



Equator Principles Review of the PCH Piedade Project, Minas Gerais, Brazil

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INTRODUCTION

1.1 BACKGROUND

Conduit Capital (Conduit) has been awarded a concession consisting of 23 small hydroelectric power plant projects (*Pequenas Centrais Hidrelétricas* or PCHs) in Brazil (see Section 1.3 below for more detail on the program). Conduit has retained ERM to provide Equator Principle (EP) based social and environmental due diligence of these projects on an individual basis.

The current report presents the results of the Equator Principles based environmental and social due diligence site visit for the Piedade hydroelectric power plant, located in the State of Minas Gerais (PCH Piedade or the Project), which was conducted during the week of October 27-31, 2008.

1.2 REPORT ORGANIZATION

- Section 1, introduction;
- Section 2, Project Description;
- Section 3, Compliance with Brazilian Environmental Regulatory Framework;
- Section 4, Main Findings;
- Section 5, Conclusions;
- Section 6, Recommendations;
- Annex A, Location Maps; and
- Annex B, Photo Log.

1.3 EVALUATION FRAMEWORK

The social and environmental assessment policy references for the EPs are the IFC's Performance Standards on Social and Environmental Sustainability (PSs). Therefore, the environmental and social due diligence of the PCH Piedade is based on this framework.

The PSs also require compliance with applicable host country regulatory framework.

1.4 BRAZILIAN REGULATORY FRAMEWORK FOR PCH PROJECTS

1.4.1 Energy Sector Regulatory Framework

Hydroelectric power provides nearly 90% of the Brazil's national electricity production. Brazil's National Electric Energy Agency (ANEEL) is the agency that regulates electrical generation in Brazil. The agency recognizes small hydroelectric plants (*Pequenas Centrais Hidrelétricas* or PCHs) as a special category of facilities and

there is significant promotion of international investment in this sector.

There are three ANEEL resolutions that regulate PCH projects. These include:

1. ANEEL Resolution N° 393 of December 4, 1998, which establishes the general procedures for registration and approvals of initial studies for evaluation of the hydroelectric potential of basins. Developers that want to study a basin must first obtain an approval from ANEEL.
2. ANEEL Resolution N° 395 of December 4, 1998, which defines the general procedures for registration and approval of feasibility studies and initial project design for PCHs. This resolution also includes provisions for issuance of the area as public utility, which allows for expropriation of properties when needed.
3. ANEEL Resolution N° 652 of December 9, 2003, which replaced ANEEL Resolution N° 394, which described the general characteristics of PCHs. Under ANEEL Resolution N° 652, a PCH is characterized by:
 - Installed capacity of 1 to 30 megawatt (MW);
 - Total area of reservoirs can be up to 3 square kilometer (km²) but ≤ 13 km² per the following equation:
$$\text{Area} \leq 14.3 * \text{Installed Capacity (MW)} / \text{hydraulic head (m)}$$

ANEEL did not specify a limit for dam height as a criterion for PCHs. There is no maximum dam height because Resolution N° 652 replaced previous resolutions and intended to expedite and incentivize power generation in alignment with national priorities following energy shortages that Brazil suffered from mid to late 1990s.

National Water Agency (ANA) Resolution No. 131 of March 11, 2003, defines the procedures for the request of the water rights for hydroelectric projects with capacities above 1.0 MW. Article 11 of this resolution states that projects already under consideration by ANEEL as of March 11, 2003, are exempt.

After passing through initial feasibility studies, the proponent must register a Basic Engineering Project with ANEEL and then obtain environmental licenses and authorization from federal or state agencies.

1.4.2 *Environmental Regulatory Framework*

Brazilian laws require that environmental regulations be enacted at all levels of the government – federal, state, and municipal.

The National Council of Environment (CONAMA) establishes general guidelines to be followed throughout the country. State and municipal agencies can impose more restrictive standards.

Per CONAMA Resolution No. 001/86, the environmental permitting process of potentially polluting projects requires the preparation of an environmental impact assessment, EIA, and the Summary of Environmental Impact Assessment (Relatório de Impacto Ambiental [RIMA]) for the issuance of three licenses, which include:

1. Preliminary License (Licença Prévia [LP]) - The LP can only be issued after the public has access to a copy of the RIMA and a public hearing is held in accordance with good public involvement practices. The LP is only a statement that the proposed project is environmentally feasible. It does not allow for any site preparation or related construction activity.
2. Installation License (Licença de Instalação [LI]) - The LI, which allows for commencement of construction activities, is usually issued after the regulatory agency has reviewed and approved a project-specific Environmental and Social Management Plan (ESMP) (Projeto Básico Ambiental). The ESMP, or equivalent plan, provides site-specific mitigation measures, procedures, and actions to be adopted during the construction phase, which aim at preventing or minimizing impacts to the environment. The LI also establishes specific requirements regarding the mitigation and monitoring of environmental and social impacts and compensations.
3. Operating License (Licença de Operação [LO]) - The LO must be obtained prior to project operation and establishes conditions for the operations of the facility. For hydroelectric projects, the LO must be obtained prior to the filling of the reservoir.

CONAMA Resolution 06/87, establishes the requirements for the permitting process of large projects, including power plants with nominal capacity above 10 MW.

CONAMA Resolution 002/96 determines that projects with significant environmental impacts shall provide funds to establish, manage, or protect environmental conservation areas/units. The funds for this environmental compensation should be a minimum of 0.5 percent of the total project cost.

CONAMA Resolution 237/1997 defines the appropriate jurisdiction for the environmental permit. IBAMA (National

Institute of Environment and Natural Resources) leads the environmental permitting process when the project is located at the border of two or more states, at international borders, at federal rivers, continental shelf, exclusive economic zone, national protected areas, and indigenous lands. Most projects, however, are licensed by state agencies with input from municipalities.

In the State of Minas Gerais, the Secretariat of Environment and Sustainable Development (SEDS), through the technical evaluation by the State Foundation of Environment (FEAM), review the environmental documents and issue the environmental licenses.

In addition to obtaining environmental licenses (LP, LI and LO), the developer must also obtain all other environmental authorizations and licenses for the following resources:

- Cultural Resources: Authorizations for performance of cultural surveys, recovery and preservation of artifacts must be obtained from the National Institute of Historic and Artistic Heritage (IPHAN).
- Vegetation Clearing: Authorization for vegetation clearing as part of site preparation and for the reservoir area must be obtained from the state environmental agency. This license may also provide authorization for transport, commercialization and disposal of vegetation.
- Animal Rescue and Relocation– Regional IBAMA offices issue an authorization for rescue and relocation of animals that may be encountered during vegetation suppression.
- Fish Rescue and Relocation – The state agency issues an authorization for rescue and relocation of fish during the construction and the filling of the reservoir.
- Creation of the Permanent Protection Area (APP). For the Project, the APP consists of a 30-meter wide area around the reservoir, measured from the edge of the designed maximum operational water level. The creation of APPs around reservoir is a requirement associated with protection of water bodies and for larger reservoirs the APPs are set at 100-m wide for the perimeter of the reservoir.
- Water Supply – The project owns and operate a water supply well and two cisterns; thus it must obtain a license from the Minas Institute of Water Management (IGAM) for the operation of the well. In addition, because the water from the well and the cisterns is used for drinking purposes, the developer must monitor the water quality in accordance with the Brazilian Ministry of Health Ordinance No. 518 of 2004.
- Use of explosives: The Army issues the authorization for the storage, handling and transportation of explosives needed for the rock quarry.

PROJECT DESCRIPTION

2.1 GENERAL CHARACTERISTICS

The Piedade Small Hydroelectric Power Plant (PCH Piedade or the Project) is a 16-MW hydroelectric power plant to be located in the Piedade River, in the Municipality of Monte Alegre de Minas, in the State of Minas Gerais, Southern Brazil. Annex A shows the location of the Project.

The Project is being developed by Piedade Usina Geradora de Energia S.A., which is owned by GLEP, a holding company consisting of Conduit Capital and Construtora Gomes Lourenço Ltda..

The reservoir will cover an area of 1.5 km², with a total storage capacity of 17,520,000 m³ and a perimeter of 10.4 km. The dam will have a height of 32 meters above the foundation and a maximum width of 294 meters.

Other major components include:

- A 6,920 meter intake channel,
- A 620- meter long and 2.4 meter in diameter intake tunnel that branches into two 2.8-meter in diameter tunnels,
- 2 horizontal Francis turbine-generator units,
- A 69-kV substation, and
- An 11-km 69-kV transmission line that will connect to the Avatinguara Substation.

2.2 PROJECT SCHEDULE AND COSTS

The Project started construction in November 2007 and the current construction schedule indicates that the filling of the reservoir will start in May 2009. As per the latest Project schedule approved by ANEEL, the Project must meet the following schedule commitments:

- First Unit – start commissioning by May 2, 2009 and commercial operation by June 1, 2009, and
- Second Unit - start commissioning by June 1, 2009 and commercial operation by July 1, 2009.

The Project will purchase 7.0 MW from the national grid from January 1, 2009 through June 2009 to fulfill its PPA conditions prior to reaching full generation.

The project cost is estimated at R\$ 88,000,000.

2.3 *CURRENT PROJECT STATUS*

The Project is currently under construction and completion of construction is slated for July 2009. The main facilities within the construction site include:

- Administration buildings;
- Lodging;
- Warehouse;
- Carpentry shop;
- Vehicle maintenance shop;
- First-aid room;
- Cafeteria;
- Restrooms;
- Concrete facility/basins;
- Septic tank system;
- Explosive storage area;
- Gravel yard;
- Waste Storage Area; and
- Chemical Storage Area.

At the time of the site visit, there were approximately 350 workers, with approximately 80% of the workers on a 7:00 AM to 5:00 PM shift and 20% on a 5:00 PM to 5:00 AM shift. Approximately 90 workers were living in the onsite lodging and the remaining workers were transported to the site by busses provided by the Construtora Gomes Lourenço, responsible for the site.

At the time of the site visit, construction activities focused on the construction of the dam, the intake channel, the power house and the intake tunnel.

2.4 *ENVIRONMENTAL, HEALTH AND SAFETY MANAGEMENT SYSTEM*

The Project has prepared an environmental management plan (PCA) for the construction of the Project. The PCA includes description of procedures and measures to be implemented during the construction, most of each aim at compliance with the conditions of the LI.

The Projects and programs included in the PCA are:

1. Water supply and sewer system within the Construction Site:
 - a. Water Supply
 - b. Effluent treatment;
 - c. Waste management;
2. Road infrastructure;
3. Security and Alert/Warning;

4. Program for the restoration of areas impacted by Construction;
5. Program for the restoration of areas impacted by the Project;
6. Program for monitoring and control of erosion around the reservoir;
7. Forest Program:
 - a. Vegetation suppression of areas impacted by the Project;
 - b. Project for restoration and revegetation of springs and water bodies;
 - c. Project for rescue of flora, germoplasm and relocation of epiphytes
 - d. Project for restoration of Flora;
 - e. Monitoring Project of vegetation in restoration;
8. Program for conservation of fauna (three species of birds of local, not national, significance):
 - a. Monitoring Project for the Great Dusky Swift (*Cypseloides senex*) and the White Collared Swift (*Streptoprocne zonaris*);
 - b. Monitoring Project for the Bare Faced Curassow (*Crax fasciolata*);
 - c. Project to rescue fauna during the vegetation clearing for the filling of the reservoir;
9. Ichthyofauna Program:
 - a. Monitoring Project before damming;
 - b. Monitoring Project post-filling of the reservoir;
 - c. Rescue of ichthyofauna during the detouring of the river and the filling of the reservoir;
 - d. Project to evaluate the need for intervention in the area of reduced river flow to prevent trapping fish in isolated pools;
 - e. Project of the mechanism for the relocation of fish;
10. Socio-environmental programs:
 - a. Project of Social Communication;
 - b. Project of Environmental Education;
 - c. Project of Cultural Resources Education;
 - d. Project for Using Local Workforce;
 - e. Project for Negotiation of Properties and Assets;
11. Project for Monitoring Socio-economic Aspects;
12. Health Program;
13. Water Quality Program:
 - a. Monitoring project of limnology and water quality;
 - b. Project to monitor and control macrophytes;
 - c. Project to monitor and control invasive mollusks;
14. Hydrometric Monitoring Program:
 - a. Monitoring of flows of the reservoir;
 - b. Monitoring of the water table;
 - c. Monitoring of the sedimentation of the reservoir;
15. Climate Monitoring Program;

16. Archaeological Research Program;
17. Program of Support and Assistance to Producers/Farmers;
18. Plan for environmental management of the area surrounding the reservoir.

The Project has also prepared health and safety documents, as required by Brazilian regulations. These include:

- Program for Environmental and Occupational Conditions in the Civil Construction Industry (Programa de Condições e Meio Ambiente de Trabalho na Indústria da Construção Civil);
- Medical Surveillance Program (Programa de Controle Médico e Saúde Ocupacional); and
- Environmental Risks Prevention Program (Programa de Prevenção de Riscos Ambientais).

These documents describe the identification of risks associated with all civil construction activities within the site and provide for mitigation measures.

COMPLIANCE WITH BRAZILIAN ENVIRONMENTAL FRAMEWORK

3.1 ANEEL AUTHORIZATIONS

On December 17, 2002, ANEEL issued a Resolution No. 696 which declared Construtora Gomes Lourenço Ltda. as the independent power producer (IPP) for the PCH Piedade. In August 2003, Piedade Geradora de Energia, S.A. became the IPP for the Project. The Project has signed PPAs through ANEEL's auction process and in the free market.

3.2 POWER PURCHASE AGREEMENTS

Power purchase agreements (PPA) through ANEEL's Auction were signed in January 2007 and these PPAs are valid for 30 years, beginning January 1, 2009 and ending December 31, 2038. Through this auction, the Project will sell 7.0 MW to 30 companies. The Project is expected to purchase electricity from the national grid to fulfill its PPA commitments as necessary (e.g., during construction).

On July 3, 2007, the Project also signed a PPA with AUNDE BRASIL S.A. to sell 2.4 MW for a period of 11 years, beginning on 1 January 2010 and ending on December 31, 2020.

3.3 EIA AND ENVIRONMENTAL LICENSES

The Project has prepared two EIAs due to changes in project description and changes in the location of the axis of the dam. The initial EIA contemplated a total capacity of 13 MW and was submitted to FEAM in late 2002. Following a public hearing, the initial LP was issued on January 30, 2004 and the LI was issued on May 6, 2004. In June 2004, FEAM revised and re-issued the LP. The Project environmental management plan (PCA) was also revised and re-submitted to FEAM in June 2004.

In October 2006, the Project started initial construction activities and it was confirmed that a geological fault existed in the area of the intake channel. Construction activities ceased and additional geotechnical and engineering studies were conducted to re-evaluate the site conditions.

A second EIA, for a redesigned 16-MW facility, was prepared and submitted to FEAM in April 2007. The new LI for the 16-MW facility was issued on March 26, 2008.

The developer will obtain an LO for the Project prior to the filling of the reservoir, which is currently scheduled for May 2009.

3.4 WATER RIGHTS AND SUPPLY

The Project developer did not have to request water rights from the federal agency because the Project was already authorized by ANEEL. However, the Project developer must receive authorization from the State of Minas Gerais Institute of Water Management (IGAM) for its water concession. This has been requested but had not yet been authorized at the time of the site visit.

The Project has a water supply well and two cisterns on site which are used for multiple purposes, including drinking water. The developer has requested a license for the well, but this has not yet been issued. The site also has two cisterns which are considered "insignificant" and are licensed without conditions.

Because the Project developer owns and operates the water supply well and two cisterns that provide drinking water to the entire construction site, the Project developer must monitor the water quality in accordance with the Ministry of Health Ordinance No. 518 of 2004. Monitoring in April 2008 indicated the presence of coli forms, high iron content and pH of 5.9, which were in violation of the standards set by the Ministry of Health, Ordinance No. 518. In addition, not all the parameters listed in this ordinance were analyzed in the drinking water samples taken in April 2008.

3.5 OTHER LICENSES AND AUTHORIZATIONS

The Project has secured the following licenses and authorizations:

- IPHAN n° 01514.001299/2007-77, for the archaeological/cultural surveys in the area of the Project;
- Authorizations from the State Institute of Forest (IEF) for cutting, transporting and commercializing lumber/vegetation removed from the site. There are several authorizations because of the number of private properties that were negotiated over time;
- License for scientific fishing activities which are associated with rescue and relocation of ichthyofauna, as part of the Project's fish management plan. The license No. 052/08 was issued by IEF;
- Environmental Compensation No. 2101010500308, in the amount of R\$ 369,326.91 (0.5% of the capital investment), that was signed between the developer and IEF. This compensation was paid between July 28, 2008 and October 28, 2008;
- FEAM Declaration No. 451696/2006, which states that the 11-km 69-kV transmission line is considered part of the Project

and does not require a separate licensing process or environmental licenses.

3.6 STAKEHOLDER AGREEMENTS AND COMMUNICATION

The Project developer has signed agreements with property owners and residents who live around the future 1.5 km² reservoir. As per the information reviewed, no resettlement was associated with the Project. Property owners and residents were compensated for the portion of land that will be flooded by the reservoir or affected by the intake channel. The Sponsor will construct access roads/bridges over the intake channel to allow livestock to reach the reservoir and will also construct fences to prevent animals from falling into or otherwise entering the intake channel.

The Project has hired a social specialist to provide information to the community and respond to complaints. The social specialist is located in Monte Alegre de Minas and is available to the public Monday-Friday, from 7:00 AM to 1:00 PM. The Project has prepared brochures with project information and how to access the social specialist for information.

As for communication with property owners and residents directly affected by the Project, the communication appears to be somewhat decentralized in that several staff members, including the environmental manager, maintain communication with the local residents. The environmental manager is also conducting environmental education at local schools in Monte Alegre de Minas.

4.1 GENERAL FINDINGS

PCH projects are subject to the typical sorts of impacts associated with dam and reservoir projects. Some PCH projects may involve dams greater than 15 m in height (e.g., this Project), which, for reference purposes, would be considered “large” dams under the 2001 World Bank Operational Policy 4.37, which requires additional reviews of design and safety considerations for dams exceeding 15 m.

Hydroelectric projects can cause real impacts to river systems through the direct effects of impounding water, flooding areas and alteration of downstream hydrology. These are generally long term effects, but are reversible if the decision is made to ever do so. In the specific case of Brazil, there is a national program to maximize energy production from hydro, and the national government and the public appear to favor what is generally considered a renewable form of energy. As a result, the country has a large number of dams on many of the river systems. Arguably, it is the first dam that has the greatest impact on a specific river, and that is not the situation Project.

The Project is located in a predominantly agricultural area, (e.g. modified habitat) with little natural vegetation that can be considered natural habitat. This conclusion is based on aerial imagery and web based searches of local, regional and national biodiversity sensitivity as well on the information in the EIA. The Project has hired the services of cultural resources consultants to conduct surveys in the area of the Project. This effort is coordinated with IPHAN. While there are several fauna species of local importance that may be impacted, the Project proposes monitoring and relocation as appropriate and in coordination with agencies.

The Project is also located in a basin with multiple dams in both the upstream and downstream directions. In such a case, the adverse effects of the specific project are likely limited to the local environment and population. Ecological or environmental flows ⁽¹⁾ have been considered as part of the design and approval process.

The complexity of the environmental and social impact assessment and management requirements of specific PCH projects will be highly variable depending on the size of the dam, the environmental sensitivity of the river and its associated upstream

(1) Consideration of the downstream effects of an altered hydrologic regime on the river ecosystem.

and downstream ecosystems, and the cultural landscape and social context of the project area. In basins where there are multiple existing or planned PCHs, cumulative impacts assessment should be considered. Likewise, there is likely to be variability in the regulatory approaches and capabilities of the various states where the PCH projects are planned. Another set of variables are the consultants preparing the assessments and management plans.

4.2 *SPECIFIC FINDINGS*

The results of document review and a site visit conducted by ERM did not identify any critical or significant impacts likely to result from the PCH Piedade. However, there are issues that need to be addressed to prevent additional environmental, health and safety, and social impacts. These findings are discussed below, organized by the relevant IFC Performance Standard:

PS 1: Social and Environmental Assessment and Management Systems

The Project was subject to an environmental permitting process that involved the preparation of an environmental impact assessment that was reviewed and approved by the State of Minas Gerais Environmental Protection Agency, FEAM. Overall, the Brazilian environmental permitting process follows the intent and process recommended by the IFC PSs.

PS 1 Social and Environmental Assessment and Management Systems are discussed further in Section 5 addressed under the EPs for Social and Environmental Assessment, Action Plan and Management System, Consultation and Disclosure, Grievance Mechanism, and Independent Monitoring and Reporting.

PS 2: Labor and Working Conditions:

Note, several of the following issues identified could be listed under PS 2, 3 and or 4 due to their overlapping nature.

- All drinking water is obtained from two cisterns and an onsite groundwater well. Analytical results from April 2008 indicate the presence of coliforms, high iron concentration and a pH of 5.9 (should be from 6 to 9.5), which are non-compliant with the Ministry of Health Ordinance No. 518 of March 25, 2004 (MS Portaria 518/2004). Drinking water samples were not analyzed for all parameters listed under Table 5 of the ordinance.
- Drinking water samples are currently monitored on a quarterly basis. As per MS Portaria 518/2004, certain

parameters are to be monitored daily and others on a weekly basis.

- Reporting: at a minimal, reports with drinking water quality results must be submitted to the agency on a quarterly basis. To date, two quarterly reports have been submitted to FATMA, which include some water quality, but the parameters and the frequency of monitoring is not in accordance with MS 518/2004.
- Air quality inside the excavation tunnel has never been monitored. ERM field observations suggest high concentration of particulates and noticeable levels of exhaust gases from machines and vehicles.

PS 3: Pollution Prevention and Abatement

- The Sponsor has requested a permit for the onsite water supply but this permit has not yet been obtained.
- Water Use License: the Project has requested authorization from the State Water Resources Institute, but has not been granted one. Authorization used to be granted by ANA, but now is granted by the state of Minas Gerais.
- Disposal of medical waste from onsite first-aid facility: As of the date of the site visit, the onsite nurse had not been recording the volume of medical wastes generated. She indicated to ERM that either she or a worker would take the waste to the local hospital for disposal. The medical staff responsible for the onsite first-aid facility stated that she not maintained records of medical waste disposal.
- Secondary Containment: The secondary containment area of the above ground fuel tank had an opening that allows for the product to migrate out of the containment, as observed during the site visit. In the event of a leak, the product could spread outside of secondary containment.
- Non-hazardous waste is transported to a local facility that segregates the wastes and then recycles and disposes. However, the record keeping for transportation and disposal of this waste is not complete since there are no signatures from representatives at the recycling/disposal facility.
- Drums and containers in the hazardous waste storage area did not have lids and were not properly identified/labeled.
- Oil/water separator: to date, there has been no monitoring of the quality of effluents from the oil/water separator. Effluent is allowed to flow down gradient toward a surface water body and also infiltrates into the ground around the oil/water separator, as observed during the site visit.
- The oil/water separator receives effluent from the vehicle maintenance/wash area as well as from the pavement of the hazardous waste storage area. If the hazardous waste storage area contains waste other than petroleum-derived, these will not be treated by the oil/water separator and

could potentially contaminate the soil and the nearby surface water body. Containers with hazardous wastes were observed without lids and heavy rain could carry diluted wastes into the oil/water separator.

- Septic Tank: Records of septic system monitoring/inspection and tank pumping events were not available. Because the total number of workers onsite is expected to exceed the initial estimates, the septic tank needs to be monitored and pumped more frequently to minimize the potential for overflow because it may have been under sized. The information in the EIA states that a maximum of 166 workers will be at the site, but current information indicates that up to 450 workers will be at the site.

PS 4: Community Health, safety and Security

- The communication with property owners and residents appears to be somewhat informal and ad hoc. It was not clear the communication mechanisms are sufficient to keep local resident fully aware regarding how construction activities could affect them.
- Excessive dust was observed by ERM at the end of the conveyor belt that transports gravel, and this appeared to potentially impact a few of the residents in the area.
- During the dry season, wind and vehicles are likely to cause an increase in suspended particulate matter. During a brief meeting with a local resident (Mr. Lary and his family), there were complaints of excessive dust in his house

5.1 ENVIRONMENTAL LICENSES AND AUTHORIZATIONS

The Project has obtained all required environmental licenses and authorization from various agencies, with the exception of the permits for the onsite well and for water use in general. However, the licenses have been applied for and are expected to be granted soon. Therefore, the Project appears to be in full material compliance with applicable national and local regulations.

5.2 ENVIRONMENTAL AND SOCIAL ASSESSMENT AND MANAGEMENT

5.2.1 *Impact Assessment*

The Project was subject to an environmental permitting process that involved the preparation of an environmental impact assessment that was reviewed and approved by the State of Minas Gerais Environmental Protection Agency, FEAM. Overall, the Brazilian environmental permitting process follows the intent and process recommended by the IFC PSs.

The Project is located in a predominantly agricultural area, with little natural vegetation of great significance. This conclusion is based on interpretation of aerial imagery and web-based searches of local, regional and national biodiversity sensitivity, as well as on the information in the EIA. While there are several fauna species of local importance (e.g., three species of birds that are widespread in other parts of Brazil and Latin America, but locally uncommon; see page 8) that may be impacted, the Project proposes monitoring and relocation, as appropriate and in coordination with relevant local and national agencies. To date, there has been very limited vegetation clearing and only snakes were rescued and relocated. When vegetation clearing is conducted in the area of the future reservoir, prior to the filling, additional species may be rescued and relocated as deemed appropriate by the Minas Gerais environmental authorities.

A potential impact which was not addressed in the EIA was the potential cumulative effects of multiple dams. However, given the national program and the number of existing dams on the river basin, it is likely that the cumulative effects are already manifested and this additional dam will not significantly increase impacts.

5.2.2 *Public Consultation*

As part of the permitting process, the Project conducted public consultation and engaged in direct communication with families

that would be directly affected by the construction of the Project. Overall, the Brazilian public consultation requirements follow the intent and process recommended by the IFC PSs. However, there is a need for improved ongoing consultation and communication with households affected by construction activities and the establishment of a more formal grievance mechanism.

5.2.3 *Implementation of the EHS Management System*

Specific environmental, health, and safety issues identified during the October 2008 construction phase site visit by ERM are presented above in Section 4.2. There is a need for improvements in the areas described (see PS 2: Labor and Working Conditions above). Recommendations are provided in the following section.

ERM provides the following recommendations, organized by the respective Equator Principles/IFC Performance Standard, as applicable:

PS 2: Labor and Working Conditions

- **Water supply:** The Sponsor needs to secure a permit for the onsite water supply well.
- **Water Use:** The Sponsor must secure the water use authorization from the State Water Resources Institute prior to filling of the reservoir.
- **Drinking Water:** Sponsor must comply with the Ministry of Health Ordinance No. 518/2004 with regard to water treatment, water quality monitoring and reporting of drinking water.
- **Air quality inside of the tunnel** needs to be monitor to ensure good air quality conditions for workers.
- **Gravel yard/conveyor belt:** Measures to minimize generation of suspended particulates should be implemented. These could include cover for the system and use of spray system.

PS 3: Pollution Prevention and Abatement

- **Medical waste:** Record keeping procedures must be implemented to document generation, storage, transportation and destination of medical waste generated at the onsite first-aid facility.
- **Secondary Containment:** The secondary containment for above ground fuel tanks must be sealed to prevent product from migrating outside of the containment.
- **Waste Management:** Record keeping procedures for generation, storage, transportation and disposal of non-hazardous and hazardous waste must be implemented to ensure proper documentation of these wastes. Manifests must be signed.
- **Oil/water separator:**
 - **Effluent Quality:** effluent from the oil/water separator discharges to the ground and flows into the nearby surface waters. It is recommended that the Project implement a discharge monitoring program per CONAMA Resolution No. 357/2005 or per the Minas Gerais requirements.
 - **Potential hazardous waste discharge to oil/water separator:** drainage from the hazardous waste storage area should not be allowed to flow into the oil/water

- separator if solvents and other non-petroleum based wastes are stored in the area.
- Septic Tank: The septic tank needs to be monitored to prevent overflow and onsite environmental manager must keep records of volume of sanitary waste pumped from site.

PS 4: Community Health, Safety and Security

- Dust at neighboring house: disturbed areas and access roads should be watered to minimize generation of dust, especially near residences.
- Stakeholder Communications: a dedicated social specialist or equivalent should be designated to implement on-going communication with property owners and residents directly affected by the Project. Although there are several avenues of communication currently, it appeared to be somewhat ad hoc. Development of a more formal program is recommended.

Action Plan and Management System

The Sponsor should develop an Action Plan to achieve full compliance with the applicable social and environmental standards and the Equator Principle/PSs gaps identified by this report.