

## **EXECUTIVE SUMMARY**

### **Project Needs and Description**

To fulfill the need for additional power The Barbados Light and Power Company Limited (BLPC) is embarking on the development of a new generating site in the Parish of St. Lucy. The lands are part of the Trents Plantation in St. Lucy located approximately 3 km inland of the Arawak Cement Plant situated along the Barbados western seacoast. The site area will ultimately be capable of accommodating at least 240 megawatts (MW) of new capacity.

Two new generation options have been identified by recent studies. One option is to install gas turbine-based combined cycle plants since there is a possibility that natural gas from Trinidad could be made available in Barbados in commercial quantities within the next few years. The other option is to use low speed diesel generators, operating on heavy fuel oil, similar to those in service at the Spring Garden Generating Station. The development of the site will occur in three stages starting with 60 MW then adding 80 MW and finally adding 100 MW to reach the ultimate capacity of 240 MW. Initially the plant will comprise of low speed diesel generators operating on heavy fuel oil with the potential to convert these to natural gas at a later date.

Should a natural gas pipeline be installed from Trinidad, it is expected that it will come ashore at Checker Hall. BLPC will also prefer to import heavy fuel by sea tanker to the Arawak pier. BPLC's Checker Hall site will be used as a fuel transfer facility for both natural gas and heavy fuel oil. Depending on the options and staging, one or both fuels will be transferred via pipeline that will follow the road corridor to the Trents Generating Station. If the receipt of heavy fuel oil via the Arawak pier is not available, this fuel will be delivered by road tanker.

### **Schedule**

BLPC needs to have additional generation developed on the site by 2008. The first stage will therefore use low-speed diesels and the latter stages may use combined cycle, should natural gas be available.

## **Approach**

Terms of Reference for completing the EIA were submitted to the Town and Country Development Planning Office, dated March 1, 2005. This report covers the requirements of the EIA process and the Terms of Reference. The EIA is based on scientific, engineering, environmental and economic parameters, professional judgement, and consultation with the public, applicable government agencies, communities, interest groups and other stakeholders directly affected by the Project. The approach includes the following steps:

1. Assembling project baseline information;
2. Scoping of the environmental issues during construction and operations;
3. Identification of the Valued Ecosystem Components (VECs) from the community and regulator concerns and from site investigations;
4. Assessment of the effects of the project on the environment; and,
5. Determining the environmental protection measures required.

## **Assessment of Environmental Effects**

This EIA has considered the effects of the two optional plants at maximum output. The final development may be a combination of plant types and hence the overall effects will lie within the environmental envelope covered by each of these options. The EIA considered the following impacts from construction activities and operations:

### Air Quality

The World Bank Group Pollution Prevention and Abatement Handbook guidelines as published in 1998 for thermal power projects were used as the preferred air emissions standards for application to the Trents Generating Station.

During construction the potential impacts on air quality are predominantly dust emissions from excavations. These will be localized short duration and can be mitigated by a dust control program and by good housekeeping. The Environmental Management Plan (EMP) for construction provides mitigation measures for dust control. The impacts from construction on air quality are therefore considered minimal.

The effects of the project on air quality from operations are primarily due to emissions from the generation equipment (low speed diesels or combined cycle using gas turbines). A detailed analysis of the air emissions impacts was completed using EPA models. The levels of emissions will meet the ambient standards as recommended by the World Bank Guidelines (WBG) for the combined cycle option (using natural gas or distillate fuels) at the full 240 MW development. For the optional plant using low speed diesels the first and second phases of development to 60 MW and 140 MW respectively will meet the WBG using heavy fuel oil.

However, development to 240 MW using low speed diesels will require the plant to switch to a lower sulphur content fuel during periods of westerly winds in order to achieve the WBG levels.

### Noise and Vibration

Noise levels during construction will be localized, of short duration and restricted to working hours, and the impacts are considered to be minor.

The effects of noise levels from plant operations were estimated based on background levels measured during the study and the proximity of sensitive receptors. The increase in noise levels at the closest houses, St. Lucy's Church and St. Lucy's School can be mitigated to within the WBG criteria for new projects with adequate attention to the design and layout of the plant.

The limits of vibration specified for the plant in relation to personal comfort shall follow the recommendations of ISO 2631. It is also recommended that the provisions of ISO 2631-2 be used to measure and assess vibrations at any sensitive receptor after start-up, and the results compared to the median threshold of perception for human subjects.

### Traffic

The most sensitive issue during construction will be the impacts on traffic during pipeline construction, as much of the routing occurs along existing roads and residential streets. This will require partial lane closures, full lane closures, and road closures with detours. The issues can be adequately managed through a communications program advising the public in advance and by adequately posting detours. Recommendations are made in the EMP for the construction phase.

The significance of effects on traffic from the construction activities is considered to be minor, as they will be localized, of small magnitude and short duration. With proper implementation of the recommended mitigation measures, no significant adverse environmental effects are likely to occur.

During the operations phase, the plant complement will be approximately 42 persons during the day shift. Current traffic counts in the vicinity of the site indicate that the flow of traffic during peak times is away from the project site in the morning and towards the plant in the afternoon. Traffic to and from the plant during peak times will be in the opposite direction to the current peak flows.

### Equipment Offloading at Arawak Cement

As an option for equipment deliveries during construction, the use of roll-on/roll-off barges is being considered to deliver the larger assemblies to the beach at the Arawak Cement Plant. The equipment will be offloaded at the Port of Bridgetown onto the barge and ferried to the

Arawak beach. This means of delivery was used during the construction of the Arawak cement plant, and some of the infrastructure remains. The advantage of this mode of transfer is that it will significantly reduce the extent of traffic disruption that will occur in shipping the large equipment assemblies via the network of roads between the port and the site.

Facilitation of the barging option will entail construction of a short section of road across the beach terminating at a beachhead at the shore. The road will follow the footprint of the prior roadway to minimize disturbance. The placement of large boulders for the road construction will allow for ease of removal and beach restoration at the conclusion of equipment deliveries. The area of beach proposed for offloading will not require dredging of the shoreline and there will be no impacts to the coral.

The University of West Indies will be contacted in advance of any construction work to determine if there any turtle nests that will need to be relocated.

The Environmental Management Plan for Construction provides a mitigation plan for minimizing the effects of this option for equipment delivery.

#### Groundwater

All of the plant facilities including pipelines are located in water zones 3 to 4 and in areas serviced by the public water supply. There are no impacts to groundwater expected during the construction phase.

The plant and pipelines have been designed with sophisticated spill prevention and detection systems to protect the environment. The depth to groundwater at the plant site is over 60 m and this provides a measure of protection from contamination. Groundwater flow is towards the west and away from the closest potable water supply well at Alleyndale. The operations of the plant are therefore not expected to cause interference with that well.

#### Accidents and Malfunctions

The Trents Generating Station and pipelines will be designed with spill protection and detection measures to minimize the potential for environmental impacts. They will also be designed to current fire protection standards for the industry. Nevertheless, despite good engineering design to protect the environment and procedures intended to minimize the effects on the environment, spills can occur.

Spill response and clean-up plans are outlined in detail in the Construction and Operations Environmental Management Plans and in BLPC's Spill Contingency Plan (see Appendices A, B and G).

In addition, the plant shall monitor the status of groundwater quality by implementing a monitoring program designed to detect changes in groundwater chemistry and to identify the migration of any potential contaminant plumes.

### **Cumulative Effects**

By conducting an analysis of potential effects of past, current and future activities in the general area of the Project, it is possible to determine if these effects could act cumulatively with the potential effects of the Proposed Project. The analysis conducted for this report has concluded that the cumulative effects are considered insignificant.

### **Conclusion**

The assessment has concluded that the Project is not likely to cause significant adverse environmental effects given implementation of the recommended mitigation measures. It was also concluded that significant adverse cumulative effects are not likely to occur.

### **Environmental Management Plans**

To complement the study, separate Environmental Management Plans (EMP) are developed for the construction and operations phases. The environmental management plan for construction covers the mitigation of environmental impacts that are likely to be encountered during construction. The EMP for operations provides guidance and direction for the operators of the facilities for the protection of the environment, as well as response plans to accidental events.