Jilamito Hydropower Project
Complementary Studies

Traffic and Transportation Study

Project # 0363579

Panamá City, November 3, 2016

Content

List of Acronyms

Acronym	Meaning
ERM	Environmental Resources Management
ESIA	Environmental and Social Impact Assessment
IFC	International Finance Corporation
WHO	World Health Organization

1.0 Introduction

1.1 Purpose of this Report

Environmental Resources Management Panamá (ERM) was selected by INGELSA to develop an Environmental and Social Impact Assessment (ESIA), consistent with the standards and guidance of the International Finance Corporation (IFC) for the Jilamito Hydroelectric Project (the Project) in Honduras. This Traffic and Transportation Study (Traffic Study) evaluates the impacts of Project construction and operation on vehicular traffic and transportation systems.

1.2 Study Area

The Study Area includes the entire Project (dams, power house, access roads, etc.); the travel route from CA-13 and the work camp in Mezapita to the Project site; and the portion of CA-13 between the Lean Bridge and Tela (see Figure 1-1).

2.0 Traffic and Transportation Baseline

This section describes existing transportation conditions in the Study Area.

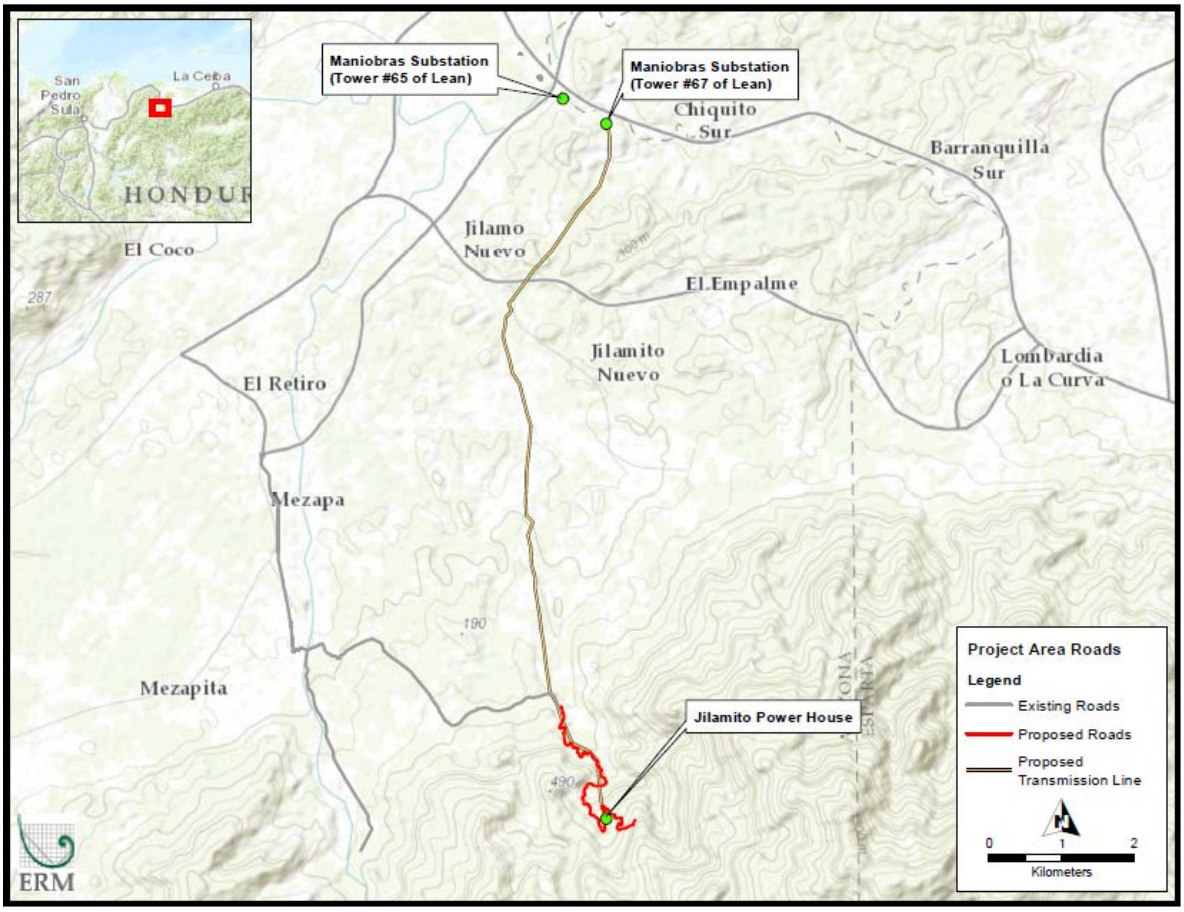
2.1 Transportation Infrastructure

The national road network in Honduras consists of approximately 14,044 km of roads, including approximatley 2,977 km of paved road and 11,067 km of unpaved roads (Fondo Vial 2016a). Maintenance of pavement and road quality is a substantial concern throughout the nation, due to limited available public funding and the need to address landslides, potholes, and other effects of the country's six-month rainy season. Much of the maintenance work on the nation's paved road network is conducted by a series of *microempresas* (microenterprises), funded through the *Fondo Vial* (national Road Fund) (World Bank 2015).

The primary road in the vicinity of the Project is Route CA-13, which stretches along the northern portion of Honduras, from the Guatemala border near San Pedro Sula to Puerto Castilla. Route CA-13 in the vicinity of the Project site (i.e., near the Rio Lean) is a two-lane paved highway, with a pavement width of approximately 7.5m. Annual traffic growth on CA-13 between San Pedro Sula and Tela is approximately 6.7 percent (COALIANZA 2016). Intercity bus service connects major population centers along CA-13 and other national highways (AMBITEC 2013).

Route CA-13 in the Atlántida department is part of the nationally-designated *Corredor Turístico* (tourism corridor). The *Corredor Turístico* consists of the construction, expansion and maintenance of more than 122 km of roads connecting major cities on the Atlantic Coast of Honduras, to reduce travel time and improve access to these cities and nearby ports. The program focuses on widening and dualization of Route CA-13 between El Progreso and Tela, but also envisions similar improvements between Tela and La Ceiba (COALIANZA 2016).

Figure 1-1: Study Area for Roads (Source: ERM, 2016).



The Honduras Secretariat of Infrastructure and Public Services (IESA 2016) conducted traffic counts on CA-13 in the Atlantida Department on May 26, 2015. Table 1 presents a summary of these counts. Figure 1-2 shows these locations.

Table 2-1. Traffic Counts, CA-13

	Count Location			
	CA-13 Aldea Cristobal (km 17)	**CA-13 Aldea las Metalias**	**Local Road (Vecinal) 311 (km 14.7)**	**CA-13 La Másica, Tela-La Ceiba**
Passenger Cars	1,049	1,039	2	1,388
Pickup Trucks	1,823	1,340	64	1,834
Buses	451	282	11	337
Trucks (2 axles)	875	584	17	734
Trucks (3 axles)	235	87	7	62
Trailer Trucks	590	311	0	424
Total Traffic	**5,023**	**4,579**	**101**	**4,779**

Source: INSEP 2015

Figure 2-1: Study Area for Roads (Source: ERM, 2016).

CA-13, Aldea Cristobal | CA-13, Aldea las Metalias

Vecinal 311 | CA-13, La Másica, Tela-La Ceiba

2.2 Travel Safety

Crash data for CA-13, between Tela and Arizona in Atlántida Department, are summarized in Table 2-2 (Policia Nacional 2016). Nationwide, the World Health Organization estimates that there were 1,408 traffic deaths in Honduras in 2013 (approximately 17.3 traffic deaths per 100,000 population). This death rate is generally comparable to other countries in the region: El Salvador (21.1), Guatemala (19.0), and Nicaragua (15.3) (WHO 2015). Nearly half of the traffic fatalities in Honduras were pedestrians.

Table 2-2. Crash Data, CA-13

	2014	2015	2016
Injury Crashes	11	12	12
Fatality Crashes	7	11	14

Source: Policia Nacional 2016.

3.0 Assessment of Impacts

This section describes the approach to evaluating the imapcts of the Project on transportation.

3.1 Methodology

As described in Section 2, there are no readily available to quantitatively characterize baseline traffic volumes and transportation safety conditions in the Study Area. In addition, available information does not include estimates or descriptions of Project-related vehicle trips. As a result, the assessment of traffic and transport impacts is qualitative only. This evaluation will be updated when additional baseline and Project-specific information are available.

3.1 Project Activities With the Potential to Create Impacts

From CA-13, access to the project site would be via the Lean – Nuevo Jilamo road (approximately 30 kilometers from city of Tela, near the Rio Lean). The Lean – Nuevo Jilamo Road is unpaved, and varies in width from 6 to 9m. From the western edge of the village of Nuevo Jilamo, access to the Project site be via a series of unpaved rural roads, stretching approximately 8.5 km to the Project boundary near the "*El Nance*" intersection. Within the Project boundary, there is no road between the power house ("*casa de máquinas")* and the penstock ("*tubería de presión"*) and dams at the upper end of the Project. Current access is via foot or pack animal.

All phases of Project construction would involve the use of public roads by Project-related trucks, buses, or other vehicles. Project construction activities with the potential to result in traffic and transportation safety impacts include (but are not limited to):

- Construction of non-public access roads;
- Construction of the 2 km long cable car ("*teleférico"*) from the power house to the penstock ("*tubería de presión"*);
- Excavation and haulage of excavated material;
- Haulage of rock, gravel, and other fill material (if excavated material cannot be reused);
- Delivery of aggregate and concrete for dam construction;
- Delivery of pipe for the penstock ("*tubería de presión"*), construction materials for the power house ("*casa de máquinas"*) and other permanent buildings and structures;
- Delivery of supplies to the construction camp and work sites;
- Daily bus movement of workers from the Mezapita construction camp to the Project site; and
- Construction of the 34.5Kv transmission line and substation.

The design vehicles for Project activities would be as follows:

- Single-unit trucks, with a maximum length of approximately 9m; and
- Buses, with a maximum length approximately 12m.

From the *El Nance* intersection, a new Project-specific access road would be constructed to the power house ("*casa de máquinas").* This road would be for Project use only; public use would be prohibited. An access road would also be constructed for the proposed substation near Lean.

Project construction would generate approximately 150 heavy truck trips per day (vehicles weighing 7 or more tons), as well as including 3 truck trips and 8 bus trips per day to transport employees between the project site and residences and construction camps in the area (IESA 2016).

Traffic associated with Project operations would be minimal, including permanent employees and periodic maintenance and monitoring activities.

3.2 Imbedded Controls

INGELSA and its construction contractors must adhere to the following travel and vehicular safety requirements:

- Mandatory adherence to all existing traffic regulations on Project access roads, including speed limits;
- Mandatory use of seat belts for drivers and all passengers;
- Periodic checks to ensure that vehicles and equipment are in proper working order, including:
    - Major vehicle systems such as brakes (capable of stopping the vehicle when fully loaded), steering, and headlights;
    - Safety devices such as directional signals, windshield wipers, , tire pressure alarm systems; mirrors, backup signals, etc.; and
    - Speed governors;
- Use of stop blocks for vehicles near excavation areas;
- Appropriate driver and maintenance training. All drivers must possess valid driver's licenses, and all vehicle maintenance staff must be qualified to provide maintenance services;
- Self-reporting of fatigue, illness, or other factors preventing the safe operation of vehicles; and
- Prohibition on transporting both passengers and hazardous materials simultaneously.

3.3 Discussion of Impacts

Project-related traffic would represent less than a 5 percent increase over existing traffic volumes on CA-13, and a 10 to 15 percent increase in heavy truck traffic on CA-13 (see Table 2-1). This traffic would be a substantial increase in traffic on local roads (i.e., Vecina 311). Such increases have the potential to affect traffic function and safety on rural roads where existing users (including drivers and pedestrians) may be less accustomed to heavy trucks. Local experience with traffic related to the Mezapa project may mitigate this lack of familiarity to some degree; however, the Project would still involve a relatively large number of heavy truck and bus trips through rural communities (including Jilamo Nuevo, Jilamo Viejo, Mezapa, Mezapita, El Retiro, and Lean).

As a result, Project construction could result in the following types of impacts.

- **Increased heavy truck traffic on Route CA-13.** Project-related traffic is unlikely to exceed the road's traffic capacity, but could result in increased road maintenance costs and an increase in the potential for crashes and injuries.
- **Damage to rural roads.** Heavy truck traffic would likely degrade the quality of unpaved rural public roads, including the Lean – Nuevo Jilamo road, as well as the rural roads between Nuevo Jilamo and the *El Nance* intersection. The addition of heavy trucks during the Project construction period would likely increase the number and severity of potholes, washouts, and erosion. Available documentation implies but does not specifically state whether the Project would include upgrades to existing public roads used for Project access.
- **Increased travel risk.** The presence of heavy truck traffic on rural public roads would increase the risk of crashes involving Project and non-Project traffic, as well as the risk of property damage and injury associated with those crashes.

Due to low traffic volumes, traffic and transportation impacts during Project operations are likely to be minimal.

4.0 Mitigation and Management

In addition to the imbedded controls described in Section 3.2, projects of this type frequently employ the following mitigation and management measures to further reduce the frequency and severity of traffic and transportation safety impacts:

- Install and use (or require the installation and use of) GPS-based monitoring systems to ensure adherence to speed limits and other traffic regulations, and to monitor vehicle and driver activity, or any other monitoring measure, including the personnel dedicated to traffic control;
- Establish and enforce procedures for cleaning of tires prior to entering paved roads, to avoid damage to other vehicles;
- Ensure that all vehicles use mutually-compatible communication systems; and
- Establish a formal grievance mechanism that enables local residents and road users to report and receive communication about Project-related road and travel incidents. As part of this measure, require all Project-related vehicles to carry Project-specific markings, to make grievance reporting easier, and to avoid incorrect grievance reports.

4.0 References

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