

CHAPTER 10 STUDY FINDINGS

10.0 FOREWORD

The Penang State Government proposes to build a new Highway that will connect the Gurney Drive area in the northern part of the Island to Bayan Lepas in the south. It will form a second north-south spine road that will provide an alternative to the Tun Dr. Lim Chong Eu (LCE) Expressway which is frequently congested and sometimes crippled by traffic gridlocks. The proposed new highway is known as the **Pan Island Link 1 Highway** or **PIL 1 Highway**.

10.1 PROJECT PROPONENT AND CONSULTANTS

The proponent for the PIL1 Highway Project is the Penang State Government. The Project Delivery Partner is SRS Consortium. The consultant undertaking the Environmental Impact Assessment (EIA) study is Wiranda (M) Sdn. Bhd.

10.2 LEGAL REQUIREMENTS

Based on the PIL1 Highway's associated components (viaducts, tunnels and embankment) and the proposed alignment (which traverse through Penang Hills), the Project falls under "Prescribed Activity 20(c) First Schedule: "Construction of road, tunnel or bridge traversing or adjacent or near to environmentally sensitive areas" and "Prescribed Activity 13(b) Second Schedule: "Construction of road, tunnel or bridge traversing an area with slope greater than or equal to 35⁰" of Subparagraph 3(1) and (4) of the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order, 2015. Hence the PIL1 Project falls under the Second Schedule of the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order, 2015.

Therefore, an EIA report has been prepared for submission to the Department of Environment (DOE) Putrajaya for approval prior to the start of the project development.

10.3 CONFORMANCE WITH THE GOVERNMENT'S DEVELOPMENT PLANS

It has long been recognized that there is a need to improve the existing highway network hierarchy as well as addressing issues related to traffic management including traffic congestion in many areas within the state of Penang (**Figure 10.3.1**). In May 2011, the State Government commissioned a comprehensive integrated study to improve transportation management within the State. Subsequently the “Recommended Penang Transport Master Plan (PTMP) Strategy” was completed and officially launched on 25th March 2013 by the Penang Chief Minister. The PTMP was further rationalized/enhanced and was adopted by the Penang State Exco on 16 Dec 2015.



Figure 10.3.1. Slow Moving Traffic Along Roads in Penang

Amongst its' recommendations, the PTMP has proposed the streamlining of new highways with existing ones to form a series of strategic National, State and District highways that would connect with the National highway network as well as to local destinations including Bayan Lepas, Batu ferringgi, Bukit Mertajam, Kepala batas and Balik Pulau (**Figure 10.3.2**). The Pan Island Link 1 Highway is a new Highway recommended in the enhanced PTMP. Thus it is in line with the State's development plans.

Among the key physical infrastructure initiatives in the 11MP period include concerted measures to enhance connectivity across transport modes and regions by implementing need-based transport infrastructure in the form of “Multimodal Transport Networks” to improve travel efficiency, increase productivity and enhance logistics. This involves the construction of strategic rural-urban highways and rail links to enhance the transportation of goods, people and provision of services. The proposed PIL1 Highway – a needs-based highway to improve road hierarchy in Penang Island and function as a crucial strategic bypass for traffic dispersal on Penang Island, will therefore be in line with the 11MP objectives.



Figure 10.3.2 Strategic Road Network

10.4 PROJECT NEED / STATEMENT OF NEED

The Tun Dr Lim Chong Eu Expressway (LCE) which is the key North-South road on Penang Island currently experiences peak-period congestions, which will worsen in the future according to the traffic volume forecasts summarized in the PTMP. There are only limited opportunities to create more capacity on this expressway due to the surrounding developments. Given that little can be done to improve conditions on the LCE, the solution must be to provide a second North–South spine road that is equipped with well-designed connector ramps/interchanges to improve local and regional traffic circulation.

The PIL 1 Highway will be able to accommodate anticipated potential increase in travel demands from the expansion of the Penang International Airport (as per Budget 2018), future expansion of the Bayan Lepas industrial zone, and increased population from the proposed reclaimed islands in the Southern Coast of Penang Island. It will allow for better traffic dispersal and improve accessibility to various suburban areas along the north-south corridor of Penang Island. It will be constructed as a dual 3–lane purpose built limited access highway that will ensure certainty in speed and travel time over the entire length of the Highway. Thus, it will be able to significantly shorten north–south travel time to only 15 minutes from Gurney Drive to the Penang International Airport compared with the current time of 45 minutes. It would also provide relief to the currently congested north-south roads on eastern Penang Island other than the LCE.

10.5 PROJECT OPTIONS

The project options can be categorized into:

- Alignment Options
- Elevated Structure plus Tunnel vs At-Grade Option
- Tunneling Options
- No-Project Option

Of the three (3) options considered in the selection of the PIL 1 Highway alignment, Option 1 was selected because it is more friendly with lesser social and environmental encumbrances and would be relatively cheaper to construct compared to the other Options. A comprehensive explanation is provided in Chapter 4.

The key factors considered in selecting an Elevated Highway with Tunnels vs. At Grade Highway include the following:

- the availability of land
- ease of construction
- land acquisition
- construction costs
- social impacts
- environmental impacts

The Elevated Highway with Tunnels was the preferred choice since there would be lesser burdens and disadvantages compared to the At-Grade Highway (as explained in Chapter 4). The elevated highway option also full fill the criteria of ensuring certainty in speed and travel time over the entire length of the highway and will be able to significantly shorten north-south travel time to only 15 minutes from Gurney Drive to the airport compared with the current 45 minutes under normal traffic conditions on the Tun Dr Lim Chong Eu Expressway.

The choice of tunnels instead of going over or around the Penang Hills will minimize potential soil erosion and sedimentation problems associated with highway construction along the slopes. The type of tunnel construction method i.e. Drill-and-Blast method for the main tunnel length was also based on the geological characteristics of the rocks in Penang Hill as explained in Chapter 5 and Chapter 6.

Lastly, the PIL1 Project is proposed because it would help to promote economic growth in Penang; it would also, by providing space on the existing roads, allow for improvements to the public transportation system and contribute towards an effective urban transport management plan in the future. The No-Project option will result in deterioration of traffic conditions on the Island. An inefficient transportation system would not be able to facilitate orderly economic growth in Penang.

10.6 PROJECT DESCRIPTION

The overall layout of the proposed PIL 1 Highway is shown in **Figure 7.1.2**.

10.6.1 Project Concept

PIL1 will be a non-tolled highway. The alignment for PIL1 will connect to the Gurney Expressway at the northern part and to the LCE Expressway at the end (southern) part. It will provide a new fast route for people to travel from the Gurney area to Bayan Lepas (and the airport) and to exit Penang Island through the Penang Second Link Highway. PIL 1 will have six interchanges along the highway to provide connectivity with the local roads at key locations viz. the LCE Interchange [IC], Awang IC, Relau IC, Paya Terubong IC, Utama IC and Gurney IC. This will also ease journeys to Tanjung Bungah, Batu Feringgi and other tourism destinations in the north of Penang Island.

10.6.2 Project Components/Activities and Potential Impacts

The PIL1 highway will consist of viaduct (elevated) sections, tunnel sections and an embankment road section. Six Interchanges (IC) will be built along the proposed alignment.

Viaduct and Interchange

The typical viaduct structure consists of the deck slab supported on precast beam, pier cross-head to support the precast beams and pier column to transfer the deck structure load to the foundation system. The foundation shall be constructed by bored piling (which generate lower ground vibrations compared to other piling methods, such as drive-in piling). Therefore, vibration impacts are not expected to cause any damage to nearby buildings and structures. The span of typical viaduct structure vary from 20 m to 40 m long. The shorter beams shall be pre-cast in the Casting Yard and transported to the site whilst the longer beams shall be cast *in-situ*. Where viaduct span need to be > 40 m but less than 180 m, the balanced cantilever box girder will be adopted. To avoid/minimize environmental concerns, a long cable stayed deck bridge with span of 250 m will be constructed in Youth Park (Botanical Gardens/Taman Perbandaran) area (Figure 5.3.2). This approach minimizes site clearing and piling works required within the park compound.

The potential impacts during the construction phase are mainly with respect to traffic flow, air quality, noise, water quality and social impacts. The impacts are expected to be significant in certain sections of the alignment due to the close proximity of residential, educational, religious and business premises, and public park to the alignment, for example along Jalan Bagan Jermal, Jalan Gottlieb, Jalan Paya Terubong (Paya Terubong Interchange) and at Sg. Ara (Taman Jajar).

Near the Kek Lok Si temple in Air Hitam, the highway alignment runs approx. 370 m behind the crematorium laterally and approx. 600 m east of the Air Itam Dam (**Figure 5.3.8**). The low vibration method that will be used to construct the viaduct piers (bored pile) and controlled blasting technique that will be adopted in the tunnel construction is not expected to cause any damage to both entities. The hard granite will not amplify propagation of any vibration over long distances.

The control of soil erosion and sedimentation impacts will be extra important in the Penang Hill area and along Sg. Ara and Sg. Kluang. A comprehensive LD-P2M2/ESCP plan is proposed to counter potential adverse impacts due to soil erosion and sedimentation (Chapter 7 and Chapter 9 [EMP]). Straightening of some sections along Sg. Ara (CH 10,000 to CH 18,000) and river improvements in Sg. Kluang shall be carried out to avoid obstruction to river conveyance (by the viaduct piers), reduce scouring and prevent potential flash flood. These measures has been approved after verification by modelling studies and extensive discussions with JPS Penang. The desktop hydraulic study indicate that the construction of piers in the coastal waters off Sg. Kluang estuary (at the LCE Interchange) could potentially cause erosion along the coast in the area. Some mitigation measures has been recommended to minimize the potential impacts. If needed, hydraulic modelling will be carried out during the detailed design stage to finalized the design of these measures.

The course of acquiring land/property for the Project development and the process to remove squatter houses and fishermen shacks along Sg. Kluang could potentially cause delay to the start of the Project; it is recommended that public engagements and negotiations with the affected parties be carried out early in the project planning stage (Chapter 8).

Six (6) Interchange (IC) will provide connectivity with the local roads in the area. The area of concern is principally at the Paya Terubong IC and Awang IC. This is because the connecting ramps of these ICs, especially at Paya Terubong, extend into populated urban hinterland areas. The connecting ramps at the Paya Terubong IC is an elevated structure that extends up to the junction with the Thien Teik Highway. Moderate to significant social and environmental impacts can be anticipated, mostly with respect to land / property acquisition and nuisance issues (traffic congestion, dust, noise, potential flash flood). Some of these impacts are transient or short term in nature.

The main issues of concern include traffic management, control of air quality, noise level, water quality and public safety. Appropriate mitigation measures are proposed to minimize these potential adverse impacts as discussed in Chapter 8.

Generally, the extent of the impacts will largely depend on the wide ranging Project planning options and the construction methods that will be used. Nonetheless, for every significant potential impact identified, there are adequate mitigation measures which can be adopted to minimize the potential adverse impacts.

Tunnels

The highway alignment through the Penang Hills area from Youth Park to Sg. Ara includes four (4) tunnels sections. The study has shown that the geology in the area consists of granite formation comprising two types of igneous rocks namely, Tanjung Bunga Granite (generally fine grained megacrystic biotite granite) and Batu Maung Granite (medium to coarse grained biotite granite). The granite is overlain by thin alluvium. The tunnels shall be constructed by the Drill and Blast method. This method is suitable given the geological conditions in the project area and has been demonstrated to lessen the environmental impacts (ground vibrations, noise and fly rock) through appropriate blast design. Access roads to the tunnel portals shall be via the local road network. Soil erosion and sedimentation impacts will be more important in the tunnel portal areas. A comprehensive ESCP (LD-P2M2 measures) is proposed to counter adverse impacts due to soil erosion and sedimentation (Chapter 9 EMP).

The Contractor must observe the following rules; it is necessary to obtain valid permits for the Drill and Blast operations from the Royal Malaysian Police and the Department of Minerals and Geoscience. A Rock Blasting Assessment and Method Statement pertaining to the proposed blasting operations must be prepared and submitted to the Department of Minerals and Geoscience for approval. A temporary magazine site is needed for overnight storage of explosives.

Once blasting is carried out, waste rocks and soils shall be transported out of the tunnel before further blasting. It is estimated that about 2,269,431 m³ of rocks will be produced. The rocks shall be temporarily stored at the portal area and subsequently transported to the crusher plant (located in the same area or close-by). The crushed rocks shall be re-used in this project or for other project(s).

A significant issue will be the transportation of biomass and soil wastes. It will add to the traffic flow along the local roads from the tunnel locations to the waste disposal site. To avoid and/or minimize adverse traffic impacts, the Project Proponent/PDP shall prepare a **Site Specific Traffic Management Plan (TMP)** for each work site. The TMPs must be

approved by the Local Authority. Mitigation measures are also presented for other environmental impacts.

Embankment Road

The embankment road is for a short stretch (1.8 km) between Tunnel 3 south portal and Tunnel 4 north portal. This stretch of embankment is proposed due to a shallow undulating section of hills in this area which does not warrant a tunnel or a viaduct. Therefore some cut and fill and abutment works shall be carried out for the construction of the embankment road (**Figure 5.3.11**). A comprehensive ESCP/LD-P2M2 plan is proposed to counter potential adverse impacts due to soil erosion and sedimentation (Chapter 8 and Chapter 9 [EMP]).

The other potential impacts will include effects on air quality, noise, water quality and flash floods due to blockage or diversion of rivers/streams in the area concerned. However, adequate mitigation measures has been proposed to minimize these potential adverse impacts (Chapter 8).

Support Facilities (Batching Plant, Crusher Yard, Casting Yard, Waste Storage, Maintenance Area, Central Labour Quarters [CLQ])

The proposed locations of the Casting Yard, Waste Storage Area, Maintenance Area, and the CLQ are close to residential/business/industrial establishments mainly in the Bayan Lepas area. The sites mostly comprise vacant land lots. If not properly designed and constructed, the operations at these facilities can be expected to cause adverse social and environmental impacts. Nevertheless, the types of impacts anticipated are quite common and many practical effective mitigation measures are available which can be adopted to minimize the potential adverse impacts. They are discussed in Chapter 8.

Traffic

Significant quantities of construction materials and wastes (soil, biomass, demolition and construction wastes) have to be moved during the construction period. This will result in a large number of trucks and other heavy vehicles to ply the public roads over the construction period. Careful planning of transport routes and management of materials during transport will be required to minimize traffic congestion and to ensure public safety. The traffic related issues has been extensively reviewed and highlighted/explained in Chapter 5 and Chapter 7. The emphasis is on control and management of transportation related elements – Site-Specific TMPs (traffic and safety control); Vehicle Control (type of

vehicle, vehicle maintenance, driver training); Routes to/from Destinations (based on approved Work Plan, travel times, speed control, approved waste dump sites); and Regulatory and Permit requirements (load factors, emissions factors, covers over haulage).

10.7 RESIDUAL IMPACTS

Construction Stage

An assessment of the construction practices that are associated with the PIL 1 Project development indicate that it will not induce permanent irreversible adverse environmental impacts. There are adequate mitigation measures which can be adopted to minimize the potential adverse impacts.

Temporary nuisance impacts (mainly due to dust, noise and traffic flow disruptions during peak hours) can be expected due to the close proximity of residential and business premises to the Project alignment, especially along Jalan Bagan Jermal and Jalan Gottlieb, near the Kek Lok Si Temple in Air Itam, near the south portal of Tunnel 4 in Sg. Ara and along Sg. Ara and Sg. Kluang.

Positive residual impacts can be intensified if job opportunities are given to locals who are qualified to participate in the Project development during its' construction period. Service/construction companies operating in the Timur Laut and Barat Daya District can also participate in the Project (construction and maintenance works).

Operations Stage

In general, the EIA study has indicated that the PIL 1 Project shall not induce long term adverse irreversible residual impacts on water quality, air quality and on land resources during normal operations to the extent that a negative shift in current equilibrium status materializes.

However, ambient noise levels may increase slightly along the Highway as the number of vehicles that use the new road increases (discussed in Chapter 7, Section 7.2). It is proposed that effective noise barriers be installed on certain sections (in proximity to NSRs) of the PIL 1 Highway to attenuate the noise levels. Consequently, property values may remain stagnant or drop slightly for some types of premises over the long term.

10.8 INCIDENT MANAGEMENT / EMERGENCY RESPONSE PLAN (ERP)

The Project Proponent (PP) must develop and implement an emergency plan for protecting employees and road users on the PIL 1 Highway. The Engineering Services section in MBPP may take the lead in the coordination and performance of the Emergency Response Plan. A summary of the steps for developing the Emergency Response Plan is presented below.

The types of emergencies normally range from - motorists trapped in vehicles, medical emergencies, vehicle break downs - to low frequency, high impact incidents (tunnel fires). Nonetheless, considerations should also be made for unregulated transport of highly dangerous goods such as liquefied natural gas, and tank trucks carrying oxidizers and illegal hazardous materials, etc.

The emergency responders may include the PP and public agency staffs (fire, medical and law enforcement groups). The responders must have strategic objectives, i.e. a prioritized order of what needs to be accomplished. (The acronym LIPEC is commonly used for this purpose i.e Life Safety, Incident Stabilization, Property Conservation, Environment protection and Crime scene preservation).

A summary of the steps for developing the emergency response plan is presented below:

1. Review performance objectives for the ERP.
2. Review hazard or threat scenarios identified during the risk assessment.
3. Assess the availability and capabilities of resources for incident stabilization including people, systems and equipment available.
4. Talk with public emergency services (e.g., fire, police and emergency medical services) to determine their response time to the PIL1 facility, knowledge of the PIL1 facility and its hazards and their capabilities to stabilize an emergency at the PIL1 site.
5. Determine if there are any regulations pertaining to emergency planning for the PIL1 facility; address applicable regulations in the plan (if necessary).
6. Develop hazard and threat-specific emergency procedures using guidance from expert consultant(s).

7. Coordinate emergency planning with public emergency services to stabilize incidents involving the PIL1 highway.
8. Facilitate exercises to practice the plan.

10.9 EMP AND ENVIRONMENTAL MONITORING

A conceptual Environmental Management Plan (EMP) and Environmental Monitoring Programme has been formulated and documented in Chapter 9. The principles of Environmental Mainstreaming shall also be adopted and included in the EMS. Since this Project development involve activities which would cause some land disturbance, the LD-P2M2 document shall be used as a guide for managing the potential impacts and instituting control measures for soil erosion and sedimentation.

The focus of the implementation is to monitor the actual impacts that could materialise during the construction and operation stages of this Project, and henceforth to undertake corrective action(s) as and when required, thereby ensuring minimal adverse impacts on the local and regional environment.

The monitoring programme focuses on monitoring air quality, water quality and noise impacts. Identified points for setting up the Monitoring Stations has been included. In addition the parameters that should be monitored, and the frequency of monitoring, have also been described.

10.10 KEY RECOMMENDATIONS

1. During the Project's construction stage, which is scheduled to take 5 years to complete, special attention shall be given to protect residents living close to the Project alignment and the Project work sites from being exposed to adverse dust and noise impacts and to safety concerns. Close monitoring and supervision in the Project work sites is essential.
2. Each section in the PIL1 highway alignment (Section A, Section B, Section C – **Figure 7.1.2**) shall be provided with a competent Environmental Officer (EO) during the Project construction phase. The EO shall monitor the work sites to ensure compliance with all regulatory requirements, Conditions of Approval (from the DOE), permit requirements, EMP conditions and adherence to Good Work

Practices. The EO shall report to the Project Proponent/PDP and implement corrective / remedial measures whenever and wherever necessary.

3. Each section in the PIL1 Road alignment (Section A, Section B, Section C – **Figure 7.1.2**) shall be provided with a competent Safety & Health Supervisor. He shall monitor the work sites to ensure compliance with all safety and health requirements. The Safety & Health Supervisor shall report to the Project Proponent/PDP and implement corrective / remedial measures whenever and wherever necessary.
4. The Drill & Blast operations for the tunnelling works shall comply with all regulatory requirements and guidelines. Proper records shall be kept and maintained. Safety and Compliance audits must be carried out at intervals as recommended by the DOE Penang and other agencies (JMG, Police, DOSH).
5. The work sites shall be fogged regularly (once every week) to control/prevent the occurrence of vector borne diseases e.g. dengue fever. Housekeeping practices in the work sites and at the CLQ shall rid the area of places that allow the disease vector(s) to breed.
6. During the operational stage, the PIL1 Highway is not expected to impact negatively on the environmental components in the vicinity of the Highway except for marginal increases in noise levels. It is recommended that effective noise barriers be installed on specific sections (in close proximity to NSRs) of the highway alignment to reduce annoyance impacts to the sensitive receptors. The type of barrier selected shall be based on its' effectiveness as well as preserving the aesthetics of the local environment.
7. Potential adverse impacts on air quality (dust), water quality, noise and vibration level, and traffic flow are anticipated to be temporary in nature i.e. during the Projects' construction phase. Nonetheless, since the construction period in specific sections of the alignment may be for an extended length of time (6 months – 5 years), the Project Proponent shall implement all of the mitigation measures mentioned in this EIA report, as far as practicable, to lessen inconveniences to the public.
8. The social survey carried out for the Project has shown that there is a fair level of social acceptability for the project. Nonetheless, it is important to continuously monitor the public's concerns of the environmental impacts and the effectiveness

and efficiency of the mitigation measures that has been planned and implemented, especially for communities living in the vicinity of the project work area(s). It is important that an avenue for consultation and dialogue be made available between all stakeholders and the project developer. A PIL1 Information Centre (**PIC**) with a Coordination Committee shall be established for this Project prior to the construction phase to handle public concerns and complaints concerning the project development activities. During the operations stage, any complaints concerning or on the highway goes to MBPP.

9. The Project Proponent/PDP may call for meetings on a regular basis and on a need basis. An integral part of the meetings shall be to discuss the project development schedule, safety concerns, hear out issues of public concern, regulatory compliance issues, etc. Proper records of these meetings must be kept and maintained. Copies of the proceedings should be disseminated to relevant parties for their scrutiny and to execute improvements (wherever and whenever required).
10. The Contractor for the PIL1 Project shall draw up pragmatic Work Plans and work schedules and adhere to specific timelines and construction targets. The work plans shall be approved by the Project Proponent/PDP and shall be verified on the ground. This would minimize the duration of any temporary adverse impacts on sensitive receptors in the Project work sites.
11. The ESCP/LD-P2M2 and EMP control measures shall be implemented, monitored and maintained by qualified personnel. Audits of the environmental control measures shall be carried out at quarterly intervals and reported to the Project Proponent/PDP and the DOE Penang.
12. All equipment and machinery should be adequately maintained on a scheduled basis, especially the tunnel ventilation system. In the event of an abnormal operation occurring, emergency maintenance crews must be in place to offset potential encumbrances. A high level of preparedness to trouble-shoot abnormal operations is required to be instilled in the minds of the highway operator.
13. The Works Package Contractor must acquire the relevant permits (from the Police and the JMG) to store explosives and to carry out Drilling and Blasting operations for the tunnelling works under expert supervision. Qualified and competent personnel must be employed for these operations.

14. A professional geologist shall be engaged to verify the alignment for the tunnels especially in areas where fault lines exist in order to ensure its' safety and appropriateness of the construction method(s).
15. A comprehensive Environmental Management Plan and Emergency Response Plan must be prepared by the Project Proponent/PDP, taking into account the relatively sensitive environmental receptors located in the vicinity of the PIL1 Highway alignment. This will provide adequate guidance to the Highway Operator to provide a service that will be accepted and appreciated by the local community, in the context that it protects their safety, health and wellbeing as well as other users of the highway.

10.11 CONCLUSIONS

Experience in many countries has shown that *Roads – Highways - Residential Developments* can be compatible, provided that real and imagined adverse environmental impacts are recognized and controlled.

Potential problems which can arise are usually related to adverse impacts on water quality (due to erosion and sedimentation), air quality, noise and visual intrusion. The magnitude and duration of such problems varies and is dependent upon a number of factors including Project Design, operational efficiency, socio-economic level of the population and an individual's degree of adaptation to the particular stimulus produced by the proposed new highway. The latter factor is important since observations show that if a stimulus is constant, the response to it generally becomes weaker with time.

The proposed development of the PIL1 Highway in Penang Island has been subjected to an Environmental Impact Assessment (Schedule 2) Study. The findings of this Study indicate that, for the most part, the construction and subsequent operation and maintenance of the proposed PIL 1 Project is not expected to impose any irreversible adverse residual environmental impacts on the surrounding environmental resources and human habitats.

Its' acceptability based on environmental grounds has been verified, subject to reliable adoption and implementation of identified mitigation and abatement measures. It is important that the Project Proponent maintain and operate the PIL 1 Highway in an optimum and efficient manner in order to realize all of the projected benefits that has been estimated.



It is important that a Coordination Committee (to handle Public Relations-Awareness-Communication) be set-up in the PIL1 Information Centre (PIC) for this Project during the construction phase and that this programme be continued during the operational life of the Project. This will pacify negative perceptions which the public could have on this Project, and provide pragmatic solutions to any complaints raised by the public.