

**A. PROJECT DESCRIPTION**

**Project Information**

|                    |   |
|--------------------|---|
| Project Name       | <b>South Luzon Expressway (SLEX) Phase II Toll Road 4 (TR4) Project</b>   |
| Location & Area    | Calamba City, Laguna<br>Sto. Tomas, Batangas<br>Alaminos, Laguna<br>San Pablo City, Laguna<br>Tiaong, Quezon<br>Candelaria, Quezon<br>Sariaya, Quezon<br>Tayabas City, Quezon |
| Project Size/Scale | Construction and operation of an expressway and associated facilities with total length of 56.862 kilometers  |
| Project Life       | 35 years of concession period   |
| Project Proponent  | South Luzon Tollway Corporation (SLTC)  |

**Proposed Realignment**

An Environmental Compliance Certificate (ECC) has been issued for the project on July 11, 2014. However, the project is still at pre-construction phase particularly at the stage of finalizing the covered area for the negotiation and acquisition of the right-of-ways. This is due to the proposed TR4 realignment upon evaluation of the factors that surfaced during the parcellary survey such as the existing land cover / land use, general topography or terrain, communities/people to be affected, accessibility, etc. In particular, the final design will include the realignment of Sections TR4-A and TR4-E as presented below.

**Features of the Proposed Realignment**

| <b>TR4 Sections</b> | <b>Features of Realignment</b>   |
|---------------------|--|
| TR4-A               | To avoid the MakBan production well underneath the initially-designed TR4 alignment.                   |
|                     | Quite far from the foot slope of Mt. Makiling  |
|                     | Less built-up areas to be affected   |
|                     | More accessible  |
| TR4-B               | <i>No proposed change in the alignment</i>   |
| TR4-C               | <i>No proposed change in the alignment</i>   |
| TR4-D               | <i>No proposed change in the alignment</i>   |
| TR4-E               | Request of the general public to transfer the road alignment to the northern side of the national road |
|                     | Less built-up areas to be affected   |
|                     | Less disturbance to the traffic flow at the existing roads   |

The TR4-A will be shifted on the southern part and will be located at 15 barangays instead of the initial 16 barangays in Calamba City and Sto. Tomas, Batangas. The final location will be traversing mostly agricultural lands or brushlands, and nearer to the highway but farther away from the buffer zone of Mt.



Makiling. On the other hand, the TR4-E will be shifted at the northern side of Daang Maharlika which is nearer at the footslope of Mt. Banahaw. Just like TR4-A, the new location is comprised mostly of farms and brushlands with slight built-up areas in the vicinity.

The Project will be implemented in two (2) phases: Phase I covering TR4-A to TR4-C or from Sto. Tomas, Batangas to Tiaong, Quezon; and, Phase II at TR4-D to TR4-E from Tiaong, Quezon to Tayabas City.

## **Technology Selection / Operation Processes**

- Both horizontal and vertical alignments are designed to minimize the demolition of buildings and land acquisition. Overpass at the intersections with national roads, barangay roads and farm crossing have been based on the actual site conditions. TR4 is passing over and sometimes passing below these roads. The clearance above roadway is generally 5.20 m and 6.80 m above railways.
- The center line of the TR4 alignment was established such that it minimizes the cut and fill works and the land acquisition by reducing the median similar to TR3.
- The alignment has been designed to avoid disturbance to industrial areas in the Municipality of Sto. Tomas by locating it in agricultural lands or brushlands. This will also avoid increasing air pollution in the industrial area due to the fuel combustion of vehicles using the TR4.
- TR4 starts at Sta. 54+393.48 of TR3. The alignment bends to the southeast through a buffer zone between the light industry area and the protected zone of Mount Makiling. The alignment continues up to Brgy. San Pablo, Sto. Tomas, Batangas then shifting slightly to the east due to the presence of industrial buildings and the road to Makban Geothermal. This will minimize the increase of air pollution in the industrial areas and incompatibility with the existing land use.
- The TR4 alignment at the intersection in Alaminos, Laguna and the national road is designed to avoid the double crossing on the barangay road and away from Malaking Tubig River. The TR4 alignment is set away from Malaking Tubig River so that it will not serve as obstruction in conducting activities in the area particularly during calamities and typhoons.
- TR4 alignment in Makban has the characteristics of a mountainous area with several valleys and steep slopes. Hence, the design standards used are those applicable to such terrain conditions. However, the alignment from San Pablo City, Laguna to Candelaria, Quezon follows the standards for rolling terrain while flat terrain from Sariaya to Tayabas City, Quezon. The design standards to be implemented will minimize the waste generation particularly during construction and positioned the TR4 alignment visually compatible with the vicinity.
- The alignment is modified to pass between an existing road and its adjacent creek to avoid the Ayala Greenfield Golf and Leisure Club located at Barangay Saimsim, Calamba City, Laguna.
- The alignment at Makban, Sto. Tomas, Batangas passes through mountainous terrain. Vertical crest curves are designed to provide the required stopping sight distance rather than overtaking sight distance. This also allows minimum length of the curves, hence the volumes of earthworks. Allowing the sight distances to the barest minimum will result in cut earth materials during construction. However, this approach will require the carriageway lane marking to indicate a no overtaking signage and similar appropriate signages. This will entail an added cost but will ensure the safety of motorists during its operation.
- Alignment from San Pablo City to Tiaong is designed taking into consideration the maximum flood level of the rivers, the topography of the barangay, farm roads crossings, and the existing railways. This will prevent inducement of flooding due to the presence of the TR4 alignment.

The proposed location and design of the TR4 alignment will minimize the waste generation, particularly from the demolition of existing structures and ground excavation during construction. It will also prevent



the potential increase in air pollution during operation by locating the TR4 alignment farther away from industrial areas. The project will be patronizing the local suppliers for the raw materials to be used during construction. Coordination with the local water and power suppliers will be prioritized for the provision of the project requirements. The operation of electric generators and usage of surface water/groundwater will be limited in the mountainous areas wherein there are no existing supply.

## **Summary of Alternatives**

Initially, the alignment will be affecting approx. 5.0 hectares (has.) of a golf course in Calamba City. The final design has shifted the alignment to the existing concrete road and its adjacent creek to avoid the impacts on the golf course. The creek is very wide and very deep wherein the alternative will be constrained by the required design standards. The length of girders and column (posts) will prohibit safe and sound construction of the bridge which entails high additional cost. Thus, this would necessitate the construction of a 640 meter long viaduct crossing the creek.

The initial design did not include the San Pablo Interchange but the result of *2012 Traffic Demand and Revenue Forecast* shows a better traffic flow in case that it will be included in the alignment of TR4. The project will provide better and extensive services if the San Pablo interchange will be provided since San Pablo City is a major destination point. Thus, the proposed realignment will have the San Pablo Interchange as one of its major components.

During operation, the project will not require extensive resources such as food, water, electricity, fuel and other amenities since its requirements is minimal and will be limited at the tollways and interchanges. The resource requirements at the tollways and interchanges could be easily provided or sourced from the local suppliers.

The supplies and materials, water, fuel and power requirements during construction are quite extensive. The contractors will be responsible in providing the manpower and their required amenities, construction supplies and materials, water, power, fuel, etc. The contractors could prioritize the local dealers and/or service providers to supply their requirements. This will minimize the project impacts since the local service providers have already existing environmental measures as part of their operation.

On the other hand, the contractors could also opt to utilize the river/s for the water requirements during construction activities. They could apply for *Water Permit* from NWRB for the use of the streamflow at the river/s adjacent to their construction sites. Considering the current usage of the rivers along and/or crossing the TR4 alignment, its possible use for the project will have minimal impact. In addition, the contractors could prioritize the services of the local power supplier. The use of standby generators could be limited during emergency such as brownouts and in areas not accessible by the existing electric transmission lines. This will minimize the air emission due to the burning of fuels.

## **B. PROJECT LOCATION**

The TR4 will interface with the existing SLEX Phase I in Calamba City, Laguna and ends in Tayabas City, Quezon. The TR4 with a total length of 56.862 km is subdivided into five (5) sections and traverses a total of 45 barangays in the Provinces of Batangas, Laguna and Quezon.

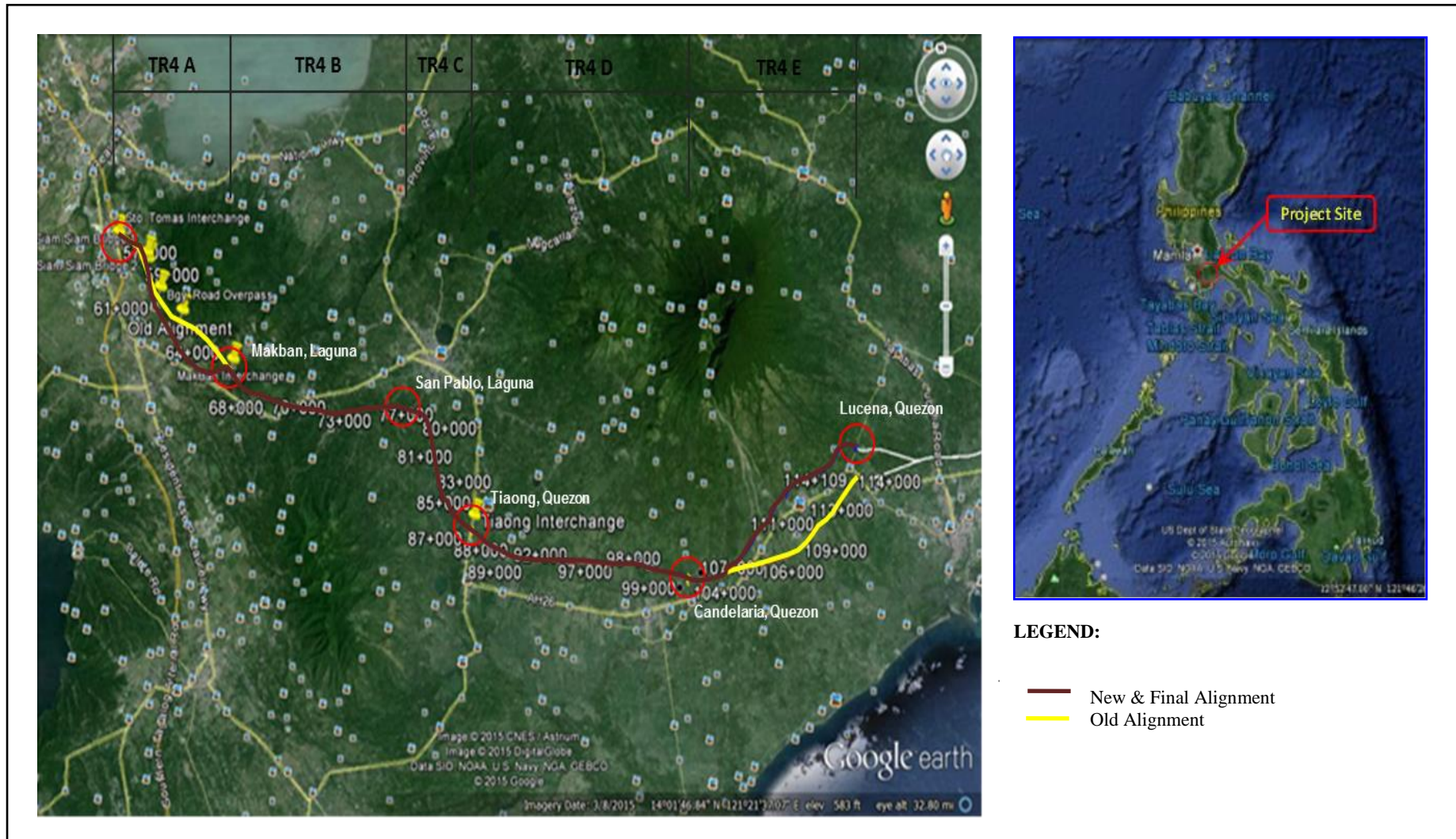
The start of the TR4-A is accessible from the existing South Luzon Expressway (TR3) and its end along the MakBan Road. The other road sections from TR4-B to TR4-E are mostly accessible thru the Maharlika highways at the proposed interchange locations and local roads along Batangas, Laguna, and Quezon. Access to the project is also possible thru some local provincial, municipal and barangay roads that it will be crossing particularly from TR4-B to TR4-E.

The proposed alignment will enclose an easement or road right-of-way (RROW) limits of 60 meters across. The alignment could be adjusted during the detailed engineering design to account for minor geometric realignment. The project involves only the main alignment of the TR4 since all its access roads will be provided and/or under the responsibility of the Department of Public Works and Highways (DPWH).





TR4 Alignment



LEGEND:

- New & Final Alignment
- Old Alignment

# EIS (Environmental Impact Statement) Summary for the Public - ESP

*EIS of SLEX Phase 2 TR4 Project*

## Location and Major Components of TR4

| TR4 Segment          | TR4 A            |             | TR4 B               |                | TR4 C               |                | TR4 D               |             | TR4 E               |             | Total         |               |    |
|----------------------|------------------|-------------|---------------------|----------------|---------------------|----------------|---------------------|-------------|---------------------|-------------|---------------|---------------|----|
| Location             | No. of Barangays |             |                     |                |                     |                |                     |             |                     |             |               |               |    |
|                      | Initial          | Realignment | Initial             | Realignment    | Initial             | Realignment    | Initial             | Realignment | Initial             | Realignment | Initial       | Realignment   |    |
| Calamba City         | 2                | 2           |                     |                |                     |                |                     |             |                     |             |               | 2             | 2  |
| Sto. Tomas, Batangas | 12               | 11          |                     |                |                     |                |                     |             |                     |             |               | 12            | 11 |
| Alaminos, Laguna     | 2                | 2           | 5 <sup>a</sup>      | 5 <sup>a</sup> |                     |                |                     |             |                     |             |               | 6             | 6  |
| San Pablo City       |                  |             | 2                   | 3              | 6 <sup>a</sup>      | 7 <sup>a</sup> |                     |             |                     |             |               | 7             | 9  |
| Tiaong Quezon        |                  |             |                     |                | 1                   | 1              | 4                   | 3           |                     |             |               | 5             | 4  |
| Candelaria, Quezon   |                  |             |                     |                |                     |                | 2                   | 3           | 4                   | 1           |               | 6             | 4  |
| Sariaya, Quezon      |                  |             |                     |                |                     |                |                     |             | 7                   | 7           |               | 7             | 7  |
| Tayabas City         |                  |             |                     |                |                     |                |                     |             | 2                   | 2           |               | 2             | 2  |
| <b>Grand Total</b>   |                  |             |                     |                |                     |                |                     |             |                     |             | <b>47</b>     | <b>45</b>     |    |
| Major Components     | Initial          | Realignment | Initial             | Realignment    | Initial             | Realignment    | Initial             | Realignment | Initial             | Realignment | Initial       | Realignment   |    |
| a) Length (km)       | 10.05            | 11.318      | 19.663 <sup>b</sup> | 12.117         | 19.663 <sup>b</sup> | 7.497          | 27.612 <sup>b</sup> | 15.00       | 27.612 <sup>b</sup> | 10.93       | <b>57.325</b> | <b>56.862</b> |    |
| b) Bridges           | 2                | 3           | 2                   | 5              | -                   | 2              | 2                   | 3           | 2                   | 3           | 8             | 16            |    |
| c) Underpasses       | -                | 8           | 5                   | 6              | 3                   | 7              | 2                   | 4           | 1                   | 2           | 11            | 27            |    |
| d) Overpasses        | 4                | 2           | 3                   | 4              | 4                   | -              | 10                  | 13          | 6                   | 7           | 27            | 26            |    |
| e) Interchanges      | 1                | 2           | 1                   | 1              | 1                   | 1              | 1                   | 1           | 1                   | 2           | 5             | 7             |    |
| f) Toll Plaza        | 1                | 1           | 1                   | 1              | 1                   | 1              | 1                   | 1           | 1                   | 2           | 5             | 6             |    |

Notes: <sup>a</sup> - indicates 1 barangay also included in the previous TR4 Segment

<sup>b</sup> - Total length of two TR4 Segments



**C. PROJECT SCHEDULE**

| STAGES   | DURATION      | TIMELINE         |                | 2012       | 2013       | 2014      | 2015             | 2016      | 2017       | 2018 | 2019 | 2020         | 2021 | 2022 |
|--|---------------|------------------|----------------|------------|------------|-----------|------------------|-----------|------------|------|------|--------------|------|------|
|  |               | FROM             | TO             |            |            |           |                  |           |            |      |      |              |      |      |
| <b>TRB Evaluation &amp; Approval</b>                                     | 5 mos.        | 01-Jan-12        | 01-Jun-13      | [Blue bar] |            |           |                  |           |            |      |      |              |      |      |
| <b>Detailed Design</b>   | 14 mos.       | 01-Sep-13        | 31-Dec-14      |            | [Blue bar] | [Red bar] |                  |           |            |      |      |              |      |      |
| <b>Parcellary Survey &amp; Plan (including revision of interchanges)</b> | 18 mos.       | 01-Jul-13        | 30-Jun-16      |            | [Blue bar] | [Red bar] | [Red bar]        | [Red bar] |            |      |      |              |      |      |
| <b>Issuance ECC</b>  | 18 mos.       |                  | 14-Jul-14      |            | [Blue bar] | [Red bar] | [Yellow diamond] |           |            |      |      |              |      |      |
| <b>Right of Way Acquisition</b>  |               |                  |                |            |            |           |                  |           |            |      |      |              |      |      |
| TR4A (Sto Tomas-Makban)  | 12 mos.6 mos. | 01-Jul-17        | 23-Dec-18      |            |            |           |                  |           | [Blue bar] |      |      |              |      |      |
| TR4B (Makban-San Pablo)  | 12 mos.       | 28-Dec-17        | 23-Dec-18      |            |            |           |                  |           | [Blue bar] |      |      |              |      |      |
| TR4C (San Pablo-Tiaong)  | 9 mos.        | 26-Jun-18        | 23-Mar-19      |            |            |           |                  |           | [Blue bar] |      |      |              |      |      |
| TR4D (Tiaong-Candelaria)   | 9 mos.        | 25-Aug-18        | 22-May-19      |            |            |           |                  |           | [Blue bar] |      |      |              |      |      |
| TR4E (Candelaria-Lucena)   | 9 mos.        | 23-Dec-18        | 19-Sep-19      |            |            |           |                  |           | [Blue bar] |      |      |              |      |      |
| <b>Construction</b>  |               |                  |                |            |            |           |                  |           |            |      |      |              |      |      |
| TR4A (Sto Tomas-Makban)  | 15 mos.       | 01-Feb-19        | 26-Apr-20      |            |            |           |                  |           | [Blue bar] |      |      |              |      |      |
| TR4B (Makban-San Pablo)  | 18 mos.       | 01-Sep-18        | 23-Feb-20      |            |            |           |                  |           | [Blue bar] |      |      |              |      |      |
| TR4C (San Pablo-Tiaong)  | 12 mos.       | 29-Oct-19        | 23-Oct-20      |            |            |           |                  |           | [Blue bar] |      |      |              |      |      |
| TR4D (Tiaong-Candelaria)   | 18 mos.       | 25-Jul-20        | 16-Jan-22      |            |            |           |                  |           | [Blue bar] |      |      |              |      |      |
| TR4E (Candelaria-Lucena)   | 15 mos.       | 21-Apr-21        | 15-Jul-22      |            |            |           |                  |           | [Blue bar] |      |      |              |      |      |
| <b>Operation (after completion of Section C)</b>                         |               | <b>24-Oct-20</b> | <b>onwards</b> |            |            |           |                  |           |            |      |      | [Blue arrow] |      |      |



**D. IMPACT AREA**

The direct and indirect impact areas of the project are determined based on *Annex 2-2* of the Revised Procedural Manual of DENR AO 2003-30. The direct impact area refers to the area covered by the road alignment and its road right-of-way limits of 60 meters. It also covers all related support facilities that includes areas to be utilized during construction, such as contractor’s field/site facility areas, concrete batching plants and other temporary facilities. The direct impact area (DIA) is represented primarily by the road alignment. The indirect impact area (IIA) during construction phase will cover the barangays and the city / town center wherein the TR4 project will be located. During operation, a wider coverage of impact area is projected emanating from the National Capital Region (NCR) down south to Mindanao that will be utilizing the project as a transport route.

**E. POTENTIAL IMPACTS**

The key physical environmental aspects and potential impacts are identified and tabulated by project phases, as follows:

| Project Phase / Environmental Aspect   | Key Environmental Aspects / Potential Impacts   |
|--|---|
| <b>I. CONSTRUCTION PHASE</b>   |   |
| <b>A. The Land</b>   |   |
| 1) Land Use  | Change/Inconsistency in land use  |
| 2) Geology<br><i>Surface Landform/Topography/<br/>Terrain/Slope</i>  | Induce mass movement such as landslide, creeps, etc.                                    |
| 3) Geohazards<br><i>Geohazards such as ground acceleration, settlement, lateral spread, and liquefaction</i> | Structure failure with potential risk to people and property                            |
| 4) Pedology  | Soil erosion  |
| 5) Terrestrial biology   | Vegetation removal and subsequent loss of animal habitat                                |
| <b>B. The Water</b>  |   |
| 1) Hydrology/ Hydrogeology   | Change in drainage morphology   |
|  | Change in stream depth  |
|  | Reduction in stream volumetric flow   |
|  | Inducement of flooding  |
| 2) Water Quality   | Water pollution   |
| 3) Freshwater Ecology  | Siltation of freshwater bodies reducing the growth and development of aquatic organisms |
|  | High volume of organic materials in freshwater bodies may result in eutrophication      |
| <b>C. The Air</b>  |   |
| 1) Meteorology<br><i>Change in local micro-climate</i>   | Increase in local temperature due to vegetation removal                                 |
| 2) Ambient Air Quality   | Increase in fugitive dust   |

# **EIS (Environmental Impact Statement) Summary for the Public - ESP**

*EIS of SLEX Phase 2 TR4 Project*

| Project Phase / Environmental Aspect                 | Key Environmental Aspects / Potential Impacts  |
|--|--|
|  | Gaseous emission from fuel-burning equipment   |
|  | Air pollution due to SO <sub>2</sub> , NO <sub>2</sub> , CO, and TSP emissions from vehicles and heavy equipment   |
| 3) Ambient Sound Levels                              | Increase in ambient noise level  |
| <b>D. The People</b>                                 |  |
| 1) Acquisition of RROW                               | Possible tenurial / land issue   |
|  | Displacement of settlers, properties, conflict with land ownership   |
|  | Cultural / Lifestyle Change due to relocation  |
| 2) Site Selection                                    | Change in physical resources   |
| 3) Relocation of Affected Households                 | Threat on food security from loss of economic opportunities and assets   |
| 4) Manpower Requirement for the Project Construction | In-migration   |
|  | Resource competition   |
| 5) Health and Safety                                 | Threat to public health and safety   |
| 6) Expected Local Benefits                           | Opportunities for employment   |
|  | Income generation opportunities  |
| 7) Traffic Condition                                 | Disturbance to travellers particularly at MakBan road and barangay roads that connect to Maharlika highway which will be used as access roads to the project |
| <b>II. OPERATION AND MAINTENANCE PHASE</b>           |  |
| <b>A. The Land</b>                                   |  |
| 1) Terrestrial Biology                               | Effects of air emissions and noise on terrestrial flora & fauna  |
| <b>B. The Water</b>                                  |  |
| 1) Hydrology   | Change in drainage morphology  |
|  | Change in stream depth   |
|  | Reduction in stream volumetric flow  |
| 2) Water Quality                                     | Sedimentation of water bodies  |
|  | Water pollution  |
| <b>C. The Air</b>                                    |  |
| 1) Change in the Local Micro-Climate                 | Increase in local temperature due to presence of road and its operation  |





| Project Phase / Environmental Aspect | Key Environmental Aspects / Potential Impacts                    |
|--------------------------------------|--|
| 2) Air quality                       | Gaseous emission from fuel-burning equipment                     |
|                                      | Noise generation from vehicular movement along the TR4 alignment |
| <b>D. The People</b>                 |  |
| 1) Project Operation                 | Change in physical resources                                     |
| 2) Manpower Requirement              | In-migration   |
|                                      | Resource competition   |
| 3) Health and Safety                 | Threat to public health and safety                               |
| 4) Safety                            | Traffic accidents  |

**F. SUMMARY OF RISKS AND UNCERTAINTIES**

The project is not expected to present significant impacts or risks to the land, air and water components. The MGB identified geologic hazards such as fault lines, volcanic eruptions and landslides are quite far and are not expected to significantly affect the alignment. The result of geotechnical investigations will be considered in the detailed engineering design for the proposed alignment. The vegetation in the area consists of common species of plants and trees. Although 14 species are listed in the *IUCN Redlist of Threatened Species*, none is cited in DAO 2007-01 or *National List of Threatened Plants and Wildlife Species*.

The project location is not a flood-prone area except for a few sections experiencing localized flooding. The flood-prone areas will be considered like incorporating the maximum flood level of the rivers along San Pablo City to Tiaong, Quezon in the parameters for the road design. In general, the project operation will have minimal impact on the air quality in the area. During construction, the contractors will be regularly monitored regarding its compliance and implementation of environmental measures to minimize negative impacts on the air quality.

The major concern of the project is the acquisition of RROW resulting to dislocation of affected persons / families; loss of livelihood, structures and properties; and, threat or uncertainty of resulting economic well-being. However, the acquisition of the RROW is the responsibility of the DPWH since this public utility is a project of the national government which is only being contracted to SLTC. The SLTC has just completed the Resettlement Action Plan (RAP) that will be used by DPWH in the RROW acquisition for the project. The RAP presents the Resettlement Policy Framework (RPF) that defines the objectives, principles and eligibility criteria for Project-Affected- Persons (PAPs), entitlements, legal and institutional framework, and modes of compensation. It also specifies the participation and consultation procedures and grievance redress mechanisms that will be employed to compensate, resettle and rehabilitate the living standards of PAPs.

**G. FOR FURTHER INFORMATION**

Further information could be requested from the following Contact Persons:

|                 |   |
|-----------------|---|
| Contact Persons | <p><b>Engr. Thelma D. Mahinay</b></p> <hr/> South Luzon Tollway Corporation (SLTC)<br>Km 44 SLEX, Sitio Latian<br>Brgy. Mapagong<br>Calamba City, Laguna<br>e-mail: <a href="mailto:thelma.mahinay@sltc.ph">thelma.mahinay@sltc.ph</a><br>(63 2) 584-4608 |
|-----------------|---|



## **EIS (*Environmental Impact Statement*) Summary for the Public - ESP**

*EIS of SLEX Phase 2 TR4 Project*

|  |   |
|--|---|
|  | <p><b>Ms. Belen N. Gacad</b><br/>Managing Director<br/>No. 1-A F. Sevilla St., Brgy. Pedro Cruz,<br/>San Juan City, Metro Manila<br/>e-mail: <a href="mailto:bngacad@yahoo.com">bngacad@yahoo.com</a></p> |
|--|---|