

Environmental and Labor Issues:

This is a category B project according to the IIC's Environmental and Social Sustainability Policy because it could produce certain effects that may be avoided or mitigated by following generally recognized performance standards, guidelines, or design criteria. The main environmental and labor issues related to the Project are efficient resource use and pollution prevention, workplace and labor conditions, community health and safety, and land acquisition.

Huaura Power Group S.A. is developing a run-of-the-river hydroelectric plant, C.H. Yarucaya, on the Huaura River. The project's water intake is located in the Cochamarca district, Oyón province, while the powerhouse is in the Sayán district, Huaura province. The penstock has a total length of 5,260 m and traverses the Leoncio Prado and Paccho districts in Huaura province. Both Oyón and Huaura provinces are located in Lima department. The 66 kV transmission line will be approximately 20 km in length, running to the Andahuasi substation, which is connected to Peru's national grid (Sistema Interconectado Nacional, SINAC).

The C.H. Yarucaya will have an installed capacity of 17.4 MW, with two Francis turbines, and is expected to generate some 130 GWh per year, with a design flow of 12 m³/s and a gross head of 184 m. A preliminary environmental assessment, prepared by Umbrella EcoConsulting S.A.C., was submitted to the Regional Bureau of Energy and Mines (Dirección Regional de Energía y Minas, DREM) of Lima's regional government in August 2013.

The project has secured the pertinent absence of archeological remains certificate (Certificado de Inexistencia de Restos Arqueológico, CIRA) from the Ministry of Culture. No surface archeological evidence has been found in the project area. Nevertheless, continual monitoring shall be undertaken during project implementation as a preventative measure to protect any archeological evidence that might be found.

Soil and water impacts: There are no protected areas or sensitive habitats in the vicinity of the project. According to the system for classifying land based on its greatest possible use, the land within the project's direct area of influence has moderate to steep gradients and is suitable for diversified seasonal crops of low agrological quality (low fertility) requiring continuous irrigation. The soil has little organic matter; fertilizers must be used annually to produce crops and steps taken to prevent the risk of erosion. At present, the land is largely fallow, with rocky outcrops and very superficial soil. There are approximately 250 hectares of cultivated land, roughly 20% of the total area. The project impact on land use is not significant, since both the water intake structures and the powerhouse take up little surface area. The penstock is underground, thereby allowing seasonal crop cultivation on the surface.

The headwaters of the Rawra mountain range are the source of the Huaura River, and there are numerous small lakes in its upper basin. The Checra, Pampahuay, and Quichas rivers are its tributaries. The Huaura River drains into the Pacific Ocean, 70 km downstream from the projected location of the plant's powerhouse. Concerning precipitation patterns, high flow season occurs from December to April and low flows from June to October, creating an average flow of 24.45 m³/s. Water quality is good, although coliforms of human origin have been detected and natural iron is also present. The use of water for irrigation is not significant. The project construction phase poses the highest risk of affecting water quality in the river due to the potential disturbance of sediments, which causes temporary turbidity and subsequent sedimentation.

Impact on local flora and fauna: The Project's area of direct influence is located in an area of periarid premontane tropical desert, with low precipitation (annual average of 60-125 mm), although clustered rainfall occasionally occurs during the El Niño Southern Oscillation (ENSO). In March

2013, a baseline environmental study was conducted using eight sampling sites for flora and fauna, complemented with interviews of residents and indirect observations.

In the study area, 51 species of vegetation were recorded, only one of which (*Acacia macracantha*) is found on Peru's protected species list and classified as "near threatened." There are three species of mammals, all of which are defined as "of least concern" according to the Red List of Threatened Species of the International Union for Conservation of Nature (IUCN). Twenty-eight bird species were also identified, two of which are classified as "near threatened" (*Vultur gryphus* and *Aratinga erythrogenys*), according to the IUCN's Red List of Threatened Species. Only one reptile species was identified, and it is not found on any list of threatened species. The impact on fauna due to the change in land use will be limited, given the project footprint. The temporary impact during construction work is expected to be greater; however, this will be reversible once the plant is up and running.

No fish species were found at the monitoring stations. The ecological flow was calculated according to the rules of the national water authority (Autoridad Nacional del Agua, ANA), a division of Peru's Ministry of Agriculture. These rules stipulate that the minimum ecological flow for rivers with average annual flows greater than 20 m³/s must be 10% of the average monthly flow during the high flow season and 12% of the average monthly flow during the low flow season. This would imply an average minimum flow of 1.19 m³/s in September; however, the project plans to maintain an average annual ecological flow of 2.45 m³/s to ensure proper functioning of the aquatic ecosystem. Further study of the ichthyofauna biological baseline was required by the IIC to verify that the established ecological flow would not cause a loss of biodiversity and would comply with the IIC's Environmental and Social Sustainability Policy.

Impact on air quality and noise: Most air emissions will occur during the construction phase, originating from vehicles and machinery operated by the contractors. In addition to gas emissions from internal combustion engines, the project will generate fugitive dust from vehicular traffic, excavations, and earthmoving operations. Noise will also be generated along with the atmospheric emissions. There will be no significant air emissions in the operational phase, and noise and vibration levels are expected to increase slightly in the areas in the vicinity of the powerhouse; this is not expected to affect external receivers, however. The project's direct area of influence is uninhabited.

In order to mitigate gas emissions and noise during the construction phase, preventative maintenance will be performed on vehicles and machinery to ensure that their emissions comply with regulations; noise mufflers will be installed; and the area will be watered down periodically. All individuals working in project construction must use hearing protectors.

Environmental and occupational safety: To prevent and mitigate potential impacts on the environment and on humans (both workers and the general population), an environmental management plan was designed for the project. This plan includes the following series of subprograms covering the construction, operations, and closure phases:

- Protecting the physical/chemical component
- Protecting the biological component
- Protecting the socioeconomic and security component
- Signage
- Environmental education
- Managing liquid effluents
- Managing solid waste

These subprograms will be complemented with environmental education and training, as well as written material and posters. The environmental management plan also provides for a monitoring and control program to evaluate the efficiency of the aforementioned subprograms that includes monitoring of water and air quality, noise, as well as the biology and sediment of the area. This monitoring includes measuring the ecological flow to ensure it complies with regulations.

All workers assigned to the field will undergo a pre- and post-employment medical examination. They will also receive medical coverage through Social Security (EsSalud). Under Peruvian law, employees are free to choose and join labor unions. During the construction phase, the company will have industrial safety supervisors on hand. All staff will have personal protective equipment.

There is a contingency plan to prevent and monitor risk during different phases of the project; this will include the creation of brigades. The plan covers internal risks, such as fires, explosions, spillages, and workplace accidents, and natural risks, such as earthquakes.

Solid and liquid waste management: During the construction phase, the peak period in terms of staff numbers, it is expected that 70 people will be working on the site. During the operational phase, 14 people are expected to be needed, spread across different work shifts. During construction, portable toilets will be leased from a service provider.

The solid waste consists of the domestic waste produced by construction personnel and industrial waste generated mainly during equipment assembly and maintenance tasks during the operational phase. The industrial waste can be further divided into hazardous and nonhazardous waste, each of which is handled by a specialized company pursuant to the relevant legislation. The environmental management plan includes a program for handling solid waste and effluents. Waste generated during construction will be disposed of in selected locations. A waste disposal company must dispose of spent oil and lubricants, cleaning and maintenance residue, and contaminated soil.

Social and community issues: The construction of the plant will not require the relocation of local inhabitants, housing, or economic activities. The plant's design, with its underground penstock, allows traditional agricultural activities to be carried out simultaneously in the project's impact area. Local residents generally have a positive opinion of the project. The area has agricultural plots that are privately owned or the property of campesino communities. To implement the project, some properties will need to be purchased and permanent easements obtained. In addition to enjoying the support of local authorities, the company has hired a team of consultants specializing in the acquisition of surface rights in order to ensure a process satisfactory to all parties involved.

When possible, local labor will be hired, which will increase the income of local residents during the construction phase. This, together with improvements in infrastructure, will improve the quality of life of the beneficiary population. The company's community relations plan aims to forge bonds of trust between the company and the community. This plan includes programs to address specific issues such as:

- Training on community relations for project employees
- Communication
- Hiring local labor

For the transmission line, the company must implement a citizen participation plan. As part of this plan, it must hold three participatory workshops, each of them in two locations (in the town of Quintay and the Sayán district capital), followed by a public hearing. In addition, comment and suggestion boxes should be installed and an information center will be open throughout the citizen

participation period.

Monitoring and reporting: C.H. Yarucaya shall prepare an Environmental and Social Action Plan (ESAP) to ensure its compliance with national standards and IIC environmental and occupational safety and health guidelines. The ESAP will include the recommendations found in the preliminary environmental assessment to prevent, mitigate, and offset impacts and risks. The company will also submit regular progress reports on the implementation of the ESAP.