



## **Supplementary Lenders Information Package (SLIP) in complement of Environmental and Social Impact Assessment**

Energética I Wind Farm Project (Tornquist,  
Argentina)

28 June 2019

Project No.: 0511793

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## Signature Page

28 June 2019

# Supplementary Lenders Information Package (SLIP) in complement of Environmental and Social Impact Assessment

Energética I Wind Farm Project (Tornquist, Argentina)

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## ACRONYMS AND ABBREVIATIONS

ADA	Autoridad del Agua
AES	AES Argentina - Developer
CAMMESA	Compañía Administradora Del Mercado Mayorista Eléctrico Sociedad Anónima
CR	Critically Endangered
DD	Data Deficient
EN	Endangered
ENRE	Ente Nacional Regulador de la Electricidad
ERM	ERM Argentina – Sustainability Consultant
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
EW	Extinct In The Wild
EX	Extinct
GDP	Gross Domestic Product
GHG	Greenhouse gas emissions
IBAT	Integrated Biodiversity Assessment Tool
IFC	International Finance Corporation
IFC PS	IFC Performance Standards
IUCN	International Union for Conservation of Nature
LC	Least Concern
LGBTIQA	Lesbian, Gay, Trans, Intersex, Queer, Asexual
MATER	Mercado a Término de Energía Eléctrica
masl	meters above sea level
NPA	Natural Protected Area
NT	Near Threatened
OPIC	Overseas Private Investment Corporation
RN	National Road
RP	Provincial Road
SADI	Argentinian Interconnection System
SEP	Stakeholder Engagement Plan
SLIP	Supplementary Lenders Information Package
UOCRA	Unión Obrera de la Construcción de la República Argentina
VEC	Valued environmental and social component
VU	Vulnerable

## EXECUTIVE SUMMARY

The "Eólica Energética" project (hereafter "the Project"), being developed by AES, consists of the construction and operation of a wind farm, including 30 wind turbines for a total installed power of approximately 100 MW, as well as related infrastructure (electrical substation and connection to high voltage electric line that passes within the site boundaries). The implementation site of the Project is located to the South of the Province of Buenos Aires, in the Partido (department) of Tornquist, at approximately 30 km north from the city of Bahia Blanca.

The Project is permitted from an environmental and social regulatory permitting standpoint (license obtained from the Provincial Environmental Authority (Organismo Provincial para el Desarrollo Sostenible – OPDS) via Resolution No. 2351 in 2016. These requirements are expected to be updated by the Authority when the second addendum submitted in November 2018 is approved and a new license is issued. The project is currently under construction phase.

The Overseas Private Investment Corporation (OPIC) is considering participating to the financing of the Project.

This Supplemental Lender Environmental and Social Information Package (SLIP) was prepared based on a review of available information, the existing environmental and social impact assessment study report provided by AES dated May 2016 and two subsequent addendums, the consultation of publically available data sources, as well as a one-day visit to the Project area.

This SLIP aims at supplementing the existing ESIA Study for the Project to provide clarity on certain environmental and social aspects, in line with the requirements of the International Finance Corporation (IFC) Environmental and Social Performance Standards, as requested by OPIC.

The most relevant aspects covered by this SLIP include the following topics:

- Legal & Administrative Framework,
- Project Alternatives;
- Area Of Influence;
- Environmental and Social baseline conditions;
- Public Consultation;
- Biodiversity (Critical Habitat Screening And Preliminary Assessment);
- Ecosystem Services;
- Community Health, Safety And Security;
- Transportation Route Assessment;
- Noise;
- Shadow Flickering;
- Supplemental Impact Assessment;
- Cumulative Impacts;
- Environmental and Social Management Plan.

The following table summarizes the main conclusions presented in this SLIP.

**Table 0-1 Summary Table of most relevant elements**

Element	Description
Public Consultation	<p>On December 14, 2016, the municipality of Tornquist called for a public consultation in order to present Energética's wind farm Project, Energética I. Within the assistants were: neighbors, governmental authorities, company authorities, academics, engineers and public. Consultation was registered in a written document signed by municipal representatives. Throughout the consultation, Energética presented its Project and answered the questions and inquiries that the assistants had. The company received various positive comments and the public showed support.</p>
Social	<p>The closest towns to the project area are Tres Picos, located at 6km and with 80 inhabitants and Tornquist located at 26 km with a population of 12.000 inhabitants, approximately.</p> <p>During construction, the social impacts identified refers to the activities and way of life of the rural population and population centers, due to the movement of equipment and vehicles in general. The potential generation of local and regional employment is considered as a positive impact.</p> <p>During the operation and maintenance stage, the generation of noise and shadows flickering, mainly for the houses located within the project footprint. Nevertheless, additional identified social impacts were addressed and are summarized within correspondent section of the report.</p>
Biodiversity	<p>Flora: the Project requires the opening of new sites where soil and vegetation cover will be removed, this moderate impact of the construction phase will be largely mitigated during operation and abandonment.</p> <p>Fauna: the impact on terrestrial fauna was rated as minor. With regards to birds and bats the assigned rates was moderate and minor, respectively. For birds, the receptor sensitivity has been assessed as high because the area is considered a relevant site for the transit of some species of birds and will last during operation phase. Mitigation measures were established, including robust monitoring and bird mortality registry within 500 m of any project element. Similarly, for bats, but the receptor sensitivity has been assessed as low because according to records obtained from databases; in this area few records of individuals and species of bats have been reported and the species with potential distribution are included under Least Concern (LC) category. Monitoring on avifauna is being already implemented.</p>
Ecosystem Services	<p>According to the Ecosystem services Screening Assessment conducted for this study, there were no specific ecosystem services identified of note potentially impacted by the Project.</p>
Transportation Route Assessment	<p>Traffic associated with Project construction could impact existing transportation conditions and resources in three primary ways: increased congestion or delay, degradation of affected road infrastructure, and increased transportation safety risk. These impacts were rated as minor, provided the indicated mitigation measures are implemented.</p>
Noise, Flickering	<p>Noise: the houses of the property owners are located within the project area. The noise effect obtained by calculation shows that 3 houses are in the order of 49.7 dB, 49.9 dB and 49.8 respectively; the remaining one is in the order of 46.6 dB. This impact was rated as minor, considering the implementation of mitigation measures including monitoring to verify compliance with standard IRAM 4062/16, (compliant with regulation of Secretary of Energy</p>

Element	Description
	<p>304/99 and ENRE 0197/2011). Grievance mechanism is part of the recommended mitigation measures, as well.</p> <p>Shadow flickering: based on modelling results, the three houses located inside the project footprint (property of the owner of the land), and the remaining house located in the vicinity, will be the most affected ones having up to 217 hours of shadow flickering per year and up to 1:12 h per day, in the worst case scenario. The associated impact was rated as Moderate having considered the implementation of mitigation measures such as: a detailed shadow flickering evaluation and according to the results, if needed install natural fences closer to the residential windows, control software of the blade spinning during the specific hours of shadow flickering and also a grievance mechanism.</p>
Cumulative Impacts	<p>This SLIP has considered the potential E&amp;S impacts from the Project effects together with the ones generated by El Mataco y San Jorge Wind Farm (approximately 200 MW) and Garcia del Rio Wind Farm (approximately 10 MW), which are located at about 30 km north from Bahia Blanca and close to the Project site.</p> <p>From a social perspective, according to the evaluation, in the constructive phase the negative cumulative impacts are associated with the increased transit of vehicles, the induced migration, and landscape modification, although this last one is based on perception and it also has a positive dimension. It should be noted that cumulative effects are accentuated by External Pressure Sources, such as the tourist flow. As mitigation measures for such impacts, it is recommended to develop and implement communication and information plans, participate in working groups with the authorities and other relevant third parties to address a joint strategy for the management of the cumulative impacts.</p> <p>With regards to biodiversity, the grouping of wind farms in the area multiplies their negative effects on birds and bats, increasing the barrier effect and the number of collisions. Only birds are considered as VEC, not bats, because in this area, few records of individuals and species have been recorded, and the species with potential distribution are included under Least Concern (LC) category. Mitigation measures require robust monitoring programs and bird mortality registry and coordination with the other activities in the area with potential negative impacts. It is also required the reporting to the environmental authority as requested by the environmental license.</p>
Environmental And Social Management System.	<p>According to the requirement of the local electricity regulation agency (Ente Nacional Regulador de la Electricidad - ENRE), an EHS Management System needs to be certified within the first 180 days of operation. Consequently, AES is developing a Management System to comply with such requirement, which in addition will incorporate Social and Biodiversity elements in line with IFC Performance Standards. The Environmental and Social Management System (ESMS) for the Project is being developed for the different project phases.</p>
Other (Indigenous People, Land Management and Cultural Heritage)	<p>These elements were not consider of particular concern for this project. However, explicit references to them were included in this document and in the ESIA, to document their relation to the project.</p>

Further detail on environmental and social aspects related to the Project are described hereunder in this SLIP. For potentially significant impacts, mitigation commitments are summarized in an environmental and social management plan, to be implemented by AES as part of the construction and operation phases.

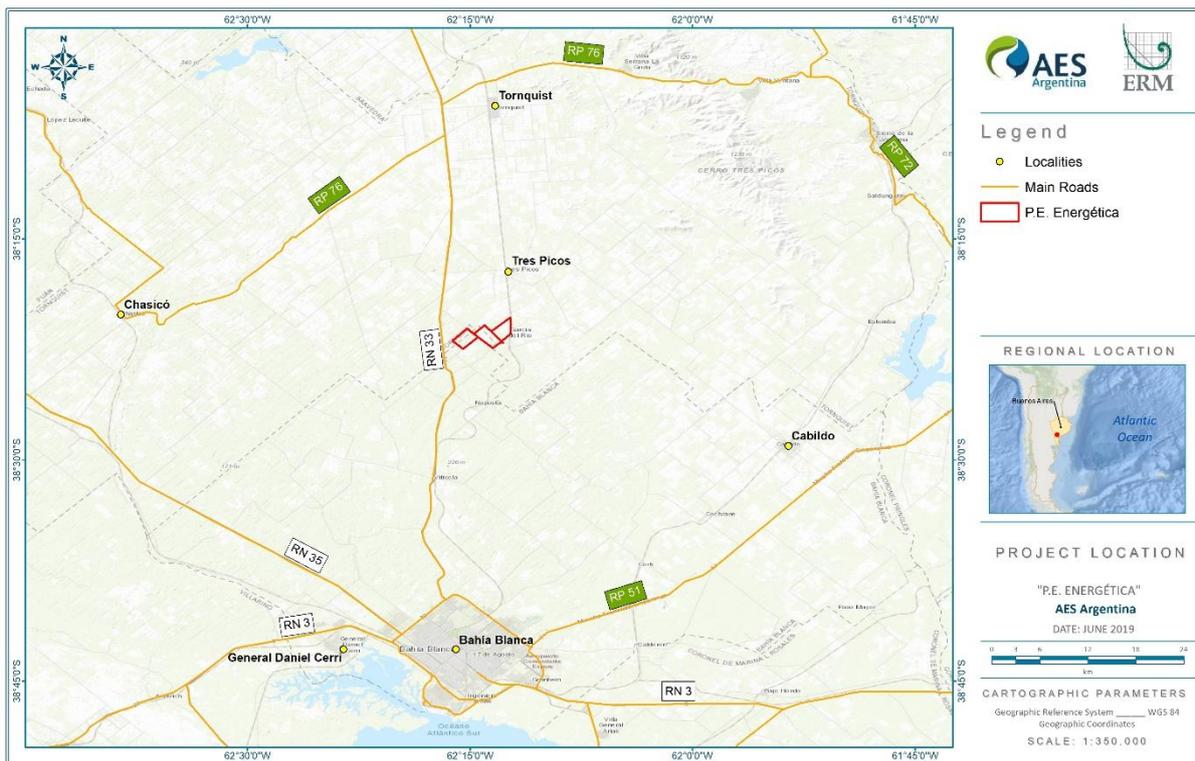
Lastly, in line with the requirements of the IFC Performance Standards, the Project's Stakeholder Engagement Plan, includes specific commitments for the disclosure of Project-related information to stakeholders, period consultation to collect stakeholder feedback on expectations and potential concerns regarding the Project. The stakeholder engagement plan will also include a Grievance Procedure (internal and external) that will allow for the collection, tracking, resolution and monitoring of potential grievance from workers or third parties related to the Project.

## 1. PROJECT DESCRIPTION

Eólica Energética I is a private windfarm development undertaking owned and developed by ENERGETICA ARGENTINA S.A, a subsidiary of the international power company AES. It will have a total installed capacity of 99.75 MW. The overall Project CAPEX is approximately 171 million US dollars,

The implementation site of the Project is located to the South of the Province of Buenos Aires, in the Partido (department) of Tornquist, close to Paraje García del Río and approximately 5 km from the town of Tres Picos, taking as reference the Northeast vertex of the Project. The total surface of the properties to be used is 950 Ha. (See Figure 1.1)

**Figure 1.1 Project Location**



The Project is based on the installation and operation of 30 wind turbines. The net energy production will be 430.276 MW-h/year and the project lifetime will be 20 years.

The collection grid will be built at the 33 KV level and will be made up of underground cables that will connect directly to the ET (MV/AT). Each wind turbine will have a 12/33 KV 3,400 KVA voltage step-up transformer and the corresponding cells at the 33 KV level, to be connected to the collecting network circuits (located in the lower section of the concrete tower).

The energy produced by the windfarm will be evacuated to the Argentine Electric Interconnection System (SADI) through a new 132/33/13,2 KV 1x110/110/40 MVA Transformer Station; the site will have an equal transformer in cold reserve. To link the windfarm, the existing transmission line (Línea de Alta Tensión or LAT) of 132 KV between EE.TT Bahía Blanca (500/132 KV) and ET Tornquist (132/33/13,2 KV) will be opened.

### Transformer Station

The function of the Transformer Station is to raise the voltage level of 33 KV that corresponds to the internal connection network of the Wind Farm to the level of 132 KV.

The area of the property will be approximately 1.10 hectares (100m x 110m) with regulatory perimeter fence. The access to the Transformer Station (for the carrier Transba S.A.) is planned to be made from the neighbourhood street located to the south of the Rural Establishment "Reyrolles", by an internal road of the Windfarm that will have an approximate length of 1.6 Km.

#### Opening of Air Electric Line (132 KV) and connection to the ET

The Air Electric Line (132 KV) that interconnects the Bahía Blanca ET with the Tornquist ET crosses the "Reyrolles" Rural Establishment, where eight concrete structures are installed. The connection with the ET (MT/AT) is expected to be made between pickets N° 151 and N° 152.

The aerial section between the Air Electric Line Opening structure and the connection to the ET entry will be approximately 50 metres. It will be built in a "U" configuration with supports of the double terna type, with one conductor per phase plus one guard cable. The supports of the line will be prestressed reinforced concrete posts and the phase conductor will be of the type Al/Ac 300/50 mm<sup>2</sup> nominal section.

#### *Windfarm*

The 30 wind turbines selected for the project are Nordex-Acciona brand, model AW 132/3300 TH120, IEC IIB class, windward three-bladed rotor type and will have a nominal power of 3.325 MW.

The wind turbines will have a hub height of 120 meters and the rotor diameter will be 132 meters.

They are regulated by a separate step change system on each blade and have an active orientation system. The control system allows the wind turbine to be operated at variable speed, maximizing the power produced at all times and minimizing loads and noise.

The towers will be 118 meters long concrete. They will be made up of six interconnected sections. Each section is made up of joined segments, perfectly sealed with high resistance mortar through their vertical joints. The union between sections is carried out by inserting the steel bars of the upper section into the sheaths of the lower section and the subsequent sealing with high resistance mortar of the horizontal joint. The concrete towers will be manufactured locally, in the Bahía Blanca Industrial Park.

#### *Required activities for the development of the Project*

- Transport System of the Windfarm
  - Transformer Station
    - Voltage level: 132/33/13,2 KV.
    - Total installed power: 1x110/40 MVA.
    - Length of the access road to the ET for the carrier (TRANSBA S.A.): 1.585 Km.
  - Opening of Air Electric Line (132 KV) and connection to the ET.
    - Service voltage level: 132 KV.
    - Place of connection to the SADI: Between the picket N° 152 and N° 153 of the LAT between ET Bahía
    - White and ET Tornquist.
    - LAT opening configuration: "U".
    - Structure configuration: Aerial, double triad.
    - Length of the connection span: 50 meters.
- Windfarm
  - Two masts (48 m and 82 m) with (existing) weather stations.
  - 30 Nordex-Axiona, model AW132/3300 TH120, class IEC IIB wind turbines
  - 30 foundations for wind turbines.

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- 30 assembly platforms for wind turbines (for the construction stage).
- 18 Km of interior roads and 6 km of accesses to readjust.
- 22 Km of underground collector network for:
  - Electricity collection network in 33 KV.
  - Grounding system.
  - Communications link system.

The Wind Energy Plant will be developed on a flat terrain with some hills, the height above sea level ranges between 210 and 265 meters. Wind turbines will be arranged in a line perpendicular to the predominant direction of the wind, sufficiently separated between them in order to optimize the use of the wind resource. The wind turbines distribution and the distance to nearest receptors can be seen in the following figures.

**Figure 1.2 Wind Turbines Distribution**

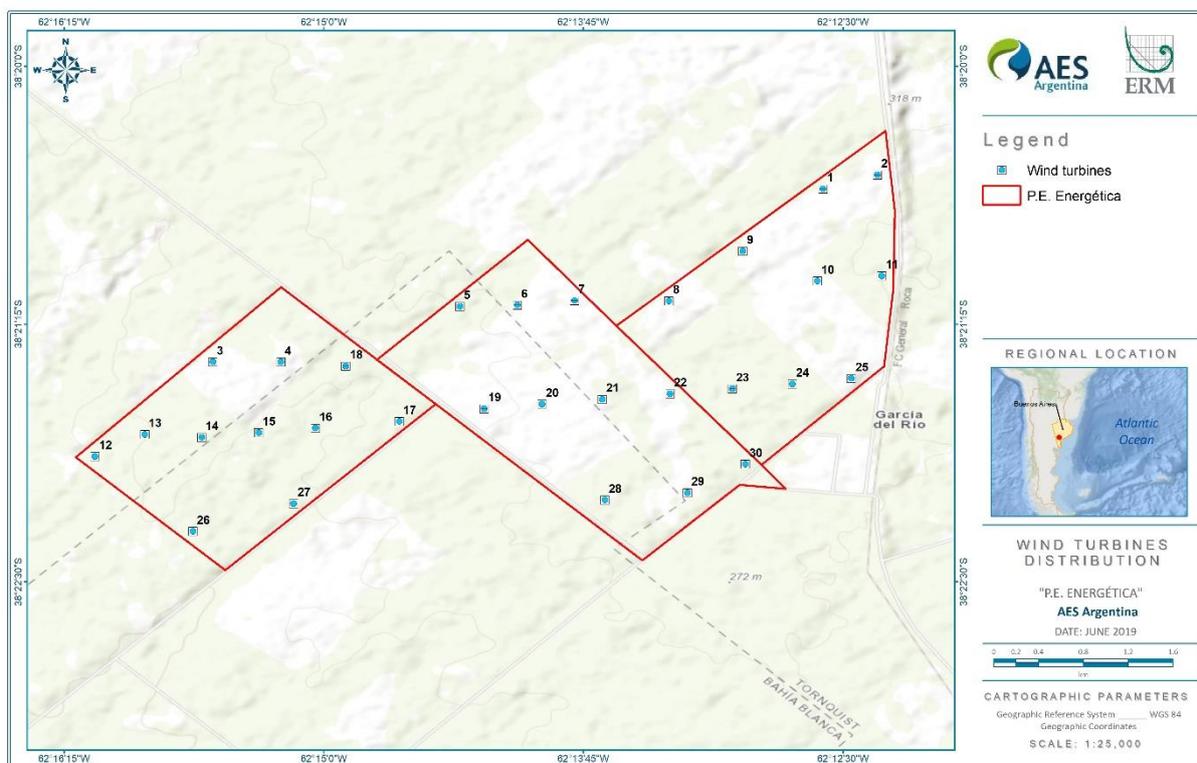


Figure 1.3 Distance to sensitive receptors



## 2. LEGAL & ADMINISTRATIVE FRAMEWORK

This section elaborates on the EHS regulations applicable to the Project, which are listed along with their associated permits in Appendix C with the purpose of facilitating the follow up of the Project's legal requirements.

The Project has obtained its Environmental License. Section 4.8 includes a description of the project-specific requirements established by the Authority in this license. A copy of the Environmental License is available in the Appendix A

Moreover, Section 7 lists other commitments assumed by AES Argentina for the Project.

### 2.1 Overview of the Legal and Institutional Organization

Argentina is divided into 23 provinces and the Autonomous City of Buenos Aires, each of which has their own constitution, but exists under a federal system.

Argentine law derives from the National Constitution originally ratified in 1853, establishing a federal and republican system of government. The National Constitution represents the supreme source of legal order, along with certain international human rights treaties that were accorded constitutional status as a result of the 1994 constitutional amendments, followed by other treaties, conventions, or agreements entered into by the federal government. Next, in descending order, are federal laws, executive decrees, resolutions, and other administrative acts of the executive branch. Subordinate to the federal sources of law are the provincial constitutions, provincial laws, and provincial administrative rules or acts. Of least hierarchical authority are municipal laws and rules.

Two discrete rulemaking systems coexist, federal and provincial, interrelated only with respect to those matters in which the provinces have expressly delegated their powers to the federal government. Therefore,

the provinces retain all the power not expressly delegated to the federal government in the National Constitution (Article 121).

The National Constitution, as amended in 1994, establishes that the provinces have primary domain over the natural resources in their territory (Article 124). The National Constitution directs the federal government to issue rules containing minimum environmental protection standards and mandates the provinces to enact legislation complementary to these federal regulations (Article 41). The regulations establishing minimum environmental protection standards are applicable throughout the entire national territory.

## 2.2 National vs. Provincial Regulatory Setting

As described previously, when adopting a federal system of government, provinces retained the power that was not expressly delegated to the federal government.

With the amendment of the National Constitution in 1994, the domain of the provinces over the natural resources present in their territories was recognized.

National Law N° 26.190 for Renewable Energy (modified by Law N° 27.191) establishes a promotion scheme including tax benefits for renewable energy activities developed in the provincial territories, granting the exemption for real estate, seals and gross income taxes. Currently, the provinces of Buenos Aires, Catamarca, Chubut, Córdoba, Formosa, Jujuy, La Pampa, Misiones, Salta, San Juan, Tucumán, Río Negro, and Santa Cruz, as well as the City of Buenos Aires, provide tax incentives to renewable energy projects.

### 2.2.1 Environmental and Health and Safety Regulations

Regulations applicable in the provincial territories may be of both federal and provincial nature depending on the aspects regulated. As mentioned previously, the provinces have primary domain over the natural resources in their territories, and are therefore empowered to issue and enforce environmental regulations to protect these resources. Health and safety regulations, on the other hand, are primarily issued by the federal government.

Federal environmental regulations usually do not apply in the provincial territories, unless they are expressly adopted by internal provincial regulations. However, federal regulations establishing minimum environmental protection standards are directly applicable to the Argentinian provinces according to the National Constitution, and the provincial governments are commissioned to complement them or establish requirements/standards that are more stringent.

## 2.3 Authorities

In the federal sphere, environmental regulations are enforced primarily by the Secretariat of Environment and Sustainable Development (“Secretaría de Gobierno de Ambiente y Desarrollo Sustentable – SAyDS”). Other significant federal agencies bearing on the environmental issues include:

- The Secretariat of Energy (“Secretaría de Gobierno de Energía”);
- The Secretariat of Renewable Resources and Electrical Market (“Secretaría de Recursos Renovables y Mercado Eléctrico”);
- The Under-Secretariat of Renewable Energy and Energy Efficiency (“Subsecretaría de Energías Renovables y Eficiencia Energética”);
- The Under-Secretariat of Energy Planning (“Subsecretaría de Planeamiento Energético”);
- The Electricity Supervisory Federal Agency (“Ente Nacional Regulador de Electricidad—ENRE”);

The National Constitution establishes that among the powers delegated to the federal government is the issuance of the Labor and Social Security Code to apply within the entire national territory (Article 75). Labor regulations are primarily enforced by the Ministry of Work, Employment and Social Security (“Ministerio de Trabajo, Empleo y Seguridad Social”), and secondly by the Superintendence of Labor Risks,

created to administer the system for the prevention of labor risks (H&S). Local offices of these agencies are present in the Provinces and interact with provincial agencies with authority over labor issues.

In Buenos Aires Province, the Sustainable Development Organism (“Organismo Provincial para el Desarrollo Sostenible – OPDS”) is the main enforcement authority for provincial environmental regulations. Other significant provincial agencies bearing on the environmental and health and safety issues include:

- The Provincial Water Authority (“Autoridad del Agua – ADA”);
- The Provincial Directorate of Energy (“Dirección Provincial de Energía – DPE”); and
- The Under-Secretariat of Labor (“Subsecretaría de Trabajo”) of the Ministry of Labor (“Ministerio de Trabajo”).

## 2.4 Federal Regulations

This section provides a summary of the most relevant federal environmental and health and safety regulations that apply to wind farms. A brief description of additional federal EHS regulations is included in Appendix C.

### 2.4.1 National Constitution

The National Constitution, amended in 1994, includes a rights and protections related to the environment. The Constitution guarantees all residents the right to a healthy, balanced environment, suitable to human development, and imposes an affirmative duty on each resident to conserve the environment for future use (Article 41). As amended, the Constitution requires the redress of environmental harm to begin with the obligation to restore the environment to its status ante quo (Article 41). The amendments also grant standing to individuals, including environmental civic associations, and the Federal Ombudsman, to sue the government and individuals to enforce an environmental right specified in the Constitution, international treaty, or Federal Law (Article 43).

As mentioned, the National Constitution also mandates the federal government to issue regulations containing minimum environmental protection standards and the provinces to issue regulations complementary to these, ensuring their applicability throughout the national territory (Article 41).

### 2.4.2 Human Rights

The Constitution of 1853 remained in force under a number of military regimes that seized power over the course of the 20th century, the only exception being the Peronist Constitution in force between 1949 and 1956.

The Constitution of 1853 and the 1860 amendments were modeled upon the U.S. Constitution, and contain relatively sparsely worded protections of key civil and political rights. Following the U.S. model, a federal system and a tripartite federal government were established. As indicated in the relevant Chart entries, amendments to the constitution (1957 and 1994) introduced a greater emphasis on economic and social rights.

From the mid-1970s to early 1980s, the Argentine military committed widespread violations of human rights in a campaign to destroy support for leftist political views. Domestic prosecution of military leaders and officers was mostly unsuccessful in the face of ongoing obstruction from the military. In late 1993, President Menem and former President Alfonsín, who led the first civilian government after the end of military rule in 1982, completed secretive negotiations to support a convention for broad amendment of the constitution. The major changes were adopted in August 1994, upon completion of the convention's deliberations.

Among the 1994 amendments was a provision to incorporate a number of ratified human rights treaties and other human rights instruments into the Argentine Constitution. This provision, in Article 75(22), specified ten instruments and a procedure for elevation of other instruments to constitutional status. These are:

- American Declaration of the Rights and Duties of Man

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- Universal Declaration of Human Rights
- American Convention on Human Rights
- International Covenant on Economic, Social and Cultural Rights
- International Covenant on Civil and Political Rights and its Optional Protocol
- Convention on the Prevention and Punishment of the Crime of Genocide
- International Convention on the Elimination of all Forms of Racial Discrimination
- Convention on the Elimination of all Forms of Discrimination against Woman
- Convention Against Torture and other Cruel, Inhuman or Degrading Treatment or Punishment
- Convention on the Rights of the Child

In addition, the Inter-American Convention on Forced Disappearance of Persons attained constitutional status in 1997, as a result of Congressional action pursuant to the procedures specified in Article 75(22).

### 2.4.3 Environmental Framework Law

National Law N° 25,675 —known as the Environmental Framework Law— establishes the “minimum environmental protection standards for the adequate and sustainable management of the environment, the preservation and protection of biological diversity and the implementation of sustainable development”.

This regulation provides a framework for environmental regulations throughout the national territory. Among other topics, it defines minimum standard of environmental protection, introduced in the National Constitution, as “any rule providing for uniform or common environmental protection for all the Argentine territory, intended to set the necessary conditions to guarantee the protection of the environment”. It also defines the objectives of the federal environmental policy and the set of principles that will regulate the environmental policy: consistency, prevention, precaution, intergenerational equity, progressiveness, liability, subsidiarity, sustainability, joint and several liability and cooperation.

The main aspects regulated by this Law include:

- The **environmental impact assessment (ESIA)** process: The regulation establishes that any work or activity, in the Argentine territory, which is likely to significantly deface the environment, any component thereof or affect the people’s quality of life, is subject to an environmental impact assessment process, prior to its execution. Within the ESIA, potential environmental impacts associated with a development project are evaluated and management measures are proposed. The ESIA gives special consideration to: land use impacts, bird and bat mortality, noise impacts, shadow flickers, and landscape impacts.
- The **environmental damage**: It defines environmental damage and, in alignment with the National Constitution, the objective responsibility to restore the environment to its status ante quo. It also states that if two or more people are involved in causing a collective environmental damage or if the extent of the damage caused by each of them cannot be accurately established, all of them shall be jointly and severally liable, without detriment, if applicable, to the right of contribution among them.
- The **environmental insurance**: It establishes that individuals performing activities that may create a risk to the environment have to hire an **insurance policy** to guarantee the funding of the restoration activities. These risky activities are defined according to the Environmental Complexity Level (NCA – Nivel de Complejidad Ambiental), which is calculated by a formula established in Resolution N° 177/2007 (and amendments) of the Secretariat of Environment and Sustainable Development (SAyDS – Secretaría de Gobierno de Ambiente y Desarrollo Sostenible). In certain cases, local authorities request that industrial facilities settled in such province provide evidence of having purchased environmental insurance in order to obtain permits issued by the local environmental authority.

### 2.4.4 Other Relevant Environmental Regulations

Other environmental regulations significant for this Project include:

- **Environmental Impact Assessment:** Resolution SE N° 475/87, establishes the need to submit an Environmental Impact Assessment before the Under-Secretariat of Strategic Planning, including the different alternatives for the energy project; the environmental studies carried out in all its stages, such as inventories, prefeasibility, feasibility; and the environmental surveillance and monitoring program implemented during the project.
- **Environmental Impact Assessment:** Resolution ENRE N° 1725/98 establishes that for the construction and/or operation of electricity transportation and/or distribution facilities, an environmental impact assessment study must be submitted before the ENRE in accordance with the guidelines of Resolution SE N° 77/98.
- **Hazardous waste:** The federal Hazardous Waste Law, Law N° 24,051 is a complement of the Law 11.720, codified by Decree N° 831/93, regulates the “cradle to grave” system of generation, transport, treatment, storage, and disposal of hazardous waste. The Law defines “hazardous waste” as waste that poses direct or indirect harm to human beings or may pollute the soil, water, atmosphere or the environment in general. The Hazardous Waste Law, modeled in part on the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, applies only to waste produced or disposed of in federal territory, waste that may affect people or the environment beyond the boundaries of a single province, or **waste that involves the transport across provincial boundaries**. It establishes the obligation of generators, operators and transporters of hazardous wastes to register in the National Register of Generators and Operators of Hazardous Wastes; and obtain the Annual Environmental Certificate, which will have to be renewed annually and validates how hazardous wastes are handled, transported, treated and disposed of by the registered generator, operator or transporter. In addition, an Annual Environmental Fee (Tasa Ambiental Anual) is due.
- **Fuel tanks:** Law N° 13,660 and its Regulatory Decree N° 10,877/60, establish the safety conditions and requirements for the production, transformation and storage of solid, liquid or gaseous fuels. Resolution N° 1,102/2004 of the Secretariat of Energy created the Register of Fuel Tanks (“Registro de Bocas de Expendio de Combustibles Líquidos, Consumo propio, Almacenadores, Distribuidores y Comercializadores de Combustibles e Hidrocarburos a Granel y de Gas Natural Comprimido”), in which the owners of fuel tanks for private consumption, among others, have to register with. National Resolution N° 419/93 (Consolidated Text by National Resolution N° 404/94) of the Secretariat of Energy and subsequent amendments sets forth the creation of auditing procedures in order to perform an efficient and accurate control of the security conditions of refineries, gas stations, storage facilities and any other points of sale of fuels within the Argentinean territory. According to Resolution N° 226/2008 of the Secretariat of Energy, only the national universities registered in a specific register (“Registro de Universidades Nacionales para la Realización de Auditorías Técnicas, Ambientales y de Seguridad”) shall conduct the safety audits of the fuel storage facilities. Finally, in 2005, the former Secretariat of Energy, by means of Resolution N° 785/2005, created the National Program to Control Leaks of Aboveground Hydrocarbon and by-products Storage Tanks. Among other issues, it establishes the need to present an environmental impact assessment prior to the installation of any aboveground storage tank (AST), the registration of all ASTs and the need to perform periodical internal and external controls and audits to verify the operation of the tanks. It also establishes requirements for the closure and decommission of the tanks.
- **Protected areas:** National Law N° 22.351 (modified by National Law N° 26.389) establishes the legal system for the protection of national parks, reservations and natural monuments, and its declaration as such. It defines the three categories for protected areas: National Parks, National Monuments and National Reserves.
- **Indigenous communities:** National Law N° 23.302 (modified by National Law N° 25.799) and its Regulatory Decree N° 155/89 declares of national interest the attention and support to natives and indigenous communities present in the country, and their defense and development towards their full participation in the national socio-economical and cultural process, respecting their own values and methods. This Law acknowledges legal status to the indigenous communities established in the country, and creates the National Register of Indigenous Communities. Finally, it creates the National

Institute of Indigenous Affairs, and appoints it as application authority for this regulation, the ILO Convention 107 (presently denounced by Argentina) and other complementary regulations. In addition, National Resolution N° 328/10 of the National Institute of Indigenous Affairs creates the National Register of Indigenous People Organizations.

### 2.4.5 Health and Safety Regulations

As mentioned, health and safety regulations are primarily issued by the federal government.

General health and safety conditions at work in Argentina are regulated by National Law N° 19,587, Regulatory Decree N° 351/79, and National Decree N° 1,338/96, including the need for facilities to have a medical and health and safety service through licensed professionals registered against the Ministry of Production and Labor (Ministerio de Producción y Trabajo, MPyT). In addition, National Law N° 24,557, its Regulatory Decree N° 170/96 and complementary regulations, establish the legal framework for the prevention of labor risks, including labor accidents and occupational diseases. According to these regulations, labor accidents and occupational diseases are required to be declared to the Labor Risks Superintendency (Superintendencia de Riesgos del Trabajo, SRT) and to contract a labor risk insurance company (Aseguradora de Riesgos del Trabajo - ART).

A brief description of the main health and safety regulations is included in Appendix C.

## 2.5 Buenos Aires Province Regulations

The following section includes a brief overview of the main environmental regulations that apply to the oil and gas industry in the Buenos Aires Province. A brief description of additional provincial environmental regulations is included in Appendix C.

### 2.5.1 Renewable Energies Regulations

Provincial Law N° 14,838 adheres to National Law N° 26,190 for the promotion of renewable sources use for electrical energy production. This Provincial Law creates the framework for the renewable energy industry, and establishes a promotion scheme in which renewable energies projects developed within the provincial territory are exempted of paying the following taxes for fifteen (15) years: gross incomes, real estate tax and stamp taxes.

Decree N° 1.293/2019 regulates Law N° 14.838, and establishes that all projects that wish to adhere to the Law's promotion scheme, must register in the Provincial Unique Register of Renewable Energy Projects ("Registro Unico de Proyectos de Energía Renovable de la Provincia de Buenos Aires – RUER") held by the Ministry of Infrastructure and Public Services. Once the registration is approved, the Ministry will inform the Provincial Tax Agency ("Agencia de Recaudación de la Provincia de Buenos Aires – ARBA"), who will grant the corresponding tax benefits.

In order to obtain these benefits, the renewable energy projects must also obtain the approval of the corresponding Environmental Impact Study from the Provincial Environmental Authority ("Organismo Provincial para el Desarrollo Sostenible – OPDS").

In addition, other relevant provincial regulations include:

- Disposition N° 12/2019 of the Provincial Directorate of Public Services, which establishes a Manual to apply Law N° 14.838 for renewable energy projects.

### 2.5.2 Environmental Impact Assessment and Environmental License

As mentioned above, Provincial Law N° 14.838 requires renewable energy projects to obtain the corresponding environmental license from the Provincial Environmental Authority (Organismo Provincial para el Desarrollo Sostenible – OPDS).

The **Environmental Impact Assessment** process in the Buenos Aires Province is regulated by Law N° 11.723. According to this regulation, projects/activities are required to obtain an **Environmental Impact**

**Declaration (“Declaración de Impacto Ambiental – DIA”)**, which is applied for preparing and submitting an Environmental Impact Study (ESIAs), among other required information.

Appendix C of the regulation establishes the activities/projects to be evaluated by the Provincial Environmental Authority and the projects/activities to be evaluated by the Municipal Environmental Authority.

OPDS Resolution No. 15/2015 establishes that Project proponents have to submit before the Authority the following documentation, among other:

- The Project Form included in the Appendix A of the regulation, duly completed and signed.
- Documentation accrediting the legal representation of the project proponent.
- Municipal zoning regulation or zoning certificate for the project site.
- Environmental Impact Assessment (hard copies and electronic copy).

Once submitted, the Environmental Impact Assessment is evaluated by the Authority which approves, approves making observations, or rejects the project.

### *2.5.2.1 Environmental License*

The Project obtained its Environmental License (Environmental Impact Declaration) from the Provincial Environmental Authority (Organismo Provincial para el Desarrollo Sostenible – OPDS) via OPDS Resolution No. 2351/2016. The approval is conditioned to the compliance with a number of requirements, among which are:

- Prior to construction, it will be necessary to verify some aspects related to the feasibility of the project site, such as: soil study, bird migratory flows study, among others.
- Prior to construction, the express agreement of the owners of the three properties where the Project will be located must be obtained. The agreements must be documented in a legal instrument.
- Dielectric insulating oils with polychlorinated biphenyls (PCB) cannot be used. Physicochemical analysis of the insulating oils used, carried out by an authorized laboratory according to OPDS Resolution No. 41/2014, shall be carried out in order to prove the absence of said substance.
- The wind turbines should be painted with a color similar to the immediate surroundings, to mitigate the visual impact of the Project.
- The contractor should monitor the vegetation status and replace the damaged or dead specimens with others of the same characteristics as those found at the baseline.
- The exploitation permit of the groundwater resource, applied for before the Provincial Water Authority (Autoridad del Agua – ADA), should be obtained in the case of using water in the cooling circuits.
- Provisions of Law No. 12,259 in which the Cauquen Colorado is declared a Natural Monument within the province of Buenos Aires, and Law No. 14,038 in which the preservation of the species of cauquenes is declared of provincial interest, must be complied with.
- The Environmental Management Plan must contain an Emergency Prevention Program, a Contingency Plan (procedures-alert levels), a Health and Safety Plan, an Operational Procedures Manual and an Environmental Monitoring Plan. In addition, it should include a specific section for monitoring bird migratory flows, clearly stating the roles and responsibilities of each of the actors involved in the implementation of mitigation and monitoring measures, from bird-watching to detention of the wind turbines, if necessary. For this purpose, a statistical record must be kept, through a qualified professional in the matter, of each of the interventions carried out in correspondence with this type of action.
- The Contingency and Environmental Management Plans must be known and complied with by all employees, contractors and subcontractors, during all phases of the Project.

- Any modification of the Project must be communicated to OPDS. If the construction has not started within one year, the ESIA must be updated.
- An Environmental Protection Area for the Project shall be under the responsibility of a HSE professional assisted by a sufficient team of other professionals. They will be in charge of coordinating all the specific activities of the Environmental Management Plan, monitoring the environmental parameters, supervising and implementing the environmental protection measures, monitoring events or impacts, among others.
- A communicational strategy for safety and environmental issues should be implemented aimed at the entire population of the area of influence of the Project.
- The OPDS and the municipality must be informed of any type of contingency and any control or mitigation action within 12 hours of the event.
- In case of any chance finding of archaeological, paleontological, cultural or historical remains within the Project Area, the company must comply with the National Law No. 25.743, informing the finding to the Provincial Directorate of Cultural Heritage, and being responsible for its conservation until the authority intervenes.
- The requirements of Resolution No. 77/98 must be met: periodic verification of the emission limits of electromagnetic fields, radio electric disturbances and noise, both mechanical and aerodynamic.
- The protocols and/or measurements of the environmental parameters must be available and signed by the responsible agents.
- The wind turbines locations should be informed to the competent authorities, in order to modify possible flight routes. Also, the ends of the blades of the wind turbines should be painted red.
- It is mandatory to sign and place beacons approved by the Argentine Air Force (F.A.A) as well as installing security systems against unauthorized access of third parties.
- The transformer station must be provided with a spill pan contain potential spills of oils or dielectric fluids, preventing the contamination of groundwater.

The main mitigation measures for all the stages of the Project are also indicated, proposed by the company and by the OPDS.

These requirements are expected to be updated by the Authority when the second addendum submitted in November 2018 is approved and a new license is issued.

### 2.5.3 Other Environmental Regulations

Other provincial environmental regulations significant for this Project include:

- **Waste management:** Provincial Law N° 11.720 and its Regulatory Decree N° 806/97 establish requirements for the management of hazardous wastes in the provincial territory. These regulations create the **Provincial Register of Generators and Operators of Hazardous Wastes**, in which all individuals and legal entities responsible for generating, handling, transporting, treating and disposing hazardous wastes within the Province must register. A **Special Waste Certificate** is granted against the registration. The Certificate has to be renewed annually with the presentation of an annual affidavit with information on the hazardous wastes generated the previous calendar year. In addition, a hazardous wastes operation record must be kept, as required by these regulations. In addition, Decree-Law N° 9.111 establishes that a Disposal Authorization must be obtained by generators that dispose their non-hazardous industrial wastes in the CEAMSE landfill.
- **Water:** The Provincial Water Code, Provincial Law N° 12.257, and its Regulatory Decree N° 3.511/07 establish the requirements for exploitation and preservation of the water resources of public domain. In addition, Resolution N° 333/2017 from the Provincial Water Authority (Autoridad del Agua - ADA) establishes the process for obtaining the following permits regarding water resources, granted by such Authority: **Hydraulic Aptitude Permit, Groundwater Exploitation Permit, Surface Water**

**Exploitation Permit, Drilling Authorization and Surface Exploitation Authorization.** Before applying for these permits, a **Pre-feasibility Certificate** must be obtained.

- **Wastewater:** Provincial Law N° 5.965 (amended by Law N° 10.408) and its Regulatory Decree N° 2.009/60 (amended by Decree N° 3.970/90), and specifically ADA Resolution N° 333/2017 establishes the process for obtaining the following permits regarding wastewater, granted by Provincial Water Authority: **Hydraulic Aptitude, Technological Aptitude for Wastewater Discharges, and Wastewater Discharge Permit.** Before applying for these permits, a **Pre-feasibility Certificate** must be obtained.
- **Protected areas:** Provincial Law N° 10.907 creates the Provincial System of Protected Natural Areas. These are classified as indicated in Article 10, according to its patrimonial status and type. Article 20 forbids economic use of these areas.

## 2.6 International Treaties and Agreements

The Argentine government has subscribed a number of convention, treaties and agreements with the aim of protecting the environment, the cultural heritage, workers, indigenous communities, etc.

Following is a brief list and description of the main treaties and agreements entered into by Argentina in relation to the issues mentioned above. The list provided includes the reference to the law number by which Argentina ratifies each treaty.

- National Law N° 23.724; Vienna Convention for the Protection of the Ozone Layer.
- National Law N° 23.778; Montreal Protocol on Substances That Deplete the Ozone Layer and subsequent amendments (approved by National Laws N° 24.167, 24.418, 25.389 and 26.106).
- National Law N° 24.295; United Nations Framework Convention on Climate Change.
- National Law N° 25.438; Kyoto Protocol on Climate Change (UN).
- National Law N° 21.836; Convention concerning the Protection of the World Cultural and Natural Heritage.
- National Law N° 24.071; ILO Convention 169 on Indigenous and Tribal Peoples.
- National Law N° 22.344 and subsequent amendments (approved by National Laws N° 23.815 and 25.337); Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- National Law N° 23.918; Convention on the Conservation of Migratory Species of Wild Animals (CMS).
- National Law N° 23.919; Convention on Wetlands of International Importance, especially as Waterfowl Habitats and subsequent amendments (approved by National Law N° 25.335).
- National Law N° 24.375; United Nations Framework Convention on Biological Diversity.
- National Law N° 24.701; United Nations Convention to Combat Desertification.
- National Law N° 23.922; Basel Convention.
- National Law N° 26.664; Amendment to the Basel Convention adopted in Genève in October 2004.
- National Law N° 21.663; ILO Convention 139 on the Prevention and Control of Occupational Hazards caused by Carcinogens.

## 2.7 International Requirements

The Project is designed to meet Argentinian regulatory requirements and commonly accepted international environmental, social, and consultation standards. These latter standards are primarily guidelines and standards of the International Finance Corporation (IFC), a unit of the World Bank, which form the *de facto* standards applied to many major operations seeking investments and guarantees from multilateral, bilateral and commercial financial institutions.

These guidelines and standards include IFC's Performance Standards (PS) on Social and Environmental Sustainability, including PS Guidance Notes; IFC's General Environmental, Health, and Safety Guidelines; IFC Environmental, Health, and Safety Guidelines for Wind Energy; IFC's Policy on Disclosure of Information; the World Bank's Anti-Corruption Strategy; and, the Voluntary Principles on Security and Human Rights. The Project is also designed to conform to the Equator Principles, a derivative of IFC/World Bank standards. All of these guidelines and standards are detailed further in the following sections.

This Supplementary Lender Information Package (SLIP) has been prepared to conform to the environmental, safety, social and human rights requirements of OPIC. These matters are explained in detail below.

## **2.7.1 FC Guidelines, Standards and Policies**

### **2.7.1.1 IFC Performance Standards**

IFC updated and consolidated existing policies and guidelines for private sector operations in its "Performance Standards on Social and Environmental

Sustainability" (Performance Standards) in April 2006 (2006a). Meeting the requirements of the Performance Standards is generally viewed as meeting good international practice in the context of private sector operations. The eight Performance Standards comprise the following:

Performance Standard 1: Social and Environmental Assessment and Management Systems

Performance Standard 2: Labor and Working Conditions

Performance Standard 3: Pollution Prevention and Abatement

Performance Standard 4: Community Health, Safety and Security

Performance Standard 5: Land Acquisition and Involuntary Resettlement

Performance Standard 6: Biodiversity Conservation and Sustainable Natural Resource Management

Performance Standard 7: Indigenous Peoples

Performance Standard 8: Cultural Heritage

### **2.7.1.2 IFC General EHS Guidelines**

The IFC General EHS Guidelines, dated April 2007, contain the performance levels and measures that IFC has determined are generally considered to be achievable at reasonable costs by existing technology. The application of these guidelines should be tailored to the hazards and risks established for each project on the basis of the results of the environmental assessment, in which site-specific variables, such as the host country context, assimilative capacity of the environment, and other project-specific factors, are taken into account. For example, the environmental assessment process may provide justification for alternative project-specific standards or requirements, such as project location, processes, or mitigation measures.

These General EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). These general guidelines are designed to be utilized in conjunction with relevant industry-sector EHS guidelines. The General EHS Guidelines are organized as follows:

Environmental

Air Emissions and Ambient Air Quality

Energy Conservation

Wastewater and Ambient Water Quality

Water Conservation

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Hazardous Materials Management  
Waste Management  
Noise  
Contaminated Land  
Occupational Health and Safety  
General Facility Design and Operation  
Communication and Training  
Physical Hazards  
Chemical Hazards  
Biological Hazards  
Radiological Hazards  
Personal Protective Equipment  
Special Hazard Environments  
Monitoring  
Community Health and Safety  
Water Quality and Availability  
Structural Safety and Project Infrastructure  
Life and Fire Safety  
Traffic Safety  
Transport of Hazardous Materials  
Disease Prevention  
Emergency Preparedness and Response  
Construction and Decommissioning  
Environment  
Occupational Health and Safety  
Community Health and Safety

### *2.7.1.3 IFC EHS Guidelines for Wind Energy*

The IFC EHS Guidelines for Wind Energy dated August 2015 include information relevant to environmental, health, and safety aspects of onshore and offshore wind energy facilities. It should be applied to wind energy facilities from the earliest feasibility assessments, as well as from the time of the environmental impact assessment, and continue to be applied throughout the construction and operational phases.

The EHS Guidelines for Wind Energy include the following topics:

Industry-Specific Impacts and Management

Environment

Landscape, Seascape and Visual Impacts;

Noise (Construction Noise, Operational Noise and Noise Mitigation Measures);

Biodiversity (Pre-construction assessments, Mitigation Measures (Onshore) and Mitigation Measures (Offshore));

Shadow Flicker; and

Water Quality (Onshore and Offshore).

Occupational Health and Safety

Working at Height and Protection from Falling Objects;

Working over Water;

Working in Remote Locations; and

Lifting Operations.

Community Health and Safety

Blade/Ice Throw;

Aviation (Aircraft Safety and Aviation Radar);

Marine Navigation and Safety (Marine Safety);

Electromagnetic Interference (Telecommunication Systems and Television);

Public Access; and

Abnormal Load Transportation.

Performance Indicators and Monitoring

Environment

Emissions and effluent guidelines;

Noise monitoring;

Environmental monitoring; and

Biodiversity Monitoring for the Operational Phase.

Occupational Health and Safety Performance

Occupational health and safety guidelines;

Accident and fatality rates; and

Occupational health and safety monitoring.

#### *2.7.1.4 IFC's Disclosure of Information Policy*

IFC adopted its current Policy on Disclosure of Information in April 2006 (2006b). The policy stipulates public consultation and disclosure requirements (including timing) for projects requesting IFC funding. AES has committed to following this policy for the Wind Farm Projects.

### **2.7.2 World Bank Policies**

#### *2.7.2.1 Anti-Corruption Strategy*

The World Bank states that corruption undermines development by distorting laws and weakening the institutional foundation on which economic growth depends. Therefore, the World Bank has identified corruption as one of the greatest obstacles to the Bank's mission and purpose, which is:

To promote open and competitive markets in developing countries;

To support companies and other private sector partners;

To generate productive jobs and deliver basic services; and,  
To create opportunity for people to escape poverty and improve their lives.  
Increasing political accountability;  
Strengthening civil society participation;  
Creating a competitive private sector;  
Establishing institutional restraints on power; and,  
Improving private sector management.

### *2.7.2.2 Increasing Political Accountability*

Political accountability is defined as the constraints placed on the behavior of public officials by organizations and constituencies that are able to apply sanctions. This largely depends on the effectiveness of the sanctions and the monitoring of public officials by accountability institutions. Sanctions can be more effective by: maintaining political competition that exposes corruption and holds candidates accountable; establishing a well-designed mechanism for political party financing; promoting the transparency of political activities through free and vibrant media; as well as establishing and enforcing rules and legal instruments to deter corrupt behavior.

### *2.7.2.3 Strengthening Civil Society Participation*

Civil society is composed of, but not limited to, citizens groups, NGOs, trade unions, business associations, think tanks, academia, religious organizations and the media. Civil society mediates between the state and the public with a stake in good governance. When adhering to high standards of accountability, transparency and democratic management, civil society effectively: increases public awareness, adds pressure to politicians, and incorporates the various sectors which may otherwise lack representation.

### *2.7.2.4 Creating a Competitive Private Sector*

Broad-based economic development is supported by a fair, competitive, honest and transparent private sector. However, a few powerful economic interests can, at times, strongly influence the decisions and policies of the state. Economic policy liberalization, enhanced competition, regulatory reform, good corporate governance, transnational cooperation, and the promotion of business associations, trade unions, and concerned parties may be utilized to balance economic interests.

### *2.7.2.5 Establishing Institutional Restraints on Power*

The state, in particular, may be institutionally restrained from committing abuses by the separation of powers (e.g., executive, legislative, judicial) and the establishment of checks and balances among these powers. Several components need be established to create an institutionally restrained state.

A system of rules is fundamental to a functioning society. As such, an independent, competent, and clean judicial system is necessary to avoid corruption. Once established, this judicial system upholds the daily rule of law.

Anti-corruption laws then deter corruption and prosecute corruptors. In addition, corruption is deterred through predictable, transparent, and accountable government decision-making as well as audits by government-supported organizations with a core of strong, independent, and credible professionals in the judicial, prosecutorial, and police arms of the state. By enforcing the anticorruption laws, the principle of justice is instilled amongst society.

### 2.7.2.6 Improving Private Sector Management

Another anti-corruption strategy is to reform the internal management of public resources and administration to minimize or eliminate the incentive and opportunities for corruption. Public sector finance and management reform requires:

- The institution of meritocratic systems for appointment, promotion, and performance evaluation that promote adequate pay and regularize benefits;
- Enhanced transparency and accountability with respect to budget management, taxes, and customs;
- Sectoral-service-delivery policy reforms; and
- Service delivery decentralization held accountable through pre-established systems of financial management and auditing.

### 2.7.3 Equator Principles

The Equator Principles are voluntary international guidelines adopted by the Equator Principles Financial Institutions (EPFI). These include many financial institutions involved in project finance in the extractive sector. The Equator Principles are intended to help investors manage environmental and social risks, which may be associated with international project financing. In general, the Equator Principles are derived from the IFC/World Bank requirements, particularly IFC's Performance Standards. Some of the conditions of the Equator Principles are as follows.

- The project risk has been categorized following the environmental and social screening criteria of IFC.
- An Environmental Assessment has been completed for all Category A and Category B projects.
- The Environmental Assessment report must address compliance with applicable host country laws, regulations, and permits required by the project and, at least, reference the guidelines and safeguard policies applicable under the World Bank and IFC PPAH guidelines.
- Where appropriate, an Environmental Management Plan must be prepared to address mitigation, action plans, monitoring, management of risk and schedules.
- Where appropriate, public consultation has been conducted to make the Environmental Assessment (or its summary) available to the public for a reasonable period.

Therefore, investors who adopt the voluntary Equator Principles are making a commitment to promote environmental stewardship and socially responsible development. At the same time, investors believe that following the Equator Principles will help reduce the financial and reputational risk of the projects they wish to finance.

### 2.7.4 Voluntary Principles on Security and Human Rights

The Voluntary Principles on Security and Human Rights were developed to "guide companies in monitoring the safety and security of their operations within an operating framework that ensures respect for human rights and fundamental freedoms." These voluntary principles were developed by the governments of the United States, the United Kingdom, Norway and the Netherlands, plus companies operating in the extractive and energy sectors and non-governmental organizations, all with an interest in human rights and corporate social responsibility. The criteria for participation were finalized in 2007.

AES will maintain its own security staff to provide security for the Project sites, its activities and workers. The potential sensitivities associated with the possible presence of informal land users within the Project boundaries, and potential for land-use conflicts, indicate the need to consider and adhere to good international practices on security and human rights. This includes a commitment by AES to follow the "Voluntary Principles on Security and Human Rights."

The Voluntary Principles recognize that governments have primary responsibility to promote and protect human rights and that all parties to a conflict are obliged to observe applicable international humanitarian

law. Applicable international standards include the United Nations Code of Conduct for Law Enforcement Officials and the United Nations Basic Principles on the Use of Force and Firearms by Law Enforcement Officials.

The Voluntary Principles regarding security and human rights in the extractive sector fall into three categories: *risk assessment*, *relations with public security*, and *relations with private security*.

Accurate and effective *risk assessments* should consider the following factors: identification of security risks; potential for violence; human rights records; rule of law; conflict analysis; and equipment transfers.

In an effort to reduce the risk of abuses and to promote respect for human rights generally, the following Voluntary Principles can guide *relationships between companies and public security* regarding security provided to companies: security arrangements; deployment and conduct; consultation and advice; and responses to human rights abuses.

Where host governments are unable or unwilling to provide adequate security to protect a Company's personnel or assets, it may be necessary to engage *private security* providers as a complement to public security. In this context, private security may have to coordinate with state forces, (law enforcement, in particular) to carry weapons and to consider the defensive local use of force. Given the risks associated with such activities, Voluntary Principles can guide private security conduct such as: private security should observe the policies of the contracting company regarding: ethical conduct and human rights; the law and professional standards of the country in which they operate; should maintain high levels of technical and professional proficiency; should act in a lawful manner; should have policies regarding appropriate conduct and local use of force; etc. Companies should consult and monitor private security providers to ensure they fulfill their obligation to provide security in a manner consistent with the principles outlined. Where appropriate, companies should seek to employ private security providers that are representative of the local population.

### 3. PROJECT ALTERNATIVES

#### 3.1 Overall Project context

Argentinian Law No. 27,191 defines renewable power generation as an area of public interest, with a commitment from the State to increase the share of renewable energies (including mini hydro under 30MW capacity) to 8 per cent of the national electricity mix by the end of 2017. With this law Argentina also set out a long term target of 20 per cent of power demand to be covered by renewable energy generation with 10,000MW of renewable power generation to be added to the grid by 2025 (Norton Rose Fulbright, 2016).

Amongst the various initiatives to increase power generation, the Argentinian government launched the RenovAr Program that seeks to develop Argentina's renewable energy sector. The expansion of the use of renewable energy sources has favorable consequences in the country since it implies, among others, a greater diversification of the national energy matrix, the expansion of the installed electric power in the short term, the reduction of both, the fossil fuel consumption and the emission of greenhouse gases, and the contribution to the mitigation of climate change. So far the program has completed three bidding rounds, awarding 147 projects with a combined capacity of 4,466 MW, of which 34 are Wind Energy projects with a total capacity of 2,466 MW (Yaneva et al., 2018)

In this context, AES Argentina seeks to develop clean energy projects, mainly as developer and operator of wind farms. Harnessing wind-energy is an eco-friendly process, with an inexhaustible wind resource and minimal environmental footprint. There are minimal fuel and water requirements for operational activities. Wind energy has a short development timeframe compared to most other forms of energy production. Only a relatively brief lead-time is required to design, install and start-up a wind plant.

For the site selection, AES Argentina carried out a screening of the available wind farm alternatives. As a result, a list of possible developments, in condition to be commercialized and in advanced stages to be built as soon as possible, was made.

Among the alternatives listed, different factors were evaluated: wind resource, proximity to the electric interconnection point, the transmission system capacity, infrastructure and logistics issues, social characteristics and potential conflicts. The main objective was to determine competitiveness and the risks associated with the alternatives evaluated.

For the pre-selected projects, audits on various aspects (technical, environmental, legal, social, among others) were carried out supported by specialist consultants. Finally, the Energetica I project was chosen after being awarded in Renovar2 and after being approved by the investment committee of AES.

#### 3.2 Site selection

The site was chosen on the bases of the assessed wind resource. Another relevant factor was the existence of a nearby overhead transmission line. The existing 132 KV transmission line that connects Bahia Blanca –Tornquist substations crosses one of the project properties and has enough capacity to evacuate the electricity generated by the Wind Farm.

Wind resource mapping and power potential assessment for the Project was done by Energética Argentina S.A. This included an assessment of the wind power generation potential through the analysis of 4 years of data provided by two meteorological masts that were located within the Project Area (see report *ESIA\_CEENI-REV A. 4.14.3.2. Estudio del recurso eólico y producción energética*). Based on these measurements, the average wind speed was 8,40 and 8,65 m/s at 48 and 82 m, respectively.

During the selection of the site, social aspects and potential conflicts were also taken into account. As indicated in the original ESIA, the Project site is located within three properties privately owned, with a total surface area of 950 Ha. Its owners express their interest in the development of this type of energy, particularly, because the project allows the activities currently given to the land (livestock-agriculture) to continue. In addition, the project does not represent a threat to access to water for example, which is obtained in the area by the owner through groundwater abstraction wells, as indicate by the ESIA. The Project can therefore been seen as a diversification of the actual land use in the area, generating a new

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income for the land owners by the leased agreement signed with the Project Owner, by which land owners are paid throughout the lifecycle of the project. The leasing contract were signed for the construction and a 20-year period of operation, and can be renewed if both parties agree. No expropriation of land took place as part of the project development and no other informal activities within the project footprint take place.

The selection of the site also responds to the existence of nearby paved access roads (National Route No. 33), and unpaved public streets in good conditions. The Project is also closed to several ports: Puerto Ing. White (Bahía Blanca), Puerto Galván (Bahía Blanca), Puerto de Coronel Rosales (Punta Alta) y Puerto Belgrano (Punta Alta). In addition, within the infrastructure and logistics aspects that were evaluated, the chosen project site is close to the city of Tornquist (30 km) and Bahía Blanca (40 km).

**3.2.1 Alternative Locations and Design for Wind Turbines**

The original layout of Energética I Wind Farm (as stated in the original *ESTUDIO DE IMPACTO AMBIENTAL-ESIA*) consisted of 73 wind turbines (Guodian United Power brand, model UP77-1.500 KW) a Transformer Station (MT/HT) and the link between the Overhead 132 KV Transmission Line that connects Bahía Blanca-Tornquist with the Transformer Station (Figure 3.1. The total installed power was 109.5 MW.

**Figure 3.1 Original Layout of Energética I Wind Farm**



Latest engineering and optimization studies for the Project led to select a different wind turbine brand, which is comparatively more efficient, and thus the new layout (Figure 3.2) include 30 wind turbines (Nordex-Acciona brand, model AW132/3300 TH120, class IEC IIB) with a total installed power of 99,75 MW (see *ESTUDIO DE IMPACTO AMBIENTAL- ADENDA Nº 2*).

**Figure 3.2 Updated Layout of Energética I Wind Farm**



### 3.3 “No Project” Alternative

No reason could be identified to justify a “no Project” alternative considering the strategic importance of developing renewable power generation capacity in Argentina in general, and the Buenos Aires province in particular. Alternative power production option would be:

- Thermal: not desirable in the context of reinforcing renewable energy production in Argentina’s power generation mix.
- Hydropower: not considered feasible in this region of Argentina which has limited hydropower generation potential, and typically requiring significantly a more complex and prolonged development process, with a range of E&S issues to be addressed;
- Solar: being developed as part of other projects in Argentina, but less suited than wind in this region.

Lastly, as further discussed in this SLIP, there are no major environmental or social sensitivities that would justify re-considering the Project at the proposed location.

### 3.4 References

- IFC, (2015). *Environmental, Health and Safety Guidelines – Wind Energy*  
[https://www.ifc.org/wps/wcm/connect/2c410700497a7933b04cf1ef20a40540/FINAL\\_Aug+2015\\_Wind+Energy\\_EHS+Guideline.pdf?MOD=AJPERES](https://www.ifc.org/wps/wcm/connect/2c410700497a7933b04cf1ef20a40540/FINAL_Aug+2015_Wind+Energy_EHS+Guideline.pdf?MOD=AJPERES)
- Norton Rose Fulbright, 2016. Renewable energy in Latin America.
- Yaneva, M; Tisheca, P and T. Tsanova. 2018. 2018 ARGENTINA RENEWABLE ENERGY REPORT.

## 4. LAND ACQUISITION

- As indicated in the original ESIA, the Project site is located within three privately-owned plots, owned by three (3) people, with a total surface area of 950 ha. Owners are dedicated to small-scale

commercial agriculture and livestock. Owners do not depend on these activities for their livelihoods; they are retired. They have no obligations to their family (children) as they are independent and live in the city or abroad.

- Land acquisition for the entire Project area was obtained through a direct negotiation process with the owners, which granted surface rights<sup>1</sup> over most of their land -excepting their already built infrastructure- during the Project's construction phase. This means that owners do not lose property rights over their land, but instead only grant surface rights for a limited amount of time, stipulated in the agreement (40 years, see below).
- IFC PS 5 is not triggered because land was accessed through a negotiation process in which the landowners entered voluntarily. After said process, an agreement was signed. If landowners refused to negotiate and did not grant surface rights to develop the Project, alternatives in other nearby areas were available to locate and develop it. No land expropriation processes were conducted as part of project development.
- Owners were compensated to remove their cattle (120) from the property during the construction phase, and AES will transfer the cattle back once the operation phase begins. During the site visit, owners stated that they feel they were not losing anything by giving up the field during construction (a year and a half). They are being compensated for lost profits. In addition, they have insurance that allows Energética to reimburse them for any damage to their property that might occur during construction.
- No other informal activities take place within the project footprint.
- Owners have expressed their interest in the development of wind energy, particularly because this kind of project allows the activities currently developed in the land (livestock-agriculture) to continue once the project has been built. In addition, the project does not represent a threat to access to water for example, which is currently obtained in the area by the owner through groundwater abstraction wells, as indicated in the ESIA. During site visits performed in May 2019, interviews were held with Miguel Marcenac. He manifested his conformity with project execution and with the agreement signed, due to favorable conditions offered by AES (see below).
- When AES finishes construction, owners plan to continue with cattle ranching.

#### 4.1 Land Acquisition Process and Agreement

- According to the agreement, the owner grants Energética Argentina surface rights on the property. The surface of the properties of the three owners are 311, 333, and 306 ha.
- Energética has been granted the right to locate wind energy installation and equipment without affecting existing constructions, and will have the exclusive right to use and exploit the wind resources in the property. The surface right is granted for a 40 years term. Energética is obliged to pay the owner a royalty/canon, established for:
  - Construction term;
  - First stage (up to 10 years) of operation and exploitation; and
  - Second stage of operation and exploitation (10-20 years).
- After the first 20 years of operation, the parties will re-negotiate the conditions of continuity of the agreement, updating the stipulated royalty/canon, not being able to be less than the canon received in second.

<sup>1</sup> In Argentinian Law, a surface right is a "temporary right in rem, which is constituted on another's property, which grants its owner the right to use, enjoy and dispose materially and legally of the right to plant, forest or build, or on what has been planted, forested or built on the land, the flight or the subsoil, according to the modalities of its exercise and term of duration established in the sufficient title for its constitution and within the provisions of this title and the special laws"

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- Agreement stipulates that AES' main office will pay this royalty/canon in US dollars, which is important in a country with currency and devaluation issues.
- Energética Argentina, during all the instances of the agreement, will allow the owner to exploit the pastures (sow, harvest and gather), granting him the necessary authorizations and agreements, as long as these do not represent limitations or impairment to the surface right of the Project.

Energética Argentina is obliged to allow those fences that are not affected by the installation of a generating unit to be used by the owner for small livestock grazing (sheep, cattle and horses) as long as they do not affect the construction of the wind farm. Once the installation is completed, all improvements (fences, gates, watering troughs, sheds) must be in working condition.

## 5. AREAS OF INFLUENCE

The Project's specifically identified physical elements, aspects, and facilities that are likely to generate environmental and social risks and impacts will be identified in the context of an Area of Influence (Aol).

As a compliment to the Projects Environmental Impact Assessment, this section defines an Area of Influence for the Project, aligning with the International Finance Corporation (IFC)'s criteria.

Under the IFC Performance Standard 1, an Area of Influence is defined to encompass:

- The area likely to be affected by:
  - The Project's activities and facilities that are directly owned, operated or managed (including by the Engineering, Procurement, Construction contractor) and that are a component of the Project; and
  - Impacts from unplanned but predictable developments caused by the Project that may occur later or at a different location.
- Indirect Project impacts on:
  - Biodiversity or on ecosystem services upon which Affected Communities<sup>2</sup>' livelihoods are dependent;
  - Associated facilities, which are facilities that are not funded as part of the Project and that would not have been constructed or expanded if the Project did not exist and without which the Project would not be viable; and
  - Cumulative impacts that result from the incremental impact, on areas or resources used or directly impacted by the Project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted.

The Aol encompasses the components that the Project is developing. Furthermore, the Aol also must consider downstream impacts, normally associated with aquatic discharges and air emissions associated with the Project during construction and operations. It is good practice to keep the Aol to a reasonable distance so that the potential impact assessed can be attributed to the Project rather than being affected by influences outside of the Project. The Aol for a particular resource/ receptor may also vary depending on the nature of the change caused by the Project activities and the type of effect being considered, but in each case, it is defined to include all the area within which significant impacts may result.

Two methodological criteria are used to define the Aol of the Project, as shown in Table 5-1.

**Table 5-1 Criteria used to define the Aol**

Criteria	Description
Geospatial	To determine the Area of Influence, the Project area and its facilities were located and a buffer was generated, from the perimeter of the Project.
Socioeconomic and sociocultural	To determine the locations of the Area of Influence the contiguous physical space in which socio-economic and socio-cultural elements were located that could be impacted by the works and activities that will be carried out during the different stages of the Project. Criteria of tenure and use of land in the municipality were also taken into account.
.Environmental	Physical (topography, geography) and biological (flora and fauna) characteristics of the sector are consistent within a 30 km radius around the project (approximately). Therefore, the parameters used to define the area where significant environmental impacts could be

<sup>2</sup> "Local communities directly affected by the project" (IFC Performance Standards on Environmental and Social Sustainability, IFC, 2012)

Criteria	Description
	caused by the project performance are the same ones used to define the Social Aol. Thus, the Aol described in this section includes both social and environmental aspects.

Source: ERM, 2019

The Project's Aol has been identified in two different categories; Direct Area of Influence and Indirect Area of Influence, according to the magnitude of potential impacts of the Project on the Stakeholders contained in each area.

## 5.1 DIRECT AREA OF INFLUENCE

The Direct Area of Influence of the Project consists in the physical space in which the Project's infrastructure is intended to be built and where the activities and processes that comprise it must be identified and delimited; it includes a buffer zone where Project activities could have direct impacts or risks.

The buffer zone is made up of a radius of 7 km around the polygon, it is the physical space surrounding the Project, but it also considers the environmental, socio-economic and socio-cultural elements that are directly impacted by the works and activities carried out during the different stages of the Project.

To define the Direct Aol of the Project, the following criteria was taken into consideration:

**Table 5-2. Identification and description of the elements of the Direct Aol**

Element	Description
Project site	The Project's site has a total surface area of 950 Ha, compounded by three private properties where a wind farm of 99.75 MW of total installed capacity is under construction.
Associated facilities	An existing 132 KV transmission line crosses one of these three properties. The transmission line is operated by TRANSBA S.A., and connects the Bahía Blanca and Tornquist substations.

### Buffer area

Social aspects	
Human settlements and/or localities	<ul style="list-style-type: none"> <li>■ There are three houses inside the Project's site, which belong to the landowners.</li> <li>■ One household near the Project.</li> <li>■ The locality of Tres Picos, which is located 5.77 km north to the Project site.</li> </ul> (See Figure 5.1)
Territorial and / or administrative units	The Project is inserted within the province of Buenos Aires, in the department of Tornquist, in a rural area called Paraje del Río.
Land tenure and utilization	The Project site is located in private property lands. The surrounding territories are predominantly agrarian and cattle lands.
Tangible or intangible cultural heritage	The presence of cultural heritage has been discarded as indicated in the original ESIA.

Element	Description
Roads	<p>The Project will be accessed through National Route N° 33, located 2.5 km from the southwestern corner of the Project boundary. This main access is located in the 40<sup>th</sup> km of the National Route N° 33, which links the city of Bahía Blanca with the city of Tornquist.</p> <p>Adjacent to the east boundary, there is an existing railway that connects the Train Stations of Bahía Blanca and Tornquist.</p> <p>(See Figure 5.2)</p>
Economic activity, goods and services	Primarily livestock based economy.
Indigenous population	<p>There is no presence of indigenous communities within the Direct Aol.</p> <p>(See Figure 5.3)</p>
<b>Environmental aspects</b>	
Hydrology	Superficial water bodies located near the project are included within the Aol described for Social aspects (see Figure 6.2).
Environmental and landscape scenario	The environmental aspects and landscape scenario are consistent within a 30 km radius around the project.
Noise	The area where noise impacts could be caused by the project performance are included within the Aol described for Social aspects (see Figure 10.1).
Shadow	Approximately 1,700 meters is the extension of the area where the project could cause shadow flicker impacts.

Source: ERM, 2019

## 5.2 INDIRECT AREA OF INFLUENCE

The Indirect Area of Influence of the Project includes the specific environmental, socio-economic and socio-cultural elements that could be indirectly be affected by the Project's activities. The Indirect Aol considers areas potentially impacted by cumulative impacts from further planned development of the Project, as well as areas potentially affected by impacts from unplanned but predictable developments caused by the Project that may occur later or at a different location.

To define the Indirect Aol of the Project, the following criteria was taken into consideration, based on the main potential indirect impacts the Project could have:

**Table 5-3. Identification and description of the elements of the Indirect Aol**

Element	Description
<b>Social aspects</b>	
Human settlements and/or localities	<ul style="list-style-type: none"> <li>■ Tornquist</li> <li>■ Bahía Blanca</li> </ul>

	<ul style="list-style-type: none"> <li>■ Cabildo</li> <li>■ Chasicó</li> <li>■ General Daniel Cerri</li> </ul> <p>(See Figure 5.1)</p> <p>Such localities, due to their closeness to the Project, could be impacted in the following ways:</p> <ul style="list-style-type: none"> <li>■ Potential impact on the activities and way of life of the population due to the movement of machinery, equipment and vehicles in general.</li> <li>■ Potential generation of local and regional employment.</li> <li>■ Potential influx migration due to foreigner workers brought in by the Project.</li> </ul>
<p>Economic activity, goods and services</p>	<p>Potential development in the surrounding localities can be induced by the Project and other similar projects in the area.</p>
<p><b>Environmental aspects</b></p>	
<p>Environmental and landscape scenario</p>	<p>Physical (topography, geography) and biological (flora and fauna) characteristics of the sector are consistent within a 30 km radius around the project (approximately). Therefore, the parameters used to define the area where significant environmental impacts could be caused by the project performance are the same ones used to define the Social AoI. Thus, the AoI described in this section includes both social and environmental aspects.</p>

Source: ERM, 2019

Different from the Direct AoI, the Project's Indirect AoI was defined not as a geographical area, but as specific localities that could be impacted by the Project's activities. As observed in Figure 5.1, the localities considered as the Indirect AoI are Tornquist, Bahía Blanca, Cabildo, Chasicó, and General Daniel Cerri.

According to the criteria listed for both the Direct and Indirect Areas of Influence, the following maps were created in order to visualize graphically the information previously mentioned.

Figure 5.1 Localities and households in the Area of Influence

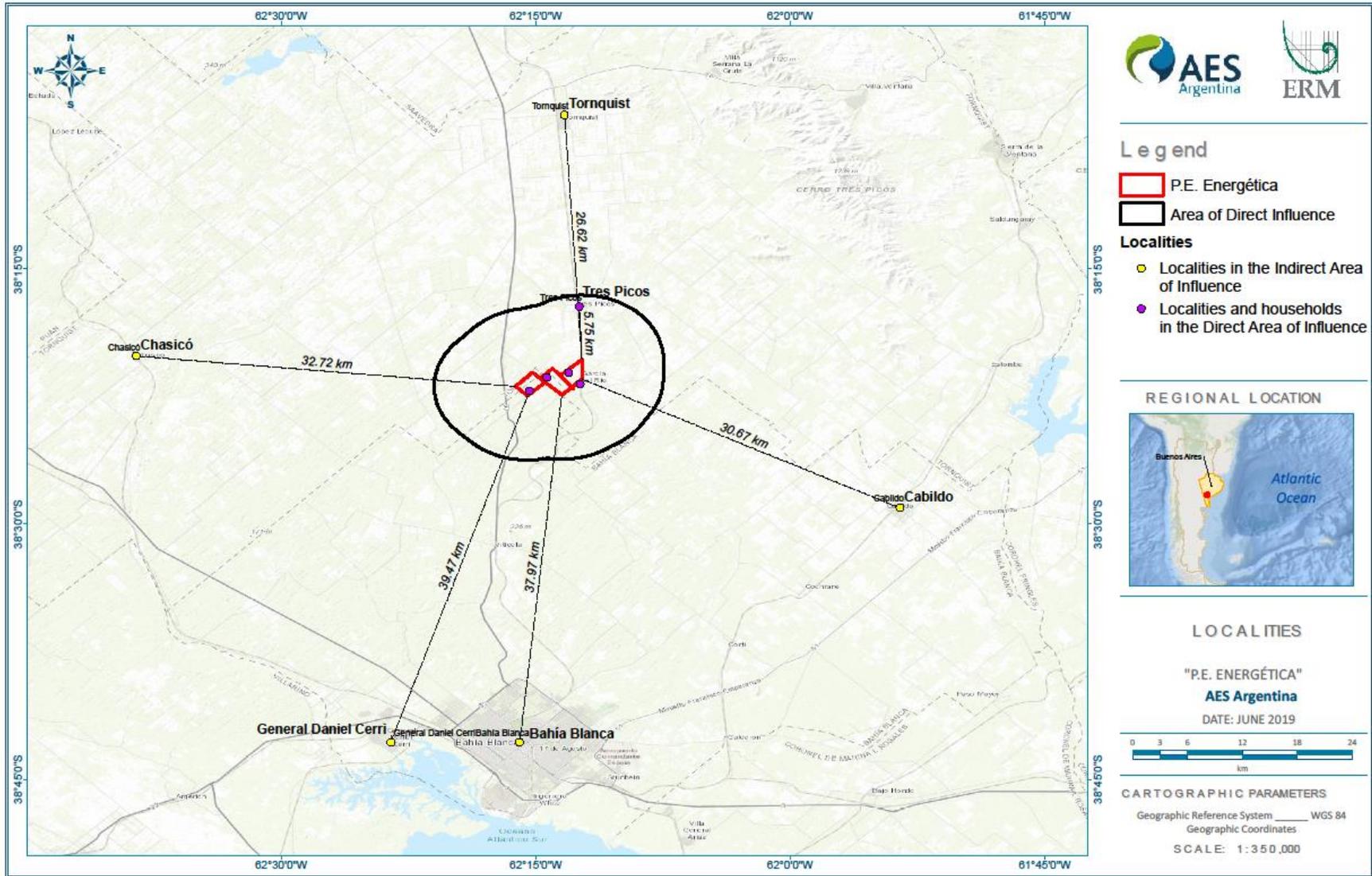


Figure 5.2 Roads in the Area of Influence

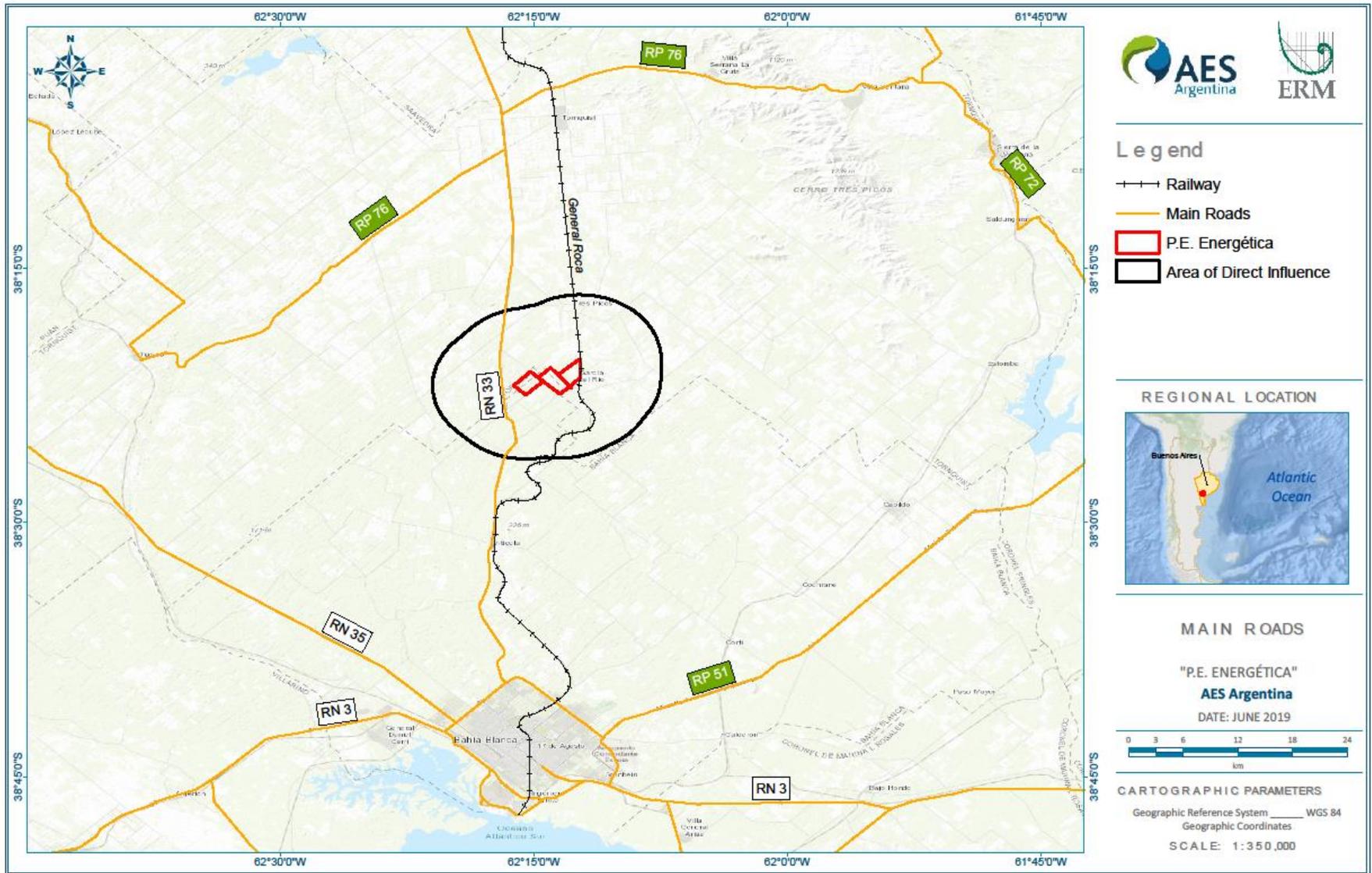
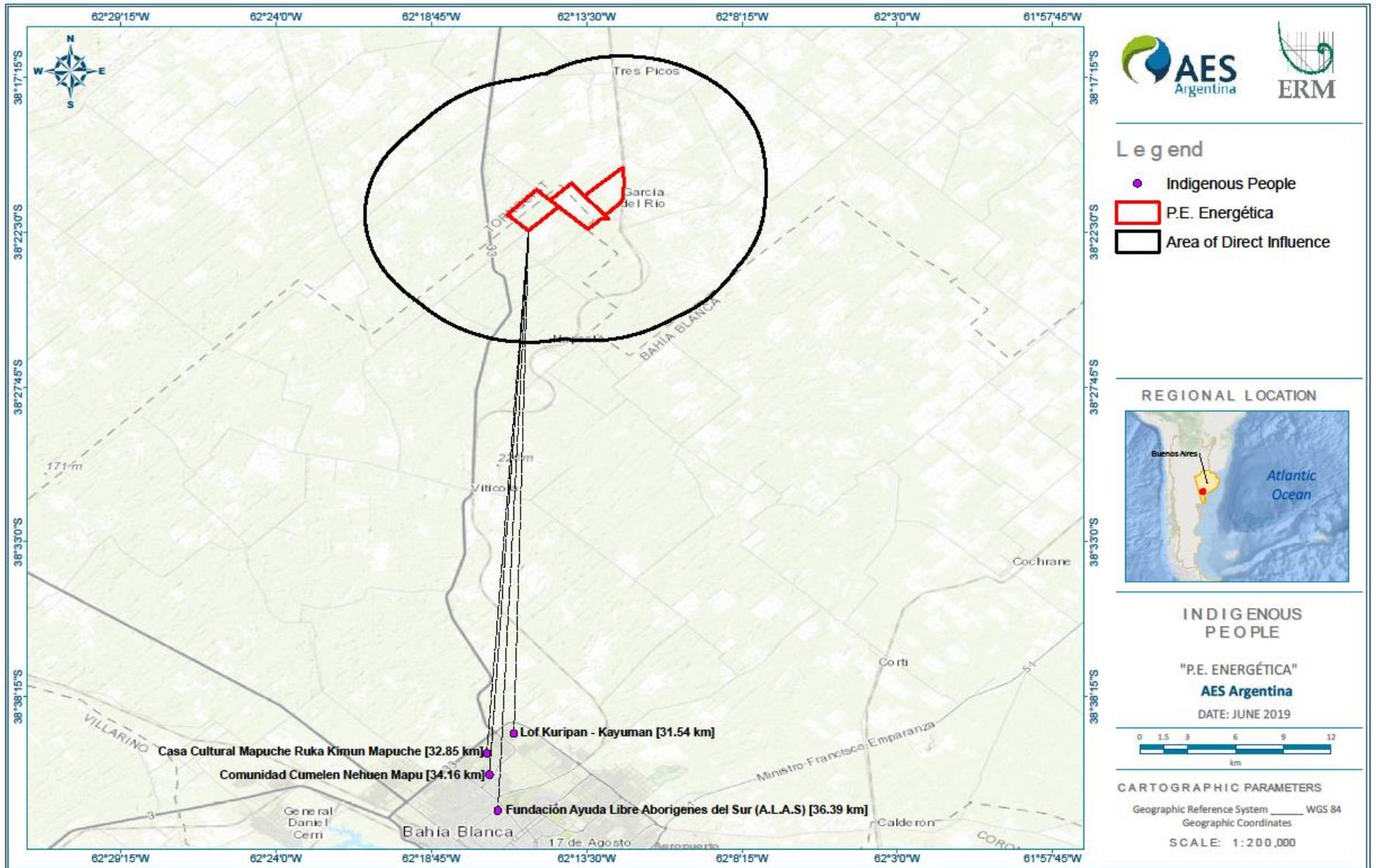


Figure 5.3 Indigenous communities in the Area of Influence



## 6. BASELINES

This section aims at supplementing the ESIA conducted for the Project, specifically in Biodiversity and Social aspects in line with IFC standards, the Equator Principles, and World Bank Group EHS Guidelines; as well as in terms of habitat analysis using the IFC PS 6 requirements. This assessment is based on a literature review. This process has completed the first two steps of critical habitat determination, as specified in paragraphs GN53 and GN60 of the IFC's Guidance Note 6<sup>3</sup>. Therefore, the scope of this assessment is limited to Step 3: Critical Habitat Determination, as defined in paragraphs GN63 to GN69.

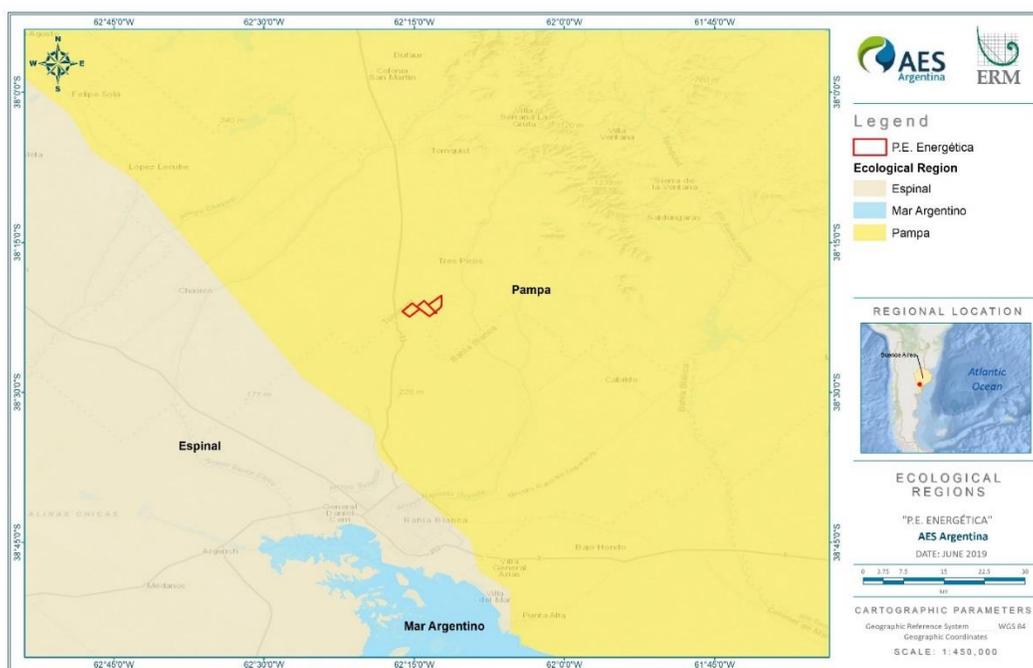
### 6.1 Biodiversity

#### 6.1.1 Environmental setting overview

The Project Energética 1 is located in the South of the Province of *Buenos Aires*, in the *Partido* (department) of *Tornquist*, close to *Paraje García del Río* and approximately 5 km from the town of *Tres Picos*, taking as reference the Northeast vertex of the Project.

The physiognomy of the landscape of the Project Area is characterized by the presence of the *Serrano de Ventania* system. This orographic unit, located in the southwest of the province of Buenos Aires, constitutes a 170 km folding system NW-SE direction, with a maximum height of 1,243 meters above sea level (*Cerro Tres Picos*).

**Figure 6.1 Ecological Regions**



No permanent bodies of surface water have been found to exist within the Project area, although the presence of depressed areas makes assume that in years of abundant rainfall small temporary lagoons are formed (Figure 6.2).

<sup>3</sup> IFC, 2019. Guidance Note 6. Biodiversity Conservation and Sustainable Management of Living Natural Resources.

The dominant vegetation in this area was originally grassland consisting of several different communities. However, this conformation has been suffering over time a profound transformation by agricultural activities and the accidental occurrence of fires, suffering a gradual replacement of native plant species by cultivated plant species, weeds and invasive exotics.

In the provincial context, the Project area is located in the region furthest away from the administrative capital, Southwest Buenos Aires. This is the most marginal sector of the Province from an agro-ecological point of view, with a dry and semi-arid sub-humid climate. Consequently, the suitability of the soils refers to a mixed production, such as livestock-agricultural or agricultural-livestock, with restrictions for summer agriculture.

The types of vegetation in the Interior Plane Pampa are pseudosteppe with mesophyte plants with and steppe with halophyte plants, each formed by two different communities. The mesophyte pseudosteppe is zonal in deep sandy loam soil where graminea such as *Poa ligularis*, *Nassella tenuissima*, *Nassella trichotoma*, *Eragrostis lugens*, *Elionurus muticus*, and *Sorghastrum pellitum*; and dicotyledons such as *Pfaffia gnaphaloides*, *Hypochaeris pampasica*, *Baccharis spp.*, and *Oenothera spp.*, are abundant. The halophyte steppe is azonal, found in plane and low areas lentic environments. Species like *Distichlis spp.*, *Hordeum pusillum*, *Leptochloa fusca*, *Puccinellia glaucescens* and *Juncus acutus*; and dicotyledons such as *Spergularia grandis*, *Lepidium spicatum*, *Plantago myosurus*; are abundant (Burkart et al. 2005.).

**Figure 6.2 Hydrology**

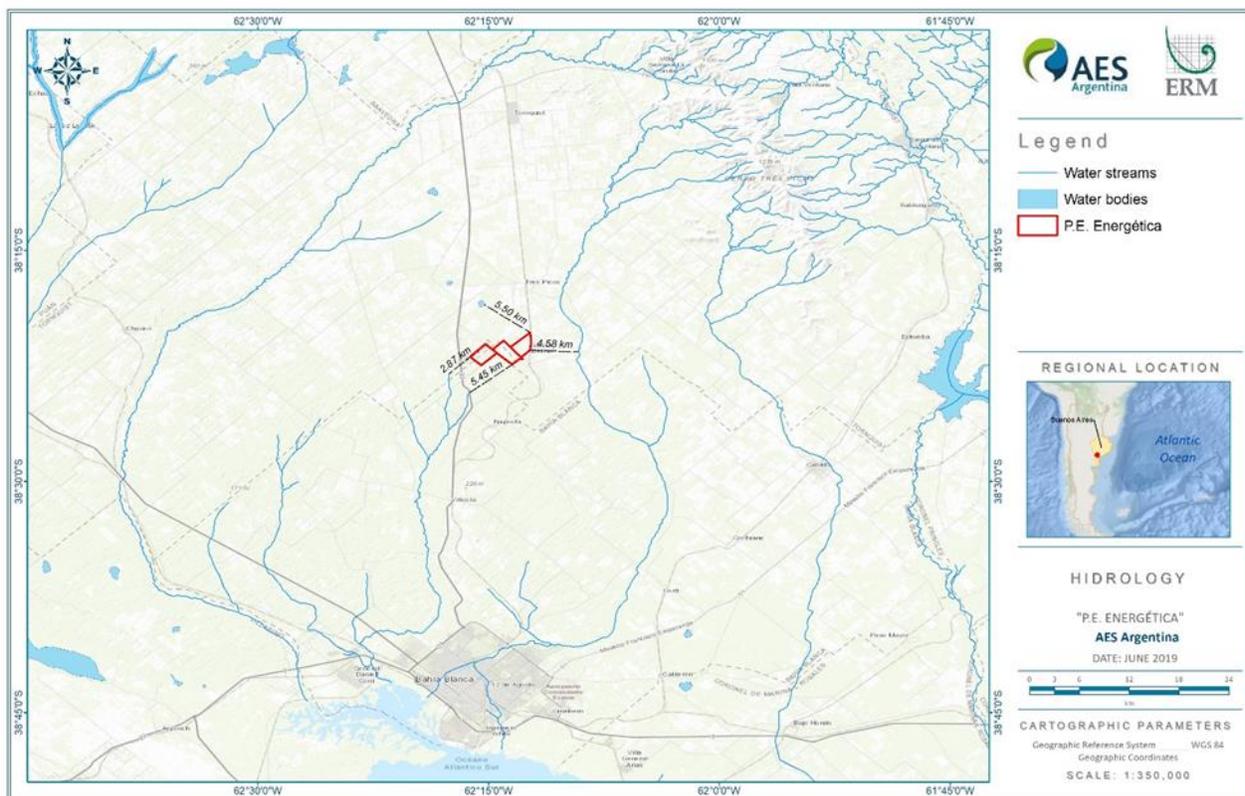
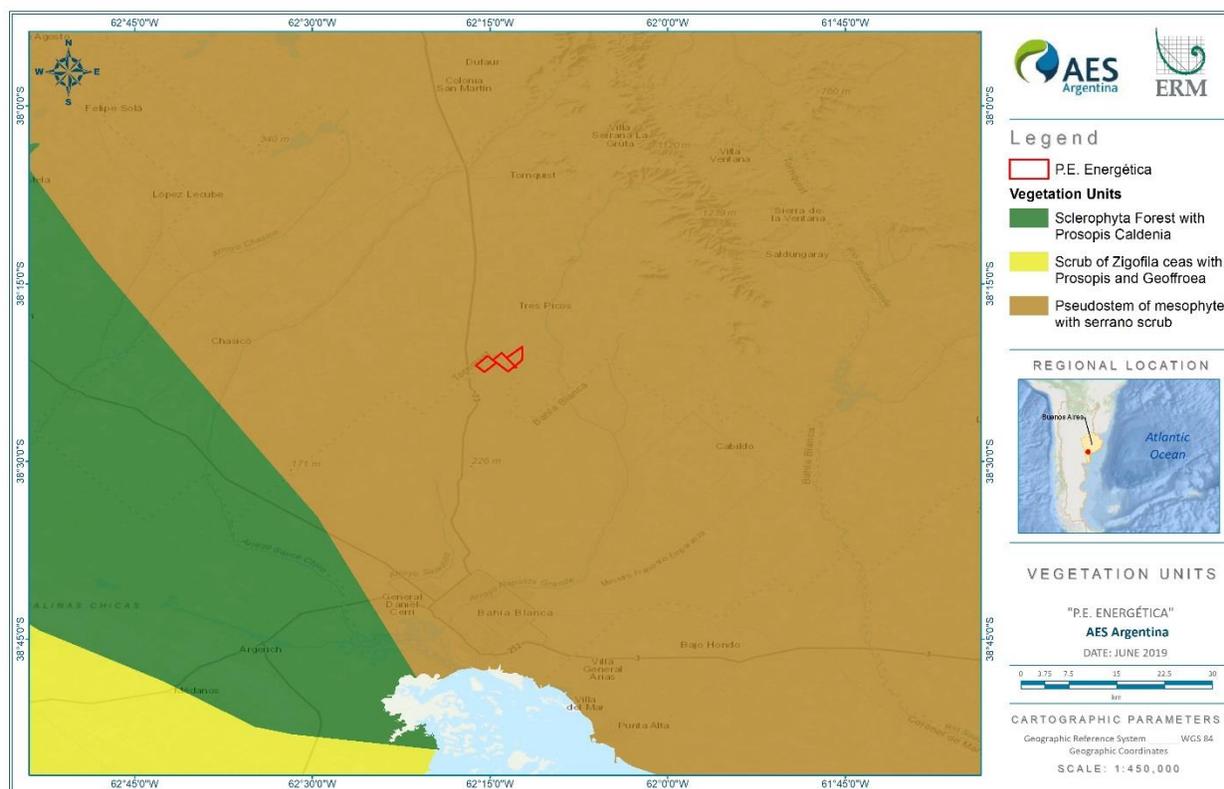


Figure 6.3 Vegetation



### 6.1.2 Methodology

The approach to data collection and the establishment of the habitat status followed the recommendations from IFC Guidance Note 6 Paragraph 66 (2019) (4) and the broad approach set out in the CBI Good Practices for Collection of Biodiversity Baseline Data (5). This comprised a **desk study** drawing on information from relevant authorities, academic/scientific institutions, and other recognized external sources of information to collate known information about biodiversity features and their value.

The study was performed in three phases, which consisted in:

- 1) **Data collection:** an extensive bibliographic research was carried to collect information regarding bird, mammal, amphibian and reptile occurrences in the Buenos Aires province. Initial screening was performed using the Integrated Biodiversity Assessment Tool (IBAT<sup>6</sup>) to obtain a list of all the species occurrences in IUCN within a 50 km buffer from the projects' areas. Additionally, a selection of articles and literature containing the species' common names, their distribution and/or their

(4) IFC. (2019). Guidance Note 6. Biodiversity Conservation and Sustainable Management of Natural Resources. Recovered from [https://www.ifc.org/wps/wcm/connect/topics\\_ext\\_content/ifc\\_external\\_corporate\\_site/sustainability-at-ifc/policies-standards/performance-standards/ps6](https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/performance-standards/ps6)

(5) Gullison, R.E., Hardner, J., Anstee, S. & Meyer, M. (2015) Good Practices for the Collection of Biodiversity Baseline Data. Prepared for the Multilateral Financing Institutions Biodiversity Working Group & Cross-Sector Biodiversity Initiative

<sup>6</sup> IBAT - WORLD BANK GROUP BIODIVERSITY RISK SCREEN Report, 2019. Generated under licence number 1071-2304 held by Environmental Resources Management from the Integrated Biodiversity Assessment Tool on 30/05/2019. <http://www.ibat-alliance.org>

occurrences and information about their habitat was employed (<sup>7, 8, 9</sup>). Literature with detailed information of the provinces fauna or the projects' area of influence were pondered before literature with information of smaller specific areas nearby or within the province (e.g. Fauna of specific natural areas).

- 2) *Primary species list elaboration*: information collected from IBAT, selected literature and the species lists published in the ESIA, were compared and fused into one unique list. To avoid an overestimation of the area's species richness, we made a species-by-species revision consulting GBIF<sup>10</sup>, IUCN<sup>11</sup>, Catalog of Life<sup>12</sup> and the Argentinian Biodiversity Information System<sup>13</sup> to eliminate repeated species because of scientific name synonyms. We also used these sources to update taxonomic and classification changes occurred since the publication date. When taxonomic variations existed between databases, we used IUCN's classification. When a species was not included in the IUCN, we used the GBIF or the Catalog of Life accepted classification. Subspecies found in the list were changed for the corresponding species name.
- 3) *Potentially distributed species list elaboration*: After the elaboration of the primary list that included all species found in selected literature, IBAT and the Project ESIA, we analyzed every species' probable occurrence in the projects' areas consulting the occurrence and distribution in GBIF, IUCN and Inaturalist<sup>14</sup>, and the species' habitat information available from all sources previously mentioned. Species whose habitat and distribution did not match the project's area and habitat were removed from the list. For the purposes of this evaluation, and considering that the ESIA does not specify the methods used to elaborate their species lists, the ESIA was considered as the rest of the information sources and the same criteria were applied to the species reported in it.
- 4) *Identifying Argentina's priority species*: wind energy parks affect flying species such as birds and bats. Priority species of Argentinian birds and bats with a potential risk of being affected by the development of wind energy in the country were identified in a workshop (Palmer et al, 2017). We compared the species of birds and bats with potential distribution in the project with the workshop list to identify priority species.

Note that a potential collision risk status could not be determined for the potentially present flying fauna in the project area and its surroundings. This latter risk category must be studied with the data obtained from the subsequent field surveys.

<sup>7</sup> *Herpetofauna, Coastal Dunes, Buenos Aires Province, Argentina (2006)*: this article contains a species checklist of reptiles and amphibian found in a study carried out in the coasts of the Buenos Aires province. The species included in the primary list were found between the Necochea and Pechuen-Có coast (near the project area) and in habitats with low vegetation grassland and ecotonal grassland.

<sup>8</sup> *Nueva lista de las aves de la provincia de Buenos Aires (2001)*: this checklist contains bird species with occurrence in the Buenos Aires Province. Authors divide the province in four areas and the areas that correspond to Tornquist are areas three and four. We included in our initial list birds with occurrences in areas 3, 4 and the whole province.

<sup>9</sup> *Mamíferos de Argentina: sistemática y distribución (2006)*: this book contains a list of mammals with occurrences in Argentina. Information about the species' habitat and distribution is also provided. Species with distribution in the Buenos Aires Province were included in the primary list.

<sup>10</sup> GBIF: Global Biodiversity information Facility <https://www.gbif.org> this platform was used to consult scientific names, synonyms, classification and taxonomic changes for species that were not included in the IUCN databases, and species distribution.

<sup>11</sup> IUCN: International Union for Conservation of Nature <https://www.iucn.org/>. This data platform was used to consult scientific names, synonyms, classification and taxonomic changes, species' distribution, and conservation status.

<sup>12</sup> Catalogue of Life: <https://www.catalogueoflife.org/>, this source was used to consult scientific names' synonyms.

<sup>13</sup> Argentinian Biodiversity Information System <https://sib.gob.ar>

<sup>14</sup> Inaturalist <https://www.inaturalist.org/>, this source was used to corroborate species distribution, alongside GBIF and IUCN.

### 6.1.3 Criteria used to select vulnerable species

For the present document, the following IUCN criteria were used:

#### **Data Deficient:**

A taxon is Data Deficient (DD) when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking.

#### **Least Concern:**

A taxon is Least Concern (LC) when it has been evaluated against the Red List criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened.

#### **Near Threatened:**

A taxon is Near Threatened (NT) when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

#### **Vulnerable (VU):**

A taxon is Vulnerable (VU) when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild.

#### **Endangered (EN):**

A taxon is Endangered (EN) when the best available evidence indicates that it meets any of the criteria A to E for Endangered, and it is therefore considered to be facing a very high risk of extinction in the wild.

#### **Critically Endangered (CR):**

A taxon is Critically Endangered (CR) when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered, and it is therefore considered to be facing an extremely high risk of extinction in the wild.

#### **Extinct In The Wild (EW)**

A taxon is Extinct In The Wild (EW) when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), and throughout its historic range have failed to record an individual. Surveys should be over a period appropriate to the taxon's life cycle and life form.

#### **Extinct (EX)**

A taxon is Extinct (EX) when there is no reasonable doubt that the last individual has died. A taxon is presumed extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), and throughout its historic range have failed to record an individual. Surveys should be over a period appropriate to the taxon's life cycle and life form.

## 6.1.4 Results

### 6.1.5 Habitat of importance

#### 6.1.5.1 Important Bird Areas

As can be noted in Figure 6.4, the Project is not in any Important Bird Area (IBA). The nearest IBA to the Project are:

- Villa Iris
- Sierras Australes de Buenos Aires
- Reserva de Uso Múltiple de Bahía Blanca Falsa y Bahía Verde

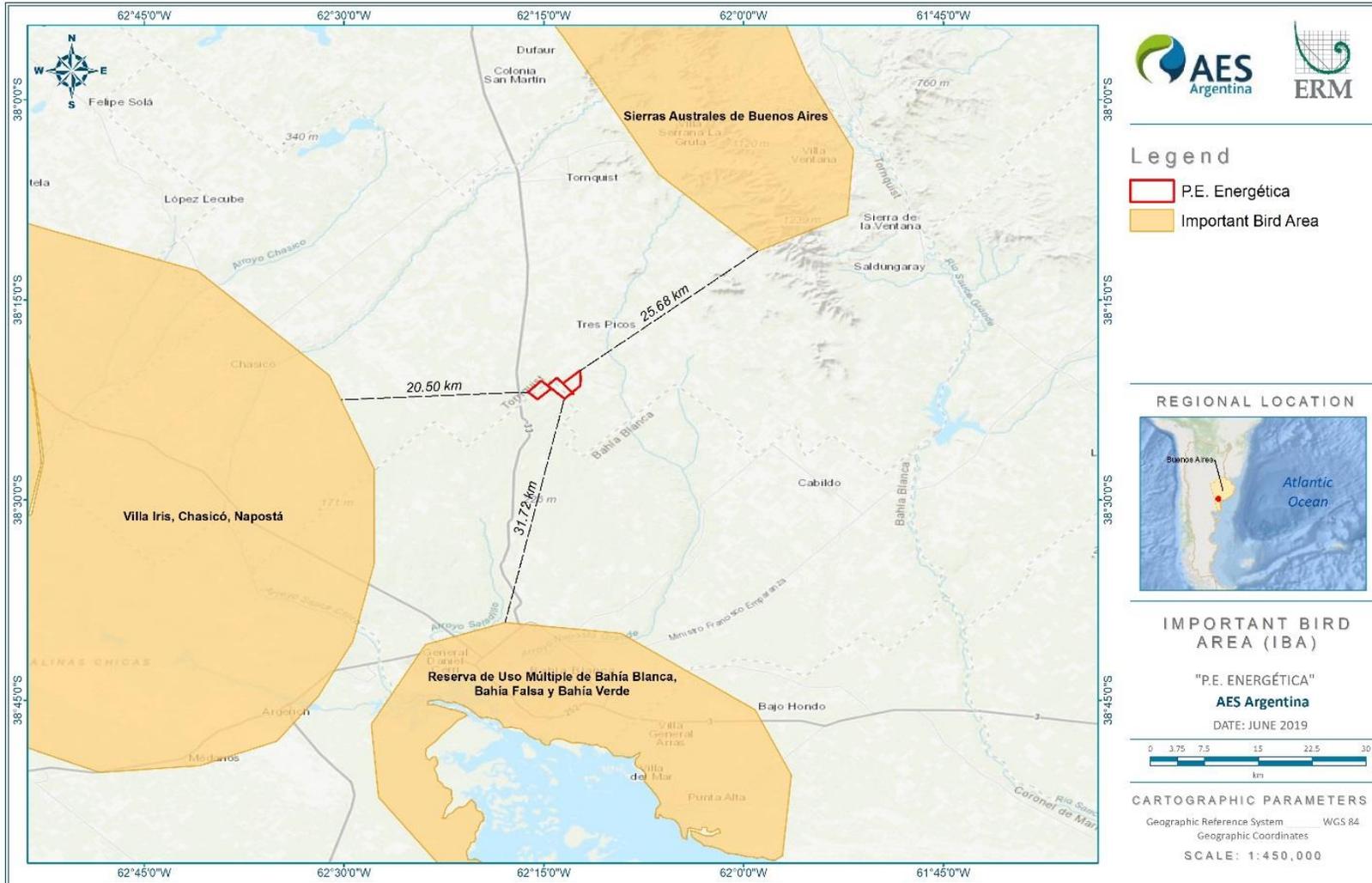
See the following table for more details.

**Table 6-1 Important Bird Areas near to the Project**

Important Bird Area	Characteristics	Distance to the Project
Villa Iris	This zone is important for the conservation of birds associated with grasslands such as <i>Rhea americana</i> and <i>Leistes defilipii</i> . This AICA has no protection.	20.5 km to the west
Sierras Australes de Buenos Aires	This AICA has a total surface of 30,000 ha with grassland, shrubs and highlands habitats. The occurrence of 125 bird species has been reported within its area, which is partially protected by the Ernesto Tornquist Provincial Park.	25.68 km to the northeast
Reserva de Uso Múltiple de Bahía Blanca Falsa y Bahía Verde	This AICA has a total Surface of 210,000 ha with marine, wetlands, shrub-steppe and grassland habitats. Its area is important for the reproduction of <i>Larus atlanticus</i> and its used by aquatic and beach birds. Its total extension has been protected since 1998 and works as a Coast-Marine Provincial Reserve.	31.72 km to the southwest

Source: ERM (2019) with information provided by Di Giacomo et al (2007), Coconier (2007), and Rabuffetti (2007)

Figure 6.4 Project location with respect to Import Bird Areas



Source: ERM (2019) with information provided by Aves Argentinas (n.d)

### 6.1.5.2 Natural Protected Areas

As can be noted in Figure 6.1, the Project is not in any Natural Protected Areas (NPA). The nearest NPA to the Project are:

- Ernesto Tornquist
- Islote de la Gaviota Cangrejera
- Bahía Blanca Falsa y Verde

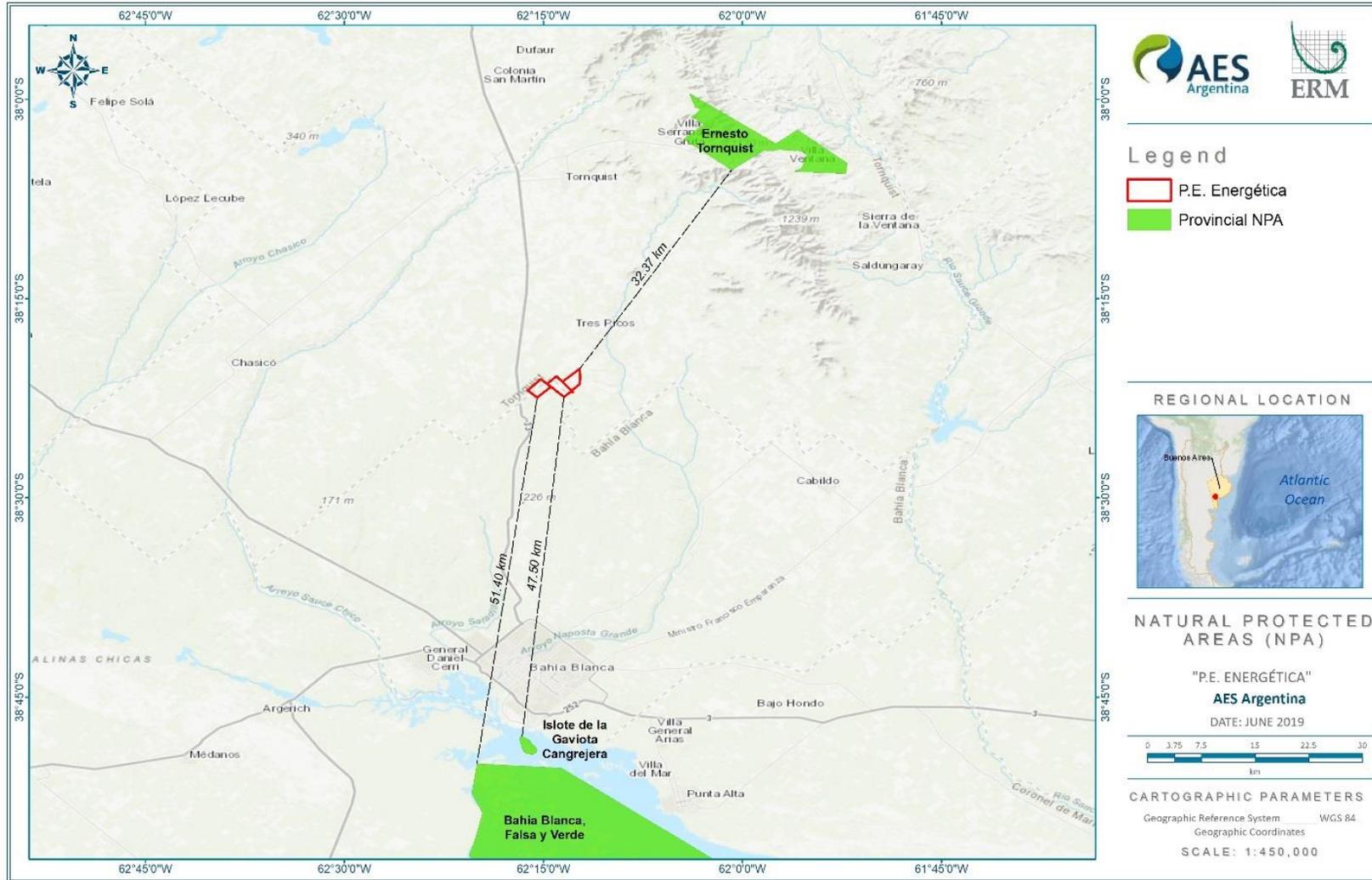
See the following table for more details.

**Table 6-2 Natural Protected Areas near to the Project**

Natural Protected Areas	Characteristics	Distance to the Project
Ernesto Tornquist	This protected area was created in 1937 and has a total surface of 6,700 ha. This park has a high species diversity and the highest number of endemic species in the province. It also protects 1,500 years-old cave paintings.	32 km to the northeast
Islote de la Gaviota Cangrejera	This protected area has a total surface of 115 ha and protects the population of the Orlo's gul ( <i>Larus atlanticus</i> ). This islet is also a nesting site for other bird species.	47 km to the south
Bahía Blanca Falsa y Verde	This protected area has a total surface of 260,000 ha. It protects numerous isles, richness of native floral and faunal species, including <i>Larus atlanticus</i> .	51 km to the southwest

Source: ERM (2019) with information provided by Gobierno de la Provincia de Neuquén (2013) & Parques Nacionales de Argentina (2018) & Gobierno de la Provincia de Buenos Aires.

Figure 6.5 Project location with respect to Natural Protected Areas



Source: ERM (2019) with information provided by Gobierno de la Provincia de Neuquén (2013) & Parques Nacionales de Argentina (2018)

## 6.1.6 Potentially distributed species

### Vegetation

From the phytogeographic point of view, the project area is in the Neotropical Region, Chaco Domain, Pampean Province, Pampeano Austral District. The type of natural vegetation is a gramineous steppe, represented by grassland.

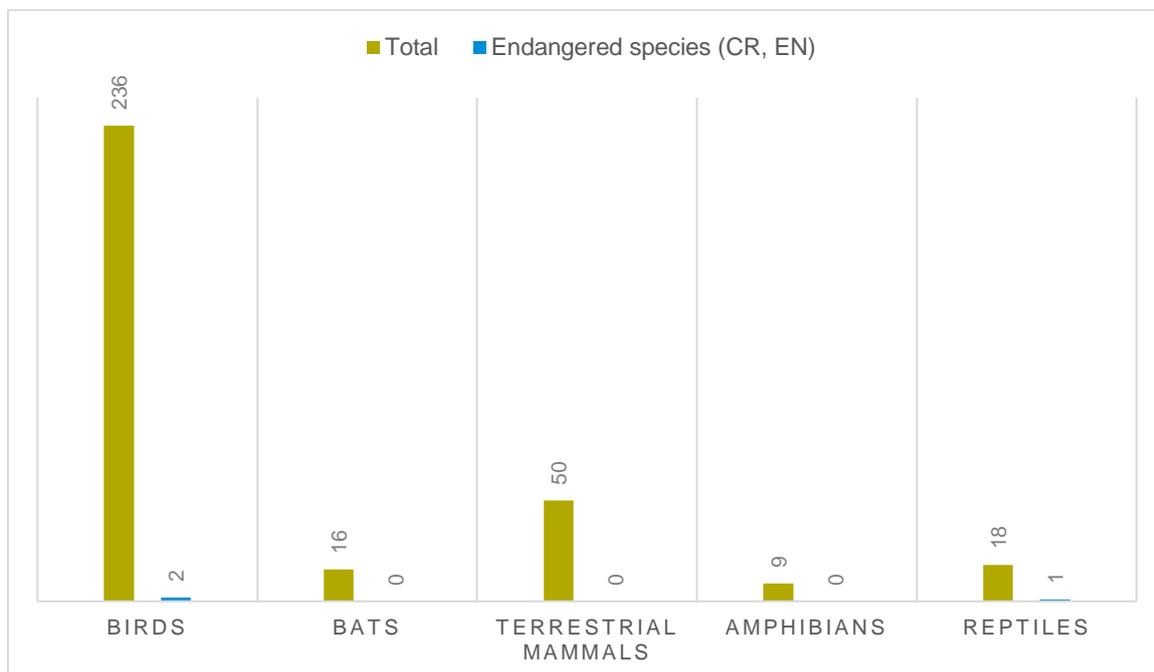
Tizon et al. (1998) identifies 540 different species in the region, of which 23% are adventitious and 77% native, and the families with the greatest number of species are: Composite (25%), Gramineae (20%) and Legumes (6%). There is a high number of endemic species (19), especially in the mountain area; therefore, it is unlikely that one of them occurs within the Project area.

### Fauna

There are 336 potentially distributed species of vertebrates for Energética 1 Project. From which a total of 234 birds species, 15 species of bats, 49 land mammals, 10 amphibians and 28 reptiles (

Figure 6.6). From 336 species, only three species are enlisted as Endangered or Critically Endangered in the IUCN Red List. The full list of resulting species is in Appendix D hat, for the purpose of critical habitat assessment, the species whose habitats did not match the Project area were not considered (eg. Marine birds – as discussed in Section 2, paragraph 3).

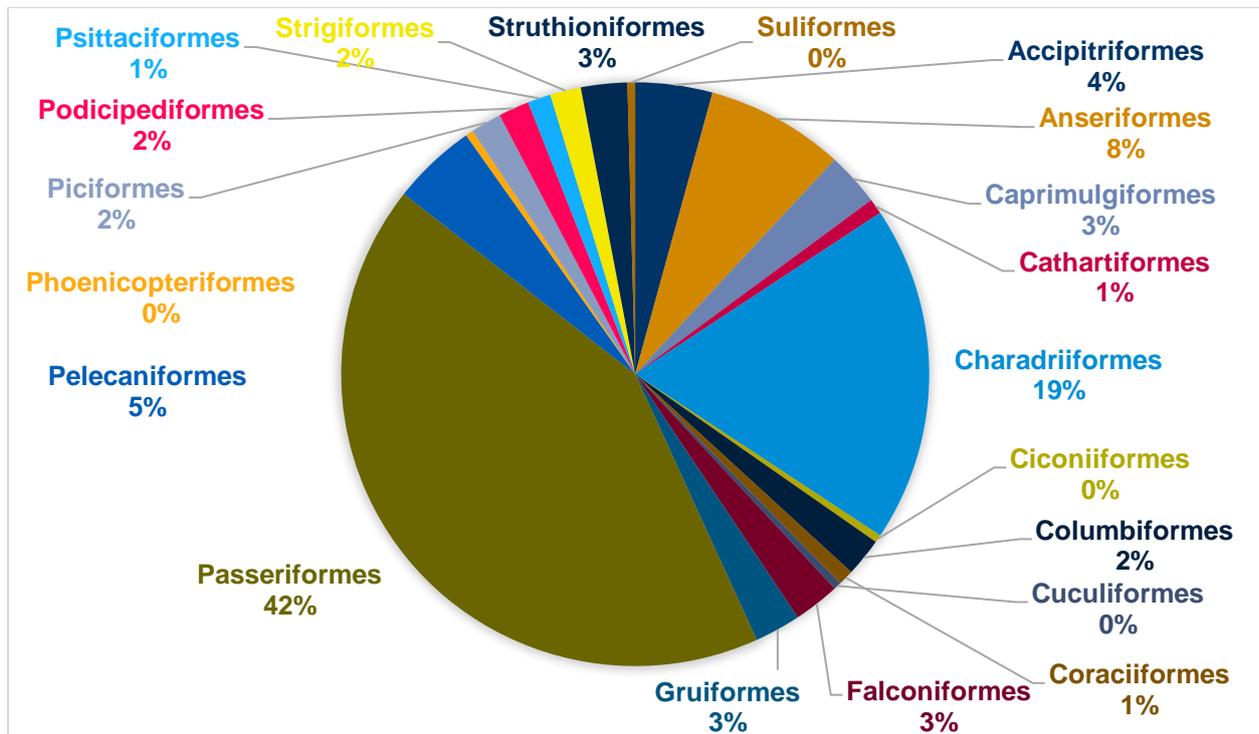
**Figure 6.6 Potentially Distributed Species Chart**



#### 6.1.6.1 Birds

A total of 234 potentially distributed species were identified for the area of study. The 234 listed species are grouped into 20 orders and 48 families. Passeriformes (passerines, and seed birds) is the most represented order with 100 species (42%), Charadriiformes (sandpipers, plovers, gulls) was the second most represented order with 44 species (19%), and Anseriformes (ducks and geese) was the thirds with 18 species (8%). The rest of the 17 orders had 5% or less of representation.

**Figure 6.7. Pie chart of Bird species by Order**



From the 234 potentially distributed bird species, only 15 species are listed in some risk category in the IUCN Red list, these species are presented in the following table alongside its source reference (Table 6-3). The most relevant protected species are the Crowned solitary eagle (*Buteogallus coronatus*), and Yellow cardinal (*Gubernatrix cristata*) both listed as Endangered (EN). The other species are also relevant (listed as NT and VU), as their category implies that if their populations continue declining, they are expected to go endangered eventually.

**Table 6-3 Potentially distributed bird species with a risk status in the IUCN Red List**

FAMILY	SPECIES	ENGLISH NAME	IUCN REDLIST STATUS	REFERENCE		
				IBAT	ESIA	15
Accipitridae	<i>Buteogallus coronatus</i>	Crowned solitary eagle	EN	X		
Laridae	<i>Larus atlanticus</i>	Olrog's gull	NT	X		
Pluvianellidae	<i>Pluvianellus socialis</i>	Magellanic plover	NT	X		
Scolopacidae	<i>Calidris canutus</i>	Red knot	NT	X		
Scolopacidae	<i>Calidris subruficollis</i>	Buff-breasted sandpiper	NT	X		X
Rallidae	<i>Porzana spiloptera</i>	Dot-winged crane	VU	X		X
Furnariidae	<i>Asthenes hudsoni</i>	Hudson's canastero	NT	X	X	X
Furnariidae	<i>Spartonoica maluroides</i>	Bay-capped wren-spinetail	NT	X	X	X
Icteridae	<i>Leistes defilippii</i>	Pampas meadowlark	VU	X	X	X
Icteridae	<i>Xanthopsar flavus</i>	Saffron-cowled blackbird	VU	X		
Thraupidae	<i>Gubernatrix cristata</i>	Yellow cardinal	EN	X		X
Tyrannidae	<i>Alectrurus risora</i>	Strange-tailed tyrant	VU	X		
Tyrannidae	<i>Polystictus pectoralis</i>	Bearded tachuri	NT	X	X	X
Phoenicopteridae	<i>Phoenicopterus chilensis</i>	Chilean flamingo	NT	X	X	X
Rheidae	<i>Rhea americana</i>	Greater rhea	NT	X	X	X

**The level of risk according to the IUCN Red list (2019): LC = Least Concern, VU = Vulnerable, NT = Near Threatened, EN = Endangered, CR = Critically endangered, and DD= Data Deficient.**

Additionally, there are 18 bird species with potential distribution within the project with a potential risk caused by the development of wind energy in the country (Table 6-4), four of them were classified with a high priority by the author. These species are *Chloephaga rubidiceps*, classified as LC in IUCN, *Buteogallus coronatus*, classified as EN in IUCN, *Gubernatrix cristata*, classified as EN in IUCN and *Leistes defilippii*, classified as VU in IUCN.

**Table 6-4 Argentina's bird priority species with probable occurrence in the project.**

SPECIES	COMMON NAME	CLASSIFICATION IN ARGENTINA	IUCN	PRIORITY
<i>Rhea americana</i>	<b>Greater rhea</b>	A	NT	Medium
<i>Chloephaga picta</i>	<b>Upland goose</b>	VU	LC	Medium

<sup>15</sup> Nueva lista de las aves de la provincia de Buenos Aires:

SPECIES	COMMON NAME	CLASSIFICATION IN ARGENTINA	IUCN	PRIORITY
<i>Chloephaga rubidiceps</i>	<b>Ruddy-headed goose</b>	CR	LC	High
<i>Chloephaga poliocephala</i>	<b>Ashy-headed goose</b>	A	LC	Medium
<i>Phoenicopterus chilensis</i>	<b>Chilean flamingo</b>	LC	NT	Medium
<i>Buteogallus coronatus</i>	<b>Crowned solitary eagle</b>	EN	EN	High
<i>Buteo swainsoni</i>	<b>Swainson's hawk</b>	VU	LC	Medium
<i>Charadrius modestus</i>	<b>Rufous-chested plover</b>	VU	LC	Medium
<i>Pluvianellus socialis</i>	<b>Magellanic plover</b>	EN	NT	Medium
<i>Bartramia longicauda</i>	<b>Upland sandpiper</b>	VU	LC	Medium
<i>Calidris canutus</i>	<b>Red knot</b>	EN	NT	Medium
<i>Calidris subruficollis</i>	<b>Buff-breasted sandpiper</b>	A	NT	Medium
<i>Larus atlanticus</i>	<b>Olrog's gull</b>	A	NT	Medium
<i>Spartonoica maluroides</i>	<b>Bay-capped wren- spinetail</b>	VU	NT	Medium
<i>Polystictus pectorali</i>	<b>Bearded tachuri</b>	VU	NT	Medium
<i>Knipolegus hudsoni</i>	<b>Hudson's black-tyrant</b>	VU	LC	Medium
<i>Gubernatrix cristata</i>	<b>Yellow cardinal</b>	EN	EN	High
<i>Leistes defilippii</i>	<b>Pampas meadowlark</b>	EN	VU	High

**Classification in Argentina:** A= Threatened, VU=Vulnerable, CR=Critically endangered, EN=Endangered, LC= Least concern. **The level of risk according to the IUCN Redlist (2019):** LC = Least Concern, VU = Vulnerable, NT = Near Threatened, EN = Endangered, CR = critically endangered, and DD= Data Deficient. Source: ERM with data provided by Palmer, R., Gordon, C., & Petracci, P (2017). Interacciones entre la Fauna Silvestre y la Energía Eólica en Argentina: Conocimiento Científico y Prioridades para el Futuro.

### 6.1.6.2 Bats

A total of 15 species of bats are potentially distributed within the area of study, grouped into three families and nine genera. There are no bat species listed under a risk category in IUCN Red list present in this area (Table 6-5).

**Table 6-5 Potentially distributed bat species**

FAMILY	SPECIES	ENGLISH NAME	IUCN REDLIST STATUS	REFERENCE		
				IBAT	ESIA	<sup>16</sup>
Molossidae	<b><i>Eumops bonariensis</i></b>	Dwarf Bonneted bat	LC			
Molossidae	<b><i>Eumops patagonicus</i></b>	Patagonian Dwarf Bonneted Bat	LC			X
Molossidae	<b><i>Molossops temminckii</i></b>	Dwarf dig-faced bat	LC			X
Molossidae	<b><i>Molossus</i></b>	Pallas' free-tailed bat	LC			X

<sup>16</sup> *Mamíferos de Argentina: sistemática y distribución*

FAMILY	SPECIES	ENGLISH NAME	IUCN REDLIST STATUS	REFERENCE		
				IBAT	ESIA	<sup>16</sup>
Molossidae	<i>Tadarida brasiliensis</i>	Free-tailed Bat	LC	X	X	X
Phyllostomidae	<i>Glossophaga soricina</i>	Pallas's Long-tongued Bat	LC			X
Vespertilionidae	<i>Eptesicus diminutus</i>	Diminutive serotine	LC			X
Vespertilionidae	<i>Eptesicus furinalis</i>	Argentine brown bat	LC			X
Vespertilionidae	<i>Histiotus alienus</i>	Strange Big-eared Brown Bat	DD	X		
Vespertilionidae	<i>Histiotus montanus</i>	Small big -eared brown bat	LC		X	X
Vespertilionidae	<i>Lasiurus blossevillii</i>	Southern red bat	LC	X		X
Vespertilionidae	<i>Lasiurus cinereus</i>	Hoary bat	LC	X	X	X
Vespertilionidae	<i>Lasiurus ega</i>	Southern yellow bat	LC	X		X
Vespertilionidae	<i>Myotis albescens</i>	Silver-tiped myotis	LC		X	X
Vespertilionidae	<i>Myotis levis</i>	Yellowish myotis	LC	X	X	X

**The level of risk according to the IUCN Redlist (2019): LC = Least Concern, VU = Vulnerable, NT = Near Threatened, EN = Endangered, CR = Critically endangered, and DD= Data Deficient.**

Additionally, from the 12 bat species with potential distribution within the project area with a potential risk caused by the development of wind energy in the country (Table 6-6), only *Lasiurus cinereus* is classified with a high priority by the author. All bat species are classified as LC by both the IUCN Red List and Argentina's classification.

**Table 6-6 Argentina's bat priority species with probable occurrence in the project**

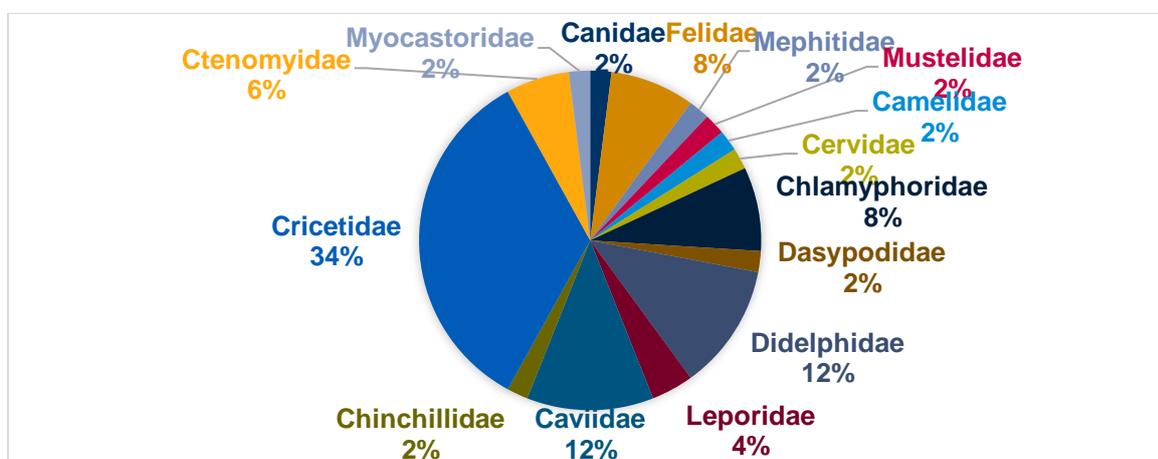
SPECIES	COMMON NAME	CLASSIFICATION ARGENTINA	IUCN	PRIORITY
<i>Eptesicus diminutus</i>	<b>Diminutive serotine</b>	LC	LC	Medium
<i>Eptesicus furinalis</i>	<b>Argentine brown bat</b>	LC	LC	Medium
<i>Histiotus montanus</i>	<b>Small big -eared brown bat</b>	LC	LC	Medium
<i>Lasiurus blossevillii</i>	<b>Southern red bat</b>	LC	LC	Medium
<i>Lasiurus cinereus</i>	<b>Hoary bat</b>	LC	LC	High
<i>Lasiurus ega</i>	<b>Southern yellow bat</b>	LC	LC	Medium
<i>Myotis albescens</i>	<b>Silver-tiped myotis</b>	LC	LC	Medium
<i>Myotis levis</i>	<b>Yellowish myotis</b>	LC	LC	Medium
<i>Eumops bonariensis</i>	<b>Dwarf Bonneted bat</b>	LC	LC	Medium
<i>Eumops patagonicus</i>	<b>Patagonian Dwarf Bonneted Bat</b>	LC	LC	Medium
<i>Molossops temminckii</i>	<b>Dwarf dig-faced bat</b>	LC	LC	Medium
<i>Tadarida brasiliensis</i>	<b>Free-tailed Bat</b>	LC	LC	Medium

**Classification in Argentina:** A= Threatened, VU=Vulnerable, CR=Critically endangered, EN=Endangered, LC= Least concern. **The level of risk according to the IUCN Redlist (2019):** LC = Least Concern, VU = Vulnerable, NT = Near Threatened, EN = Endangered, CR = Critically endangered, and DD= Data Deficient. Source: ERM with data provided by Palmer, R., Gordon, C., & Petracci, P (2017). Interacciones entre la Fauna Silvestre y la Energía Eólica en Argentina: Conocimiento Científico y Prioridades para el Futuro.

### 6.1.6.3 Terrestrial Mammals

Within the Project area, a total of 49 potentially distributed species were identified. The 49 listed species are grouped into 6 orders and 15 families. Cricetidae (hamsters, voles, lemmings, and New World rats and mice) is the most represented Family with 17 species (34%), Caviidae (maras and wild cavies) and Didelphidae (opossums) were the second most represented Families with 6 species each (19%), and Felidae (cats), and Chlamyphoridae (armadillos) were the third with 4 species each (8%). The rest of the 10 ordrs had 6% or less of representation.

**Figure 6.8 Pie chart of terrestrial mammals species by Family.**



From the 49 potentially distributed terrestrial mammals, only 9 species are listed in some risk category in the IUCN Redlist, these species are presented in the next table alongside its source reference (Table 6-7). All 9 species are listed as NT, this is relevant because this category implies that, if their populations continue declining, they are expected to go threatened eventually.

**Table 6-7 Potentially distributed terrestrial mammal species with a risk status in the IUCN Red List**

FAMILY	SPECIES	ENGLISH NAME	IUCN REDLIST STATUS	REFERENCE		
				IBAT	ESIA	17
Felidae	<i>Leopardus colocolo</i>	Pampas cat	NT	X	X	X
Cervidae	<i>Ozotoceros bezoarticus</i>	Pampas deer	NT			X
Chlamyphoridae	<i>Zaedyus pichiy</i>	Pichi	NT	X	X	X

<sup>17</sup> *Mamíferos de Argentina: sistemática y distribución*

FAMILY	SPECIES	ENGLISH NAME	IUCN REDLIST STATUS	REFERENCE		
				IBAT	ESIA	17
Dasypodidae	<i>Dasypus hybridus</i>	Southern long-nosed armadillo	NT	X		X
Didelphidae	<i>Thylamys fenestrae</i>	Fat-tailed mouse opossum	NT	X		
Caviidae	<i>Dolichotis patagonum</i>	Patagonian mara	NT	X		
Cricetidae	<i>Necromys obscurus</i>	Dark bolo mouse	NT			X
Cricetidae	<i>Phyllotis bonariensis</i>	Buenos aires leaf-eared mouse	NT	X		
Ctenomyidae	<i>Ctenomys porteusi</i>	Porteous's tuco-tuco	NT	X		X

The level of risk according to the IUCN Redlist (2019): LC = Least Concern, VU = Vulnerable, NT = Near Threatened, EN = Endangered, CR = Critically endangered, and DD= Data Deficient.

#### 6.1.6.4 Reptiles and Amphibians

At least 10 species of amphibians and 28 species of reptiles are distributed within the Project area (Table 6-8).

**Table 6-8 Potentially distributed amphibian's species**

FAMILY	SPECIES	ENGLISH NAME*	IUCN REDLIST STATUS	REFERENCE		
				IBAT	ESIA	18
Bufo	<i>Melanophryniscus stelzneri</i>		LC	X	X	
Bufo	<i>Rhinella arenarum</i>		LC	X	X	Xbe
Bufo	<i>Rhinella dorbignyi</i>		LC			Xe
Ceratophryidae	<i>Ceratophrys ornata</i>		NT	X	X	Xe
Hylidae	<i>Hypsiboas pulchellus</i>		LC	X		
Leptodactylidae	<i>Leptodactylus latrans</i>		LC	X		
Leptodactylidae	<i>Leptodactylus mystacinus</i>		LC	X		
Leptodactylidae	<i>Leptodactylus ocellatus</i>		**		X	Xe
Odontophrynidae	<i>Odontophrynus americanus</i>	Common lesser escuerzo	LC	X	X	Xe

<sup>18</sup> Herpetofauna, Coastal Dunes, Buenos Aires Province, Argentina:

FAMILY	SPECIES	ENGLISH NAME*	IUCN REDLIST STATUS	REFERENCE		
				IBAT	ESIA	18
Odontophrynidae	<i>Odontophrynus occidentalis</i>		LC	X	X	Xe

**The level of risk according to the IUCN Redlist (2019): LC = Least Concern, VU = Vulnerable, NT = Near Threatened, EN = Endangered, CR = critically endangered, and DD= Data Deficient.**

**\*Common names in English were not available for most species under the sources cited.**

**\*\*IUCN Red List status was not available for this particular species.**

Potentially present species of amphibians are distributed in one order (Anura) and five families. With respect to their risk status within IUCN's Red List, there are no species listed under the categories of Vulnerable, Endangered or Critically Endangered, only *Ceratophrys ornata* as near threatened.

Regarding reptiles, there are 28 potentially present species of one order (Squamata) and 10 families. With respect to their risk status within IUCN's Red List, one species (*Pristidactylus casuhatiensis*) was listed under the category Critically Endangered.

**Table 6-9 Potentially distributed reptile species**

FAMILY	SPECIES	ENGLISH NAME*	IUCN REDLIST STATUS	REFERENCE		
				IBAT	ESIA	<sup>19</sup>
Amphisbaenidae	<i>Amphisbaena alba</i>	Red Worm Lizard	LC	X	X	Xe
Amphisbaenidae	<i>Amphisbaena heterozonata</i>		LC	X	X	Xe
Dipsadidae	<i>Erythrolamprus jaegeri</i>	Jaeger's Ground Snake	LC	X		
Dipsadidae	<i>Erythrolamprus poecilogyrus</i>	Yellow-bellied Liophis	**		X	Xe
Dipsadidae	<i>Erythrolamprus sagittifer</i>		LC		X	
Dipsadidae	<i>Lygophis elegantissimus</i>		LC	X	X	Xe
Dipsadidae	<i>Oxyrhopus rhombifer</i>	Amazon False Coral Snake	**		X	Xe
Dipsadidae	<i>Phalotris bilineatus</i>	Spegazzini's Diadem Snake	**		X	
Dipsadidae	<i>Philodryas aestiva</i>	Brazilian green racer	**		X	
Dipsadidae	<i>Philodryas varia</i>	Jan's Green Racer	LC		X	Xe
Dipsadidae	<i>Pseudotomodon trigonatus</i>	False tomodon snake	LC	X		
Dipsadidae	<i>Xenodon dorbignyi</i>	South American Hognose Snake	**		X	Xbe
Dipsadidae	<i>Xenodon semicinctus</i>	Ringed hognose snake	LC	X		Xe
Gymnophthalmidae	<i>Cercosaura steyeri</i>		DD		X	
Leiosauridae	<i>Pristidactylus casuhatiensis</i>	Casuhatien anole	CR	X	X	
Leptotyphlopidae	<i>Epictia australis</i>	Freiberg's blind snake	LC	X	X	
Leptotyphlopidae	<i>Epictia munoai</i>	Rio Grande Do Sul Blind Snake	**		X	Xe
Leptotyphlopidae	<i>Rena unguirostris</i>	Southern blind snake	LC		X	
Liolaemidae	<i>Liolaemus darwinii</i>	Darwin's tree iguana	LC	X	X	Xe
Liolaemidae	<i>Liolaemus gracilis</i>	Graceful tree iguana	LC	X		Xbe
Liolaemidae	<i>Liolaemus wiegmannii</i>		LC	X	X	Xe
Phyllodactylidae	<i>Homonota williamsii</i>		LC	X		
Teiidae	<i>Cnemidophorus longicaudus</i>	Longtail whiptail	LC			Xe
Teiidae	<i>Salvator merianae</i>	Black-and-white tegu	LC	X		Xe
Teiidae	<i>Teius oculatus</i>	Ocellated Whiptail Lizard	**		X	
Tropiduridae	<i>Stenocercus pectinatus</i>		LC	X		Xe
Viperidae	<i>Bothrops alternatus</i>	Urutu Lancehead	**		X	Xe
Viperidae	<i>Bothrops ammodytoides</i>	Patagonia Lancehead	**		X	Xe

**The level of risk according to the IUCN Red list (2019): LC = Least Concern, VU = Vulnerable, NT = Near Threatened, EN = Endangered, CR = critically endangered, and DD= Data Deficient.**

<sup>19</sup> Herpetofauna, Coastal Dunes, Buenos Aires Province, Argentina:

**\*Common names in English were not available for some species under the sources cited.**

**\*\*IUCN Red List status was not available for this particular species.**

## 6.2 Socioeconomic Baseline and Stakeholder Mapping

### 6.2.1 Introduction

#### 6.2.1.1 Overview

This chapter provides an overview of the socio-economic conditions in the Project's Study Area within the context of Buenos Aires province and the *partidos* (departments) of Bahía Blanca and Tornquist. Information is presented in this section at a province level, with reference to other levels (i.e. national and local) where relevant and available.

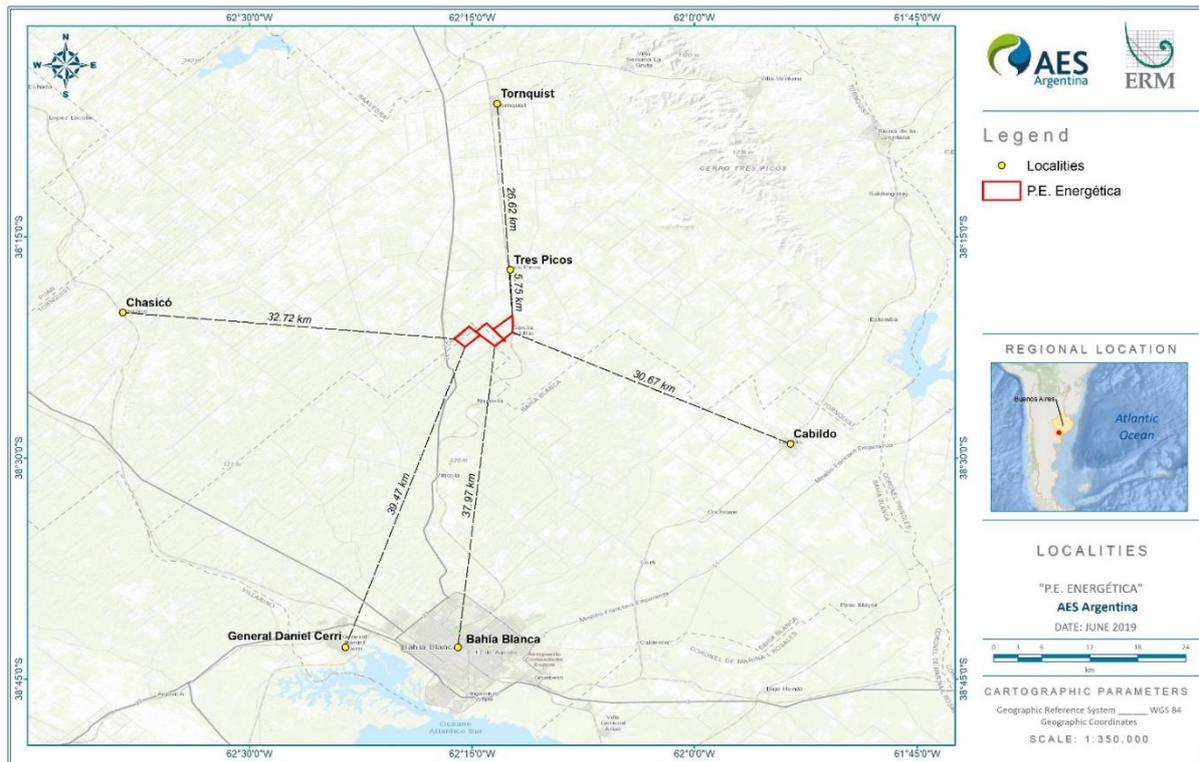
The data presented has been gathered from publicly available secondary sources, mainly: the National Institute of Statistics and Census (INDEC for its acronym in Spanish) (2010), the Government of Buenos Aires Province webpage, and others.

ERM carried out a rapid site visit on May 24<sup>th</sup>2019 to understand the site setting and the social and environmental sensitivities within the study area. The site visit included meeting with local authorities from Tornquist, landowners, etc. and a walkover of the site. As part of the site visit, primary data was collected from sensitive areas and other key receptors inside the study area. The following subsections provide an understanding of the same.

#### 6.2.1.2 Study Area used for Socio-economic baseline

The Study Area was defined considering the closest communities to the Project, as they might be potentially impact by its activities. Additionally, elements such as water resources, human settlements, location of labor sites, access roads, shadow flicker etc. were also include for the definition of the Study Area. The following map shows the site and the nearest communities.

**Figure 6.9 Communities within the Study Area**



Source: ERM, 2019

Based on the aforementioned, the following table shows the departments and communities that were considered for this socio-economic baseline.

**Table 6-10 Project's Study Area**

ID	Province	ID	Partidos	ID	Community	Distance to the Project
06	Buenos Aires	056	Bahía Blanca	010	Bahía Blanca	37.88km
				020	Cabildo	31.19km
				030	General Daniel Cerri	39.64km
		819	Tornquist	010	Chasicó	32.86km
				040	Tornquist	26.25km
				050	Tres Picos	5.77km

Source: ERM, 2019

**Figure 6.10 Tres Picos, Tornquist**



Source: ERM, 2019

## **6.2.2 Governance and Administration**

### **6.2.2.1 Administrative Structures in the Project Area**

Argentina, located in the South Hemisphere, belongs geographically to South America. The country is divided into twenty-three (23) “provinces” and one (1) autonomous city (Buenos Aires) which is Argentina’s capital city. Each province is divided in a second-level administrative subdivision call departments, except for Buenos Aires which second-level subdivision are “partidos”, each of these subdivisions is further subdivided in municipalities and localities while in the city of Buenos Aires, in neighborhoods and communes

The provinces and the capital are autonomous but exist under a federal system rule by a national Constitution. Each province can organize their local governments and manage their natural and financial resources. Thus, each of them have their own legislation and justice system, Supreme Court, police force and Congress.

### **6.2.2.2 Local Decision-Making**

In the case of Buenos Aires, each of the 135 partidos, is administrated by an executive (mayor, “intendente”) and legislative branch (council, “concejo deliberante”) respectively. The mayor is elected for a four-year period and can be re-elected for a new term with an interval of one period. In the case of the council, it is a unicameral body; one-half of its members are elected every two years to serve four-year terms. They can also be re-elected with the same restriction of one period away. The number of councilors depends of the population of every *partido* in a range from 6, to 24.

### 6.2.3 Government and Territorial distribution

Considering its geographical characteristics. Argentina can be divided into four (4) main regions ( Andes, North, Patagonia and Pampas). In the case of Buenos Aires province, it locates in the former, known for largely flat surfaces; lying south of the Paraná River and southeast of La Plata River. Buenos Aires, whose capital is La Plata, is the largest and most populated of the provinces as well as the cultural and economic center of Argentina. It is crossed by the 580-km Salado River. from the northwest to southeast while In the south, it has two mountain ranges (Sierra del Tandil and Sierra de la Ventana). Its highest point is Cerro Tres Picos (1,230 m)

For the purposes of this socio-economic baseline, the next table shows only the *partidos* of the Study Area.

**Table 6-11 Government per partido**

Partido	Capital	Year of creation	Mayor (Intendente)	Political party	Extension
Bahía Blanca	Bahía Blanca	1834	Héctor Gay	Cambiamos	2,247 km2
Tornquist	Tornquist	1905	Sergio Bondoni	Cambiamos	4,184 km2

Source: *Partidos*´ official websites, 2019.

As the table below shows, the party that rules both *partidos* is “*Cambiamos*” (Let’s change). This party was created in 2015 as a political coalition, formed by the Republic Proposal (PRO), the Radical Civil Union (UCR) and the Civic Coalition(CC-ARI), resulting in a combination of ideologies such as conservatism, social democracy and liberalism. On August 9, 2015 Mauricio Macri was chosen as the coalition’s candidate and in November won the presidential election.

### 6.2.4 Land Use and Spatial Planning

The Pampean Region, which comprises the Buenos Aires province, is considered one of the main agricultural areas of the world due to its extension and productivity. Agriculture has expanded exponentially in the last four decades, mainly because of the cultivation of soybeans. This has generated concern due to the possible degradation caused in the soil. However, the average yield of grain crops has doubled-tripled in the last 40 years, without these possible effects becoming evident in the production.

Regarding Bahía Blanca and Tornquist, there is no agricultural land use registered. The main economic activities are industry, trading and fishing.

### 6.2.5 Population

According to INDEC in 2010, date of the last census, 15,625,084 people live in Buenos Aires province, the largest population age group was formed by people from 15-64 years old (10,077, 275 people) , followed by 0-14 years old and lastly, people over more than 65 years. This same trend repeats in both *partidos* of the Study Area. In the case of Bahía Blanca, 39,595 people are over 65 years while the largest majority is between 15 to 64 years old.

**Table 6-12 Population by age group (2010)**

Division	Name	Total per age group			
		Total	0-14	15-64	65 +
Province	Buenos Aires	15,625,084	3,876,553	10,077,275	1,671,256
Partido	Tornquist	12,723	2,759	8,081	1,883
	Bahía Blanca	301,572	63,271	198,706	39,595

Source: INDEC, 2010

Regarding gender distribution, with the exception of Tornquist, women are the largest group in the Study Area. In the case of Buenos Aires province, from 15,625,064 people 7,604,581 are men while 8,020,503 are women. As the table shows, women have a higher expectancy life than men in all the communities of the Study Area; for example, in Tornquist, from 854 men that are over 65 years, 1,029 women reach the same age.

**Table 6-13 Gender distribution in the Study Area (2010)**

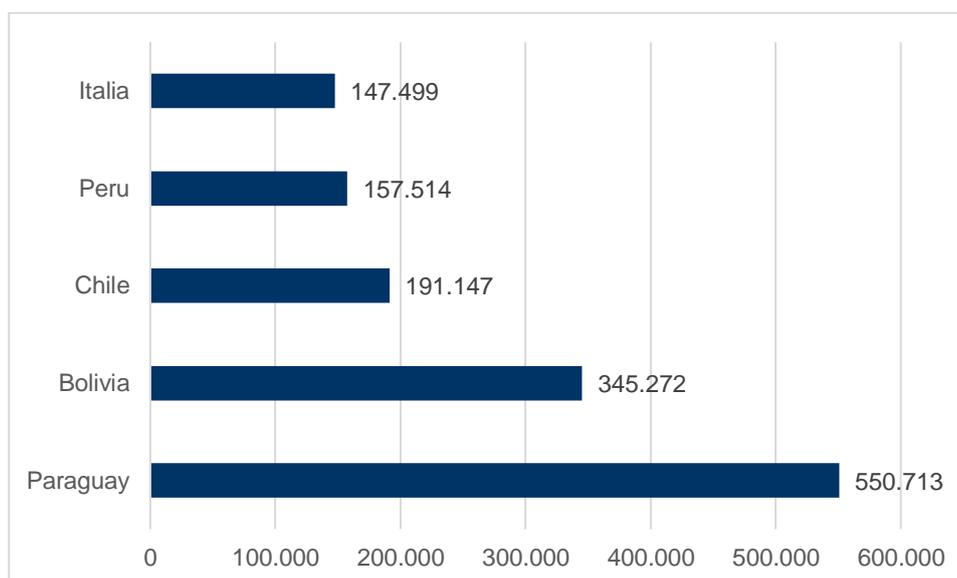
		Men				Women			
Division	Name	Total	0-14	15-64	65 +	Total	0-14	15-64	65 +
Province	Buenos Aires	7,604,581	1,971,222	4,955,019	678,340	8,020,503	1,905,331	5,122,256	992,916
Partido	Tornquist	6,354	1,416	4,084	854	6,369	1,343	3,997	1,029
	Bahía Blanca	144,648	32,297	96,761	15,590	156,924	30,974	101,945	24,005

Source: INDEC, 2010

### 6.2.6 Migration

According to the Argentinean Chamber of Commerce and Services, in relative and absolute terms, Argentina receives the largest amount of foreigners in South America. There are 2,200,000 migrants representing 4.9% of the total population of the country; people between 15 to 64 years old are the largest share of this group. On the other hand, Paraguay, Bolivia and Chile are the main countries of origin of this group.

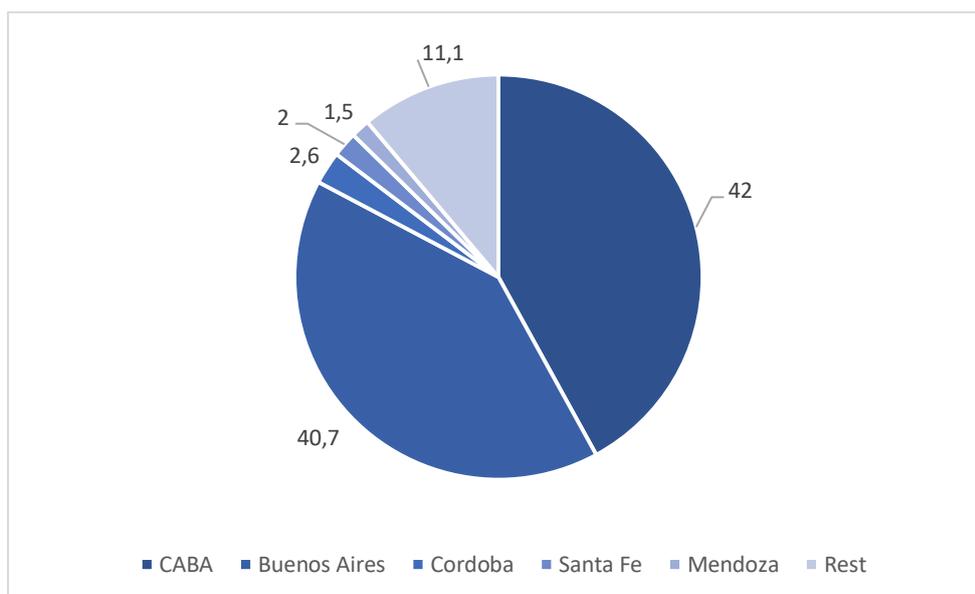
**Figure 6.11 Main countries of origin of Argentina’s migrant population (2010)**



Source: UEPE CAC based on INDEC, 2010

Regarding request for residence, Paraguay and Bolivia remain as the main applicants followed by Venezuela, Peru and Colombia. In the case of Venezuela, in 2014, due to the domestic political and economic crisis, requests for residence increased to 1,777. On the other hand, the Autonomous City of Buenos Aires (CABA for its acronym in Spanish), followed by Buenos Aires and Cordova are the main recipients of newly arrived migrants.

**Figure 6.12 Requests for residence per province (2017)**



Source: UEPE CAC 2010

At a *partido* level, INDEC estimated that in 2010 in Bahía Blanca 13,465 foreigners live there; mostly from Chile (8,717), Italy (1,650) and Bolivia (662) while in Tornquist, the institute counted 376 foreigners from Chile (149), Paraguay (63) and Uruguay (35) mainly.

### 6.2.7 Education

Education in Argentina is managed by the Ministry of Education and implemented at the national, provincial and federal levels and by private institutions. In the case of state institutions, education is free at the initial, primary, secondary and tertiary levels but not in graduate studies. Private education is paid; however, in some cases, state can subsidize its cost. It is mandatory until secondary level.

**Table 6-14 Education levels by sector's percentage (2010)**

Division	Total (%)		Initial (%)		Primary (%)		Secondary (%)		Tertiary (%)	
	State	Private	State	Private	State	Private	State	Private	State	Private
Total/country	71	29	66.59	33.41	73	27	70	30	69	31
Buenos Aires	64	36	60	40	63	37	66	34	75	25

Source: INDEC, 2010

Argentinean educative system is divided in four levels. Initial level (kindergarten, initial education); primary, secondary and tertiary level- Depending the province the number of years at the primary/secondary level might vary (-/+1 year). The next table shows the organization of the Argentinean educative system by level.

**Table 6-15 Argentinean educative system (2010)**

Education	School/Level	Grades	Age	Years
Initial	Kindergarten, Initial education			
Primary	Primary Education	1-6	6-11	6-7
Secondary	Lower secondary	7-9	12-14	2-3
	Upper-secondary (polimodal)	10-12	15-17	3
	Post-secondary			1-4
Tertiary	Bachelor			4-5
	Master			1-3
	Doctorare			3

Source: Ministry of Education website.

### 6.2.7.1 Literacy rate and school participation rate

According to the World Bank Argentina has worked heavily in decreasing illiteracy in men and women; from 93.91% in 1980 to 99.13% in 2017, the country has surpassed countries like Chile (97%), Brazil (92%), and Mexico (95%). Currently, adult literacy rate is now at 99.13%; where women over 15 years have a literacy rate of 99.14% and men, 99.1%. In the case of the Buenos Aires province, more women than men are illiterate; from 88,705 men who do not know how to write or read, 90,303 women cannot do it.

**Table 6-16 Literacy rate per gender (2010)**

Division	Name	Literate			Illiterate		
		Total	Men	Women	Total	Men	Women
Total/country	Argentina	32,756,397	15,788,575	16,967,822	641,828	319,467	322,361
Province	Buenos Aires	12,865,686	6,203,482	6,662,204	179,008	88,705	90,303

Source: INDEC, 2010

According to the WENR (World Education News-Reviews), despite Argentina performs better than most South American countries, Argentinean system produces fewer university graduates, as a percentage of its population, than Brazil or Chile. Therefore, regardless the implementation of policies that aim to strengthen its educative system through investment (since 2006, Argentina spends at least 5.0% of its GDP in education), increasing literacy rate and promoting a larger enrolment rates in tertiary education, the country has one of the highest dropout rates in the world. According to the Centre of Studies on Argentine Education (CEA), only 27% of Argentinian students completed their studies, which means a dropout of 73%, in comparison to 50% in Brazil, 41% in Chile and 39% in Mexico.

### 6.2.7.2 Educative infrastructure

Argentinean Chamber of Construction, in its report “*Educative Infrastructure 2016-2025*”, counted that in 2013, Buenos Aires province had 5,727 educative centers at the initial level. At all levels (initial, primary, secondary and tertiary) Buenos Aires ranked first in the number of educative centers in comparison to other provinces and in territorial distribution with 29.8%, 27.0%, 38.4% and 29.8% respectively. On the other hand, Bahía Blanca had, in 2017, 280 state educative units and 98 private in contrast to Tornquist, with 56 from the state sector and 5 from the private sector.

### 6.2.8 Economics and Livelihoods

Buenos Aires province plays an essential role in the Argentinean economy, as it is the most important region in terms of GDP with more than 30% of the total. According to the Argentinean Chamber of

Commerce and Services, the province contributes approximately with 38% of the production of goods and 31% of the production of national services, generating 30% of private employment registered in Argentina.

### 6.2.9 Labor Force

Depending his labor status, Argentina's Ministry of Economy classify a person in one of the following categories:

- Economically Active Population (PEA for its acronym in Spanish): group of people who have an activity that without actively looking for it. It is composed of the employed population plus the unemployed.
- Occupied Population: group of people who have at least one occupation. Operationally, it is defined as such to the population that, during the specific period of the reference week, has worked for at least one hour in compensation without remuneration. It includes those who did not work during the week. It includes those suspended in which payment is maintained at the time of suspension.
- Unemployed population: group of people who, without having any work, search actively in the last four weeks.
- Inactive Population: group of people who have neither work nor seeking actively one.
- Sub employees visible or seasonal: set of employed population that works less than 35 hours per week and desirable to work more hours.

According to INEC 2010, in Buenos Aires province 699,000 people, over 5,624,000 people who are part of the active population are unemployed (12.4%); this rate is 2.8 points above the national average (9.6%). On the other hand, sub employees sum up 704,000 people. The most affected group are the youngsters; in the case of women under 29 years, the unemployment rate is 24.6% and among men is 22.0%.

### 6.2.10 Industrial Sector

Buenos Aires province is characterized for its highly diversified industrial production; from petrochemicals and energy in Bahía Blanca and Ensenada, to metallurgy in Campana-San Nicolás, auto parts in Buenos Aires, farming in 9 de Julio, agriculture-livestock in Pampa Húmeda, fishing in Mar del Plata to mining in Olavarría, Buenos Aires. In terms of services, the province has one of the most important touristic center in the country (Mar de la Plata). Additionally, it has five technology poles (Mar del Mar Silver, La Plata, Junín, Tandil and Bahía Blanca) which coexist with micro, small and medium enterprises, located primarily in the big urban centers that also have transnational companies. This province represents 50% of Argentina's industrial sector. The most important value chains are food, steel, petrochemical, chemical, textile, leather, automotive, pharmaceutical and capital assets.

**Figure 6.13 Preparation for Installation of Wind turbines for the Project**



Source: ERM, 2019

### **6.2.11 Agriculture Sector**

The province also has a leading role in the agricultural and livestock sector, reaching 29% of the agricultural national product. In Buenos Aires province is produced 54.5% of sunflower, 32.3% of corn, 27.8% of soybeans and 58.5% of the country's wheat. In addition, it has 34% of the heads of cattle, 70% of the catches of fish and mollusk in the country.

### **6.2.12 Tourism and Recreation Sector**

The World Tourism Organization (UNWTO) estimated that in 2017, Argentina received 6,759,000 tourists being the most visited country in South America and second, behind Mexico, in Latin America. Due to its diverse geography, Argentina is an attractive destination for Latin American and world visitors as it offers multiple touristic options (i.e. beaches, mountains, glaciers, etc.). In the case of Buenos Aires province, the interior region was the one that received the largest amount of tourists (32.6%) followed by the coastline, the North and Cordoba.

In the case of the *partidos* considered in the Study Area, in Bahía Blanca 62.64% of its visitors are from Argentina while 37.36% are from other countries like France, Venezuela, Germany, Brazil, Mexico, Uruguay and Spain. From them, 65.93% travel alone and 15.38% in couple. The main reason why tourists visit Bahía Blanca are layover (21.98%), holidays (18.68%) and work (14.29%). According to the Regional Statistics Observatory, Bahía Blanca in 2016 had 43 places for accommodation thus, 2,621 spaces for lodging. In comparison, Tornquist had 96 places for accommodation and 2,248 available spaces.

A relevant touristic area in the Tornquist municipality is the Ventania or Sierra de la Ventana mountain range system. It is one of the two mountainous areas of the province of Buenos Aires, and it has a longitude of 188 km from northwest to southeast.

Its most important hills are Cura Malal Chico (1000 meters above sea level (masl)), Cura Malal Grande (1037 masl), Napostá Grande (1108 masl), Ventana (1136 masl) and the highest in the province of Buenos Aires: Tres Picos (1239 masl).

**Figure 6-14. Ventania touristic region**



Source: Tornquist municipality, 2019

In relation to the information presented above, the locations in Table 6-17 were identified as the principal touristic attractions near the Project site.

**Table 6-17. Closest touristic attractions**

Touristic attraction	Description	Approximate linear distance to the Project
Villa Serrana la Gruta	It is a village located at the side of Provincial Route N°76, 5 minutes from Cerro Ventana. It is well known for its lush vegetation and impressive geology. Among its valleys, the main touristic activities are horseback riding, tea drinking, and gastronomy touring.	20 km
Tornquist city	Tornquist is the head town of the Tornquist municipality. The city is the center of the primary municipal activities.  It was founded by Ernesto Tornquist, on April 17, 1883. It has approximately 7,000 inhabitants and offers all the necessary facilities and services for tourists, such as accommodations, restaurants, spas, and parks. Tornquist has touristic information office as seen in <b>Error! Reference source not found..</b>	26 km
Cerro Tres Picos	With its 1238 masl it is the highest in the province of Buenos Aires. From its summit can be distinguished nearby towns such as Sierra de la Ventana, Tornquist, Villa Ventana and Bahía Blanca.	30 km

Touristic attraction	Description	Approximate linear distance to the Project
San Andrés de las Sierras	Located in front of Villa Serrana La Gruta, San Andres de la Sierra is a small village with several private buildings, resorts and tourist services. The peace and the beautiful views of the mountain range are its main attraction.	32 km
Ernesto Tornquist Provincial Park	<p>The park has more than 6000 hectares and is declared a protected area. It has a botanical garden where several species belonging to the Ventania System are protected and studied.</p> <p>The park has 2 access, one of them is at the base of Cerro Ventana, called "Cerro Ventana Base", the other one is called "Base Cerro Bahía Blanca".</p>	34 km
Garganta olvidada	It is a small ravine in the Sierra de la Ventana, within at an altitude of 604 masl.	35 km
Garganta de Diablo	It is a ravine, with a 15 meter water fall, a 8 meters deep natural pool and a set of caves.	35 km
Bahía Blanca	Bahía Blanca is a port city with large buildings of the nineteenth century and early twentieth century, such as its Municipal Palace or Plaza Rivadavia. The city is known as an access road to Patagonia, further south.	38 km
Villa Ventana	It is a small town, with only 609 inhabitants, which makes it the ideal destination for a quiet holiday, enjoying nature.	38 km
Saldungaray	<p>It is a village located in the wide valley, between the Sierras de la Ventana and Pillahuincó, on the western margin of the Sauce Grande River.</p> <p>This small town that has 1351 inhabitants attracts tourists for its simplicity and tranquility.</p>	41 km
Sierra de la Ventana	Sierra de la Ventana is a town in the Pampa and is known to be a good base to visit the mountain range. It is located in the course of the Sauce Grande River and the San Bernardo Stream, it has many recreations, hotel services, bungalow complexes, restaurants, confectioneries, teahouses and camping sites.	42 km

Source: ERM, 2019

**Figure 6.15 Government office in Tornquist**



Source: ERM, 2019

### **6.2.13 Roads and Transportation Means**

The nearest road nearby the Project is the National Route 33 (RN 33) that crosses from North to South the Study Area; other roads that connect the area are Provincial Route 76 (RP 76), Provincial Route 72 (PR 72) and Provincial Route 51 (PR 51).

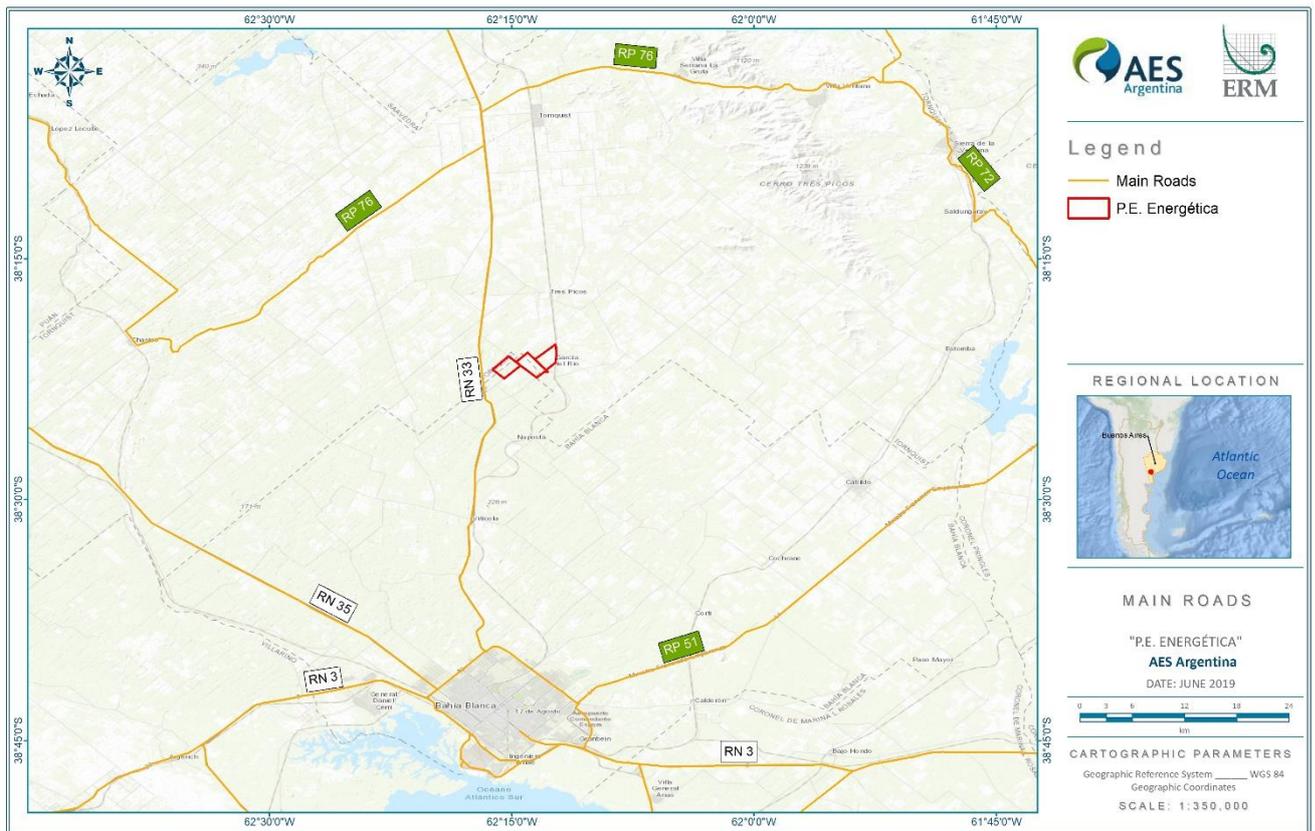
### **6.2.14 Poverty in the Study Area**

In the second quarter of 2017, indicators ranked the Province of Buenos Aires as one of the jurisdictions with the highest degree of inequality in Argentina. The Income Gap was 20.6, the highest in the country, while the Gini Coefficient (0.419) was the third highest. The levels of poverty (31.8%) and indigence (7.7%) recorded in the first semester of 2017 were also the highest, being respectively the fifth and third highest in the country. Both percentages were higher than the national and regional averages.

In the second semester of 2018, according to data provided by the Ministry of Economy, through the Permanent Household Survey (EPH, per its acronym in Spanish), the percentage of provincial households below the poverty line in the Pampean region (which comprises the *partidos* of Bahía Blanca and Tornquist) was of 17.5%; this comprised 25% of its population. Within this group, 2.6% of indigent households were identified thus, representing the 3.8% of its population.

The aforementioned indicators registered a general increase in the poverty and indigence levels with respect to the second semester of 2017 and a decrease with respect to those registered in the first half of 2017. The results came from the information of the EPH and the valuation of the basic food basket and the total basic basket.

**Figure 6.16 Main roads in the Study Area**



Source: ERM, 2019

**Figure 6.17 Typical house of the Study Area**



Source: ERM, 2019

### 6.2.15 Potential Vulnerable Groups Identified

As declared by the Ministry of Justice and Human Rights of the Republic of Argentina, vulnerability leads to structural discrimination, exclusion and marginalization, based on characteristics of the identity of a person, which may represent permanent traits of which these people cannot voluntarily dispense without a risk of losing their identity.

Argentina has identified several groups in situations of vulnerability and lines of action with the aim to deepen the guarantee of the respect of their human rights:

- Girls, boys and teenagers;
- Persons suffering from mental ill-health ;
- Handicapped / disabled people;
- Migrants;
- Indigenous people;
- Victims of state terrorism and the abuse of power;
- Elderly people;
- People who perceive themselves, or are perceived by others, as having a Lesbian, Gay, Trans, Intersex, Queer, Asexual (LGBTIQA) identity.

The country outlines the progress and deficiencies in regard of the public policies elaborated to respond to each of these groups and aspects in the 2011 publication: “*Groups in situation of vulnerability and human rights, Public policies and international commitments*”.

## 6.3 Sociocultural

### 6.3.1 Religion

There is no official religion in Argentina, as freedom of religion is guaranteed to the population according to Article 14 of the Constitution of the Republic of Argentina.

Between 2006 and 2011, five different studies on religion were carried out nationally, with the aim of deepening Argentina’s values, attitudes and beliefs on religion. All of them described the predominance of Catholicism and the tendency of expansion of other cults. For instance, the survey developed by the Observatory of Argentine Social Debt of the Catholic University of Argentina of 2011, showed that from the total number of Argentineans interviewed, 90.5% believed in God, 74.3% considered themselves as Catholics, 8.7% declared belonging to some other evangelical religion, 2.3% belong to other religions and 14.8% declared not being part of any religion.

In the central region of the country, including Buenos Aires province, the percentage of people who believe in God and other spiritual entities is similar to the average, the same happens with religious affiliation. Religious practices are remain similar in the rest of the country since there is minimum religious conversion.

### 6.3.2 Indigenous People and Culture

Historically, indigenous people in Argentina have lived in rural spaces. However, for several decades, many families have migrated to cities mainly for economic and labor reasons.

The National Institute of Statistics and Census of the Republic of Argentina (INDEC, per its acronym in Spanish) revealed in its last census (2010) that 2.4% of the country’s population is considered indigenous. Meanwhile, Buenos Aires province has a population of 15,482,751 people, of which, 299,311 individuals are considered indigenous, thus representing 1.9% of its total population.

Today, different indigenous people are distributed throughout the entire national territory. The following indigenous peoples are present in Buenos Aires province: Mapuche, Tehuelche, Mocovi, Qom, Kolla, and Guaraní. The Mapuche are present in the *partido* of Bahía Blanca, whereas in Tornquist there is no registry of indigenous peoples.

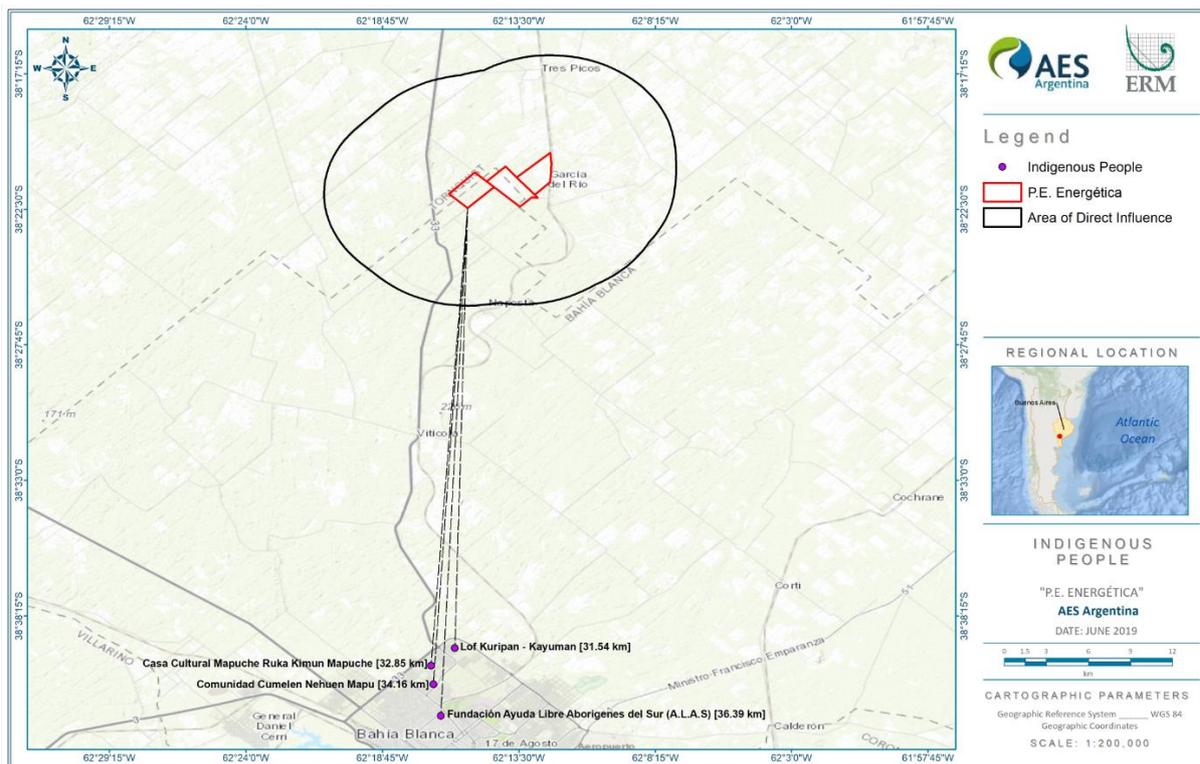
The Mapuches or Araucanians (name given by the Spaniards to the indigenous people who lived in the historic region of Araucanía or Arauco) are native American people that live in Chile and Argentina. It generally refers to all those who spoke or speak the Mapuche or Mapudungun language, including several groups that emerged from the araucanization between the 17th and 19th centuries through the eastward expansion of the Andes mountain range (hypothesis of the araucanization).

The indigenous presence identified in the region where the Project is located includes the following:

- Casa Cultural Mapuche Ruka Kimun Mapuche: Space designed for educational and cultural bolstering, apropos of the Mapuche culture.
- Fundación Ayuda Libre Aborigenes del Sur (A.L.A.S): Association that promotes indigenous culture.
- Lof Kuripan – Kayuman: Mapuche community
- Comunidad Cumelen Nehuen Mapuche: Mapuche community

As appreciated in the next figure, these indigenous communities and supporting organizations are located further than 30 km to the Project site (source: National Institute of Indigenous Affairs (INAI-Argentina<sup>20</sup>).

**Figure 6.18 Indigenous People. Distant to the Project Site.**



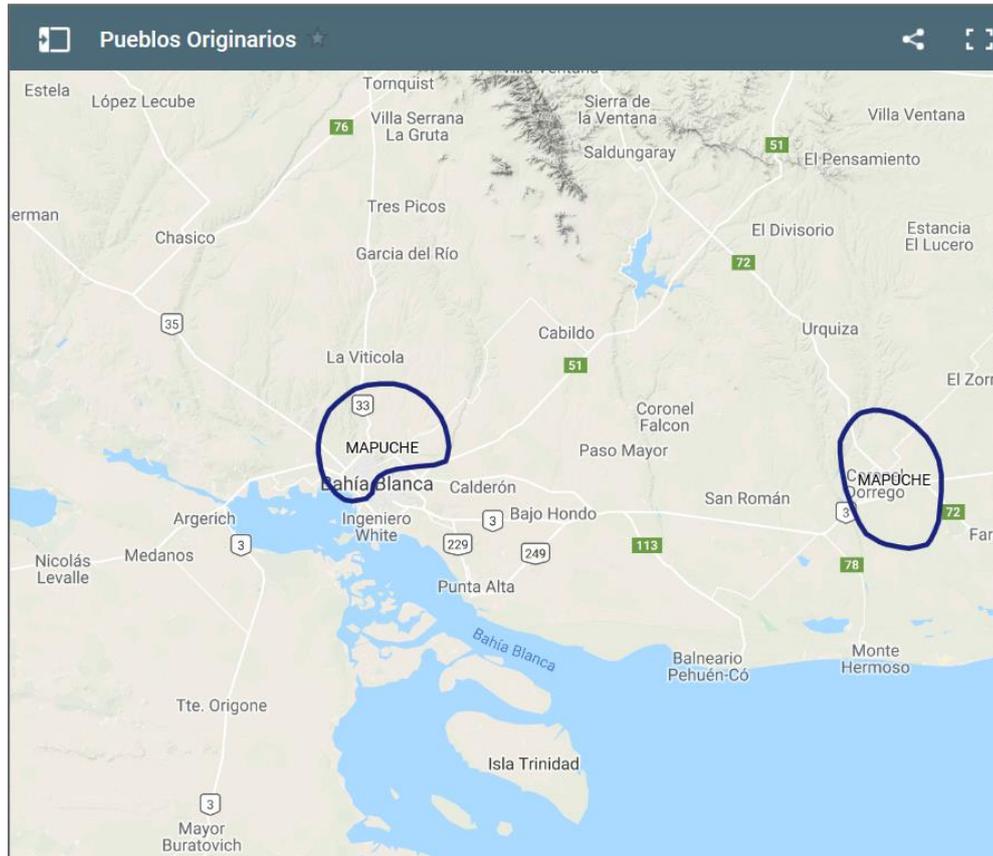
It should be noted that, according to the National Institute of Indigenous Affairs (INAI-Argentina<sup>21</sup>), the project area (Tres Picos) is located outside the territorial distribution of the Mapuche Indigenous People in the region (see Figure 6.19).

<sup>20</sup> See: <https://www.argentina.gob.ar/derechoshumanos/inai/mapa>

<sup>21</sup> See: <https://www.argentina.gob.ar/derechoshumanos/inai>

IFC PS 7 states that “11. Affected Communities of Indigenous Peoples may be particularly vulnerable to the loss of, alienation from or exploitation of their land and access to natural and cultural resources” and that a Free, Prior, and Informed Consent is required when the Project generates “Impacts on Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use”. Project activities do not generate impacts on indigenous communities’ lands or natural resources subject to a traditional property regime or under customary use and Project Area holds no Indigenous Communities that could be affected by the Project.

**Figure 6.19 Location of Mapuche Communities in Southern Buenos Aires.**



Source: National Institute of Indigenous Affairs (INAI) <https://www.argentina.gob.ar/derechoshumanos/inai/mapa>

## 6.4 Community Health

### 6.4.1 Public Health Facilities and Personnel

The Argentinian health system is characterized by an excessive fragmentation, which occurs first, in three large subsectors: public, of social security and private. This fragmentation implies different financing sources, coverages, co-insurance and co-payments applied, regimes, control and oversight bodies.

In 2010, 36% of the population did not have medical coverage, social security, or had the ability to pay for private care; therefore, they were treated in public hospitals and health centers. The percentage of people using public hospitals and health centers throughout the country hides important inequalities, since there are big differences between the provinces.

By the end of 2017, the national health system had 17,485 assistance establishments including those of public administration, social security and the private sector. There were 166,187 doctors in the country (3.94 doctors per 1,000 inhabitants) and 179,175 nursing personnel (4.24 per 1,000 inhabitants), little more than half having professional qualification.

## 6.4.2 Key Community Diseases

As stated by the INDEC, in 2016, the number of deaths caused by Chagas disease, one of the more historically problematical diseases in Argentina, was of 435 nationwide and 90 in Buenos Aires province. AIDS was responsible for 3.4% of the deaths in the country and for 3.8% at a provincial level, whereas tuberculosis caused 1.5% of the deaths in Argentina and 1.2% in the province. In both cases, men were more affected than women were.

Other causes of death in the country include circulatory system diseases (28.9%), followed by diseases of the respiratory system (18.5%) and malignant tumors (17.7%). To a lesser extent, infectious and parasitic diseases (3.9%) and diseases of the urinary system (3.7%).

## 6.4.3 Water, Hygiene and Sanitation

### Domestic Water

As stated by the Argentinian Water Platform, 77.85% of Argentinians have access to a public water network in their homes, 11.75% access through drilling on the property, 5.50% public network access in the field, and 1.65% through well access on the property.

The North-Patagonian region, which includes Bahía Blanca and Tornquist, is characterized by a serious hydric problem regarding quality and quantity, given the high presence of fluorine and arsenic.

Currently, 62.88% of this region's population has water service. However, according to the Ministry of Infrastructure and Public Services, big investments have been made in Bahía Blanca in order to enlarge the drinking water and sewer service, and to expand the pipes by 200 km and to renew them in 150 km.

With this new plan, the water service is expected to reach 2,200 by its tenth year and 5,200 by its thirtieth. Meanwhile, the sewer service is currently working for 23,500 people and is expected to increase its reach for other 28,400 and 48,900 respectively.

### Sanitation

As stated by the Argentinian Water Platform, 97.37% of the country's population has access to sanitation services. In the urban communities, 58.57% is given through the public sewer network, in rural grouped households 53.31% is through septic cameras and wells, and in scattered rural homes 46.81% is through wells.

At a province level, 98.25% has access to sanitation services. In the urban communities, 54.25% is given through the public sewer network, in rural grouped households 52.13% is through septic cameras and wells, and in scattered rural homes 52.53% is through wells.

## 6.5 Community Safety and Security

### 6.5.1 Crime

As reported by the National Citizen Observatory, in 2017, per every 100,000 Argentinians, there were reported:

- 2,293 deceitful murders, 312 more than the previous year;
- 255,264 burglaries;
- 406,342 thefts; and
- 16,114 cases of sexual assault.

According to the most recent information provided by INDEC, in 2015 within the province's territory per every 100,000 inhabitants, there were reported 2,314.39 criminal incidents including:

- 606.6 crimes against people, which, among others, include deceitful murders and injuries, or as a consequence of transit accidents;
- 28.5 crimes against sexual integrity and honor;
- 367 crimes against freedom;
- 1,021 offenses against private property;
- 170.9 crimes against the State and the community; and
- 31.4 crimes against marital status.

According to the National Victimization Survey conducted by INDEC, in 2017, 66.9% of Argentinians trusted the National Gendarmerie, 49.2% the Federal Police, and 33.1% the courts and judges. As for the province, data does not varied significantly, with 64.6%, 44.9% and 33% respectively.

Nationwide, less than half of the people (47.6%) reported feeling safe or very safe walking near where they live, with a similar scenario at a provincial level (42.4%).

Citizens were also asked about the evolution of delinquency in comparison to the previous year. The proportion of respondents who consider that in their area of residence (close to where they live) insecurity increased (44%) is very similar to that of those who consider that it stayed the same (46%).

On the other hand, the broad majority of the population believes that insecurity worsened between 2016 and 2017, regarding their city (68%), their jurisdiction (72%), and their country (80%).

## 6.6 Community Perception and Expectation

According to interviews done during fieldwork (i.e. authorities, landowner) there is no opposition against the Project.

## 6.7 Key Stakeholder Identification and Analysis

### 6.7.1 Key Stakeholder Identification

The identification of Stakeholders is very important, as it establishes the bases of engagement and communication strategies necessary for achieving greater participation and social acceptance of the Project. According to the International Finance Corporation (IFC) in "Stakeholder Engagement: A good practice handbook for companies doing business in emerging markets" (2007), Stakeholders are:

*"Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests, the academic community, or other businesses."*

The exercise of Stakeholder identification and analysis was carried out by gathering data from secondary and primary sources (i.e. interviews with key informants and field observations). Additionally, this analysis includes mapping the Stakeholders identified according to their position, and capacity for influencing the Project. For further information, refer to Appendix F of this report, where it was enclosed the Stakeholder Engagement Plan (SEP) for this project

It is important to mention that the identification, mapping, and analysis of Stakeholders should be a dynamic and continuous exercise in the execution of any project, as it allows deep understanding of the social context and increases the possibilities of effectiveness and adoption of liaison strategies in the social context. The specific objectives of this section are:

- Identify the Stakeholders in the Study Area and define their characteristics;
- Analyze the positions, degree of influence, concerns, and interests of these Stakeholders regarding Project development;

- Propose prioritization of key stakeholders.

As mentioned above, identification of Stakeholders was carried out by gathering data based on secondary sources. Publicly-available data was gathered from the following organizations:

- The National Institute of Statistics and Census (INDEC for its acronym in Spanish);
- The Regional Statistics Observatory;
- A Review of External Factors (REF) performed by ERM through consulting news from the municipalities, communities, and governmental agencies of the Project's Area of Influence; and
- Available academic information.

### 6.7.2 Key Stakeholder Analysis

Once the Stakeholders had been identified, their influence and position regarding the Project was assessed. This assignment is based on knowledge of social, cultural, political, and environmental conditions and factors associated with Project development. The criteria used for their classification and subsequent prioritization consider their capacity for potentially influencing the Project's development.

Influence is defined as the degree of orchestration with other Stakeholders and the capacity to influence Project development. The next table indicates the criteria used to measure Stakeholder influence

**Table 6-18 Parameters for assigning the potential level of influence**

Degree	Description
Low	Stakeholders possess little capacity to influence Project development and/or few relationship networks with local stakeholders.
Medium	Stakeholders possess a medium level of capacity for orchestration and influence, exercise influence on social networks with important connections to local stakeholders such as inhabitants, workers, tourists, politicians, among others.
High	Stakeholders possess a high level of capacity for orchestration and influence on Project development, as well as significant relationship networks with local stakeholders such as inhabitants, workers, tourists, politicians, among others.

Source: ERM, 2019

#### 1. Position on the Project

The potential influence of Stakeholders on the Project was determined based on the information gathered (Table 6-21). The following table indicates the criteria used to assign the potential type of position of Stakeholders on the Project.

**Table 6-19 Parameters for assigning potential position on the Project**

Potential position	Description
In favor	Stakeholders are aware of and recognize convergence between their interests and Project development. Additionally, they would not use their influence, regardless of degree, against the Project. Their perception of the Project is mainly positive.
Neutral	Stakeholders are unaware of and do not recognize convergence between their interests and Project development. Additionally, they would not use their influence, regardless of degree, against the Project. They do not have a positive or negative perception of the Project.
Against	Stakeholders are aware of and recognize convergence between their interests and Project development. They could potentially use their influence, regardless of degree, against the Project. They have a negative perception of the Project.

Source: ERM, 2019

**Table 6-20 Identification of Key Stakeholders**

Category	Description	Stakeholders		
Relevant authorities for this stage of the Project	Federal			
	This refers to federal government organizations that could influence the Project a) through issuing permits and/or b) that could act as allies in communication and/or liaison strategies with other Stakeholders, and c) whose opinion could influence other Stakeholders.	<ul style="list-style-type: none"> <li>• Presidency;</li> <li>• Ministry of Interior;</li> <li>• Ministry of Finance;</li> <li>• Ministry of Energy;</li> <li>• Ministry of Sustainable Development and Environmental Policy;</li> <li>• Ministry of Social Development;</li> </ul>		
	Province			
	This refers to provincial government organizations that could influence the Project a) through issuing permits and/or b) that could act as allies in communication and/or liaison strategies with other Stakeholders, and c) whose opinion could influence other Stakeholders.	<u>Buenos Aires</u> <ul style="list-style-type: none"> <li>• Ministry of Interior;</li> <li>• Ministry of Social Development;</li> <li>• Ministry of Economy;</li> <li>• Ministry of Infrastructure and Public Services.</li> </ul>		
	<i>Partido</i>			
	This refers to <i>partido</i> government organizations that could influence the Project a) through issuing permits and/or b) that could act as allies in communication and/or liaison strategies with other Stakeholders, and c) whose opinion could influence other Stakeholders.	<table border="0"> <tr> <td> <u>Bahía Blanca</u> <ul style="list-style-type: none"> <li>• Ministry of Interior;</li> <li>• Ministry of Finance and Economic Development</li> <li>• Ministry of Environmental Management;</li> <li>• Ministry of Social Policies;</li> <li>• Ministry of Security and Civil Protection;</li> <li>• Direction of Employment;</li> <li>• Relevant municipal delegations.</li> </ul> </td> <td> <u>Tornquist</u> <ul style="list-style-type: none"> <li>• Ministry of Interior;</li> <li>• Ministry of Development;</li> <li>• Direction of Finance;</li> <li>• Direction of Environment;</li> <li>• Development Agency</li> <li>• Delegate of Tres Picos;</li> </ul> </td> </tr> </table>	<u>Bahía Blanca</u> <ul style="list-style-type: none"> <li>• Ministry of Interior;</li> <li>• Ministry of Finance and Economic Development</li> <li>• Ministry of Environmental Management;</li> <li>• Ministry of Social Policies;</li> <li>• Ministry of Security and Civil Protection;</li> <li>• Direction of Employment;</li> <li>• Relevant municipal delegations.</li> </ul>	<u>Tornquist</u> <ul style="list-style-type: none"> <li>• Ministry of Interior;</li> <li>• Ministry of Development;</li> <li>• Direction of Finance;</li> <li>• Direction of Environment;</li> <li>• Development Agency</li> <li>• Delegate of Tres Picos;</li> </ul>
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Landowners	This refers to the people whose land would be rent or is rented for the activities/installation of infrastructure related to the Project.	<ul style="list-style-type: none"> <li>• Three landowners of the land within Project footprint.</li> </ul>		
Community members living in the nearest communities to the Project	This refers to community members who live in the nearest communities that could perceive themselves as affected by the Project activities.	<table border="0"> <tr> <td> <u>Bahía Blanca</u> <ul style="list-style-type: none"> <li>• Bahía Blanca</li> <li>• Cabildo</li> <li>• General Daniel Cerri</li> </ul> </td> <td> <u>Tornquist</u> <ul style="list-style-type: none"> <li>• Chasicó</li> <li>• Tornquist</li> <li>• Tres Picos</li> </ul> </td> </tr> </table>	<u>Bahía Blanca</u> <ul style="list-style-type: none"> <li>• Bahía Blanca</li> <li>• Cabildo</li> <li>• General Daniel Cerri</li> </ul>	<u>Tornquist</u> <ul style="list-style-type: none"> <li>• Chasicó</li> <li>• Tornquist</li> <li>• Tres Picos</li> </ul>
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Category	Description	Stakeholders												
Indigenous population	This refers to indigenous population that live within the Study Area and might perceive themselves as affected by the Project activities.	<ul style="list-style-type: none"> <li>Mapuches living in urban localities of Bahía Blanca and Tornquist, both considered as the Project's Indirect Area of Influence nearest community</li> </ul>												
Business organizations	This refers to the trade groups whose representatives could benefit from the power sector or perceive themselves as affected by the Project activities.	<ul style="list-style-type: none"> <li>Argentinean Wind Energy Association (AEE for its acronym in Spanish)</li> </ul> <table border="1"> <thead> <tr> <th><u>Bahía Blanca</u></th> <th><u>Tornquist</u></th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> <li>Rural Associations' Confederation of Buenos Aires and La Pampa (CARBAP for its acronym in Spanish)</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>Farmers and livestock breeders Association</li> </ul> </td> </tr> </tbody> </table>	<u>Bahía Blanca</u>	<u>Tornquist</u>	<ul style="list-style-type: none"> <li>Rural Associations' Confederation of Buenos Aires and La Pampa (CARBAP for its acronym in Spanish)</li> </ul>	<ul style="list-style-type: none"> <li>Farmers and livestock breeders Association</li> </ul>								
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Academic institutions	This refers to academic institutions with whom alliances could be formed to create local capacities and/or whose opinions with reference to the Project's environmental and social performance could influence the opinions of other Stakeholders.	<table border="1"> <thead> <tr> <th><u>Bahía Blanca</u></th> <th><u>Tornquist</u></th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> <li>Universidad Nacional del Sur</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>Universidad Provincial del Sudoeste</li> </ul> </td> </tr> </tbody> </table>	<u>Bahía Blanca</u>	<u>Tornquist</u>	<ul style="list-style-type: none"> <li>Universidad Nacional del Sur</li> </ul>	<ul style="list-style-type: none"> <li>Universidad Provincial del Sudoeste</li> </ul>								
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Communications media	This refers to news and information media, which could influence public opinion and awaken interest in general regarding the Project.	<table border="1"> <thead> <tr> <th>Buenos Aires Newspapers</th> <th><u>Bahía Blanca Radio</u></th> <th><u>Tornquist Radio</u></th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> <li>Clarín</li> <li>La Capital</li> <li>La Nación</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>Radio Norte</li> <li>Radio Universidad Nacional del Sur</li> <li>Radio Bahía Blanca</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>Radio de las Sierras</li> <li>Reflejos</li> </ul> </td> </tr> <tr> <td></td> <th><u>Website</u></th> <th><u>Website</u></th> </tr> <tr> <td></td> <td> <ul style="list-style-type: none"> <li>La Nueva Provincia</li> <li>La Brújula 24</li> </ul> </td> <td> <ul style="list-style-type: none"> <li><u>Noticias Tornquist</u></li> <li><u>Tornquist Distrital</u></li> <li><u>Observador Serrano</u></li> </ul> </td> </tr> </tbody> </table>	Buenos Aires Newspapers	<u>Bahía Blanca Radio</u>	<u>Tornquist Radio</u>	<ul style="list-style-type: none"> <li>Clarín</li> <li>La Capital</li> <li>La Nación</li> </ul>	<ul style="list-style-type: none"> <li>Radio Norte</li> <li>Radio Universidad Nacional del Sur</li> <li>Radio Bahía Blanca</li> </ul>	<ul style="list-style-type: none"> <li>Radio de las Sierras</li> <li>Reflejos</li> </ul>		<u>Website</u>	<u>Website</u>		<ul style="list-style-type: none"> <li>La Nueva Provincia</li> <li>La Brújula 24</li> </ul>	<ul style="list-style-type: none"> <li><u>Noticias Tornquist</u></li> <li><u>Tornquist Distrital</u></li> <li><u>Observador Serrano</u></li> </ul>
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General members of society not included in the above groups	This refers to community members who live in the urban centers of the Study Area and who could take a position regarding the Project.	<ul style="list-style-type: none"> <li>General society not included in the above groups.</li> </ul>												
Civil Society Organizations (CSOs)	This refers to CSOs of international, national, or local scope that could generate an opinion due to the Project's environmental and social performance.	<table border="1"> <thead> <tr> <th><u>Bahía Blanca</u></th> <th><u>Tornquist</u></th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> <li>FUNDASUR;</li> <li>Aves Argentinas;</li> <li>500 RPM</li> </ul> </td> <td> <ul style="list-style-type: none"> <li><u>N/A</u></li> </ul> </td> </tr> </tbody> </table>	<u>Bahía Blanca</u>	<u>Tornquist</u>	<ul style="list-style-type: none"> <li>FUNDASUR;</li> <li>Aves Argentinas;</li> <li>500 RPM</li> </ul>	<ul style="list-style-type: none"> <li><u>N/A</u></li> </ul>								
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Category	Description	Stakeholders
Workforce	This refers to future workers hired for Project execution.	<ul style="list-style-type: none"> <li>Project workers related to the activities prospected.</li> </ul>
Contractors and subcontractors	This refers to potential contractors and subcontractors who might benefit from participating in the provision of services during Project operation.	<ul style="list-style-type: none"> <li>Contractors and subcontractors who will provide services to the Project, such as: NORDEX.</li> </ul>
Neighboring projects	This refers to neighboring companies that could be carried out similar activities in the same period as the Project.	<ul style="list-style-type: none"> <li>Three (3) under construction (and nearest to the Project) Mataco, San Jorge and García del Río.</li> <li>Two (2) wind farm in operation: La Castellana and Genoveva</li> </ul>
Unions	This refers to the unions for workers interested in participating in the Project.	<ul style="list-style-type: none"> <li>Construction and Allied Workers' Union (UECARA for its acronym in Spanish)</li> <li>Union of Construction Workers of Argentina (UOCRA for its acronym in Spanish)</li> </ul>

Source: ERM, 2019

An analysis of Stakeholders is presented below. It includes: needs, interests, concerns, expectations, interest and influence on the Project, as well as their position regarding the same and potential interaction with it.

**Table 6-21 Mapping of Key Stakeholders**

Stakeholder	Potential needs	Potential interests	Potential concerns	Potential expectations	Potential Influence on the Project	Potential Position
Relevant authorities for this stage of the Project	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Receiving information on projects (timeline, potential impacts, benefits)</li> <li>Promoting economic development</li> <li>Attraction of private investment</li> <li>Establishing clear channels of communication</li> <li>Liaison between companies and the corresponding authorities</li> </ul>	<ul style="list-style-type: none"> <li>Incorrect management of expectations with landowners and communities</li> </ul>	<ul style="list-style-type: none"> <li>Economic revenue (employment generation, use of local services)</li> <li>Active liaison between key stakeholders and power companies</li> <li>Organizing participative committees with cooperatives and communities</li> </ul>	High	In favor
Landowners	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Receiving information on projects (timeline, potential impacts, benefits)</li> <li>Payments on time.</li> </ul>	<ul style="list-style-type: none"> <li>Not receiving their payments on time.</li> <li>Change of conditions without their consent/not in a timely manner</li> </ul>	<ul style="list-style-type: none"> <li>Maintain a good relationship with the Project.</li> </ul>	High	In favor
Community members living in the nearest community to the Project	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Receiving information on projects (timeline, potential impacts, benefits)</li> <li>Being taken into account by companies to consider needs, greater participation</li> </ul>	<ul style="list-style-type: none"> <li>Lack of attention from the provincial government</li> <li>Access to good quality public services</li> <li>Unemployment</li> <li>Impact on tourist areas</li> </ul>	<ul style="list-style-type: none"> <li>Economic revenue (use of local services)</li> <li>Employment generation.</li> </ul>	Medium	Neutral
Indigenous population	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Receiving information on projects (timeline, potential impacts, benefits)</li> </ul>	<ul style="list-style-type: none"> <li>Lack of attention from the provincial government</li> <li>Access to good quality public services</li> </ul>	<ul style="list-style-type: none"> <li>Economic revenue (use of local services)</li> <li>Employment generation.</li> </ul>	Medium	Neutral

Stakeholder	Potential needs	Potential interests	Potential concerns	Potential expectations	Potential Influence on the Project	Potential Position
		<ul style="list-style-type: none"> <li>Being taken into account by companies to consider needs, greater participation</li> </ul>	<ul style="list-style-type: none"> <li>Unemployment</li> </ul>			
Business organizations	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Economic revenue and business opportunities by utilizing local networks of local suppliers</li> <li>Establishing strategic relationships with the power sector.</li> <li>Receiving information on relevant business opportunities</li> </ul>	<ul style="list-style-type: none"> <li>Lack of liaison with power companies</li> </ul>	<ul style="list-style-type: none"> <li>Strategic business opportunities with the sector</li> </ul>	Medium	In favor
Academic institutions	<ul style="list-style-type: none"> <li>Funding for improvements in infrastructure, school equipment</li> <li>Further liaison with power companies</li> </ul>	<ul style="list-style-type: none"> <li>Increase in local capacities through the training of professionals</li> <li>Funding of research programs and involvement of students/trainees</li> </ul>	<ul style="list-style-type: none"> <li>Generating suitable means and conditions for placement of their students in the sector</li> <li>No local hiring.</li> </ul>	<ul style="list-style-type: none"> <li>Establishing strategic relationships with the sector.</li> </ul>	Medium	Neutral
Communications media	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Receiving relevant information on the Project (timeline, potential impacts, benefits) to inform the population</li> </ul>	<ul style="list-style-type: none"> <li>The Project's poor environmental and social performance</li> <li>Not having relevant information about the Project to disseminate</li> </ul>	<ul style="list-style-type: none"> <li>Disseminating relevant and attractive information for their audience on Project development</li> </ul>	Medium	Neutral
General members of society not included in the above groups	<ul style="list-style-type: none"> <li>Access to good quality public services.</li> </ul>	<ul style="list-style-type: none"> <li>Having access to relevant information on the Project (e.g. work timeline and management measures to be implemented)</li> <li>Benefiting from social investment</li> </ul>	<ul style="list-style-type: none"> <li>Condition of public services</li> </ul>	<ul style="list-style-type: none"> <li>Training of local population in case of opportunities in the sector</li> </ul>	Low	Neutral

Stakeholder	Potential needs	Potential interests	Potential concerns	Potential expectations	Potential Influence on the Project	Potential Position
		opportunities and infrastructure				
Civil Society Organizations (CSOs)	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Receiving information on projects (timeline, potential impacts, benefits)</li> </ul>	<ul style="list-style-type: none"> <li>Potential adverse environmental and social impacts</li> </ul>	<ul style="list-style-type: none"> <li>Establishing channels of communication with power sector companies</li> <li>Establishment of strategic social investment alliances</li> </ul>	Low	Neutral
Workforce	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Increase of opportunities for direct employment</li> <li>Economic benefits due to dynamism of regional economic activity</li> <li>Receiving relevant information on the Project (timeline, activities, duties, expected results)</li> </ul>	<ul style="list-style-type: none"> <li>Response to contingencies or unplanned events</li> </ul>	<ul style="list-style-type: none"> <li>Working in a safe environment free of conditions that foster inequality and lack of attention to human rights</li> </ul>	Medium	In favor
Contractors and subcontractors	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Economic benefits due to dynamism of regional and municipal economic activity</li> <li>Receiving information on relevant business opportunities</li> </ul>	<ul style="list-style-type: none"> <li>Response to contingencies or unplanned events</li> </ul>	Increase of opportunities for indirect employment	Medium	In favor
Neighboring projects	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Integrated growth in the region.</li> <li>Establish and maintain adequate communication with key Stakeholders (i.e. relevant authorities)</li> </ul>	<ul style="list-style-type: none"> <li>Response to contingencies or unplanned events</li> <li>Cumulative impacts of activity</li> </ul>	<ul style="list-style-type: none"> <li>Establishing prompt and efficient channels of communication with the other projects</li> </ul>	Low	In favor
Unions	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Promoting labor agreements and the rights of their members</li> </ul>	<ul style="list-style-type: none"> <li>Lack of labor opportunities.</li> </ul>	<ul style="list-style-type: none"> <li>Establishment of strategic alliances that allow placement of their members in the sector</li> </ul>	Low	In favor

Energética I Wind Farm Project (Tornquist, Argentina)

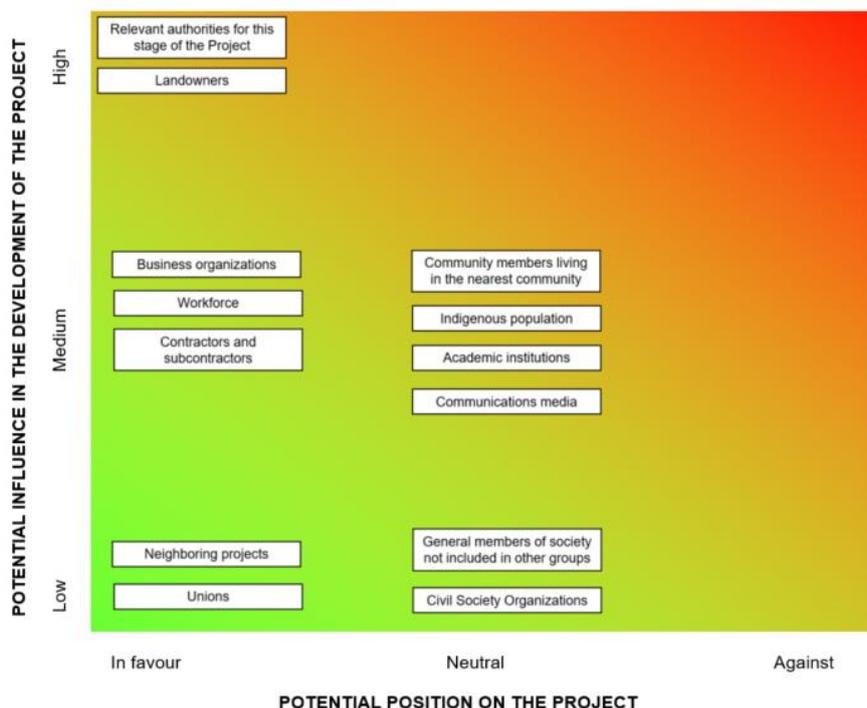
Stakeholder	Potential needs	Potential interests	Potential concerns	Potential expectations	Potential Influence on the Project	Potential Position
		<ul style="list-style-type: none"> <li>Increasing member number.</li> </ul>	<ul style="list-style-type: none"> <li>Guaranteeing optimal labor conditions for their members</li> </ul>			

Source: ERM, 2019

A Stakeholder Engagement Plan (SEP) was prepared for the project (see Appendix F). It is important to mention that community engagement tasks have been taking place with the stakeholders. In addition, the Environmental and Social Management System establishes as a commitment to keep the aforementioned Plan with periodic updates.

The next figure presents a mapping of Stakeholders considering both their position on the Project (“x” axis) and their potential influence on the same (“y” axis).

**Figure 6.20 Key Stakeholder Mapping**



Source: ERM, 2019

Based on the EFR and fieldwork information, it can be said that, at this time, no Stakeholder was identified as a potential opponent against the Project as all of the relevant Stakeholders had a favorable or neutral potential position. Additionally, for the EFR conducted, no major negative incidents were identified in the Study Area regarding windfarms. Thus, if the Project establishes and maintain an adequate Stakeholder Management (i.e. provide timely information, comply with the agreements arranged with the landowners, establish a transparent communication with local authorities, etc.) since the beginning, it could be possible that the development of it would be successful for all the Stakeholders involved.

## 7. PUBLIC CONSULTATION

According to IFC's, "public consultation is a tool for managing two-way communication between the project sponsor and the public. Its goal is to improve decision-making and build understanding by actively involving individuals, groups and organizations with a stake in a project. This involvement will increase a project's long-term viability and enhance its benefits to locally affected people and other stakeholders".

"Companies that start the process early and take a long-term, strategic view are, in essence, developing their local social license to operate<sup>22</sup>." (*Doing Better Business Through Effective Public Consultation and Disclosure: Good Practice Manual*, IFC)

As a complement to the Project's Environmental Impact Assessment and in order to fulfill compliance with the IFC's best international practices, this section of the document evidences the public consultation process carried out by the Project's responsible.

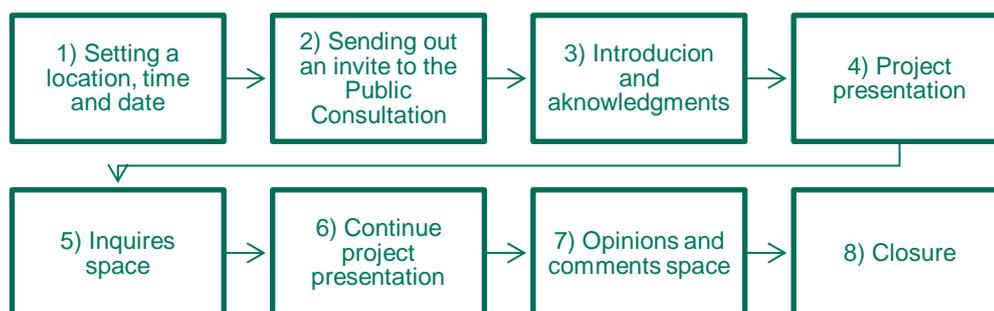
On December 14, 2016, the municipality of Tornquist called for a public consultation meeting in order to present Energética's wind farm Project, Energética I, to be located in Tres Picos and the García del Río station (See Appendix B). Within the assistants were; neighbors, governmental authorities, company authorities, academics, engineers and public. Throughout the consultation, Energética presented its Project and answered the questions and inquiries that the assistants had. The company received various positive comments from the initiative and the public showed support.

Note that this consultation was carried out the municipality in coordination with AES / the Energetica Project with support from its ESIA consultant. ERM was at the time not commissioned as consultant to the Project and therefore not involved in this process.

### 7.1 Methodology used

The public consultation carried out by Energética used a methodology that can be divided into eight (8) parts; they are showed in the diagram below and described further on.

**Figure 7.1 Methodology Used by the Project as part of Public Consultation Event (2016)**



Source: ERM, 2019

The stepwise process was as follows:

<sup>22</sup> "The Social License has been defined as existing when a project has the ongoing approval within the local community and other stakeholders, ongoing approval or broad social acceptance and, most frequently, as ongoing acceptance." (Shinglespit Consultants, *What is Social Licence?*, 2018)

- 1) Setting a location, time and date to carry out the consultation. It was set to be on December 14<sup>th</sup> of 2016, at 18:00, in a room located in the municipal palace.
- 2) Sending out an invite to assist to Energética's Project presentation. Within the assistants were governmental authorities, local authorities, company authorities, engineers and public.
- 3) Introducing the public consultation and acknowledging of the assistants; presented by Dr. Gonzalo Iparraguirre (head of the Municipality Development Agency of Tornquist).
- 4) Presenting the Project; Eng. Guillermo Coccoz (Energética's CEO), used a PowerPoint presentation in which he introduced the team leading the project, described the wind farm components, the way wind turbines work, as well as the way the integration process was to be carried out. Legal aspects were also mentioned in the presentation, and he gave a detailed description of the project.
- 5) Inquiries space; the assistants had the opportunity to give their opinion or ask questions.
- 6) Continued project presentation; Eng. Coccoz continued with the Project presentation as he described the stages of the project, mentioned the time frames and the needed resources (human and economic), he also invited the local people to be part of the construction team. Later on, Eng. Coccoz talked about the Environmental Impact Assessment and described the positive and negative impacts of the project. Finally, he informed the public that the project is considered as environmentally fit by the OPDS (Buenos Aires Sustainable Development Provincial Organism).
- 7) Opinions and comments space. The assistants shared their opinions and gave comments on the wind farm project proposed By Energética; people were supportive and gave positive feedback.
- 8) Closure, At 8:40 pm and without negative observations from any of the assistants, the consultation ended.

## 7.2 Results and Conclusions of Consultation Event

The Public Consultation carried out by Energética, can be considered a successful one, since the assistants were informed about the Project, were given the chance to ask or comment any inquiry, showed support and gave positive feedback towards the Project.

By carrying out the Public Consultation, Energética established an open dialogue between the company and the public; they were able to build understanding and involve individuals in the Project and therefore increase the Project's long-term viability.

## 7.3 Subsequent Stakeholder Engagement

As part of the pre-construction, construction, commissioning and operations phase, the Project is in the process of developing a stakeholder engagement plan (SEP) that shall serve to guide stakeholder engagement and community relations throughout the various phases of the Project life.

The SEP is being developed in line with the principles of IFC PS 1 regarding stakeholder engagement.

This will include a grievance mechanism to allow for the issue, collection, review, resolution, and communications upon, grievances received from third parties on the Project.

This SEP is provided by AES separately from this SLIP.

## 8. IMPACT ASSESMENT

This section provides an overview assessment of how the Project will interact with physical, ecological or social elements that will lead to potential impacts to resources/ receptors.

This IA is a complement to the Environmental and Social Impact Assessment (ESIA) of the Project. The approved ESIA was carried out in May 2016 and modified twice, first in June 2016 and later in November 2018.

The impacts identified in the Project ESIA cover both stages (construction and maintenance & operation), and are the following:

- Erosion and destabilization
- Generation of radio interference
- Noise generation by corona effect
- Generation of vibrations
- Shadow flickering
- Light pollution
- Impact to the population
- Waste generation
- Landscape quality
- Agricultural activities
- Commercial / industrial activities
- Touristic development
- Road infrastructure
- Induced secondary development
- Cultural heritage
- Public health and safety
- Air traffic

Additional impacts not identified in the ESIA are assessed in this section, and those that were already evaluated in the ESIA but are considered relevant are already here included. The methodology is as follow:

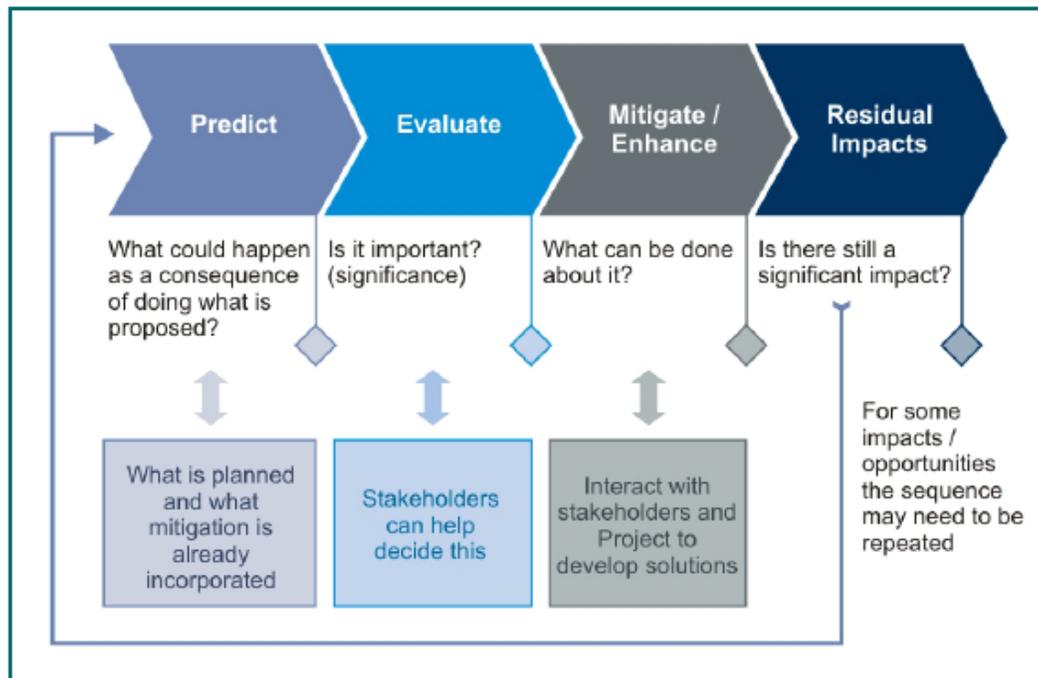
### 8.1 Methodology

Impact identification and assessment requires the following steps (see Figure 8.1):

- **Impact prediction:** to determine what could potentially happen to resources/receptors because of the projects and its associated activities.
- **Impact evaluation:** to evaluate the significance of the predicted impacts by considering their magnitude and likelihood of occurrence, and the sensitivity, value and/or importance of the affected resource/receptor.
- **Mitigation and enhancement:** to identify appropriate and justified measures to mitigate negative impacts and enhance the positive ones.

- **Residual impact evaluation:** to evaluate the significance of impacts assuming effective implementation of mitigation and enhancement measures.

**Figure 8.1 Impact Assessment steps**



Source: ERM, 2019

The impact assessment was carried out to determine what is likely to happen to the environment as a consequence of the Project and its associated activities.

Every impact was assigned a level of Magnitude according to its characteristics. Magnitude describes the intensity of a change that could occur in a receptor as a result of the impact. The magnitude varies on a resource/receptor-by- resource/receptor basis. The universal magnitude designations are:

- Negligible
- Small
- Medium
- Large
- Positive

Additionally, vulnerability of the impacted receptor is analyzed. There are ranges of factors (physical, biological, cultural or human) with different levels such as:

**Table 8-1 Level of Vulnerability**

Degree of Significance	Description
<b>Low</b>	Minimal areas of vulnerability; consequently with a high ability to adapt to changes brought by the Project and opportunities associated with it.
<b>Medium</b>	Some, but few areas of vulnerability; retaining an ability to at least in part adapt to change brought by the Project and opportunities associated with it.
<b>High</b>	Profound or multiple levels of vulnerability that undermine the ability to adapt to changes brought by the Project and opportunities associated with it.

Source: ERM, 2019

Once the magnitude and vulnerability is defined, then the significance of the impact is assigned (see Figure 8.2).

**Figure 8.2 Impact Significance**

		Sensitivity/Vulnerability/Importance of Resource/Receptor		
		Low	Medium	High
Magnitude of Impact	Negligible	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major

Source: ERM, 2019

The matrix applies to all resources/receptors. Table 8-2 provides a context of what the various impact significance ratings imply:

**Table 8-2 Context of Impact Significance**

- An impact of **negligible** significance is one where a resource/receptor (including people) will essentially not be affected in any way by a particular activity or the predicted effect is deemed to be ‘imperceptible’ or is indistinguishable from natural background variations.
- An impact of **minor** significance is one where a resource/receptor will experience a noticeable effect, but the impact magnitude is sufficiently small (with or without mitigation) and/or the resource/receptor is of low sensitivity/ vulnerability/ importance. In either case, the magnitude should be well within applicable standards.
- An impact of **moderate** significance has an impact magnitude that is within applicable standards, but falls somewhere in the range from a threshold below which the impact is minor, up to a level that might be just short of breaching a legal limit. Clearly, to design an activity so that its effects only just avoid breaking a law and/or cause a major impact is not best practice. The emphasis for moderate impacts is therefore on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that impacts of moderate significance have to be reduced to minor, but that moderate impacts are being managed effectively and efficiently.
- An impact of **major** significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. An aim of IA is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into the long-term or extend over a large area. However, for some aspects there may be major residual impacts after all practicable mitigation options have been exhausted (i.e. ALARP has been applied). An example might be the visual impact of a facility. It is then the function of regulators and stakeholders to weigh such negative factors against the positive ones, such as employment, in coming to a decision on the Project.

Source: ERM, 2019

Once the significance of an impact has been characterized, the next step is to evaluate what mitigation and enhancement measures are warranted.

Most of the environmental and social impacts were assessed in the original ESIA and its two addendums. In addition, hereinafter is presented a supplemental evaluation of some impacts that require a detailed assessment and correspondent mitigation measures. See identification in Table 8-3:

**Table 8-3 Preliminary identification of interactions**

Environmental and Social Impact		Ambient Noise	Biodiversity (Fauna & Flora)	Landscape	Community Health and Safety	Soil	Transportation route	Shadow flickering
<b>Windfarm</b>								
<b>On site preparation and construction</b>								
	Soil excavation, soil and vegetation removal and soil compaction	N	N	N	N	N	N	
	Mounting and operation of the workshop	N	N	N	N	N	N	
	Extraction of loan materials (quarries)	N	N	N	N	N	N	
	Vehicle and machinery operation	N			N		N	
<b>Operation and Maintenance Stage</b>								
	Presence of Wind Farm (operation of wind turbines)	N	N	N	N			N
	Electric field generation	N			N			
	Magnetic induction field generation				N			
<b>Abandonment/ Dismantling</b>								
	Dismantling of the building site, cleaning and final recomposition of the land.)	P		P			N	P

Source: ERM; 2019

Note: Only interactions considered to require a deeper and more detailed assessment were considered in this table

	Interaction generating a potentially significant impact		Interaction generating a potentially non-significant impact	N/P	N: Negative impact
					P: Positive impact

## 8.2 Environmental impacts

The environmental impacts identified in the Table 8-3, will be detailed in this section of the document.

### 8.2.1 Ambient Noise and Corona Effect

#### 8.2.1.1 Impacts from Noise Levels

##### Impacts on Noise Levels

##### Impact description

During the construction phase, there will be an increase in the local sound level motivated by the circulation of vehicles and machinery used, metal cutting and assembly of structures, among others. The disturbance is transitory and disappears once the activities cease.

During the operations phase, noise is generated by the operation of the wind turbines. For the tall, modern turbines, most sound comes from flowing air in contact with the wind turbine blades: aerodynamical sound. The most important contributions are related to the atmospheric turbulence hitting the blades (inflow turbulence sound) and air flowing at the blade surface (trailing edge sound) (van Kamp and van den Berg, 2017).

The Project will have 30 turbines with a rated capacity of 3.2 MW each. The hub height will be 120 m. Based on the available information from the ESIA Addendum 2, the noise generated at the hub height is around 108,5 dB(A). According to the Noise Effect Analysis, the noise at ground level at a wind speed of 8.8 m/s goes from 55 dB(A) in the vicinity of the turbines to 35 in most distant areas dB(A).

Noise from wind turbines can be annoying to some and associated with some reported health effects (e.g., sleep disturbance), especially when found at sound pressure levels greater than 40 dB(A) (Knop per and Olson, 2011). According to the World Health Organization (2009), sleep disturbance can occur at an average sound level at the facade at night of 40 dB and higher.

The closest sensitive receptors to the windfarm are the three houses located inside the Project Area (property of the owner of the land), which, based on the Noise Effect Analysis will be exposed to noise levels up to 50 dB(A) and one house near the Project Area which will be exposed to noise levels around 45 dB(A). (See Figure 8.1).

It is important to keep in mind that according to the IFC (2007) noise impacts should not exceed 55 dB in residential, institutional or educational areas.

**Table 8-4 Noise Level Guidelines**

Table 1.7.1- Noise Level Guidelines <sup>54</sup>		
Receptor	One Hour L <sub>Aeq</sub> (dBA)	
	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational <sup>55</sup>	55	45
Industrial; commercial	70	70

Based on the distance to the nearest community (5.7 km), and considering the attenuation of the sound levels from the generation point to the community, it is expected that these are not receptors of the noise generated by the wind farm and that noise levels are always below 45 dB(A).

### Impacts on Noise Levels

According to van Kamp and van den Berg (2017), living in areas with wind turbines is associated with an increased percentage of highly annoyed residents. Nevertheless, a common conclusion of observational and experimental studies seems to be that Amplitude Modulation appears to aggravate existing annoyance, but does not lead to annoyance in persons who benefit from or have a positive attitude towards wind turbines, which will be the case of the closest sensitive receptors to the windfarm.

Taking into account that a change of 5-10 dB is expected (a noise baseline must be done to assess this), and that the expected noise levels in the closest sensitive receptors will be up to 45 dB(A), the significance is considered Moderate; depending on the results of the noise baseline the significance of the impact may change.

#### Fauna

Wind turbines are very noisy when active, a feature that may interfere with the lives of animals beneath them (Rabin et al., 2006). Noise levels generated may also lead to secondary effects on fauna, resulting in avoidance and displacement behaviors.

#### Mitigation measures

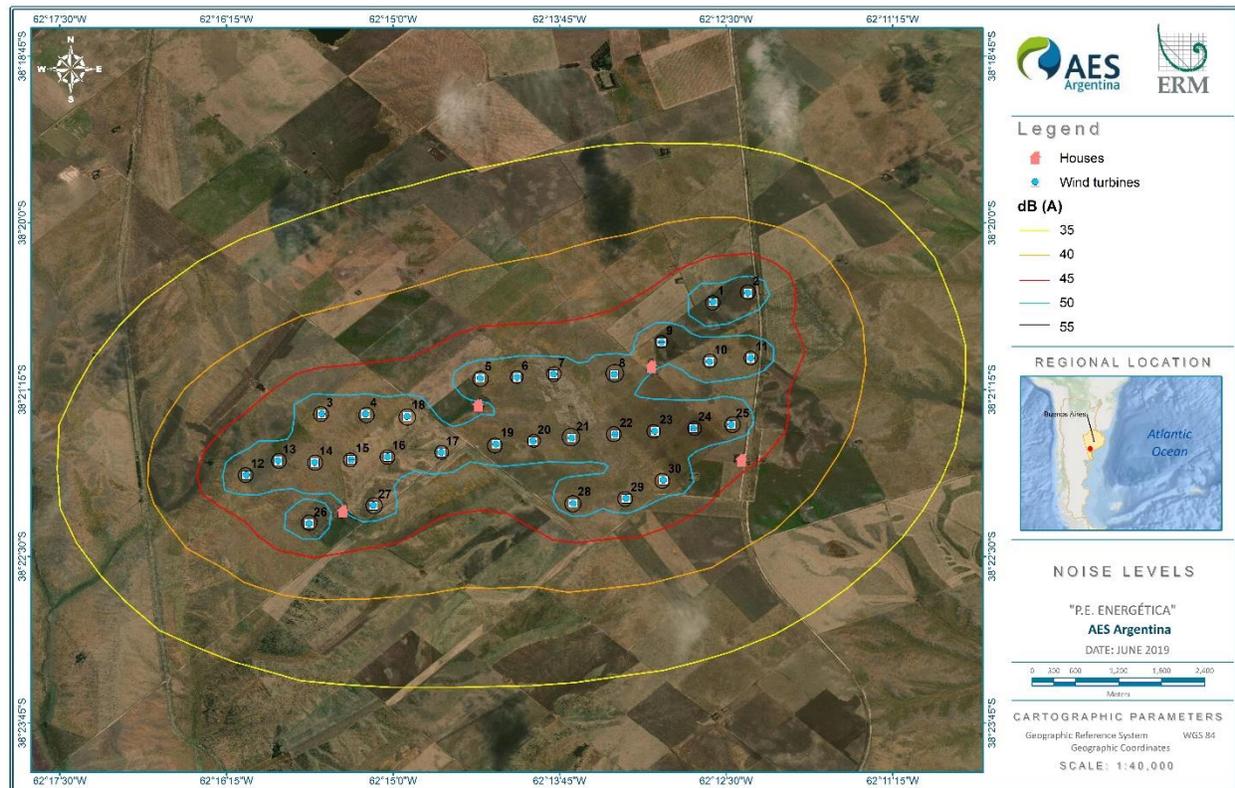
- Design and conduct a monitoring program for the operational stage according to the IEC 61400-11 Wind Turbines – Part 11: Acoustic Measurement Techniques (2006) as required by the Wind Energy Environmental Health and Safety Guideline (IFC, 2015).
- Stakeholder engagement plan and grievance process to assess, monitor, and report on nuisance perceived by third parties if affected by Project noise.
- Operating turbines in reduced noise mode.
- If needed, building walls/appropriate noise barriers around potentially affected buildings.
- Curtailing turbine operations above the wind speed at which turbine noise becomes unacceptable in the project-specific circumstances.
- Regular maintenance of wind turbines.

#### Residual impact evaluation

Considering the nearness of four sensitive receptors of the Project to the wind turbines, the results of the modeling and the implementation of the proposed mitigation measures, which may diminish the noise levels near people's houses, the residual impact during the operation phase is assessed as Moderate.

Impact rating for noise during construction phase	Minor
Impact rating for noise during operational phase	Moderate
Impact rating for noise during abandonment phase	Minor

**Figure 8.3 Noise calculation model carried out by the Project in the initial ESIA**



### 8.2.1.2 Impacts from Electromagnetic Fields, Low Frequency Fields and Corona Effect

#### Impacts by electromagnetic fields, low frequency fields and corona effect

##### Impact description

Two relevant assessment areas with important public access have been identified: a) the area where the existing High Voltage Line (132 KV) Progresa and where the wind farm will be linked; and b) the area where the 33 KV wind farm collection network is developed.

Given that the property is crossed by the overhead transmission line (132 KV) that links the *Bahía Blanca* ET and the *Tornquist* ET, from where the ET (MT/AT) of the Wind Farm will be undertaken, an analysis of the electromagnetic fields of the same is carried out to demonstrate that the new project will not adversely modify them.

Of the results obtained from the estimates made by calculation, under the assumptions adopted, for all the environmental parameters analyzed in this Annex to Addendum 2 to the Environmental Impact Study, the existing 132 kV aerial conduit and the perimeter of the 132/33 kV Wind Farm Transformer Station comply with the requirements of Resolution 77/98 of the Secretariat of Energy.

As for the interior of the Wind Farm Transformer Station, no evaluations have been carried out since access to it is restricted to operation and maintenance personnel.

### Impacts by electromagnetic fields, low frequency fields and corona effect

With respect to the magnetic induction levels of the wind farm collection network, the maximum limits accepted by the National Electricity Regulatory Body (*Ente Nacional Regulador de la Electricidad*) are verified, reaching maximum levels of the order of 4 T, below the limit of 25 T accepted by Argentine regulations. Meanwhile, with respect to the electric field of the medium-voltage collector network, as it is underground, its effect is null and void. On the other hand, in normal operation of wind turbines, the underground collection network does not contribute to the effects of radio interference, corona and audible noise.

#### Mitigation measures

It is necessary to implement a Monitoring Program that allows to control and register:

- Electric field -Res. ENRE 1.724/98-.
- Magnetic field -Res. ENRE 1.724/98-.
- Radio interference -Res. SE 77/98; publication CISPR 18/1; 18/2; 18/3-.
- Contact and step voltages (IRAM 2281- II and IV).
- Audible noise (IRAM 4061 and 4062).

#### Residual impact evaluation

With respect to the magnetic induction levels of the wind farm collection network, the maximum limits accepted by the National Electricity Regulatory Body (*Ente Nacional Regulador de la Electricidad*) are verified, reaching maximum levels of the order of 4 T, below the limit of 25 T accepted by Argentine regulations, considering this, the residual impact is assessed as Minor.

Impact rating for corona effect during construction phase	N/A
Impact rating for corona effect during operational phase	Minor
Impact rating for corona effect during abandonment	N/A

## 8.2.2 Biodiversity (Fauna & Flora)

### 8.2.2.1 Impacts to Flora

#### Impact description

During the site preparation and construction stage, vegetation will be affected in the sectors where the works are carried out (roads, trenches for conductors, foundations and wind turbine assembly platforms) and in the construction site. The Project requires the opening of new sites where soil and vegetation cover will be removed. There are no plans to affect any of the sites with tree species (which are very specific within the three lots) with infrastructure works of any kind.

The soil and associated vegetation is an element that will be affected significantly, due to the great earth movement that is required.

Another aspect that could affect vegetation is the occurrence of a spill with polluting substances used both in vehicles and in the machinery used for the work. In this case, the effect would be very limited and the medium does not facilitate the dispersion of the fluid.

The vegetation is not expected to be affected during operation and maintenance phase. If required, transport vehicles (spare parts for wind turbines, among others) will not circulate outside the roads of the wind farm where

there is vegetation cover, nor will they operate equipment (cranes, etc.) outside the areas assigned to each wind turbine.

#### Mitigation measures

- For maneuvers of heavy/large machinery, the clearance of the ground should be limited to what is strictly necessary in order to reduce the disturbance of existing vegetation.
- Once the works are finished, the temporarily affected surfaces will be covered respecting the edaphic sequence, preserving the organic soil and with the suitable measures of restitution of the fertile layer.
- All vehicles and machinery entering the site will be in a good state of maintenance and have the Vehicle Technical Verification certificate in force to date
- Assisted translocation
- Spontaneous repopulation of open spaces from seed sources of neighboring populations
- Assisted repopulation through rolls of seeds of native species

#### Residual impact evaluation

Considering the estimated surface to be affected, and the implementation of the above-mentioned mitigation measures, which may promote the restitution of the fertile layer and the restoration of vegetation cover, the magnitude of the residual impact is assessed as Moderate.

Impact rating for impacts to flora during site preparation and construction phase	Moderate
Impact rating for impacts to flora during operational phase	Negligible
Impact rating for impacts to flora during abandonment	Positive

### 8.2.2.2 Impacts to Terrestrial Fauna

#### Impacts to Terrestrial Fauna

##### Impact description

When the fauna associated with the existing vegetation is found, it is expected that the animals will move away from the environment when the environment is disturbed –during the construction phase- and return to it, when the conditions are similar to the original ones.

During road opening, land clearing, etc., habitat fragmentation is likely to occur.

The human presence, the circulation of machinery, the opening of roads, the emission of noise and the generation of waste cause changes in the behavior of native species. While many move away from the disturbance, some ubiquitous species are attracted and their populations increase with the consequent imbalance in trophic networks.

The diversity and abundance of species is affected when the environmental conditions necessary for their survival are altered. During this stage, the abundance of some species is likely to decrease, and diversity may even decline too much localized levels.

In the region where this project will be implemented, endangered animal and plant species have been detected, either because of their restricted distribution (endemic), because of their marked population decline, or because they are indicator or key species that play an important ecosystem role.

During the operation phase, the energy undertaking will be developed in an environment affected by intensive agro-ecosystems destined for agricultural and livestock production, and also highly modified by anthropogenic action.

## Impacts to Terrestrial Fauna

Therefore, the fauna present in the property is very scarce; it is mainly limited to those species that adapted to live with man, in disturbed areas.

### Mitigation measures

- In case of finding a cave or nest of wild fauna, it is necessary to work with extreme care, avoiding to produce damages to the specimens. If necessary, they should be moved to a safe place; a qualified professional in the subject should do this.
- Avoid leaving excavations or trenches open for a long time. If necessary, they should be adequately covered to prevent animals from falling.
- It is suggested that -through the methodology of counting points and vantage points- the surveys in order to establish the presence, abundance, seasonality and use of airspace for all species in general, with emphasis on the species mentioned in the fauna baseline of Addendum 2 of the ESIA are continued.
- Development of an action plan including a protocol of procedures for personnel working in the wind farm, which establishes the steps to follow in case of encounters with the species of the Xenartros group.
- In the action plan for the case of the Pajonal Cat, it is suggested to survey the area, establish its abundance for the place, and develop outreach tasks with the local inhabitants in order to raise awareness about the situation of the species.

### Residual impact evaluation

Considering that potential protected species have been identified for the region where the Project is to be developed and the implementation of the above-mentioned mitigation measures which may contribute to the preservation of wildlife individuals during the construction of the Project, the impact is assessed as minor.

Impact rating for terrestrial fauna during site preparation and construction phase	Minor
Impact rating for terrestrial fauna during operational phase	Minor
Impact rating for terrestrial fauna during abandonment	Positive

## 8.2.2.3 Impacts on Birds

### Impacts on birds

#### Impact description

The main negative impacts of wind farm operations on birds include collision mortality, species displacement due to habitat modification, barrier effect, and habitat loss. Collision mortality can occur not only from collisions with rotors, but also with meteorological towers, nacelles and associated structures such as support cables and transmission lines (Uribe-Rivera et al., 2018).

The impact rating for avifauna in the construction phase is a potential impact which, with current information is not expected to be significant, given the type of habitat (mostly modified, agricultural/pastureland), very extended in area. However can only be assessed with certainty after a breeding season bird survey has taken place, to confirm lack of particularly sensitive habitat for breeding birds.

Atienza *et al.*, (2008) mentions the following as direct impacts to avifauna generated by the operation of wind farms:

- Collisions. Collisions with moving blades, with the tower or with associated infrastructure, such as evacuation power lines, are direct causes of death. Rotors can cause injuries due to the turbulence they produce.

- Habitat destruction. The installation of wind turbines and associated infrastructures entails the transformation or loss of habitat, with multiple effects that can produce the loss of habitat in animal populations, including decreasing in the size of population and changes in migratory routes (Dolman and Southerland, 1995).
- Nuisance. Wind turbines produce nuisances that cause birds to avoid them and may even cause them to avoid using the entire area occupied by the wind farm. If birds are displaced from their preferred habitats for this reason and are unable to find alternative sites, their reproductive success and survival may be reduced due to increased energy expenditure caused by the need to locate new territories.
- Barrier effect. Wind farms are a barrier to bird mobility, as they fragment the connection between feeding, breeding and other important areas for its life cycle. In addition, the movements necessary to avoid wind farms cause greater energy expenditure that can lead to a decrease in their physical condition. This type of effect can occur both in the case of a large linear wind farm and by the cumulative effect of several parks.

**Indirect impacts:**

The construction and operation of a wind farm involves the construction and installation of other auxiliary elements such as accesses to the National Electricity Network. These elements, in turn, can generate a series of negative impacts of their own on the environment: alteration and destruction of habitat, destruction of eggs and juvenile individuals, disturbances, electrocutions, electromagnetism, erosion, alteration of water flow, among others.

**Mitigation measures**

- Action plan to include a bird mortality registry, recording all carcasses within 500 m of any project element and apply temporary shutdown, to lock the rotors in place during peak migration periods or relocation of towers if mortality is significant.
- Complete a one of pre-operation baseline survey using best international practices. Findings will inform this management plan to evaluate adaptive mitigation and management measures.
- Avoid the use of red lights to minimize the attraction bird species.
- A system of flashing strobe lights or LEDs shall be used on the turbines to be visible at night. Constant light should not be used at night, as it may attract nocturnal migrants or predatory birds.
- The number of lights placed in the wind turbines should not be greater than necessary for aviation, to affect as little as possible migratory birds or nocturnal habits.
- Use of strobe white lighting in the towers (with the longest possible interval between pulses, and the pulses synchronized for all turbines within the wind farm).
- Regular checking of the vacuums or holes in the towers for nesting bird species must be done.

**Residual impact evaluation**

Considering the number of potential protected species that have been registered in the surroundings of the site and the implementation of the above-mentioned mitigation measures, which may decrease the magnitude of the impact, the residual impacts on avifauna derived of the operation of the wind farm has been assessed to be of Moderate significance.

Impact rating for avifauna in construction phase	Minor
Impact rating for avifauna in operation phase	Moderate
Impact rating for avifauna in abandonment phase	Positive

## 8.2.2.4 Impacts on Bats

### Impacts on bats

#### Impact description

Although studies of the impact of wind turbines on wildlife have focused on birds, it has recently expanded to include bats (Arnett et al., 2008), which have higher mortality rates than birds (Camina, 2012; Strickland et al., 2011)

Bats are affected by wind turbines because their rest areas, feeding areas and migratory routes coincide with the most suitable sites for the installation of wind farms (EKOenergy, 2015).

Wind turbines damage bats primarily because the blades hit and kill bats that fly at high altitudes, so direct impacts of wind farms on bats include collision and barotrauma (damage to tissues from changes in air pressure in the vicinity of wind turbines), while indirect impacts may include habitat loss and fragmentation (BCT, 2019).

According to Laranjeiro *et al* (2018) the risk of collision, or probability of mortality due to collision of individuals crossing a wind turbine, occurs during the operational phase of a wind farm. Species that do not generally conduct avoidance behavior toward man-made structures, specifically wind turbines, run the risk of colliding with turbine blades or towers. On the other hand, displacement can be occurred and it is produced as a reduction of flight activity within the wind farm area as a result of a functional loss of habitat (May, 2015), it can also be considered as a reduction of flight activity within the wind farm area as a result of a functional loss of habitat (May, 2015). This is valid for resident species and for migratory species due to the loss of resting places. It can also result in increased energy expenditure when individuals need to modify their flight path to avoid wind farms (also known as barrier effect), which can have potential consequences for the health of the bat population (Laranjeiro *et al.*, 2018).

Bat mortality from wind turbines is caused by collision as well as barotrauma and is explained by factors other than those that cause bird collisions, mainly because bats use a different method to locate themselves in space. In general, terms, the occurrence of the impact on bats can be much greater than that described for birds since the latter are often able to see the blades of wind turbines and avoid them, but not bats. Barotrauma is defined as the rapid decompression experienced by bats, due to changes in atmospheric pressure between one side of the turbine and the other, which are called vortices. Bats, being small in size, are affected at the pulmonary and cardiovascular levels. This effect is observed in animal carcasses that do not show external traumas, but internal lesions in the thoracic and abdominal cavity (González et al., 2014).

Fifteen bat species with potential distribution in the area were considered for the Project: *Eumops bonariensis*, *Eumops patagonicus*, *Molossops temminckii*, *Molossus molossus*, *Tadarida brasiliensis*, *Glossophaga soricina*, *Eptesicus diminutus*, *Eptesicus furinalis*, *Histiotus alienus*, *Histiotus montanus*, *Lasiurus blossevillii*, *Lasiurus cinereus*, *Lasiurus ega*, *Myotis albescens*, *Myotis levis*. Almost all are included in the LC category according to IUCN due the species *Histiotus alienus* is classified as DD. The receptor sensitivity has been assessed as low because according to records obtained from biodiversity databases; in this area few records of individuals and species of bats have been reported and the species with potential distribution are included under LC category. On the other hand, the magnitude has been evaluated as medium because there are different sources of impact on the bats to be generated during the operation of the Project and this impact will be produced in a constant way while the Project is operating.

#### Mitigation measures

### Impacts on bats

- Use of the starting speed<sup>23</sup> to avoid the impact of collisions and barotrauma
- Implementation a monitoring program during the pre-construction stage of annual duration, which allows establishing the presence and abundance of the different species of bats. This study should be approached using ultrasound sampling methodologies
- Action plan to include a bat mortality registry, recording all carcasses within 500 m of any project element and apply temporary shutdown, to lock the rotors in place during peak migration periods or relocation of towers if mortality is significant.

### Residual impact evaluation

Considering that fifteen potential species of bats have been recorded in the zone and none of them are protected, as well as the implementation of the above mentioned mitigation measure, which may decrease the magnitude of the impact, the residual impacts on bats derived of the operation of the wind farm has been assessed to be of Minor significance.

Impact rating for bats in construction phase	In order to accurately assess the potential impact, a robust wildlife survey needs to be conducted and the final rating may change.
Impact rating for bats in operation phase	Minor
Impact rating for bats in abandonment phase	Positive

## 8.2.3 Landscape

### Impacts on Landscape

#### Impact description

During the construction phase, the activities necessary for the development of the Project will temporarily affect the landscape.

The circulation of vehicles and operation of machinery, the transport of materials and equipment, and the accumulation of waste are elements that promote the temporary modification of the landscape.

The presence of large cranes and the assembly of wind turbines cause alterations in the quality of the landscape, but also arouse the curiosity of the spectators. It is considered that –during this phase- there will be a transitory deterioration of the quality of the landscape, negative of low level.

Based on the site visit description, the site selected for the Project is considered as a suitable place for the development of a wind farm being sufficiently far from the main tourist attractions (20 km from the nearest location)

<sup>23</sup> The increase of the starting speed is a mitigation measure that consists of avoiding the operation of those wind turbines considered as problematic (those that have registered mortalities) during the periods in which bats register a greater activity, which is achieved by increasing the threshold of wind speed required for the wind turbines to start operating (González et al., 2014).

### Impacts on Landscape

and recreational uses of the region (see section 6.2.12 and section 8); travelers who travel along National Route 33 will appreciate the wind turbines only from certain specific places more than 1.2 km from the nearest wind turbine. Nevertheless, the presence of the 30 wind turbines will affect the visual scenario within the area by the introduction of new elements that will be seen mainly by observers from the nearby roads, those who use the train as a mean of transport and those who hike high altitude mountains in the Sierra de la Ventana (see section 5.2.12).

As for the opening structure of the Overhead Transmission Line and ET, is not expected to have a significant visual impact, given that the site selected for its location is remote, in an inconspicuous location, and without observers.

### Mitigation measures

A detailed visual and landscape study must be conducted, the following must be assessed:

- Project description (wind turbine layout, wind turbines, aviation obstacle lighting, substation facility, power lines, on site access tracks)
- People's perception of wind farms.
- The view shields (zones of visual impacts).
- Planning considerations (local planning policy framework, regional planning policy framework, particular provisions).
- Landscape units within the view shield.
- Seen area analysis.
- Assessment of indicative viewpoints from publicly accessible locations (and landscape mitigation measures).
- Impact on residential properties (and landscape mitigation measures).
- Cumulative impact
- Night lighting assessment

### Residual impact evaluation

Even though once the wind turbines are decommissioned and the landscape will recover its original state, sequential and simultaneous visual impact is bigger from the main roads and highways where the development of wind farms may lead to a change in people's perception of a region and will be evident as they travel through the road network. Alternation to the perception of a landscape will occur when a visitor is able to view two or more wind farms.

As mentioned in section 6.2.12, there is tourism that occur in the area close to Tornquist, but is important to clarify that tourist places are located more than 20 km away from the project site.

Considering that the Project will be developed in rural properties, where landscape does not present in the immediate environment a visual attraction with scenic values of importance, the impact is assessed as Minor.

Impact rating for landscape during construction phase	Minor
Impact rating for landscape during operational phase	Minor
Impact rating for landscape during abandonment phase	Positive

## 8.2.4 Soil

### Impacts on Soil

#### Impact description

During the construction phase, the chemical features of the soil may be modified due to the potential affectation by hydrocarbon derivatives during contingencies. These contingencies could happen while carrying out the work tasks

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## Impacts on Soil

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or due to the improper management of waste and sewage effluents and the subsequent discharge to the field. The physical characteristics of the soil may also be modified by the tasks of soil movement, filling, leveling, scarification and compaction. The construction of permanent facilities will involve the physical modification of specific areas of land for the period in which the wind farm find in operation. Finally, the elimination of the vegetal cover by clearing the land will be able to contribute with the increase of hydric and pluvial erosion processes that degrade the edaphic layer.

Once the wind turbines, cables and foundations of the facilities have been removed, the excavations that contained them must be filled. During the decommissioning activities, waste will be generated that could be inadequately stored and / or disposed. However, this potential negative impact will be largely compensated by the filling, leveling, scarification and revegetation with native species that will allow the restitution of the vegetal cover by the restoration of the superficial surface of the soil of the potentially affected areas.

The impact on the soil will be generated by the removal of soil and vegetation, extraction of loan materials (quarry), filling, compaction and leveling of the land, affecting its physical properties. Also potential spills of fuels, oils, lubricants or any other substance other than their original constitution could affect its chemical properties.

During soil movements, there could be increase in the current rate of erosion, loss of fertility and potential destabilization of the soil. These impacts will affect the areas of the construction area (access roads, internal roads, installation areas of the wind turbines. ditches for underground conductors, etc.).

The excavations of the foundations will cause a direct affectation of the edaphic layer. This affectation is considered punctual and localized, as long as the pre-established dimensions are not exceeded in relation to the needed area of the wind turbines and assembly platforms.

The activities of soil movements and leveling could affect the geomorphological characteristics of the project site.

The site of extraction of materials can be affected by destabilization of slopes, increasing erosion and quarry edges. Erosive processes by water and / or wind action, landslides, visual impact and alteration of the landscape are other impacts associated with this activity. The quality of air and water will be impacted by the emission of particulate material affecting visibility, surrounding vegetation, nearby drainages and fauna.

The transit of vehicles of the construction and operation personnel of heavy and large machinery, can affect the quality of the soil due to fuel, oil or lubricant losses. Although transport and machinery will be required for a short period, this action could affect the surrounding soil, generating negative impacts if they are not immediately cleaned up.

The installation of the workshop can affect the current constitution of the soils by the compaction produced by the collection of materials, manufacture of concrete, movements of equipment, presence of work and trailers. The storage of fuels, oils, lubricants and hazardous substances is a potential impact to the soil due to losses that can reach the ground if they are not properly disposed.

Potential risks of contaminating the soil would arise from improper handling of polluting residues, concrete spills, spills of fuels, oils, lubricants or dangerous substances.

Under normal conditions, no environmental impacts have been identified on the soil resource during the operation stage of the project.

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## Mitigation measures

- Adequate planning of road and drainage construction must be carried out.
  - Minimize to what is strictly necessary the removal of vegetation in the project area, as bare soils are more susceptible to erosion and landslides.
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### Impacts on Soil

- In cases of spills, soils impregnated with fuels, oils, lubricants or other chemical products will be removed verifying compliance with the measures adopted to that end.
- Avoid refueling, adding lubricating oils, or repairing machinery on the job site front.
- Separate the soil and vegetation in the removal or excavation area for later use in restoration work.
- If possible, the different layers should be arranged in such a way that they do not mix and thus allow the edaphic horizons to be maintained. This extracted land should not be used immediately to support underground conductors or mechanical protection ducts.
- The layer of soil removed should be piled to one side of the excavation or trench; once all the tasks on the site have been completed, it will be replaced to favor the recovery of the herbaceous stratum.
- During windy days, practices should be adopted to avoid blasting, such as watering the area of operations.
- During the days of excessive rain or later, in soil conditions with a lot of mud, it is necessary to avoid the circulation of vehicles and heavy/large equipment that mark tracks, in order to maintain the natural drainage of the waters.
- No waste of any kind or nature should be thrown into excavations or ditches.
- As far as possible, provision should be made for the collected materials to be isolated from the ground and protected from climatic effects.
- After the activities in the areas delimited by the assembly platforms are finished, the tasks of restitution of the topography and surface decompaction will be carried out to allow a better rooting and advance of the colonizing plants, favoring the revegetation process.
- At the end of the works, the affected land must be returned to conditions similar to those pre-existing.

### Residual impact evaluation

With the recommended protection measures, the areas where permanent installations are not located will be restored once the construction stage has been completed. It is considered a negative and low level impact, which will be mitigated during the recomposition of the land.

For the alteration of the geomorphology a negative and low level impact is expected, which will be mitigated by a correct recomposition of the land. Appropriate mitigation measures should be taken when the works are concentrated in nearby depressed and low flood areas.

Impact rating for soils during construction phase	Minor
Impact rating for soils during operational phase	Minor
Impact rating for soils during abandonment	Positive

## 8.2.5 Air

### Impacts on Air

#### Impact description

During the construction phase, the impacts on this receptor are particulate matter and gaseous emissions.

Particulate matter emissions will occur because of the movement of soil, and those produced by the circulation of vehicles and machinery, as well as operation of machinery and equipment, especially when the activities are carried out with windy days.

There is also chemical alteration of the air, caused by the release of combustion gases from the use of fossil fuels as an energy source for the movement of machinery and transport vehicles. According to the ESIA, it is considered that these environmental impacts are negative and minor.

## Impacts on Air

On the other hand, wind energy plays an important, global role in addressing climate change. Many developed nations have worked hard to reduce their carbon dioxide (CO<sub>2</sub>) emissions from electricity over the past couple of decades. Energética Argentina S.A. through thirty wind turbines will prevent the generation and emission of carbon dioxide (CO<sub>2</sub>), nitrogen oxide (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>) and particulate matter (PM), compared to what would be emitted from the generation of energy electricity through a thermal power plant, whose energy resource is natural gas, coal or oil (fossil fuels). It is estimated that the emission factors avoided annually and during the Project's useful life are:

- CO<sub>2</sub>: 230,396 tons per year; 4,607,920 tons for 20 years
- NO<sub>x</sub>: 415 Tons per year; 8,300 tons for 20 years
- SO<sub>2</sub>: 149 tons per year; 2,980 tons for 20 years
- PM: 13 tons per year; 260 tons for 20 years

Considering Energética Argentina S.A. will provide 8,738,100 MWh to the electricity system and given that the Project contributes directly to the reduction of greenhouse gas emissions and climate change, the impact during the operation phase will be positive.

Finally, during abandonment phase, the main impacts will be also generated by the circulation of vehicles and its gaseous and particulate matter emissions.

## Mitigation measures

- Covering entirely by impervious sheet or frequently watering of the on-site stockpile of excavated materials to keep wet always before backfilling;
- Frequent watering of exposed area or worksite of excavation to maintain surface wet, if necessary and practical;
- Provision of vehicle washing to remove any dusting materials from small village trucks' body and wheel at the exit of worksite;
- Well-maintained diesel-powered mechanical equipment to avoid black smoke emissions;
- Shutdown of diesel-powered mechanical equipment or trucks inside the worksites when they are not in operation.

## Residual impact evaluation

Due the nature of the Project, which consist in the construction and operation of a Wind Farm, no residual air quality impacts would be anticipated during construction, operational and abandonment phase.

Impact rating for air during construction phase	Minor
Impact rating for air during operational phase	Positive
Impact rating for air during abandonment	Minor

## 8.2.6 Shadow Flickering

### Impacts from Shadow Flickering

#### Impact description

Wind turbines are known to produce shadow flicker by interruption of sunlight by the turbine blades. Exposure to flicker from a turbine is determined by the hub height and the diameter of the blades, the height of the sun and the direction of the blades relative to the observer. These variables are affected by the time of day, time of year, wind direction, and geographical location (Vekuijlen and Westra, 1984)

As reported by van Kamp and van der Berg (2017), a study was made by Voicescu *et al.* (2016) on the effect of shadow flicker exposure in combination with sound levels and distance, on annoyance and health complaints including dizziness. As shadow flicker exposure increased, the percentage of highly annoyed increased. Variables associated with the percentage highly annoyed due to shadow flicker included concern for physical safety and noise sensitivity. Reported dizziness was also found to be significantly associated with shadow flicker.

The recommended standards outlined in the Wind Energy Environmental, Health, and Safety (EHS) Guidelines, (2015), prepared by International Finance Corporation (IFC), were followed. Following is the specific language from the IFC guideline regarding the shadow flickering impact from wind turbines:

*“If it is not possible to locate the wind energy facility/turbines such that neighboring receptors experience no shadow flicker effects, it is recommended that the predicted duration of shadow flicker effects experienced at a sensitive receptor not exceed 30 hours per year and 30 minutes per day on the worst affected day, based on a worst-case scenario.”*

According to this IFC guideline, the predicted duration of shadow flicker should be less than 30 hours per year and be less than 30 minutes per day at all sensitive locations.

Based on modelling results, due the location of sensitive receptors (owners of the land leased for the project), the houses located inside the property “B and “C” will be the most affected ones (more than house identified as “D” and “A”), having up to 217 hours of shadow flickering per year (7.3 times above the IFC limit) and up to 1:12 h per day (2.4 times above the IFC limit), in the worst case scenario.

#### Mitigation measures

- A detailed shadow flickering study must be performed, considering environmental factors like topography, windows, doors, trees, etc. that according to the Addendum 2 of the ESIA, were not considered for the available study.
- Install natural fences like shrubs or trees closer to the residential windows, this could reduce the impact of shadow flickering in the properties.
- Install a control software to shut down the blade spinning during the specific hours of shadow flickering.
- Implement a grievance mechanism to record the frequency of shadow on receptors, and consider additional mitigation at receptor level, if justified following treatment and resolution of grievance.

#### Residual impact evaluation

Taking into account the nearness of four sensitive receptors of the Project to the wind turbines, the results of the modeling and the implementation of the proposed mitigation measures, which may diminish the perception of shadow flickering inside the people’s houses, the residual impact is assessed as Moderate.

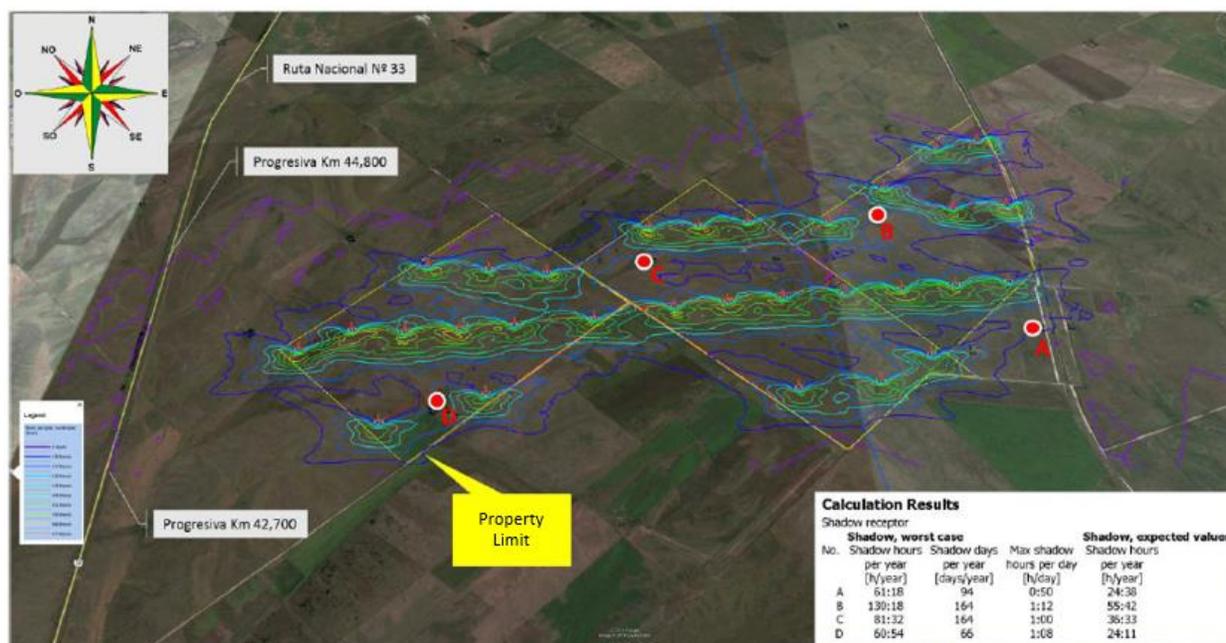
Impact rating for shadow flickering during construction phase	N/A
Impact rating for shadow flickering during operational phase	Moderate

## Impacts from Shadow Flickering

Impact rating for shadow flickering during abandonment phase

Positive

**Figure 8.4 Shadow flickering**



## 8.3 Social Impacts

The social impacts identified in the Project's Environmental Impact Assessment (ESIA) are considered robust and in compliance with best international practices. According to the International Finance Corporation's environmental, health, and safety guidelines for wind energy published in 2015, the social impacts suggested in the chapter "Industry-specific impacts and management" are covered in the ESIA. The social impacts identified in the study are the following:

- **Impact to the population**  
 It refers to the potential impact on the activities and way of life of the rural population and population centers in the Project's Area of Influence, due to the movement of machinery, equipment and vehicles in general.  
 During the operation and maintenance stage, the generation of noise and shadows (from wind turbines and power transformers) is considered.  
 Potential generation of local and regional employment is considered as a positive impact.
- **Landscape quality**  
 The alteration of the existing visual environment, due to the intrusion of new elements, and modification or elimination of existing visual resources.
- **Agricultural activities**  
 It refers to the potential impact on agricultural activities in the nearby rural area.
- **Commercial / industrial activities**  
 It refers to the potential impact of non-agricultural productive activities in the region.

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- **Touristic development**  
It refers to the potential impact on tourism in the region.
- **Road infrastructure**  
It refers to the deterioration of the road network (public roads) by vehicular traffic and heavy machinery.
- **Induced secondary development**  
Potential development in the surrounding area induced by the Project.
- **Cultural heritage**  
It refers to the potential impact of cultural heritage (natural protected areas, historical, archaeological and paleontological) existing in the area.
- **Public health and safety**  
It refers to the impact of public health and safety by contact stresses and exposure to electromagnetic fields, due to the operation of wind turbines and power transformers.
- **Air traffic**  
It refers to the impact of potential aircraft that could carry out flights at low altitude, associated with agricultural activities (fumigation), or monitoring of high voltage power lines (132 KV), among others.

As mentioned previously, this social impact identification is considered pertinent by both ERM's specialized criteria and IFC's industry-specific guidelines recommendations.

A specific impact on indigenous communities was discarded due to the remoteness of the Project in regards to the identified indigenous communities.

As appreciated on Figure 6.18 indigenous communities and supporting organizations are located further than 30 km to the Project site.

Given the case, no public consultation or communication with this group was required.

Nevertheless, additional identified social impacts (see Table 8-5) were addressed and are summarized below.

### 8.3.1 Community Health and Safety

**Table 8-5 Additional Identified Social Impact**

Impacts to community Health and Safety

**Impact description**

- Community safety issues may arise with public access to wind turbines or to the wind energy facility substation. (For example, unauthorized climbing of the turbines)
- Emergencies that may result in risks to human health, property, or the environment, either within the facility or in the local community.

Mitigation measures

- Public access to the Project's facilities must be limited by:
  - The use of gates on access roads.

### Impacts to community Health and Safety

- Where public access is not promoted to the site and/or there are no current rights of way across the site, consider fencing the wind energy facility site, or individual turbines, to prohibit public access to the turbines.
- Provide fencing of an appropriate standard around the substation with anti-climb paint and warning signs.
- Prevent access to turbine tower ladders.
- Post information boards about public safety hazards and emergency contact information.

- An Emergency Preparedness and Response Plan that considers Affected Communities

### Residual impact evaluation

Considering the dispersion of the identified rural population centers of the Area of Influence, the impact to community, health, safety and security is assessed as Negligible.

Impact rating for shadow flickering during construction phase	Negligible
Impact rating for shadow flickering during operational phase	Negligible
Impact rating for shadow flickering during abandonment phase	Negligible

## 8.3.2 Transportation route

### Impacts to transportation route

#### Impact description

Traffic associated with Project construction could impact existing transportation conditions and resources in three primary ways: increased congestion or delay, degradation of affected road infrastructure, and increased transportation safety risk.

#### Mitigation measures

- Use of convoys, time-of-day restrictions

### Residual impact evaluation

Speed controls, GPS tracking, driver training, maintenance requirements, use of convoys, and time-of-day travel restrictions.

Impact rating for shadow flickering during construction phase	Minor
Impact rating for shadow flickering during operational phase	Negligible
Impact rating for shadow flickering during abandonment phase	Minor

## 9. VISUAL IMPACT

Impacts on landscape had already been assessed in the ESIA and its Addendums. Nevertheless, supplemental considerations are discussed under this section.

*“Surrounding landscape, community input, proximity of turbines to residential areas/properties should be taken into consideration when establishing turbine layout, size and scale”.*

Observations made during the site visit carried out the 27th to the 31st of May 2019, indicated that six wind turbines of the wind farm are already under construction. The Project is located in a rural area, 5 km North from the nearest locality (Tres Picos), and it is considered there are few residents receiving the impact on the landscape (three houses inside the property and on in the vicinity). The presence of the 30 wind turbines will affect the visual scenario within the area by the introduction of new elements that will be seen mainly by observers on site, from the nearby roads and from those who use the train as a mean of transport. Disclosing information in the engagement activities and getting perception on the different involved stakeholders will facilitate communication and understanding of the project, as well as early identification of negative perceptions.

On the other hand, landscape perception is, however, subjective and while one element can be obtrusive for some, it can also be positive for others. The presence of wind turbines and the rotational movement of the blades are elements that stand out in the perception of the landscape. The project is developed in fields of livestock and agricultural activity where there is no influx of people for recreation or tourism, or visual attraction with scenic values of importance.

The site selected for the project is considered as a suitable place for the development of a wind farm being sufficiently far from the main tourist attractions and recreational uses of the region; travelers who travel along National Route 33 will appreciate the wind turbines only from certain specific places more than 1.2 km from the nearest wind turbine. As indicated in section 5.2.12, there is tourism that occur in the area close to Tornquist, but is important to clarify that these places are located more than 20 km away from the project site (see distance to closest tourist attractions in Table 6-17).

The perception of the Project among the neighbors is positive. AES has already started engagement activities with its stakeholders to collect and analyze their perception. The community perceives the Project as a potential economic boost for the region, and believe that clean energy projects will provide technological advance as well. The area does not have representative landscape value (please see section 5.2.12). According to the interview carried out in May 2019, the community indicates that wind farms are a pleasant element to see. In addition to these factors, a specific study was included in the ESMP section (see section 18).

As a reference of the area, an overview of the socio-economical overview of the Study Area can be seen in the following figure:

**Figure 9.1 Socio-economical overview of the Study Area**



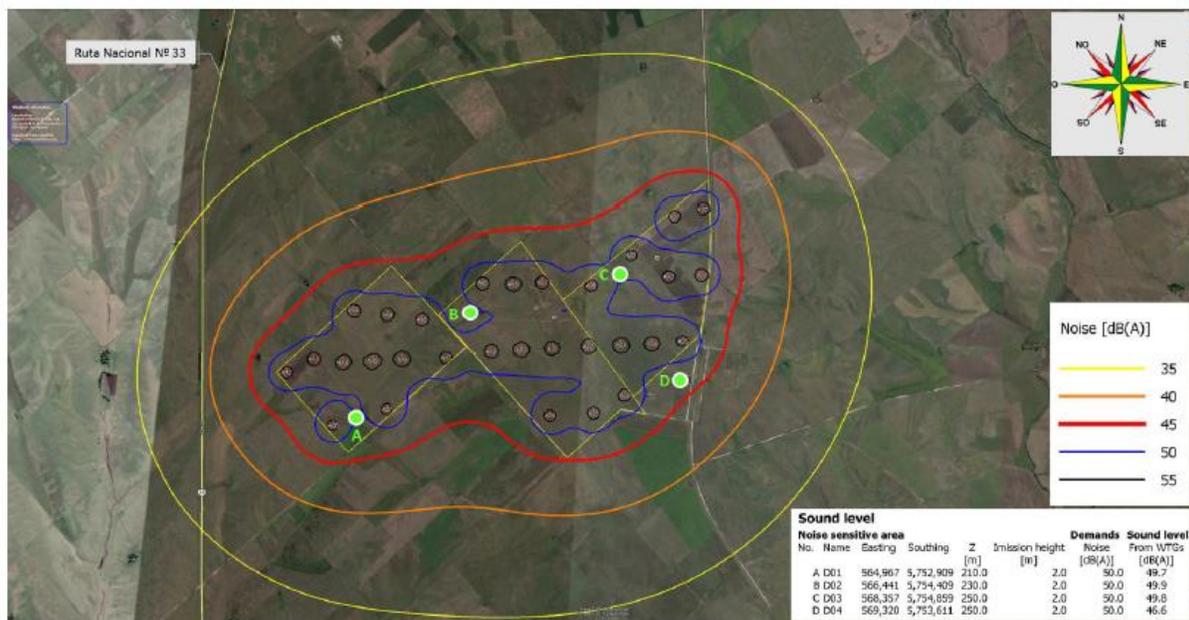
## 10. NOISE

As part of Addendum No. 2 to the Environmental Impact Assessment, an analysis of the effect of noise produced by wind turbines was carried out in August 2018. The report was developed using the calculation program "WindPRO 3.2.701 by EMD International A/S, Noise".

WindPRO is an internationally recognized modelling tool for noise assessment from windfarms, applying best practice standards (e.g. ISO 9613-2). The parameters input listed in the report are consistent with IFC and best practice requirements for noise modelling.

From the results obtained by calculation, it is expected that the dwellings identified as "Internal receivers: A, B and C" are in the order of 49.7 dB, 49.9 dB and 49.8 respectively; the one identified as "External Receiver: D, *Paraje García del Río*" is in the order of 46.6 dB, as shown in the following figure:

**Figure 10.1 Noise Map presented in the Addendum 2 of the ESIA**



The conclusions of this study (in a pre-operational situation) are that the inhabitants in the aforementioned houses will not be affected, given that the background noise produced by the wind on the curtain of trees surrounding them and on the rural facilities (sheds, silos, mills, etc.) will be higher than the noise produced by the nearest wind turbines.

According to the information generated in the study and legal regulations, the recommendation from the ESIA is that noise levels produced by the wind turbines must be monitored and recorded, verifying compliance with standard IRAM 4062/16, called "Disturbing Noise to the Neighborhood" (SE 304/99 and ENRE 0197/2011, Article 4a and b; for Wind Generators).. This and other recommended actions related to noise were included in the ESMP of this report (see section 18). Please refer to section 8.2.1.1 of this study for more detailed information.

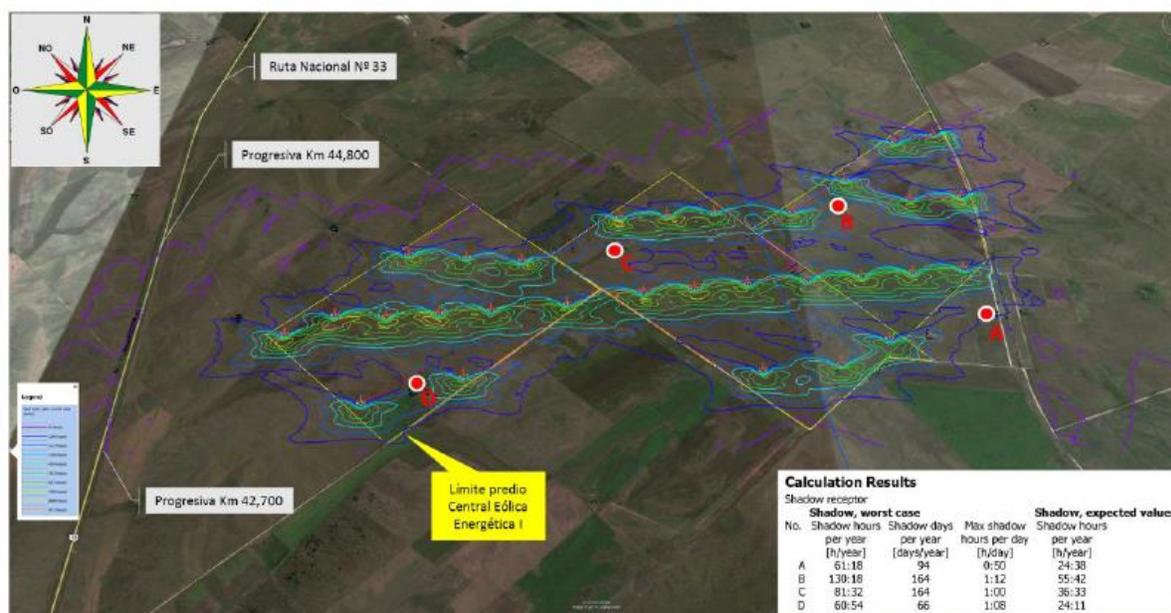
## 11. SHADOW FLICKERING

Within the environmental impacts produced by the Project, the effect of shadows (blinking) projected by wind turbines in neighboring areas when the sun is visible has been identified.

A study of the shadows to be produced by the wind turbines in the project environment was performed in August 2018, and attached to the ESIA. The calculation program windPRO 3.2.712 by EMD International A/S, Shadow was used for the simulation.

Based on the results obtained from this study, it is to be expected that areas close to the project (up to approximately 1,700 meters) may be affected by the shadow effect (blinking) produced by the wind turbines,

**Figure 11.1 Shadow flickering map**



The rural houses located within the wind farm identified as "B and C", will be the sites most affected by the effect of shadows (blinking); the rural house of the neighboring neighbor (Paraje García del Río) identified as "A" and "D" will also be affected. (See Figure 11.1)

In section 18, the specific actions to control, mitigate and monitor this impact were established, most of them already considered in the original ESIA. These measures include a study of Shadow Flickering Effect once the operation starts which will account for windows or openings of facilities where specific activities are carried out and that may be annoying to people. Also a grievance mechanism to detect any negative perceptions on this particular topic. Based on the obtained results, the implementation of the other corresponding mitigation measures will be considered.

Some perceptible Shadow Flickering is expected in the National Route Nº 33 in approximately 2,1 Km (between *Progresiva* Km 42,700 and *Progresiva* Km 44,800).

According to the ESIA, considering the implementation of the environmental protection measures indicated, this environmental impact is negative, of low level, of punctual extension and permanent duration (useful life of the project). Please refer to section 8.2.6 of this report for more detail.

## 12. CLIMATE CHANGE RISK ANALYSIS

### 12.1 Overall Approach

This analysis was performed based on data from the web-based tool *ThinkHazard!* developed by GFDRR (Global Facility for Disaster Reduction and Recovery) in partnership with the World Bank Group and various other international and national institutions active in the field of climate change research and analysis<sup>24</sup>. This section includes a risk analysis for Climate Change.

Country climate-fact-sheets developed by the KfW Development Bank and the German Climate Service Center (GERICS)<sup>25</sup> were also used, as these provide information about future climate change at country level based on the climate change projections presented in the 5<sup>th</sup> Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC)<sup>26</sup>.

The area of focus of the climate change risk analysis is in the region of Tornquist, in the province of Buenos Aires.

Low to high emissions scenarios as developed by the IPCC were considered to obtain the most likely levels of risk.

Level of confidence however remains medium on average given the uncertainty of climate projections for the risks considered.

### 12.2 Summary of Risk Assessment

#### 12.2.1 Key Climate Change Risks Related to the Project

The main risks to the Project area, related to climate change, are likely to be:

- floods (mainly due to changes in precipitation patterns and increased frequency of extreme weather events);
- wildfire (increased risks of forest or bushfires due to prolonged periods of drought).

Potential change in wind patterns was also assessed as part of this analysis since this could have an impact on the productivity of the wind farm.

In this chapter, these risks are assessed for the long term (by convention, a time horizon of 2050 has been used), and are compared to the current risks.

<sup>24</sup> The Global Facility for Disaster Reduction and Recovery (GFDRR) defines itself as “a global partnership that helps developing countries better understand and reduce their vulnerability to natural hazards and climate change. GFDRR is a grant-funding mechanism, managed by the World Bank, that supports disaster risk management projects worldwide. Working on the ground with over 400 local, national, regional, and international partners, GFDRR provides knowledge, funding, and technical assistance.” ([www.gfdr.org/](http://www.gfdr.org/))

<sup>25</sup> As per its official website presentation, “The Climate Service Center Germany (GERICS) was initiated by the German Federal Government in 2009 as a fundamental part of the German hightech-strategy for climate protection. Since June 2014, GERICS has been a scientific organizational entity of Helmholtz-Zentrum Geesthacht – Zentrum für Material- und Küstenforschung GmbH.” ([www.climate-service-center.de/](http://www.climate-service-center.de/))

<sup>26</sup> As per its official website presentation: “Created in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP), the objective of the IPCC is to provide governments at all levels with scientific information that they can use to develop climate policies. IPCC reports are also a key input into international climate change negotiations. The IPCC is an organization of governments that are members of the United Nations or WMO.” ([www.ipcc.ch/](http://www.ipcc.ch/))

All the above mentioned risks were estimated as low for the Project for both short and long-term. However, the wildfire risk, although considered as low in the long-term given the agricultural parcels around the wind farm, might increase to medium should these parcels become undeveloped land with wild vegetation. Therefore, activities and new developments on these parcels should be monitored during the entire Project duration.

## 12.2.2 Risk Rating Methodology and Results

### Methodology

Risks induced by climate change may have diverse impacts on the production capacity and working conditions of a wind turbine.

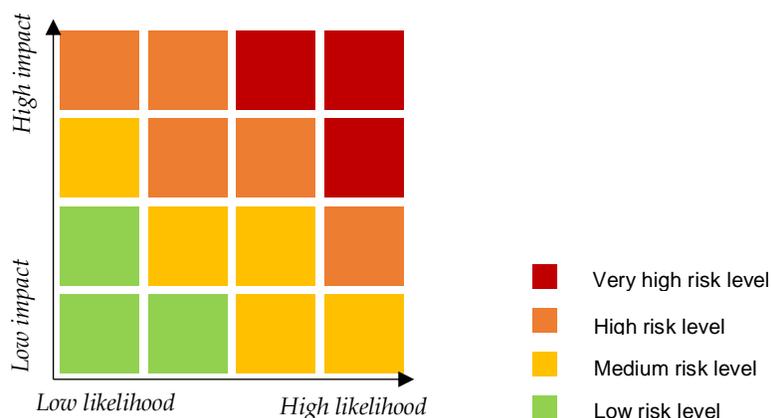
Four levels of likelihood and impact have been set based on information coming from reputable databases using combined (low, medium and high emissions) IPCC climate scenarios.

**Table 12-1 “Likelihood” and “impact” definition for the analysis**

Likelihood	Impact
<b>Very high likelihood:</b> the event already occurred or is very likely to occur according to available scenarios, <i>ceteris paribus</i> .	<b>Very high impact:</b> potentially disruptive consequences on activities.
<b>High likelihood:</b> the event is likely to occur following the current trend.	<b>High impact:</b> potential significant consequences on activities and operations of the site (high operational or commercial impact).
<b>Medium likelihood:</b> the event may occur according to available projections, but depending on the development of other linked phenomena’s, that might be more or less likely to occur.	<b>Medium impact:</b> potential consequences on activities and operations of the site (e.g. operational impact without significant commercial impact).
<b>Low likelihood:</b> the event is not likely to occur according to available projections.	<b>Low impact:</b> low consequences on the activities and operations of the site (“business as usual”).

The overall risk level is obtained by combining the likelihood and the impact as illustrated in the risk matrix presented in Figure 12.1

**Figure 12.1 Risk level definition according to impact and likelihood**



*Key Results for Energetica Project*

For this Project, the following overall risk levels (considering likelihood and magnitude of impact) were obtained (see Table 11.2).

**Table 12-2 Level of current risk and of risk in 2050 with likelihood and impact levels**

Risk	Current		2050		Current	2050
	Likelihood	Magnitude of impact	Likelihood	Magnitude of impact	Overall risk level	
<b>Flood</b>	Low	Medium	Low	Medium	<b>Low</b>	<b>Low</b>
<b>Wildfire</b>	Medium	Low	Medium	Low	<b>Low</b>	<b>Low</b>
<b>Change in wind patterns</b>	-	-	Low	Medium	-	<b>Low</b>

The following sections provide a more in-depth discussion of likelihood and impact for each risk.

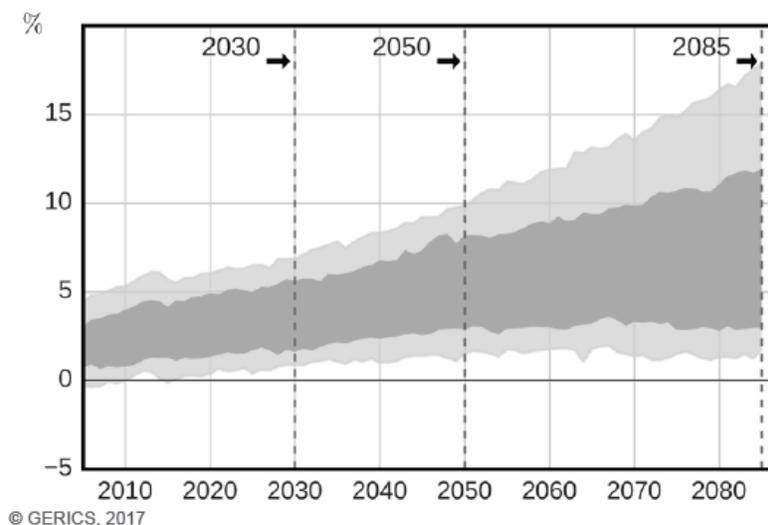
## 12.3 Topic-by-Topic Assessment

### 12.3.1 Floods

#### Heavy Rains

Heavy rain events are also expected to increase from +3% to +8% in intensity by 2050 (likely range considering all model simulations from IPCC AR5) compared to the reference period from 1971 to 2000 (see next figure).

**Figure 12.2 Projection of possible development of heavy rains intensity**



\*Dark grey: likely range (central 66%)

Light grey: very likely range (central 90%)

The frequency of heavy rainfall is expected to increase by 12% by 2050 compared to the reference period from 1971 to 2000<sup>27</sup>. This increase in intensity and frequency of heavy rainfalls will have little effect on the flood likelihood.

#### River Flood

The likelihood of river floods in the region of Tornquist is classified as low<sup>28</sup>. Moreover, there is no river near the Project area.

In northern Argentina, model projections are inconsistent in changes in rainfall. The present likelihood is projected to increase on the long term due to the effects of climate change but remains low.

Combining the two previous flood causes, the flood **likelihood** is assessed to be **low** for both **short and long-term** due to non-proximity to river and a low change in rain patterns.

<sup>27</sup> From Climate-Fact-Sheets, Updated Version 2015; Argentina; Helmholtz-Zentrum Geesthacht Zentrum für Material-und Küstenforschung GmbH, GERICS, May 2018

<sup>28</sup> <http://thinkhazard.org/en/report/4500-argentina-buenos-aires-tornquist/FL>

The **magnitude of impact** can be considered as **medium**. Indeed, wind farms are not very sensitive to flood in general, but the electrical grid infrastructure might be affected, potentially causing electrical disruption.

The **flood overall risk level** is **currently low** and projected to **stay low** on the **long-term** (2050) due to the low likelihood in the area of the Project and a medium impact.

### 12.3.1.2 Wildfire

In extreme fire weather events, elevated temperatures combined with strong winds and wind born debris may weaken the integrity of infrastructure.

The likelihood of wildfires occurring in the Tornquist region is currently classified as high<sup>29</sup>. This means that there is 50% likelihood occurrence every year of a weather propitious to significant wildfire. However, the wind farm is located in an agricultural area. The area being less arid, the current **likelihood** of wildfires is therefore reduced to **medium**.

Future climate projections suggest a likely increase in daily temperatures and greater variability in rainfall. This is likely to increase the frequency of occurrence in the region of weathers propitious to fires. In areas already affected by wildfire hazard, the fire season is likely to increase in duration, and include a greater number of fire events. Climate projections also indicate that there could also be an increase in the severity of fire. Nevertheless, provided that the agricultural parcels around the area will remain during the project lifetime, we can consider that the wildfire **likelihood** will stay **medium** on the **long-term**.

According to satellite views, the area of the Project is mainly composed of low-lying crops, which would reduce the **magnitude of impact** to a **low** level in case of potential fire.

Both **current** and **long-term** (2050) **wildfire overall risk level** can be considered as **low** provided that the area around the project would remain agricultural.

### 12.3.1.3 Change in Wind Patterns

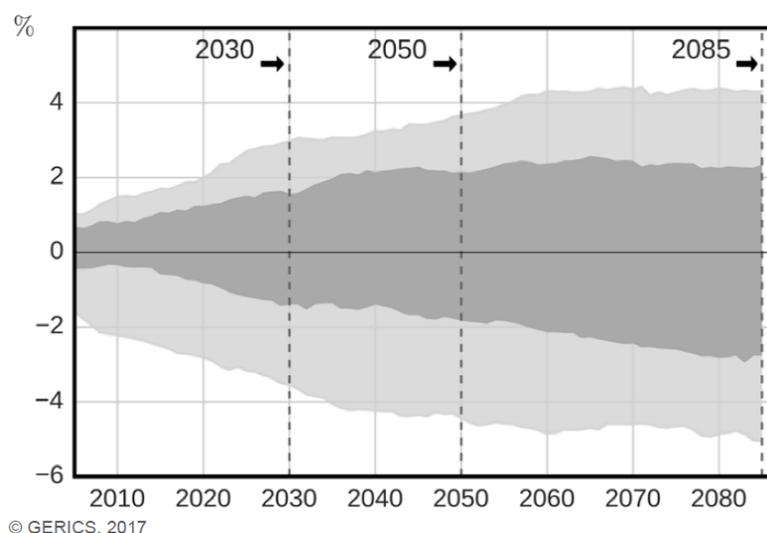
A significant increase or reduction of the annual average wind speed can directly impact the productivity of the plant since current wind turbines operate within a defined range of wind speed (up to 25 m/s for the wind turbine AW132/3300 used for this project). **Impact** is assessed as **medium** for the Project and its commercial model.

The likely range of projected change in annual mean wind speed indicates almost no change by 2050 compared to reference period from 1971 to 2000<sup>30</sup>. The very likely range is from -4 to +4% (see *Figure 12.3*). Confidence in these figures is medium. The **change in annual mean wind speed** can be considered to be **low**.

<sup>29</sup> <http://thinkhazard.org/en/report/4500-argentina-buenos-aires-tornquist/WF>

<sup>30</sup> From Climate-Fact-Sheets, Updated Version 2015; Argentina; Helmholtz-Zentrum Geesthacht Zentrum für Material-und Küstenforschung GmbH, GERICS, May 2018

**Figure 12.3 Projections of possible development of wind speed**



\*Dark grey: likely range (central 66%)  
 Light grey: very likely range (central 90%)

Change in wind speed regularity and wind speed extreme values might also have an impact on the productivity of the wind turbine. However, no further information was available to draw conclusions on impact on productivity.

Potential impacts on the wind farm's productivity have been identified but no significant changes (inferior to 4%) are expected in the annual average wind speed. **Long-term change in the wind speed overall risk level** can be considered as **low** at country level.

## 12.4 Mitigation Measures Proposed

No high risk was identified for the wind turbines through this climate change risk assessment.

This is largely related to the fact the Project is not located in an area with high natural hazards exposure such as floods and given wind turbines are generally engineered to be resilient to physical risks.

The wildfire risk, although considered as low in the long-term given the agricultural parcels around the wind farm, might increase to medium should these parcels become undeveloped land with wild vegetation. Therefore, activities and new developments on these parcels should be monitored during the entire Project duration.

## 13. BIODIVERSITY (CRITICAL HABITAT SCREENING AND PRELIMINARY ASSESSMENT)

### 13.1 Definition of Critical Habitat

The term «critical habitat» is defined in Paragraph 16 of IFC Performance Standard 6, 2012 (PS6) as areas with high biodiversity value. This includes areas that meet one or more of the following criteria (Guidance Note [GN] 53):

- Criterion 1: Critically Endangered (CR) and/or Endangered (EN) species;
- Criterion 2: Endemic and/or restricted-range species;
- Criterion 3: Migratory and/or congregatory species;
- Criterion 4: Highly threatened and/or unique ecosystems; and
- Criterion 5: Key evolutionary processes.

In addition, as specified by paragraph GN54 of IFC/WB Guidance Note 6, the determination of critical habitat can include other recognized high biodiversity values which are to be evaluated on a case-by-case basis. Paragraph GN54 provides the following two examples:

- Areas that meet the criteria of the IUCN's Protected Area Categories Ia, Ib and II.
- Key Biodiversity Areas (KBAs), which encompass Important Bird and Biodiversity Areas (IBAs), and meet the criteria and thresholds described in paragraphs GN70-GN83.

#### 13.1.1 Gradient of Critical Habitat

IFC Guidance Notes GN70 through GN83 detail critical habitat criteria and thresholds, based on relative vulnerability (degree of threat) and irreplaceability (rarity or uniqueness). For Criteria 1 to 4, quantitative thresholds are provided to assign critical habitat.

Table 13-1 details the relevant thresholds. Criteria 1 through 3 are focused on species level, whilst Criteria 4 and 5 focus on ecosystem and landscape levels.

These thresholds rely on the availability of estimates of species global/local population (either from published sources or obtainable by reasonable means through an in-field assessment in the case of the local population). Should this type of information not be available for any of the species under consideration, the Project proponent is expected to use expert opinion to determine the significance of the unit of analysis for critical habitat (CH) determination with respect to the global population. Surrogates of population size (e.g., extent of occurrence, estimates of total area of known sites, estimates of area of occupied habitat) can aid in this process.

**Table 13-1 Description and thresholds for Critical Habitat Criteria.**

Criteria		Description	Threshold(s)
Criterion 1	Critically Endangered (CR)/ Endangered (EN) Species	Species threatened with global extinction and listed as CR and EN on the IUCN Red List of Threatened Species shall be considered as part of Criterion 1. Critically Endangered species face an extremely high risk of extinction in the wild. Endangered species face a very high risk of extinction in the wild. The inclusion of species in Criterion 1 that are listed nationally/regionally as CR or EN in countries that have adhered to IUCN guidance, shall be determined on a project-by-project basis in consultation with competent professionals.	(a) Areas that support globally-important concentrations of an IUCN Red-listed EN or CR species (> 0.5% of the global population AND > 5 reproductive units of a CR or EN species). (b) Areas that support globally-important concentrations of an IUCN Red-listed Vulnerable (VU) species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds in Criterion 1. (c) As appropriate, areas containing important concentrations of a nationally or regionally-listed EN or CR species.
Criterion 2	Endemic/ Restricted Range Species	For purposes of this Guidance Note, the term endemic is defined as restricted-range. Restricted range refers to a limited extent of occurrence (EOO). For terrestrial vertebrates and plants, a restricted-range species is defined as those species that have an EOO less than 50,000 square kilometers (km <sup>2</sup> ).	Areas that regularly hold $\geq 10\%$ of the global population size AND $\geq 10$ reproductive units of a species.
Criterion 3	Migratory/ Congregatory Species	Migratory species are defined as any species of which a significant proportion of its members cyclically and predictably move from one geographical area to another (including within the same ecosystem). Congregatory species are defined as species whose individuals gather in large groups on a cyclical or otherwise regular and/or predictable basis.	(a) Areas known to sustain, on a cyclical or otherwise regular basis, $\geq 1$ percent of the global population of a migratory or congregatory species at any point of the species' lifecycle. (b) Areas that predictably support $\geq 10$ percent of the global population of a species during periods of environmental stress.
Criterion 4	Highly Threatened or Unique Ecosystems	The IUCN is developing a Red List of Ecosystems, following an approach similar to the Red List for Threatened Species. The client should use the Red List of Ecosystems where formal IUCN assessments	a) Areas representing $\geq 5\%$ of the global extent of an ecosystem type meeting the criteria for IUCN status of CR or EN.

Criteria	Description	Threshold(s)
	<p>have been performed. Where formal IUCN assessments have not been performed, the client may use assessments using systematic methods at the national/regional level, carried out by governmental bodies, recognized academic institutions and/or other relevant qualified organizations (including internationally-recognized NGOs).</p>	<p>b) Other areas, not yet assessed by IUCN, but determined to be of high priority for conservation by regional or national systematic conservation planning.</p>
<p>Criterion 5</p>	<p>Key Evolutionary Processes</p> <p>Evolutionary processes are often strongly influenced by structural attributes of a region, such as its topography, geology, soil and climate over a period of time.</p> <p>Guidance Note GN96 provides the following examples of spatial features that are associated with evolutionary processes:</p> <ul style="list-style-type: none"> <li>■ • Level of isolation (e.g., islands, mountaintops, lakes are associated with populations that are phylogenetically distinct);</li> <li>■ • Extent of endemism (areas of high endemism often contain flora and/or fauna with unique evolutionary histories);</li> <li>■ • Spatial heterogeneity;</li> <li>■ • Presence of environmental gradients (ecotones produce transitional habitat which has been associated with the process of speciation and high species and genetic diversity);</li> <li>■ • Edaphic interfaces; and Connectivity between habitats (e.g. biological corridors).</li> </ul>	<p>Criterion 5 is usually considered heavily reliant on scientific knowledge, and thus would be triggered in areas that have already been investigated or where significant research results are available to indicate the potential or existence of unique evolutionary processes.</p>

Source: IFC/WB (Guidance Note PS6), 2019.

## 13.2 Critical Habitat Methodology

The following section outlines the basic steps in defining the biodiversity features within an *ecologically appropriate area of analysis (EAAA)* that have the potential to trigger critical habitat status.

The IFC PS6 recognizes critical habitats to be based on either modified or natural habitats. The process of recognizing critical habitats therefore follows an approach that can be summarized in three key steps (*Paragraph 60, GN6; IFC 2019*).

1. Stakeholder Consultation and Initial Literature Review.
2. Field Data Collection and Verification of Available Information
3. Critical Habitat Determination.

GN63. Based on the broad pool of data obtained as part of Steps 1 and 2, biodiversity values should be screened using critical habitat criteria and thresholds (paragraphs GN70–83 in this note) at an appropriate ecological scale, as defined in GN59.

GN59. The project should identify an ecologically appropriate area of analysis to determine the presence of critical habitat for each species with regular occurrence in the project's area of influence, or ecosystem, covered by Criteria 1-4. The client should define the boundaries of this area taking into account the distribution of species or ecosystems (within and sometimes extending beyond the project's area of influence) and the ecological patterns, processes, features, and functions that are necessary for maintaining them. These boundaries may include catchments, large rivers, or geological features. The client will use this area of analysis to assess applicability of the critical habitat criteria and thresholds (see paragraphs GN70–GN83 of this note) in order to determine critical habitat for the species and/or ecosystems concerned.

The *ecologically appropriate area for analysis* determined for the Project is described in section 13.2.2 of this assessment.

GN64. By carrying out these steps, the client should be in a position to determine if the project is located in a critical habitat based on identified high biodiversity values. *This determination is independent of the project type, impacts or its mitigation strategy.*

GN65. Where estimates of species' global population and/or local population are not available (or not obtainable by reasonable means through a field assessment in the case of the local population), the client is expected to use expert opinion to determine the significance of the potential critical habitat with respect to the global population. Surrogates of population size (for example, extent of occurrence, estimates of total area of known sites, estimates of area of occupied habitat) will be essential in this decision-making. This statement applies to Criteria 1 through 3.

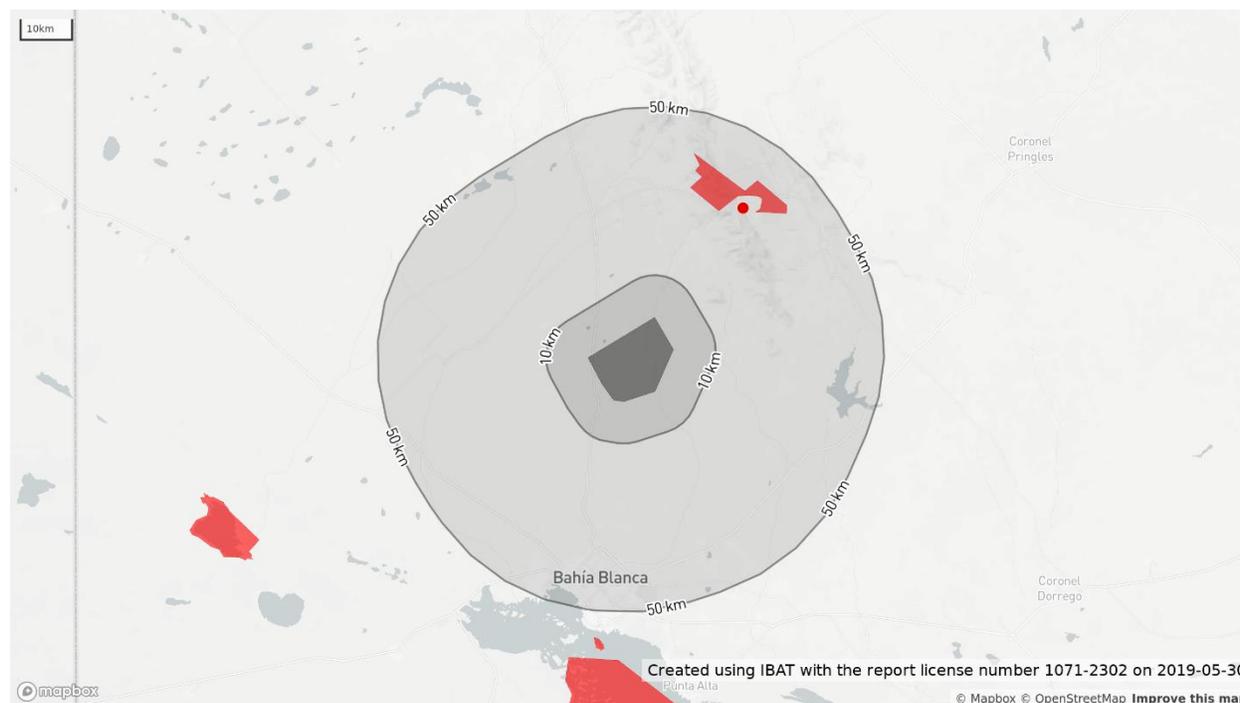
### 13.2.2 Ecologically Appropriate Area for Analysis (EAAA)

The Pampan region surrounding Project Energética 1 is characterized for its extensive homogeneity. This area lacks of the land and hydrology delimitations that cause variations in flora and faunal occurrences. Because of the extensive homogeneity of the area surrounding the Project Energética 1, and the lack of any regional land and hydrology delimitation parameters, a 50 km buffer was considered as an ecologically appropriate area for analysis (EAAA) based on the initial screening using the Integrated Biodiversity Assessment Tool (IBAT<sup>31</sup>), which was the buffer that the system used to build the probable occurrence list of species presented on the biotic baseline on previous sections. A quality of

homogeneous areas is that species composition remains with very few variations, which makes the 50 km buffer an adequate and appropriate area to evaluate species occurrences for the initial screening.

In the Figure 13.1, the 50 km buffer used as an ecologically appropriate area for analysis is presented.

**Figure 13.1. Ecologically appropriate area for analysis. Generated under license number 1071-2304 held by Environmental Resources Management**



### 13.2.3 Criterion 1: Critically Endangered and/or Endangered Species

Footnote 11 of the IFC's Performance Standard 6 (2018) defines Critically Endangered and/or Endangered Species as species either:

- Listed nationally/regionally as critically endangered or endangered, in countries that have adhered to IUCN guidance, the critical habitat determination will be made on a project-by-project basis, in consultation with competent professionals.
- In instances where nationally or regionally listed species' categorizations do not correspond well to those of the IUCN (e.g., some countries more generally list species as "protected" or "restricted"), an assessment will be conducted to determine the rationale and purpose of the listing. In this case, the critical habitat determination will be based on such an assessment.

Critically Endangered and Endangered species that have the potential to be present within the Project Area have been identified. This has been completed with reference to the IUCN Red List.

### 13.2.4 Criterion 2: Endemic and/or Restricted Range Species

Quoting the text of the IFC PS 6 Guidance Note:

*GN74. For purposes of this Guidance Note, the term endemic is defined as restricted-range. Restricted range refers to a limited extent of occurrence (EOO). (IFC PS6 Guidance Notes)*

- For terrestrial vertebrates and plants, a restricted-range species is defined as those species that have an EOO less than 50,000 square kilometers (km<sup>2</sup>). (IFC PS6 Guidance Notes)

### 13.2.5 Criterion 3: Migratory and Congregatory Species

GN76. Migratory species are defined as any species of which a significant proportion of its members cyclically and predictably move from one geographical area to another (including within the same ecosystem).

GN77. Congregatory species are defined as species whose individuals gather in large groups on a cyclical or otherwise regular and/or predictable basis. (IFC PS6 Guidance Notes) Examples include the following:

- Species that form colonies.
- Species that form colonies for breeding purposes and/or where large numbers of individuals of a species gather at the same time for non-breeding purposes (for example, foraging and roosting).
- Species that utilize a bottleneck site where significant numbers of individuals of a species occur in a concentrated period of time (for example, for migration).
- Species with large but clumped distributions where a large number of individuals may be concentrated in a single or a few sites while the rest of the species is largely dispersed (for example, wildebeest distributions).
- Source populations where certain sites hold populations of species that make an inordinate contribution to recruitment of the species elsewhere (especially important for marine species).

### 13.2.6 Criterion 4: Highly Threatened and/or Unique Ecosystems

GN79. The IUCN is developing a Red List of Ecosystems, following an approach similar to the Red List for Threatened Species. The client should use the Red List of Ecosystems where formal IUCN assessments have been performed [...] (IFC PS6 Guidance Notes)

### 13.2.7 Criterion 5: Key Evolutionary Processes

GN81. The structural attributes of a region, such as its topography, geology, soil, temperature, and vegetation, and combinations of these variables, can influence the evolutionary processes that give rise to regional configurations of species and ecological properties. In some cases, spatial features that are unique or idiosyncratic of the landscape have been associated with genetically unique populations or subpopulations of plant and animal species. Physical or spatial features have been described as surrogates or spatial catalysts for evolutionary and ecological processes, and such features are often associated with species diversification [...] (IFC PS6 Guidance Notes)

For the purposes of this assessment, the Project Area has been screened against the following factors:

- Level of isolation (e.g., islands, mountaintops, lakes are associated with populations that are phylogenetically distinct)
- Extent of endemism (areas of high endemism often contain flora and/or fauna with unique evolutionary histories)
- Spatial heterogeneity
- Presence of environmental gradients (ecotones produce transitional habitats which have been associated with the process of speciation and high species and genetic diversity)

- Edaphic interphases
- Connectivity between habitats (e.g., biological corridors)

### 13.3 Critical Habitat Determination

#### 13.3.1 Criterion 1

Three potentially distributed species are classified in the IUCN Red list as Critically Endangered or Endangered globally; these species are shown in Table 12.2.

**Table 13-2 Species with a moderate/high probability of occurrence within the EAAA that have an Endangered/Critically Endangered status on the IUCN Red list**

Species	Scientific Name	Status IUCN	Habitat	Population Tend.	Principal threats
Crowned solitary eagle	<i>Buteogallus coronatus</i>	EN	Shrub land, grassland, forest, artificial/ terrestrial, Savanna	Decreasing	Habitat destruction and hunting
Yellow cardinal	<i>Gubernatrix cristata</i>	EN	Shrub land, Savanna, Grassland	Decreasing	Illegal trade and possibly extraction of wood
Casuhatien anole	<i>Pristidactylus casuhatiensis</i>	CR	Highland grassland	Unknown	Loss of habitat, invasive species and illegal extraction by tourists.

#### **Crowned solitary eagle (*Buteogallus coronatus*)**

The available information<sup>32</sup> suggests that this eagle has a very small, highly fragmented population and probably a significant and continuing decline in numbers. Crowned eagles occur in mostly open country, including grasslands, brush lands, savannas, and lightly wooded foothills, where it soars or perches for long periods in tall trees, on fence posts, stakes, or even on the ground. Often occurs in pairs, at times accompanied by a juvenile. This species feeds mostly on armadillos and other medium-sized mammals, especially skunks, medium-sized birds, lizards, and carrion of various types. Collision and/or electrocution Power lines are one of the most relevant risks that the species is facing in Argentina

Classified as Vulnerable locally in Argentina and Endangered globally under the IUCN Redlist. In addition to the destruction and fragmentation of its habitat, the species faces other threats related to anthropic factors, such as collision and/or electrocution with power lines, and this may represent an important source of mortality for this species in Argentina.

#### **Yellow cardinal (*Gubernatrix cristata*)**

It is distributed in the northern center of Argentina associated with the Ecorregión del Espinal in the provinces of Corrientes, Entre Ríos, Santa Fe, Buenos Aires, La Pampa, Córdoba, Santiago del Estero, La

<sup>32</sup> Global Raptor Information Network. 2019. Species account: Crowned Solitary Eagle *Buteogallus coronatus*. Downloaded from <http://www.globalraptors.org> on 10 Jun. 2019 <http://www.globalraptors.org/grin/SpeciesResults.asp?specID=8041>

Rioja, San Juan, Mendoza, Neuquén and Río Negro. A global population of 1,500 - 3,000 individuals are estimated. There are no population estimates in Argentina but the population size would not exceed 2,500 individuals. A population reduction of at least 50% is presumed due to a decrease in the area of extension and occupation, of habitat quality and by the extraction of individuals (especially males) to supply illegal trade in cage birds. It is considered Endangered locally (Argentina) and globally under the IUCN Redlist.

**Casuhatien anole (*Pristidactylus casuhatiensis*)**

The Casuhatien anole is a species of lizard of the family Liolaemidae, endemic to the center of Argentina. The adult male has a pattern of coloration composed of green background covered with fine black reticules, even more on the sides. In the tail and legs presents yellow or orange tones. The adult female is brown with transverse dark bands. Its body measures between 7 and 7.5 cm long between snout and cloaca. It has an elongated, triangular head, and its tail is almost twice the length of the body: 16 cm. Its limbs are robust, typical of rock-jumping lizards. It characterizes to this species the presence of teeth with the posterior margin projecting from the dental crown. It feeds mainly on terrestrial snails, specifically of the species *Plagiodontes patagonicus*, as well as. It also eats insects, and spiders. It can be captured by the Pampas fox (*Lycalopex gymnocercus*), snakes, and raptors. It is considered Endangered locally (Argentina) and Critically Endangered globally under the IUCN Redlist. Loss of habitat, invasive species and illegal extraction by tourists are the reported reason for the species decline.

Additionally, there are 18 bird species with potential distribution within the project with a potential risk caused by the development of wind energy in the country, from which 5 are considered Endangered locally for Argentina, and one critically endangered (Table 13-3). The Ruddy-headed goose case will be discussed in Criterion 3.

**Table 13-3 Species with a moderate/high probability of occurrence within the EAAA that have an Endangered/Critically Endangered status on Argentina’s legislation.**

SPECIES	COMMON NAME	CLASSIFICATION IN ARGENTINA	IUCN	PRIORITY
<i>Chloephaga rubidiceps</i>	<b>Ruddy-headed goose</b>	CR	LC	High
<i>Buteogallus coronatus</i>	<b>Crowned solitary eagle</b>	EN	EN	High
<i>Pluvianellus socialis</i>	<b>Magellanic plover</b>	EN	NT	Medium
<i>Calidris canutus</i>	<b>Red knot</b>	EN	NT	Medium
<i>Gubernatrix cristata</i>	<b>Yellow cardinal</b>	EN	EN	High
<i>Leistes defilippii</i>	<b>Pampas meadowlark</b>	EN	VU	High

**Classification in Argentina: A= Threatened, VU=Vulnerable, CR=Critically endangered, EN=Endangered, LC=Least concern. The level of risk according to the IUCN Redlist (2019): LC = Least Concern, VU = Vulnerable, NT = Near Threatened, EN = Endangered, CR = Critically endangered, and DD= Data Deficient.** Source: ERM with data provided by Palmer, R., Gordon, C., & Petracci, P (2017). Interacciones entre la Fauna Silvestre y la Energía Eólica en Argentina: Conocimiento Científico y Prioridades para el Futuro.

The presence of species such as the crowned solitary eagle, the Yellow cardinal, or the locally endangered species previously mentioned could trigger PS6’s Critical Habitat status, but their presence must be confirmed first during the oncoming on-site wildlife monitoring surveys, and their abundance should be estimated to represent at least 0.5% of the global population in order to trigger PS6’s Critical Habitat.

### 13.3.2 Criterion 2

The species identified in the ESIA and additional bibliographical baseline, as well as the ones identified in this study have been screened to identify the ones range-restricted. Three potentially distributed species meet the criteria of restricted range species set by IFC of an EOO less than 50,000 square kilometers (km<sup>2</sup>).

#### **Strange Big-eared Brown Bat (*Histiotus alienus*)**

The strange big-eared brown bat is a bat species from South America, is known from southern Brazil, Uruguay and east-central Argentina. According to IUCN Redlist records, the species estimated extent of occurrence (EOO) is 4,020 km<sup>2</sup>. There is no data on population and ecology. It is possible that the presence of the Strange Big-eared Brown Bat (*Histiotus alienus*) could trigger PS6's Critical Habitat status, but their presence must be confirmed first during the oncoming on-site wildlife monitoring surveys, and the abundance in the study site should indicate that the area regularly hold  $\geq 10\%$  of the global population size AND  $\geq 10$  reproductive units of this species in order to trigger PS6's Critical Habitat.

#### **Buenos aires leaf-eared mouse (*Phyllotis bonariensis*)**

Buenos aires leaf-eared mouse (*Phyllotis bonariensis*), its extent of occurrence (EOO) is 27,745 km<sup>2</sup>, the area of the EAAA, is approximately 7,850 km<sup>2</sup>, therefore the EAAA is 28% of the EOO. Using that as a proxy, it could be argued that the probability of finding 10% of the global population and 10 reproductive units in the EAAA exists, however, as mentioned for Casuhatién anole (*Pristidactylus casuhatiensis*), the habitat of the mouse is restricted to the Sierra de la Ventana in Buenos Aires province, (Steppan and Ramirez 2015). The altitudinal range is from 500 m to 2,200 m, the maximum height of the Sierra de la Ventana, but restricted mainly to rocky outcrops (Robles et al. 2014). Therefore the possibility of finding it in the steppe Pampa areas surrounding the wind Park it's practically zero.

#### **Casuhatién anole (*Pristidactylus casuhatiensis*)**

The Casuhatién anole is a species of lizard of the family Liolaemidae, endemic to the center of Argentina. It is only distributed in the mountain ranges of Ventania, the southwestern massif of the province of Buenos Aires, in the central-eastern area of Argentina, and there are records of collections in Tres Picos very close to the Project area. So close that it is only 16 km away. On the other hand, the EAAA overlaps in great part with the distribution area (taken from the IUCN distribution map). Therefore, regardless of the impact, which comes later there is a probability, higher or lower, that the threshold is met.

The known extent of occurrence (EOO) is estimated as only 30 km<sup>2</sup> (the AOO would be even less,) with the overlap of the project EAAA (approximately 60% of the AOO). Therefore, in theory, the EAAA could actually hold more than 0.5% of the global population. The five reproductive units is debatable “*park rangers and tour guides have surveyed the known localities between 2013 and 2015, and have recorded only eight individuals at two of the known localities*” (F. Kacoliris pers. comm. 2016)”, that is why it is CR in IUCN Redlist.

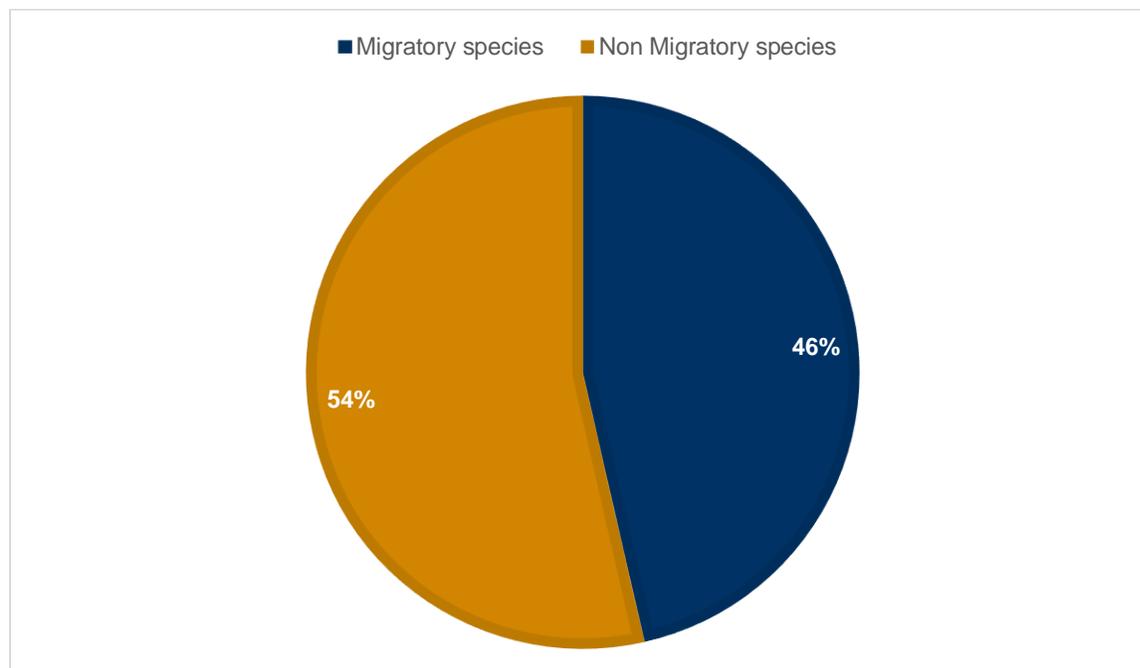
The EAAA has been selected using a circular radius, but the whole northeast sector is fundamentally and ecologically different (south of Buenos aires mountains) than where the site is located (Interior Plane Pampa, pseudosteppe with mesophyte plants), therefore the EAAA could actually be bigger but with a different shape. The South Buenos Aires Mountains is where the lizards actually are, occurring in Sierra de la Ventana, in Buenos Aires province, located above 700 m asl (Abdala et al. 2012). At present it is known from Cerro Ventana, Cerro Tres Picos and Cerro el Destierro, three localities close to one another characterized by high, rocky grasslands above 800 m asl.) Therefore, even if we admit that strictly speaking a conservative EAAA could hold population above Criterion 1 (and 2 in fact) thresholds, the habitat of this

species is totally different from the site location, the probability of finding it the site location or in fact in a more ecologically relevant EAAA is practically zero.

### 13.3.3 Criterion 3

According to the International Union for the Conservation of Nature (IUCN) records, 156 species out of 336 potentially distributed species, are migratory, and represent a total of 46% of the total species. Species that are of migratory nature other than birds (such as bats and terrestrial mammals) have been screened and they are not present.

**Figure 13.2 Migratory species vs non-migratory species**



A relevant Migratory species to be considered is the **Ruddy-headed goose** (*Chloephaga rubidiceps*). According to Imberti et al. (2007), the continental population of this species is under serious threat, as derived from several surveys in Tierra del Fuego (i.e. breeding areas) and wintering sites in Buenos Aires province. The Ruddy-headed Goose mainland population is migratory, has a small population size and very restricted distribution. Breeding areas are located in mainland Chile along the Straits of Magellan and in the northern portion of Tierra del Fuego Island (Madsen et al. 2003). Brood-rearing sites, such as San Gregorio and San Juan, are characterized by swamps and/or open water offering retreat in case of predation attempts by foxes (Madsen et al. 2003). After the breeding season, the Ruddy-headed Goose migrates north to Buenos Aires Province, and coincides with the Energética Project area. The migration route is largely unknown, but twice a year geese fly across Patagonia, which separates the breeding and wintering quarters, covering around 1,500 km. Three uncertain records suggest the use of an inland corridor close to the coast (Wetlands International unpubl. data); which Pedrana et al. (2018) confirmed from the satellite tracking of six adults that they effectively used the Atlantic coast migration route.

During the non-breeding season, the species concentrates in San Cayetano and Tres Arroyos districts, in southern Buenos Aires province (Blanco et al. 2003). This region, where they share the habitat with other *Chloephaga* geese (*Ch. picta* Upland Goose and *Ch. poliocephala* Ashy-headed Goose), is predominantly agricultural with a mosaic of crops, mainly wheat and planted pastures.

This species must be confirmed in the Project area, but its presence may probably during winter. Considering the low numbers of the continental population, under a conservative approach the species may potentially trigger Criterion 1 (as well as Criterion 3 for migratory species; considering the >1% population threshold) for Critical habitat for the area of analysis. Ongoing monitoring efforts at the Energética Project area have not observed it to date; it is recommended that should it be positively identified, the Project undertake specific biodiversity management measures for the species in consultation with local avifauna experts.

Although there are other potentially 155 migrating bird species that can be distributed at some point of the year in the study area, the nearest Important Bird and Biodiversity Area (IBA) is that of “Villa Iris”, which is at 20.5 km to the west of the project, and have a total surface of 112,000 ha (view Biotic Baseline in the previous section for more detail).

The possibility exist that the presence of these species (such as the Ruddy-headed goose) could trigger Criterion 3 PS6's Critical Habitat status, but their presence and abundance must be confirmed first during the oncoming on-site wildlife monitoring surveys, and the abundance in the study site should indicate that the area sustain on a cyclical or otherwise regular basis,  $\geq 1$  percent of the global population of a migratory species at any point of the species' lifecycle.

#### 13.3.4 Criterion 4

The IUCN is developing a Red List of Ecosystems, following an approach similar to the Red List for Threatened Species, and where formal IUCN assessments have been performed should use the Red List of Ecosystems for evaluation of Criterion 4. In the cases where assessment by IUCN has not been performed, the next criteria to be used is of areas determined to be of high priority for conservation by regional or national systematic conservation planning.

The area where the Energética I Wind Farm Project is being developed and its immediate surroundings has not been considered for formal IUCN assessments, and has not been identified as high priority for conservation by regional or national systematic conservation planning. The closest natural protected area is “Ernesto Tornquist” Provincial Natural Protected Area, which is at 32.7 km to the northeast of the Project, and have a total surface of 6,700 ha (view Biotic Baseline in the previous section for more detail). The analyzed sector is located in the Pedemontana area, to the southwest of the Southern Sierras of Buenos Aires. Phytogeographically, it represents an ecotone or transitional sector, between the Pampa and Espinal ecoregions (Morello et al., 2012) and is influenced by the mountain flora. For this reason, the area is of great botanical and conservation interest, when it has little anthropic transformation. Due to the agricultural use of livestock and urbanizations, most of the Pampa ecoregion is almost completely transformed, mostly without its characteristic floristic elements, such as the Project area. The fields not worked or at rest, usually present a high percentage of exotic herbs and sub-shrubs, with abundance of yellow flower (*Diploaxis tenuifolia*), Russian thistle (*Salsola kali*), thistle (*Carduus thoermeri*), among other weeds.

Under the current information at the time of this review, there is no argument to consider any possibility of Criterion 4 being triggered.

#### 13.3.5 Criterion 5

The importance of the Project area from an evolutionary perspective is assessed by screening its features against factors that indicate importance for evolutionary processes. Table 12.4 summarizes the factors considered likely to indicate importance for evolutionary processes and their relevance to the Project area.

**Table 13-4 Criterion 5 Summary Table**

	Isolation	High endemism /flora and/or fauna with unique evolutionary histories	Spatial heterogeneity	Presence of environmental gradients	Connectivity between habitats (e.g. biological corridors)
Project Area of analysis	No	Probable	No	No	Probable

The area is not considered highly heterogeneous in terms of favoring evolutionary processes; being a single landscape unit, though with distinct geomorphological features e.g. plains versus valleys; with these, geomorphology features constituting potential environmental gradients. Considering the latter, the area is not deemed to trigger Critical Habitat under Criterion 5.

### 13.3.6 Other criteria

A range of additional criteria for the determination of critical habitat have been considered in this assessment. Table 12.5 details the additional criteria considered and provides a brief summary of their relevance to the Project Area.

**Table 13-5 Other criteria considered for Critical Habitat determination**

Criteria	Relevance to Project area	Critical Habitat Triggered?
Internationally and/or nationally recognized areas	The Project Area does not include any internationally or nationally recognized area. The closest is “Ernesto Tornquist” Provincial Natural Protected Area, which is at 32.7 km to the northeast of the Project	No
Areas required for the reintroduction of CR and EN species and refuge sites for these species (habitat used during stress periods like floods, droughts or fires).	Project Area highly unlikely to be used for reintroduction of CR or EN species.	No
Ecosystems of known special significance to EN or CR species for climate adaptation purposes.	Project Area highly unlikely to be of significance to CR or EN species for climate adaptation.	No
Concentrations of Vulnerable (VU) species in cases where there is uncertainty regarding the listing,	Not identified, still to be determined.	Not likely

Criteria	Relevance to Project area	Critical Habitat Triggered?
and the actual status of the species may be EN or CR.		
Areas of primary/old growth/pristine forests and/or other areas with especially high levels of species diversity.	No high diversity habitats present	No
Landscape and ecological processes (e.g., water catchments), areas critical to erosion control or disturbance regimes (e.g., fires or floods) required or maintaining critical habitat.	Not relevant to Project area	No
Habitat necessary for the survival of keystone species.	Not identified, still to be determined	Not likely
Areas of high scientific value such as those containing concentrations of new and/or little known to science species.	Project Area highly unlikely to represent high scientific value and species new to science.	No

### 13.3.7 Summary of Critical Habitat

Table 12.6 summarizes the most relevant biotic features identified for the Energética I Wind Farm Project, and if critical habitats are considered confirmed of relevance to the Project.

**Table 13-6 Summary of Critical Habitat**

PS6 Criterion	Feature	Critical Habitat
Criterion 1	<p>Three potentially distributed species are classified in the IUCN Redlist as Critically Endangered or Endangered globally:</p> <ul style="list-style-type: none"> <li>• Crowned solitary eagle (<i>Buteogallus coronatus</i>),</li> <li>• Yellow cardinal (<i>Gubernatrix cristata</i>),</li> <li>• Casuhatién anole (<i>Pristidactylus casuhatiensis</i>)</li> </ul>	<p>As discussed previously, the Casuhatién anole is not considered viable in the Project area, but the crowned solitary eagle or the Yellow cardinal could trigger PS6's Critical Habitat status, but their presence must be confirmed first during the oncoming on-site wildlife monitoring surveys.</p>
Criterion 2	<p>Three potentially distributed species meet the criteria of restricted range species set by IFC of an EOO less than 50,000 square kilometers (km<sup>2</sup>).</p> <ul style="list-style-type: none"> <li>• Strange Big-eared Brown Bat (<i>Histiotus alienus</i>),</li> <li>• Buenos Aires leaf-eared mouse (<i>Phyllotis bonariensis</i>),</li> <li>• Casuhatién anole (<i>Pristidactylus casuhatiensis</i>)</li> </ul>	<p><i>Phyllotis bonariensis</i> and <i>Pristidactylus casuhatiensis</i> are not considered viable for the Project area, but it is possible that the presence of the Strange Big-eared Brown Bat (<i>Histiotus alienus</i>) could trigger PS6's Critical Habitat status, but their presence must be confirmed first during the oncoming on-site wildlife monitoring surveys, and the abundance in the study site should indicate that the area regularly holds <math>\geq 10\%</math> of the global population size AND <math>\geq 10</math> reproductive units of this species in order to trigger PS6's Critical Habitat.</p>
Criterion 3	<p>There are potentially 156 migrating bird species that can be distributed at some point of the year in the study area.</p>	<p>The presence of these species, such as the Ruddy-headed goose (<i>Chloephaga rubidiceps</i>) could trigger Criterion 3 PS6's Critical Habitat status, but their presence and abundance must be confirmed first during the oncoming on-site wildlife monitoring surveys.</p>
Criterion 4	<p>The area has not been considered for formal IUCN assessments, and has not been identified as high priority for</p>	<p>The area is not deemed to trigger Critical Habitat under Criterion 4.</p>

PS6 Criterion	Feature	Critical Habitat
	conservation by regional or national systematic conservation planning.	
Criterion 5	The area is not considered highly heterogeneous in terms of favoring evolutionary processes; being a single landscape unit, though with distinct geomorphological features e.g. plains versus valleys; with these geomorphology features constituting potential environmental gradients.	The area is not deemed to trigger Critical Habitat under Criterion 5.
Other/Additional criteria	None of the additional criteria for the determination of critical habitat detailed in the Table 13-5 have been confirmed in the project.	The area is not deemed to trigger Critical Habitat under other/additional criteria.

As a summary and conclusion of the previous individual Criteria assessment discussed in the previous sections, **the area of analysis does not clearly qualify as a Critical Habitat**. Confirmation based on extensive field data is necessary to fully evaluate Criterion 1 to 3, and if the species population meet the thresholds set by each criteria. Due the high presence of agricultural activity, and several wind energy projects in the vicinity, confirmation of high densities of endangered species in the area is highly unlikely as previously discussed.

It is expected the current bird and bat monitoring efforts taking place on a monthly basis since June 2019 at the Energética I Wind Farm Project site by local experts may provide data that would decrease the degree of uncertainty in regards to endangered, range restricted and migrating species (either of conservation concern or not) in order for the Project developers to make informed decisions in regards to the Projects biodiversity management.

The IFC Performance Standard 6 (PS6) provides various mitigation requirements for proposed projects located within modified, natural and critical habitats. These requirements should be addressed either through:

- the ESIA's biodiversity management plan (BMP) or general project's Environmental and Social Management Plan (ESMP);
- If necessary, an associated Biodiversity Action Plan (BAP) focused on specific species or habitats.

Based on the contents of the ESIA documents reviewed it is deemed that the Projects Environmental Management Plan provides general measures for biodiversity protection. The project developers are currently starting comprehensive bird monitoring surveys that are expected to continue throughout the early life of the windfarm project (i.e. construction and first years of operation) in the Project area in order to gain a better understanding of seasonal presence and abundance of avifauna.

It is recommended that if these surveys (or operational surveys based on carcass searches, which are expected to be undertaken by the developer) should identify migrating bird species a specific BAP be developed under an adaptive management scheme for the Project.

## 14. ECOSYSTEM SERVICES

Ecosystem services are defined as the benefits that people, including businesses, derive from ecosystems (IFC, 2012). These services are substantial and varied, underpinning basic human health and survival needs as well as supporting economics activities, the fulfillment of people's potential, and enjoyment of life.

In order to provide a uniform basis to assess the status of all major global habitat across all of the world's bioregions, the United Nation's Millennium Ecosystem Assessment (UN, 2005) combine diverse Ecosystem services typologies into a consistent classification scheme.

There are four categories of ecosystem services defined in Millennium Ecosystem Assessment as outlined in IFC Performance Standard 6:

- **Provisioning Services;** these services that can be extracted from ecosystem to support human needs. This term is more or less synonymous with the term “**Ecosystem Goods**” that was used in some prior classification schemes, including such tangible assets as fresh water, food, fiber, timber and medicinal plants;
- **Regulating Services;** the benefit obtained from an ecosystem's control of the natural environment, including of the regulation of surface water purification, carbon storage, and sequestration, climate regulation, protection from natural hazard, air quality, erosion and pests;
- **Cultural Services;** non-material benefits including diverse aspect of aesthetic, spiritual, recreational, and others cultural value;
- **Supporting services;** the natural process essential to the maintenance of the integrity, resilience, and functioning of ecosystem, thereby supporting the delivery of all other benefits. They include soil formation, nutrient cycling, and primary production.

The International Finance Corporation's (IFC) Performance Standards require projects to assess and preserve the benefits from ecosystem services. The IFC also requires that the environmental and social risks and impacts identification process considers a project's dependence on ecosystem services. A fundamental component is to apply the mitigation hierarchy to determine measures to limit impacts on ecosystem services.

The ecosystem services review was undertaken following the next steps:

- **Identification assessment:** Identifying ecosystem services that may occur within the study area;
- **Prioritization assessment:** Prioritizing the identified ecosystem; and;
- **Impact assessment:** Identifying the impacts to ecosystem services and their human beneficiaries as a result of the Project.

### 14.1 Identification Assessment

An ecosystem services screening assessment was undertaken to determine the likely ecosystem service values that could be potentially important to Affected Communities.

The scoping exercise was undertaken in order to identify the following:

- **Potential Beneficiaries:** Known and potential beneficiaries for a service were identified and where possible identifying people at the local, national, and / or global level;
- **Sources of Impact:** Potential sources of impact were considered based on the social data obtained for the site;
- **Project Dependence:** IFC PS-6 requires that the Ecosystem services assessment take into consideration any services that the Project may rely upon during construction, operation and/or

Energética I Wind Farm Project (Tornquist, Argentina)

decommissioning. Therefore all services for which there is a potential project dependency were scoped into the prioritization stage.

The goal of the scoping exercise was to identify a list of Ecosystem services to be assessed during through the surveys.

**Table 14-1 Ecosystem Services Screening Assessment**

Ecosystem service type	Description	Current known ecosystem services
<b>Provisioning services</b>		
Food: cultivated crops	Annual and permanent crops grown for subsistence use and commercial sale	Seasonal crops are grown within the Aol.
Livestock farming	Sedentary and nomadic livestock farming	Some livestock farming exists within the Aol, primarily cows.
<b>Regulating services</b>		
Ecosystem functions	The influence ecosystems have on air quality by extracting chemicals from the atmosphere (i.e., serving as a “sink”) or emitting chemicals to the atmosphere (i.e., serving as a “source”)	The implementation of this project will allow the reduction of greenhouse gases per megawatt of power produced in Argentina.
	Role played by vegetation and bacteria in the filtration and decomposition of organic wastes and pollutants and the assimilation and detoxification of compounds.	The presence of bacteria decompose the organic matter, taking the waste to the level of chemical compounds
	Influence ecosystems have on the incidence and abundance of human pathogens	The Project area has an ecosystem with a medium degree of disturbance due to agricultural activities. However, no abundance or incidence of human pathogens are detected.
	Role of vegetation in regulating erosion on slopes and riparian areas	The presence of grassland prevents water and wind erosion.
	Birds, insects and some small mammals pollinate certain flora species, including some agricultural crops	The presence of bats and bees and other birds in the area helps pollinate certain flora species. In addition, the aforementioned fauna spills the seeds.

Ecosystem service type	Description	Current known ecosystem services
<b>Cultural services</b>		
Spiritual, religious or cultural value	Use of natural spaces and resources for tourism and recreation	In the province of Tornquist is the Provincial Park Ernesto Tornquist,
<b>Existence values</b>		
Non-use value of biodiversity (e.g. existence, bequest value)	Species and areas valued globally as of high conservation value	The Aol contains the Javan Coastal Endemic Bird Area, which is an internationally recognized area for the protection of endemic bird species.
	Formation of biological material by plants through photosynthesis and nutrient assimilation.	The Aol does not play an important role in the formation of biological material by plants through photosynthesis and nutrient assimilation
	Flow of nutrients (e.g., nitrogen, sulfur, phosphorus, carbon) through ecosystems.	The Aol does not play an important role in the flow of nutrients through ecosystems.
	Flow of water through ecosystems in its solid, liquid, or gaseous forms.	The Project area does not contain natural watercourses or waterbodies. Several artificial water bodies occur to serve settlements and agricultural developments. Overland flow would likely occur onsite during rainfall events. The Project area or EAA should not affect the flows of greater ecosystem.
	Natural soil-forming processes throughout vegetated areas.	The Aol does not play a role in the natural formation of soil forming processes.
	Natural spaces that maintain species populations and protect the capacity of ecological communities to recover from disturbances.	The Aol does contain the Javan Coastal Endemic Bird Area and several protected areas. The species populations of these area are unknown.

Source: ERM, 2019

## 14.2 Prioritization assessment

The World Resources Institute (WRI) guidelines<sup>33</sup> and IFC PS6 requires that priority ecosystem services are identified, and impacts to those services are assessed (IFC, 2012). The prioritization process is aimed at identifying those services for which project impacts would be most likely to result in adverse impacts on project affected communities and other beneficiaries.

Using the information collected through the baseline data collection and stakeholder engagement processes, ecosystem services were prioritized according to a priority matrix ranking two (2) criteria:

- Importance of the ecosystem service to the beneficiary which considers the intensity of use, degree of dependence and the importance expressed by the project affected communities; and
- Irreplaceability of the ecosystem service, which refers to the availability of alternatives, the accessibility, cost and appetite for those alternatives as discussed with the beneficiary.

**Table 14-2 Ecosystem service prioritization matrix**

Importance to Beneficiaries		Irreplaceability		
		High	Moderate	Low
Low	The service is used and valued by parts of the community, but it is not important in maintaining quality of life or livelihoods of Project Affected Communities.	<b>Low Priority</b>	<b>Low Priority</b>	<b>Moderate Priority</b>
Medium	The service is readily used by some members of the Project Affected Communities for income or subsistence, but they are not dependent upon the service for their livelihoods, and not everyone utilizes the service.	<b>Low Priority</b>	<b>Moderate Priority</b>	<b>High Priority</b>
High	The service is highly important in maintaining the livelihoods of the Project Affected Communities, and is used by most of the community regularly.	<b>Moderate Priority</b>	<b>High Priority</b>	<b>Major Priority</b>
Essential	The service is essential to maintain the health of the Project Affected Communities, and the service is used by all members of the community.	<b>High Priority</b>	<b>Major Priority</b>	<b>Major Priority</b>

Irreplaceability definition

High	Many spatial alternatives exist that are readily available to the Project Affected Communities, and there are no major impediments to their usage.
Moderate	Spatial alternatives exist but are either less accessible than the affected service, or there are other barriers to their use such as distance, cost and skills required to access the service.
Low	There are few to no spatial alternatives available to the Project Affected Communities.

Source: ERM, 2016

<sup>33</sup> World Resources Institute, "Weaving Ecosystem Services into Impact Assessment", 2013, Available at: <https://www.wri.org/publication/weaving-ecosystem-services-into-impact-assessment>

**Table 14-3 Results of Prioritization**

Ecosystem services	Trends and Sustainability	Beneficiaries	Importance to Beneficiaries	Irreplaceability	Potential Alternatives	Priority (H,M)
<b>Provisioning services</b>						
■ Food: cultivated crops	There is no current data available on the sustainability of the fishery.	Local people are the beneficiaries of the agricultural products, however some may be sold to other villages.	Cultivated crops are important to local people as a food source and also as income.	N/A	N/A	<b>Moderate</b>
■ Livestock farming	There is no current data on the crop yield or sustainability of agriculture within the Aol.	Local people are the beneficiaries of the farming products, however some may be sold to other villages	Livestock farming is important to local people as a food source and also as income.	Livestock farming is considered to be replaceable and can be substituted with bought meat.	Alternative food sources may be purchased by local people.	<b>Moderate</b>
<b>Regulating services</b>						
■ Influence ecosystems have on air quality	There is no current data on the influence ecosystems have on air quality	Local people are the beneficiaries	The local people develop in a healthy environment	N/A	N/A	<b>Moderate</b>
■ Decomposition of organic wastes and pollutants	There is no current data on the decomposition of organic wastes and pollutants	Local people are the beneficiaries	The local people develop in a healthy environment	N/A	N/A	<b>Moderate</b>
■ Influence ecosystems have on the incidence and abundance of human pathogens	There is no current data on the influence ecosystems have on the incidence and abundance of human pathogens	Local people are the beneficiaries	The local people develop in a healthy environment	N/A	N/A	<b>Moderate</b>
■ Role of vegetation in regulating erosion on slopes and riparian areas	There is no current data on the role of vegetation in regulating erosion on slopes and riparian areas	Local people are the beneficiaries	The local people develop in a healthy environment	N/A	N/A	<b>Moderate</b>
■ Birds, insects and some small mammals pollinate certain flora species, including some agricultural crops	There is no current data on the birds, insects and some small mammals pollinate certain flora species, including some agricultural crops	Local people are the beneficiaries	The local people develop in a healthy environment	N/A	N/A	<b>Moderate</b>
<b>Cultural services</b>						
■ Spiritual, religious or cultural value	In the province of Tornquist is the Provincial Park Ernesto Tornquist	Local people are the beneficiaries of the Provincial Park, however the tourism could impact to the flora and fauna in the area	There are no direct benefits to beneficiaries,	N/A	Alternative Natural Parks may be visited by locals	<b>Moderate</b>
<b>Existence values</b>						
■ Species and areas valued globally as of high conservation value	The Ernesto Tornquist Provincial Park has been designated as an Area of Importance for the Conservation of Birds (AICA) thanks to the high concentration of endemic species and the great plant diversity that sustains them	There are no beneficiaries	There are no direct benefits to beneficiaries; however, the conservation of the natural park has regional and global significance.	The endemic species would be irreplaceable if they were to become extinct.	There are no alternatives	<b>Moderate</b>
■ Formation of biological material by plants through photosynthesis and nutrient assimilation.	There is no current data on the formation of biological material by plants through photosynthesis and nutrient assimilation.	There are no beneficiaries	There are no direct benefits	N/A	N/A	<b>Moderate</b>

<ul style="list-style-type: none"> <li>Flow of nutrients (e.g., nitrogen, sulfur, phosphorus, carbon) through ecosystems.</li> </ul>	There is no current data on the flow of nutrients (e.g., nitrogen, sulfur, phosphorus, carbon) through ecosystems.	There are no beneficiaries	There are no direct benefits	N/A	N/A	<b>Moderate</b>
<ul style="list-style-type: none"> <li>Flow of water through ecosystems in its solid, liquid, or gaseous forms.</li> </ul>	There is no current data on the flow of water through ecosystems in its solid, liquid, or gaseous forms.	There are no beneficiaries	There are no direct benefits	N/A	N/A	<b>Moderate</b>
<ul style="list-style-type: none"> <li>Natural soil-forming processes throughout vegetated areas.</li> </ul>	There is no current data on the natural soil-forming processes throughout vegetated areas.	There are no beneficiaries	There are no direct benefits	N/A	N/A	<b>Moderate</b>
<ul style="list-style-type: none"> <li>Natural spaces that maintain species populations and protect the capacity of ecological communities to recover from disturbances.</li> </ul>	In the province of Tornquist is the Provincial Park Ernesto Tornquist	There are no beneficiaries	There are no direct benefits to beneficiaries; however, the conservation of the natural park has regional and global significance.	The natural park would be irreplaceable if it is not managed	There are no alternatives	<b>Moderate</b>

Source: ERM, 2019

No high-priority ecosystem services were not identified; therefore, it is not necessary to develop a specific impact assessment for ecosystem services.

## 15. CUMULATIVE IMPACT ASSESSMENT

The objective of a Rapid Cumulative Impact Assessment (RCIA) is to determine a) if the execution of the Project has the potential to contribute significantly to the cumulative impacts on Valued Environmental and social Components (VEC), and 2) if the viability of the project may be at risk from cumulative effects on VEC they depend on.

The main steps carried out during this chapter, are:

- Identifying other existing, planned and future projects that could cause cumulative effects;
- Identifying the VEC that could be cumulatively impacted;
- Evaluating the cumulative impacts on the VEC;
- Develop a framework for the management of cumulative impacts.

### 15.1 Methodology

The Rapid Cumulative Impact Assessment has been prepared following the guidelines of the *Manual of Good Practice Evaluation and Management of Cumulative Impacts: A Guide for the Private Sector in Emerging Markets of the IFC*<sup>34</sup>. The assessment focuses on a VEC as a recipient of the impacts of different projects and activities, and not on a single project as a generator of impacts on different environmental and social receptors.

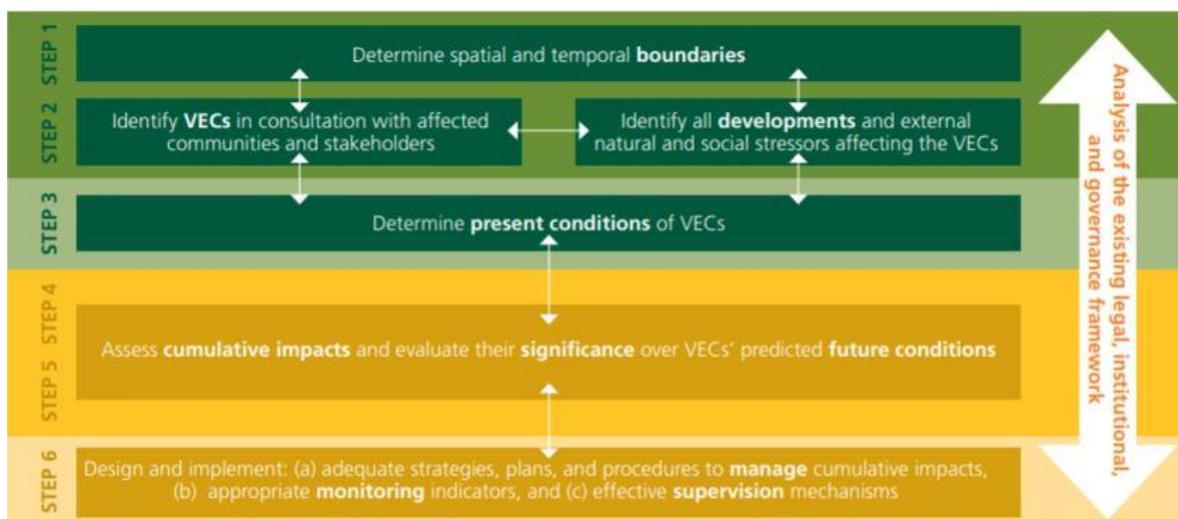
A RCIA will assess the potential impacts and risks of the project over time, in the context of potential effects from other developments and environmental and social external drivers on a chosen VEC, by verifying that the project's cumulative social and environmental impacts and risks will not exceed a threshold that could compromise the sustainability of selected VEC. As a result, a RCIA will confirm that cumulative social and environmental effects do not limit the project's feasibility. RCIA supports the development of governance structures for making decisions and managing cumulative impacts at the appropriate geographic scale, ensuring that the concerns of affected communities about the cumulative impacts of a proposed development are addressed.

It is an iterative and flexible process based on the IFC's six-step approach, shown in the Figure below.

1. Scoping Phase I – VECs, Spatial and Temporal Boundaries
2. Scoping Phase II – Other Projects and External Pressure Sources
3. Establish information on baseline status of VEC
4. Assess cumulative impacts on VEC
5. Assess significance of predicted cumulative impacts
6. Management of Cumulative Impacts

<sup>34</sup> International Finance Corporation (2015). *Manual of Good Practice Evaluation and Management of Cumulative Impacts: Guide for the Private Sector in Emerging Markets*. Washington DC.

**Figure 15.1 Cumulative Impact Assessment Process (IFC)**



Source: IFC 2015.

Following the indicated steps, cumulative impacts will be identified and assessed, considering that a cumulative impact includes two components:

- The anticipated future condition, which is the total effect of the other existing, and predictable future developments and external pressure sources, and
- The contribution of the development under evaluation to the cumulative impacts.

Within the RCIA context, the incremental impact of the project under review will be the difference between the condition of the VEC when impacted only by the other developments in the future baseline and the condition of the VEC when impacted by both the project under review and the future baseline impacts.

Based on the Project description, the spatial boundaries of the study area consider El Mataco, Garcia del Rio and San Jorge as the main local wind farms. The temporal boundary will be the next 3 years, including the Project's construction activities finishing on February 2020 and the first two years of the operation stage, in charge of Nordex, the EPC<sup>35</sup> contractor.

<sup>35</sup> Engineering, Procurement and Construction

## 15.2 Limitations

The information review involved desk review of available information, including existing ESIA's, and on-line public information. Thus, the scope of the assessment takes into account the typical limitations that a project developer may face in this type of evaluation, including:

- Lack of detailed VEC baseline information;
- Uncertainty regarding the execution of future projects;
- Incomplete information about other projects and activities (for example, if the information is not available in the public domain);
- Lack of provincial strategic plans, or integrated resource planning schemes.

## 15.3 Other Projects

This section identifies other Projects within the spatial and temporal boundaries of the cumulative impact assessment. It was based on information from existing environmental and social studies and information available in the public domain as well as observations during a field visit.

The scope of this assessment covers the following projects:

- El Mataco y San Jorge Wind Farm
- Garcia del Rio Wind Farm
- La Genoveva I & II Wind Farms
- La Castellana I & II Wind Farms
- Corti Wind Farm
- De la Bahía Wind Farm
- Vientos del Secano Wind Farm
- Wayra I & II Wind Farms

**Tabla 1 Wind Farms in a 100 km radius**

<u>Name</u>	<u>Distance from the Project</u>	<u>Phase</u>
<u>P.E. El Mataco</u>	<u>6 km</u>	<u>Construction</u>
<u>P.E. San Jorge</u>	<u>7 km</u>	<u>Construction</u>
<u>P.E. García Del Río</u>	<u>6 km</u>	<u>Operation</u>
<u>P.E. La Genoveva II</u>	<u>31 km</u>	<u>Development</u>
<u>P.E. La Genoveva</u>	<u>33 km</u>	<u>Development</u>
<u>P.E. Corti</u>	<u>36 km</u>	<u>Operation</u>
<u>P.E. Wayra I &amp; II</u>	<u>37 km</u>	<u>Development</u>
<u>P.E. De la Bahía</u>	<u>59 km</u>	<u>Development</u>
<u>P.E. La Castellana</u>	<u>52 km</u>	<u>Operation</u>
<u>P.E. La Castellana II</u>	<u>55 km</u>	<u>Development</u>
<u>P.E. Vientos del Secano</u>	<u>98 km</u>	<u>Development</u>

### 15.3.1 El Mataco y San Jorge Wind Farm

The company Luz de Tres Picos S.A. (business unit of the company PCR SA, renewable division) is developing the El Mataco I and San Jorge wind farms in the same property located on the National Route No. 33, at the height of the town of Tres Picos (Tornquist Party) in the Province of Buenos Aires, and 40 km north from the town of Bahía Blanca.

- It will be developed on an area of 4,500 hectares of private property about 40 km north of the city of Bahía Blanca.
- The Project Owner is "Luz de Tres Picos S.A".<sup>36</sup>
- The Parks as a whole are composed of 51 wind turbines, for a total power of 203.6 MW
- In total 51 towers of model V136 of the Vestas brand will be built, with an individual nominal power of 4.2mw and a height of almost 200 meters (130 corresponding to the tower and 68 to the blades)<sup>37</sup>
- The 51 wind turbines, 255 stretches will be transported by Route No. 33, from Santa Fe, and 205, from Greater Buenos Aires. From the Bahía Blanca port, 153 blades will be transported. They will use Route No. 33, then Sesquicentenario road and finally the Route No. 33.<sup>38</sup>
- The arrival of the towers will be completed between September and October, with a weekly frequency of 8 to 10 trips by truck (between 65 and 80 trips, in total). The shipment of blades, nacelles and bushings from Ingeniero White, will demand 10 to 12 weekly trips between August and January (240 to 290 trips).

### 15.3.2 García del Río Wind Farm

With the start of the development activities in 2008 García del Río was one of the very first projects of Sowitec and Enivison. The wind project is located in the Buenos Aires province 30 km north from the city of Bahía Blanca. It was designed as a small pilot project with 10 MW.

- It is located on lands belonging to Estancia "Lomas del Pinar", in a plot of 385 hectares, 35 km from the city of Bahía Blanca on Route 33,
- The Park is composed of 4 wind turbines of 2.5 MW, for a total power of 10 MW.<sup>39</sup>

### 15.3.3 La Genoveva Wind Farm

La Genoveva is a CP Renovables (a subsidiary of Central Puertos) project, consisting of two (2) phases, with 87 MW and 42 MW of power each. The first phase has 23 wind turbines, and the second 11<sup>40</sup>. The project is located in the Buenos Aires province, in Bahía Blanca, over Provincial Route No. 51. The Wind Farm is scheduled to come into service in June 2019<sup>41</sup>.

La Genoveva Wind Farm is located 33 km away from the Project.

<sup>36</sup> <https://www.lanueva.com/nota/2019-2-23-6-30-33-tornquist-los-parques-eolicos-el-mataco-y-san-jorge-van-tomando-forma>

<sup>37</sup> <https://www.energiaspatagonicas.com/energia/el-parque-eolico-el-mataco-y-san-jorge-inicia-su-etapa-de-construccion/>

<sup>38</sup> <https://www.lanueva.com/nota/2019-6-9-6-30-4-energia-eolica-en-julio-empezaran-a-llegar-51-aerogeneradores-a-tornquist>

<sup>39</sup> <http://uibb.org.ar/avances-para-la-construccion-del-parque-eolico-garcia-del-rio/>

<sup>40</sup> See: <http://www.centralpuerto.com/es/lugares/parque-eolico-la-genoveva/>

<sup>41</sup> See: <http://www.energiaestrategica.com/la-empresa-uruguay-ingener-construira-para-central-puerto-la-infraestructura-electrica-de-sus-parques-eolicos/>

### **15.3.4 La Castellana Wind Farm**

La Castellana is also a CP Renovables project, consisting of two (2) phases. The first phase has 32 wind turbines with a total 99 MW power and the second 4 with a total 15 MW power. The project is located in the Buenos Aires province, 33 km south from Bahía Blanca.

The first phase, La Castellana I, provides power since August 2018<sup>42</sup>. CP Renovables announced recently (June 2019) that it had achieved financial closure for the construction of La Castellana II, which is scheduled to come into service starting in the third quarter of 2019 (July 2019)<sup>43</sup>.

La Castellana Wind Farm is located 55 km away from the Project.

### **15.3.5 Corti Wind Farm**

Corti Wind Farm has 29 3.45 MW wind turbines, adding up to 100 MW power. Currently operational, it is developed, operated and owned by Pampa Energía. The project is located in the Buenos Aires province, 20 km northeast from Bahía Blanca. Corti came into service in May 2018<sup>44,45</sup>.

Corti is located 36 km from away the Project.

### **15.3.6 De la Bahía Wind Farm**

De la Bahía is a wind farm project developed by Pampa Energía, involving a US\$ 70 million investment in a 15 wind turbines farm, with a total 50 MW power<sup>46</sup>.

De la Bahía is located 59 km from away the Project.

### **15.3.7 Vientos del Secano Wind Farm**

Vientos del Secano Wind Farm is a Envision Project located south of the Buenos Aires province in the Mayor Buratovich locality. The project considered 20 2.5 MW wind turbines, for a total 50 MW power, and located in the Buenos Aires province, 115 km south from Bahía Blanca<sup>47</sup>. Project was scheduled to come into service on March 2019<sup>48</sup>.

Vientos del Secano is located 98 km away from the Project.

### **15.3.8 Wayra Wind Farm**

Wayra I Wind Farm is an Autotrol Renovables S.A. project, located in Bahía Blanca, in the Buenos Aires province. Project consists of 80 wind turbines, of 2.3 MW each, adding up to a 100 MW total power. Wayra has a second phase, Wayra II, which is also developed and owned by Autotrol Renovables S.A., with a 100 MW power<sup>49</sup>, and which as of November 2018, was also already developed and awaiting access to power transportation<sup>50</sup>.

Wayra I & II is located 37 km away from the Project.

<sup>42</sup> See: <https://www.argentina.gob.ar/noticias/el-ministro-iguacel-inauguro-el-parque-eolico-la-castellana>

<sup>43</sup> See: <https://www.cprenovables.com.ar/noticias-y-novedades/proyect-finance-para-el-pe-la-castellana-ii-un-proyecto-financiado-por-banco-galicia/>

<sup>44</sup> See: <https://www.lanacion.com.ar/economia/energias-renovables-en-que-consiste-el-parque-eolico-corti-que-inaugurara-macri-en-bahia-blanca-nid2137121>

<sup>45</sup> See: [https://www.thewindpower.net/windfarm\\_es\\_24063\\_corti.php](https://www.thewindpower.net/windfarm_es_24063_corti.php)

<sup>46</sup> See: <http://inbahiablanca.info/nota-principal/avanza-la-construccion-del-parque-eolico-de-la-bahia>

<sup>47</sup> See: [https://www.iic.org/sites/default/files/disclosures/eia\\_-\\_habilitacion\\_ambiental\\_-\\_vientos\\_del\\_secano.pdf](https://www.iic.org/sites/default/files/disclosures/eia_-_habilitacion_ambiental_-_vientos_del_secano.pdf)

<sup>48</sup> See: <http://revistanuevasenergias.com/2018/08/22/vientos-del-secano-contara-con-una-capacidad-de-50-mw-para-el-2019/>

<sup>49</sup> See: <http://www.autotrol.net/es/pdfs/proyecto-wayra.pdf>

<sup>50</sup> See: <http://portalweb.cammesa.com/Documentos%20compartidos/Noticias/RESFC-2018-262-APN-DIRECTORIO-ENRE.pdf>

## 15.4 Valued Environmental Components (VEC)

VECs are environmental and social components valued and considered as the final recipients of cumulative impacts. To be included in this assessment, it must first be demonstrated that an environmental and social component is valued by at least one stakeholder, be it the national or international scientific community or a national, regional or local group.

VECs are environmental and social attributes that are considered to be important in assessing risks; they may be:

- physical features, habitats, wildlife populations (e.g., biodiversity),
- ecosystem services,
- natural processes (e.g., water and nutrient cycles, microclimate),
- social conditions (e.g., health, economics), or
- cultural aspects (e.g., traditional spiritual ceremonies).

While VEC may be directly or indirectly affected by the project, they are often also affected by the cumulative effects of several other projects. VEC are the ultimate recipient of impacts because they tend to be at the ends of ecological pathways. Then, the VEC must be affected by both the Project and a combination of the Other Projects. If any VEC is affected by the Project, but not by the Other Projects or vice versa, this VEC will not be included.

During the establishment of the scope, the impacts to VEC were used as a basis. Based on the information reviewed, the following VEC reflect the concern of the professional community, affected communities and the government entities consulted during the site visit:

- Local Employment
- Increase in vehicular traffic
- Induced migration
- Landscape modification
- Birds diversity

**Table 15-1 Selection of VEC's**

VEC*	Valued by stakeholders	Probability of being affected by the Project	Potentially affected by other projects	Probability of being affected by one or more external factors
Local employment	Yes	Yes	Yes	No
Increased transit of vehicles	Yes	Yes	Yes	Yes
Induced migration	Yes	Yes	Yes	Yes
Landscape modification	Yes	Yes	Yes	No
Birds diversity	Yes	Yes	Yes	No

\* The VEC's are limited to the information related to the other projects in the area and the low probability of being affected by the Project.

Source: (ERM, 2019)

## 15.5 External Pressure Sources

### 15.5.1 Tourist flow

The Party of Tornquist is a party of the province of Buenos Aires, that is located south of the province and its capital is the city of Tornquist. Tornquist is characterized by having plains with elevations. In the northeast is the Ventania System. The most important elevations are Cerro Tres Picos, Cerro La Ventana, Cerro Napostá and Cerro Cura Malal Grande. The landscape of hills, is complemented by the various streams and lagoons of the area.

The mountains are the main tourist attraction. All the Comarca Serrana, and mainly the towns of Sierra de la Ventana and Villa Ventana are the most visited, by tourism focused on nature and extreme sports. According to the authorities, in high season, they can receive up to 7 thousand tourists in formal places, such as hotels. However, a big part of the tourism is ecotourism, and it is hosted in camping areas, so there is no clarity on the number of tourists visiting the region.

## 15.6 Cumulative Impact Assessment

The significance of a cumulative impact is evaluated in terms of the effect of vulnerability and / or risk to the sustainability of the integral condition of the VEC. Being limited by the information available in the public domain and the information generated by existing environmental and social studies, the cumulative impact assessment was mainly qualitative and descriptive.

Its significance was prioritized, following the following definitions:

- **Major Priority:** it is necessary to take action in the short term to mitigate the adverse cumulative effects, considered of greater significance, which are currently occurring on the VEC and that the Project would contribute,
- **Medium Priority:** action is required in the medium term to mitigate the potential adverse cumulative effects that could occur on the VEC and,
- **Minor Priority:** no action is required, since the expected cumulative adverse effects on the VEC are considered less significant.

### 15.6.1 Local Employment

There are no official estimates of the amount of local labor required for the different Projects. However, according to media, local workers are going to be needed for the construction stages of the projects. Wind farms are looking to hire local workers for formwork and metal structures, welders, electricians and security personnel.<sup>51</sup> When it comes to Energetica wind farm, it is foreseen that the project can generate employment sources for local people.

Besides direct jobs, the demand for local goods and services and indirect jobs are going to rise in the municipalities that will host the workforce. These workers will require goods and services to satisfy their basic needs, and will benefit existent and new businesses by increasing their commercial activity. Among the required goods and services are lodging, catering and/or restaurants, laundry shops, etc. Indirect employment, typically expressed in number of indirect jobs created for each direct job generated by the industry, is difficult to estimate even with proper data. Based on the nature of these projects (which are capital- and not labor-intensive), the significance of the impact on demand of local goods and services would not be high. Nevertheless, based on the level of development that is to come, the significance of the generation of direct and indirect employment on an accumulated level is likely to be of **medium priority**.

### 15.6.2 Increased transit of vehicles

Considering the presence of several projects in the area, all of which have access to the National Route N° 33, a transit cumulative impact may generate negative impacts to the local population.

These impacts may increase during construction stage when Projects required more equipment, goods and workers. Although information related to flows of personnel and equipment during the construction stage was not available for this assessment, trucks and other vehicles transporting personnel, supplies and equipment to and from the project are expected to increase.

The increase in vehicular transit, risk of accidents, increased particulate matter and noise due to the increased presence of vehicles and time of transportation are negative, temporary (construction stage) and local in extension. Finally, this cumulative impact has been considered of **medium priority**.

### 15.6.3 Induced migration

The arrival of workers to the Project's area of influence will increase the number of inhabitants and the subsequent demand of accommodation services.

Facilities located in Tres Picos and Tornquist could be not enough to accommodate all Project workers. According to the information collected in the field visit, there is infrastructure to receive up to 7 thousand visitors, however, is focused on tourism and in high season they are busy. It is not clear how the Projects will manage the workers flow. There is no supply and demand analysis to know the local offer to cover the Projects demand.

Additionally, as an indirect impact, the saturation of accommodation services will affect the local demand for tourist services, such as restaurants, sport-fishing equipment, tire chains rental, etc. Clearly, tourist spend more money than workers do. Since the largest hiring of workers will be local, and the contribution of foreign workers to the area will be mainly during the construction period of the project, the cumulative impact is considered to be temporary.

Still, based on the scenario above described, it is considered of **major priority**, since action on the short term is required in order to prevent and/or mitigate negative impacts associated with the saturation of accommodations services.

<sup>51</sup> <https://www.infocampo.com.ar/instalacion-dos-parques-eolicos-en-tornquist/>

### 15.6.4 Landscape modification

According to the information collected during the field visit, the main economic activity of the region is tourism, especially ecotourism. This is why there is a concern that the wind farms that are developing in the region affect the landscape in a negative way and scare away tourists more focused on nature. There is also a vision that wind parks can be a visual attraction and contribute to the landscape as sources of renewable energy. For this reason, it is considered of **minor priority**, since it is very likely that it will have a positive impact on the region.

### 15.6.5 Birds diversity

With regards to biodiversity, the grouping of wind farms in the area multiplies their negative effects on birds and bats, increasing the barrier effect and the number of collisions. However, only birds and not bats, are considered as VEC because, according to records obtained from databases, in this area few records of individuals and species of bats have been reported and the species with potential distribution are included under Least Concern (LC) category.

A total of 234 potentially distributed species were identified for the area of study, of which fifteen are in a risk category according to the IUCN and four species are classified high priority by Palmer, R., Gordon, C., & Petracci, P (2017). The receptor sensitivity has been assessed as high because according to records obtained from biodiversity databases, this area is considered a relevant site for the transit of some species of birds.

Mitigation measures that include biodiversity surveillance require robust monitoring programs and bird mortality registry and coordination with the other activities in the area with potential negative impacts. It is also required the reporting to the environmental authority as requested by the environmental license. Due to the lack of information of specific migratory routes and flight height of the species and the potential presence of endangered species, the necessity to take action in the short term to mitigate the potential adverse cumulative effects is considered of greater significance, for this reason this cumulative impact is considered of **major priority**.

## 15.7 Cumulative Impact Management Framework

The effective management of cumulative impacts requires a stakeholder consultation and a collaboration of all parties that contribute to these cumulative impacts. In many cases, a minor impact of a project can result in a significant cumulative impact on a VEC. Consequently, the effective management of negative cumulative impacts transcends the capacity of a single interested party and therefore a management on two fronts is recommended:

- Apply a hierarchical mitigation methodology of the environmental and social impacts management generated by different projects on the VEC (ecological or human): Avoid, Minimize, Compensate.
- Develop a collaborative approach of all stakeholders to implement collective management measures, since cumulative impacts cannot be managed at a single project level. The creation of a provincial framework for the management of cumulative impacts is essential.

The management of cumulative effects is the shared responsibility of various proponents and actors. The proponent of a project can take actions to minimize the contribution of its individual effects to cumulative effects. If individual actions are not sufficient to mitigate cumulative impacts, collaborative efforts, usually at a provincial level, are required (IFC 2013). The strategy of collaborative efforts depends on the complexity of cumulative effects and can range from information exchange between proponents to multidisciplinary working groups and provincial initiatives (Franks et al 2010).

Ideally, cumulative impact management should be led by government entities that have direct influence on proponents, in order to identify the contributions of each actor and establish the mechanism to handle the cumulative effects. International best practice establishes that individual proponents should mitigate the

effects generated by their project and, at a minimum, support and influence cumulative effects management strategies (IFC 2013).

According to the evaluation, in the constructive phase, the VEC with negative cumulative impacts are the increased transit of vehicles, the induced migration, and landscape modification, although it is an impact based on perception it also has a positive dimension. It should be noted that cumulative effects are accentuated by External Pressure Sources, such as the tourist flow.

### **15.7.1 Project Management**

At the Project level, the following actions should be performed:

- Develop and implement communication and information plans associated with the cumulative impacts of increased transit of vehicles and the induced migration, both at the construction stage.
- Participate in working groups with the authorities of the Provincial Government of Buenos Aires, the Municipalities of Tornquist and Bahia Blanca Development Commission, to address a joint strategy for the management of the increase of vehicular congestion.

Regarding the second item, according to IFC, the collaborative nature of cumulative impact management translates into the need to implement joint actions with other actors, which generally include the promoters of other projects, government agencies, affected communities and groups of experts. The responsibility of the Project lies in the following:

- Interact and actively collaborate with cumulative impact management strategies and other existing provincial strategies;
- Participate and promote the participation of third parties in provincial monitoring programs that contribute to establishing the magnitude and importance of the cumulative impacts on the condition of a VEC.
- AES will promote the creation of a technical committee that include local authorities and scientific community from the area to exchange information on the potential impacts on birds and other biological groups. AES will also promote the design of joint strategies with the aim to minimize the impact on birds.

## 15.7.2 Provincial Management

Based on the complexity of the cumulative effects and the different actors involved, it is recommended to participate in provincial working groups for the management of cumulative effects. The purpose of these spaces will be to confirm the priority of affected VECs, share information and experiences, coordinate joint efforts to mitigate cumulative effects, and encourage or improve strategies at that level.

The working groups should include the collective participation of stakeholders related to the VEC: national, provincial and local government entities; project developers; affected communities and non-governmental entities.

It is expected that technical committees will be set up to manage the different topics that affect the VEC, mainly the increased transit of vehicles and the induced migration.

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## 16. COMMUNITY HEALTH, SAFETY AND SECURITY

This section is presented as a supplement of the ESIA for the Project in relation to the Equator Principle 3 and the Performance Standard 4 of the International Finance Corporation, to include the identification of the Project areas where accidents and emergencies may occur in which communities and individuals may be affected.

The following Project activities are considered relevant during the Construction, Operation and Maintenance stages in order to assess the risks on community health, safety and security:

- Construction Stage (> 200 employed personnel)
  - Perform the topographic survey of the site of work and their corresponding accesses
  - Carry out the necessary geotechnical studies for the definition of the corresponding foundations
  - In the case of wind turbine foundations, all those geotechnical studies that meet the supplier's requirements will be executed
  - Opening of the Power Line and the Transformer Station, according to the current regulations
  - Perform all the adaptations and verifications of the basic engineering
  - Installation of temporary gates and fences
  - Installation of temporary facilities (changing rooms and dining rooms)
  - Installation of chemical toilets for construction personnel
  - Temporary installation of electricity, water, toilets, and communications
  - Creation of an oil and lubricant deposit area
  - Cleaning the area
  - Transportation and assembly of wind turbines
  - Transportation of materials, equipment and personnel

Other negative effects on community health for this project are not expected related to influx of workers given that most of these are based in nearby towns or the city of Bahía Blanca.

- Operation and Maintenance Stage (15 employed personnel):
  - Installation of a Real Time Operation System with SCADA
  - Scheduled maintenance of wind turbines (routine, every 6 months, every year, every 2 years)
  - Scheduled maintenance of electrical infrastructure
  - Scheduled maintenance of civil infrastructure
  - Hazardous waste generation
  - Noise generation of mechanical and aerodynamic origin

*Risk description related to construction, operation and decommissioning activities*

According to the electromagnetic effects study carried out as part of the Project's ESIA, compliance with the limits established by current legislation is verified (Resolution No. 77/98 of the Energy Secretariat). Therefore, no impacts on public health and safety related to the generation of contact voltages or to permanent exposure to electromagnetic fields are identified.

Other potential impacts that could result from the Project are:

Community safety issues that may arise with public access to wind turbines or to the wind energy facility substation. (For example, unauthorized climbing of the turbines)

Emergencies that may result in risks to human health, property, or the environment, either within the facility or in the local community.

*Mitigation measures*

The following list of mitigation measures will be implemented in order to mitigate risks on community health and safety:

- Public access to the Project's facilities must be limited by:
  - The use of gates on access roads.
  - Where public access is not promoted to the site and/or there are no current rights of way across the site, consider fencing the wind energy facility site, or individual turbines, to prohibit public access to the turbines.
  - Provide fencing of an appropriate standard around the substation with anti-climb paint and warning signs.
  - Prevent access to turbine tower ladders.
  - Post information boards about public safety hazards and emergency contact information.
- Accident prevention measures that consider the Affected Communities.
- An Emergency Preparedness and Response Plan that considers Affected Communities.

*Residual Impact Evaluation*

Considering the dispersion of the identified rural population centers of the Area of Influence, the impact to community, health, safety and security is assessed as Negligible.

Impact Rating for Community Health, Safety and Security

Negligible

## 17. TRANSPORTATION ROUTE ASSESSMENT

This section discusses existing traffic and transportation conditions and facilities, as well as the Project’s potential impacts on local and regional transportation during the construction and decommissioning phases. ERM understands that AES has received authorization to begin site preparation, construction of the substation, and installation of 6 of 30 WTGs at the Energetica site. As a result, this section evaluates the traffic and transportation impacts associated with remaining site preparation and installation of the remaining 24 WTGs.

Because Project operation would involve minimal vehicular traffic, Project operations will have minimal impacts on transportation, and the operations phase is not discussed any further.

### 17.1 Baseline

This section provides a summary of the baseline traffic characteristics and traffic safety concerns along the roads used to transport Project components, personnel, materials, and supplies during Project construction (see also Appendix E).

Baseline data were collected through desktop data search only.

#### 17.1.1 Existing Traffic Network and Proposed Itineraries for Project Supplies

The main component of materials required for this project will be transported from Puerto Galván in Bahía Blanca. The materials include WTG blades and all other WTG components (i.e., nacelles, hubs, tower segments, etc.), which will be transported by truck.

Vehicles carrying WTG components are extremely heavy, wide, and long. They can weigh several hundred tons, and require trailer trucks with up to 42 axles. In 2018, ALE (on behalf of Nordex) prepared studies of the travel routes for WTG components from Bahía Blanca. The intent of these studies was to identify feasible travel routes WTG components. These evaluations considered the ability of roads to support the weight of WTG components, as well as the physical space necessary at intersections and curves—i.e., to ensure that turning movements could be completed without damage to surrounding structures and property. The next table describes the resultant routes for Project vehicles traveling to the site from Bahía Blanca.

**Table 17-1 Route from Bahia Blanca to the Project Site**

Road	Segment	Distance Utilized (km)	Road Type	Lanes	Pavement
18 de Julio/RN252	Puerto Galvin - RN3	4.4	Local Road	2	Asphalt
RN3	RN3 - RN33	8.9	National Route	2-4	Asphalt
RN33	RN33 – Project Site	32.4	National Route	2	Asphalt

*RN = Ruta Nacional; RP = Ruta Provincial*

*Source: Google Maps, 2019*

The paved roads listed in Table 17-1, generally have a paved width of about 6 to 8 meters, and have gravel shoulders. Some segments are unpaved. Within cities or other settlements, the roads often have multiple lanes in each direction, center medians, and dedicated turn lanes. Other affected roads, such as those leading from ports to national routes, have varying characteristics.

The primary route, RN33 is a major arterial road with significant buffers from surrounding development that goes around, rather than through Bahía Blanca. RN33 bypasses small towns north of Bahía Blanca. Residential and commercial development along RN33 is typically set back from the edge of the roadway, typically 40m in developed areas at the edge of Bahía Blanca. Setbacks are 5-10m along 18 de Julio and RN3 near the port (see also Appendix E).

Next table show the range of average annual daily traffic (AADT) for all National Routes along the proposed routes. No traffic volume data were available for provincial and local roads.

**Table 17-2 Average Annual Daily Traffic for National Routes**

Road	Segment	AADT/TMDA
18 de Julio/ RN252	Puerto Galvan - RN3	4,001 – 10,000
RN3	RN3 - RN33	>10,000
RN33	RN33 – Project Site	>10,000

Source: Ministerio de Transporte 2019<sup>52</sup>

No readily available data or studies describe known points of congestion or delay along the proposed routes. The Google Maps traffic visualization tool suggests that traffic is generally free flowing, with minor delays and slow areas on roads in Bahía Blanca. These delays typically occur only at peak traffic hours in the morning and evening. (Google 2019).<sup>53</sup>

### 17.1.2 Condition of Transportation Infrastructure

Based on photos taken of the project site, the roads in Table 17-1 are generally in good condition, and are well maintained. On major highways and roads, pavement markings and signage are generally intact and potholes and cracks are not prevalent.

### 17.1.3 Transportation Safety

Traffic volumes listed in tables Table 17-1 suggest relatively moderate to high amounts of traffic in the area. However, based on the Google Maps traffic visualization tool, traffic is typically free-flowing and without congestion along the proposed routes. Crash rates are likely to be low to moderate in and around the cities and low along highways and along rural parts of the route.

## 17.2 Impacts

Traffic associated with Project construction could impact existing transportation conditions and resources in three primary ways: increased congestion or delay, degradation of affected road infrastructure, and increased transportation safety risk. This section discusses the Project's transportation impacts, based on the impact assessment framework provided in this Section.

This section discusses the Project's transportation impacts, based on the impact assessment framework provided in Section 8.1. Impacts associated with Project decommissioning are expected to be similar to those experienced during construction; therefore, decommissioning is not discussed in any further specific detail.

### 17.2.1 Project Activities Impacting Transportation Resources

Project construction would involve the following activities with the potential to affect transportation:

- The movement of WTG components from ports to the Project site. Each WTG would require 10 separate haul movements (Scudelati 2017), all of which will be oversized loads—either extremely long, an in the case of the blades or towers segments, or wide and/or heavy, for nacelles and other

<sup>52</sup> Ministerio de Transporte. 2019. Sistema de Información Geográfica (SIG) de la Dirección Nacional de Vialidad (SIG-Vial). <https://www.argentina.gob.ar/vialidad-nacional/sig-vial>

<sup>53</sup> The “typical traffic” tool shows the generalized average speed of traffic, based on historical data collected from smartphones running on Android software. These data are only published visually (i.e., specific speeds are not provided). Google does not provide data on traffic congestion, volume, or mode of transportation. Google. 2019. *Plan Your Commute or Trip*. <https://support.google.com/maps/answer/7565193?co=GENIE.Platform%3DAndroid&hl=en>

components. Project construction would require a total of 240 round-trips to deliver components of the 24 remaining WTGs;

- Worker bus trips to and from the Project site. Existing work at the Project site has already reached peak construction activity, with a maximum of approximately 580 employees on site. This analysis assumes that all workers would travel to the Project site from Bahía Blanca, and that an average of four workers would be carried in each vehicle or minibus, resulting in about 150 worker round trips per day;
- Delivery of construction materials (i.e., aggregate, concrete rebar, piping, or other special materials); substation, transmission line, and telecommunication components;
- Delivery of construction equipment to and from the site; and
- Consumable supplies (water, petrol, etc.).

Construction materials, equipment, and consumable supplies would be delivered via conventional trucks (i.e., tractor-trailers or dumpers). The Project has not determined the number of such truck trips; however, the Project will likely generate several truck trips per day during construction.

This SLIP assumes that wind turbine component deliveries would include front and rear escort vehicles and/or police vehicles to halt or otherwise manage non-Project traffic. Escort vehicles would have exterior flashing lights, flags, high visibility markings, and other identifying characteristics, as required by law. Pilot vehicles should be equipped with radios or other communication systems to maintain contact with the escorted truck and other escort drivers. Consistent with international best practice, this SLIP also assumes that escort and police vehicles would be supplemented with flaggers and spotters at key locations, to reduce or avoid damage to infrastructure or property.

### 17.2.2 Receptor Sensitivity

Receptors for transportation impacts include other users of the public roads described in Section 17. Outside of Bahía Blanca, these users are likely to be unaccustomed to frequent heavy-truck traffic or substantial congestion; however, as residents of a generally rural part of Argentina, these users likely have experience dealing with unexpected road conditions. As a result, based on the methodology used for described in Section 8.1, receptor sensitivity for transportation impacts is medium.

### 17.2.3 Discussion of Impacts

This section discusses transportation impacts in terms of congestion and delay, transportation infrastructure, and transportation safety.

#### 17.2.3.1 Traffic Congestion and Delay

As described above, vehicles carrying WTG components are extremely large. These trucks are oversized loads that could require more than just a single lane on straight-line road segments. At intersections or sharp curves, WTG component trucks would likely block the entire intersection or road. Trucks carrying WTG components would also move at slower speeds and would be dangerous to pass.

As a result, delivery of WTG components would cause temporary delays for non-Project road users. Vehicles following the trucks' paths would be delayed by the slow speed of the trucks and the inability to safely pass. Vehicles traveling in the opposite direction would need to slow to pass on straight road segments, and may need to stop entirely on curves or at intersections (including those near delivery ports).

Some construction equipment may also require oversize-load trucks, although substantially smaller than trucks carrying WTG components.

Other Project trucks and buses would be similar in size and weight to trucks normally seen on public roads throughout Argentina. These truck trips would typically represent an incremental increase in existing traffic, and would not likely generate congestion or delay.

Overall, delays and for non-Project road users would be sporadic, and would primarily be associated with movement of the WTG components. While some non-Project road users may find delays to be unacceptable, Project activities would not prevent non-Project road users from reaching their destination, and would not permanently block access to other roads or uses. AES states that they have not observed notable congestion or delay on public roads due to Project traffic. Project-related traffic would also be temporary, lasting for less than one year. As a result, Project-related traffic congestion and delay would have a low magnitude, and the Project's overall impacts on traffic congestion and delay would be **minor**.

### 17.2.3.2 Degradation of Transportation Infrastructure

Project vehicles, especially the extremely large vehicles carrying heavy components, could degrade roads faster than typical automobiles, particularly along pavement edges or where cracks or potholes already exist. As described above, each WTG component trip would be carefully managed with pilot vehicles, flaggers, and spotters. Based on the Nordex studies, the bridges, culverts, and pavement, on these roads would be sufficient to support the WTG components. Other Project-related heavy vehicles would be similar to non-Project heavy vehicles commonly present on public roads. Due to the number of Project-related truck trips and the physical characteristics of trucks carrying WTG components (e.g.: number of axis to distribute for proper weight distribution), Project-related road degradation would have a medium magnitude, and the Project's overall impacts on the road infrastructure would be **moderate**.

### 17.2.3.3 Transportation Safety Impacts

The Project would affect transportation safety through physical intrusion into other traffic and through increased traffic volume. To avoid trucks carrying WTG components, non-Project vehicles may need to (or may be directed to) pull onto the gravel shoulders to allow larger vehicles to pass. In cases where non-Project traffic must stop altogether (such as at intersections or on sharp curves), vehicles approaching stopped traffic if not sufficiently warned. Project-related traffic could also delay emergency response.

The risk of a crash or injury generally increases as overall traffic volume increases, and is generally higher in urban areas, which have higher traffic volumes and land uses closer to the roadway. The presence of heavy trucks, which have longer stopping distances and more momentum in a crash, also increases the risk and severity of traffic incidents. Excluding trucks carrying WTG components, the overall increase in Project traffic would thus incrementally increase transportation safety risks. Adverse weather, including wind, rain, and snow, would also increase transportation safety risks, a risk that would be higher for heavy trucks, particularly for trucks hauling WTG components.

As stated in Section 17, AES determined that the identified route to the Project site from Bahía Blanca was feasible without damage to surrounding properties or structures. As a result, Project construction would not require any displacement of residents or businesses in these areas. In some cases, transport of WTG components could require temporary removal of roadside signage or streetlights.

Overall, Project-related increases in transportation safety risk would have a medium magnitude, and the Project's overall impacts on transportation safety would be **moderate**.

## 17.3 Mitigation Measures and Residual Impact

Recommended mitigation measures to address the transportation impacts described in Section 8.3.2 include speed controls, GPS tracking, driver training, maintenance requirements, use of convoys, and time-of-day travel restrictions.

- Speed limits, as well as speed governor and GPS tracking devices installed on Project vehicles.
- Requirements that all Project drivers are trained and certified to drive their assigned vehicles, especially vehicles hauling WTG components.
- Completion and documentation of regular preventative maintenance, as well as as-needed maintenance on Project vehicles.

- Grouping of Project trucks (including, but not limited to trucks carrying WTG components) into convoys (multiple large trucks traveling together, with front and rear escort vehicles) would avoid some potential traffic and transportation impacts, such as by maintaining proper speed. Convoys would also consolidate traffic delays and congestion. While it would take longer for a convoy to pass a given location, use of a convoy would reduce the number of instances of such delays.
- Project truck trips—specifically trucks hauling WTG components—should be scheduled to avoid the busiest time of day on public roads. These “peak” hours typically occur in the morning and afternoon but would be determined through consultation with local authorities. This could include night time travel for some truck trips. Consolidating truck travel outside of peak hours would reduce congestion and delay, and would reduce the risk of crashes or other incidents.

The tables below summarize the Project’s impacts on congestion and delay, infrastructure degradation, and transportation safety, considering the mitigation measures described above.

<i>Impact description</i>	
Traffic congestion and delay	
<i>Mitigation measures</i>	
Speed controls, GPS tracking, driver training, maintenance requirements, use of convoys, and time-of-day travel restrictions.	
<i>Residual Impact evaluation</i>	
Use of mitigation measures would reduce the pre-mitigation impacts.	
Impact Rating for traffic congestion and delay	Minor

<i>Impact description</i>	
Degradation of road infrastructure	
<i>Mitigation measures</i>	
None	
<i>Residual Impact evaluation</i>	
None	
Impact Rating for road infrastructure degradation	Moderate

<i>Impact description</i>	
Transportation safety risk	
<i>Mitigation measures</i>	
Speed controls, GPS tracking, driver training, maintenance requirements, use of convoys, and time-of-day travel restrictions.	
<i>Residual Impact evaluation</i>	
Use of mitigation measures would reduce the pre-mitigation impacts.	
Impact Rating for traffic congestion and delay	Minor

## 18. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

This Section present a summary of the measures committed by AES to control, mitigate and monitor the impacts that were identified in this SLIP.

Impact	Project Phase	Management Plan	Responsibility for ensuring implementation	Means of verification that mitigation has been implemented	Timelines/Frequency	Supervision responsibility	Reporting requirements
Impacts on Flora	Site preparation and construction	<ul style="list-style-type: none"> <li>For maneuvers of heavy/large machinery, the clearance of the ground should be limited to what is strictly necessary in order to reduce the disturbance of existing vegetation.</li> <li>Once the works are finished, the temporarily affected surfaces will be covered respecting the edaphic sequence, preserving the organic soil and with the suitable measures of restitution of the fertile layer.</li> <li>All vehicles and machinery entering the site will be in a good state of maintenance and have the Vehicle Technical Verification certificate in force to date.</li> <li>Assisted translocation.</li> <li>Spontaneous repopulation of open spaces from seed sources of neighboring populations.</li> <li>Assisted repopulation through rolls of seeds of native species.</li> </ul>	Energética	<ul style="list-style-type: none"> <li>Vehicle Technical Verification certificate in all vehicles.</li> <li>Report of the assisted translocation.</li> <li>Photographic evidence of the assisted repopulation of vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>After the construction phase and maintenance during the operation.</li> </ul>	<ul style="list-style-type: none"> <li>Energética HSE Department</li> </ul>	<ul style="list-style-type: none"> <li>Report from site HSE Officer of Energética Contractor to Energética HSE Department</li> </ul>
	Operation	<ul style="list-style-type: none"> <li>Monitoring of the restoration of vegetation cover process on the property affected</li> </ul>	Energética	<ul style="list-style-type: none"> <li>Photographic evidence of the restoration vegetation cover process.</li> </ul>	<ul style="list-style-type: none"> <li>During operation</li> </ul>	<ul style="list-style-type: none"> <li>Energética HSE Department</li> </ul>	<ul style="list-style-type: none"> <li>Report from site HSE Officer of Energética Contractor to Energética HSE Department.</li> </ul>
Impacts on Terrestrial Fauna	Site preparation and construction	<ul style="list-style-type: none"> <li>In case of finding a cave or nest of wild fauna, it is necessary to work with extreme care, avoiding producing damages to the specimens. If necessary, they should be moved to a safe place; this should be done by a qualified professional in the subject.</li> <li>Avoid leaving excavations or trenches open for a long time. If necessary, they should be adequately covered to prevent animals from falling.</li> <li>It is suggested that -through the methodology of counting points and vantage points- the surveys in order to establish the presence, abundance, seasonality and use of airspace for all species in general, with emphasis on the species mentioned in the fauna baseline of Addendum 2 of the ESIA are continued.</li> <li>Prepare a protocol of procedures for personnel working in the wind farm, which establishes the steps to follow in case of encounters with the species of the Xenartros group.</li> <li>In the case of the Pajonal Cat, it is suggested to survey the area, establish its abundance for the place, and develop outreach tasks with the local inhabitants in order to raise awareness about the situation of the species.</li> </ul>	Energética	<ul style="list-style-type: none"> <li>Report of the nests relocation.</li> <li>Results of the surveys of the use of airspaces for all spaces in general.</li> <li>Procedures for personnel working in the wind farm, regarding Xenartros group.</li> <li>Results of the surveys for the Pajonal Cat</li> </ul>	<ul style="list-style-type: none"> <li>During site preparation and construction</li> </ul>	<ul style="list-style-type: none"> <li>Energética HSE Department</li> </ul>	<ul style="list-style-type: none"> <li>Report from site HSE Officer of Energética Contractor to Energética HSE Department.</li> </ul>
Impacts on Birds	Operation	<ul style="list-style-type: none"> <li>Maintain a bird mortality register for the windfarm, recording all carcasses within 500 m of any project element and apply temporary shutdown, to lock the rotors in place during peak migration periods or relocation of towers if mortality is significant.</li> <li>Complete a one of pre-operation baseline survey using best international practices. Findings will inform this management plan to evaluate adaptive mitigation and management measures.</li> <li>Avoid the use of red lights to minimize the attraction bird species.</li> <li>A system of flashing strobe lights or LEDs shall be used on the turbines to be visible at night. Constant light should not be used at night, as it may attract nocturnal migrants or predatory birds.</li> </ul>	Energética	<ul style="list-style-type: none"> <li>Site inspection</li> <li>Register of bird mortality</li> </ul>	<ul style="list-style-type: none"> <li>During operation</li> </ul>	<ul style="list-style-type: none"> <li>Energética HSE Department</li> </ul>	<ul style="list-style-type: none"> <li>Report from site HSE Officer of Energética Contractor to Energética HSE Department</li> </ul>

Impact	Project Phase	Management Plan	Responsibility for ensuring implementation	Means of verification that mitigation has been implemented	Timelines/Frequency	Supervision responsibility	Reporting requirements
		<ul style="list-style-type: none"> <li>The number of lights placed in the wind turbines should not be greater than necessary for aviation, to affect as little as possible migratory birds or nocturnal habits.</li> <li>Use of strobe white lighting in the towers (with the longest possible interval between pulses, and the pulses synchronized for all turbines within the wind farm).</li> <li>Regular checking of the vacuums or holes in the towers for nesting bird species must be done.</li> </ul>					
Impacts on Bats	Site preparation and construction	<ul style="list-style-type: none"> <li>Implementation a monitoring program during the pre-construction stage of annual duration, which allows establishing the presence and abundance of the different species of bats. This study should be approached using ultrasound sampling methodologies</li> </ul>	Energética	<ul style="list-style-type: none"> <li>Results of the monitoring program</li> </ul>	<ul style="list-style-type: none"> <li>One year before the construction stage</li> </ul>	<ul style="list-style-type: none"> <li>Energética HSE Department</li> </ul>	<ul style="list-style-type: none"> <li>Report from site HSE Officer of Energética Contractor to Energética HSE Department</li> </ul>
	Operation	<ul style="list-style-type: none"> <li>Use of the starting speed<sup>54</sup> to avoid the impact of collisions and barotrauma</li> <li>Maintain a bat mortality registry, recording all carcasses within 500 m of any project element and apply temporary shutdown, to lock the rotors in place during peak migration periods or relocation of towers if mortality is significant.</li> </ul>	Energética	<ul style="list-style-type: none"> <li>Site inspection</li> </ul>	<ul style="list-style-type: none"> <li>During operation</li> </ul>	<ul style="list-style-type: none"> <li>Energética HSE Department</li> </ul>	<ul style="list-style-type: none"> <li>Report from site HSE Officer of Energética Contractor to Energética HSE Department</li> </ul>
Impacts from Noise	Operation	<ul style="list-style-type: none"> <li>Design and conduct a monitoring program for the operational stage according to the IEC 61400-11 Wind Turbines – Part 11: Acoustic Measurement Techniques (2006) as required by the Wind Energy Environmental Health and Safety Guideline (IFC, 2015).</li> <li>Establishing a stakeholder engagement plan and grievance process to assess, monitor, and report on nuisance perceived by third parties if affected by Project noise.</li> <li>Operating turbines in reduced noise mode.</li> <li>If needed, building walls/appropriate noise barriers around potentially affected buildings.</li> <li>Curtailing turbine operations above the wind speed at which turbine noise becomes unacceptable in the project-specific circumstances.</li> <li>Regular maintenance of wind turbines.</li> </ul>	Energética	<ul style="list-style-type: none"> <li>Results from noise monitoring</li> <li>Site inspection</li> <li>Maintenance logbook</li> </ul>	<ul style="list-style-type: none"> <li>Before and during operation</li> </ul>	<ul style="list-style-type: none"> <li>Energética HSE Department</li> </ul>	<ul style="list-style-type: none"> <li>Report from site HSE Officer of Energética Contractor to Energética HSE Department</li> </ul>
Impacts from Corona Effect	Operation	<p>Monitoring Program that allows to control and register:</p> <ul style="list-style-type: none"> <li>Electric field -Res. ENRE 1.724/98-</li> <li>Magnetic field -Res. ENRE 1.724/98-</li> <li>Radio interference -Res. SE 77/98; publication CISPR 18/1; 18/2; 18/3-</li> <li>Contact and step voltages (IRAM 2281- II and IV).</li> <li>Audible noise (IRAM 4061 and 4062).</li> </ul>	Energética	<ul style="list-style-type: none"> <li>Report from the Monitoring Program</li> </ul>	<ul style="list-style-type: none"> <li>During the operation</li> </ul>	<ul style="list-style-type: none"> <li>Energética HSE Department</li> </ul>	<ul style="list-style-type: none"> <li>Report from site HSE Officer of Energética Contractor to Energética HSE Department</li> </ul>
Impacts from Shadow Flickering	Operation	<ul style="list-style-type: none"> <li>Detailed shadow flickering study, considering environmental factors like topography, windows, doors, trees, etc. that according to the Addendum 2 of the ESIA, were not considered for the available study.</li> <li>Implement a grievance mechanism to record the frequency of shadow on receptors.</li> <li>If needed according to monitoring results, install natural fences like shrubs or trees closer to the residential windows, this could reduce the impact of shadow flickering in the properties.</li> </ul>	Energética	<ul style="list-style-type: none"> <li>Results from the shadow flickering study</li> <li>Site inspection</li> <li>Evidence from the actions established in the grievance mechanism</li> </ul>	<ul style="list-style-type: none"> <li>Before and during operation</li> </ul>	<ul style="list-style-type: none"> <li>Energética HSE Department</li> </ul>	<ul style="list-style-type: none"> <li>Report from site HSE Officer of Energética Contractor to Energética HSE Department</li> </ul>

<sup>54</sup> The increase of the starting speed is a mitigation measure that consists of avoiding the operation of those wind turbines considered as problematic (those that have registered mortalities) during the periods in which bats register a greater activity, which is achieved by increasing the threshold of wind speed required for the wind turbines to start operating (González et al., 2014).

Impact	Project Phase	Management Plan	Responsibility for ensuring implementation	Means of verification that mitigation has been implemented	Timelines/Frequency	Supervision responsibility	Reporting requirements
		<ul style="list-style-type: none"> <li>Install a control software to shut down the blade spinning during the specific hours of shadow flickering.</li> </ul>					
Impacts on Soil	Site preparation and construction	<ul style="list-style-type: none"> <li>Adequate planning of road and drainage construction must be carried out.</li> <li>Minimize to what is strictly necessary the removal of vegetation in the project area, as bare soils are more susceptible to erosion and landslides.</li> <li>In cases of spills, soils impregnated with fuels, oils, lubricants or other chemical products will be removed verifying compliance with the measures adopted to that end.</li> <li>Avoid refueling, adding lubricating oils, or repairing machinery on the job site front.</li> <li>Separate the soil and vegetation in the removal or excavation area for later use in restoration work.</li> <li>If possible, the different layers should be arranged in such a way that they do not mix and thus allow the edaphic horizons to be maintained. This extracted land should not be used immediately to support underground conductors or mechanical protection ducts.</li> <li>The layer of soil removed should be piled to one side of the excavation or trench; once all the tasks on the site have been completed, it will be replaced to favor the recovery of the herbaceous stratum.</li> <li>During windy days, practices should be adopted to avoid blasting, such as watering the area of operations.</li> <li>During the days of excessive rain or later, in soil conditions with a lot of mud, it is necessary to avoid the circulation of vehicles and heavy/large equipment that mark tracks, in order to maintain the natural drainage of the waters.</li> <li>No waste of any kind or nature should be thrown into excavations or ditches.</li> <li>As far as possible, provision should be made for the collected materials to be isolated from the ground and protected from climatic effects.</li> <li>After the activities in the areas delimited by the assembly platforms are finished, the tasks of restitution of the topography and surface decompaction will be carried out to allow a better rooting and advance of the colonizing plants, favoring the revegetation process.</li> <li>At the end of the works, the affected land must be returned to conditions similar to those pre-existing.</li> </ul>	Energética	<ul style="list-style-type: none"> <li>Photographic evidence of the soil and vegetation separation.</li> <li>Photographic evidence of the pile of soil removed.</li> <li>Photographic evidence of the tasks of restitution of the topography and surface decompaction.</li> </ul>	<ul style="list-style-type: none"> <li>After the construction phase</li> </ul>	<ul style="list-style-type: none"> <li>Energética HSE Department</li> </ul>	<ul style="list-style-type: none"> <li>Report from site HSE Officer of Energética Contractor to Energética HSE Department</li> </ul>
Impacts on Landscape	Site preparation and construction	<p>Landscape study considering the following components:</p> <ul style="list-style-type: none"> <li>Project description (wind turbine layout, wind turbines, aviation obstacle lighting, substation facility, power lines, on site access tracks)</li> <li>People's perception of wind farms.</li> <li>The view shields (zones of visual impacts).</li> <li>Landscape units within the view shield.</li> <li>Seen area analysis.</li> <li>Assessment of indicative viewpoints from publicly accessible locations (and landscape mitigation measures).</li> <li>Impact on residential properties (and landscape mitigation measures).</li> <li>Cumulative impact</li> <li>Night lighting assessment</li> </ul>	Energética	<ul style="list-style-type: none"> <li>Report of the Visual and Landscape Study</li> </ul>	<ul style="list-style-type: none"> <li>Before the operation phase</li> </ul>	<ul style="list-style-type: none"> <li>Energética HSE Department</li> </ul>	<ul style="list-style-type: none"> <li>Report of the Visual and Landscape Study</li> </ul>

Impact	Project Phase	Management Plan	Responsibility for ensuring implementation	Means of verification that mitigation has been implemented	Timelines/Frequency	Supervision responsibility	Reporting requirements
Impact on Community Health and Safety	Site preparation, construction, operation and decommissioning	<ul style="list-style-type: none"> <li>Public access to the Project's facilities must be limited by:                             <ul style="list-style-type: none"> <li>The use of gates on access roads.</li> <li>Where public access is not promoted to the site and/or there are no current rights of way across the site, consider fencing the wind energy facility site, or individual turbines, to prohibit public access to the turbines.</li> <li>Provide fencing of an appropriate standard around the substation with anti-climb paint and warning signs.</li> <li>Prevent access to turbine tower ladders.</li> <li>Post information boards about public safety hazards and emergency contact information.</li> </ul> </li> <li>An Emergency Preparedness and Response Plan that considers Affected Communities.</li> </ul>	Energética	<ul style="list-style-type: none"> <li>Photographic evidence of the limitation measures for public access to Project's facilities.</li> <li>Evidence reports of Emergency Preparedness and Response Plan disclosure and consideration of Affected Communities</li> </ul>	<ul style="list-style-type: none"> <li>Annually</li> </ul>	<ul style="list-style-type: none"> <li>Energética HSE Department and Community Relations responsible</li> </ul>	<ul style="list-style-type: none"> <li>Report from Community Relations responsible to Energética HSE Department</li> </ul>
Impact on transportation routes	Site preparation, construction, and decommissioning	<ul style="list-style-type: none"> <li>Speed limits, as well as speed governor and GPS tracking devices installed on Project vehicles.</li> <li>Requirements that all Project drivers are trained and certified to drive their assigned vehicles, especially vehicles hauling WTG components.</li> <li>Completion and documentation of regular preventative maintenance, as well as as-needed maintenance on Project vehicles.</li> <li>Grouping of Project trucks (including, but not limited to trucks carrying WTG components) into convoys (multiple large trucks traveling together, with front and rear escort vehicles) would avoid some potential traffic and transportation impacts, such as by maintaining proper speed. Convoys would also consolidate traffic delays and congestion. While it would take longer for a convoy to pass a given location, use of a convoy would reduce the number of instances of such delays.</li> <li>Project truck trips—specifically trucks hauling WTG components—should be scheduled to avoid the busiest time of day on public roads. These “peak” hours typically occur in the morning and afternoon but would be determined through consultation with local authorities. This could include nighttime travel for some truck trips. Consolidating truck travel outside of peak hours would reduce congestion and delay, and would reduce the risk of crashes or other incidents.</li> </ul>	Energética	<ul style="list-style-type: none"> <li>Speed limits: police reports and GPS logs (if applicable).</li> <li>Convoys and time-of-day restrictions: Daily or weekly schedules.</li> <li>Driver training and vehicle maintenance and training logs.</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly reviews of driver training and vehicle maintenance logs.</li> <li>As-needed (minimum weekly) review of police reports and GPS logs for speeding.</li> <li>Daily schedules for truck deliveries (mandatory for all trucks hauling WTG components)</li> </ul>	<ul style="list-style-type: none"> <li>Energética HSE Department</li> </ul>	<ul style="list-style-type: none"> <li>Report from site HSE Officer of Energética Contractor to Energética HSE Department</li> </ul>

In addition to the mitigation measures, other commitments assumed are those cited in the Environmental License (See Section 2), in the Environmental and Social Management System (See Section 18) and in the Cumulative Impact Management Framework (see Section 15.7).

## 19. ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM

According to the requirement of the Ente Nacional Regulador de la Electricidad (ENRE), an EHS Management System needs to be certified within the first 180 days of operation. Consequently, AES is developing a Management System to comply with such requirement, which in addition will incorporate Social and Biodiversity elements in line with IFC Performance Standards. The Environmental and Social Management System (ESMS) for ‘Energetica I” wind farm, will be developed for the different project stages and will incorporate the following commitments:

**Table 19-1 Commitments for each ESMS element**

Elements of an ESMS	Commitments
<b>Policy</b>	<p>Environmental (including Biodiversity), H&amp;S and Social Policies signed by managers, employees and contractors reflecting acknowledgement and commitment with the implementation.</p> <p>HR Policy developed and communicated to all workers.</p>
<b>Identification of risks and Impacts</b>	<p>Update of environmental, biodiversity, social, labor and H&amp;S risks associated with the Project in all its stages, incorporating risks in the supply chain.</p> <p>Risks and impacts identification process will be updated on recent baseline data and will be periodically updated based on environmental and social information gather by experienced environmental and social specialists that will be part of the ESMS team. A stakeholder mapping and local perceptions analysis will be updated periodically to identify social risks of the projects within the project’s area of influence. In addition, biological baseline studies will be updated at least in two different seasons (considering migratory and breeding seasons) in the project area. For the same purpose, information on Ecosystem Services Impact Analysis provided in this report will be updated through all stages of the Project.</p>
<b>Management Programs</b>	<p>Supplement the Project’s existing Action Plans with the following Management Programs:</p> <p><b>Health and Safety</b></p> <ul style="list-style-type: none"> <li>■ Occupational H&amp;S Management Plan;</li> <li>■ Community H&amp;S Management Plan;</li> <li>■ Traffic Management Plan; and</li> <li>■ Emergency Preparedness and Response Plan.</li> </ul> <p><b>Environmental</b></p> <ul style="list-style-type: none"> <li>■ Biodiversity Management Plan;</li> <li>■ Water Management Plan;</li> <li>■ Waste and Effluents Management Plan;</li> <li>■ Hazardous Substances and Materials Management Plan; and</li> <li>■ Noise &amp; Flickering Management Plan.</li> </ul>

Elements of an ESMS	Commitments
	<p><b>Social</b></p> <ul style="list-style-type: none"> <li>■ Stakeholder<sup>55</sup> Engagement Plan;</li> <li>■ Grievance Mechanism.</li> </ul> <p><b>Human Resources</b></p> <ul style="list-style-type: none"> <li>■ Internal Work Regulations;</li> <li>■ Recruitment and Selection of Personal;</li> <li>■ Staff Training;</li> <li>■ Performance Management;</li> <li>■ Management of Living Conditions at Project Area/Campsites;</li> <li>■ Medical Assistance for Work Related Incidents;</li> <li>■ Grievance mechanism for workers, contractors and subcontractors;</li> <li>■ Management of Employment Termination;</li> <li>■ Relocation of Pregnant Employees;</li> <li>■ Management of Worker Common Regime and Civil Construction Regime Remuneration;</li> <li>■ Crisis Plan in case of strike and work stoppage;</li> <li>■ Collective Bargaining Process With Workers Union and Project Committee;</li> <li>■ Follow-up of Collective Bargaining Agreement;</li> <li>■ Retrenchment Plan ;</li> <li>■ Third Parties Management Plan;</li> <li>■ Contractor Supervision Plan and</li> <li>■ Security Personnel Plan.</li> </ul> <p>The Management Plans have the purpose of addressing the risks and impacts identified and prioritized. Each plan has measurable events to the extent possible, with elements such as performance indicators (KPI), targets, or acceptance criteria that can be tracked over defined time periods, and with estimates of the resources and responsibilities for implementation.</p>
<p><b>Organizational Capacity and Competency</b></p>	<ul style="list-style-type: none"> <li>■ Environmental and social roles, responsibilities and authorities defined within an organizational structure in order to well implement the ESMS.</li> <li>■ Experienced staff assigned. At least, one responsible for the implementation of the Management System, who will be an HSE specialist with extensive experience in biodiversity management familiar with IFC Performance Standards, assisted by a team of other professionals with experience in social management, community health and community engagement.</li> <li>■ Environmental and social responsibilities communicated to key relevant personnel and the rest of the organization.</li> </ul>

<sup>55</sup> "Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively." (IFC, 2007)

Elements of an ESMS	Commitments
	<ul style="list-style-type: none"> <li>■ Relevant training programs given to the HSE personnel, including social and biodiversity related topics. Environmental and social responsibilities communicated to key relevant personnel and the rest of the organization.</li> <li>■ Public Affairs role, with excellent communication skills to manage communication with third parties, well trained and in close coordination with ESMS Manager.</li> </ul>
<p><b>Emergency Preparedness and response</b></p>	<ul style="list-style-type: none"> <li>■ Development of an Emergency Action Plan (EAP), which includes assistance and collaboration with the Affected Communities<sup>56</sup> for risk analysis.</li> <li>■ Disclosure of EAP with the Affected Communities.</li> <li>■ .</li> <li>■ Coordination with local authorities for the alignment of the Response Plan with the guidelines of the National Civil Defense System at the local level to respond to emergencies due to natural hazards.</li> </ul>
<p><b>Stakeholder Engagement</b></p>	<ul style="list-style-type: none"> <li>■ Stakeholder's identification and mapping.</li> <li>■ Development and implementation of a Stakeholder Engagement Plan (SEP) with the following specifications:                             <ul style="list-style-type: none"> <li>-Annual revision and update, according to results of the updated stakeholder mapping.</li> <li>-The SEP must be an active tool tailored to the Project's risks and impacts.</li> </ul> </li> </ul>
<p><b>Communications and Grievance Mechanisms</b></p>	<ul style="list-style-type: none"> <li>■ Development and implementation of a Grievance Mechanism that complies with the following:                             <ul style="list-style-type: none"> <li>-Available and communicated to all relevant internal and external Stakeholders as early as possible in the Project development phase.</li> <li>-Performance and maintenance of a grievance registration system, in order to systematize results and use the information to update the Social Programs.</li> </ul> </li> </ul>
<p><b>Ongoing Reporting to Affected Communities</b></p>	<ul style="list-style-type: none"> <li>■ Submission of monitoring results to the Authority, as requested in the Environmental License.</li> <li>■ Proactive addressing of Affected Communities' issues and concerns.</li> <li>■ Ongoing communication in order to avoid risks and impacts of the Project.</li> <li>■ Immediate update of ESMS if new environmental or social risks emerge.</li> <li>■ Reporting of progress on implementation of environmental and social commitments.</li> <li>■ Reporting of monitoring results on issues that interest the Affected Communities.</li> <li>■ Information disclosure that uses local language and easily understandable formats.</li> </ul> <p>According to IFC's guidelines, the frequency of this communication will be proportional to the scale of stakeholders' concerns, but it should be at least annual.</p>
<p><b>Monitoring and Review</b></p>	<ul style="list-style-type: none"> <li>■ Biological Monitoring Program for all the Project stages (, construction and operation), including birds and bats.</li> </ul>

<sup>56</sup> "Local communities directly affected by the project" (IFC, 2012)

Elements of an ESMS	Commitments
	<ul style="list-style-type: none"> <li>■ Including a seasonal approach for Birds and bats Monitoring Program, focused on species of heightened concern, in order to assess collision-related impacts to bats and birds at land-based wind energy facilities for a minimum of one to three years subsequent to the initiation of wind farm operation.</li> <li>■ Alignment of monitoring sites with the Project's facilities. Performance of an additional bird migratory flows monitoring, as required in the Environmental Impact Declaration of the Project issued by OPDS.</li> <li>■ Development of an Effluent Monitoring Program in order to identify water quality prior to discharges and if is necessary apply corrective actions.</li> <li>■ Development of Social Monitoring Programs as well as indicators to evaluate efficiency on the mitigation measures implemented.</li> <li>■ Community H&amp;S related monitoring programs developed, including noise and flickering compliance testing.</li> <li>■ Representatives from Affected Communities involved in monitoring activities.</li> <li>■ Documentation of monitoring results to track performance and compare these against the previously established points of reference or requirements in the management program, and to identify and reflect the necessary corrective and preventive actions.</li> <li>■ Development of internal inspections and audits, to verify compliance and progress towards the desired outcomes of the management program.</li> <li>■ Performance of E&amp;S Independent Review including site visit to the Project through an Independent Environmental and Social Consultant.</li> <li>■ Development of a Contractor Supervision Procedure that:                         <ul style="list-style-type: none"> <li>- Describes how and when the contractors' environmental and social performance will be reviewed;</li> <li>- Outlines the mechanisms that will be used (e.g. internal document reviews, random or scheduled audits, etc.);</li> <li>- Indicates general measures to implement corrective actions;</li> <li>- Introduces Key Performance Indicators</li> <li>- Verifies the health and safety performance of subcontractors.</li> </ul> </li> </ul>

The ESMS will apply over the entire Project life cycle, including construction, operation, and site decommissioning and restoration. It applies to the oversight activities conducted by AES Argentina as well as Nordex, who will serve as the Project's engineering, procurement, and construction (EPC) contractor.

Nordex has communicated the following degree of progress regarding the following procedures:

**Table 19-2 Status of Nordex documents**

Document		Status
Workforce recruitment management policies		Ok
Procedures for workers influx management	Housing	In process
	Drinking water	Ok
	Effluents	Ok
	Waste management	Ok
	Food supply	Ok
	Local transportation	Ok
	Behavior of workers with respect to host communities	Ok
	Camping sites	N/A
	Security in working areas	In process
Drugs and alcohol prevention Plan		Ok
Labor relations plan and workers' complaints mechanism		In process
Procedure for Project residents inspections and visits		Ok
Workers behavior instructions		Ok
Rules of conduct before communities, including the avoidance of sexual harassment and gender violence		Missing
HSE Project specific procedures		Ok
Induction program for new workers and training program		
Project's specific control programs	Food supply	Ok
	Drinking water	Ok
	Housing	In process
Health and safety risks management Programs		Ok
External Grievance Mechanism		Ok
Supplier development Program		Ok

**APPENDIX A: ENVIRONMENTAL APTITUDE CERTIFICATE  
(ENVIRONMENTAL LICENSE)**

LA PLATA, - 2 AGO. 2016

VISTO el expediente N° 2145-9512/16 y Anexo, las Leyes N° 10.397, N° 11.723, N° 14.803, N° 14.805, 14.808, y

CONSIDERANDO:

Que la firma ENERGETICA ARGENTINA SA, tramita la Declaración de Impacto Ambiental en el marco de la Ley N° 11.723 para el proyecto de obra denominado "Parque Eólico Energética I" de noventa y nueve con dos Megavatios (99,2 MW) de potencial nominal, a ejecutarse en el Partido de Tornquist;

Que a fojas 1/10 la firma ENERGETICA ARGENTINA SA, presenta proyecto y documentación requerida por el artículo 11 de la Ley N° 11.723;

Que el proyecto tiene como objetivo principal, el aprovechamiento de un recurso renovable gratuito como lo es el viento, sirviéndose de él para la producción de la energía eléctrica "limpia", reduciendo emisiones que contribuyen al cambio climático por efecto invernadero, resultando este el factor justificativo más relevante;

Que a fojas 12/27 el Departamento de Evaluación de Impacto Ambiental manifiesta la factibilidad de dar curso favorable al proyecto presentado, de acuerdo a lo establecido por la Ley N° 11.723, supeditado al estricto cumplimiento de los condicionantes establecidos por el Anexo I de la presente resolución;

Que a fojas 28 es opinión de la Dirección Provincial de Evaluación de Impacto Ambiental que se encuentran dadas las condiciones para otorgar la Declaración de Impacto Ambiental;

Que de acuerdo a lo establecido en el Código Fiscal -Ley N° 10.397 (Texto ordenado 2011), modificatorias y la Ley 14.808, la firma ENERGETICA ARGENTINA SA, se encuentra exento del pago del arancel en concepto de Análisis y Evaluación de Estudios de Impacto Ambiental previstos en el Anexo II Apartado I de la Ley N° 11.723;

Que la presente medida se dicta en uso de las atribuciones conferidas por la Ley N° 14.803 modificada por Ley N° 14.805;



*cel*

COPIA FIEL DEL ORIGINAL  
María Cecilia Venancio  
Secretaría Privada O.P.D.S.

**EL DIRECTOR EJECUTIVO  
DEL ORGANISMO PROVINCIAL PARA EL DESARROLLO SOSTENIBLE  
RESUELVE**

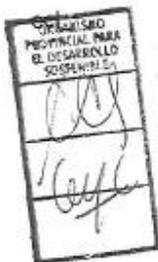
**ARTÍCULO 1°.** Declarar Ambientalmente Apto el Proyecto de Obra denominado "Parque Eólico Energética I" de noventa y nueve con dos Megavatios (99,2 MW) de potencial nominal, a ejecutarse en el Partido de Tornquist, presentado por la firma ENERGETICA ARGENTINA SA, en el marco de la Ley N° 11.723

**ARTÍCULO 2°.** Dejar establecido que, sin perjuicio de todo otro requerimiento que en el marco de su condición de autoridad de aplicación este Organismo pudiera exigir, la obra declarada ambientalmente apta en el Artículo 1°, queda condicionada al estricto cumplimiento de los requisitos que constan en el Anexo I que pasa a formar parte integrante de la presente resolución.

**ARTÍCULO 3°.** Dejar expresamente establecido que, de acuerdo a lo establecido en el Código Fiscal -Ley N° 10.397 (Texto ordenado 2011), modificatorias y Ley 14.808, la firma ENERGETICA ARGENTINA SA se encuentra exenta del pago del arancel en concepto de Análisis y Evaluación de Estudios de Impacto Ambiental previstos en el Anexo II Apartado I de la Ley N° 11.723.

**ARTÍCULO 4°.** Registrar, comunicar, notificar. Cumplido, archivar.

RESOLUCION N° 2351



COPIA FIEL DEL ORIGINAL  
Merla Cecilia Venancio  
Secretaría Privada O.P.D.S.

RICARDO EDUARDO PASOLA  
Director Ejecutivo  
Organismo Provincial para  
el Desarrollo Sostenible

## ANEXO I

Vista la documentación remitida por la Empresa **ENERGETICA ARGENTINA S.A.**, consistente en la construcción de una Central Eólica denominada "**Parque Eólico Energética I**" de NOVENTA Y NUEVE con DOS MEGAVATIOS (99,2 MW) de potencia nominal, compuesta por TREINTA Y UN (31) unidades aerogeneradoras que se vincularán al Sistema Interconectado Nacional (S.I.N), a través de una Línea Aérea de A.T. (132 kV), procediendo a la apertura de la existente L.A.A.T. de 132 kV E.T. Bahía Blanca – E.T. Tornquist, y una vez realizada la evaluación de dicha documentación en el marco de la Ley de Medio Ambiente de la Provincia de Buenos Aires, Ley N° 11.723, a efectos de obtener la **Declaración de Impacto Ambiental**, se desprenden las siguientes consideraciones:

### I.- DESCRIPCIÓN DEL PROYECTO

#### JUSTIFICACIÓN DE LA OBRA

El principio básico de la futura Granja Eólica es aprovechar la energía cinética del viento para producir energía eléctrica renovable, inyectando 99,2 MW a la red interconectada al mallado nacional, generando unos 430.276 MWh anualmente de energía adicional.

El principal objetivo de estos tipos de emprendimientos es el aprovechamiento de un recurso renovable y gratuito como lo es *el viento*, sirviéndose de él para la producción de la energía eléctrica "limpia", (comparadas, por ejemplo, con las producidas a través de las *Centrales Térmicas*), por ser su principio de funcionamiento totalmente distinto de todas aquellas que provienen de la quema de combustibles fósiles, dado que no liberan a la atmósfera gases considerados de efecto invernadero (G.E.I).

Es importante manifestar que según los datos suministrados por la empresa emprendedora, surgidos a partir del modelaje de los aerogeneradores preseleccionados (Siemens), y considerando una vida útil estimada en 20/25 años, se desprende que el proyecto evaluado permitirá inyectar al *Sistema Interconectado Nacional* aproximadamente 8.605.520 MW-h en el aludido periodo de tiempo, evitando contaminar a la atmósfera los siguientes valores de factores de emisión:

Total generado MW-h/20Años	Total de CO <sub>2</sub> Tn	Total de NO <sub>x</sub> Tn	Total de SO <sub>2</sub> Tn	Total de MP Tn
8.605.520	4.538.000	8.160	2.920	258

Por otra parte la **velocidad e intensidad del viento** conforman las variables fundamentales en todo sistema de conversión de energía eólica y estas magnitudes características están condicionadas por la climatología, la topografía, las geoformas, la flora o cualquier estructura antrópica presente en un determinado lugar que pueda incidir en la optimización de la utilización del recurso.

El emprendimiento, como modo de promoción del empleo de la energía eólica, puede implicar, en un futuro no muy lejano, colaborar con la reducción de las Emisiones de Gases contaminantes a la atmósfera, generando un ahorro en el uso de las reservas de combustible fósiles en general, constituyendo un aporte al uso racional de la energía, favoreciendo un ahorro de divisas con motivo de minimizar las importaciones de electricidad procedentes de

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países vecinos, creando nuevos puestos de trabajo, mayores ingresos, asistiendo al desarrollo de la economía local, como así también diversificando la matriz energética nacional.

Por otro lado, los eventuales impactos sobre la salud pública son considerablemente menores a los que se generarían por otras fuentes energéticas convencionales, como las de carbón, petróleo, o gas natural, las cuales provocan efectos nocivos sobre el medio a niveles muy superiores. A título informativo, la proponente ha presentado un estudio de ahorro de Barcos Metaneros por año para producir la misma energía anual que generaría la granja eólica Energética I, donde se observa que puede llegar a ahorrarse 1,61 buques en ese período, con todas las implicancias que ello implica.

## 1.- PARQUE EÓLICO "ENERGETICA I"

### INTRODUCCIÓN

#### Evaluación de su emplazamiento

Antes de comenzar con el proyecto del parque eólico se deberá verificar algunos aspectos relacionados a la factibilidad del emplazamiento de los aerogeneradores en el terreno elegido, como ser:

- ✓ Potencial eólico existente en la zona preseleccionada. (Evaluación del Recurso Eólico y la calidad del mismo).
- ✓ Ubicación geográfica.
- ✓ Situación legal del predio.
- ✓ Dimensiones del mismo.
- ✓ Estudios de suelos.
- ✓ Normas reguladoras de futuros emprendimientos de edificación y urbanismo.
- ✓ Viabilidad de vinculación al Sistema Interconectado Nacional (S.I.N).
- ✓ Estudios de rutas migratorias y comportamiento de la avifauna zonal.
- ✓ Conformidad y aprobación Municipal.

#### Criterios Aplicados para la Selección del predio

Los siguientes criterios fueron los que se han adoptado para la selección del sitio donde se emplazaría la futura Central Eólica Energética I:

- **Potencial Eólico.**

Estudio y Predicción del recurso eólico: Los efectos orográficos combinados con el alto régimen de vientos de la zona hacen que el emplazamiento elegido sea, a *prima facie*, un lugar adecuado para el aprovechamiento de este recurso, favoreciendo la producción energética.

Para la búsqueda del emplazamiento del presente proyecto, se tuvieron en cuenta, entre otros factores, los ambientales, los económicos, el punto de interconexión en relación con la infraestructura existente y la maximización del rendimiento técnico de conversión del recurso eólico en energía eléctrica.

Para alcanzar este último objetivo según la proponente del proyecto se han realizado estudios o Campaña de medición de vientos y los factores que influyen en el rendimiento de las máquinas a utilizar (marca: Siemens, modelo: WT 113 - 3,2 MW), la rugosidad del terreno, los obstáculos existentes, etc.

De la información extraída de la documentación aportada por EL DESARROLLADOR DEL PROYECTO, y elaborada por la firma Provener Argentina y AWS Truepower, se puede extraer lo siguiente:

La campaña de medición fue realizada con datos aportados por dos (2) torres meteorológicas totalmente independientes.

La Torre de Medición N° 1 se encuentra ubicada en las coordenadas Latitud -38,356567 ° y Longitud -62,227633 °, midiendo las magnitudes a 48 m y su elevación aproximada es de 263 m sobre el nivel del mar. Se dispone de registros

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de datos a partir del 09/02/2010. En la misma se mide la velocidad del viento a dos niveles (48 m y 30 m aproximadamente), la dirección se mide a un solo nivel (46,5 m), y la presión y temperatura a 2,5 m.

De los datos medidos se desprenden las siguientes conclusiones:

- La velocidad media anualizada es de 8,40 m/s a 48 m de altura.
- Las temperaturas medidas en el emplazamiento varían entre los promedios mensuales de 7,15 °C y 22,8 °C.
- La presión media es de 847 mBar.

**NOTA:** La distribución direccional del recurso eólico es un factor clave para diseñar un parque eólico, ya que permite determinar la disposición de los aerogeneradores de manera que se minimice el efecto de apantallamiento, demostrándose que la dirección Noroeste (NNO) es claramente dominante, tanto en la frecuencia como en sus componentes energéticas.

La Torre de Medición N° 2 se encuentra ubicada en las coordenadas Latitud -38.3487 ° y Longitud -62.212133 °, midiendo las magnitudes a 82 m y su elevación aproximada es de 244 m sobre el nivel del mar. Se dispone de registros de datos a partir del 24/08/2010. En la misma se midió la velocidad del viento a cinco niveles (82 m, 80 m, 60 m, 48 m y 40 m, aproximadamente), su dirección en tres niveles (80 m, 58,5 m, y 38,5 m), y la temperatura a 7 m.

De los datos medidos se desprenden las siguientes conclusiones:

- La velocidad media verificada fue de 8,65 m/s a 82 m de altura.
- Las temperaturas medidas en el emplazamiento varían entre los promedios mensuales de 8,7 °C y 22,4 °C.

**NOTA 1:** La distribución direccional del viento de frecuencia y de energía observada en la torre de medición muestra que las direcciones Norte y Noroeste (N, NNO) son claramente dominantes, tanto en la frecuencia como en sus componentes energéticas.

#### Conclusión:

La velocidad del viento resultante, ajustada a largo plazo y a la altura del buje (80m), arrojaron las siguientes conclusiones para las dos (2) torres estudiadas del emplazamiento se presenta en tablas.

P.E. Energética I	Velocidad a largo plazo a 48m (m/s)	Velocidad a largo plazo a 80m (m/s)
Torre I	8,09	9,00

P.E. Energética I	Velocidad a largo plazo a 82m (m/s)	Velocidad a largo plazo a 80m (m/s)
Torre II	8,65	8,60

#### • Ubicación geográfica.

El sitio de implantación de la Central Eólica se encuentra localizado al Sur de la Provincia de Buenos Aires, en el Partido de Tornquist, próximo al Paraje García del Río, y aproximadamente a 5 Km de la localidad de Tres Picos, tomando como referencia el vértice NE del proyecto.

Se puede ingresar a los predios preseleccionados, a partir de la Ruta Nacional N° 33 y de calles públicas vecinales de tierra consolidadas. Los accesos serían los siguientes:

- ❖ El acceso principal al emprendimiento se realiza a partir de la Ruta Nacional N° 33 en la progresiva Km 40 que vincula a las ciudades de Bahía Blanca y Tornquist. Tomando como cabecera a la ciudad de Bahía Blanca, se deberán recorrer 40 Km. en dirección Norte, y luego, a partir de la progresiva

  
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indicada, aproximadamente 4,7 Km por una calle pública vecinal de tierra, en dirección NE.

❖ A partir de la progresiva Km 47, también se puede acceder al proyecto recorriendo aproximadamente 5 Km. por una calle pública vecinal de tierra, en dirección SO.

❖ También se puede tener acceso a los predios, a partir de una calle pública vecinal de tierra, que comunica la localidad de Tres Picos, pasando por el Paraje García del Río.

• **Situación Legal de los predios.**

La futura **Central Eólica** se implantaría sobre un área de aproximadamente **950 ha**, correspondiente a tres (3) fracciones de campo, cuyos establecimientos rurales se identifican según los datos siguientes:

Nombre del Establecimiento Rural	Partido	Nomenclatura Catastral	Superficie
A) Guanaco Chico	Tornquist	Partida 3533 – Circ. III - Parcela 39 F	311 ha
B) Reyrolles	Tornquist	Partida 45 – Circ. VIII - Parcela 569	333 ha
C) San Bautista Sur	Tornquist	Partida 14852 – Circ. VIII - Parcela 566B	306 ha

Con respecto a la *Situación Legal* de los mismos, según información extractada del E.I.A. y que fuese aportada por la proponente del emprendimiento (**ENERGETICA ARGENTINA S.A.**), se celebrará los respectivos usufructos de las propiedades, para llevar a cabo la ejecución del futuro parque eólico por un periodo de 20/25 años.

Este contrato definirá con claridad los roles de responsabilidades de todas las partes actoras, precisando las acciones que se realizarán en los predios involucrados, asegurando por ende a los propietarios la respectiva *contraprestación económica* que percibirán a cambio. Este instrumento protegerá tanto al inversor como a la entidad financiera actuante, garantizando la continuidad del emprendimiento evaluado, disminuyendo riesgos asociados a través de un instrumento legal conforme a derecho real (servidumbre) asentado en el correspondiente registro de la propiedad.

De acuerdo a lo especificado por el promotor del proyecto esta inscripción no afectará la libre disponibilidad del predio, pudiendo el propietario hipotecarlo, venderlo o disponer de él de la manera que considera conveniente.

El sitio de instalación de las torres de medición, apertura de Línea Eléctrica en 132 KV, Estación Transformadora, y de la implantación de las turbinas eólicas, se encuentran distribuidas en los Establecimientos Rurales de la siguiente manera:

- **Establecimiento Rural Guanaco Chico:**
  - Molinos marca SIEMENS, modelo: **SWT 113 – 3,2 MW** N°s: 1; 2; 3; 4; 5; 6; 7; 8; 9 y 10
- **Establecimiento Rural Reyrolles:**
  - Mástil con estación meteorológica (48 m)
  - Futura E.T. 132/33/13,2 kV
  - Apertura Línea existente Bahía Blanca - Tornquist entre piquetes Ns 152 y 153.
  - Molinos marca SIEMENS, modelo: **SWT 113 – 3,2 MW** N°s: 11; 12; 13; 14; 15; 16; 21; 22; 27; 28; y 29

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➤ **Establecimiento Rural San Bautista Sur**

- Mástil con estación meteorológica (82 m).
- Molinos marca SIEMENS, modelo: **SWT 113** – 3,2 MW N°s: 17; 18; 19; 20; 23; 24; 25; 26; 30 y 31

● **Actividad Zonal.**

En los tres predios bajo evaluación se desarrolla una producción mixta del tipo ganadero-agrícola.

Entre los principales cultivos de invierno se destaca el trigo, la avena y en menor medida la cebada cervicera.

Entre los principales cultivos de verano pueden mencionarse el girasol y el sorgo forrajero.

La principal actividad ganadera es la invernada y la cría. También se explota en muy pequeña escala el ganado ovino, principalmente para consumo propio y la producción de miel.

### CARACTERISTICAS DE LOS AEROGENERADORES.

#### MEMORIA DESCRIPTIVA

Cada aerogenerador será del tipo tripala a barlovento (horizontal), y estará conformado por los siguientes elementos:

- Una torre o mástil de acero tronco cónica (4 secciones).
- Una góndola o nacelle (Sala de máquinas, transformador para la conversión de cadena de tensiones).
- Tres palas o aspas de fibra de vidrio plásticas reforzadas, con acabado mate para evitar la reflexión de la radiación solar.
- Un rotor.
- Acople de fundación.
- Fundaciones o bases propiamente dichas de hormigón armado.

Como se ha mencionado, este proyecto utilizará como marca genérica aerogeneradores **Siemens: SWT 113 – 3,2 MW** de Potencia Nominal.

#### Descripción general

Las máquinas preseleccionadas, marca **Siemens: SWT 113 – 3,2 MW**, son de paso regulable y contarán con un sistema de orientación activo, disponiendo de un rotor de 113 m de diámetro, un generador sincrónico, PMG de 3.4 MW de potencia nominal, mientras que su torre tendrá una altura libre de 92,5 m.

#### Datos Técnicos del Parque Eólico

Numero de aerogeneradores	31 unidades
Marca y Modelo de aerogeneradores	Siemens: SWT 113 – 3,2 MW IIB
Potencia nominal	3,2 MW c/u
Altura de buje	92,5 m
Diámetro del rotor	113 m
Potencia nominal total del Parque Eólico	99,2 MW
Número de transformadores M.T. / M.T.	31 x 3.400 kVA – Relación de Transf.: 0,69 / 33 kV
Estación Transformadora M.T. / A.T.	1(una) E.T conformada por: 2 (dos) Transformadores de Potencia trifásicos, aislados en baño de aceite mineral de 110/110/15 MVA – Rel. 132/33/13,2 kV –, Refrigeración: ONAN 70% -ONAF I - ONAF II, Grupo de conexión: YN, yn0, d11, Reg. Secundaria ±10 x 1,25% (±12,5%) y 2 (dos) campos de salida de líneas de 132 kV completos, Tableros de M.T. (33 kV)

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Circuitos internos de M.T. (33 kV)	Configuración: Radial, conformado por 5 (Cinco) circuitos totales, 4 (Cuatro) de ellos por 6 (seis) aerogeneradores (3,2 MW x 4 x 6 = 76,8 MW), y el restante conformado por 7 (Siete) aerogeneradores (3,2 MW x 1 x 7 = 22,4 MW). Potencia total = 76,8 MW + 22,4 MW = 99,2 MW
Caminos internos nuevos	Se prevé realizar caminos internos del Parque (20,8 Km), de 6m de ancho útiles, por lo que se presupone un importante movimiento de tierra.
Cableado interno subterráneo	La superficie afectada por los cableados del sistema colector en M.T., dependerá de los tipos de montaje, que variará su ancho, según la cantidad de temas a soterrar, estimándose una longitud aproximada de los ductos en 23,1 Km.
Plataforma de montaje - sectorizada en cuatro áreas de trabajo de grúas.	Al pie de cada molino se construirá un área propia para el trabajo de las grúas, y posicionado de las partes constitutivas de cada aerogenerador, requiriendo una superficie aproximada de 2.200 m <sup>2</sup> , con una capacidad de carga mínima de 2 Kg./cm <sup>2</sup> .

#### Datos Operativos

Potencia nominal	3,2 MW
Velocidad Límite inferior de funcionamiento	3 a 5 m/s
Velocidad nominal del viento	12 a 14 m/s
Velocidad Límite superior de funcionamiento	25 m/s
Tipo de Diseño	Tripala de eje horizontal.

#### Rotor

Diámetro	113 m
Área barrida	10.000 m <sup>2</sup>
Número de palas	3
Velocidad de giro del rotor	Variable entre 8,5 y 15,8 r.p.m
Velocidad nominal de trabajo	15 r.p.m
Orientación	A barlovento: Cuando el rotor se encuentra enfocado de frente a la dirección del viento dominante.

#### Palas o aspas del Rotor

Longitud	55 m
Material	Fibra de vidrio reforzado con poliéster.

#### Sistema de Orientación

Diseño - Sistema Yaw	Consiste en una corona dentada solidaria a la torre y motorreductoras unidas al nacelle, con sus respectivos piñones engranados en la corona de la torre, que hace que la góndola gire en ambos sentidos respecto al eje del mástil sobre el rodamiento Yaw. Posee ocho (8) motores eléctricos. Sistema de freno de fricción pasiva.
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#### Generador

Potencia nominal	3.400 KW
Diseño	Generador sincrónico trifásico tipo DDPM, con una velocidad nominal de operación de 15 r.p.m. Rango de velocidad operacional: 6,5 a 15,8 r.p.m.
Tensión de generación	Tensión máxima generada: 750 V. Tensión de operación : 590 V

#### Transformador

Potencia	3.400 kVA
Tensión primaria/secundaria	0,69 / 33 kV
Frecuencia	50 Hz
Refrigeración	En baño de aceite, libre de PCB's
Grupo de conexión	Dy11

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**Sistema de Control**

Diseño	Sistema de control de par y ángulo de peso de la pala (Pitch)
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**Torre**

Altura del buje	92,5 m
Diseño	Torre tubular tronco-cónica de acero en cuatro (4) tramos.

**Cimentación**

Tipo	Octogonal (Ø19,8 m) – Prof. 3,8 m
Material utilizado	Hormigón Armado. La zapata será de un hormigón tipo H30 y el cilindro superior de H45.
Volumen total de excavación aproximada	1.411 m <sup>3</sup> por fundación (43.741 m <sup>3</sup> )
Volumen total de Hormigón	587 m <sup>3</sup> por fundación (18.197 m <sup>3</sup> )
Cantidad total de hierro (Armadura activa)	62 Tn por fundación (1.922 Tn)

Diseño de armaduras según condiciones del suelo

La fijación de la torre al terreno, se realiza mediante una corona formada por una doble hilera concéntrica de pernos, embebida en una zapata de hormigón armado. La parte superior de dichas hileras de pernos verticales queda visible tras el fraguado del hormigón, y preparada para recibir el tramo inferior del mástil (Ø exterior de la base de la torre de acero 4.500 mm).

**Distribución asignada de cada uno de los equipos aerogeneradores**

Coordenadas UTM			
Aerogenerador	X	Y	a.s.n.m. (m)
Turbina 1	564313	5753353	225,6
Turbina 2	564619	5753693	230,1
Turbina 3	564805	5753995	229,8
Turbina 4	565042	5754289	233
Turbina 5	565316	5754548	233,9
Turbina 6	565593	5754278	225,8
Turbina 7	565225	5753157	214,8
Turbina 8	565474	5753399	217,8
Turbina 9	565732	5753666	221,1
Turbina 10	565978	5753902	226,2
Turbina 11	566696	5754759	237,2
Turbina 12	566951	5754996	250,8
Turbina 13	567232	5754634	254,6
Turbina 14	566689	5753900	237
Turbina 15	567058	5754015	248
Turbina 16	567400	5754130	251,4
Turbina 17	567930	5754526	252
Turbina 18	568696	5755267	247,8

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Turbina 19	568963	5755514	244
Turbina 20	569289	5755820	244,4
Turbina 21	567190	5753430	248,4
Turbina 22	568038	5753957	250,6
Turbina 23	568325	5754181	248
Turbina 24	568714	5754418	247,8
Turbina 25	568987	5754681	243,8
Turbina 26	569281	5754955	242,9
Turbina 27	567592	5753015	246,4
Turbina 28	568082	5753180	245
Turbina 29	568309	5753571	248,8
Turbina 30	568721	5753826	246,3
Turbina 31	569213	5754363	245,4

## MOVIMIENTO DE SUELOS, SUPERFICIES AFECTADAS

### Fundaciones de los aerogeneradores

Las obras civiles más importantes en la construcción del Parque Eólico corresponden a las fundaciones de los aerogeneradores, cuyo volumen será del orden de 587 m<sup>3</sup> por fundación, lo que arroja un volumen total aproximado de **18.197 m<sup>3</sup>** de hormigón estructural para las 31 máquinas. Si bien las dimensiones son poco significativas, en relación al área que ocupa el parque, el suelo es un elemento que se verá afectado sensiblemente, debido al gran movimiento de tierra que se requiere.

Dichas fundaciones estarán conformadas, en principio, por zapatas de sección octogonal de aproximadamente 19,8 metros ( $\varnothing$ ). La parte inferior tendrá sección octogonal, luego tronco-cónica para terminar en un pedestal cilíndrico de aproximadamente 5,5 metros de diámetro sobre el que se anclará la base de la torre del aerogenerador. La zapata será de un hormigón tipo H30 y el cilindro superior de H45. El nivel de fundación sugerido por los estudios de suelo preliminares será de 3,60 metros por debajo del nivel natural del terreno. Según las especificaciones del proveedor tienen una cuantía de acero de 62 toneladas, lo que arroja una cantidad de acero de aproximadamente 1.922 toneladas.

### Viales interiores - Área de maniobras de grúas

El camino de acceso al emprendimiento, será desde la Progresiva Km 40 de la Ruta Nacional N° 33, siendo la misma de tierra consolidada y entoscada, encontrándose en buen estado de conservación, siendo su ancho de 20 metros entre alambrados.

Las sendas existentes deberán ser compactadas y perfiladas para recibir el paquete estructural que asegure la capacidad portante y las características geométricas requeridas por el proveedor y por el montador de los equipos.

Los caminos interiores, entre los aerogeneradores, tendrán una longitud estimada de 20,8 Km y un ancho mínimo de 6 metros de manera de permitir la circulación de la grúa principal entre ellos, sin necesidad de desmontarla.

En el emplazamiento de cada aerogenerador se conformará una plataforma de trabajo de aproximadamente 2.200 m<sup>2</sup>, con una capacidad de carga mínima de 2 Kg/cm<sup>2</sup>.

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La orientación de la plataforma de montaje en zona de instalación dependerá de la posición de la fundación del aerogenerador con relación al vial interno del sitio.

#### Estación Transformadora

El predio para la construcción de la futura E.T. ocupará un terreno de aproximadamente 405 m por 50 m, (20.250 m<sup>2</sup>).

#### Edificio de Comando y Control

Adyacente a la Estación Transformadora se construirá una estructura edilicia de comando y control.

La misma se construirá, en la medida que ello sea posible, con la mayoría de sus instalaciones bajo techo, (del tipo Interior), con una terminación estética amigable con el medio ambiente.

Dicho edificio servirá, entre otras funciones, para almacén de repuestos y consumibles de los servicios de Mantenimiento.

Este edificio contará con los siguientes locales:

- ✓ Sala de Tren de celdas de M.T (33 kV).
- ✓ Sala de Comando, Protecciones y Telecontrol.
- ✓ Sala de Baterías.
- ✓ Recinto para los Transformadores de Servicios Internos.
- ✓ Oficinas.
- ✓ Baños

#### SISTEMAS COLECTORES ELECTRICOS

Como la energía eléctrica es generada en el nivel de *Baja Tensión* (0,690 kV), para ser inyectada al sistema de *Media Tensión* (33 kV), se hace necesario adecuar este parámetro, lográndose a través de un Centro de Transformación instalado al pie de la góndola de los aerogeneradores, compuesto por Transformador Elevador, de 3.400 kVA de Potencia nominal - Relación de Transformación 0,690 / 33 kV.

Los aerogeneradores se interconectarán a través de un cableado subterráneo, (utilizando cables con aislaciones del tipo seco - XLPE - 56,359 Km), en disposición tres bolillos, por lo que se prevé la realización de zanjas, cuya profundidad y ancho se ajustarán a las necesidades del proyecto (Tipo D01; D02 y D03). En cruces de caminos, las fases activas irán alojadas dentro de cañeros de PVC (Tipo 4; 5 y 6), según se trate.

En todos los casos, dentro de las zanjas se instalarán además de los cables de potencia, un cable de fibra óptica para comunicación y control de los molinos (SCADA), como así también un conductor desnudo de 50 mm<sup>2</sup> de Cu que completará la red de puesta a tierra del Parque.

La red eléctrica interna del futuro Parque Eólico será la encargada de coleccionar la energía producida por cada aerogenerador y conducirla a la Estación Transformadora Principal, donde la tensión será elevada al nivel de 132 KV y entregada a la futura Línea Aérea de Transmisión (doble tema) que se interconectará a la existente L.A.A.T. que vincula las EE.TT. Bahía Blanca y Tornquist.

El propósito del sistema colector eléctrico, además de la interconexión entre los aerogeneradores, es la de proporcionar la evacuación y transferencia de la energía generada por la granja eólica al mallado nacional. (Transformación, Transmisión de la Energía Eléctrica, para el control, supervisión, medición, maniobra, protecciones, comunicaciones, etc.)

El cableado de media tensión (M.T.) lo compondrán tres conductores (uno por fase) que vincularán a los circuitos de los aerogenerador. Según los datos consignados por la proponente del Proyecto evaluado, el futuro parque constará de 31 aerogeneradores, conformando un total de cinco (5) circuitos independientes.

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Cuatro (4) circuitos estarán compuestos por seis (6) molinos cada uno, totalizando una potencia de 76,8 MW, mientras que el restante colector lo conformarán siete (7) aerogeneradores, totalizando una potencia de 22,4 MW, (Potencia total = 76,8 MW + 22,4 MW = 99,2 MW).

Todos estos circuitos convergerán a barra de 33 kV de la futura E.T. P.E. Energética I, la cual poseerá dos (2) transformadores de 110/110/15 MVA cada uno, elevando la tensión primaria de 33 kV a 132 kV.

## 2.- LINEA AEREA DE ALTA TENSION

Las obras previstas, para la construcción de *Líneas Aéreas de Transmisión de Energía Eléctrica de Alta Tensión*, son generalmente del tipo lineal, su montaje responde a períodos de tiempo relativamente cortos, sus actividades son seriadas y se desarrollan exclusivamente en zonas puntuales (piquetes), y/o dentro de los límites perfectamente preestablecidos, definidos por la franja de servidumbre administrativa.

El proyecto evaluado incluye además de la construcción del propio Parque Eólico, la realización de la apertura de la existente Línea Área de A.T., simple tema, de 132 kV, que vincula la E.T. Bahía Blanca con la E.T. Tornquist, cuya banda de trazado atraviesa el Establecimiento Rural identificado como Reyrolles, en cuya propiedad se encuentran implantadas ocho (8) estructuras soportes de hormigón.

Dicha apertura se realizará entre los piquetes 152 y 153, debiendo realizarse un tramo de línea en configuración doble tema que recorrerá 50 m hasta la nueva estructura aporticada de entrada de la futura E.T. Energética I.

Como se ha mencionado las características de este tramo de línea, responderá a un vano de doble tema (132 kV), realizada con conductores de fase en Al / Ac de 300/50 mm<sup>2</sup> de sección nominal, montado sobre postación de soportes de H<sup>9</sup>A<sup>9</sup>, permitiendo vincular la futura E.T. Parque Eólico Energética I con la L.A.A.T. de 132 kV, propiedad de la Transportista TRANSBA S.A.

Del análisis del estudio de evaluación de la documentación aportada por ENERGETICA ARGENTINA S.A., surge que la superficie mínima afectada, para realizar la aludida apertura ocupará un espacio de aproximadamente 0,13 hectáreas.

### Franja de servidumbre

- **Servidumbre Administrativa de Electroducto (S.A.E.):** El área que se establecerá para la regulación de la S.A.E, en correspondencia al futuro tramo de L.A.A.T., involucrará una superficie, definida en función directa a la geometría de la configuración adoptada. Las limitaciones al uso del terreno se regirán según las Restricciones Impuestas en la Franja de Servidumbre.
- La Servidumbre Administrativa que requerirá el nuevo tramo de línea de transmisión, estará sujeta, en lo que respecta a su constitución y manutención a lo establecido por la Ley 19.552 "Régimen de Servidumbre Administrativa de Electroducto" y lo establecido en la Reglamentación sobre Servidumbre de Electroducto, Especificación Técnica N° T-80 y a la Especificación Técnica N° 040 de TRANSBA S.A. (Agrimensura para Líneas Aéreas).
- De corresponder, se deberá actualizar la franja de servidumbre, la que estará compuesta por una zona de seguridad mas una adicional, cuyo ancho se calculará usando la metodología propuesta por la Reglamentación de Líneas Aéreas Exteriores de Media Tensión y Alta Tensión AEA 95301 - Apartado 9 v, en correspondencia con las normativa indicada anteriormente. El ancho de la mencionada franja se la denomina Zona de Seguridad y tendrá su eje coincidente con el de la línea en cuestión.
- De corresponder, se deberán cumplir todas las normas vigentes en cuanto a gestiones, permisos, pago de tasas y cualquier otra tramitación que correspondiere para

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obtener la aprobación por parte de los Entes u Organismos competentes de la documentación de obra para realizar los cruces de línea en rutas, vías férreas, cursos de agua, y otros que pudieran corresponder.

- Materialización de adecuados "Programas de Compensación Económica a eventuales Superficiales perjudicados".

#### Fundaciones

Las fundación de las estructura (RDDTE) será resuelta mediante macizos de cimentación, zapatas o pilotes, según surja del estudio *Geotécnico y Fundaciones de la transportista*. Las zapatas serán ubicadas en localizaciones donde el terreno circundante a las excavaciones sea desmoronable o el nivel freático esté por sobre el nivel de fundación. Se emplearán fundaciones indirectas con pilotes pre-excavados hormigonados "in situ", en aquellas localizaciones donde los estudios geotécnicos indiquen una baja capacidad portante.

#### Puesta a tierra

##### a) En estructuras de la L.A.A.T

Todos los soportes adicionales y nuevas estructuras aporticadas, deberán poseer bloquetes internos de bronce para la conexión de la puesta a tierra, los que se vincularán a las jabalinas cilíndricas acoplables de acero-cobreado.

- Longitud: 3.000 mm
- Tipo: Cilíndrica ("Cadwell")
- Diámetro: 16 mm
- Resistencia total a tierra: 5  $\Omega$  (Cinco Ohms) mínimo x cada estructura.
- Hincada y conectada a la estructura por medio de cable de acero cobreado de 50 mm<sup>2</sup>.

##### b) De alambrados

De acuerdo a las Normativas de Seguridad vigentes se deberán medir las tensiones eléctricas inducidas en los alambrados rurales perimetrales. Se utilizarán aparatos de campo autorizados por la Inspección actuante y contarán con certificados de contraste vigentes. De resultar valores mayores que los mínimos permitidos por las normas, se deberá interrumpir la continuidad de los alambres y poner a tierra todos los tramos en conflicto.

No obstante cuando el tramo de Línea de Alta Tensión se sitúe junto a los alambrados en forma paralela por más de un (1) km, también se deberá cortar la continuidad de los mismos por lo menos una vez y poner a tierra los tramos divididos. Posteriormente se llevará a cabo el procedimiento de medición mencionado en el primer párrafo.

### 3.- ESTACIÓN TRANSFORMADORA (M.T. / A.T.)

Para la conexión de la futura Central Eólica con el Sistema Interconectado Nacional, se construirá una Estación Transformadora 33/132 kV, acorde a los procedimientos de CAMMESA, Anexo 16, REGLAMENTO DE CONEXION Y USO DEL SISTEMA DE TRANSPORTE DE ENERGIA ELECTRICA, la cuál será operada por TRANSBA S.A.

#### DESCRIPCIÓN TÉCNICA DE LA ESTACIÓN TRANSFORMADORA.

**IMPORTANTE:** La Empresa SIEMENS ENERGY MANAGEMENT ha realizado un informe técnico en correspondencia a los estudios de funcionamiento eléctrico previsto por el Procedimiento Técnico N° 1 de la *Compañía Administradora del Mercado Mayorista Eléctrico S.A. (CAMMESA)* para formalizar ante la Transportista: TRANSBA S.A., la *Solicitud de Acceso a la Capacidad de Transporte Existente*, para la instalación de 100 MW proveniente del futuro Parque Eólico ENERGETICA I.

El lugar seleccionado para la implantación de la futura instalación deberá tener acceso directo desde una calle pública o desde la propia Ruta, sin la necesidad de tener que solicitar permiso para su ingreso a superficies privados.

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Para tal acceso, se deberá prever dos (2) entradas independientes, una para TRANSBA S.A. y otra propia para ENERGÉTICA ARGENTINA S.A.

La futura Estación Transformadora Principal se ubicará dentro de uno de los tres (3) predios preseleccionados, más precisamente en el **Establecimiento Rural Reyrolles** y ocupará un área de terreno aproximada a los **20.250 m<sup>2</sup>** (405 m x 50 m), la misma deberá cercarse, mediante un cerramiento perimetral de alambre tejido independiente al de la granja eólica.

La obra correspondiente a la Estación Transformadora incluye:

- La construcción de dos (2) Campos de Salida de Línea de 132 KV, uno para vincularse a la E.T. Bahía Blanca y el otro a la E.T. Tornquist.
- La construcción de dos (2) Campos de Transformación para albergar a las máquinas de poder: 2 x 110 / 110 / 15 MVA – Rel. 132 / 33 / 13,2 KV, Grupo de Conexión: YN, yn0, d11, Regulación Secundaria:  $\pm 10 \times 1,25\%$  ( $\pm 12,5\%$ ).
  - Construcción de dos (2) boxes para la instalación de los Transformadores de Potencia con sus respectivos muros parallas.
  - Ante posibles derrames de aceites dieléctricos, se deberá construir bateas / cisternas cuya capacidad deberá proyectarse para almacenar la totalidad de los líquidos aislantes alojados dentro de las cubas de los transformadores.
- La construcción de un Sistema de Doble Juego de Barras en 132 KV completo, con acoplamiento de barras.
- La construcción de Campos Medición de tensión de barras.
- Provisión y montaje de Celdas de 33 KV del tipo anti-arco, para uso interior y su vinculación a los Transformadores de Potencia mediante conductos para cables uni - multipolares desarrollados en función directa a los diagramas unifilares definitivos de la granja. El tren de celdas contará con ductos expansores de gases.
- Provisión y montaje de los Transformadores de Servicios Auxiliares 33 / 0,400 KV.
- Provisión y montaje de los Servicios Auxiliares de Corriente Alterna y de Corriente Continua, incluyendo el suministro de los tableros generales: TGSACA y TGSACC.
- Provisión y montaje de Reactancias de Cortocircuito para el neutro de 33 KV.
- Provisión y montaje de los tableros de comando, protección, señalización y alarmas para los campos de maniobra y de transformación de 132 KV. (tableros independientes para el comando y la protección). Adecuación del sistema de protecciones de los extremos remotos.
- Provisión y montaje del Sistema de Comando y Telecontrol para la nueva E.T.
- Provisión y montaje del Sistema de Medición Comercial SMEC en las salidas de 33 KV a la Central Eólica y backup en el nivel de tensión de 132 KV.
- Provisión y montaje del Sistema de Comunicaciones de la E.T. y adecuación del Sistema actual de TRANSBA S.A. en los extremos remotos.
- Construcción de un camino de acceso a efectos de proveer a la Transportista un acceso independiente desde la calle pública vecinal acondicionada de manera que por él se pueda acceder con los pesos y dimensiones que demandan los aparatos a instalar.
- Ejecución de todas las obras complementarias que incluirán: relleno y nivelación del terreno, provisión y montaje de pórticos, fundaciones, canalizaciones, malla de puesta a tierra, caminos de acceso e internos de la E.T. ya sean principales o secundarios, alcantarillas, iluminación, cercos, etc.
- Construcción Edificio destinada al comando, protección, medición, telecontrol, comunicaciones, celdas y servicios auxiliares para las instalaciones del Transportista. Contará con: Sala de comando, sala de celdas para la tensión de 33 KV dejando espacio para las futuras de 13,2 KV, sala de baterías, baño y oficina. Se adosará al presente edificio otro, de similares características para el Operador de la Central Eólica (ENERGÉTICA ARGENTINA S.A.).

  
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**II.-Enumeración de las principales actividades de mayor relevancia y posible incidencia en la Construcción de las obras proyectadas para la Generación de Energía producida por el "Parque Eólico ENERGÉTICA I", su posterior Operación - Mantenimiento, asimismo se identifican los potenciales impactos de significancia ambiental asociados y los planes o procedimientos internos tendientes a eliminar, prevenir, mitigar, controlar y/o compensar su afectación al medio ambiente.** (Estos últimos conformados por los propuestos por la firma y este Organismo de Estado).

El mayor tiempo en ejecutar las Tareas y Obras Generadoras de Impactos Ambientales (TOGIA), se circunscriben, respecto a la granja eólica, puertas adentro de los predios seleccionados, por lo que la mayoría de las alteraciones ocurrirán principalmente en el interior de éste. Mientras que las obras previstas, para el montaje de Líneas Aéreas de Transmisión de Energía Eléctrica de A.T., son generalmente del tipo lineal, su montaje responde a periodos de tiempo relativamente cortos, sus actividades son seriadas desarrollándose exclusivamente en zonas puntuales (piquetes), y/o dentro de los límites perfectamente preestablecidos, definidos por la franja de servidumbre administrativa.

**A) Etapa de construcción:**

ACTIVIDADES TOGIA	IMPACTOS POTENCIALES	MEDIDAS MITIGADORAS
(Válido para la L.A.A.T.)  Gestión de tierras según elección de traza.	Banda de circulación establecida por la <u>selección del trazado</u> que presentan criticidad por segmentos que interaccionan sobre Áreas Naturales protegidas u otras asignaciones de <u>Uso del Suelo</u> intangibles o de alto valor biofísico, cultural o socio económico. Limitaciones al uso del terreno según Restricciones Impuestas en la Franja de Servidumbre.	Desarrollar programas de difusión orientados a la población zonal. Cumplimiento Ley Prov. 12.814 Servidumbres de distinto tipo pre acordadas. Acuerdos Indemnizatorios con superficiarios afectados. Gestión de Permisos de Pasos y de Construcción autorizados. Coordinación General.
(Válido para el Parque Eólico, E.T. y L.A.A.T.)  Instalación de Obradores temporarios. Acopio de materiales. Parque de Maquinarias.	Cambio de condiciones sobre aspectos tales como: Higiénico, Sanitarias, Salud y Seguridad. (Infestación de Vectores). Remoción de tierra y cobertura vegetal. Generación de residuos sólidos (RSU) producto de las actividades propias del obrador. Generación de efluentes líquidos. Cuestionamientos: Aceptación Social y Socio-culturales. Molestias a vecinos por Generación de disturbios. Alteración de la fauna autóctona. Pérdida del Valor Paisajístico: alteraciones al paisaje.  <u>Impacto Positivo:</u> Demanda de insumos y servicios sobre el comercio local. Creación de Fuentes de trabajo Transitorias.	Información a la población zonal (Usuarios/ superficiarios) respecto a las características de la obra y del tiempo de duración de la misma. Demarcación del terreno, cartografía y preparación de mapas de zonas de riesgo, áreas protectoras de fauna y flora silvestre y control de inundaciones. Orientar y controlar el comportamiento del personal de obra, en relación con la comunidad. Prohibición de portación de armas, cazar, comerciar con la fauna autóctona y/o animales silvestres, quemar de cualquier tipo, arrojar materiales o residuos a los cursos de agua, ingesta de alcohol Evitar reuniones de operarios que generen posibles disturbios etc. Utilización de baños Químicos. Retiro y disposición adecuada (R.S.U). Minimizar la ocupación de espacios fuera del área de trabajo. Restauración final de las áreas utilizadas como Obradores.

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<p>(Valido para el Parque Eólico, E.T. y L.A.A.T.)</p> <p><b>Caminos de servicios. Desarrollo de accesos</b> (Apertura y mejoras de accesos).</p>	<p>Remoción y afectación de la cobertura vegetal, de acuerdo al trazado del corredor o banda alternativa. Posible afectación a la normal circulación vehicular. Desplazamiento temporal de la fauna terrestre y aérea de la zona afectada. Esquema de restricciones o conflictos Naturales: áreas de humedales, de valor biológico u ornamental representativo. Fragmentación del hábitat.</p>	<p>Utilizar preferentemente, al máximo de lo posible, los accesos disponibles de Rutas Nacionales, Provinciales, Caminos vecinales y privados. Acuerdos previos establecidos con la autoridad competente. Respetar rigurosamente los códigos de planeamiento y uso del suelo en zonas urbanas y periurbanas. No se deberá interrumpir el drenaje, conexión de humedales, y fragmentación del hábitat natural.</p>
<p>(Valido para P.E., E.T. y L.A.A.T.)</p> <p><b>Movilización de Equipos, Mat. y Personal.</b> (Transporte, carga, posicionamiento y descarga del generador eólico, mastil, góndola, rotor, Transformadores, postes, Equipamiento y Materiales, al sector de obras).</p>	<p>Afectaciones a la normal circulación peatonal y vehicular en la zona. Contaminación del aire por emisiones gaseosas no controladas de monóxido de carbono, dióxido de azufre, derivadas del transporte automotor. Vehículos de gran porte, propios, contratados y subcontratados: Topadora, motorizadora, retroexcavadoras, tractores, Camiones (mixer), mezcladores-veladores, semiorbitales, culteras especiales, grúas, hidrogúas, hoyadoras, etc. Probabilidad de contaminación de los recursos agua y suelo con potenciales derrames y pérdidas de combustibles y/o lubricantes. Ocupación temporaria de banquetas, utilización de espacios verdes para estacionamientos de máquinas y/o equipos. Incremento de ocurrencias de accidentes de personal de obra o terceros en tareas de carga y descarga de materiales. Afectación a la actividad rural. Afectación al medio Antrópico. Pérdida del aspecto estético local.</p>	<p>Señalización del área afectada. Deberá desarrollarse, en forma consensuada con la totalidad de las Autoridades Administrativas, cuyas jurisdicciones se encuentren involucradas en la ruta elegida para el transporte de los equipos de envergadura a emplearse, la logística aplicable para tal fin. Vigencia de la VTV (verificación técnica vehicular). Horarios e itinerarios permitidos Cumplimiento de las Normas de higiene y seguridad. Control de velocidades de desplazamientos de vehículos y/o máquinas. Estacionamientos autorizados por Permisos Municipales. Pólizas de seguros actualizadas de la totalidad de Vehículos intervinientes, personal actuante y equipamiento transportado. Control de cargas: alturas y pesos máximos permitidos. Se evitará la movilización de maquinaria pesada en humedales o terreno fangoso.</p>
<p>(Valido para el Parque Eólico, E.T. y L.A.A.T.)</p> <p><b>Rescate del Patrimonio Histórico, Cultural y Paleontológico.</b></p>	<p>Escasa probabilidad de ocurrencia. Impacto Positivo: Descubrimiento de restos fósiles u otro objeto de valor Cultural o Histórico.</p>	<p>Suspensión inmediata de toda tarea. Comunicación a las Autoridades pertinentes.</p>
<p>(Valido para P.E., E.T. y L.A.A.T.)</p> <p><b>Limpieza y Preparación del Área de emplazamiento. Movimiento de Tierra, Excavaciones.</b> (Refino, compactación, Nivelación, Zanjados, fundaciones, etc)</p>	<p>Reducción, Poda, Despeje / Desmalezado de ejemplares: remoción de tierra y/o pérdidas de la cobertura vegetal. Perjuicios a superficiarios o parcelas privadas. Ingreso a propiedades privadas por terceros no autorizados. Menor valor inmobiliario de las propiedades cercanas o próximas al emprendimiento. Desmejoramiento del primer horizonte del suelo por la utilización de equipos pesados. Afectación al uso actual del espacio y a la infraestructura existente. Degradación de la capa edáfica. Restricción de actividades por fragmentación del territorio.</p>	<p>Plan previo de sondeos de inspección. Raleo selectivo a cada lado del eje de la franja. (Ancho). Evitar uso de agroquímico para el control de maleza (herbicidas). Manejo del material de poda evitando su acumulación. Programa de recomposición de la zona intervenida. Restitución de especies arbóreas que interfieran en el posicionamiento de los aerogeneradores y área de servidumbre. - Programa de reforestación. Confinar los trabajos al espacio definido. (Predios y banda Seleccionados). Estudios de suelos y ensayos para conocer el grado de compactación. Delimitar la zona /señalizar.</p>

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<p>(Valdo para P.E., E.T. y L.A.A.T.)</p> <p><b>Limpieza y Preparación del área de emplazamiento. Movimiento de Tierra, Excavaciones.</b> (Retiro, compactación, Nivelación, Zanjas, fundaciones, etc)</p>	<p>Alteraciones temporales menores en suelo, aire, agua y flora. Afectación a la normal circulación vehicular en la zona. Potencial alumbamiento de nivel freático. Emisiones atmosféricas de material particulado. Extracción de suelos potencialmente contaminados. Riesgo de accidentes de personal de obra o terceros, en caso de caídas a pozos o por demolición incontrolada. Idem por Apertura de zanjas para el montaje de CSMT (33 kV). Desmoronamiento de pendientes. Generación de residuos inertes. Impacto paisajístico. Intrusión y contaminación visual. Impactos asociados en la preparación del área de emplazamiento de grúas para montajes.</p>	<p>Balizaje nocturno. Encajonamientos de tierra y/o arena, retiro material sobrante. Utilización de rejillas de madera p/ cobertura de zanjas. Apuntalamientos. Utilización de vallas, pasarelas, acordonamientos. Abatimiento de napas. Racionalización en el uso del bombeo en tareas de posible depresión de napas freáticas. Cumplimiento de Normas de higiene y seguridad. Personal capacitado y disponibilidad de medios y recursos. A.R.T. Seguros de vida pólizas vigentes. Prohibición de circulación de móviles en tándem.</p>
<p>(Valdo para P.E., E.T. y L.A.A.T.)</p> <p><b>Ejecución de obras civiles.</b> (Edificios, Oficinas, Fundaciones, anclajes, placas, bases, Ejecución de bases oficas p/ Transit, canalizaciones, etc.)</p>	<p>Impacto por Alteración del perfil del suelo. Cambio radical de las características geomorfológicas del terreno, en el área afectada por el emplazamiento de los mástiles o torres, fundaciones de HFA, y demás obras auxiliares asociadas. Alteración de la compactación de suelos. Alteración del normal escurrimiento de aguas superficiales y subterráneas. Impacto visual negativo temporal por el movimiento de operarios, partes constitutivas del molino y equipos complementarios. Potencial alumbamiento de nivel freático. Extracción de suelos potencialmente contaminados. Contaminaciones atmosféricas por quema de combustibles fósiles. Emisión de Monóxido de carbono, óxido de azufre, derivadas del parque automotor. Contaminación de suelos y/o agua por vertidos no controlados de las hormigoneras. Riesgo de accidentes que pueden ocasionar lesiones y/o muertes. Suspensión de operaciones por períodos prolongados.</p>	<p>Estudios de suelos previos. Medidas de señalización. Adecuado almacenamiento y disposición material sobrante. Utilización de contenedores apropiados p/ recolección de tierras, desechos de construcción y/o escombros. La fundación de los aerogeneradores respetarán las Especificaciones Técnicas del fabricante: Armadura Activa, Pirámide propiamente dicha, Tronco de la misma, inserto de anclaje, encastré de los troncos. Control del fraguado. Cobertura de los pozos de todas las fundaciones durante la etapa de construcción. Cumplimiento de normas de Seguridad e Higiene. Cumplimiento de la verificación técnica vehicular de los móviles utilizados. Racionalización en el uso del bombeo en tareas para la depresión de napas. Restablecimiento a las condiciones originales encontradas en línea de base.</p>
<p>(Valdo para P.E. y E.T.)</p> <p><b>Instalación de equipos c/ aceites.</b></p>	<p>Probabilidad de contaminación del Suelo y Agua por pérdidas o derrames de aceites. Riesgo de pérdidas en la Calidad de los Recursos. Alteración de las propiedades físico-químicas del aceite por humedad, debidas a fallas de estanqueidad de la cuba de los transformadores (en caso de no ser seco) y circuito de lubricación de los aerogeneradores (Transformadores de Potencia, Servicio Auxiliares, Reactancias y Reactores de Neutro). Riesgos de accidentes personales. Almacenamiento o manipuleo inadecuado de tambores con aceite dieléctrico aislante, utilizado para las reposiciones.</p>	<p>Medidas preventivas para evitar pérdidas en tareas de Lubricación y Refrigeración del aerogenerador (Intercambiador de calor c/ Circuito de circulación forzada de aceite por Bomba). Construcción de Bateas de Hormigón de capacidad mayor a la cantidad de aceite contenido en cada uno de los transformadores de poder y servicios auxiliares de la futura Estación Transformadora. Elementos de contención de derrames (prevención y remediación de derrames). Verificación: hermeticidad, estanqueidad de equipos. Prohibición de uso PCB's Disposición y almacenamiento adecuado.</p>

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<p>(Válido para P.E., E.T. y L.A.A.T.)</p> <p><b>Montajes de los aerogeneradores, cableados y conexiones eléctricos. M.T.</b> (vinculación entre equipos).</p>	<p>Impacto visual ante la presencia de las turbinas eólicas e infraestructuras asociadas.</p> <p>Ocupación del Suelo.</p> <p>Ateración al Medio Percceptual o Paisajístico por intrusión visual de las nuevas instalaciones, desarmonía por presencia de los molinos, tendido de C.S. de 33 kV, E.T., L.A.A.T., etc.</p> <p>Accidentes a personal propio o contratado en tareas afines a los montajes electro-mecánicos.</p> <ul style="list-style-type: none"> <li>➤ Riesgo de caída al montar los componentes de los aerogeneradores</li> <li>➤ Riesgo eléctrico. (Choque eléctrico)</li> <li>➤ Riesgo de Accidentes por trabajos en altura.</li> <li>➤ Riesgo de Accidentes por falta de orden y limpieza.</li> <li>➤ Riesgo de Accidentes por mala manipulación de equipamientos y/o herramientas.</li> <li>➤ Riesgo de Accidentes por falta, no uso o por mal estado de elementos de protección.</li> <li>➤ Riesgos por Pérdidas de rigidez dieléctrica asociadas a las herramientas.</li> </ul>	<p>Estricto Cumplimiento de las cartillas técnicas y Especificaciones Técnicas del fabricante, respecto a la alineación, nivelación, balanceo y posicionamiento final de cada tramo del mástil, nacelle, rotor y el eje del generador eólico.</p> <p>Se deberá mitigar los impactos visuales ocasionados por el Aerogenerador, (percepción visual), pintando el molino en colores neutros acorde al entorno circundante.</p> <p>Confinar emplazamiento al espacio definido.</p> <p>Minimizar el desbalanceo de potencia con el reparto equilibrado de los molinos, a los sub-circuitos de M.T.</p> <p>Personal debidamente capacitado en el conexonado de la nueva L.A.A.T. de 132 kV a la infraestructura existente.</p> <p>A.R.T, Seguros de vida, pólizas vigentes.</p>
<p>(Válido para P.E., E.T. y L.A.A.T.)</p> <p><b>Puesta a tierra.</b></p>	<p>Afectación a la Seguridad Operativa: Deterioro de la Red de puesta a Tierra: cable de Cobre, jabalinas, uniones, soldaduras del mallado por sufrir daños involuntarios (Vicios ocultos) o intencionales (Sabotajes).</p> <p>Futuros riesgos de posibles accidentes personales.</p> <p>Presencia de futuras tensiones de paso y de contacto por Valores Altos en resistencia eléctrica de puestas a tierra.</p> <p>Incorrecto diseño de la malla y/o montaje de los electrodos de Puestas a Tierras.</p> <p>Discontinuidad eléctrica entre tramos de la torre o mástil.</p> <p>Robo de jabalinas y cables en piquetes de la L.A.A.T.</p> <p><u>Impactos Positivos:</u> Disminución de riesgos de accidentes personales.</p> <p>Aumento de la calidad de la prestación del servicio.</p>	<p>Cumplimiento de Norma IEEE N° 80.</p> <p>Respetar las recomendaciones del fabricante de cada generador eólico.</p> <p>Perforación a napa de agua p/ PaT y de protecciones contra descargas atmosféricas sobre las turbinas.</p> <p>Estudios de Resistividad del Suelo, en zonas aledañas a la E.T., Molinos, y L.A.A.T.</p> <p>Todo equipo, aparato, blindaje de cables, estructuras metálicas, tramos del Mástil o Torre, góndola, cercos, canales, Postes de HªA y en general cualquier instalación o dispositivo principal o accesorio, que no estén sometidos bajo tensión, deberán quedar vinculados <u>rigidamente</u> a tierra en forma segura.</p> <p>Verificaciones de continuidad de la Red de puesta a tierra.</p> <p>Uso de elementos de seguridad y de señalética adecuada.</p> <p>Comprobaciones de valores de resistencia de P.a.T, según Normas.</p> <p>Normas de Higiene y Seguridad.</p>
<p><b>Tareas generales asociadas a la etapa de construcción.</b></p>	<p>Contaminación de los recursos suelos y/o agua por vertidos no controlados de hormigoneras en tareas del coronamiento de las fundaciones durante la cementación de la Armadura Activa, Tronco de la misma, inserto de anclaje, encastrado del primer tramo, fundaciones de las estructuras de la L.A.A.T., y apartamiento de la E.T.</p> <p>Cambios en la estructura del recurso suelo, (Propiedades físico-químicas).</p> <p>Modificación de drenajes naturales.</p> <p>Formación de procesos erosivos.</p> <p>Accidentes a personal de obra, contratado y/o terceros en tareas de posicionamiento de las grúas de montaje, izado, pivoteamiento, nivelación, montaje, anclaje de los</p>	<p>Desarrollar programas de difusión orientados a la población zonal.</p> <p>Clasificación, almacenamiento y segregación de residuos.</p> <p>Disposición final de residuos.</p> <p>Almacenamiento en bolsas y/o tambores estancos correctamente identificados.</p> <p>Retiro y disposición mediante empresa habilitada.</p> <p>Control de fraguado.</p> <p>Utilización de elementos de protección del personal.</p> <p>Utilización de elementos absorbentes y adecuada recolección de los mismos.</p> <p>Contención de tierra para evitar dispersión.</p> <p>Ingeniería de contención de emisiones.</p>

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<p><b>Tareas generales asociadas a la etapa de construcción.</b></p>	<p>tramos de la Torre. Riesgos de lesiones a los operarios por desplomes, caída incontrolada en montaje del rotor, generador, góndola. Generación de residuos: Inadecuado almacenamiento, segregación de residuos inertes/ especiales y/o vertidos de hormigón. Deficiencias de su gestión. Acumulación prolongada de materiales, y/o producto de excavaciones fuera del predio. Afectaciones a la normal circulación vehicular en la zona próximas al predio. Afectación al aire por emisiones atmosféricas de material particulado. Perturbaciones al personal del Parque Eólico ENERGETICA I y/o Empresa contratistas / sub-contratistas, por emisiones sonoras y vibraciones producto de herramienta y/o móviles, Perturbaciones a la salud de operarios y fauna avícola por emisión de ruidos temporales. Transformación del paisaje original por la inclusión de estructuras, de gran envergadura, no compatibles con el entorno circundante.</p>	<p>Realización de trabajos en horarios de menor molestia a los vecinos. Monitoreos periódicos de niveles sonoros.</p>
<p>(Valdo para P.E., E.T. y L.A.A.T.)  <b>Adaptación de las nuevas construcciones a las preexistentes.</b></p>	<p>Riesgo de Accidentes a personal o terceros. Idem, Idem riesgos de electrocución, asociado a los trabajos de vinculación de la nuevo tramo de L.A.A.T con los porticos de la E.T. del Parque Eólico ENERGETICA I. Impactos asociados a la construcción de la playa intemperie y celdas interiores de M.T. Alteración del normal escurrimiento de las aguas por la compactación de suelos y debidas a las bases de la aparments toda y los piquetes de la L.A.A.T.</p>	<p>Señalizaciones adecuadas. Todo personal Contratista respetará, durante el desarrollo de sus tareas, el área de trabajo confinada y delimitada, tomando en cuenta las advertencias y/o mensajes de los carteles indicadores, no pudiendo circular ni permanecer en otros lugares. Programa de recomposición del terreno o predio intervenido. Normas de Higiene y Seguridad.</p>
<p><b>Generación de puestos de trabajo.</b></p>	<p><b>Impactos Positivos:</b> Mejoramiento en la calidad de vida y desarrollo socioeconómico de la población.</p>	<p>Medidas de Fortalecimiento.</p>

**B) Fase de operación y mantenimiento.**

b. Explotación de las Instalaciones.  
En condiciones de **OPERACIÓN NORMAL**, la Central Eólica suministrará la Energía Eléctrica generada en función directa y de acuerdo a las condiciones del **VIENTO**, siendo supervisada a través de un Sistema de Monitoreo a distancia (**SCADA**) que dispondrá el propio Parque Eólico **ENERGETICA I** en su futuro Centro de Operación.

ACTIVIDADES: TOGIA	IMPACTOS POTENCIALES	MEDIDAS MITIGADORAS
<p><b>Habilitación del Parque Eólico.</b></p>	<p><b>Impactos Positivos:</b> Ahorro en toneladas de reservas de combustibles fósiles (petróleo). Generación de energía eléctrica asociado a costos más bajos. Ahorro de divisas por no utilizar hidrocarburo importado. Emisiones de dióxido de carbono, óxido</p>	<p>Aporte de 99,2 MW de potencia adicional al S.A.D.I., de origen renovable. Sustitución de Energías denominadas sucias por Energías Limpias. Niveles NULOS de Emisiones Contaminantes. CO, CO<sub>2</sub> - NO<sub>x</sub> - SO<sub>2</sub>. Beneficio económico adicional (Leyes de Promoción Nac. y Prov.), obtenido a partir</p>

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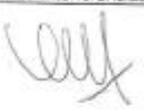
<p><b>Habilitación del Parque Eólico.</b></p>	<p>nitroso, dióxido de azufre, y material particulado evitados a la atmósfera, en comparación con la generación de Energía Eléctrica que hubiese sido producida por una central térmica. Proyecto con Alto nivel de Aceptación Social. Mínima Superficie utilizada como uso del terreno. <u>Impactos Negativos:</u> Generación de energía eléctrica discontinua: en función a las condiciones y a las rigurosidades del viento. Debido a momentos giroscópicos generados por el viento, sobre las estructuras, pueden ocasionar roturas de palas y fractura de los dientes de la corona y del piñón. Perturbaciones relacionadas con la fluctuación o calidad de la tensión en el punto de interconexión, que causan variación lenta de tensión, distorsiones armónicas, flicker, huecos de tensión, etc. Problemas de Estabilidad del Sistema.</p>	<p>del Uso de los parques eólicos. Aumento de Generación Eléctrica para satisfacer a la demanda creciente. Atractiva Tecnología seleccionada por el alto grado de previsibilidad de los logros propuestos, diversificando la matriz energética nacional. Planificación adecuada para un desarrollo ordenado de la infraestructura eléctrica necesaria. Mayor probabilidad de futuras inversiones privadas. Coordinación y selectividad de las protecciones de acuerdo a la calidad del servicio exigida. Menor frecuencia (FMIK), y duración (TTIK) en cortes no programados. Análisis del sistema eléctrico de potencia en su conjunto, considerando la interacción entre el futuro <b>PARQUE EÓLICO ENERGÉTICA I, E.T., L.A.A.T. y SADI.</b></p>
<p><b>Existencia de las instalaciones como estructura física.</b></p>	<p>Alteración de infraestructura física territorial. Afectación al paisaje por intrusión visual. Contaminación lumínica. Alteración en los niveles de luces y sombras, por rotación de las aspas, según: hora, mes y año. (Efecto parpadeo) Alteración del hábitat zonal por los reflejos, destellos y sombras que se producen por la incidencia de la luz solar sobre el conjunto mástil - rotor- pala de las turbinas eólicas. Encandilamiento por acción del sol con los rotores y aspas de los molinos. Impacto negativo sobre la fauna aérea y vegetación circundante. Generación de Ruidos mecánicos y aerodinámicos de las partes móviles de cada una de las máquinas. Molestia a actividades recreativas cercanas. Interferencias al espacio aéreo.</p>	<p>Demarcación de los predios establecidos. Planificación: La distancia más próxima a los primeros asentamientos urbanos no deberá ser menor a 10 veces el diámetro del rotor de las turbinas eólicas. Seleccionar adecuados colores neutros para el pintado de los aerogeneradores: tanto para la torre o mástil, caseta, como así también para el rotor y aspas, de manera que se atenúen y se confundan con el entorno del paisaje. Resguardar la zona de la central eólica. Estadísticas de control respecto a la mortandad de la avifauna regional. Ruta migratoria de aves. Denunciar las nuevas instalaciones ante las autoridades de la F.A.A., Administración Nacional de Aviación Civil, etc., para que se incorpore el Parque Eólico en sus itinerarios de vuelo.</p>
<p><b>Colisión de avifauna.</b></p>	<p>Alteración de patrones y rutas de vuelo de la avifauna local y migrante. Mortandad de aves por colisión contra los nuevos molinos. Potenciales afectaciones negativas directas a la población de las especies: <i>Chloephaga Rubriceps</i>, <i>Chloephaga Poocephala</i>, <i>Chloephaga Picta</i>, etc.</p>	<p>Dinámica de vuelo y control de la mortandad de aves por colisión contra las instalaciones del emprendimiento (monitoreos, estadísticas, registros, etc.); deberán ser recomendadas y llevadas a cabo por profesionales idóneos y con incumbencia en la materia. Estudio de rutas migratorias de Aves. Cumplimiento de las Leyes N° 12.250 y N° 14.038. Se deberá evaluar la necesidad de monitorear exhaustivamente la migración de las especies mencionadas, con el objeto de detener momentáneamente el funcionamiento de los aerogeneradores cada vez que las mismas atraviesen la zona de la granja eólica en su trayecto migratorio. En caso de necesidad y para poder cumplir con este objetivo, se deberá acordar un <b>SISTEMA DE AVISTAJE</b> prematuro de las aves</p>

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<p><b>Generación, Transformación y Transporte de Energía Eléctrica.</b></p>	<p>Generación de campos electromagnéticos no ionizantes de baja frecuencia. (Generadores, Transformadores, CSMT, Estación Transformadora 33/132 kV y líneas aéreas de A.T. asociadas).</p>	<p>Monitoreo periódico de niveles aceptables de C.E.M. según Res. Secretaría Energía N° 77/98 en la Cadena de conversión de tensiones.</p>
<p><b>Puestas a tierra de la instalación.</b></p>	<p>Riesgos de transferencia de potenciales peligrosos. Presencia de tensiones de paso y de contacto consideradas peligrosas por valores altos en resistencia eléctrica de puestas a tierra. Riesgos de contactos directos por circulación de corrientes, de magnitudes tales, que pongan en riesgo la vida de personas.</p>	<p>Monitoreos de las tensiones de paso y contacto. Tareas para mejoramiento en nivel de suelo. Verificaciones de continuidad de la Red de puesta a tierra. Uso de elementos de seguridad y de señalética de advertencia <i>peligro de muerte</i> presencia de instalaciones con tensión.</p>
<p><b>Mantenimiento y limpieza de los Parques Eólicos.</b></p>	<p>Eventos acaecidos por Ausencia de Planes de Mantenimiento, Supervisión, inspección de instalaciones. Presencia de hielo sobre las aspas de los molinos y/o insectos adheridos a las mismas, que afectan el rendimiento del parque. Falta o inadecuado estado del equipo de prevención, detección y extinción de incendios que pueden originar un agravamiento en caso de un siniestro. Accidentes al personal propio o contratado en tareas afines a los Mantenimientos. &gt; Riesgo eléctrico. &gt; Riesgos de Explosión e Incendio. &gt; Riesgo de accidentes debido a factores Meteorológicos. &gt; Riesgos por Actos vandálicos. &gt; Riesgo de Accidentes por trabajos en altura. &gt; Riesgo de Accidentes por falta de orden y limpieza. &gt; Riesgo de Accidentes por manipulación de equipamientos y/o herramientas. &gt; Riesgo de Accidentes por falta, no uso o mal estado de elementos de seguridad y/o protección. &gt; Riesgo de aceleración incontrolada del rotor, ante fallas en el sistema de frenado.</p>	<p><b>Programa de Mantenimiento de los Parques eólicos:</b> Trabajos de verificación y ensayos de acuerdo a manuales entregados por los fabricantes. Análisis de Ciclo de Vida. Control periódico de las partes metálicas ante la posibilidad de presencia de óxido. Estas actividades se deberán realizar a c/u de los componentes y/o circuitos: torre, góndola y capota, palas del rotor, elementos de transmisión, sistema de orientación, sistemas hidráulicos, controladores e instalaciones eléctricas. (Chequeo de puestas a tierras y aislaciones, verificaciones periódicas del estado de conservación de equipos asociados), desarrollándose en correspondencia con las exigencias establecidas en las normas y procedimientos estándares de seguridad. Parada obligatoria del molino hasta el desprendimiento acumulado del hielo. Categorización de los impactos. Utilización de elementos de protección personal en óptimo estado de conservación. A.R.T., Seguros de vida pólizas vigentes</p>
<p><b>Mantenimiento preventivo y correctivo de los equipos y/o protecciones eléctricas.</b></p>	<p><b>Impactos Positivos:</b> Prevención de potenciales contaminaciones de suelos, aguas y aire. Prevención de potenciales fallas. Reducción de la interrupción del servicio eléctrico. Alargamiento de la vida útil de las instalaciones. Disminución de riesgo de accidentes a operarios y/o terceros. Aumento de la calidad del producto suministrado (niveles adecuados de tensión, sin perturbaciones de la energía por flickers o presencia de armónicos).</p>	<p><b>Medidas de Fortalecimiento.</b> Cumplimiento estricto del Plan de Mantenimiento. Monitoreo de la torre, góndola, rotor, aspas, generador, sistema de frenos, Multiplicador, transformadores, Líneas de AT y MT, E.T., pozos y mallas de puesta a tierra etc. Previsiones para minimizar ocurrencia de eventos no deseados. Estudios valorativos de estadísticas de emergencias. Plan de Gestión Ambiental. Mitigaciones.</p>
<p><b>Supervisión e inspección de instalaciones.</b></p>	<p>Prevención de ocurrencias de potenciales contingencias. Potencial afectación a la seguridad, salud y calidad de vida de la población ante ocurrencias de contingencias no deseadas por mala supervisión: Perturbaciones por efecto corona. Ruido audible. Interferencias a emisiones</p>	<p>Prevención de emergencias o incidentes ambientales mediante el estricto cumplimiento del Plan de mantenimiento del Parque Eólico. Cumplimiento del Plan de Gestión Ambiental. Monitoreos Ambientales obligatorios y periódicos de magnitudes respecto a sus Niveles Máximos Admisibles.</p>

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<b>Supervisión e inspección de instalaciones.</b>	Radio y TV. Generación de tensiones inducidas, descargas eléctricas (parciales y/o disruptivas), Ionizaciones, Efluvios, Arcos eléctricos. Posibilidad de efectos sinérgicos ante presencia de otras instalaciones. Choques o Shocks eléctricos. Generación de pulsos Electromagnéticos (C.E.M.), Flicker, huecos de tensión, (Oscilaciones de intensidad luminosas).	Organización de cursos periódicos de capacitación. Evaluaciones al Grupo de Respuestas a programas de simulacros.
<b>Tareas inherentes a la etapa de Operación o Mantenimiento.</b>	Generación de residuos inertes: Degradación del aspecto visual de la Granja y/o salud de los operarios por inadecuado almacenamiento y/o segregación de residuos inertes. Generación de residuos especiales: (Filtro de aceite, Filtro de aire, Juntas, Escobillas de carbón, Pastillas de freno, Restos de grasa, Aceite diluido, Contenedores vacíos de aceite y grasa, Material de embalaje, Trajes de limpieza, etc.). Posible contaminación de suelos y/o conductos pluviales por inadecuada disposición y segregación de residuos especiales. Aumento del riesgo de accidentes / incidentes y salud de operarios por almacenamiento o manipuleo inadecuado de residuos especiales. Riesgos operativos varios: al personal de la Empresa, contratistas y/o sub-contratistas por tareas afines con la Explotación y/o Mantenimiento del Parque Eólico ENERGETICA I.	Correcta gestión y manejo adecuado de todo tipo de residuos. Almacenamiento en bolsas y/o tambores estancos correctamente identificados. Retiro y disposición mediante empresa habilitada. Utilización de elementos de protección del personal. Utilización de elementos absorbentes y adecuada recolección de los mismos. Personal capacitado con disponibilidad de medios y recursos necesarios para realizar los Mantenimientos predictivo, preventivo y/o correctivo según se trate.

**b<sub>2</sub>. Incidentes y Emergencias.**

INCIDENTES y RIESGOS	IMPACTOS POTENCIALES	MEDIDAS MITIGADORAS
<b>Explosión e Incendio de Equipos.</b>	Potencial contaminación de suelo, agua y aire. Afectación del patrimonio natural y salud de la comunidad aledaña a la granja en caso de explosión seguida de incendio no controlado. Afectación flora y fauna zonal. Afectación a otros servicios asociados. Posibles lesiones, quemaduras o muerte de operarios y/o terceros. Interrupciones abruptas del servicio eléctrico. Incremento de ocurrencias de efecto cascada ante eventual siniestro individual. Probabilidad de afectación a la estabilidad eléctrica del sistema. Agraviamiento en caso de un siniestro por falta o inadecuado estado de los equipos de prevención, detección y extinción de incendios.	Plan de contingencia ante incendios de los aerogeneradores e instalaciones. En todos los casos se deberá detener la marcha del molino siniestrado y desligarlo del sistema. El equipo no podrá ponerse en funcionamiento en caso de detectarse signos de fallas. Recurrir siempre al Servicio autorizado p/ evaluaciones e Informe de averías. Personal capacitado y disponibilidad de medios y recursos necesarios para prevenir, contener y remediar eventuales incendios. Inspecciones periódicas del estado de conservación de equipos de extinción. Correcta logística en la separación entre molinos de manera de no afectar la Seguridad Operativa. Hoja de Seguridad: Operación ante riesgos y modo de actuar en caso de contingencias seguidas de incendio. Agentes entrenados para brindar primeros auxilios a los posibles afectados y trasladados a centro médico. Señalética visible del Listado de Teléfonos de EMERGENCIA MÉDICA. Programas y entrenamiento de simulaciones al personal actuante, Comité de Crisis, Medios de Apoyo: Bomberos, Def. Civil, etc.

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<b>Sobreceleración.</b>	Marcha fuera de Control. Aceleración incontrolada de los molinos. Efectos adversos, debidos a la rigurosidad del viento (generación de momentos giroscópicos), que ocasionan inconvenientes en el sistema de orientación de la góndola. (Velela, anemómetros, etc.). Fallas próximas al generador, que afecten sustancialmente la capacidad de transferencia de energía, resultando un embalamiento de los rotores debido al desbalance de potencia. Destrucción del molino.	Control de velocidad en Rotor / Generador. Pitch. Control que regula el paso de la pala (aspa) en función de la velocidad del viento. Sistemas de frenos de extremo de pala (las puntas Tip giran 90° respecto al aspa). Frenos de aspa, mantiene las r.p.m bajo control. Detección automática por desgaste en zapatas de freno. Actuación de las protecciones. Categorización de los impactos.
<b>Actos de Vandalismo.</b>	Impactos intencionales: Daños producidos por la población en general que provocan trabajos adicionales de mantenimiento correctivo.	Estrategia Comunicacional. Educación y Responsabilidad cívica.
<b>Fallas ocasionadas por condiciones climáticas adversas.</b>	Riesgo de Accidentes debidos a factores meteorológicos adversos: Caída de Rayos, granizos, nieve, vientos huracanados, etc. Falla catastrófica: Desprendimiento de pala o aspa de la turbina, o piezas de la misma que se separen del rotor ante eventos bajo circunstancias de vientos extremos. Destrucción del Aerogenerador, ante eventual caída del mástil	Protección contra descargas atmosféricas - Rayos. Cumpimiento Norma IEC 1024 - clase 1. Pararrayos ubicados en lugares estratégicos. Probabilidad de mínima ocurrencia. Cumpimiento de medidas de seguridad. Frenado automático en caso de vientos superiores a los 25 m/seg. (Disposición bandera con respecto al viento). Área del prado desprobleada. Separación entre aerogeneradores de manera de no producir efecto cascada. Control de la trazabilidad de los eventos y aplicar técnicas de auditoría para su control, en resguardo de la seguridad pública en forma integral.
<b>Derrame o pérdidas de líquidos refrigerantes.</b> "Aceites Dieléctricos Aislantes, refrigerantes y/o lubricantes".	Contaminación de suelos y/o agua ante pérdidas o derrames de aceite mineral refrigerante y/o lubricante. Riesgo de interrupción del servicio. Aumento del riesgo de accidentes / incidentes de operarios por almacenamiento o manipuleo inadecuado de aceites. Pérdidas de rigidez dieléctrica del equipo asociado por humedad del aceite. Afectación a la actividad rural y de esparcimiento ante cortes no programados del suministro eléctrico.	Instalación de sistemas de contención y recuperación de eventuales pérdidas de líquidos refrigerantes. (Bateos - Fosas en E.T.) Inspecciones periódicas de diagnóstico ambiental de infraestructura. Estrategias de mantenimiento. Ensayos de calidad de los aceites. Organización de cursos de Seguridad: Riesgos de manipulación y modo de actuar en caso de contingencias. Instructivos de trabajo para el adecuado accionar ambiental en las actividades realizadas. Personal capacitado y disponibilidad de medios y recursos necesarios para prevenir, contener y remediar eventuales pérdidas o derrames de aceites. Recolección adecuada, identificación y disposición de residuos impregnados.
<b>Pérdidas de rigidez dieléctrica asociadas al equipamiento.</b>	Riesgos de lesiones o muerte al personal, por fallas en las aislaciones de los cables y/o equipamiento. Eventuales contactos directos: Arco eléctrico, descargas disruptivas (Choque eléctrico). Riesgo de vida ante carencia de carteles indicadores de "Peligro" por presencia de instalaciones con tensión. Riesgos debidos a daños: Involuntarios u operacionales (Vicios ocultos, malas maniobras, etc.) o intencionales (Sabotajes).	Control de aislaciones, (Resistencia de Aislación), puesta a tierra de las pantallas de los cables, contactos de terminales en cada acometida, P.a.T. de cuba del Transformador. Estudios de Resistividad del Suelo. Cumpimiento de los procedimientos técnicos ante contingencias simples. Personal debidamente capacitado sobre riesgos inherentes al trabajo y primeros auxilios de reanimación. Disponibilidad de medios para traslados a centro médico.

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<b>Pérdidas de rigidez dieléctrica asociadas al equipamiento.</b>	Envejecimiento prematuro de los materiales aislantes o degradados a causa de factores meteorológicos.	Utilización obligatoria de elementos de protección al personal. Todo equipamiento deberá cumplir con las exigencias establecidas por las Normas Nacionales (IRAM) y/o Internacionales. (IEC, VDE, IEEE, ASTM, etc.).
<b>Invasión a las instalaciones privadas por parte de terceros.</b>	Posibles lesiones o muerte de operarios y/o terceros. Interrupciones abruptas del servicio. Disminución de la calidad del servicio.	Iluminación nocturna del predio. Instalaciones de sistemas de seguridad, (vigilancia, señalización, cerramientos, enclavamientos, etc.) con reserva de ingreso al molino solo a personal habilitado. Cercado obligatorio, con alambrado olímpico, de la futura E.T.
<b>Colisión de Aeronaves.</b>	Accidente aéreo debido a la presencia de estructuras de gran altura. NOTA: Se deberá Denunciar las instalaciones ante la F.A.A., Administración Nacional de Aviación Civil, etc.	Se deberá cumplir con las disposiciones del Código Nacional Aeronáutico. (Ley Nº 17.285 y sus modificaciones) referentes a las "superficies de despeje de obstáculos, alturas, balizamiento y/o señalamiento". Señalizar y Balizar obligatoriamente. (Baja probabilidad de ocurrencia). Se recomienda resaltar las puntas de palas de los molinos con pintura roja, bajo recomendación de Fuerza Aérea, para evitar colisiones en periodos de niebla.
<b>Fallas en las instalaciones que puedan ocasionar corte de suministro eléctrico a gran número de usuarios.</b>	Afectación de la calidad de vida de la población y actividades rurales y recreativas. Disminución en la calidad del servicio (continuidad en la prestación del mismo). Disminución en la calidad del producto suministrado (niveles no adecuados de tensión, huecos de tensión, perturbaciones por flickers o presencia de armónicos). Inestabilidad del sistema. Afectación a otros servicios. Posibles lesiones o muerte de operarios y/o terceros. Interrupciones abruptas del servicio. Cuestionamientos sociales.	Adaptación de las nuevas instalaciones a los sistemas de supervisión, control, medición, señalización, alarma, comando, protección y comunicación en concordancia con los agentes interconectados al M.E.M. Estrategia de operación: se deberá asegurar el despeje selectivo de fallas en el menor tiempo posible en sincronismo y coordinación con el S.I.N. Calidad de prestación acorde a los parámetros establecidos en los contratos de concesión del nuevo agente. Obligación de ENERGETICA ARGENTINA S.A. en construir, operar y mantener sus instalaciones y equipos en forma que no constituyan peligro alguno para la seguridad pública. Ajustes en el Plan de Gestión Ambiental y de Contingencias. Tipificación y clasificación de eventuales anomalías eléctricas. Cronograma de acciones y remediación con la actuación de personal competente.
<b>Emisiones sonoras y vibraciones superiores a los establecidos en normas vigentes.</b>	Generación de Ruidos Permanentes y Eventuales. Ruidos mecánicos y aerodinámicos. Perturbaciones de los vecinos a las instalaciones, operarios y fauna avícola por emisión de ruidos molestos. Molestias por niveles altos de vibraciones.	Separación entre molinos, de acuerdo al Lay-out presentado. Monitoreo periódico de niveles sonoros. Seleccionar diseños aptos de cajas multiplicadoras y aspas del rotor. Grupo de Respuesta: Mantenimiento, Mitigación y Remediación de factores generadores de ruidos mecánicos, aerodinámicos y/o vibraciones del parque edico.
<b>Generación de CEM no ionizantes de baja frecuencia, por sobre los parámetros establecidos en las normativas vigentes.</b>	Afectación a la seguridad y calidad de vida de la población ante presencia de radiaciones no ionizantes de baja frecuencia y radiointerferencias de niveles superiores a los normados (medio antrópico). Afectación a la salud de la población y trabajadores. Afectación a la actividad zonal.	Realización de estudio de emisión de campos electromagnéticos de las nuevas instalaciones (modelaje). Monitoreo periódico de los niveles de campos eléctricos y magnéticos. Verificación de los resultados con los Umbrales Máximos Permitidos. (Valor Límite Admisible). Cumplimiento de las exigencias establecidas

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Generación de CEM no ionizantes de baja frecuencia, por sobre los parámetros establecidos en las normativas vigentes.		En la Resolución Secretaría de Energía de la Nación N° 77/98: Límites de Emisión de Campos Eléctricos, Magnéticos y Ruido Audible. Plan de contingencias (P.G.A). Protección contra radiaciones no ionizantes de baja frecuencia. Corrección de la situación presentada y remediación de eventuales daños producidos.
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### c) FASE DE ABANDONO.

Una vez concluida la vida útil de la instalación, (estimados en 20/25 años), se deberá proceder al desmontaje de los turbogeneradores eólicos, y a restaurar completamente las áreas afectadas.

### III.- SE DEBERÁ DAR CUMPLIMIENTO A LOS SIGUIENTES REQUERIMIENTOS:

1. **ENERGETICA ARGENTINA S.A.**, deberá solicitar autorización, ante la Secretaría de Energía, para ingresar como Agente Generador del MERCADO ELECTRICO MAYORISTA (MEM), con su PARQUE EOLICO, de NOVENTA Y NUEVE CON DOS MEGAVATIOS (99,2 MW).
2. **ENERGETICA ARGENTINA S.A.**, deberá solicitar la intervención de TRANSBA S.A., ante el ENRE para gestionar la correspondiente solicitud de Acceso y Ampliación del Sistema de Transporte de Energía Eléctrica consistente en la construcción, montaje y puesta en servicio de una nueva Estación Transformadora MT/AT., y su vinculación al mallado nacional.
3. A consecuencia de ello, **ENERGETICA ARGENTINA S.A.** deberá dar cumplimiento obligatorio a toda normativa y/o Resoluciones emanadas por el Ente Nacional Regulador de la Electricidad (E.N.R.E), y por la Secretaría de Energía de la Nación, para realizar las obras proyectadas, debiendo estar resueltas todas las cuestiones relativas a autorizaciones, permisos, licencias, en relación a los trabajos que se realizarán.
4. En caso de convocarse a una Audiencia Pública, (a fin de resolver sobre el otorgamiento del Certificado de Conveniencia y Necesidad Pública), en la que se planté modificaciones que deriven en cambios del actual proyecto, este O.P.D.S. se reserva el derecho a emitir las reconsideraciones y otros requerimientos que surjan a causa de tales replanteos.
5. **ENERGETICA ARGENTINA S.A.** deberá contar, antes del inicio de las obras, con la expresa conformidad del propietario de las tres fracciones de campo para ocupar la extensión de las 950 Ha donde se emplazará la futura granje eólica. A tal fin se deberá documentar a través de una figura legal que la circunstancia amerite.
6. Bajo ninguna circunstancia podrán ser utilizados en equipamiento y sistema alguno, (transformador elevador, circuito de lubricante y de refrigeración forzada), aceites dieléctricos aislantes con bifenilos Policlorados (PCB's), debiendo obrar en el Parque Eólico los protocolos de análisis físico químicos de los aceites aislantes utilizados, realizados por laboratorio habilitado según Resolución O.P.D.S. N° 41/14, a efectos de acreditar la ausencia de dicha sustancia (ASKARELES). Gestión de residuos especiales acorde al Decreto 806/97, reglamentario de la Ley 11.720. (Prohibición de Uso).
7. Se deberá definir obligatoriamente los "LIMITES DE PROPIEDAD", entre las instalaciones de la TRANSPORTISTA y las propias de la CENTRAL EOLICA ENERGETICA I, de manera de que exista una real separación física entre ellos. En el Contrato entre Partes se deberá especificar los derechos y obligaciones asumidos por cada una de las partes actoras.
8. Se deberá compensar los impactos visuales ocasionados por la construcción del PARQUE EOLICO ENERGETICA I, (percepción visual), con el pintado del mástil, gondola, rotor y aspas de color tal que sea contexturable con el entorno inmediato.
9. **ENERGETICA ARGENTINA S.A.**, exigirá a sus Contratistas ejercer el Control de la vegetación y reposición de los ejemplares dañados o muertos de iguales características a los encontrados en el nivel de base.
10. Todas las tareas y estudios técnicos, (Prefactibilidad Civil y Electromecánica), en correspondencia al proyecto ejecutivo, deberán respetar las Normativas referentes a la construcción de instalaciones de M.T/A.T., siguiendo para ello los mismos lineamientos técnicos que los

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- exigidos a TRANSBA S.A., en los distintos Sistemas (Transporte, Transformación, Distribución de la Energía Eléctrica, para el control, supervisión, medición, maniobra, protecciones, etc.), según las pautas y requerimientos de CAMMESA.
11. Se deberá garantizar, en toda la longitud del futuro tramo de la L.A.A.T, la correspondiente franja de seguridad (Aplicación de la Ley N° 19.552/72, "Servidumbre Administrativa de Electroductos"), que permita mantener las distancias mínimas de seguridad exigible y de cumplir tanto las **Afectaciones y Restricciones** a determinadas actividades como así también las **Limitaciones** al dominio Público y Privado, con el fin de prevenir accidentes a personas y a los bienes de terceros.
  12. **ENERGETICA ARGENTINA S.A.** deberá gestionar ante quien corresponda los permisos y/o autorizaciones materializando los adecuados Acuerdos y Programas contra **Perjuicios a Superficiales**, tales como: Pago de montos indemnizatorios, Protección de Hacienda, Permisos de Pasos a zonas o parcelas privadas. El pago de los montos indemnizatorios a los superficiarios perjudicados por la Servidumbre Administrativa de Electroducto estará a cargo de la Empresa responsable de la obra, debiendo gestionar los certificados de dominio y anotaciones catastrales que las circunstancias así lo requieran.
  13. Se deberán canalizar, ante quien corresponda, las solicitudes de los soportes técnicos para la realización de los **sondeos estratigráficos, cateos e inspecciones**, previas a la etapa de construcción, de manera de identificar las instalaciones preexistentes, evitando daños de infraestructura. (Estudios vinculados a la accidentología; topografías, planialtimetrías, fotogrametría, imágenes satelitales, etc.)
  14. En el caso de utilizar agua en los circuitos de refrigeración, se deberá contar con el correspondiente permiso de explotación del recurso hídrico subterráneo, solicitado ante el A.D.A.
  15. Cumplimiento de las Leyes N° 12.250, en la que se declara Monumento Natural al Cauquén Colorado, en el ámbito de la Provincia de Buenos Aires, y N° 14.038 en la que se declara de interés Provincial la preservación de las especies de los cauquenes.
  16. Se deberá ajustar el **Plan de Gestión Ambiental** que fuese oportunamente remitido, en concordancia al proyecto ejecutivo, donde, además de los Programas de Prevención de Emergencias, Plan de Contingencias (procedimientos - niveles de alerta), Plan de Seguridad e Higiene, Manual de Procedimientos Operativos y el Plan de Monitoreos Ambientales, deberá incluir un apartado específico para el seguimiento de las corrientes migratorias de la avifauna zonal, donde se consigna claramente los roles y responsabilidades de cada uno de los actores intervinientes en la ejecución de las medidas de mitigación y plan de monitoreo previsto, desde el avistamiento hasta la detención de los aerogeneradores, si resultase necesario. En tal sentido **ENERGETICA ARGENTINA S.A.**, deberá llevar un registro estadístico, a través de un profesional idóneo en la materia, de cada una de las intervenciones realizadas en correspondencia con este tipo de acción.
  17. Deberá ser de estricto conocimiento y cumplimiento obligatorio, por parte de los empleados de **ENERGETICA ARGENTINA S.A.**, contratistas, subcontratistas y operarios de éstos, independientemente de su jerarquía y ocupación, los **Planes de Contingencia y de Gestión Ambiental** que contemplen las prioridades en materia de seguridad y protección en los lugares de trabajo y el medio ambiente, durante las etapas de **construcción, operación, mantenimiento y abandono del proyecto**.
  18. Se deberá comunicar a este **Organismo de Estado**, cualquier tipo de modificación del presente proyecto, cuyo personal evaluará la incidencia que ocasionará tal innovación. En caso de que las obras no hubiesen comenzado dentro del término de un año de emitida la **Declaración de Impacto Ambiental**, **ENERGETICA ARGENTINA S.A.** deberá actualizar la información técnica vertida en el E.I.A., ya sean por cambios en las condiciones de base, nuevas interferencias en el entorno, revaloración de impactos, etc.
  19. La **Proponente** y responsable de llevar a cabo el Proyecto, deberá contar en su organización con un **Área de Protección Ambiental** a cargo de un profesional con incumbencias en la materia, cuya función será la de coordinar todas las actividades específicas del **Plan de Gestión Ambiental (P.G.A)**, monitoreo de los parámetros ambientales, supervisión e implementación de las Medidas de mitigación y control de Impactos que corresponda, idear los **Planes específicos de Contingencias y Seguridad, tratamiento y seguimiento de eventos o impactos acaecidos**, etc., debiéndose especificar en un plazo no mayor a treinta (30) días, el profesio-

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- nal responsable seleccionado para llevar adelante tal gestión ambiental del proyecto ejecutivo. (En la etapa de construcción, explotación y abandono)
20. Se deberá implementar una **estrategia Comunicacional Direccionada a toda la población del área de influencia del proyecto**, en lo que respecta a la Seguridad Operativa y en materia ambiental. La aludida estrategia deberá contemplar la totalidad de las acciones que la firma emprenda en el marco del presente Proyecto, incluida la logística de traslado de equipos, a efectos que se disponga de la información necesaria e indispensable para su propia ponderación de eventuales riesgos, promoviendo confiabilidad en cada tarea ejecutada por **ENERGETICA ARGENTINA S.A.**, basada en la total transparencia de gestión y fortalecida a través del diálogo y la posterior confirmación en logros reales en todas las etapas del emprendimiento.
  21. Se deberá actualizar el estudio del **SISTEMA ELÉCTRICO DE POTENCIA EN SU CONJUNTO**, considerando la interacción entre el Parque de generación eólica, Estación transformadora (Dos Maquinas de Poder), L.A.A.T. (considerando el nuevo tramo) y el Sistema Interconectado Nacional.
  22. Se deberán estudiar en particular las **perturbaciones** relacionadas con la **Calidad de la Tensión** en el punto de interconexión, a saber: variación lenta de tensión, índices de flicker, componentes distorsivos de armónicos, impactos originados por los equipos con el Sistema, según su tipo y características eléctricas asociadas.
  23. Se deberán considerar los resultados de los estudios frente a perturbaciones del tipo **"Huecos de Tensión"** originadas por cortocircuitos en distintos puntos de la red. En particular para fallas próximas al futuro Parque, ya que, la tensión terminal del mismo se vería reducida significativamente, afectando sustancialmente la capacidad de transferencia de energía. Como consecuencia de esto podría producirse un **Embalamiento** de los rotores en las turbinas debido al **desbalance de potencia**.
  24. Los Sistemas de Protecciones deberán contar con los mayores grados de confiabilidad, seguridad, calidad y coordinación entre equipos. La aparamenta de protecciones deberá ser tal que asegure el despeje selectivo de fallas en el menor tiempo posible, a fin de evitar daños mayores, en los propios equipos o en los de otros agentes interconectados. **La sincronización y coordinación de las protecciones como así también los tiempos de despejes deberán ser compatibles con las necesidades de Estabilidad del Sistema.**
  25. Se deberá comunicar a esta Organismo de Estado y a las autoridades del Municipio cualquier tipo de **contingencia**, fundamentando las acciones emprendidas para su control, mitigación y/o corrección, dentro de las **12 horas** de ocurrido el evento como así también las medidas adoptadas para evitar la reiteración del mismo.
  26. **En caso de encontrarse cualquier objeto arqueológico, resto paleontológico, cultural o histórico dentro del predio, la firma deberá adecuarse a lo establecido por la Ley Nacional N° 25.743 de Protección del Patrimonio Arqueológico y Paleontológico, denunciando dicho descubrimiento a la Dirección Provincial de Patrimonio Cultural (TE: 0800-999-2002 Int. 215),** siendo responsable de su conservación hasta que dicho Organismo de Aplicación tome intervención y se haga cargo de los mismos.
  27. Se deberá cumplir estrictamente con las exigencias establecidas en la **Resolución Secretaría de Energía de la Nación N° 77/98:** Verificación periódica de los Límites de Emisión de Campos Electromagnéticos, perturbaciones radioeléctricas y ruido audibles, tanto de origen mecánico como aerodinámico.
  28. **ENERGETICA ARGENTINA S.A.** deberá contar en la granja eólica con los **protocolos** de ensayos y/o mediciones resultantes de los **Parámetros Ambientales**, debidamente **firmados** por los agentes responsables; realizados con posterioridad a la ejecución del Proyecto Ejecutivo. Sin perjuicio de lo solicitado, este Organismo de Gobierno se reserva el derecho de verificar los parámetros que estime corresponda.
  29. Se deberá implementar un Control obligatorio y periódico de **puestas a tierra** en especial aquellas estructuras más cercanas y de accesibilidad a la comuna.
  30. **De corresponder, ENERGETICA ARGENTINA S.A. deberá denunciar las instalaciones del "PARQUE EÓLICO ENERGETICA I" ante los organismos de competencia (Fuerza Aérea Argentina, Administración Nacional de Aviación Civil, etc.) a los efectos de que se proceda a la incorporación de las nuevas estructuras a sus itinerarios o rutas de vuelo, debiendo resal-**

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tar las puntas de las aspas de los molinos con pintura roja, para evitar eventuales colisiones en periodos de niebla.

31. Se deberá, obligatoriamente, **Señalizar y colocar Balizas** nomologadas por la F.A.A., como así también instalar **Sistemas de Seguridad** contra ingreso de terceros no autorizados. Controlar puertas dentro del predio de la granja, (iluminación nocturna, balizamiento, señalización, cerramientos perimetrales, imposibilidad de acceso al interior del mástil, etc.), con reserva de ingreso solo a personal habilitado.
32. **ENERGETICA ARGENTINA S.A.**, deberá implementar adecuados procedimientos de mantenimiento, predictivo, preventivo y/o correctivo según se trate, en condiciones de máxima seguridad, comprometiéndose a hacer respetar mediante la señalética adecuada (**Advertencia, Prohibición y Obligatoriedad**) toda medida destinada al resguardo de personas y/o bienes.
33. Para la Estación Transformadora M.T / A.T, se deberán programar la **ejecución de bateas**, para contener eventuales pérdidas de aceite y/o vuelcos de líquidos dieléctricos de los Transformadores de Potencia, evitando la contaminación de las napas más superficiales de los recursos suelo y agua. Las mismas deberán poseer una capacidad superior a los volúmenes de aceite alojados en las cubas de las citadas máquinas de poder.
34. La futura Estación Transformadora deberá contar con un cerco perimetral independiente al del Parque, a fin de evitar el ingreso de personas no autorizada, debiendo tener acceso directo desde una **calle pública**, evitando la necesidad de solicitar permiso de ingreso a terceros o propietarios privados.

#### OBSERVACIONES:

- Será de aplicación obligatoria toda Normativa, Ordenanzas Municipales y/o Resoluciones emanadas por el **Municipio de Tornquist**, el Ente Nacional Regulador de la Electricidad (ENRE), y la **Secretaría de Energía de la Nación**.
- Se deja constancia que en caso que las **Autoridades del Municipio involucrado** emitan opinión debidamente fundamentada, sobre la presente **Declaración de Impacto Ambiental** que involucre la reconsideración de algunos de sus contenidos, este O.P.D.S., se reserva el derecho de su evaluación y, de considerarse pertinente, la eventual modificación del presente **Acto Administrativo**.
- Las medidas mitigadoras a implementarse durante la etapa de **construcción, operación, mantenimiento y abandono**, como así también las objeciones que pudieren surgir con motivo de las fiscalizaciones de los condicionamientos, de ser necesario, podrán ser modificadas por este **Organismo**.
- **ENERGETICA ARGENTINA S.A.**, será responsable de la **capacitación** y del cumplimiento estricto de todas las medidas concernientes al **PLAN de GESTION AMBIENTAL (P.G.A.)**, en las distintas etapas del proyecto.
- Con respecto al Equipamiento: **ENERGETICA ARGENTINA S.A.**, se comprometerá a que todos los equipos y materiales empleados en los montajes de futuros **mantenimientos** de la GRANJA, cumplirán con las exigencias establecidas en las normas IRAM, y/o Recomendaciones IEC, como así también a las Normas Nacionales de los países fabricantes de los equipos, en ese orden. Responderán, según corresponda, a las normas AES, AISC, ANSI, ASME, ASTM, DIN, ISO, NEMA, NFPA, IEEE, SSPC, VDE, etc.
- **ENERGETICA ARGENTINA S.A.**, deberá atender todo requerimiento de acuerdo al "**Marco Jurídico**" establecido por la Constitución Nacional, Leyes (Nac. / Prov.), Decretos Reglamentarios, Decretos del Poder Ejecutivo, Resoluciones Administrativas, Ordenanzas Municipales, Especificaciones Técnicas y toda Normativa de carácter General o Particular asociada al desarrollo del presente estudio.

  
SECRETARÍA AMBIENTAL  
MARIA CECILIA VIGNANZO  
Secretaría Privada O.P.D.S.

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□ Sin perjuicio de lo expuesto, **ENERGETICA ARGENTINA S.A.**, deberá cumplir con el Marco Legal vigente.

**IMPORTANTE:** Se deja constancia que el presente informe ha sido basado en los datos consignados en la documentación presentada por **ENERGETICA ARGENTINA S.A.**, a la que se le asigna carácter de Declaración Jurada, por lo que, comprobada la falsedad u omisión de alguno de los mismos, los firmantes se harán pasibles de las sanciones penales, administrativas y/o civiles que correspondan, siendo los profesionales actuantes solidariamente responsables de los informes técnicos remitidos.

  
Lic. SANDRA INÉS MARTINEZ  
A.C. Departamento de Evaluación Ambiental  
Organismo Provincial para el Desarrollo Sostenible

  
Ing. JUAN ANGEL GARCIA  
Director de Evaluación de Impacto Ambiental  
Organismo Provincial para el Desarrollo Sostenible

  
Ing. PATRICIO MARRANGHELLO  
Director Provincial de Evaluación de Impacto Ambiental  
Organismo Provincial para el Desarrollo Sostenible

**DEPARTAMENTO EVALUACIÓN AMBIENTAL.  
DIRECCIÓN DE EVALUACION DE IMPACTO AMBIENTAL.  
DIRECCIÓN PROVINCIAL DE EVALUACIÓN DE IMPACTO AMBIENTAL.  
ORGANISMO PROVINCIAL PARA EL DESARROLLO SOSTENIBLE.**

  
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## **APPENDIX B: PUBLIC HEARING MEETING DOCUMENT**

## ACTA DE AUDIENCIA PÚBLICA POR "PROYECTO DE PARQUE EÓLICO EN EL DISTRITO"

En la Ciudad de Tornquist, a los 14 días del mes de Diciembre de 2016, siendo las 18:00 horas en la Sala de Situaciones del palacio municipal, se reúnen con el objeto de realizar la Audiencia Pública convocada por el Municipio de Tornquist junto al Honorable Concejo Deliberante, donde la Empresa Energética Argentina S.A. presentará a los vecinos el proyecto detallado del Parque Eólico propuesto para ser construido, en inmediaciones de la localidad de Tres Picos y la estación García Del Río.

Se encuentran reunidas las siguientes autoridades: el titular de la Agencia de Desarrollo del Municipio de Tornquist, Dr. Gonzalo Iparraguirre; la Directora de Medio Ambiente del Municipio de Tornquist, Sra. Melisa Herrada; la concejal María Ofelia Skolak; el Presidente de la firma Energética Argentina S.A., Ing. Guillermo Coccoz, acompañado por la Directora y Gerente Técnica de Energética Argentina S.A., Ing. Agustina Peralta, el Gerente Comercial de Energética Argentina S.A., Ing. Alejandro Hunko, y el Gerente de Desarrollo, Sr. Agustín Marcenac; entidades educativas interesadas en la carrera de capacitación sobre energía sustentable, como así también ingenieros y referentes de Cooperativas Eléctricas de la zona y público en general.

Abre el acto de la Audiencia el Dr. Gonzalo Iparraguirre, quien tras saludar a los presentes, hace mención a la audiencia pública por el Proyecto de Parque Eólico en el Distrito", y agradece a las autoridades y a todo el público presente.

El Presidente de la empresa Energética Argentina S.A., Ing. Guillermo Coccoz toma la palabra y comienza su exposición mediante un power point, presentado el esquema asociativo de empresas que impulsan el proyecto y el equipo de trabajo que está llevando a cabo el proyecto, y que se encuentra presente en el Acto para evacuar cualquier duda que surgiera de la presentación. Asimismo describe los componentes del parque eólico y cómo se van integrando en el proceso de desarrollo del proyecto

Continúa presentando la situación energética actual en la Argentina, las características de la matriz energética del país y el impacto de las importaciones de gas en el déficit fiscal de la Argentina. En este contexto, propone a la Energía Eólica como parte de la solución a este problema tan importante, describiendo las ventajas de esta fuente renovable de generación de energía eléctrica, por encima de las fuentes convencionales que dominan la matriz energética actual del país. Asimismo se informa a la audiencia acerca del crecimiento de la energía eólica a nivel global durante los últimos 10 (diez) años; cuales son los países con mayor desarrollo en el mundo; y también en nuestra región.

Siguiendo con la presentación, el Ing. Guillermo Coccoz expone la evolución de la energía eólica en el tiempo, explica técnicamente cómo funcionan los



aerogeneradores que se instalarán en el proyecto, en función del recurso eólico de la zona donde se llevará a cabo. Luego explica la excelencia de este recurso en la Argentina en general, y en el distrito de Tornquist en particular.

El próximo tema a desarrollar en la presentación es el referido a los Antecedentes de la Energía Eólica en el país, cómo se llega a la nueva Ley de promoción de las Energías Renovables (Ley N° 27.191), y cuáles son sus principales características. El Ing. Guillermo Cocoz continúa explicando los mecanismos de selección de proyectos para la firma de contratos de abastecimiento de energía eléctrica a partir de fuentes renovables, en función de esta nueva ley, y cómo el Proyecto Eólico Energética I se encuadra en uno de estos mecanismos.

A partir de este momento, comienza a detallar las características particulares del Parque Eólico Energética I, desde su ubicación geográfica, hasta la excelencia del recurso eólico en el sitio, razones por las cuales se seleccionó para la instalación del proyecto. También se informa sobre las características de los aerogeneradores modernos, y como fue evolucionando la tecnología durante los 7 años de desarrollo que lleva el proyecto.

En este momento, se abre un espacio para las consultas de los asistentes a la audiencia, donde un representante de una cooperativa eléctrica de la zona da su opinión acerca del parque eólico y su importancia para el abastecimiento de energía del Partido de Tornquist.

Luego, el Director de la Escuela de Educación Secundaria Técnica N° 1 de Tornquist, Prof. Luis Quintana, consulta sobre si existe un proceso definido sobre la transferencia tecnológica para la instalación de industrias locales que puedan proveer de insumos y servicios a este tipo de proyectos. El Ing. Guillermo Cocoz explica que los suministradores de tecnología para proyectos eólicos ya han tomado contacto con potenciales suministradores locales, y que en la medida en que estos proyectos avancen en su desarrollo, se profundizarán estos vínculos, y proveedores locales prestarán sus servicios a los parques eólicos. También se explica que, por cuestiones de financiamiento de proyectos, es más difícil integrar localmente suministros, ya que la industria local no cuenta con experiencia en este tipo de tecnología.

Más adelante, luego de algunos intercambios de opiniones entre los asistentes y el equipo técnico del proyecto, el representante de una de las industrias más importantes del distrito se interesa en conocer las características técnicas de los sistemas de protecciones que se instalarán en la Subestación transformadora del parque. Interviene en este momento el Ing. Alejandro Hunko, quien informa que todos los equipamientos a utilizar en la Estación Transformadora están definidos por las especificaciones técnicas de TRANSBA (empresa transportista de la energía eléctrica de la provincia de Buenos Aires, y operadora de la red de Alta Tensión donde se conectará el parque eólico). También se explican las características de operación del parque eólico y su vínculo con el sistema



Interconectado nacional.

El Ing. Guillermo Cocoz propone continuar con la presentación, informando que al final de la misma se abrirá otro espacio para responder a todas las consultas de los asistentes. Se continúa con la presentación describiendo las etapas de construcción del parque eólico, informando acerca de los tiempos necesarios, los recursos a utilizar, tanto económicos como humanos, y la necesidad de obtener mano de obra local para la obra.

El tema siguiente es el Estudio de Impacto Ambiental del Proyecto. Se profundiza en los medios analizados por el estudio, y se indican y describen los Impactos Positivos y Negativos de la Instalación del Parque Eólico Energética I en el lugar propuesto, para que los asistentes a la Audiencia Pública puedan dar sus opiniones con mayor conocimiento del impacto físico, biológico y medioambiental / cultural del proyecto.

Por último, dentro de la presentación del Ing. Guillermo Cocoz, se informa a la audiencia de la declaración del Proyecto Ambientalmente apto por parte de la OPDS (Organismo Provincial para el Desarrollo Sostenible de la Provincia de Buenos Aires), y se concluye explicando la importancia de instalar el parque eólico como fuente de generación de energía limpia, reemplazando la importación de barcos metaneros, alimentando de energía eléctrica a más de 220.000 hogares en el año, y reduciendo emisiones de CO2 por un volumen equivalente al que producen alrededor de 100.000 automóviles en un año.

Finalmente se pide a los asistentes sus opiniones y comentarios acerca de la instalación del parque eólico Energética I en el ámbito del distrito de Tornquist, recibiendo respuestas positivas sobre la iniciativa, y muestras de apoyo de los sectores de interés.

Siendo las 20.40 hs. del día de la fecha, habiendo expuesto la totalidad de los interesados y no habiéndose formulado observaciones por los participantes presentes en la audiencia, el Dr. Gonzalo Iparraguirre anuncia que se da por concluida la Audiencia pública, labrándose acta de la misma-----.



Dr. GONZALO IPARRAGUIRRE  
SECRETARIO DE DESARROLLO  
MUNICIPALIDAD DE TORNIQUET

MARIA OFELIA SKOLAK  
PRESIDENTE BLOQUE  
FRENTE PARA LA VICTORIA

Lic. Melissa Salgado Ferrero  
Directora de Medio Ambiente  
MUNICIPALIDAD DE TORNIQUET

Laura García  
Concejal  
F.P.C.P.S.

## APPENDIX C: HSE REGULATIONS AND PERMITS

## Environmental Regulations

REGULATIONS	DESCRIPTION	ASSOCIATED PERMITS
<b>National Regulations</b>		
<i>General Environmental</i>		
National Constitution of the Republic of Argentina (1994)	<p>The National Constitution guarantees all residents the right to a healthy, balanced environment, suitable to human development, and imposes an affirmative duty on each resident to preserve the environment for future use (Article 41).</p> <p>It requires the redress of the environmental damage to begin with the obligation to restore the environment to its status ante quo, and grant standing to individuals, including environmental civil associations and the federal Ombudsman, to sue the government and private individuals to enforce and environmental right recognized in the Constitution, international treaty or federal law (Articles 41 and 43).</p> <p>The Constitution directs the national government to issue rules containing minimum environmental protection standards and mandates the provinces to enact legislation complementary to these federal regulations (Article 41).</p> <p>The National Constitution establishes that the provinces have the primary domain over the natural resources in their territory (Article 124).</p> <p>It also establishes the distribution map of competencies between the federal and provincial governments. According to this distribution, the provinces retain all the power not expressly delegated to the federal government in the Constitution (Article 121). Among the powers delegated to the federal government is to pass the Civil, Commercial, Criminal, <u>Mining</u> and Labor and Social Security Codes (Article 75).</p>	
National Law N° 25.675 and National Decree N° 2.413/00 General Environmental Law	<p>This regulation establishes the minimum environmental protection standards for the adequate and sustainable management of the environment, the preservation and protection of biological diversity and the implementation of sustainable development.</p> <p>It establishes that any work or activity that is likely to significantly degrade the environment, any component thereof or affect the people's quality of life, is subject to an <u>environmental impact assessment</u>.</p> <p>The General Environmental Law defines <u>environmental damage</u> as any relevant alteration that modifies negatively the environment, its resources, the balance of ecosystems, or collective goods or values.</p> <p>Anyone that causes the environmental damage will be responsible to restore the environment to its status ante quo.</p> <p>Law N° 25.675 also establishes that any individual or legal entity performing activities hazardous to the environment must obtain <u>insurance</u>, which shall guarantee financing the</p>	

	<p>reversion of any possible damage to the environment; likewise, on a case-by-case basis and depending on the possibilities, it may create an environmental restoration fund to instrument restoration actions.</p> <p>In addition, it establishes regulations on environmental damage, citizen participation, public hearings, etc.</p>	
<p>Resolution N° 102/2019 Environmental Impact Studies Consultants Register</p>	<p>This Resolution establishes the updating of the Register of Consultants in Environmental Impact Studies, which will be renamed the National Register of Consultants in Environmental Assessment ("Registro Nacional de Consultores en Evaluación Ambiental" - RNCEA). Any person who carries out Environmental Impact Studies in which the Secretariat of Environmental Governance and Sustainable Development (SGAyDS) takes action must register. Once the application has been entered through the Distance Processing platform (Trámite a Distancia - TAD) and the documentation is approved, the Certificate of Registration will be issued. It is valid for two years.</p>	

#### *Environmental Regulations for Wind Farm Projects*

<p>National Law N° 26.190, National Law N° 27.191 and Decree N° 531/16</p>	<p>National Law N° 26.190, modified by National Law N° 27.191, establishes that an 8% of the electricity consumption at a national level must be supplied by renewable energy sources by December 31<sup>st</sup>, 2017.</p> <p>Decree N° 531/16 regulates the National Promotion Regime for the Use of Renewable Sources of Energy destined to the Production of Electricity and attributes CAMMESA (company in charge of managing the wholesale electricity market) with an outstanding role. In fact, the Decree appoints CAMMESA responsible for managing a significant share of the power purchases from renewable sources.</p>	
<p>National Law N° 25.019 and Decree N° 1597/99</p>	<p>Establishes of national interest the generation of electric energy of wind and solar origin throughout the national territory and establishes the mechanisms to promote the development of projects. In addition, it promotes the development of Renewable Energy Projects.</p>	
<p>National Resolution SE N° 475/87</p>	<p>Establishes the need to submit an Environmental Impact Assessment before the Under-Secretariat of Strategic Planning including the different alternatives for the energy projects; the environmental studies carried out in all its stages, such as inventories, prefeasibility, feasibility; and the environmental surveillance and monitoring program implemented during the project.</p> <p>As part of the process of registering as a member of the Wholesale Electricity Market (MEM), companies must submit an environmental impact study to the National Ministry of Energy and Mining in accordance with the provisions of the Resolution SE N° 475/87. Companies must also comply with jurisdictional requirements (at provincial and municipal level), and complete an affidavit indicating that equipment and installations are free of PCB's</p>	<p>Environmental Impact Assessment</p>

Resolution SE N° 15/92 modified by Resolution SE N° 77/98 and N° 297/98	Approves the Environmental Management Manual for Extra High Voltage Transmission Lines defined in Annex I, mandatory for any company whose activity is subject to national jurisdiction, and carry out projects and/or works of extra high voltage transmission lines.	
Resolution SE N° 304/99	Notes that companies must fulfill the "Conditions and requirements applicable to installation of Wind Power Generation Plants, which aspire to become MEM agents", which includes the EIA, Environmental Management Plan, and specific construction/installation requirements.	
National Law N° 24.065	Generators, transporters, distributors and users of electricity are obliged to operate and maintain their facilities and equipment in a manner that does not constitute a danger to public safety. Such facilities and equipment will be subject to inspection, review and testing periodically carried out by the ENRE, which will also have powers to order the suspension of the service, the repair or replacement of facilities and equipment, or any other measure tending to protect the public safety.	
National Resolution ENRE N° 1.725/98	Resolution ENRE N° 1725/98 establishes that for the construction and/or operation of electricity transportation and/or distribution facilities, an environmental impact assessment study must be submitted before the ENRE in accordance with the guidelines of Resolution SE N° 77/98.	
National Resolution ENRE N° 555/01, modified by Resolutions N° 197/11	The agents of the Wholesale Electricity Market must elaborate and implement an Environmental Management System (SGA) including, at least, the organizational structure, planning activities, responsibilities, practices, procedures, processes and the resources to develop, implement, review and maintain the environmental policy. This SGA must be certified by a Quality Systems Certification entity.	
National Resolution ENRE N° 13/12	Defines in Annex, the Procedure for the Measurement and Recording of Air Emissions. In addition, all agents of the Wholesale Electricity Market (MEM) must comply with the limit values established in Resolution SEyM N° 108/2001, modified by Resolution ASPA N° 01/12, for generation units that must carry out continuous and non-continuous monitoring of air emissions, according to the frequency defined in Annex.	
Resolution ENRE - ENARGAS N° 401/2011	Approves the "Guide for underground electrical work in proximity to gas pipelines"	
Resolution MEM N° 281/17	Creates the National Registry of Renewable Energy Projects (RENPER), which will register all the generation, cogeneration and self-generation projects of renewable source electric energy that are developed with a connection to the Argentine Interconnection System (SADI - Sistema Argentino de Interconexión). Projects that have the Certificate of Inclusion in the Regime of Promotion of the	

	Renewable Energies will be automatically registered in the RENPER.	
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### *Waste Management*

National Law N° 25.916 and Decree N° 1.158/04 Integral Management of Domestic Wastes	<p>Establishes the minimum environmental protection standards for the integral management of domestic waste, to which all current national, provincial and municipal legislation will have to adequate.</p> <p>Regulates management of domestic waste from its generation until its final disposal, including initial disposal, general or selective, collection, transfer and transportation and processing or treatment.</p> <p>It establishes that the enforcing authorities are the ones corresponding to each local jurisdiction.</p> <p>At a national level, it establishes an inter-jurisdictional coordination system, coordinated by Federal Environmental Council (COFEMA), which is in charge of accomplishing the objectives of the law.</p>	
National Law N° 24.051 and its Regulatory Decree N° 831/93 Hazardous Wastes Law	<p>Establishes the legal framework applicable to the generation, transportation and final disposal of hazardous wastes under federal jurisdiction. This excludes all domestic wastes, radioactive wastes and waste derived from the normal operation of ships.</p> <p>It prohibits the importation, introduction and transportation of all kind of wastes from other countries into national territory and airspace and territorial waters. According to Article 3 of National Regulatory Decree N° 831/93, the prohibition comprises those products obtained from recycled or recovered materials that do not have a sanitary and/or environmental harmlessness certificate, depending on the case, emitted prior to the shipping by applicable authorities in the country of origin, and ratified by the local enforcing authorities prior to the unloading.</p> <p>It establishes the obligation of generators, operators and transporters of hazardous wastes to register in the <u>National Register of Generators and Operators of Hazardous Wastes</u>.</p> <p>Also, they must apply for the <u>Annual Environmental Certificate</u>, which will have to be renewed annually and validates how hazardous wastes are handled, transported, treated and disposed of by the registered generator, operator or transporter.</p>	Annual Environmental Certificate
National Decree N° 181/92 and National Resolution N° 946/02 of the National Secretariat of Environment and Sustainable Development Importation of Non-Hazardous Waste	<p>National Decree N° 181/92 prohibits the transportation, introduction and temporary or definite importation of all kinds of waste or residues included in a non-taxative list presented in Annex I of said regulation.</p> <p>The National Secretariat of Environment and Sustainable Development, being the applicable authority, has regulated the procedures and forms to request the authorization to import non-hazardous wastes or residues, through National Resolution N° 409/01 now replaced by National Resolution N° 946/02.</p>	

### *Fuel Tanks*

National Law N° 13.660 and its Regulatory Decree N° 10.887/60 (modified by National Decree N° 401/05) Safety Regulations for the Production, Transformation and Storage of Fuels	Establishes safety regulations for the facilities where production, transformation and/or storage of solid, mineral, liquid and gaseous fuels are produced. This regulation establishes safety provisions for tank farms.	
National Decree N° 2.407/83 Safety Regulations for Fuel Supply through Pumping Stations	Establishes safety regulations for the supply of fuel through pumping stations.	
National Resolution N° 419/93 (Consolidated Text by National Resolution N° 404/94) of the Secretariat of Energy and subsequent amendments (modified by National Resolutions N° 1.102/04 and 266/08)	Creates the Register of National Universities for the Execution of Technical, Environmental and Safety Audits for storage areas; filling points; processing, fractioning and storage plants; refineries; underground and aboveground storage tanks, transportation tanks for hydrocarbons and by-products. Establishes provisions for the execution of these audits.	
National Resolution N° 266/08 of the Secretariat of Energy	Modifies National Resolution N° 419/93, creating the Register of National Universities for the Execution of Technical, Environmental and Safety Audits mentioned above.	
National Disposition N° 76/97 of the Under-secretariat of Fuels and complementary regulations	Approves technical norms for tanks to transport liquid fuels and liquefied petroleum gases through public roadways. Complements provisions of National Resolution N° 404/94 of the Secretariat of Energy.	
National Resolution N° 1.102/04 of the Secretariat of Energy	Creates the Register of Filling Points for Liquid Fuels, Own Consumption, Storage, Distribution and Commercialization of Hydrocarbons and Natural Compressed Gas.	
National Resolution N° 785/05 of the Secretariat of Energy	Establishes the National Program to Control Leaks of Aboveground Hydrocarbon and by-products Storage Tanks. Among other issues, it establishes the need to present an environmental impact assessment prior to the installation of any aboveground storage tank (AST), the registration of all ASTs and the need to perform periodical internal and external controls and audits to verify the operation of the tanks. It also establishes requirements for the closure and decommission of the tanks.	
<i>Protected Areas</i>		
National Law N° 22.351 (modified by National Law N° 26.389)	National Law N° 22.351 establishes the legal system for the protection of national parks, reservations and natural monuments, and its declaration as such. It defines the three categories for protected areas: National Parks, National Monuments and National Reserves.	

<p>National Parks, Reservations and Natural Monuments</p>	<p>Industrial activities, mining exploration and exploitation activities and exploitation of natural resources, among others, are expressly forbidden in National Parks. Furthermore, any type of activity, with the exception of authorized scientific investigations and governmental inspection, is forbidden in Natural Monument areas.</p> <p>Lastly, industrial activities are allowed in Natural Reserve areas subject to obtaining an authorization from the enforcement authority.</p>	
<p>National Law N° 23.302 (modified by National Law N° 25.799) and its Regulatory Decree N° 155/89 Indigenous Communities</p>	<p>Declares of national interest the attention and support to natives and indigenous communities present in the country, and their defense and development towards their full participation in the national socio-economical and cultural process, respecting their own values and methods.</p> <p>Plans shall be implemented to allow their access to the property of land and the promotion of their agricultural, forestry, mining, industrial or handmade production; the preservation of their cultural rules in teaching programs and the protection of health of its members.</p> <p>This Law acknowledges legal status to the indigenous communities established in the country, and creates the National Register of Indigenous Communities.</p> <p>Finally, it creates the National Institute of Indigenous Affairs, and appoints it as application authority for this regulation, the ILO Convention 107 (presently denounced by Argentina) and other complementary regulations.</p>	
<p>National Resolution N° 328/10 of the National Institute of Indigenous Affairs National Register of Indigenous People Organizations</p>	<p>This resolution creates the National Register of Indigenous People Organizations.</p> <p>Indigenous People Organizations registered in the aforementioned Register will have, among others, the following attributions:</p> <ul style="list-style-type: none"> <li>Participate in activities organized by the National Institute of Indigenous Affairs;</li> <li>Participate in meetings performed within the Indigenous Participation Council;</li> <li>Participate in meetings related to the National Program of Territorial Survey of Indigenous Communities;</li> <li>Present projects to improve representation and participation levels within the organization to the National Institute of Indigenous Affairs;</li> <li>Propose initiatives and proposals related to the compliance of indigenous rights to the National Institute of Indigenous Affairs;</li> <li>Participate, within the framework to be established for the regulation of the Right to Consultation and Participation, in relation to interests that affects them and linked to the implementation of the rights of indigenous people.</li> </ul>	

## Buenos Aires Province Regulations

### General Environmental

<p>Provincial Law N° 11.723 and OPDS Resolution No. 15/2015</p>	<p>The Environmental Impact Assessment process in the Buenos Aires Province is regulated by Law N° 11.723. According to this regulation, projects/activities are required to obtain an Environmental Impact Declaration (“Declaración de Impacto Ambiental – DIA”), which is applied for preparing and submitting an Environmental Impact Study (EIAS), among other required information.</p> <p>Annex II of the regulation establishes the activities/projects to be evaluated by the Provincial Environmental Authority and the projects/activities to be evaluated by the Municipal Environmental Authority.</p> <p>OPDS Resolution No. 15/2015 establishes that Project proponents have to submit before the Authority the following documentation, among other:</p> <p>The Project Form included in the Annex of the regulation, duly completed and signed.</p> <p>Documentation accrediting the legal representation of the project proponent.</p> <p>Municipal zoning regulation or zoning certificate for the project site.</p> <p>Environmental Impact Assessment (hard copies and electronic copy).</p> <p>Once submitted, the Environmental Impact Assessment is evaluated by the Authority, which approves, approves making observations, or rejects the project.</p>	<p>Environmental Impact Declaration (“Declaración de Impacto Ambiental – DIA”),</p>
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*Environmental Regulations for Wind Farm Projects*

<p>Provincial Law N° 14.838 and Regulatory Decree N° 1.293/2019</p>	<p>This Law adheres to National Law N° 26.190 and creates the framework for renewable energy industry in the provincial territory.</p> <p>Renewable energy projects developed within the provincial territory are exempted of paying the following taxes for fifteen (15) years: gross incomes, real estate tax and stamp taxes.</p> <p>Decree N° 1.293/2019 establishes that all projects that wish to adhere to the Law’s promotion scheme, must register in the Provincial Unique Register of Renewable Energy Projects (Registro Unico de Proyectos de Energía Renovable de la Provincia de Buenos Aires – RUER) held by the Ministry of Infrastructure and Public Services. Once the registration is approved, the Ministry will inform the Provincial Tax Agency (Agencia de Recaudación de la Provincia de Buenos Aires - ARBA).</p> <p>ARBA is the Authority in charge of granting the tax benefits, and will collect the information indicated in Article 3.</p> <p>The project responsible must submit an annual affidavit informing the Authority on the operative status of the project. In order to obtain these benefits, the renewable projects must also obtain the approval of the corresponding Environmental Impact Study from the Provincial Environmental Authority (Organismo Provincial para el Desarrollo Sostenible - OPDS).</p>	
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Disposition N° 12/2019 of the Provincial Directorate of Public Services	Establishes a Manual to apply Law N° 14.838 for renewable energy projects, which indicates documentation, procedures, minimum content, requirements and timeframes.	
<i>Waste Management</i>		
Provincial Law N° 11.720 and Regulatory Decree N° 806/97 Resolution N° 592/2000 of the ex-SPA (former Provincial Environmental Authority)	<p>These regulations establish requirements for the management of hazardous wastes in the provincial territory. These regulations create the Provincial Register of Generators and Operator of Hazardous Wastes, in which all individuals and legal entities responsible for generating, handling, transporting, treating and disposing hazardous wastes within the Province must register. A Special Waste Certificate is granted against the registration . The Certificate has to be renewed annually with the presentation of an annual affidavit with the information on hazardous wastes generated the previous calendar year.</p> <p>Transport manifests and treatment and disposal certificated must be kept by the generator, and signed by generator, transporter and operator. In addition, a hazardous wastes operation record must be kept, as required by these regulations.</p> <p>Generators must comply with storage requirements establishes in Annex VI of Decree N° 806/97.</p>	Registration in the Provincial Register of Generators and Operator of Hazardous Wastes/ Special Authorization Certificate
Decree-Law N° 9.111 OPDS Resolution N° 188/12	<p>Decree-Law N° 9.111 establishes that a Disposal Authorization must be obtained by generators that dispose non-hazardous industrial wastes in the CEAMSE landfill. OPDS Resolution N° 139/2013 indicates that a Non-hazardous Solid Waste Management Plan must be prepared and submitted before the Authority for approval.</p> <p>This Resolution establishes that generators must keep transport manifests of non-hazardous solid wastes.</p>	
<i>Protected Areas</i>		
Provincial Law N° 10.907	<p>Creates the Provincial System of Protected Natural Areas. These are classified as indicated in Article 10:</p> <p>According to patrimonial status:</p> <ul style="list-style-type: none"> <li>Provincial Natural Reserves</li> <li>Municipal Natural Reserves</li> <li>Private Natural Reserves</li> </ul> <p>According to type:</p> <ul style="list-style-type: none"> <li>Provincial Parks: zoning established in Article 12.</li> <li>Integrated Natural Reserves: restricted access except for scientific explorations.</li> <li>Natural Reserves of Defined Objects: allows regulated human activity.</li> <li>Reserves of Multiple Uses: orientated to research and experimentation purposes.</li> <li>Wildlife Refuges: forbids hunting with two exceptions indicated in Article 10.</li> </ul>	
Provincial Law N° 1.356	Creates the Provincial Cultural Institute, Authority in charge of supervising provincial politics regarding conservation,	

	promotion, enrichment, diffusion and extension of the provincial historical and artistic-cultural heritage.	
<i>Water and Wastewater Management</i>		
Provincial Law N° 12.257 (Provincial Water Code) and Regulatory Decree N° 3.511/07 ADA Resolution N° 333/2017	<p>The Provincial Water Code, Provincial Law N° 12.257 and its Regulatory Decree N° 3.511/07 establish the requirements for exploitation and preservation of the water resources of public domain, and requirements of water provision and wastewater discharge facilities.</p> <p>As indicated in Resolution N° 333/2017, the following permits and authorizations must be obtained, with the indicated expiration frequencies:</p> <p><u>Water sources:</u>  Hydraulic Aptitude Permit: no expiration.  Drilling Authorization: expiration will be informed in the Resolution that grants the permit.  Groundwater Exploitation Permit: valid for 4 years.  Surface Water Exploitation Authorization: expiration will be informed in the Resolution that grants the permit.  Surface Exploitation Permit: valid for 4 years.</p> <p><u>Wastewater:</u>  Hydraulic Aptitude Permit: no expiration.  Technological Aptitude for Wastewater Discharges: expiration will be informed in the Resolution that grants the permit.  Wastewater Discharge Permit: valid for 4 years.  Before applying for these permits, a Pre-feasibility Certificate must be obtained, with a validity of 1 year.</p>	Hydraulic Aptitude Permit, Drilling Authorization, Groundwater Exploitation Permit, and Surface Exploitation Authorization, Surface Exploitation Permit, Technological Aptitude for Wastewater, and Wastewater Discharge Permit
ADA Resolution 336/2003	This regulation establishes wastewater limits for discharge into sewage system, surface water course, soil and sea.	

## Technical Energy Regulations

REGULATIONS	DESCRIPTION	ASSOCIATED PERMITS
<b>National Regulations</b>		
Resolution ENRE N° 171/95	Establishes the general standards to assure the enclosures of medium and low voltage transformation centers, to prevent the access of unauthorized third parties.	
Resolution ENRE N° 311/01	It requires to the electricity distribution companies the development and implementation of a Public Safety Plan, which contains the analysis of risks and actions to avoid them. Ten plans are determined, such as: plan of detection and correction of anomalies in installations on public road; preventive maintenance plan for installations on public roads; plan for control, registration, analysis and prevention of accidents; public safety claims response plan; plan to control works on public roads; plan for surveying and normalizing medium and low voltage overhead lines; control plan for transformer chambers; signaling plan on public roads; training and authorization plan for the distribution company personnel and its contractors, subcontractors and suppliers who carry out tasks that can affect public safety; and plan for the analysis and prevention of specific unusual events (fires, localized floods, etc.).	
Resolution ENRE N° 57/03.	Establishes the Minimum Contents Guide for the Public Safety System of the Installations of Transportation Companies. The resolution requires transport companies to develop and implement a Public Safety Plan, such as prevention, risk analysis and actions to avoid them.	
Resolution ENRE N° 86/05, modified by Resolution N° 1098/06.	Establishes the technical standard on safety conditions that the low voltage pillars and connections must have in the connections from distribution companies to users.	
Resolution ENRE N° 773/05	Defines the procedure of a sanctioning system on subjects related to Public Safety for companies that transport high and extra-high voltage electricity.	
Resolution ENRE N° 805/05	Establishes the minimum frequencies of revision that distribution companies must perform to its facilities located in the public road, within the framework of their Public Safety Systems.	
Resolution ENRE N° 384/06	Defines the technical standard on outdoor transformation centers that establishes the minimum parameters that these centers must meet to safeguard public safety.	

## Health and Safety Regulations

REGULATIONS	DESCRIPTION	ASSOCIATED PERMITS
<b>National Regulations</b>		
National Law N° 19.587 and its Regulatory Decree N° 351/79 and amendments Health and Safety at Work	National Law N° 19.587 has the final purpose of regulating the health and safety conditions at work, wherever this is developed or carried out. This regulation is intended to preserve the psychophysical integrity of workers, in order to reduce accidents and work-related illnesses, as well as risks from different aspects of work activities. Specifically it regulates the following aspects: i) Medical and health and safety services at the workplace; ii) Building construction features, including drinking water supply and industrial sewage; iii) Hygiene conditions in work environments, including heat stress, indoor air quality standards for the workplace, radiations, ventilation, illumination and color, noises and vibrations; iv) Industrial site safety conditions, including electrical equipment, machines and tools, pressured vessels, hazardous work, fire protection; v) Personal Protective Equipment; vi) Staff training.	Health and Safety Supporting Documentation.
National Decree N° 1.338/96 Medical and Health & Safety Services	Establishes provisions for the operation of the medical and health and safety services required by National Law N° 19.587 and its Regulatory Decree N° 351/79.	
National Law N° 24.557, its Regulatory Decree N° 170/96 and complementary regulations Labor Risk Prevention Law	National Law N° 24.557, its Regulatory Decree N° 170/96, and complementary regulations establish the legal framework for the integral system for the prevention of labor risks, including labor accidents and occupational diseases; and the legal system applicable to the labor risks insurance companies.	Labor Risks Insurance
National Resolution N° 295/03 of the Ministry of Labor, Employment and Social Security	This Resolution approves technical specifications for ergonomics and manual load lifting, and radiations, that are applicable throughout the national territory. In addition, it modifies Annexes II, III and V of Regulatory Decree N° 351/79 on Health and Safety.	
National Resolution N° 743/03 of the Superintendence of Labor Risks	It creates the National Register for the Prevention of Major Industrial Accidents and establishes a list of chemical substances and threshold volumes. Employers that produce, import, use, obtain, sell or transfer the chemical substances in volumes equal or higher than indicated in this regulation are required to register themselves in the aforementioned Register. The registration shall be completed through the Labor Risks Insurance Company.	
National Resolution N° 1.604/07 of the	It creates the Register of Labor Accidents, administered by the Superintendence of Labor Risks and procedures to report labor accidents. Employers must report the occupational	

Superintendence of Labors Risks	diseases and accidents to their Labor Risks Insurance company, in accordance with the instructions provided by these. Within 48 hours of the occurrence, the employer should submit the insurance company with a Report Form following guidelines established in Form D of Annex II of National Resolution N° 1.604/07. The employer should provide the worker with a copy of the report submitted to the insurance company.	
National Resolution N° 37/10 of the Superintendence of Labors Risks	Establishes the medical examinations included in the labor risks system, which comprise: 1. Pre-occupational. 2. Periodical. 3. Prior to the transference to another activity. 4. Following an extended absence. 5. Prior to ending the employment relationship. Pre-occupational examinations are mandatory. The Labor Risks Insurance company will determine the need for and frequency of periodical examinations. The results of the medical examinations should be kept in the personal file of each employee.	
National Resolution N° 299/11 of the Superintendence of Labors Risks	Establishes that personal protective equipment provided to workers shall be certified by duly recognized organisms according to National Resolution N° 896/99 of the Secretariat of Industry, Commerce and Mining. It also creates the form "Working Clothing and Personal Protective Equipment Delivery Record" of mandatory use by employers. A form shall be completed for each worker in which the delivery of all working clothing and personal protective equipment shall be registered.	
National Resolution N° 905/15 of the Superintendence of Labors Risks	Establishes the functions of the H&S and Medical Service professionals, in compliance with Decree N° 1.338/96, in which are included the following: a) Verify the compliance of the H&S regulations by identifying the hazards and assessing the risks that could affect the employee's health, and developing effective preventive measures. b) Verify and register the actions performed by the Labor Risks Insurance Company (ART), in which are included: Medical examinations, H&S compliance inspections, H&S benefits, etc. c) Conduct periodically visits on the working stations with the frequency depending on the risks assessments, the size of the company, and to verify compliance with any potential plan developed by the SRT (Superintendence of Labor Risks).	
National Resolution N° 84/12 of the Superintendence of Labors Risks	Establishes that annual monitoring must be conducted to verify if lighting is in compliance with the requirements and the lighting levels established in Annex IV of National Decree N° 351/79. It also requires to comply with guidelines established in the Protocol for Workplace Lighting Monitoring approved by this	

	Resolution. Corrective measures must be implemented if light levels are detected to be below minimum levels for working stations.	
National Resolution N° 85/12 of the Superintendence of Labors Risks	Comply with guidelines established in the Protocol for Workplace Noise Monitoring approved by this Resolution. Workplace noise monitoring results shall be valid for a term of twelve (12) months (i.e. monitoring is required at least every 12 months).	
Resolution N° 886/15 of the Ministry of Job, Labor and Social Security	Requires to conduct an ergonomic assessment of the activities performed on site, according to Protocol for Ergonomics Monitoring approved by this Resolution.	
Resolution ENRE N° 114/2005	Defines the technical standard that establishes the minimum fire safety conditions that transformation centers must have within private properties, including a standardization plan to be carried out within the Public Safety Systems of the distribution companies.	
Resolution ENRE N° 597/2010	It establishes preventive measures to avoid accidents and incidents in the performance of underground works on public roads by delivering plans by the distributor to the different contractors that act in the public space, through the Municipalities.	

## **APPENDIX D: LIST OF POTENTIAL FAUNA SPECIES**

Class	Order	Family	Species	Common Name	IUCN Red List Category	Restricted Range	Movement Patterns	IBAT	EIA	Specialized Literature
Aves	Accipitriformes	Accipitridae	<i>Buteo swainsoni</i>	Swainson's hawk	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Accipitriformes	Accipitridae	<i>Buteogallus coronatus</i>	Crowned solitary eagle	EN	-	Not a migrant	X		
Aves	Accipitriformes	Accipitridae	<i>Circus buffoni</i>	Long-winged harrier	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Accipitriformes	Accipitridae	<i>Circus cinereus</i>	Cinereous harrier	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Accipitriformes	Accipitridae	<i>Elanus leucurus</i>	White-tailed kite	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Accipitriformes	Accipitridae	<i>Geranoaetus albicaudatus</i>	White-tailed hawk	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Accipitriformes	Accipitridae	<i>Geranoaetus melanoleucus</i>	Black-chested buzzard-eagle	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Accipitriformes	Accipitridae	<i>Geranoaetus polyosoma</i>	Variable hawk	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Accipitriformes	Accipitridae	<i>Parabuteo unicinctus</i>	Harris's hawk	LC OR LR/LC	-	Not a migrant	X		a
Aves	Accipitriformes	Accipitridae	<i>Rupornis magnirostris</i>	Roadside hawk	LC OR LR/LC	-	Not a migrant			a
Aves	Anseriformes	Anatidae	<i>Anas bahamensis</i>	White-cheeked pintail	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Anseriformes	Anatidae	<i>Anas flavirostris</i>	Yellow-billed teal	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Anseriformes	Anatidae	<i>Anas georgica</i>	Yellow-billed pintail	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Anseriformes	Anatidae	<i>Chloephaga picta</i>	Upland goose	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Anseriformes	Anatidae	<i>Chloephaga poliocephala</i>	Ashy-headed goose	LC OR LR/LC	-	Full migrant	X		a

Class	Order	Family	Species	Common Name	IUCN Red List Category	Restricted Range	Movement Patterns	IBAT	EIA	Specialized Literature
Aves	Anseriformes	Anatidae	<i>Chloephaga rubidiceps</i>	Ruddy-headed goose	LC OR LR/LC	-	Full migrant	X		a
Aves	Anseriformes	Anatidae	<i>Coscoroba</i>	Coscoroba swan	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Anseriformes	Anatidae	<i>Cygnus melancoryphus</i>	Black-necked swan	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Anseriformes	Anatidae	<i>Dendrocygna bicolor</i>	Fulvous whistling-duck	LC OR LR/LC	-	Full migrant	X		a
Aves	Anseriformes	Anatidae	<i>Dendrocygna viduata</i>	White-faced whistling-duck	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Anseriformes	Anatidae	<i>Heteronetta atricapilla</i>	Black-headed duck	LC OR LR/LC	-	Full migrant	X		a
Aves	Anseriformes	Anatidae	<i>Mareca sibilatrix</i>	Chiloe wigeon	LC OR LR/LC	-	Full migrant	X		
Aves	Anseriformes	Anatidae	<i>Netta peposaca</i>	Rosy-billed pochard	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Anseriformes	Anatidae	<i>Oxyura vittata</i>	Lake duck	LC OR LR/LC	-	Full migrant	X		a
Aves	Anseriformes	Anatidae	<i>Spatula cyanoptera</i>	Cinnamon teal	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Anseriformes	Anatidae	<i>Spatula platalea</i>	Red shoveler	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Anseriformes	Anatidae	<i>Spatula versicolor</i>	Silver teal	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Anseriformes	Anhimidae	<i>Chauna torquata</i>	Southern screamer	LC OR LR/LC	-	Not a migrant	X		a
Aves	Caprimulgiformes	Caprimulgidae	<i>Hydropsalis torquata</i>	Scissor-tailed nightjar	LC OR LR/LC	-	Full migrant	X		a
Aves	Caprimulgiformes	Caprimulgidae	<i>Chordeiles minor</i>	Common nighthawk	LC OR LR/LC	-	Full migrant			a

Class	Order	Family	Species	Common Name	IUCN Red List Category	Restricted Range	Movement Patterns	IBAT	EIA	Specialized Literature
Aves	Caprimulgiformes	Caprimulgidae	<i>Systellura longirostris</i>	Greater band-winged nightjar	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Caprimulgiformes	Caprimulgidae	<i>Chordeiles nacunda</i>	Nacunda Nighthawk	LC OR LR/LC	-	Full migrant			a
Aves	Caprimulgiformes	Trochilidae	<i>Chlorostilbon lucidus</i>	Glittering-bellied Emerald	LC OR LR/LC	-	Full migrant		X	a
Aves	Caprimulgiformes	Trochilidae	<i>Leucochloris albicollis</i>	White-throated hummingbird	LC OR LR/LC	-	Full migrant		X	a
Aves	Caprimulgiformes	Trochilidae	<i>Sephanoides sephaniodes</i>	Green-backed firecrown	LC OR LR/LC	-	Full migrant	X		a
Aves	Cathartiformes	Cathartidae	<i>Cathartes aura</i>	Turkey vulture	LC OR LR/LC	-	Full migrant	X		a
Aves	Cathartiformes	Cathartidae	<i>Coragyps atratus</i>	American black vulture	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Charadriiformes	Charadriidae	<i>Charadrius collaris</i>	Collared plover	LC OR LR/LC	-	Not a migrant	X		a
Aves	Charadriiformes	Charadriidae	<i>Charadrius falklandicus</i>	Two-banded plover	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Charadriiformes	Charadriidae	<i>Charadrius modestus</i>	Rufous-chested plover	LC OR LR/LC	-	Full migrant	X		a
Aves	Charadriiformes	Charadriidae	<i>Charadrius semipalmatus</i>	Semipalmated plover	LC OR LR/LC	-	Full migrant	X		
Aves	Charadriiformes	Charadriidae	<i>Oreopholus ruficollis</i>	Tawny-throated dotterel	LC OR LR/LC	-	Full migrant	X		a
Aves	Charadriiformes	Charadriidae	<i>Pluvialis dominica</i>	American golden plover	LC OR LR/LC	-	Full migrant	X		a
Aves	Charadriiformes	Charadriidae	<i>Vanellus chilensis</i>	Southern lapwing	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Charadriiformes	Chionidae	<i>Chionis albus</i>	Snowy sheathbill	LC OR LR/LC	-	Full migrant	X		a

Class	Order	Family	Species	Common Name	IUCN Red List Category	Restricted Range	Movement Patterns	IBAT	EIA	Specialized Literature
Aves	Charadriiformes	Haematopodidae	<i>Haematopus ater</i>	Blackish oystercatcher	LC OR LR/LC	-	Not a migrant	X		
Aves	Charadriiformes	Haematopodidae	<i>Haematopus palliatus</i>	American oystercatcher	LC OR LR/LC	-	Full migrant	X		
Aves	Charadriiformes	Jacanidae	<i>Jacana</i>	Wattled jacana	LC OR LR/LC	-	Full migrant			a
Aves	Charadriiformes	Laridae	<i>Gelochelidon nilotica</i>	Common gull-billed tern	LC OR LR/LC	-	Full migrant	X		a
Aves	Charadriiformes	Laridae	<i>Larus atlanticus</i>	Olog's gull	NT OR LR/NT	-	Full migrant	X		
Aves	Charadriiformes	Laridae	<i>Larus cirrocephalus</i>	Grey-headed gull	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Charadriiformes	Laridae	<i>Larus dominicanus</i>	Kelp gull	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Charadriiformes	Laridae	<i>Larus maculipennis</i>	Brown-hooded gull	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Charadriiformes	Laridae	<i>Rynchops niger</i>	Black skimmer	LC OR LR/LC	-	Full migrant	X		
Aves	Charadriiformes	Laridae	<i>Sterna hirundinacea</i>	South american tern	LC OR LR/LC	-	Full migrant	X		a
Aves	Charadriiformes	Laridae	<i>Sterna hirundo</i>	Common tern	LC OR LR/LC	-	Full migrant	X		
Aves	Charadriiformes	Laridae	<i>Sterna vittata</i>	Antarctic tern	LC OR LR/LC	-	Full migrant	X		
Aves	Charadriiformes	Laridae	<i>Sternula superciliaris</i>	Yellow-billed tern	LC OR LR/LC	-	Not a migrant			a
Aves	Charadriiformes	Laridae	<i>Thalasseus maximus</i>	Royal tern	LC OR LR/LC	-	Full migrant	X		
Aves	Charadriiformes	Laridae	<i>Thalasseus sandvicensis</i>	Sandwich tern	LC OR LR/LC	-	Full migrant	X		

Class	Order	Family	Species	Common Name	IUCN Red List Category	Restricted Range	Movement Patterns	IBAT	EIA	Specialized Literature
Aves	Charadriiformes	Pluvianellidae	<i>Pluvianellus socialis</i>	Magellanic plover	NT OR LR/NT	-	Full migrant	X		
Aves	Charadriiformes	Recurvirostridae	<i>Himantopus</i>	Black-winged stilt	LC OR LR/LC	-	Full migrant	X		a
Aves	Charadriiformes	Rostratulidae	<i>Nycticryphes semicollaris</i>	South american painted-snipe	LC OR LR/LC	-	Full migrant	X		a
Aves	Charadriiformes	Scolopacidae	<i>Bartramia longicauda</i>	Upland sandpiper	LC OR LR/LC	-	Full migrant	X		a
Aves	Charadriiformes	Scolopacidae	<i>Calidris alba</i>	Sanderling	LC OR LR/LC	-	Full migrant	X		
Aves	Charadriiformes	Scolopacidae	<i>Calidris bairdii</i>	Baird's sandpiper	LC OR LR/LC	-	Full migrant	X		a
Aves	Charadriiformes	Scolopacidae	<i>Calidris canutus</i>	Red knot	NT OR LR/NT	-	Full migrant	X		
Aves	Charadriiformes	Scolopacidae	<i>Calidris fuscicollis</i>	White-rumped sandpiper	LC OR LR/LC	-	Full migrant	X		a
Aves	Charadriiformes	Scolopacidae	<i>Calidris melanotos</i>	Pectoral sandpiper	LC OR LR/LC	-	Full migrant	X		a
Aves	Charadriiformes	Scolopacidae	<i>Calidris subruficollis</i>	Buff-breasted sandpiper	NT OR LR/NT	-	Full migrant	X		a
Aves	Charadriiformes	Scolopacidae	<i>Gallinago paraguaiiae</i>	South american snipe	LC OR LR/LC	-	Full migrant	X		a
Aves	Charadriiformes	Scolopacidae	<i>Limosa haemastica</i>	Hudsonian godwit	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Charadriiformes	Scolopacidae	<i>Numenius phaeopus</i>	Whimbrel	LC OR LR/LC	-	Full migrant	X		
Aves	Charadriiformes	Scolopacidae	<i>Steganopus tricolor</i>	Wilson's phalarope	LC OR LR/LC	-	Full migrant	X		a
Aves	Charadriiformes	Scolopacidae	<i>Tringa flavipes</i>	Lesser yellowlegs	LC OR LR/LC	-	Full migrant	X		a

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Aves	Charadriiformes	Scolopacidae	<i>Tringa melanoleuca</i>	Greater yellowlegs	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Charadriiformes	Stercorariidae	<i>Catharacta antarctica</i>	Brown skua	LC OR LR/LC	-	Full migrant	X		
Aves	Charadriiformes	Stercorariidae	<i>Catharacta chilensis</i>	Chilean skua	LC OR LR/LC	-	Not a migrant	X		a
Aves	Charadriiformes	Stercorariidae	<i>Stercorarius parasiticus</i>	Arctic jaeger	LC OR LR/LC	-	Full migrant	X		a
Aves	Charadriiformes	Thinocoridae	<i>Thinocorus rumicivorus</i>	Least seedsnipe	LC OR LR/LC	-	Full migrant	X		a
Aves	Ciconiiformes	Ciconiidae	<i>Ciconia maguari</i>	Maguari stork	LC OR LR/LC	-	Full migrant	X		a
Aves	Columbiformes	Columbidae	<i>Columba livia</i>	Rock dove	LC OR LR/LC	-	Not a migrant		X	a
Aves	Columbiformes	Columbidae	<i>Columbina picui</i>	Picui dove	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Columbiformes	Columbidae	<i>Patagioenas maculosa</i>	Spot-winged pigeon	LC OR LR/LC	-	Full migrant	X		
Aves	Columbiformes	Columbidae	<i>Patagioenas picazuro</i>	Picazuro pigeon	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Columbiformes	Columbidae	<i>Zenaida auriculata</i>	Eared dove	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Coraciiformes	Alcedinidae	<i>Chloroceryle americana</i>	Green kingfisher	LC OR LR/LC	-	Not a migrant		X	a
Aves	Coraciiformes	Alcedinidae	<i>Megaceryle torquata</i>	Ringed kingfisher	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Cuculiformes	Cuculidae	<i>Guira</i>	Guira cuckoo	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Falconiformes	Falconidae	<i>Caracara plancus</i>	Southern caracara	LC OR LR/LC	-	Not a migrant	X	X	a

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Aves	Falconiformes	Falconidae	<i>Falco femoralis</i>	Aplomado falcon	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Falconiformes	Falconidae	<i>Falco peregrinus</i>	Peregrine falcon	LC OR LR/LC	-	Full migrant	X		a
Aves	Falconiformes	Falconidae	<i>Falco sparverius</i>	American kestrel	LC OR LR/LC	-	Full migrant	X		a
Aves	Falconiformes	Falconidae	<i>Phalcoboenus chimango</i>	Chimango caracara	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Falconiformes	Falconidae	<i>Spizapteryx circumcincta</i>	Spot-winged falconet	LC OR LR/LC	-	Not a migrant	X		a
Aves	Gruiformes	Rallidae	<i>Coturnicops notatus</i>	Speckled rail	LC OR LR/LC	-	Full migrant	X		a
Aves	Gruiformes	Rallidae	<i>Fulica armillata</i>	Red-gartered coot	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Gruiformes	Rallidae	<i>Fulica leucoptera</i>	White-winged coot	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Gruiformes	Rallidae	<i>Fulica rufifrons</i>	Red-fronted coot	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Gruiformes	Rallidae	<i>Pardirallus sanguinolentus</i>	Plumbeous rail	LC OR LR/LC	-	Full migrant	X		a
Aves	Gruiformes	Rallidae	<i>Porzana spiloptera</i>	Dot-winged crane	VU	-	Not a migrant	X		a
Aves	Passeriformes	Cotingidae	<i>Phytotoma rutila</i>	White-tipped plantcutter	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Fringillidae	<i>Chloris</i>	European greenfinch	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Fringillidae	<i>Spinus magellanicus</i>	Hooded siskin	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Passeriformes	Furnariidae	<i>Anumbius annumbi</i>	Firewood-gatherer	LC OR LR/LC	-	Not a migrant	X	X	a

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Aves	Passeriformes	Furnariidae	<i>Asthenes baeri</i>	Short-billed canastero	LC OR LR/LC	-	Not a migrant	X		a
Aves	Passeriformes	Furnariidae	<i>Asthenes hudsoni</i>	Hudson's canastero	NT OR LR/NT	-	Full migrant	X	X	a
Aves	Passeriformes	Furnariidae	<i>Asthenes modesta</i>	Cordilleran canastero	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Passeriformes	Furnariidae	<i>Asthenes pyrrholeuca</i>	Sharp-billed canastero	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Furnariidae	<i>Cinclodes fuscus</i>	Buff-winged cinclodes	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Furnariidae	<i>Cranioleuca pyrrhophia</i>	Stripe-crowned spinetail	LC OR LR/LC	-	Not a migrant	X		a
Aves	Passeriformes	Furnariidae	<i>Cranioleuca sulphurifera</i>	Sulphur-throated spinetail	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Furnariidae	<i>Drymornis bridgesii</i>	Scimitar-billed woodcreeper	LC OR LR/LC	-	Not a migrant	X		a
Aves	Passeriformes	Furnariidae	<i>Furnarius rufus</i>	Rufous hornero	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Passeriformes	Furnariidae	<i>Geositta cunicularia</i>	Common miner	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Furnariidae	<i>Lepidocolaptes angustirostris</i>	Narrow-billed woodcreeper	LC OR LR/LC	-	Not a migrant	X		a
Aves	Passeriformes	Furnariidae	<i>Leptasthenura pallida</i>	Pallid tit-spinetail	LC OR LR/LC	-	Full migrant	X		
Aves	Passeriformes	Furnariidae	<i>Leptasthenura platensis</i>	Tufted tit-spinetail	LC OR LR/LC	-	Not a migrant	X		a
Aves	Passeriformes	Furnariidae	<i>Phleocryptes melanops</i>	Wren-like rushbird	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Furnariidae	<i>Pseudoseisura gutturalis</i>	White-throated cachalote	LC OR LR/LC	-	Not a migrant	X		a

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Aves	Passeriformes	Furnariidae	<i>Spartonoica maluroides</i>	Bay-capped wren-spinetail	NT OR LR/NT	-	Full migrant	X	X	a
Aves	Passeriformes	Furnariidae	<i>Synallaxis albescens</i>	Pale-breasted spinetail	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Furnariidae	<i>Upucerthia dumetaria</i>	Scale-throated earthcreeper	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Hirundinidae	<i>Hirundo rustica</i>	Barn swallow	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Hirundinidae	<i>Progne chalybea</i>	Grey-breasted martin	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Hirundinidae	<i>Progne elegans</i>	Southern martin	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Hirundinidae	<i>Progne tapera</i>	Brown-chested martin	LC OR LR/LC	-	Full migrant	X		
Aves	Passeriformes	Hirundinidae	<i>Pygochelidon cyanoleuca</i>	Blue-and-white swallow	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Hirundinidae	<i>Riparia</i>	Collared sand martin	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Hirundinidae	<i>Tachycineta leucorrhoa</i>	White-rumped swallow	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Hirundinidae	<i>Tachycineta meyeni</i>	Chilean swallow	LC OR LR/LC	-	Full migrant	X		
Aves	Passeriformes	Icteridae	<i>Agelaioides badius</i>	Greyish baywing	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Passeriformes	Icteridae	<i>Leistes defilippii</i>	Pampas meadowlark	VU	-	Full migrant	X	X	a
Aves	Passeriformes	Icteridae	<i>Leistes loyca</i>	Long-tailed meadowlark	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Icteridae	<i>Leistes superciliaris</i>	White-browed blackbird	LC OR LR/LC	-	Full migrant	X	X	a

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Aves	Passeriformes	Icteridae	<i>Molothrus bonariensis</i>	Shiny cowbird	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Icteridae	<i>Molothrus rufoaxillaris</i>	Screaming cowbird	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Passeriformes	Icteridae	<i>Pseudoleistes virescens</i>	Brown-and-yellow marshbird	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Icteridae	<i>Xanthopsar flavus</i>	Saffron-cowled blackbird	VU	-	Not a migrant	X		
Aves	Passeriformes	Mimidae	<i>Mimus patagonicus</i>	Patagonian mockingbird	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Mimidae	<i>Mimus saturninus</i>	Chalk-browed mockingbird	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Passeriformes	Mimidae	<i>Mimus triurus</i>	White-banded mockingbird	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Passeriformes	Motacillidae	<i>Anthus chacoensis</i>	Pampas pipit	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Motacillidae	<i>Anthus correndera</i>	Correndera pipit	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Motacillidae	<i>Anthus furcatus</i>	Short-billed pipit	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Motacillidae	<i>Anthus hellmayri</i>	Hellmayr's pipit	LC OR LR/LC	-	Full migrant		X	a
Aves	Passeriformes	Passerellidae	<i>Ammodramus humeralis</i>	Grassland sparrow	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Passerellidae	<i>Zonotrichia capensis</i>	Rufous-collared sparrow	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Passeriformes	Passeridae	<i>Passer domesticus</i>	House sparrow	LC OR LR/LC	-	Not a migrant	X		
Aves	Passeriformes	Rhinocryptidae	<i>Rhinocrypta lanceolata</i>	Crested gallito	LC OR LR/LC	-	Not a migrant	X		a

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Aves	Passeriformes	Thraupidae	<i>Catamenia analis</i>	Catamenia analis	LC OR LR/LC	-	Full migrant		X	a
Aves	Passeriformes	Thraupidae	<i>Corydospiza carbonaria</i>	Carbon sierra-finch	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Thraupidae	<i>Diuca</i>	Common diuca-finch	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Thraupidae	<i>Embernagra platensis</i>	Great pampa-finch	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Passeriformes	Thraupidae	<i>Gubernatrix cristata</i>	Yellow cardinal	EN	-	Not a migrant	X		a
Aves	Passeriformes	Thraupidae	<i>Microspingus pectoralis</i>	Black-breasted warbling-finch	LC OR LR/LC	-	Full migrant	X		
Aves	Passeriformes	Thraupidae	<i>Paroaria coronata</i>	Red-crested cardinal	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Passeriformes	Thraupidae	<i>Phrygilus gayi</i>	Grey-hooded sierra-finch	LC OR LR/LC	-	Full migrant	X		
Aves	Passeriformes	Thraupidae	<i>Pipraeidea bonariensis</i>	Blue-and-yellow tanager	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Thraupidae	<i>Rhopospina fruticeti</i>	Mourning sierra-finch	LC OR LR/LC	-	Full migrant		X	a
Aves	Passeriformes	Thraupidae	<i>Saltator aurantiirostris</i>	Golden-billed saltator	LC OR LR/LC	-	Not a migrant	X		a
Aves	Passeriformes	Thraupidae	<i>Sicalis flaveola</i>	Saffron finch	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Passeriformes	Thraupidae	<i>Sicalis lebruni</i>	Patagonian Yellow-finch	LC OR LR/LC	-	Full migrant		X	a
Aves	Passeriformes	Thraupidae	<i>Sicalis luteola</i>	Grassland yellow-finch	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Thraupidae	<i>Sporophila caeruleascens</i>	Double-collared seedeater	LC OR LR/LC	-	Full migrant	X	X	a

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Aves	Passeriformes	Troglodytidae	<i>Cistothorus platensis</i>	Grass wren	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Troglodytidae	<i>Troglodytes aedon</i>	House wren	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Turdidae	<i>Turdus falcklandii</i>	Austral thrush	LC OR LR/LC	-	Full migrant			a
Aves	Passeriformes	Tyrannidae	<i>Agriornis micropterus</i>	Grey-bellied shrike-tyrant	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Tyrannidae	<i>Agriornis montanus</i>	Black-billed shrike-tyrant	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Tyrannidae	<i>Agriornis murinus</i>	Lesser shrike-tyrant	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Tyrannidae	<i>Alectrurus risora</i>	Strange-tailed tyrant	VU	-	Full migrant	X		
Aves	Passeriformes	Tyrannidae	<i>Anairetes flavirostris</i>	Yellow-billed tit-tyrant	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Tyrannidae	<i>Elaenia albiceps</i>	White-crested elaenia	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Tyrannidae	<i>Elaenia parvirostris</i>	Small-billed elaenia	LC OR LR/LC	-	Full migrant			a
Aves	Passeriformes	Tyrannidae	<i>Griseotyrannus aurantioatrocristatus</i>	Crowned slaty flycatcher	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Tyrannidae	<i>Hymenops perspicillatus</i>	Spectacled tyrant	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Tyrannidae	<i>Knipolegus aterrimus</i>	White-winged black-tyrant	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Tyrannidae	<i>Knipolegus hudsoni</i>	Hudson's black-tyrant	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Tyrannidae	<i>Lessonia rufa</i>	Austral negrito	LC OR LR/LC	-	Full migrant	X	X	a

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Aves	Passeriformes	Tyrannidae	<i>Machetornis rixosa</i>	Cattle tyrant	LC OR LR/LC	-	Full migrant			a
Aves	Passeriformes	Tyrannidae	<i>Muscisaxicola maclovianus</i>	Dark-faced ground-tyrant	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Tyrannidae	<i>Myiarchus swainsoni</i>	Swainson's flycatcher	LC OR LR/LC	-	Full migrant	X		
Aves	Passeriformes	Tyrannidae	<i>Myiophobus fasciatus</i>	Bran-colored Flycatcher	LC OR LR/LC	-	Full migrant			a
Aves	Passeriformes	Tyrannidae	<i>Neoxolmis rufiventris</i>	Chocolate-vented tyrant	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Tyrannidae	<i>Pitangus sulphuratus</i>	Great kiskadee	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Tyrannidae	<i>Polystictus pectoralis</i>	Bearded tachuri	NT OR LR/NT	-	Full migrant	X	X	a
Aves	Passeriformes	Tyrannidae	<i>Pseudocolopteryx flaviventris</i>	Warbling doradito	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Tyrannidae	<i>Pyrocephalus rubinus</i>	Common Vermilion Flycatcher	LC OR LR/LC	-	Full migrant		X	a
Aves	Passeriformes	Tyrannidae	<i>Serpophaga nigricans</i>	Sooty tyrannulet	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Tyrannidae	<i>Serpophaga subcristata</i>	White-crested tyrannulet	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Tyrannidae	<i>Stigmatura budytoides</i>	Greater wagtail-tyrant	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Tyrannidae	<i>Sublegatus modestus</i>	Southern scrub-flycatcher	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Tyrannidae	<i>Suiriri</i>	Suiriri flycatcher	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Tyrannidae	<i>Tachuris rubrigastra</i>	Many-colored rush-tyrant	LC OR LR/LC	-	Full migrant	X	X	a

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Aves	Passeriformes	Tyrannidae	<i>Tyrannus melancholicus</i>	Tropical kingbird	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Tyrannidae	<i>Tyrannus savana</i>	Fork-tailed flycatcher	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Tyrannidae	<i>Xolmis coronatus</i>	Black-crowned monjita	LC OR LR/LC	-	Full migrant	X		a
Aves	Passeriformes	Tyrannidae	<i>Xolmis irupero</i>	White monjita	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Passeriformes	Tyrannidae	<i>Xolmis rubetra</i>	Rusty-backed monjita	LC OR LR/LC	-	Full migrant	X		a
Aves	Pelecaniformes	Ardeidae	<i>Ardea alba</i>	Great white egret	LC OR LR/LC	-	Full migrant	X		a
Aves	Pelecaniformes	Ardeidae	<i>Ardea cocoi</i>	Cocoi heron	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Pelecaniformes	Ardeidae	<i>Bubulcus ibis</i>	Cattle egret	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Pelecaniformes	Ardeidae	<i>Butorides striata</i>	Green-backed heron	LC OR LR/LC	-	Full migrant	X		a
Aves	Pelecaniformes	Ardeidae	<i>Egretta thula</i>	Snowy egret	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Pelecaniformes	Ardeidae	<i>Ixobrychus involucris</i>	Stripe-backed bittern	LC OR LR/LC	-	Full migrant	X		a
Aves	Pelecaniformes	Ardeidae	<i>Nycticorax</i>	Black-crowned night-heron	LC OR LR/LC	-	Full migrant	X		a
Aves	Pelecaniformes	Ardeidae	<i>Syrigma sibilatrix</i>	Whistling Heron	LC OR LR/LC	-	Full migrant		X	a
Aves	Pelecaniformes	Threskiornithidae	<i>Platalea ajaja</i>	Roseate spoonbill	LC OR LR/LC	-	Full migrant	X		a
Aves	Pelecaniformes	Threskiornithidae	<i>Plegadis chihi</i>	White-faced ibis	LC OR LR/LC	-	Full migrant	X	X	a

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Aves	Pelecaniformes	Threskiornithidae	<i>Theristicus melanopis</i>	Black-faced ibis	LC OR LR/LC	-	Full migrant	X		a
Aves	Phoenicopteriformes	Phoenicopteridae	<i>Phoenicopterus chilensis</i>	Chilean flamingo	NT OR LR/NT	-	Full migrant	X	X	a
Aves	Piciformes	Picidae	<i>Colaptes campestris</i>	Pampas flicker	LC OR LR/LC	-	Not a migrant	X		
Aves	Piciformes	Picidae	<i>Colaptes melanolaimus</i>	Golden-breasted woodpecker	LC OR LR/LC	-	Full migrant	X		
Aves	Piciformes	Picidae	<i>Colaptes melanochloros</i>	Green-barred Woodpecker	LC OR LR/LC	-	Not a migrant		X	a
Aves	Piciformes	Picidae	<i>Veniliornis mixtus</i>	Checkered woodpecker	LC OR LR/LC	-	Full migrant	X		
Aves	Podicipediformes	Podicipedidae	<i>Podiceps major</i>	Great grebe	LC OR LR/LC	-	Full migrant	X		
Aves	Podicipediformes	Podicipedidae	<i>Podiceps occipitalis</i>	Southern silvery grebe	LC OR LR/LC	-	Full migrant	X		a
Aves	Podicipediformes	Podicipedidae	<i>Podilymbus podiceps</i>	Pied-billed grebe	LC OR LR/LC	-	Full migrant	X		a
Aves	Podicipediformes	Podicipedidae	<i>Rollandia rolland</i>	White-tufted grebe	LC OR LR/LC	-	Full migrant	X		a
Aves	Psittaciformes	Psittacidae	<i>Cyanoliseus patagonus</i>	Burrowing parrot	LC OR LR/LC	-	Full migrant	X		a
Aves	Psittaciformes	Psittacidae	<i>Myiopsitta monachus</i>	Monk parakeet	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Psittaciformes	Psittacidae	<i>Psittacara acuticaudatus</i>	Blue-crowned parakeet	LC OR LR/LC	-	Nomadic	X		a
Aves	Strigiformes	Strigidae	<i>Asio flammeus</i>	Short-eared owl	LC OR LR/LC	-	Full migrant	X	X	a
Aves	Strigiformes	Strigidae	<i>Athene cunicularia</i>	Burrowing owl	LC OR LR/LC	-	Full migrant	X	X	a

Class	Order	Family	Species	Common Name	IUCN Red List Category	Restricted Range	Movement Patterns	IBAT	EIA	Specialized Literature
Aves	Strigiformes	Strigidae	<i>Bubo virginianus</i>	Great horned owl	LC OR LR/LC	-	Full migrant			a
Aves	Strigiformes	Tytonidae	<i>Tyto alba</i>	Common barn-owl	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Struthioniformes	Rheidae	<i>Rhea americana</i>	Greater rhea	NT OR LR/NT	-	Not a migrant	X	X	a
Aves	Struthioniformes	Tinamidae	<i>Eudromia elegans</i>	Elegant crested tinamou	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Struthioniformes	Tinamidae	<i>Nothoprocta cinerascens</i>	Brushland tinamou	LC OR LR/LC	-	Not a migrant	X		a
Aves	Struthioniformes	Tinamidae	<i>Nothura darwinii</i>	Darwin's nothura	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Struthioniformes	Tinamidae	<i>Nothura maculosa</i>	Spotted nothura	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Struthioniformes	Tinamidae	<i>Rhynchotus rufescens</i>	Red-winged tinamou	LC OR LR/LC	-	Not a migrant	X	X	a
Aves	Suliformes	Phalacrocoracidae	<i>Nannopterum brasilianus</i>	Neotropical cormorant	LC OR LR/LC	-	Not a migrant	X	X	a
Amphibia	Anura	Bufo	<i>Melanophryniscus stelzneri</i>		LC OR LR/LC	ND	ND	X	X	
Amphibia	Anura	Bufo	<i>Rhinella arenarum</i>		LC OR LR/LC	ND	ND	X	X	b
Amphibia	Anura	Bufo	<i>Rhinella dorbignyi</i>		LC OR LR/LC	ND	ND			b
Amphibia	Anura	Ceratophryidae	<i>Ceratophrys ornata</i>		NT OR LR/NT	ND	ND	X	X	b
Amphibia	Anura	Hylidae	<i>Hypsiboas pulchellus</i>		LC OR LR/LC	ND	ND	X		
Amphibia	Anura	Leptodactylidae	<i>Leptodactylus latrans</i>		LC OR LR/LC	ND	ND	X		

Class	Order	Family	Species	Common Name	IUCN Red List Category	Restricted Range	Movement Patterns	IBAT	EIA	Specialized Literature
Amphibia	Anura	Leptodactylidae	<i>Leptodactylus mystacinus</i>		LC OR LR/LC	ND	ND	X		
Amphibia	Anura	Leptodactylidae	<i>Leptodactylus ocellatus</i>		*	*	*		X	b
Amphibia	Anura	Odontophrynidae	<i>Odontophrynus americanus</i>	Common lesser escuerzo	LC OR LR/LC	ND	ND	X	X	b
Amphibia	Anura	Odontophrynidae	<i>Odontophrynus occidentalis</i>		LC OR LR/LC	-	Not a migrant	X	X	b
Mammalia	Carnivora	Canidae	<i>Lycalopex gymnocercus</i>	Pampas fox	LC OR LR/LC	ND	ND	X	X	c
Mammalia	Carnivora	Felidae	<i>Herpailurus yagouaroundi</i>	Jaguarundi	LC OR LR/LC	ND	ND	X		c
Mammalia	Carnivora	Felidae	<i>Leopardus colocolo</i>	Pampas cat	NT OR LR/NT	ND	ND	X	X	c
Mammalia	Carnivora	Felidae	<i>Leopardus geoffroyi</i>	Geoffroy's cat	LC OR LR/LC	ND	ND	X	X	c
Mammalia	Carnivora	Felidae	<i>Puma concolor</i>	Puma	LC OR LR/LC	ND	ND	X		c
Mammalia	Carnivora	Mephitidae	<i>Conepatus chinga</i>	Molina's hog-nosed skunk	LC OR LR/LC	ND	ND	X	X	c
Mammalia	Carnivora	Mustelidae	<i>Galictis cuja</i>	Lesser grison	LC OR LR/LC	ND	ND	X	X	c
Mammalia	Cetartiodactyla	Camelidae	<i>Lama guanicoe</i>	Guanaco	LC OR LR/LC	-	ND		X	c
Mammalia	Cetartiodactyla	Cervidae	<i>Ozotoceros bezoarticus</i>	Pampas deer	NT OR LR/NT	ND	ND			c
Mammalia	Chiroptera	Molossidae	<i>Eumops bonariensis</i>	Dwarf Bonneted bat	LC OR LR/LC	ND	ND			c
Mammalia	Chiroptera	Molossidae	<i>Eumops patagonicus</i>	Patagonian Dwarf Bonneted Bat	LC OR LR/LC	ND	ND			c

Class	Order	Family	Species	Common Name	IUCN Red List Category	Restricted Range	Movement Patterns	IBAT	EIA	Specialized Literature
Mammalia	Chiroptera	Molossidae	<i>Molossops temminckii</i>	Dwarf dig-faced bat	LC OR LR/LC	ND	ND			c
Mammalia	Chiroptera	Molossidae	<i>Molossus</i>	Pallas' free-tailed bat	LC OR LR/LC	ND	ND			c
Mammalia	Chiroptera	Molossidae	<i>Tadarida brasiliensis</i>	Free-tailed Bat	LC OR LR/LC	ND	ND	X	X	c
Mammalia	Chiroptera	Phyllostomidae	<i>Glossophaga soricina</i>	Pallas's Long-tongued Bat	LC OR LR/LC	ND	ND			c
Mammalia	Chiroptera	Vespertilionidae	<i>Eptesicus diminutus</i>	Diminutive serotine	LC OR LR/LC	ND	ND			c
Mammalia	Chiroptera	Vespertilionidae	<i>Eptesicus furinalis</i>	Argentine brown bat	LC OR LR/LC	ND	ND			c
Mammalia	Chiroptera	Vespertilionidae	<i>Histiotus alienus</i>	Strange Big-eared Brown Bat	DD	X	ND	X		
Mammalia	Chiroptera	Vespertilionidae	<i>Histiotus montanus</i>	Small big-eared brown bat	LC OR LR/LC	ND	ND		X	c
Mammalia	Chiroptera	Vespertilionidae	<i>Lasiurus blossevillii</i>	Southern red bat	LC OR LR/LC	ND	ND	X		c
Mammalia	Chiroptera	Vespertilionidae	<i>Lasiurus cinereus</i>	Hoary bat	LC OR LR/LC	ND	ND	X	X	c
Mammalia	Chiroptera	Vespertilionidae	<i>Lasiurus ega</i>	Southern yellow bat	LC OR LR/LC	ND	ND	X		c
Mammalia	Chiroptera	Vespertilionidae	<i>Myotis albescens</i>	Silver-tiped myotis	LC OR LR/LC	ND	ND		X	c
Mammalia	Chiroptera	Vespertilionidae	<i>Myotis levis</i>	Yellowish myotis	LC OR LR/LC	ND	ND	X	X	c
Mammalia	Cingulata	Chlamyphoridae	<i>Chaetophractus vellerosus</i>	Screaming hairy armadillo	LC OR LR/LC	-	ND	X		c

Class	Order	Family	Species	Common Name	IUCN Red List Category	Restricted Range	Movement Patterns	IBAT	EIA	Specialized Literature
Mammalia	Cingulata	Chlamyphoridae	<i>Chaetophractus villosus</i>	Large hairy armadillo	LC OR LR/LC	-	ND	X	X	c
Mammalia	Cingulata	Chlamyphoridae	<i>Chlamyphorus truncatus</i>	Pink fairy armadillo	DD	-	ND	X		c
Mammalia	Cingulata	Chlamyphoridae	<i>Zaedyus pichiy</i>	Pichi	NT OR LR/NT	-	ND	X	X	c
Mammalia	Cingulata	Dasyopodidae	<i>Dasyopus hybridus</i>	Southern long-nosed armadillo	NT OR LR/NT	-	ND	X		c
Mammalia	Didelphimorphia	Didelphidae	<i>Didelphis albiventris</i>	White-eared opossum	LC OR LR/LC	ND	ND	X	X	c
Mammalia	Didelphimorphia	Didelphidae	<i>Lutreolina crassicaudata</i>	Little water opossum	LC OR LR/LC	ND	ND	X		c
Mammalia	Didelphimorphia	Didelphidae	<i>Monodelphis dimidiata</i>	Southern short-tailed opossum	LC OR LR/LC	ND	ND	X		c
Mammalia	Didelphimorphia	Didelphidae	<i>Thylamys fenestrae</i>	Fat-tailed mouse opossum	NT OR LR/NT	ND	ND	X		
Mammalia	Didelphimorphia	Didelphidae	<i>Thylamys pallidior</i>	Pallid fat-tailed opossum	LC OR LR/LC	ND	ND	X		c
Mammalia	Didelphimorphia	Didelphidae	<i>Thylamys pusillus</i>	Small fat-tailed Opossum	LC OR LR/LC	ND	ND		X	
Mammalia	Lagomorpha	Leporidae	<i>Lepus capensis</i>	Cape hare	LC OR LR/LC	ND	ND		X	
Mammalia	Lagomorpha	Leporidae	<i>Lepus europaeus</i>	European hare	LC OR LR/LC	ND	ND	X		
Mammalia	Rodentia	Caviidae	<i>Cavia aperea</i>	Brazilian guinea pig	LC OR LR/LC	ND	ND	X		c
Mammalia	Rodentia	Caviidae	<i>Dolichotis patagonum</i>	Patagonian mara	NT OR LR/NT	ND	ND	X		

Class	Order	Family	Species	Common Name	IUCN Red List Category	Restricted Range	Movement Patterns	IBAT	EIA	Specialized Literature
Mammalia	Rodentia	Caviidae	<i>Galea leucoblephara</i>	Lowland yellow-toothed cavy	LC OR LR/LC	ND	ND	X		
Mammalia	Rodentia	Caviidae	<i>Galea musteloides</i>	Common yellow-toothed cavy	DD	ND	ND		X	c
Mammalia	Rodentia	Caviidae	<i>Hydrochoerus hydrochaeris</i>	Capybara	LC OR LR/LC	ND	ND			c
Mammalia	Rodentia	Caviidae	<i>Microcavia australis</i>	Southern mountain cavy	LC OR LR/LC	ND	ND	X		c
Mammalia	Rodentia	Chinchillidae	<i>Lagostomus maximus</i>	Plains viscacha	LC OR LR/LC	-	ND	X	X	c
Mammalia	Rodentia	Cricetidae	<i>Akodon azarae</i>	Azara's grass mouse	LC OR LR/LC	-	ND	X		
Mammalia	Rodentia	Cricetidae	<i>Akodon dolores</i>	Cordoba akodont	LC OR LR/LC	-	ND	X		
Mammalia	Rodentia	Cricetidae	<i>Akodon iniscatus</i>	Intelligent grass mouse	LC OR LR/LC	-	ND			c
Mammalia	Rodentia	Cricetidae	<i>Akodon molinae</i>	Molina's grass mouse	LC OR LR/LC	-	ND	X		c
Mammalia	Rodentia	Cricetidae	<i>Calomys laucha</i>	Small vesper mouse	LC OR LR/LC	-	ND	X	X	c
Mammalia	Rodentia	Cricetidae	<i>Calomys musculus</i>	Drylands vesper mouse	LC OR LR/LC	-	ND	X	X	c
Mammalia	Rodentia	Cricetidae	<i>Eligmodontia typus</i>	Lowland gerbil mouse	LC OR LR/LC	-	ND	X		c
Mammalia	Rodentia	Cricetidae	<i>Graomys griseoflavus</i>	Gray leaf-eared mouse	LC OR LR/LC	-	ND	X	X	c
Mammalia	Rodentia	Cricetidae	<i>Holochilus brasiliensis</i>	Web-footed Marsh Rat	LC OR LR/LC	-	ND	X	X	c

Class	Order	Family	Species	Common Name	IUCN Red List Category	Restricted Range	Movement Patterns	IBAT	EIA	Specialized Literature
Mammalia	Rodentia	Cricetidae	<i>Necomys benefactus</i>	Argentine Bolo Mouse	LC OR LR/LC	-	ND	X		c
Mammalia	Rodentia	Cricetidae	<i>Necomys obscurus</i>	Dark bolo mouse	NT OR LR/NT	ND	ND			c
Mammalia	Rodentia	Cricetidae	<i>Oligoryzomys flavescens</i>	Yellow pygmy rice rat	LC OR LR/LC	-	ND	X		c
Mammalia	Rodentia	Cricetidae	<i>Oligoryzomys nigripes</i>	Black-footed pygmy rice rat	LC OR LR/LC	-	ND			c
Mammalia	Rodentia	Cricetidae	<i>Oxymycterus rufus</i>	Red Hociendo	LC OR LR/LC	-	ND	X		c
Mammalia	Rodentia	Cricetidae	<i>Phyllotis bonariensis</i>	Buenos aires leaf-eared mouse	NT OR LR/NT	X	ND	X		
Mammalia	Rodentia	Cricetidae	<i>Phyllotis xanthopygus</i>	Yellow-rumped Leaf-eared mouse	LC OR LR/LC	-	ND			c
Mammalia	Rodentia	Cricetidae	<i>Reithrodon auritus</i>	Hairy-soled Conyrat	LC OR LR/LC	-	ND	X	X	c
Mammalia	Rodentia	Ctenomyidae	<i>Ctenomys porteousi</i>	Porteous's tuco-tuco	NT OR LR/NT	ND	ND	X		c
Mammalia	Rodentia	Ctenomyidae	<i>Ctenomys talarum</i>	Talas Tuco-Tuco	LC OR LR/LC	-	ND	X		c
Mammalia	Rodentia	Myocastoridae	<i>Myocastor coypus</i>	Coypu	LC OR LR/LC	-	ND	X	X	c
Reptilia	Squamata	Amphisbaenidae	<i>Amphisbaena alba</i>	Red Worm Lizard	LC OR LR/LC	ND	ND	X	X	b
Reptilia	Squamata	Amphisbaenidae	<i>Amphisbaena heterozonata</i>		LC OR LR/LC	ND	ND	X	X	b
Reptilia	Squamata	Dipsadidae	<i>Erythrolamprus jaegeri</i>	Jaeger's Ground Snake	LC OR LR/LC	ND	ND	X		

Class	Order	Family	Species	Common Name	IUCN Red List Category	Restricted Range	Movement Patterns	IBAT	EIA	Specialized Literature
Reptilia	Squamata	Dipsadidae	<i>Erythrolamprus poecilogyrus</i>	Yellow-bellied Liophis	ND	ND	ND		X	b
Reptilia	Squamata	Dipsadidae	<i>Erythrolamprus sagittifer</i>		LC OR LR/LC	ND	ND		X	
Reptilia	Squamata	Dipsadidae	<i>Lygophis elegantissimus</i>		LC OR LR/LC	ND	ND	X	X	b
Reptilia	Squamata	Dipsadidae	<i>Oxyrhopus rhombifer</i>	Amazon False Coral Snake	ND	ND	ND		X	b
Reptilia	Squamata	Dipsadidae	<i>Phalotris bilineatus</i>	Spegazzini's Diadem Snake	ND	ND	ND		X	
Reptilia	Squamata	Dipsadidae	<i>Philodryas aestiva</i>	Brazilian green racer	ND	ND	ND		X	
Reptilia	Squamata	Dipsadidae	<i>Philodryas varia</i>	Jan's Green Racer	LC OR LR/LC	ND	ND		X	b
Reptilia	Squamata	Dipsadidae	<i>Pseudotomodon trigonatus</i>	False tomodon snake	LC OR LR/LC	ND	ND	X		
Reptilia	Squamata	Dipsadidae	<i>Xenodon dorbignyi</i>	South American Hognose Snake	ND	ND	ND		X	b
Reptilia	Squamata	Dipsadidae	<i>Xenodon semicinctus</i>	Ringed hognose snake	LC OR LR/LC	ND	ND	X		b
Reptilia	Squamata	Gymnophthalmidae	<i>Cercosaura steyeri</i>		DD	ND	ND		X	
Reptilia	Squamata	Leiosauridae	<i>Pristidactylus casuatiensis</i>	Casuhatién anole	CR	X	ND	X	X	
Reptilia	Squamata	Leptotyphlopidae	<i>Epictia australis</i>	Freiberg's blind snake	LC OR LR/LC	ND	ND	X	X	
Reptilia	Squamata	Leptotyphlopidae	<i>Epictia munoai</i>	Rio Grande Do Sul Blind Snake	ND	ND	ND		X	b
Reptilia	Squamata	Leptotyphlopidae	<i>Rena unguirostris</i>	Southern blind snake	LC OR LR/LC	ND	ND		X	

Class	Order	Family	Species	Common Name	IUCN Red List Category	Restricted Range	Movement Patterns	IBAT	EIA	Specialized Literature
Reptilia	Squamata	Liolaemidae	<i>Liolaemus darwini</i>	Darwin's tree iguana	LC OR LR/LC	ND	ND	X	X	b
Reptilia	Squamata	Liolaemidae	<i>Liolaemus gracilis</i>	Graceful tree iguana	LC OR LR/LC	ND	ND	X		b
Reptilia	Squamata	Liolaemidae	<i>Liolaemus wiegmannii</i>		LC OR LR/LC	-	ND	X	X	b
Reptilia	Squamata	Phyllodactylidae	<i>Homonota williamsii</i>		LC OR LR/LC	ND	ND	X		
Reptilia	Squamata	Teiidae	<i>Cnemidophorus longicaudus</i>	Longtail whiptail	LC OR LR/LC	ND	ND			b
Reptilia	Squamata	Teiidae	<i>Salvator merianae</i>	Black-and-white tegu	LC OR LR/LC	ND	ND	X		b
Reptilia	Squamata	Teiidae	<i>Teius ocellatus</i>	Ocellated Whiptail Lizard	ND	ND	ND		X	
Reptilia	Squamata	Tropiduridae	<i>Stenocercus pectinatus</i>		LC OR LR/LC	ND	ND	X		b
Reptilia	Squamata	Viperidae	<i>Bothrops alternatus</i>	Urutu Lancehead	ND	ND	ND		X	b
Reptilia	Squamata	Viperidae	<i>Bothrops ammodytoides</i>	Patagonia Lancehead	ND	ND	ND		X	b

The level of risk according to the IUCN Redlist (2019): LC = Least Concern, VU = Vulnerable, NT = Near Threatened, EN = Endangered, CR = Critically endangered, and DD= Data Deficient. Specialized Literature: a= Darrieu, C. A., & Camperi, A. R. (2001). Nueva lista de las aves de la provincia de Buenos Aires., b= Kacolis, F., Horlent, N., & Williams, J. (2006). Herpetofauna, Coastal Dunes, Buenos Aires Province, Argentina. Check List, 2, 15., c= Barquez, R. M., Díaz, M., & Ojeda, R. A. (2006). Mamíferos de Argentina: sistemática y distribución (No. 599 (82) MAM).. ND= No Data

## APPENDIX E: ROUTE SURVEY

## TRES PICOS WIND FARM ROUTE SURVEY



### TECHNICAL AND COMMERCIAL PROPOSAL

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All business is undertaken subject to the company's conditions of contract. Copies of these will be supplied on application.

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Client: **Nordex**  
Project: **Tres Picos Wind Farm**

N/Ref: **ALE-08-AA200805-COMM-RTE-001**

Date: **18 Jul. 18**

Rev: **0**

## 1. INTRODUCTION

This report describes the main obstacles identified in the route survey from Bahía Blanca port to Tres Picos Wind Farm.

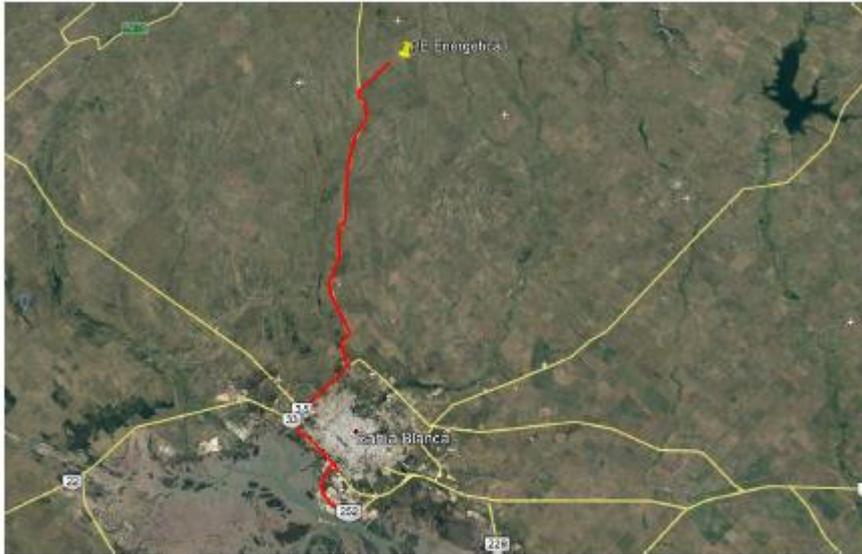


Client: **Nordex**  
Project: **Tres Picos Wind Farm**

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Rev: **0**

## 2. ROUTES PERFORMED

The route performed from Bahía Blanca Port to Tres Picos Wind Farm comes from previous experience in heavy transport.



STRETCH	DISTANCE (KM)	ACUM. (KM)
18 de Julio Street from Ing. White Port to NR 3	8.62	8.62
National Route 3 from 18 de Julio Street to NR 33	6	14.62
National Route 33 from NR 3 to Los Chumiches Street	7.69	22.31
National Route 33 from Los Chumiches Street to Tres Picos Wind Farm	29.8	52.11



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### 3. EXECUTIVE SUMMARY

This report describes the main obstacles identified in the route survey for Tres Picos Wind Farm in Argentina, at the north of Bahía Blanca, in Buenos Aires province.

The suggested transport route from Bahía Blanca has a total length of around 52 km and is the most direct transport route to site.

Transport of the proposed cargo should be feasible under the proposed routes. Nevertheless, the final approval of the route is subject to the local Road Authorities (Dirección de Vialidad Nacional, public website: <http://www.vialidad.gov.ar/>). Argentinean transport legislation allows a total gross load of 1,8 tons per tire and maximum 14,4 tons per axle for bridge crossing, which is respected under the presented transport configurations.

There is one viaduct over the road in the junction between 18 de Julio Street and National Route 3 with a height of 4.95 meters. If the transport height exceeds this height, the viaduct must be bypassed following the note described in Stretch 18 de Julio Street from Ing White Port to NR 3; if the transport doesn't exceed a total 4.95 meters' height, the transport can go under the viaduct and take the curve to National Route 3. This road will require some street light pole removals.

Under the current state of the road, all obstacles are by-passable with minor improvements. Some curves would only require minor signs removal, such as the round points on National Route 33.

The supposed access roads to Tres Picos Wind Farm named in Stretch National Route 33 between Los Churinches street and Tres Picos Wind Farm were inspected and will require varying degrees of earthworks to be performed.



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#### 4. ARGENTINE TRANSPORT LEGISLATION

The Argentine transport law (decree number 79/98, date 22<sup>nd</sup> January 1998, section 2.3) states that the "trailers with more than 4 tires per axle, are allowed to have a total gross load of 1.8 tons per tire".

(Law available in Spanish under in the link below of the Chamber of Private Transport Companies)

Even though this restriction has no engineering background, it is what's requested as minimum by authorities when asking for road permits. This is the reason why road transports in Argentina are always executed with a large amount of axle lines. In order to provide an idea, the chart below shows the axle lines needed to transport components of different weights:

Weight of component	Axle lines needed (single or total side-by-side)	Trailer's weight	Gross weight	Weight per wheel (t)
100	10	37	137	1,71
200	20	74	274	1,71
250	24	88,8	338,80	1,76
300	32	118,4	418,4	1,63
350	36	133,20	483	1,67

The same law applies to lighter transports (as Lowboys, etc.)

Besides such initial restriction, if a transport crosses a bridge or any kind of civil structure, authorities could ask for a lower weight axle (minimum required: 14,4tons) or also a girder frame trailer, depending on the result of the engineering study executed by them.

Therefore, the company that will execute the transport should propose a transport configuration to the authorities. Later, the final transport configuration will depend on the recommendation made by them, after carrying out engineering studies of the infrastructure to be crossed



Client: **Nordex**  
Project: **Trec Plooc Wind Farm**

N/Ref: **ALE-08-AA200806-COMM-RTE-001**

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## 5. BAHÍA BLANCA PORT

Ing. White port in Bahía Blanca is located 646 km at the south of Buenos Aires Province. Many private operators wharfs exist there, but of importance for heavylift offloading are the multipurpose wharf currently operated by Patagonia Norte S.A. and the public wharf of Puerto Galván. Both are shown in the following satellite image:



Figure 1: Plan view of Bahía Blanca port (Ing. White). Marked are Patagonia Norte terminal and Puerto Galván terminal.

### TARIFFS BAHÍA BLANCA

Due to past working relationships, ALE proposes to arrive to the multipurpose wharf of Patagonia Norte. Its tariffs can be checked at the following link:

<http://www.patagonia-norte.com.ar/index.php/tarifas>

### CONTACT FOR TERMINAL 21, PATAGONIA NORTE

German Larralde (Commercial Manager): [glarralde@patagonia-norte.com.ar](mailto:glarralde@patagonia-norte.com.ar)

In case of arriving at terminal 5 (Puerto Galván), tariffs can be checked at the following link:

[http://puertobahiablanca.com/normativas/Cuadros\\_Tarifarios\\_actualiz\\_1\\_diciembre\\_2016.pdf](http://puertobahiablanca.com/normativas/Cuadros_Tarifarios_actualiz_1_diciembre_2016.pdf)

### CONTACT FOR PUERTO GALVÁN PORT (CONSORCIO DE GESTIÓN DEL PUERTO DE BAHÍA BLANCA)

Edgardo Spagnolo (Chief Operations Manager): [espagnolo@puertobahiablanca.com](mailto:espagnolo@puertobahiablanca.com)



Client: Nordex  
Project: Tres Picos Wind Farm

N/Ref: ALE-08-AA200805-COMM-RTE-001  
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**5.1. MAIN CHARACTERISTICS (PATAGONIA NORTE)**

The quay is formed by a big rectangular operation platform, which longer side, corresponding to the mooring station, is 270m length, while dimensions of the smaller side is 40m. Such platform of 10.800 m<sup>2</sup> is complemented by a mooring located 50m to the east of the platform, this concludes in a total mooring length between external moorings of 320m. Depth at quay level is of 15,24m (50') in relation to local zero.

Its structural design makes it suitable to support a uniformly distributed load of 5 t/m<sup>2</sup>, also taking into account the storage of containers at heights, till a maximum of 37,5 t per support at each corner, independent from resisting the transit of several equipment for horizontal mobilization of the loads, specially containerized. It also allows the future installation of gantry cranes on rails for moving containers, with a track of 30,50, raising capacity of 53t and 35m of sea side range, as well as the operation of mobile cranes over wheels up to 104 t of raising capacity.

Besides, mooring station has capacity bollards of 100t and 175t.

Additionally, the quay also has some complementary installations such us the supply of drinking water to ships, fire protection, lightening through three towers of 25m high with an average illuminance of more than 85 Lux, three points distributed along the mooring station each one having a man overboard alarm and intermittent fire siren and fire protection elements.

Night beaconing as a help element to navigation is composed of a red beacon, with solar panel, a range of 3 MN, 1 flashes every 2 seconds, located in the mooring dolphin.

Quay has the necessary infrastructure to allow portainer ships and general load ships to operate in an optimal way. Now and till the volume of containers increases significantly, operations land-ship are executed by means of Gotwald 4<sup>th</sup> generation mobile crane over wheels.

**5.1.1.OVERVIEW OF TERMINAL PATAGONIA NORTE**



Client: **Nordex**  
 Project: **Tres Picos Wind Farm**

N/Ref: **ALE-08-AA200806-COMM-RTE-001**  
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### 5.2. PUERTO GALVÁN (TERMINAL 5) DESCRIPTION

Terminal 5, called Puerto Galván, is located on the west margin of the Bahía Blanca Port. It is a public site where different operators can work.



Ilustración 1: Plant view of Puerto Galván. In red are shown storage areas and dock area.

The following table summarizes the main characteristics of the port:

Site	Length (m)	Draft	Type	Capacity (m <sup>3</sup> )	Equipment	Capacity
5	252	25'	Cubierto	2700	2 Guinches + 2 Grúas	35T x 16m
6	120	27'	Abierto	3600		20T
7	68	20'	Abierto	13000		5T

The primary area for storage is actually quite reduced, due to the storage of railway beams at the time of assessment.



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The exit from this terminal is complicated mainly due to a curve under a pipe rack, but depending on final transport configurations might be feasible. Subject to a curve swept path analysis.



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## 6. TECHNICAL EVALUATION OF ROUTE – BAHÍA BLANCA PORT TO TRES PICOS

### 6.1. STRETCH 18 DE JULIO STREET FROM ING WHITE PORT TO NR 3



**STRETCH OBSTACLE SUMMARY**

STRETCH OBSTACLE SUMMARY			
Bridges	1		
Culverts	4		
Round Point	3		
Railroads	3		
Cables	LV	MV	HV
	4	1	2
Traffic Signs	2		

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Project: Tres Picos Wind Farm

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Pipe Rack	1
Junction	1

Km.	Description	Photos	Comments
			Wide entrance
0,30	FFCC		Security toll

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 Project: Tres Picos Wind Farm

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0,35	CULVERT		WIDTH: 2.4m
0,40	ROUND POINT		Pictures going along transport direction. WIDTH: 10.9m

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 Project: Tres Plooc Wind Farm

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<p>0,40</p>	<p>ROUND POINT</p>		<p>Pictures taken looking against traffic. Maybe could avoid removing traffic signs.</p>
<p>0,70</p>	<p>CABLES</p>		<p>HV HEIGHT: 9.35m</p>
<p>0,70</p>	<p>CULVERT</p>		<p>N°SPANS: 1 N°BEAMS: Slab WIDTH: 3.2m</p>

Client: Nordex  
Project: Trec Plooc Wind Farm

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1,90	FFCC		
2,10	FFCC		
2,90	CABLES		LV HEIGHT: 8.8m
3,10	CABLES		LV
3,20	TRAFFIC SIGN		GANTRY TYPE

Client: Nordex  
Project: Trec Plooc Wind Farm

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<p>3,30</p>	<p>PIPE RACK</p>		<p>HEIGHT: 7.26m</p>
<p>3,40</p>	<p>CABLES</p>		<p>HEIGHT: 8.64m</p>
<p>3,60</p>	<p>TRAFFIC SIGN</p>		<p>GANTRY TYPE</p>
<p>4,80</p>	<p>CULVERT</p>		

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Project: Tres Picos Wind Farm

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5,00	CABLES		MV HEIGHT: 7.56m
5,50	CABLES		LV HEIGHT: 7.29m
6,70	BRIDGE		<p>There are two bridges over 18 de Julio Avenue  TOTAL L: 92.6  N° SPANS: 4  N° BEAMS: 7  LENGTH OF EACH SPAN: 27m  WIDTH: GOING OVER THE BRIDGE: 10.8m  HEIGHT: 4.95m  THE COMPONENTS WITH HEIGHT LESS THAN 4,95 m CAN GO UNDER THE BRIDGE</p>



Client: Nordex

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6,80	JUNCTION		Asphalt width: 11m between flex beams. WIDTH: 6m SEE SWEEP PATH
6,90	CULVERT		WIDTH: 1.5m

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 Project: **Tres Picos Wind Farm**

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**Note:**  
Depending on the dimensions of the components to be transported, there are two possibilities to go through the bridge over 18 de Julio street.  
In the following analysis, we describe the alternative marked in white.

To define the obstacles to be removed, both alternatives need a swept path analysis, but for sure in both cases is necessary the removal of street lights.



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	<p>JUNCTION</p>		<p>Is necessary the removal of at least one street light, subject to a swept path analysis.</p>
	<p>ROUND POINT</p>		<p>Is necessary the removal of at least 2 street lights.</p>



Client: **Nordex**  
 Project: **Tres Picos Wind Farm**

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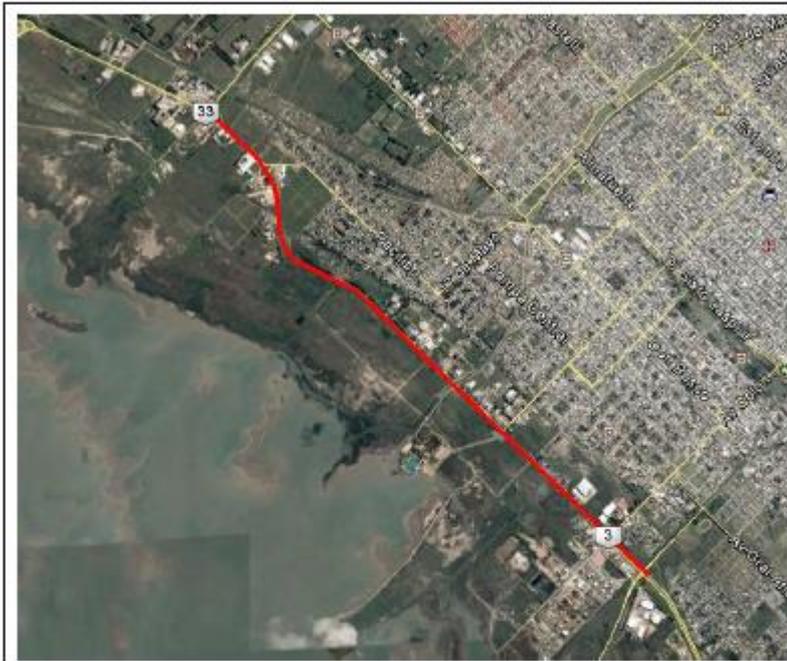
	<p>BRDGE</p>		<p>WIDTH: GOING OVER THE BRIDGE: 10.8m HEIGHT: 4.95m THE COMPONENTS WITH HEIGHT LESS THAN 4,95 m CAN GO UNDER THE BRIDGE</p>
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Client: Nordex  
Project: Tres Picos Wind Farm

N/Ref: ALE-06-AA200805-COMM-RTE-001  
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6.2. STRETCH NATIONAL ROUTE 3 BETWEEN 18 DE JULIO STREET AND NR 33



STRETCH OBSTACLE SUMMARY			
Culverts	4		
Round Point	1		
Curves	1		
Railroads	2		
Cables	LV	MV	HV
	4	1	0
Traffic Signs	1		



Client: Nordex  
 Project: Tres Picos Wind Farm

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Km.	Description	Photos	Comments
0,50	ROUND POINT		Plenty of outer space
0,50	CABLES		LV HEIGHT: 8.2m
1,10	CULVERT		WIDTH: 1.2m
1,60	CULVERT		WIDTH: 1.5m
2,60	CABLES		LV Very high. Without obstacle
4,10	CULVERT		WIDTH: 1.5m
4,30	CULVERT		WIDTH: 1.2m
4,80	CABLES		LV Very high. Without obstacle
5,00	FFCC		



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Project: Tres Picos Wind Farm

NiRef: ALE-08-AA200806-COMM-RTE-001

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5,30	TRAFFIC SIGN		GANTRY TYPE HEIGHT: 7.8m
5,70	CABLES		MV Very high. Without obstacles
5,90	CABLES		LV HEIGHT: 6.5m Very high. Without obstacles



Client: Nordex  
Project: Tres Picos Wind Farm

NiRef: ALE-08-AA200806-COMM-RTE-001

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Rev: 0

6.3. NATIONAL ROUTE 33 BETWEEN NR 3 AND NR 35



STRETCH OBSTACLE SUMMARY			
Roll Roads	1		
Cables	LV	MV	HV
	4	0	0
Traffic signs	3		
Round Point	1		



Client: Nordex  
 Project: Tres Picos Wind Farm

NiRef: ALE-06-AA200805-COMM-RTE-001  
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Km.	Description	Photos	Comments
0	TRAFFIC SIGN		Gantry type, plate at 7.36, bolted pipe at 8.4m HEIGHT: 7.36m
0,1	CABLES		Multiple LV HEIGHT: 7.9m
0,2	CABLES		TYPE: TV Cable HEIGHT: 6.1m
0,3	CABLES		TYPE: TV Cable HEIGHT: 6.4m
0,5	FFCC		
0,7	TRAFFIC SIGN		2 FFCC plates, Flag type

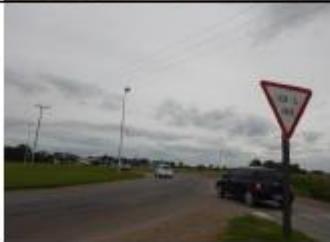


Client: Nordex  
Project: Tres Picos Wind Farm

NiRef: ALE-08-AA200806-COMM-RTE-001

Date: 18 Jul. 18

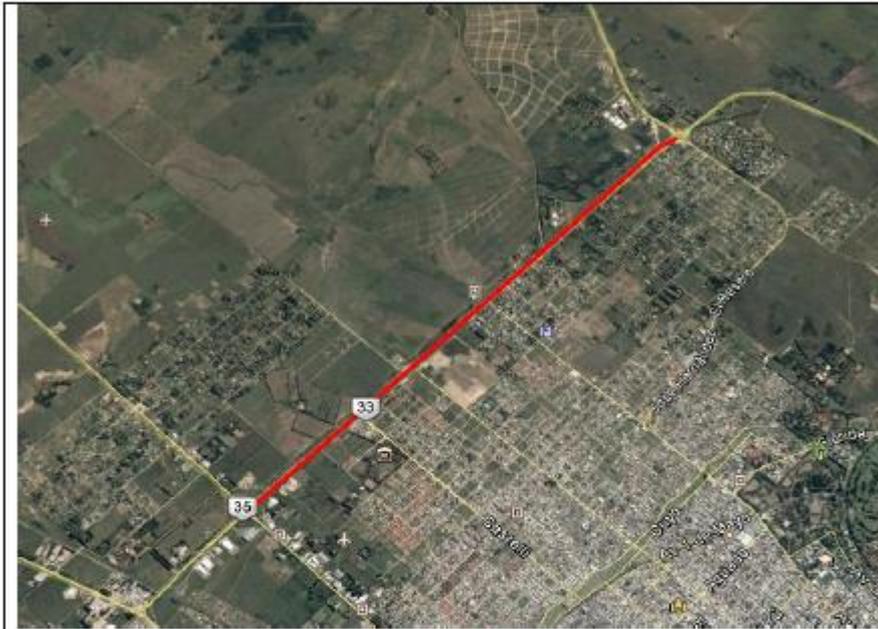
Rev: 0

1,4	TRAFFIC SIGN		<p>Gantry type, plate at 7.9, bolted pipe at 8.3m HEIGHT: 7.9m</p>
2,6	ROUND POINT		
3,9	CABLES		<p>TYPE: LV HEIGHT: 9m</p>
5,2	END OF STRETCH		

Client: Nordex  
Project: Tres Ploos Wind Farm

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Date: 19 Jul. 18  
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6.4. STRETCH NATIONAL ROUTE 33 BETWEEN NR35 AND LOS CHURRICHENS STREET



STRETCH OBSTACLE SUMMARY

Culvert	4		
Cables	LV	MV	HV
	7	2	1
Traffic signs	5		
Round Point	1		
Road Status	1		
Boulevard	1		



Client: Nordex  
Project: Tres Picos Wind Farm

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Km.	Description	Photos	Comments
0,10	CULVERT		N° SPANS: 1 LENGTH: 1.2m
0,40	CABLES		Type: HV HEIGHT: 7.9m
0,50	TRAFFIC SIGN		Gantry type, bolted pipe HEIGHT: 7.5m
0,50	ROAD STATUS		Single Lane WIDTH: 7.6m

Client: Nordex  
 Project: Tres Plooc Wind Farm

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2,00	TRAFFIC SIGN		Flag type
2,10	CULVERT		
2,20	TRAFFIC SIGN		Flag type, the height corresponds to the lower part HEIGHT: 5.7m
2,90	TRAFFIC SIGN		Flag type HEIGHT: 7m
3,00	CABLES		TYPE: MV
3,40	CABLES		HEIGHT: 7.4m

Client: Nordex

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Project: Tres Ploos Wind Farm

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4,00	CABLES		TYPE: Telephone HEIGHT: 7m
4,30	CABLES		TYPE: TV Cable HEIGHT: 7.7m
4,30	CABLES		TYPE: MV HEIGHT: 8m
4,60	CABLES		Milestone KM 7 RN33 TYPE: Telephone
5,10	CULVERT		
5,30	CULVERT		N° SPANS: 1 LENGTH: 2.2m
5,30	TRAFFIC SIGN		HEIGHT: 7.3m
5,5	CABLES		TYPE: LV



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			HEIGHT: 7.5m
5,5	CABLES		TYPE: LV HEIGHT: 9.4m
5,6	BOULEVARD		WIDTH: 5.1m
5,70	ROUND POINT		WIDTH: 6,90m

Client: Nordex  
Project: Tres Ploos Wind Farm

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Client: **Nordex**  
Project: **Tres Picos Wind Farm**

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**6.5. STRETCH NATIONAL ROUTE 33 BETWEEN LOS CHURRINCHES STREET AND TRES PICOS WIND FARM**



STRETCH OBSTACLE SUMMARY			
Culvert	19		
Cables	LV	MV	HV
	11	4	2
Curve	3		
Road Status	1		
Slope	7		
Gradient	1		
Parking area	2		



Client: **Nordex**  
 Project: **Tres Picos Wind Farm**

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Km.	Description	Photos	Comments
0,2	CABLES		TYPE: LV HEIGHT: 7.37m
0,3	CULVERT		Gas pipe N°SPANS: 1 LENGTH: 1.7m
0,6	CULVERT		N°SPANS: 1 LENGTH: 1.7m
0,7	CABLES		Asphalt OK, single lane TYPE: MV WIDTH: 7.3m HEIGHT: 10.4m



Client: Nordex  
Project: Tres Plooc Wind Farm

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0,7	ROAD STATUS		WIDTH: 10m
1,2	CABLES		TYPE: LV HEIGHT: 11.4m
1,2	CABLES		TYPE: MV
1,3	PARKING AREA		Potential resting area Milestone KM 10 RN33
1,8	CABLES		KM11 RN33 TYPE: HV HEIGHT: 29.5m
1,9	CULVERT		
3,6	CULVERT		Quite open curve with transversal gradient
4,1	CULVERT		LENGTH: 1.7m
4,2	PARKING AREA		



Client: **Nordex**  
Project: **Tres Plooc Wind Farm**

NiRef: **ALE-06-AA200805-COMM-RTE-001**

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4,3	CABLES		TYPE: LV
5,6	CULVERT		
5,7	CABLES		TYPE: HV HEIGHT: 20.5m
5,8	CULVERT		KM15 NR33 LENGTH: 1.7m
6,7	CABLES		No need to lift TYPE: LV
7,3	CURVE		Open curve
7,6	CABLES		No need to lift TYPE: LV
9,1	CABLES		No need to lift TYPE: LV
9,3	CULVERT		LENGTH: 1.7m
12,3	CULVERT		LENGTH: 1.5m
14	CABLES		TYPE: LV



Client: Nordex  
Project: Tres Pinos Wind Farm

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14,4	CURVE		La Viticola Open curve
14,5	CABLES		Road width 6.7 Milestone KM24 RN33 TYPE: LV WIDTH: 6.7m HEIGHT: 8.2m
	GRADIENT		6% WIDTH: 6.7m
14,9	CABLES		TYPE: MV
15	CURVE		
15,3	CULVERT		Milestone KM25 RN33
19,5	SLOPE		Downhill 2.5% longitudinal slope (approx)
19,7	CULVERT		
20	SLOPE		Uphill 1.5% slope uphill approx.
0	CABLES		TYPE: LV HEIGHT: 7.5m

Client: Nordex  
Project: Tres Ploos Wind Farm

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20,7	CULVERT		2 spans of 2.5m. N°SPANS: 2 LENGTH: 5m
21	SLOPE		3.3% slope uphill
21,3	CULVERT		
22,4	CABLES		TYPE: MV HEIGHT: 8.4m
22,6	CULVERT		
23,4	SLOPE		Downhill
23,6	CULVERT		
24,2	CULVERT		LENGTH: 1.7m
	SLOPE		Uphill
	SLOPE		Several hills
25,1	CULVERT		



Client: **Nordex**  
Project: **Tres Picos Wind Farm**

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25,8	CABLES		TYPE: LV HEIGHT: 9.78m
	SLOPE		
26,7	CULVERT		N°SPANS: 2 LENGTH: 5m
27,6	CULVERT		N°SPANS: 2 LENGTH: 4m
27,9	CABLES		TYPE: MV WIDTH: 8.6m



Client: **Nordex**  
 Project: **Trec Ploos Wind Farm**

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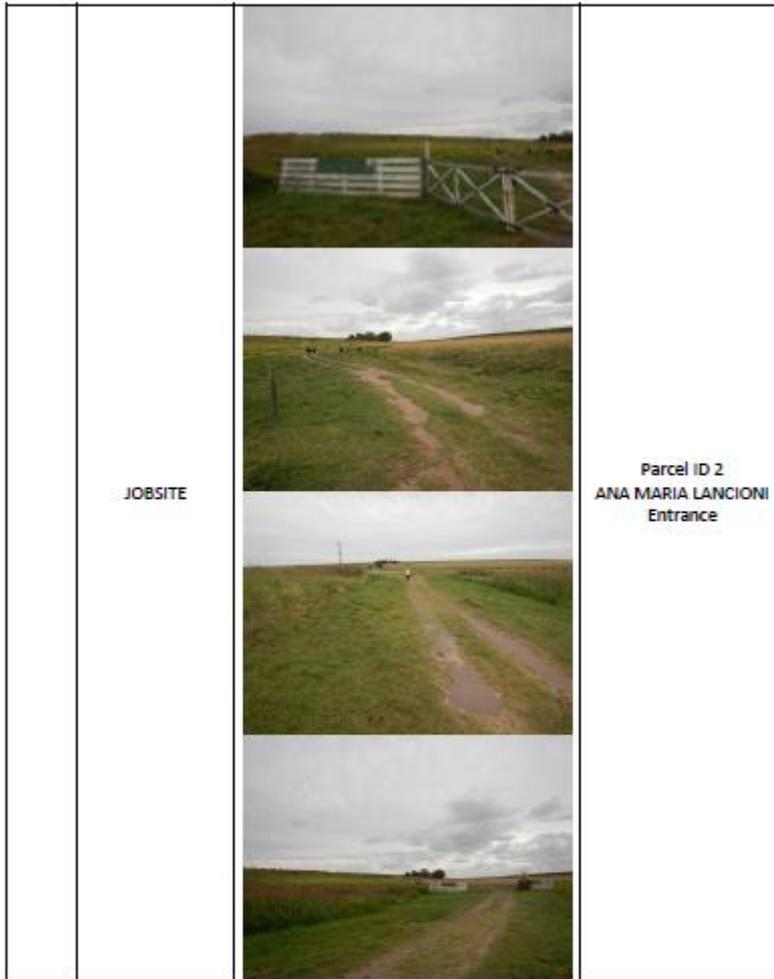
Rev: **0**

28	SLOPE		Milestone KM39 RN33
29,5	END OF STRETCH		<p>Road width 3.5m it can easily be widened up to 10m these pictures correspond PARCEL ID3 - MARIO MARTINI WIDTH: 3.5m</p>



Client: Nordex

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Client: Nordex  
Project: Trec Plooc Wind Farm

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	JOBSITE	  	Road to parcel ID 1 MARTIN MARTINI Slopes of approx. 2,5%



Client: Nordex  
Project: Tres Ploce Wind Farm

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Client: Nordex  
Project: Tres Picos Wind Farm

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Client: Nordex  
Project: Tres Picos Wind Farm

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## 7. FINAL SUMMARY

The following is the total summary of all obstacles found through the route. Notice the number of culverts should not represent a real obstacle but will be considered in a future detailed engineering survey.

Obstacle	Qty.
Bridges	1
Cables *	42
Curves	4
Traffic Signs	11
Culverts	31
Railroads	3
Road Status	2
Round Points	8
Boulevards	1
Pipe rack	1
Junction	1
Slopes	7
Parking Area	2
Gradient	1

*\*NOTE: Read comments on the different Stretch details.*



Client: **Nordex**  
 Project: **Tres Ploos Wind Farm**

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## **APPENDIX F      STAKEHOLDER ENGAGEMENT PLAN**



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