

7.0 ENVIRONMENTAL EFFECTS ASSESSMENT - CONSTRUCTION

The VECs identified from the construction phase in Section 6.0 of this report are assessed in this section. The section outlines the relevant environmental issues associated with the project construction, the potential effects and the recommended mitigation required to minimize these effects.

Current standard construction practices relating to power plant facilities generally include environmental protection measures that will mitigate potential environmental concerns. Standard practices have been developed and potential effects have been assessed in consideration of these protection measures.

To avoid adverse environmental effects and to minimize unavoidable negative effects, an Environmental Management Plan (EMP) has been prepared specifically for the construction phase of the Project (see Appendix A). The EMP prescribes all environmental management measures, mitigation measures, spill prevention protocols, contingency measures, responsibilities, supervision, and reporting measures necessary to ensure the least impact to the environment during construction. The EMP is an essential tool for minimizing adverse environmental effects. The contractor for the plant construction will be required to adhere to the EMP

7.1 Air Quality

The potential effects on air quality and the related Project interactions during construction are overburden disturbance and construction equipment operation. These are described in the following subsections.

7.1.1 Overburden Disturbance

The primary air quality concern during construction is the impact of particulate matter on the surrounding environment. Particulate emissions during the Project construction are associated with land clearing, blasting, excavation, and backfilling operations.

The potential effects of particulates is influenced by site and weather conditions (rain and wind direction) and by preventative measures implemented during construction to minimize emissions. Emissions of particulates that exceed air quality guidelines may result in problems on the construction site and under special circumstances (such as strong winds) in off-site areas as well. The generation of particulates at construction sites depends on the silt content of the soils being disturbed, the proportion of dry days, operator habits, construction vehicle type and speeds, vehicle weights, and the number of vehicles.

Studies indicate that dust from similar construction activities, including excavation and grading, settles out very quickly and a level of $150\mu\text{g}/\text{m}^3$ will be exceeded at a distance of 50 m, only 2 to 3% of the time (Canadian National Cooperative Highway Research Program).

Particulate emissions will be generated during overburden disturbance as part of the Project construction.

Recommended Mitigation

Specific mitigation required is outlined in the Construction Environmental Management Plan in Appendix A. These measures include:

- The application of dust suppressants such as water, calcium chloride, or tree lignin based dust suppressant on the work sites as required (calcium chloride will not be used on agricultural fields);
- All rock drills are equipped with dust collectors in good working order; and,
- That there will be adequate control of dust at work sites that are in proximity to nearby residences.

Significance of Environmental Effects

The significance of effects on air quality due to overburden disturbance is considered to be minor, as they will be localized, of small magnitude and short duration. No significant adverse environmental effects are likely to occur.

7.1.2 Construction Equipment Operation

Construction equipment produces emissions typical of gas or diesel fuelled vehicles. Generally, emissions may cause occasional nuisance problems on construction sites; however, they do not present significant problems outside the construction site due to their transitory nature. The level of gaseous emissions during construction and the potential effect of these emissions relates to the duration and intensity of the emissions.

Recommended Mitigation

It is recommended that all construction equipment operate with the standard emissions controls that each piece of equipment was originally equipped with. All vehicles shall be maintained in a proper fashion in order to minimize vehicle emissions to the extent possible.

Significance of Environmental Effects

Potential effects due to gaseous emissions during construction are expected to be localized, of limited volume, and of short duration. No significant adverse environmental effects are expected.

7.2 Noise

Construction activities will contribute to an increase in noise levels at the project site and along the pipeline route typical of any roadwork. For the most part this is unavoidable but is relatively short lived for any individual receptor such as along the pipeline route. The construction activities will occur during the daytime hours and should not affect night-time noise levels.

Recommended Mitigation

The major sources of noise will be the excavation equipment and trucks. To prevent excessive noise levels, all contractors will be required to provide working machinery and equipment with noise suppression devices equivalent to original equipment.

In addition BLPC's Project Manager should maintain liaison with the Church Minister to ensure that the construction works are not adversely affecting the activities of the Church and Rectory. If there is a special requirement for Sunday construction work involving heavy equipment, then this should be discussed with the Minister to minimize the effects.

Significance of Environmental Effects

No significant adverse environmental effects from construction related noise are likely with proper implementation of the recommended mitigation measures.

7.3 Beach Environment

As an option for delivery of major pieces of equipment it is proposed to use a roll-on/roll-off barge to ship equipment to the beach at the Arawak Cement Plant. This approach was successfully used during the construction of the cement plant.

The equipment will be offloaded at the port onto the barge and will be ferried to the Arawak beach. The advantage of this mode of transfer is that it allows for higher and wider assemblies to be shipped than is possible to negotiate via the network of roads between the port and the Trents site. This will reduce assembly times, improve schedule and reduce the disruption of traffic during equipment transfers.

The barges will beach and the bow will lower to form a ramp allowing for direct off loading of the equipment. Crane and vehicle access will be required across the beach and loads will be

transported across the Arawak site onto BLPC's Checker Hall site and then on to the road network to the Trents site. The area of beach proposed for offloading will not require dredging of the shoreline.

Reconstruction of the beachhead and road across the beach at Arawak will be required. The roadway will follow the footprint of the prior roadbed installed during construction of the cement plant. No coral will be removed for the installation of the road or beachhead.

Upon completion of the shipments, the road will be removed and the beach restored.

Recommended Mitigation

As the beach has the potential for turtle nesting, the Turtles Study Group of the University of West Indies must be contacted prior to construction to determine if there are any nests that will be affected and arrange for them to be moved.

To minimise the environmental impact and to allow ease of restoration, large boulders will be placed across the short section of the beach to form the roadbed and terminating at the shore to form a beachhead. A cover of rock fill will provide a road surface. This will enable easy removal of the road after completion of the deliveries. The road will follow the footprint of the prior roadway to remain within the disturbed area.

All barging operations should be completed with the utmost care to prevent spills to the marine environment. The following mitigation methods are recommended:

- Prior to any construction, the University of West Indies will be contacted to survey the beach for potential turtle nests and to relocate where possible;
- The access road and beachhead will be constructed using large boulders and rock for easy removal after use;
- Construction of the road and beachhead will be restricted to the footprint of the former roadway;
- Barges will be floated into position at high tide and secured;
- All trucks and equipment will be restricted to the roadway and there will be no equipment allowed on the beach;
- BLPC will have a representative present at all times during equipment offloading;
- Work will stop immediately if conditions are observed that may have an adverse environmental effect; and,
- The roadway will be removed and the beach will be restored to its original condition once shipments are complete.

Significance of Environmental Effects

With careful implementation of the above mitigation methods and supervision of the shipments, no significant adverse environmental effects from construction related to transferring equipment are likely.

7.4 Traffic

The most sensitive issue during construction will be the impacts on traffic during pipeline construction, as the routing west of the Babbs area occurs along existing roads and residential streets. Pipeline routing west of Babbs will take place in an agricultural, less populated area. Due to the size of equipment and the size of the pipeline trench, it will be necessary to modify the existing traffic flows in areas of construction. These modifications may include partial lane closures, full lane closures, and road closures with detours.

The shipment of major equipment from the port or from Arawak beach will require advance planning as components will include oversize loads. For prior BLPC expansions, movements of major equipment have been completed overnight, and that approach has worked well in minimizing disruption of traffic.

The Trents Generating Station will provide 200 - 300 temporary positions during the construction phase of the project. It can be conservatively estimated that 75% (225) of 300 employees will travel to the Project site in individual vehicles, while the remaining employees will carpool or use public transport.

The distribution of construction traffic entering and leaving the site at peak periods can be expected to approximate the current patterns of traffic flows. Based on the current distribution of traffic flow at the four stations shown on Figure 5-11 (four major points of entry to project site area), the proportions of construction traffic flow in either direction supported by the respective roads are estimated as follows:

- To/from Alleyndale - 50%, or 113 vehicles;
- In front of Project site - 15%, or 34 vehicles;
- To/from Sutherlands - 10%, or 22 vehicles; and,
- Trents Road - 25%, or 56 vehicles.

In Table 7-1 below, the expected traffic flows due to commuting construction workers are shown in relation to the corresponding local traffic flow rates during the morning and evening peaks.



Table 7-1 Construction Traffic Effects at Peak Periods

Station # and Traffic Count Location Description		Direction	Current Average Vehicles/Day	Current Average Vehicles/Hour	Expected Peak Times	Current Traffic Counts During Peak Times	Expected Construction Vehicles During Peak Times	Total Estimated Vehicles
1	Travel via Alleyndale	North from Lancaster	2568	107	7-8 am	173	113	286
					5-6 pm	214	0	214
		South from St. Lucy	2841	118	7-8 am	300	0	300
					5-6 pm	200	113	313
2	Travel via O'Neal Hwy, in front of Project Site	East to Project Site	1289	54	7-8 am	38	34	72
					5-6 pm	18	0	18
		West away from Project Site	1365	57	7-8 am	34	0	34
					5-6 pm	33	34	67
3	Travel via Checker Hall Rd. to Sutherlands (near Cement Plant)	Towards Project Site	1055	44	7-8 am	19	22	41
					5-6 pm	28	0	28
		To Sutherlands	1075	45	7-8 am	25	0	25
					5-6 pm	34	22	56
4	Travel via Trents Road near St. Lucy School	South to Church	2973	123	7-8 am	76	56	132
					5-6 pm	55	0	55
		North to School	2563	107	7-8 am	58	0	58
					5-6 pm	48	56	104
TOTAL						1353	450	1803

The traffic contribution from construction workers will increase current traffic counts by approximately 25%. Local traffic typically radiates from the Project site area in the morning, and returns to the area in the evening, whereas construction worker traffic will be travelling in the opposite direction to current traffic patterns.

For example, counts of southbound traffic travelling from St Lucy towards Alleyndale during the morning peak are currently 300 vehicles per hour. Construction traffic travelling southbound will only contribute to the evening peak, resulting in approximately of 313 vehicles per hour. This is marginally above the morning traffic flows and therefore, major impacts to the local traffic patterns during peak flow are not expected.

Recommended Mitigation

Specific mitigation required for traffic management during pipeline construction is outlined in the Construction Environmental Management Plan in Appendix A. These measures include:

- Provide the Ministry of Public Works Traffic Division with the schedule for pipeline construction and possible road closures at least one month in advance so that there will be no conflicts with other road work. The schedule will be updated weekly;
- Prior to commencing pipeline construction, a description of possible road closures and estimated time of closure will be provided to newspapers to ensure the public is aware of the project;
- The public will be provided with advance information on possible road closures through announcements in the newspapers; and,
- Road closures will be posted with detour signs and the detour routes will be fully sign posted throughout to ensure traffic follows the correct routing.

This mitigation will aim to minimise the extent of inconvenience to traffic flow by keeping the public and key agencies informed, and confine traffic restrictions to the shortest time possible.

For movement of major equipment involving oversized loads, all routes should be assessed in advance to determine any constraints that will need to be overcome such as overhead wires and sharp corners. The Ministry of Public Works Traffic Division should be provided with a plan indicating the routing, need for road closure, date, time and duration of the movements.

Significance of Environmental Effects

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.