general.</p> <p>The EIA presented by the Project includes proposed mitigation measures. The Project prepared a thorough environmental evaluation for qualification by the SEIA, in order to obtain a favorable RCA. Complementing this, application of the socio-environmental risk management plan is proposed as a measure of controlling and monitoring the actions described in the EIA.</p>
<p>DS N° 430 / 92 MINECON, Sets the consolidated, coordinated and systematized text of Law N° 18,892 of 1989 and its amendments, General Law on Fisheries and Aquaculture</p>	<p>The owner will adopt all the safeguard and security measures contemplated by the law, in such a way as not to incur in the criminal type described in Article 136 of this legal body.</p>
<p>Law N° 19,473 Replaces Text of Law No. 4,601, on Hunting, and Article 609 of the Civil Code</p>	<p>The holder will carry out, prior to the construction of the Project, a Rescue and Relocation Plan for the <i>Liolaemus Stolzmanni</i> and <i>Phyllodactylus gerrhopygus</i> species. For the above, compliance with PAS 146 of DS N° 40/2012 MMA is requested in Chapter 10. Together with the foregoing, the Owner will instruct and prohibit its workers and contractors from hunting in all places where the Project will be developed.</p>
<p>DS N° 5/98 MINAGRI, Hunting Law Regulation</p>	
<p>Decree Ex. No. 225/95 MINECON, establishes ban on the hydro biological resources indicated</p>	<p>A presentation will be made to employees regarding the biological importance of marine species and their conservation. The workers will be warned that breach of the regulations for the protection of the species is punishable by law and will not be tolerated by the Owner.</p>
<p>DS N° 179 / 08 MINECON, It establishes prohibition of capture of species of cetaceans that are indicated in waters of national jurisdiction</p>	<p>A presentation will be made to employees about the biological importance of marine species and their conservation. The workers will be warned that the breach of the regulations for the protection of the species is punishable by law and will not be tolerated by the Owner.</p>
<p>Decree Ex. N° 1 892/09 MINECON, establishes extractive season for the common sea lion resource in area and period that</p>	<p>A presentation will be made to employees regarding the biological importance of marine species and their conservation. The workers will be warned that breach of the regulations for the protection of the species is punishable by law and will not be tolerated by the Owner.</p>

indicates	
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PS 7: Indigenous Peoples

In accordance with the RCA and the baseline, the Project does not generate significant impacts on the life systems of humans including indigenous people based on the background and modelling presented during the evaluation process, which allows it to determine that the resources used by these groups will not be affected.

PS 8: Cultural Heritage

The measures associated with cultural heritage are associated with paleontological and archaeological patrimony that could be affected during the excavations of the Project. These are summarized in the table below.

National Regulation	Compliance
Law No. 17,288 National Monuments	If due to excavations or any other work performed during the construction and operation stages of the Project, both on land and in the sea, an archaeological site or cultural value not identified in the baseline is discovered, the Owner will interrupt the work that led to the discovery and immediately inform the Provincial Governor, Police of Chile and the Council of National Monuments, in order to adopt the necessary measures for the conservation of the site.
Decree Ex. No. 311/99 MINEDUC, Declaring Historical Monument Subaquatic Heritage that indicates, whose seniority is over 50 years	The Project will provide training in the care of cultural heritage through induction and educational talks on the paleontological and archaeological findings present in the Project area and their due protection, to all those who enter the work areas for the first time

12. Evaluation and Monitoring Plan

The implementation of the proposed evaluation and monitoring plan will establish a track record and internal processes required to support a monitoring/supervision program that ensures achievement of the mitigation and performance improvement measures. It will also provide information for the periodic performance reviews provided to senior management with regard to the effectiveness of the ESMS. Senior management will take the necessary steps to ensure that the policies are complied with and that the appropriate procedures, practices and plans are implemented. A key aspect of monitoring will be defining relevant indicators as a quantitative or qualitative measure of progress against set goals. Some indicators will focus on performance and will be evaluated against the criteria defined in the RCAs. The format for implementation of the monitoring and evaluation reports will be developed as indicated by the RCA.

The tables below summarize the monitoring plans that must be implemented and reported to the authorities in accordance with the RCAs: The tables separately indicate the monitoring plans approved during the construction for each plant component and in the operation phase for the PSH plant component.

i) **Monitoring Plan during Construction: Espejo de Tarapacá Project – Pumped Storage Hydro Plant Component**

Environmental Impact	Preventive Measure	Frequency & Duration	Reporting Requirement
Archeological Intervention	Installation of informative signs and protective fences, as applicable, in areas when archeological findings are located	Specialists will survey the areas once a month during construction in order to verify compliance with signs and protective measures	Monthly report to be prepared during construction period
Archeological Intervention	Management plan requires rescue and transfer of all archeological findings to local museum	Every time archeological findings are located	One-time report to be prepared within 30 days of delivery of archeological findings to museum
Archeological Intervention	Permanent archeological monitoring	Qualified archeological specialist will perform monthly inspection; Project team will perform daily inspections during performance of excavations during construction	Quarterly reports to be prepared; in the event archeological findings are located, the Council of National Monuments will be notified by report within 10 days.
Paleontological Intervention	Paleontological monitoring	Qualified paleontological specialist and Project manager will coordinate bi-weekly visual monitoring during construction	Quarterly reports to be prepared
Seawater Quality	Sample measurement of numerous quality of water parameters and comparison to baseline study	Measurements to be performed every 6 months during construction	Quarterly reports to be prepared
Marine Sediment Quality	Sample measurement of numerous marine sediment parameters and comparison to baseline study	Measurements to be performed every 6 months during construction	Quarterly reports to be prepared
Abundance of Benthic Communities	Monitoring of alteration in benthic species and comparison to baseline study	Measurements to be performed every 6 months during construction	Bi-annual reports to be prepared
Loss of Plankton Communities	Qualitative and quantitative monitoring of plankton species and comparison to baseline study	Measurements to be performed during one day and one night during each of the four seasons (4 times per year)	Seasonal (4 times per year) reports to be prepared
Quantity of	Quantitative monitoring of	Measurements to be	Bi-annual reports to

Marine Mammals	marine mammals and comparison to baseline study	performed every 6 months during construction	be prepared
Quantity of Birds	Quantitative monitoring of birds and comparison to baseline study	Measurements to be performed every 6 months during construction	Bi-annual reports to be prepared
Quantity of Protected Reptiles	Rescue and relocation plan for the species <i>Liolaemus stolzmanni</i> and <i>Phyllodactylus gerrhopygus</i> , moving them from the reservoir area to an area not intervened by the Project	To be implemented by area prior to the start of construction in each area	Compliance report to be prepared within 60 days of completion of each rescue area
Noise Level	Measurement of noise affecting humans and fauna	Measurement to be performed every 30 days during construction and each time new work area is implemented	Monthly reports to be prepared
Underground Water	Sample measurement of numerous quality of water parameters and comparison to parameters prior to start of construction	Measurement to be performed every 2 weeks during construction	Quarterly reports to be prepared

ii) **Monitoring Plan during Operation: Espejo de Tarapacá Project – Pumped Storage Hydro Plant Component**

Environmental Impact	Preventive Measure	Frequency & Duration	Reporting Requirement
Reservoir Water Quality	Monitoring of physical, chemical and biological alterations via sample measurements of numerous quality of water parameters	Monthly water measurements during the 1 st two years of operation; analysis will be conducted in the 3 rd year of operation to determine in seasonal (4 times per year) monitoring is feasible; sediments will also be monitored monthly during the 1 st two years of operation and quarterly thereafter	Quarterly reports to be prepared during the 1 st three years of operation and the frequency and continuity thereafter will be evaluated
Birds Related to High Voltage Transmission Lines	Installation of anti-collision bird markers on the high voltage transmission line and measurement of live and dead birds in the transmission	Monthly measurements during the 1 st three years of operation of the transmission line	Annual reports to be prepared

	line area		
Seawater Quality	Sample measurement of numerous quality of water parameters and comparison to baseline study and construction period measurements	Quarterly measurements to be performed during the 1 st two years of operation and bi-annually thereafter	Quarterly reports to be prepared during the 1 st two years of operation and bi-annually thereafter
Marine Sediment Quality	Sample measurement of numerous marine sediment parameters and comparison to baseline study and construction period measurements	Quarterly measurements to be performed during the 1 st two years of operation and bi-annually thereafter	Quarterly reports to be prepared during the 1 st two years of operation and bi-annually thereafter
Abundance of Benthic Communities	Monitoring of alteration in benthic species and comparison to baseline study	Quarterly measurements to be performed during the 1 st two years of operation and bi-annually thereafter	Quarterly reports to be prepared during the 1 st two years of operation and bi-annually thereafter
Loss of Plankton Communities	Qualitative and quantitative monitoring of plankton species and comparison to baseline study, construction period measurements and reservoir measurements	Measurements to be performed during one day and one night during each of the four seasons (4 times per year)	Seasonal (4 times per year) reports to be prepared

iii) **Monitoring Plan during Construction: Cielos de Tarapacá Project – Photovoltaic Solar Plant Component**

Environmental Impact	Preventive Measure	Frequency & Duration	Reporting Requirement
Cultural Heritage	Detailed registry/survey of cultural and historical sites and findings	Preparation of report to be submitted to National Monuments Council	Approval of report submitted to National Monuments Council
Archeological Intervention	Collection and transfer of all archeological findings to local museum; protection of site area with signs	Every time archeological findings are located	Every time archeological findings are located
Archeological Intervention	Permanent archeological monitoring and training induction for workers	Qualified archeological specialist will perform quarterly inspection of intervention in surface areas	Quarterly monitoring reports to be prepared.

The monitoring indicators will be accompanied by visual observation that it will take place at the appropriate frequency for the nature of each Project plant component. Interviews and consultations with workers, managers and external stakeholders will also be conducted regularly. Examples of topics to be discussed include: understanding of policies

and procedures by workers and managers, impacts on stakeholders, facility and comfortability for the filing of complaints by external stakeholders, etc. Regular reporting and records will also be maintained and provided in accordance with GCF requirements.

These reporting requirements shall include:

- Annual implementation and evaluation reports;
- Final evaluation report confirming compliance of the Project with GCF's environmental and social standards, as well as any other applicable environmental and social provisions;
- Ad hoc monitoring, reporting or audits on specific environmental and social issues, which may also include site visits and consultations with communities and/or national designated authorities, as specified in the respective monitoring plans^{13,14}.

The appropriate channels and procedures for the flow of information and reports between the Project and the GCF will be defined. These processes will take into consideration the following:

- The environmental and social monitoring performance of the Project will include participation from the community, local stakeholders and civil society organizations at all stages of the Project cycle. This participatory monitoring approach will also encourage the designated national authority to organize Project portfolio reviews in accordance with national, regional and local development objectives.
- Project management will notify the authorities in the event of significant changes in the design and execution of the Project.
- Project management will also notify the authorities when changes to the ESMF or other management plans are needed. In the context of adaptive risk management, the plans should be modified as necessary to respond to changing conditions and/or monitoring results throughout the Project life cycle.

The action plan should be designed in order to provide a robust system for continual learning and improvement. Senior management will receive periodic reports detailing environmental and social performance and progress toward objectives and targets, thereby ensuring that GCF funded project decisions consider these factors.

13. Grievance Mechanisms and External Communications

Since initiation of the Project, the community of San Marcos has been critical of Project design and development. The Project initiated community engagement with San Marcos several years before submitting the environmental permit request to authorities, in order to address community concerns in early development. As explained previously, various collaboration agreements have been executed with the community which aim to share the benefits of successful Project development and completion with these affected groups. It is important to note the Project will not generate physical resettlement of local

¹³ http://seia.sea.gob.cl/archivos/Cap_09_Plan_de_seguimiento_20140728.pdf

¹⁴ http://seia.sea.gob.cl/archivos/2015/01/06/CAP_09_Plan_Seguimiento_Amb_CdT_rev_0.pdf

communities nor should it generate direct economic displacement in any of its components or stages.

It is expected that this early engagement process will help facilitate management of grievance mechanisms and consolidate the process of stakeholder engagement as a part of the Project's regular activities, facilitating fluent and inclusive communication and a regular stakeholders' consultation process. The Project is committed to ensuring the effective participation of communities, vulnerable populations, groups and individuals affected or likely to be affected by the Project through effective community engagement planning.

This line of action describes the disclosure of information, meaningful consultation and informed participation, and under certain circumstances, free, prior and informed consent as required in the ESMS. The commitment will be designed and carried out in a manner that is commensurate with the risks and impacts of the proposed activities and will continue throughout the Project life cycle. These activities and consultations will be:

- culturally appropriate,
- carried out throughout the project life cycle,
- based on information provided and disclosed in a timely manner and in an understandable format,
- inclusive and gender-sensitive,
- free of coercion and
- open in order to incorporate the views of stakeholders in the decision-making process.

In the event that a contractor acts in an executing role, the Project will apply adequate supervision and monitoring for compliance with all commitments developed in this ESMF, performing due diligence and supervision as required.

14. Roles and Responsibilities for Managing Environmental and Social Requirements

The ESMU will be established and maintained throughout the life cycle of the Project. The ESMU will be integrated by a community relations staff member and at least one Project manager. The ESMU will have the responsibility of creating communication channels and maintaining good working relationships with environmental units and national, regional and municipal authorities.

The selection of the members and structure of a functional and effective ESMU for the Project is key. This will ensure timely follow-up, design and addressing of recommendations on participatory actions with communities and neighborhood residents to ensure ownership by the population, as well as the social and cultural sustainability of the Project. The ESMF includes procedures and responsibilities to provide internal follow-up to the Project and prepare reports on environmental and social monitoring in accordance with the frequency established for the progress reports to be submitted to SEIA.

C. Appendix

- 1) Environmental Impact Assessment of Espejo de Tarapacá – Pumped Storage Hydro Component
<http://seia.sea.gob.cl/documentos/documento.php?idDocumento=2129687972>
- 2) Environmental Impact Assessment of Cielos de Tarapacá – Photovoltaic Solar Component
<http://seia.sea.gob.cl/documentos/documento.php?idDocumento=2130127820>
- 3) Environmental Qualification Resolutions (RCAs) of Espejo de Tarapacá – Pumped Storage Hydro Component
http://seia.sea.gob.cl/archivos/2015/12/11/RCA_completa.pdf
- 4) Environmental Impact Assessment of Cielos de Tarapacá – Photovoltaic Solar Component
http://seia.sea.gob.cl/archivos/2016/02/05/RCA_05_CdT.pdf