Environmental and Social Review Summary

Jamaica Energy Partners and West Kingston Power Partners Power Projects

This Environmental and Social Review Summary (ESRS) is prepared by MIGA staff and disclosed in advance of the MIGA Board consideration of the proposed issuance of a Contract of Guarantee. Its purpose is to enhance the transparency of MIGA’s activities. This document should not be construed as presuming the outcome of the decision by the MIGA Board of Directors.

Any documentation which is attached to this ESRS has been prepared by the project sponsor, and authorization has been given for public release. MIGA has reviewed the attached documentation as provided by the applicant, and considers it of adequate quality to be released to the public, but does not endorse the content.

Country: Jamaica
Sector: Infrastructure
Project Enterprise: Jamaica Energy Partners (JEP) and West Kingston Power Partners (WKPP)
Environmental Category: B
Date ESRS Disclosed: April 25, 2011
Status: Due Diligence

A. Project Description

The applicant, Conduit Capital Partners, seeks a guarantee for Latin Power III, L.P.’s investment in Jamaica. The project enterprise consists of Jamaica Energy Partners (JEP) and West Kingston Power Partners (WKPP). The investment project considered by MIGA comprises of the following:

- JEP’s existing two barge-mounted power plants operate diesel engines firing heavy fuel oil (74 MW Dr. Bird I and 49.5 MW Dr. Bird II) and are located on the seacoast at Old Harbour Bay, St. Catherine (about 40 km west of Kingston), and
- WKPP’s proposed 66 MW diesel engine power plant in an industrial area in Kingston, Jamaica. The plant will be land-based, and fueled with heavy fuel oil (HFO).

The existing plants and the one proposed use Wartsila diesel engines with fuel supplied by Petrojam. All three plants will sell power to Jamaica Public Service Company (JPSCo).

The WKPP project site is leased from the National Water Commission, which operated the Western Wastewater Treatment Facility on the property for many years. The site is a portion of the old treatment facility, about 5 ha in area, which allows adequate space for construction of the 66 MW facility, as well as a future expansion of 66 MW. All immediately surrounding land uses are industrial, with warehousing to the east, west and south, and an abandoned Jamaica Railway Corporation maintenance facility to the north. JPSCo’s Hunts Bay generating plant lies on the waterfront just to the west of the site, and WKPP will deliver power to the Hunts Bay substation. Petrojam will supply HFO to the
project by pipeline from its refinery next to the Hunts Bay generating station. Light fuel oil and lubricants will be delivered by truck, and the truck unloading facilities can also be used for truck delivery of HFO if needed. Water for the engine cooling radiators and for other plant uses will be drawn from a nearby city main, and treated by reverse osmosis before use. Sewage and reject water from the RO system will be discharged to the city sewage system. Site runoff will be diverted to Tivoli Gully, which runs parallel to the western site boundary and empties into Kingston Harbor.

IFC has previously financed JEP’s two barge-based power plants at Old Harbour Bay, and recently supported WKPP. IFC disclosed its Environmental Review Summary of JEP in April 2005 and its Environmental and Social Review Summary (ESRS) of WKPP in June 2010. MIGA’s review is largely based on IFC’s review and is supplemented by MIGA’s review of documentation provided by the client.

B. Environmental and Social Categorization and Impacts

This is a Category B project because a limited number of specific environmental impacts may result which can be avoided or mitigated by adhering to generally recognized performance standards, guidelines or design criteria. The project involves continuing to operate existing power barges, and the construction and operation of a relatively small-scale, fuel oil-fired thermal power plant in an industrialized area by an existing IFC client who has demonstrated it can effectively operate similar facilities. Key risks are limited to air quality impacts of emissions in the airshed, as well as ambient noise levels and accidental fuel oil spills (which may also pose risks to community health and safety).

C. Applicable Standards

While all Performance Standards are applicable to this investment, MIGA’s environmental and social due diligence indicates that the investment will have impacts which must be managed in a manner consistent with the following Performance Standards:

PS1 – Social and Environmental Assessment and Management Systems
PS2 – Labor and Working Conditions
PS3 – Pollution Prevention and Abatement; and
PS4 – Community Health, Safety and Security.

PS 5, PS 6, PS 7, and PS 8 are not expected to apply. WKPP will be located in an existing industrialized area in Kingston, which has been significantly disturbed and intervened over the years. There are no people living on, or using the site for economic purposes. There are no indigenous peoples resident in the project area, nor is this in an area where cultural heritage is expected to be found. The existing power barges have been in operations for several years. JEP commissioned the original barge in the mid 1990s, and Dr. Bird II in the mid 2000s.
D. Key Documents and Scope of MIGA Review

Documents reviewed by MIGA for WKPP include:

- Environmental Impact Assessment (Draft) of the Proposed Jamaica Energy Partners 60 MW West Kingston Power Plant at Industrial Terrace, Kingston, Jamaica; prepared by CL Environmental; October 2009.
- Rapid Environmental Assessment, Proposed Six Medium Speed 11 Megawatt Diesel Generators at Garvey Drive, Kingston, Jamaica; prepared by CL Environmental; August 21, 2008.

Monitoring documents reviewed by MIGA for JEP’s existing power barges include:

- Doctor Bird Power Station Quarterly Environmental Report January to March 2010; prepared by Jamaica Energy Partners, and
- Doctor Bird Power Station Environmental Report for the Year 2009; prepared by Jamaica Energy Partners.

Additionally, MIGA reviewed a transcript of the public consultation proceedings held in May 2005 for the 49.5 MW Dr. Bird II power barge.

IFC environmental staff visited the proposed location for the WKPP and surrounding industrial area in Kingston, and JEP’s operations in June 2009. MIGA has relied on IFC’s review and due diligence, and the majority of the text for this ESRS originates from IFC’s ESRS.

E. Key Issues and Mitigation

PS1: Social and Environmental Assessment and Management Systems

With the assistance and services of qualified, experienced external consultants (CL Environmental Co. Ltd. and Golder Associates Inc.), JEP/WKPP completed the EIA process for the proposed development. In accordance with Jamaican Environmental laws and requirements, JEP/WKPP first prepared a Rapid Environmental Assessment (August 2008) which helped guide and frame the scope for the full EIA for the WKPP. Jamaica’s Natural Resources Conservation Authority (NRCA) also participated in determining the scope of the EIA, and managed the approval and public participation process. The approved EIA includes a description of significant expected environmental and social impacts, both direct and cumulative, and the recommended mitigation measures necessary to eliminate or minimize these consistent with the requirements of PS1.
As expected, the principal impact identified for the WKPP project is the potential to adversely impact the ambient air quality of the surrounding Hunt’s Bay Air Shed. Recently conducted continuous monitoring (at two stations from September 2009 to March 2010) indicates existing ambient air quality is within the Jamaican ambient air quality standards (JAAQS) notwithstanding contributions from existing sources such as the Petrojam oil refinery, the JPS Hunts Bay, JPS Rockfort, and the JPPC power plants. The analysis of air quality impacts on this non-degraded Air Shed of the proposed WKPP power plant relied on dispersion modeling conducted by Golder Associates, who appropriately followed the procedures specified in the relevant NRCA air quality modeling guideline document, as well as currently accepted modeling approaches used by the US Environmental Protection Agency (EPA).

JEP has received all necessary host-country permits for operating its existing barges and continues to operate in material compliance with the permits.

Management Program: The WKPP full EIA presents frameworks of the management plans for mitigating the impacts identified. Comprehensive management plans will be developed and submitted to MIGA which will indicate the schedule and party responsible (i.e., WKPP or its EPC contractor, Wartsila) for implementing mitigation measures during both the construction and operation phases. JEP has already developed and implemented plans to ensure environmental compliance of existing operations.

Organizational Capacity and Training: The organizational responsibility to successfully undertake the implementation of the EIA Action Plans and to generally ensure performance of the project will be shared among the existing JEP organizational structure, the EPC contractor (Wartsila), and the WKPP Plant Manager at the time the plant begins operating. JEP’s Chief Technical Officer has overall responsibility for the planning and construction of the project, and is supported by an Environmental Manager and Engineering Services Manager in the implementation of specific environmental and social activities, as appropriate. JEP’s Human Resources Manager is responsible for coordinating all public participation and community outreach activities. As the EPC contractor, Wartsila will have a dedicated EHS supervisor on site. During operations, WKPP Plant Manager will be supported by an EHS Specialist to coordinate relevant operating aspects. WKPP, JEP and Wartsila will ensure all construction and operating employees are informed of their respective EHS responsibilities and trained, as appropriate. Training methods will include health and safety induction training prior to commencing work, regular toolbox meetings, and periodic refresher courses.

Monitoring and Reporting: WKPP will establish monitoring and reporting programs for both the construction and operating phases of the project. Activities monitored during construction will include: construction vehicle movement, fueling and repair; erosion control and water quality; noise and dust generation; waste disposal; and employee health and safety practices. During operation, monitoring will include: stack air emissions and ambient air quality; noise; storm water and wastewater discharges; and employee health and safety. For each monitoring activity, specific parameters will be chosen to demonstrate compliance, and the frequency of monitoring will also be specified. WKPP
will prepare and submit periodic reports of monitoring results to Company management and Jamaican regulatory authorities as required. Reports shall present numerical summaries of monitoring data, discuss exceedances and non-compliances, and indicate any corrective steps to be taken to prevent reoccurrence.

JEP conducts (through consultants) several monitoring programs for its existing operations, including ambient air quality, stack emissions, cooling water discharge characteristics, noise surveys, and condition surveys of its barges and equipment. Operations are substantially in compliance with MIGA requirements. Improvements to operations are being made, as discussed under PS 3.

**PS2: Labor and Working Conditions**

WKPP expects to employ approximately 45 persons during site clearance/demolition activities, 50 persons during construction, and 60 staff during the plant’s operation. Employees will be divided among the three main departments: Management and Administration; Operations; and Maintenance. They will be governed by JEP’s established HR policies and practices, which have proved to be effective in ensuring fair labor and working conditions for JEP’s existing 121 employees. Policies and procedures are compliant with Jamaican law and consistent with the requirements of PS2.

Employees will be provided with a written Benefits and Assistance Profile Summary that describes their rights related to wages and benefits. WKPP is committed to a Wage Administration Program similar to that of its affiliate, JEP, and designed to compensate employees on a fair and consistent basis and attract and retain a highly qualified workforce. It is the policy of JEP to pay wages competitive with the local and industry marketplace to equitably conduct performance and wage/salary reviews and adjust wages on a scheduled basis. The administration of JEP’s Performance Review and Wage Adjustment programs is designed and practiced to ensure consistency, objectivity and fairness.

There is a Problem Resolution Procedure to ensure fair and equitable treatment of all employees and to provide a process for employees to discuss and resolve employment problems. JEP is committed to effectively resolving employee problems brought to management's attention. The problem resolution process is available to all employees and is structured to address employment issues promptly and fairly.

JEP prohibits discrimination in hiring, training, compensation practices, promotion and dismissal of any individual based on gender, race and or color of skin, religion and political persuasion. The Company also prohibits the harassment of any individual based on gender, race and or color of skin, religion and political views.

JEP has a Social and Welfare Committee that consist of a representative from each department and the Human Resource Manager. The committee meets on welfare issues is also responsible for planning and executing of staff social event and team building activities within the organization.
WKPP will develop and implement an occupational health and safety program relying on the successful policies and practices applied at JEP’s existing operating power plants. Employees will be provided with personal protective equipment (PPE), and procedures will be developed to ensure their use. They also will be properly trained in the relevant hazards, safety procedures and emergency response. Safety rules and guidelines will be established and regularly communicated to employees through internal circulars and training programs. All new employees will receive a basic safety and security presentation and regular training will be conducted for first aid and CPR, fire fighting, and emergency response. WKPP will ensure Wartsila and other construction contractors apply appropriate occupational health and safety plans and controls, including provision of PPE and appropriate training in safe construction practices and avoidance of hazards. Wartsila shall conduct regular safety inspections and track all incidents and loss time injuries during the construction phase.

**PS 3: Pollution Prevention and Abatement**

Pollution prevention and abatement issues of concern at the WKPP plant include: air quality; pre-existing site contamination; and noise. The EIA recommends a number of mitigation measures to minimize these and other impacts in both construction and operation phases.

**Air Quality:** Limited ambient monitoring suggests that existing air quality in the plant vicinity is non-degraded. That is, despite existing emissions from major sources like the Petrojam refinery and JPS’ Hunts Bay power station, among others, the Jamaican Ambient Air Quality Standard (JAAQS) for sulfur dioxide, nitrogen oxides, and particulates – the key parameters of concern -- are not currently exceeded. Furthermore, modeling of the contributions of these pollutants from the proposed WKPP power plant predicts resulting ambient concentrations will remain in compliance with the JAAQS. Consistent with World Bank Group EHS Guidelines for new Thermal Power Plants, WKPP will ensure that the stack emissions of these pollutants do not exceed the following concentrations:

<table>
<thead>
<tr>
<th>Pollutant Emission Limit</th>
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<tbody>
<tr>
<td>Sulfur Dioxide ≤ 2.0% S in fuel</td>
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<tr>
<td>Nitrogen Oxides 1850 mg/Nm3</td>
</tr>
<tr>
<td>Particulate Matter 50 mg/Nm3</td>
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In keeping with the Company’s Air Quality Monitoring Plan, should WKPP’s monitoring of the Air Shed’s ambient air quality indicate JAAQS are exceeded, the Company will implement additional pollution control measures to mitigate this condition. Specifically and in the case that sulfur dioxide standards are exceeded, WKPP will switch to using fuel with sulfur content of not greater than 0.5%. Where ambient standards for nitrogen oxides (NOx) are exceeded, the Company will install a selective catalytic reduction (SCR) system, or implement other approved control measures, to appropriately reduce the concentration of NOx in the engine exhaust. The proposed stack heights for each of the 6 engines (32.5 meters above ground level) are consistent with Good Engineering
Practice (GEP) Guidelines established by NRCA and the US EPA, and will enhance diffusion of air pollutants and minimize local air quality impacts.

*Pre-existing Contamination:* Owing to its former use as a municipal wastewater treatment plant, some areas of the WKPP site contain waste, such as old treatment sludges, contaminated soils, and oily materials, which need to be removed and disposed prior to construction of the new power plant. Prior to initiation of site preparation activities, WKPP will conduct the necessary investigations to identify all contaminated wastes, soils, and other materials that need to be removed and disposed, and prepare a Closure Plan that meets Jamaican NEPA requirements.

*Noise:* Diesel engines of the type being installed at the site are significant noise generators. Although the industrial land uses immediately adjacent to the site (warehousing and light-medium manufacturing) are not noise sensitive, there are two schools and a residential community nearby (within a few hundred meters). Predictive modeling suggests that noise levels at these receptors will be in excess of allowable Jamaican and World Bank Group ambient guidelines unless additional mitigation is implemented. Consequently, WKPP will provide supplemental noise shielding and attenuation for the engines (e.g., masonry walls, insulation) to ensure noise is controlled to acceptable levels.

*Hazardous Materials and Wastes Management:* WKPP will have two (2) large fuel oil storage tanks with a total capacity of approximately 6,000 m³ for HFO and several smaller tanks and containers storing lesser quantities of fuels, lubricants, and maintenance chemicals. Areas where fuels or other hazardous materials are stored will be constructed within secondary containment structures to contain and prevent any leaks from being released to the environment.

Wastes generated during operations include waste oils, other maintenance wastes, lab wastes, and general plant trash. These materials will be suitably collected and disposed by licensed, commercial contractors. The plant will generate sewage, oily water from the plant floor and parking area, and reject effluent from the cooling water treatment system. Sewage and water treatment effluent will be discharged to the existing sewerage system operated by the National Water Commission. Oily water and any contaminated rainwater collected in tank containment areas will be treated in an oil/water separator and ultimately discharged to the existing municipal sewerage system.

*Emergency Preparedness and Response:* Storage and use of HFO at the facility presents potential hazards in relation to accidental spills, fires, or explosions. Consistent with NEPA requirements, WKPP will develop an Emergency Preparedness Plan, as well as an Oil Spill Contingency Plan. Specific measures will include: fuel tank storage alarm systems; engine hall alarm systems; and fire protection equipment. Employees will be trained in their responsibilities under each of these Plans. The Company will also coordinate its emergency response activities with the surrounding industrial activities and local communities.
Greenhouse Gas Emissions and Energy Efficiency: With an expected thermal generating efficiency of 42%, the resulting CO2 emissions performance of the WKPP plant will be 655 gCO2/kWh. Because the project is planned to generate 459 GWh/year, it will emit 300,645 tonnes CO2/year of greenhouse gases.

Based on stack emissions monitoring conducted in 2009, the resulting CO2 emissions performance for the Dr. Bird Power Facility was approximately 503 g/kWh and approximately 834 GWh of power was generated for that year. This resulted in the emission of 419,387 tonnes CO2/year.

A number of reduction and control options have been explored in the past for both JEP and WKPP. With respect to Oxides of Nitrogen (NOx), the reduction / control options explored included but were not limited to Selective Catalytic Reduction (SCR) for both JEP & WKPP; however, SCR and most of the other methods explored were determined to be infeasible due to cost and other factors. In 2006, with the addition of Dr. Bird II, JEP committed to using 1.8% Sulphur Heavy Fuel Oil (HFO) for the entire Dr. Bird Facility which is below Jamaica’s national standard of 2.2% sulphur. JEP currently uses HFO with the lowest sulphur content available on the island. Emissions offset has also been explored and although JEP / WKPP provides an energy solution that is more efficient than most of the existing old, inefficient power plants, these old plants are not owned / operated by JEP / WKPP. However, as long as power supply by JEP / WKPP is reliable, some overall offset would result since the more efficient units on the Island are expected to be dispatched first based on a “merit order system”.

Greenhouse gas emissions will be included as part of the JEP/WKPP annual monitoring to be submitted to MIGA.

Existing Operations: As the JEP power barges are existing and were supported by IFC prior to the release of the World Bank Group’s Environmental, Health, and Safety Guidelines for Thermal Power Plants (2008), the World Bank Group Guidelines from 1998 (ie., Pollution Prevention and Abatement Handbook) are applied to the existing power barges. JEP’s existing operations focus on monitoring ambient air quality, stack emissions, cooling water discharge characteristics, noise surveys, and condition surveys of its barges and equipment. JEP’s 2009 environmental monitoring report included an action plan to address areas of improvement going forward. For example, JEP will investigate the higher than normal air emissions and water effluent values, reinstall an ambient air quality monitoring station, schedule repairs to a cooling water discharge line at Dr. Bird I, and continue ongoing work with respect to waste management and training programs.

PS 4: Community Health, Safety and Security

All immediately surrounding land uses of the WKPP site are industrial. The nearest residential area is 300 m away. Fuel will be delivered to the WKPP site via a short pipeline from the nearby Petrojam tank farm, and/or by fuel truck from the refinery. While neither the pipeline nor trucks will pass through residential areas, the trucks will
necessarily travel along a busy industrial road and the pipeline through the port area. Consequently, WKPP’s Emergency Response Plan (see above) will also include specific aspects and actions to mitigate the potential hazards associated with the delivery of fuel. It will include:

- Emergency call lists of key outside parties;
- Community liaison procedures;
- Coordination with the local fire department in the event of a fire or explosion;
- Evacuation routes, where applicable; and
- Provision of emergency response training to these various parties.

JEP’s existing operations has an oil spill contingency plan in place. JEP has an assigned Health and Safety officer and uses U.S. OSHA requirements as guidance. Fuel is provided via an undersea pipeline and is stored onboard. The barges are double hulled for spill protection. Spill response equipment is stored onsite and JEP has a contract in place with a specialized spill response contractor in the event of larger spills.

Noise monitoring for the existing power barges and their environs continue to indicate that the Doctor Bird Facility is meeting the relevant requirements with respect to noise. Old Harbour Bay community, approximately 1.5 km away, is the nearest community to the Facility.

JEP has re-installed an ambient air quality monitoring station approximately 5.5 km (“as the crow flies”) from the Facility at a site located in a housing scheme known as the Longville Park housing scheme (installed in connection with the Dr. Bird Facility). There are also two ambient air quality monitoring stations installed in Kingston (in relation to the WKPP Project), the data collected from all three stations continue to consistently demonstrate compliance with JAAQS.

**Security Arrangements:** Unarmed in-house security guards are employed by WKPP / JEP. A Security plan has been developed for the WKPP project and is based on similar arrangements at the Dr. Bird power plant, both of which are consistent with PS 4. Some of the key aspects of Security management as outlined in the WKPP Security plan include (but is not limited to): the development of lines of communication with the Community by building relationships through community based organizations (CBO); physical security, gates, doors and door locks; protection of storage areas / rooms; inventory control; and utility infrastructure security.

**F. Environmental Permitting Process and Community Engagement**

In accordance with NRCA’s EIA public consultation and disclosure requirements and consistent with PS1, WKPP will directly involve the affected public in consultations during the EIA process. With assistance from its consultant, WKPP will conduct a public participation/consultation program on the findings of the EIA to inform, solicit, and discuss comments from the public on the proposed plant. Specifically, WKPP and NRCA will:
Document the program;
Describe the public participation methods, timing, type of information to be provided, and the stakeholder target groups involved;
Summarize the issues identified during the process; and
Ensure that input has been incorporated into the proposed project design and management systems.

After final approval of the project by NRCA, WKPP will develop an ongoing Community Engagement Program (CEP) to keep local people well informed about project implementation progress and to enable them to express their concerns during construction and operations. The CEP will include procedures to receive and respond to complaints of local residents.

JEP carried out public consultation activities as part of the environmental impact assessment process in 2005 for Dr. Bird II. JEP is an established entity in Jamaica with local offices and an active corporate website. JEP has an active CEP programme similar to WKPP where the members of the community and the local community based organizations are kept informed of plant activities. JEP also forms partnerships with the community in the areas of environmental awareness, education, training, health and sports. JEP is currently in the process of establishing and implementing an effective grievance policy and procedure with the local community. For 2010, no issues with the local community were reported.

G. Availability of Documentation

Documentation regarding the WKPP and JEP operations is posted at: http://www.jamenergy.com/projects.html#ohbj

Information can also be requested from:
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The project ESRS for WKPP has been disclosed also by IFC since June 2010 and the project Environmental Review Summary for JEP operations by IFC since April 2005.