



# CERTIFICATION AND FINANCING PROPOSAL

## BASIC ENVIRONMENTAL INFRASTRUCTURE PROJECT NUEVO LAREDO, TAMAULIPAS

*Submitted: June 11, 2012*

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**NUEVO LAREDO, TAMAULIPAS**

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## EXECUTIVE SUMMARY

### BASIC ENVIRONMENTAL INFRASTRUCTURE PROJECT NUEVO LAREDO, TAMAULIPAS

<b>Project:</b>	The proposed project consists of constructing basic infrastructure for water and wastewater systems, storm drainage, street paving and other roadway improvements in Nuevo Laredo, Tamaulipas (the “Project”).
<b>Project Objective:</b>	The purpose of the Project is to increase access to basic water and wastewater services in unserved areas, reduce exposure to untreated wastewater discharges, improve storm water management infrastructure, increase street paving coverage and improve roadway infrastructure to promote efficient urban mobility.
<b>Expected Project Outcomes:</b>	<p>The Project is expected to generate environmental and human health benefits related to the following project outcomes:</p> <ul style="list-style-type: none"><li>• Water system improvements will increase potable water service coverage by making it possible for an estimated 1,024 households to connect to the water system in areas currently lacking service.</li><li>• Wastewater system improvements will increase wastewater collection coverage by making it possible for an estimated 5,116 households to connect to the sewer system in areas currently lacking service. Once all of these connections are installed an estimated 45.5 liters per second (lps) or 1.04 million gallons a day (mgd) of wastewater will be collected and treated.</li><li>• Storm drainage improvements will reduce the risk of flooding within the city.</li><li>• Paving and roadway improvements are expected to contribute to the reduction of 265.4 metric tons/year of PM<sub>10</sub>, while better mobility and less congestion will help reduce vehicle emissions, including an estimated 249.6 metric tons/year of volatile organic compound (VOC) emissions, 652.1 metric tons/year of carbon monoxide (CO) emissions and 253.0 metric tons/year of nitrogen oxides (NOx).</li></ul>
<b>Population Benefitted:</b>	384,033 residents of Nuevo Laredo, Tamaulipas.
<b>Sponsor:</b>	Municipality of Nuevo Laredo, Tamaulipas.

**Borrower:** Municipality of Nuevo Laredo, Tamaulipas.

**Project Cost:** Up to \$468.9 million pesos (US\$ 35.5 million).<sup>1</sup>

**Loan Amount:** Up to \$175.0 million pesos (US\$ 13.3 million)

**Uses & Sources of Funds:**  
 (Millions of pesos)

Uses	Amount	%
Construction*	\$468.9	100.0
<b>TOTAL</b>	<b>\$468.9</b>	<b>100.0</b>
Sources	Amount	%
NADB Loan	\$175.0	37.3
Federal, State and Municipal funds	293.9	62.7
<b>TOTAL</b>	<b>\$468.9</b>	<b>100.0</b>

\* Includes costs related to design, construction, supervision, contingencies and taxes.

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<sup>1</sup> Unless otherwise noted, all U.S. dollar figures are quoted at an exchange rate of \$13.20 pesos per dollar, according to Bloomberg.com dated April 23, 2012.

# CERTIFICATION AND FINANCING PROPOSAL

## BASIC ENVIRONMENTAL INFRASTRUCTURE PROJECT NUEVO LAREDO, TAMAULIPAS

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### 1. ELIGIBILITY

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#### **Project Type**

The Project falls within the eligible categories of water, wastewater, storm drainage, and air quality.

#### **Project Location**

The Project is located in the city of Nuevo Laredo, Tamaulipas, Mexico, immediately adjacent to the U.S.-Mexico border.

#### **Project Sponsor and Legal Authority**

The **public-sector** Project sponsor is the Municipality of Nuevo Laredo, Tamaulipas (the “Municipality” or “Sponsor”), a public entity legally constituted under the Mexican Constitution, the Constitution of the State of Tamaulipas and the Municipal Code of Nuevo Laredo. The Project Sponsor has been granted authorization by the Tamaulipas State Congress to contract a loan for this Project. The Congressional decree was issued on March 22, 2012.

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### 2. CERTIFICATION CRITERIA

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#### 2.1 TECHNICAL CRITERIA

##### 2.1.1. Project Description

#### **Geographic Location**

The Project is located in the city of Nuevo Laredo, in the northern part of the state of Tamaulipas at the western end of the Rio Grande Plains, and directly across the Rio Grande River from Laredo, Texas. The two cities are connected by three international bridges and a rail bridge. Figure 1 shows the approximate geographical location of the Project.

**Figure 1**  
**PROJECT VICINITY MAP**

**General Community Profile**

According to the 2010 Mexican census, Nuevo Laredo has a population of 384,033, which represents 11.7% of the state's population.<sup>2</sup> Between 2000 and 2010, Nuevo Laredo experienced an average annual growth rate of 1.56%, slightly lower than that of the country (1.8%).<sup>3</sup>

In terms of economic activity, Nuevo Laredo has benefited from the North American Free Trade Agreement (NAFTA), signed in 1994. Since then, it has experienced steady economic growth, particularly in the commercial and industrial sectors, where there has been an increase in production and the transportation of goods and services, thus turning Nuevo Laredo into the most important inland corridor and port of entry on the entire continent. With almost 36% of all international trade goods and merchandise to the U.S., Canada, Mexico, Central America and South America, passing through Nuevo Laredo's ports of entry, the city registers a daily average of 1,500 railway crossings, 4,255 export shipments and 4,306 import shipments.<sup>4</sup>

According to the latest economic census, manufacturing constitutes the most important sector in Nuevo Laredo, generating 33.6% of the municipality's gross domestic product (GDP) and employing 28.8% of its working population. Transportation, shipping and storage services together represent the second largest sector, generating 27.2% of the Municipality's GDP and employing 13.8% of its work force. Commerce represents 18.7% of its economy and contributes with 25.8% of total employment. Overall, Nuevo Laredo's economy constitutes 5.5% of the State's GDP.<sup>5</sup>

The status of public services in Nuevo Laredo is described below:

**Table 1**  
**BASIC PUBLIC SERVICES AND INFRASTRUCTURE**

<b>Water System*</b>			
Coverage	98%		
Supply source	Rio Grande River		
Number of connections	105,416		
<b>Wastewater Collection*</b>			
Coverage	96%		
Number of connections:	103,426		
<b>Wastewater Treatment</b>			
Coverage	79%		
Treatment facilities**	<b>Plant</b>	<b>Type</b>	<b>Capacity</b>
	International	Activated sludge	1,300 lps (29.7 MGD)
	Northwest	Activated sludge	200 lps (4.6 MGD)
<b>Solid Waste</b>			
Collection coverage	99%		
Final disposal	Landfill		
<b>Street Paving***</b>			
Street paving coverage	80%		

\* Source: Nuevo Laredo water utility, COMAPA-Nuevo Laredo, May 2012.

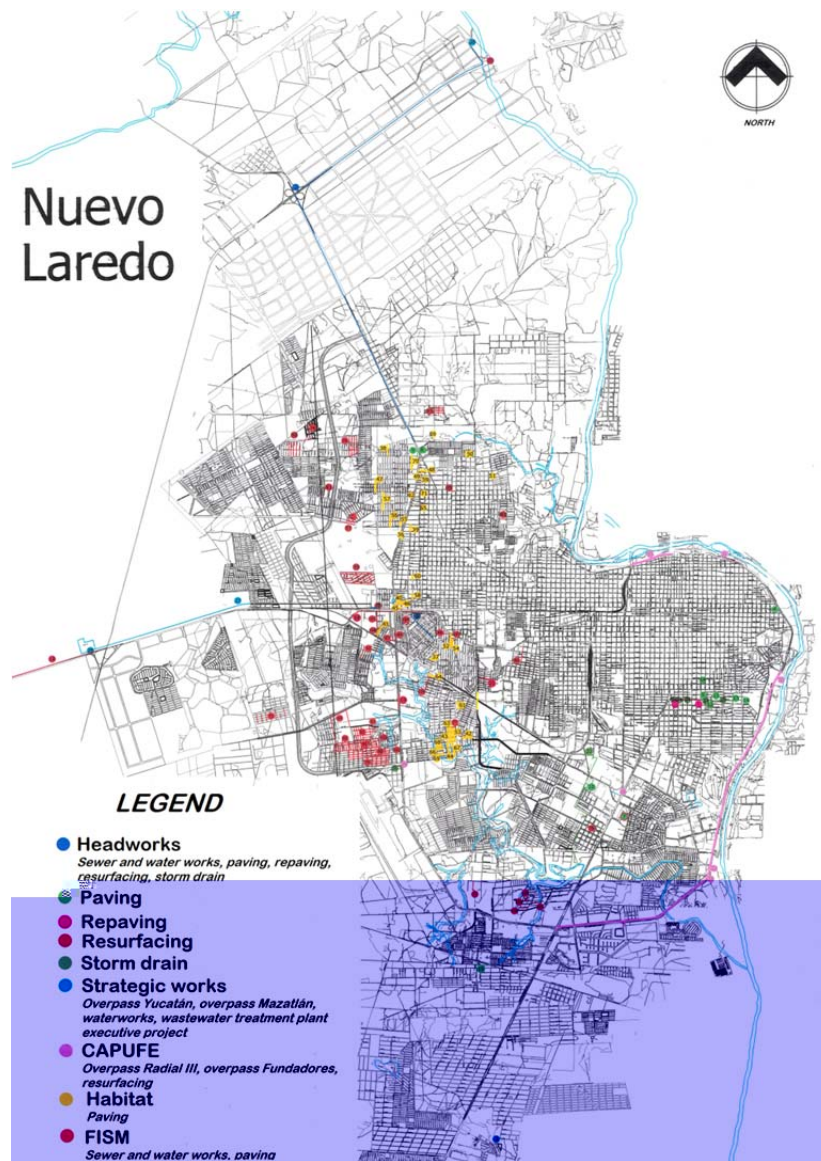
\*\* Sufficient capacity exists to treat 100% of wastewater collected.

\*\*\* Source: 2011-2013 Nuevo Laredo Municipal Development Plan.

**Project Scope and Design**

The Project is part of the Municipality’s comprehensive basic urban infrastructure program. The works selected for certification include: water and wastewater systems, storm drainage systems, street paving, roadway rehabilitation and expansion, and urban overpasses. Figure 2 shows the general location of the Project components throughout the city of Nuevo Laredo.

**Figure 2**  
**LOCATION OF PROJECT**



Infrastructure components for each sector are described below.

*Drinking Water and Wastewater*

The water and wastewater works considered for this Project are part of a comprehensive plan of the local water utility, COMAPA, and are mainly aimed at increasing coverage to unserved areas. Under Mexican federal and state program rules, funding for these works must include a municipal match. Nuevo Laredo will use a portion of this loan to support its required funding participation.



The specific water infrastructure components are enumerated in Table 2.

**Table 2**  
**Water and Wastewater Components**

Drinking Water	
Distribution lines	905 m (2,969 ft.)
Transmission line	13,640 m (44,750 ft.)
Existing pump stations to be upgraded	2
Wastewater:	
Sewer lines	26,543 m (87,083 ft.)
Existing conveyance line to be rehabilitated	914 m (2,999 ft.)
Wastewater treatment plant	0.5 lps (11,400 gd)
Existing lift station to be upgraded	1

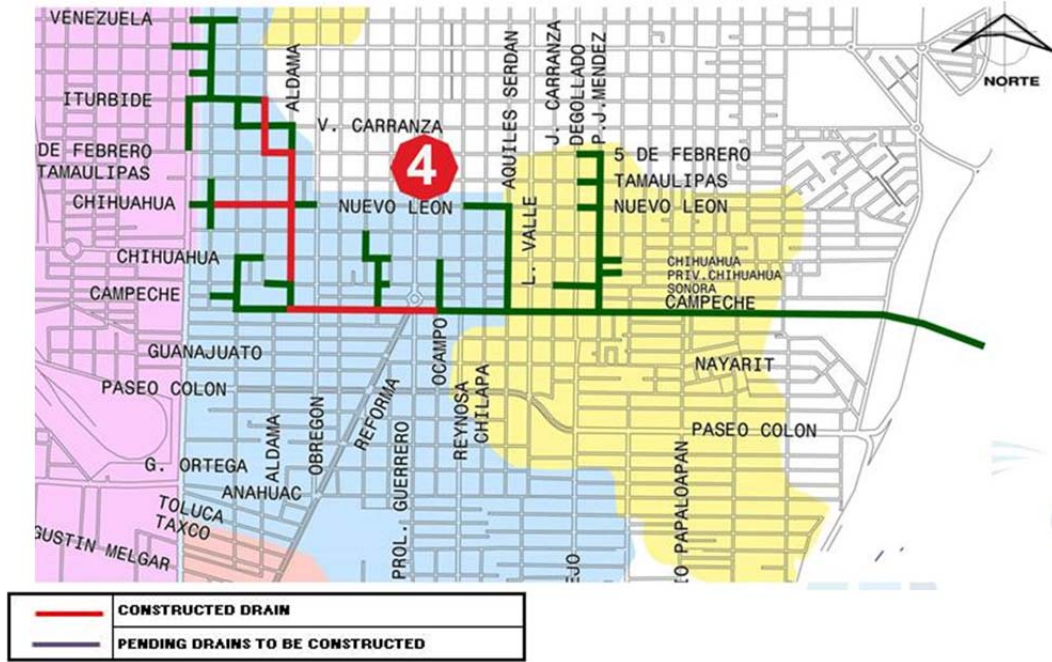
*Storm Water Management*

The storm drainage works are part of the Comprehensive Storm Sewer Project certified by BECC in 2006 and financed by NADB. Although these works were included in the previous project, the funds were not sufficient to complete all of the storm water system improvements. The Municipality will use part of the loan to complete other sources of funding required to construct 1,072 linear meters (3,517 ft.) of storm water lines to complete the Campeche Storm Drain and Concordia Canal systems.<sup>6</sup> Figure 3 shows the location of the storm drain improvements.

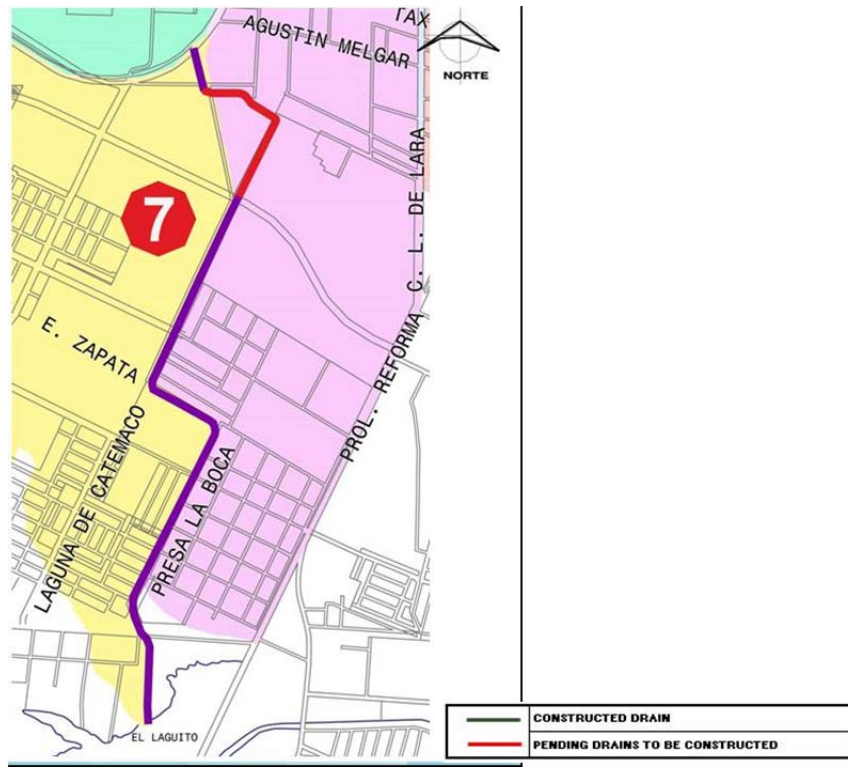
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<sup>6</sup>The financing structure of the original sewer project in 2006 included up to 50% participation by the Municipality with its own resources. With this proposal, the implicit participation of the Municipality in that project will be reduced and NADB's participation will increase, but will not exceed the 85% limit established in the Loan Policies and Procedures.

**Figure 3**  
**STORM WATER SYSTEM**



**Camanche Storm Drain**



**Concordia Canal**

### Air Quality

The following infrastructure components, which contribute to air quality improvements, are included in the Project:

- First-time paving for streets: 123,955 square meters (m<sup>2</sup>)<sup>7</sup>
- Road rehabilitation and expansion: 332,255 square meters (m<sup>2</sup>)<sup>8</sup>
- Urban overpasses: 4

The new paving works proposed for certification support efforts to reduce the deficit of unpaved dirt roads in residential neighborhoods. The Municipality has made continuous investments to address paving deficiencies throughout the city, including those paving works certified and financed in 2008. According to the 2008 certification document, the paving coverage was approximately 58% prior to the project. Now, with a current coverage ratio slightly above 80%, these additional paving efforts complement that project, continue to improve access to basic road infrastructure and reduce exposure to harmful PM<sub>10</sub> emissions in residential areas.

In addition to paving areas with unpaved roads, in 2009 the Nuevo Laredo Municipal Institute of Research, Planning and Urban Development (IMPLADU) developed a traffic origin-destination study for the city to determine traffic loads and congestion points within Nuevo Laredo's roadway system. The outcome of this study was a strategic infrastructure plan aimed at identifying projects that will improve mobility within the city. The mobility components included in this project are part of this plan and complement other investments made by Nuevo Laredo in past years, such as the Roadway System and Air Quality Improvements project certified by BECC and financed by NADB in 2009.

Among the components of the Project to be certified and financed are works related to repairing roads in poor condition—both reconstruction and resurfacing—aimed at providing additional PM<sub>10</sub> reduction benefits, as well as improving the fluid mobility of traffic within the city. Additionally, to improve the mobility of both local and interstate traffic, which influences the successful movement of goods through this important international trade corridor, the Project includes the following overpasses: Fundadores, Mazatlán, Yucatán and Héroes de la Independencia Boulevard. Together, these overpasses account for approximately 40% of the total cost of this Project.

The Project components were designed based on standard engineering practices and technical regulations and in accordance with the municipal urban development plan.<sup>9</sup> To date, the construction of 59 of the 105 Project components was completed. All additional construction activities related to the Project are scheduled to be concluded by September 2013.

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<sup>7</sup> Equivalent to approximately 11.9 kilometers based on Google Earth measurement tool.

<sup>8</sup> Equivalent to approximately 2.5 kilometers based on Google Earth measurement tool.

<sup>9</sup> The Project was developed in conformance with standard engineering practices and is consistent with the guidelines established by the Mexican Ministry of Communication and Transportation (SCT) for geometric pavement design, by COMAPA for water and wastewater designs, and with CONAGUA's technical guidelines for storm water drain design. There are standard street paving designs available that will be used as the basis for developing the final designs for the selected streets.

## **2.1.2. Technical Feasibility**

### **Selected Technology**

#### **Water and Wastewater**

As part of project development, Nuevo Laredo, in coordination with the local utility (COMAPA), evaluated water and wastewater services based on the following parameters:

- Capital and O & M costs
- Material and equipment reliability
- Environmental impact
- Social/community acceptance
- Topography

The analysis considered the use of pipe materials in compliance with current norms and regulations. High-density polyethylene and PVC pipes were evaluated based on the soil type. In order to reduce costs and make the best use of the topography in the Project area, the shortest routes were considered for pipe alignments. Crossings through paved avenues were also minimized, as well as avoiding other existing underground infrastructure.

Sewer pipe diameters were calculated using slopes and velocities aimed at preventing silting or over excavation, and minimizing the use of lift stations that might increase project costs. Maximum flow rate, full build-out in the Project areas and treatment capacity were also taken into consideration for pipe diameter requirements in order to avoid oversized pipelines. Pipe layout was designed based on existing rights-of-way, according to the urban land use plan. The water and wastewater works will use appropriate technology consistent with the Municipality's operational and maintenance capacity.

#### **Storm Drainage**

As part of the Comprehensive Storm Sewer Project, certified by BECC in 2006 and financed by NADB, priority storm water investments were identified. Both the Campeche storm sewer collector and the Concordia canal were included among these priorities and development related to these works was reviewed during the former certification process.

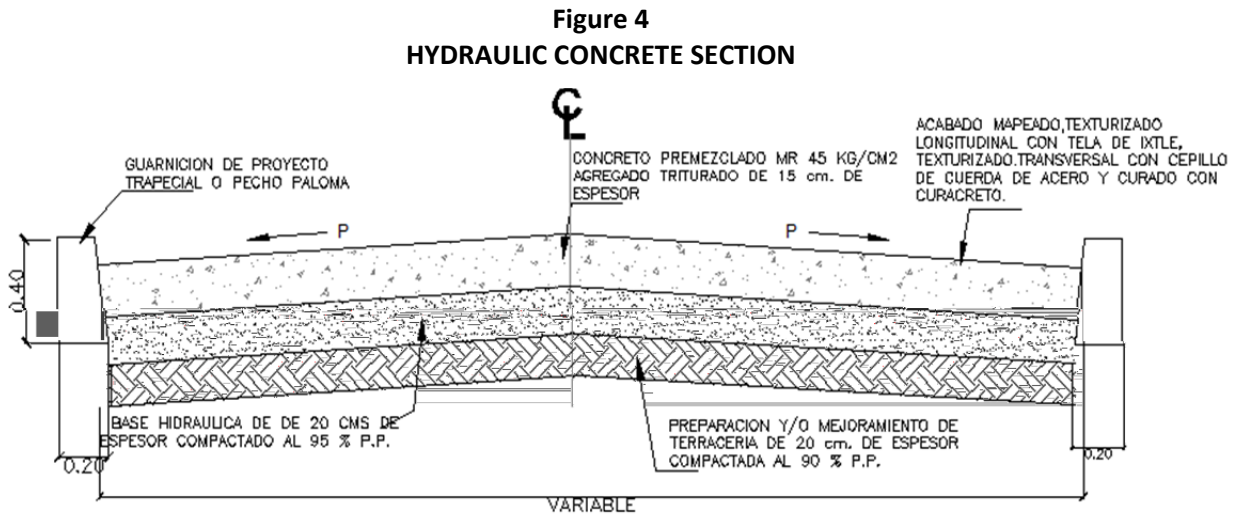
The storm drainage systems were designed to convey storm water by means of gravity, using reinforced-concrete pipes resistant to sulfates and furnished with hermetical joints, which will give the collectors an average useful life of 50 years. The design of the structures for the manholes and the hydraulic calculations for the storm water pipes and the Concordia Canal were developed based on the specifications described in Storm Drainage Manual published by the Mexican national water Commission (CONAGUA). Additionally, the access structures, such as manholes, include components for grit removal and screening to prevent sedimentation of solids and garbage.

Air Quality

The paving designs are consistent with standard engineering practices and comply with the applicable Municipal Code. Street paving design standards were used as the basis for developing the final designs for selected streets. Asphalt or hydraulic concrete were considered as options for roadway paving. Hydraulic concrete was considered for main intersections with heavy traffic in order to reduce maintenance and extend their average life, while asphalt pavement was considered for secondary streets with less traffic. Additionally, flexible pavement (asphalt) or rigid pavement (hydraulic concrete) was selected on the basis of the city's geotechnical zoning.

The pavements consist of a subgrade layer compacted at 90% (Proctor Test), finished to the established design elevation. Over this layer, a 20-cm thick granular base compacted at 95% (Proctor) will be installed. The base will consist of a layer of selected bank material typically used for lining, as established by Municipal regulations. The material will be piled up, mixed, homogenized, laid out, shaped, compacted, and brought to optimal humidity. The Municipality's project engineers are responsible for confirming that the paving works comply with the applicable specifications. Below are brief descriptions of the design criteria for each paving method.

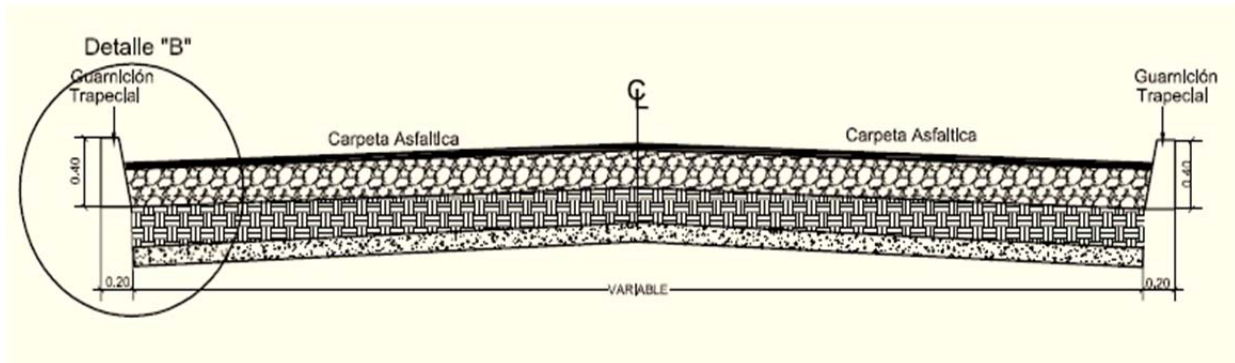
Hydraulic Pavement: Pre-mixed concrete will have standard resistance. The concrete is poured in transverse slabs with a surface large enough to prevent fractures caused by temperature. Caulking is applied to the joints, including vibrating and curing with a material designed for this purpose. The works include the construction of curbs similar to those shown in Figure 4.



Asphalt Pavement: The base layer is covered by a prime coat layer with an asphalt emulsion. Before placing the flexible pavement layer over the compacted base layer, a tack coating of asphaltic emulsion is sprayed with minimal penetration. Next an asphalt concrete layer with standard thickness is laid. The asphalt mix must meet the volumetric rate established by Mexican paving norms and contain the least amount of impurities in order to satisfy spatial specifications. The Project also includes construction of curbs and gutters. Curbs are constructed

of hydraulic concrete placed over the compacted base before the asphalt layer is applied, as shown in Figure 5.

**Figure 5**  
**ASPHALT SECTION**



Paving is carried out in subdivisions that already have water and wastewater infrastructure. Any excess, unusable material produced as a result of the paving works are removed from the work area and hauled to a waste site designated by the Municipality outside of the work area.

The primary mobility components—overpasses—were designed in accordance with federal design standards issued by the Mexican Ministry of Communications and Transportation (SCT) and are to be built, operated, and maintained in a cost-effective manner to achieve the primary goal of improving urban mobility, as established in the 2011-2013 Municipal Development Plan of Nuevo Laredo. All new road works include terrain plotting and leveling, excavation or cutting, hauling of material, formation and compaction of earth-fills, treatment of the subgrade layer and development of the hydraulic base layer. The pavement includes hydraulic base prime coating and tack coating for the asphalt layer, followed by the installation of the asphalt concrete layer.

The geometric design of roadways incorporates the installation of a minimum 2% transverse slope (crown) towards the center of the street that will convey runoff to the shoulders. Manholes are built above the runoff level to prevent water from infiltrating the sewer system. Manholes that are not located at the pavement crown will be elevated at the runoff level and sealed to prevent infiltration of rainwater. The Project also includes curb plotting and leveling and the construction of hydraulic concrete curbs.

### **2.1.3. Land Acquisition and Right-of-way Requirements**

The proposed Project is being developed within the urban area, primarily within existing rights-of-way. The Project Sponsor has indicated that property ownership and appropriate access to rights-of-way for all works within the urban area have been secured. For those projects outside of municipal easements, the Sponsor has provided a statement related to ownership/access status and provided related documentation. The Sponsor is completing proper access permits

related to the Yucatán overpass project, which are currently under negotiation with affected property owners. Additionally, the relocation of electricity lines will be necessary to have complete right-of-way access for the Mazatlán overpass project.

#### **2.1.4. Management and Operations**

During Project implementation, the Municipality of Nuevo Laredo will oversee the execution of the proposed construction tasks through its Department of Public Works, which has a Director, Deputy Director, senior staff, and trained personnel to operate and maintain the project components. Additionally, the Sponsor has specialized personnel available to provide technical support.

In accordance with the Internal Code of Municipal Public Administration and other applicable agreements and provisions, the Municipality of Nuevo Laredo is responsible for maintaining the roadways. It will be responsible for implementing preventive and corrective maintenance and absorbing operation and maintenance costs, which will be considered part of its operating budget.

The local water utility, COMAPA, will maintain and operate the water and wastewater works in compliance with the Operation Program and Subprograms in place for each specific type of work.

## **2.2 ENVIRONMENTAL CRITERIA**

### **2.2.1. Compliance with Applicable Environmental Laws and Regulations**

#### **Applicable Laws and Regulations**

The Project will be implemented in areas subject to the jurisdiction of the Municipality. In the case of Project components that include only equipment replacement, no environmental authorization requirement applies. Additionally, as documented in the previous storm water project certification, the Mexican Ministry of Environment and Natural Resources (SEMARNAT) determined that the storm sewer project for Nuevo Laredo does not require an authorization with respect to environmental impact because it is located away from delicate ecosystems, protected natural areas, or regions considered a priority due to biodiversity.

Therefore, no formal federal environmental clearance authorizations are required and a consultation with the National Anthropology and History Institute (*Instituto Nacional de Antropología e Historia*, INAH) is not required. No cultural or historical resources are expected to be disturbed; however, should any cultural resources be found, construction tasks will be deferred until an assessment is performed by the INAH.

The Project will support compliance with the following environmental laws and regulations related to water and wastewater:

- Official Mexican Standard NOM-002-SEMARNAT-1996, which establishes the maximum permissible levels of contaminants for wastewater discharges to urban or municipal wastewater collection systems.
- Official Mexican Standard NOM-127-SSA1-1994, which establishes treatment processes and quality standards for drinking water for environmental health and human use and consumption.

#### **Environmental Studies and Compliance Activities**

The Sponsor has consulted with the corresponding authorities regarding the type of environmental impact statement required for each project component. Typically, final designs for new construction must be submitted to obtain environmental clearance authorization from the corresponding environmental authority. Because the Project is located in the pre-disturbed urban area, only minimal impacts are anticipated, including primarily temporary impacts associated with construction. In accordance with practices recommended by federal environmental authorities, mitigation measures to address temporary environmental effects of construction are noted in the issued ruling.

Additionally, BECC has developed an analysis of anticipated emission reductions resulting from the Project. The results are provided in section 2.2.2.

#### **Pending Environmental Tasks and Authorizations**

Documentation related to the environmental clearance authorizations for completed works under the jurisdiction of the Municipality have been made available to the two institutions. For three overpass projects, environmental clearance documentation from the Municipality has also been submitted. For project components anticipated to be contracted in 2012, including the fourth overpass (Fundadores), an environmental authorization will be requested upon completion of the final designs and prior to construction procurement.

#### **Compliance Documentation**

The Sponsor maintains all issued environmental clearance rulings in the technical file of the various Project components, a practice also required by any federal funding program contributing to such components. BECC/NADB staff observed the availability of the issued communication documents related to federally-funded water infrastructure and paving projects at the Sponsor's offices and has received copies. The Sponsor has also provided an environmental ruling related to the three overpasses already constructed. Documentation of any pending rulings from the Municipality will be received prior to the disbursement of funds.



## 2.2.2. Environmental Effects/Impacts

Nuevo Laredo has experienced rapid urban growth and development and as an important trade corridor for North America is required to meet the demands of significant commercial traffic.<sup>10</sup> The environmental effects of these conditions and potential impacts related to the Project are described below.

### **Existing Conditions and Project Impact – Environment**

The local utility, with the support of the Municipality, has worked to keep up with the demand for basic services with continuous investments to extend infrastructure to unserved areas and mitigate incidents of untreated discharges to the Rio Grande River. **The drinking water distribution works included in the Project will provide service to nearly 1,030 residential connections, and wastewater collection infrastructure will provide more than 5,000 homes with this important wastewater disposal service, better protecting human health and the environment.** Additionally, storm water infrastructure improvements are intended to mitigate flooding risks in the urban area and appropriately manage storm water separately from wastewater collection infrastructure, avoiding illegal cross-connections that have existed in the past and providing adequate conveyance capacity to protect urban areas.

Air quality in Nuevo Laredo, in recent years, has been affected by the large number of vehicles and constant traffic congestion, as well as by airborne dust and PM<sub>10</sub> generated by the poor condition of existing pavement. First time paving, repaving and road reconstruction are considered proven methods to reduce the amount of fugitive dust resulting from vehicle traffic. This Project also contributes to a reduction of the concentration of pollutant emissions, such as volatile organic compounds (VOCs), nitrogen oxides (NOX) and carbon monoxide (CO), by improving traffic mobility conditions in Nuevo Laredo.

The implementation of the proposed Project helps achieve compliance with the following air quality standards:

- *Official Mexican Norm NOM-025-SSA1-1993. "Environmental Health. Criteria for evaluating ambient air quality with respect to total suspended particles (TSP), particles below 10 microns (PM<sub>10</sub>), and particles below 2.5 microns (PM<sub>2.5</sub>). Criteria for evaluating air quality." Permissible limit of 150 µg/m<sup>3</sup> in 24 hours, once a year.*
- *Official Mexican Norm NOM-020-SSA1-1993. "Environmental Health. Criteria for evaluating ambient air quality with respect to ozone (O<sub>3</sub>). Regulated value for ozone (O<sub>3</sub>) concentrations in ambient air, as a public health protection measure." Permissible limit of 0.11 ppm or what is equivalent to 216 mg /m<sup>3</sup> in one hour, once a year.*
- *Official Mexican Norm NOM-021-SSA1-1993. "Environmental Health. Criteria for evaluating ambient air quality with respect to carbon monoxide (CO). Permissible value for carbon monoxide (CO) concentrations in ambient air, as a public health protection*

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<sup>10</sup> According to INEGI and industrial profile data, approximately 850 trucks cross the border each day at Nuevo Laredo.

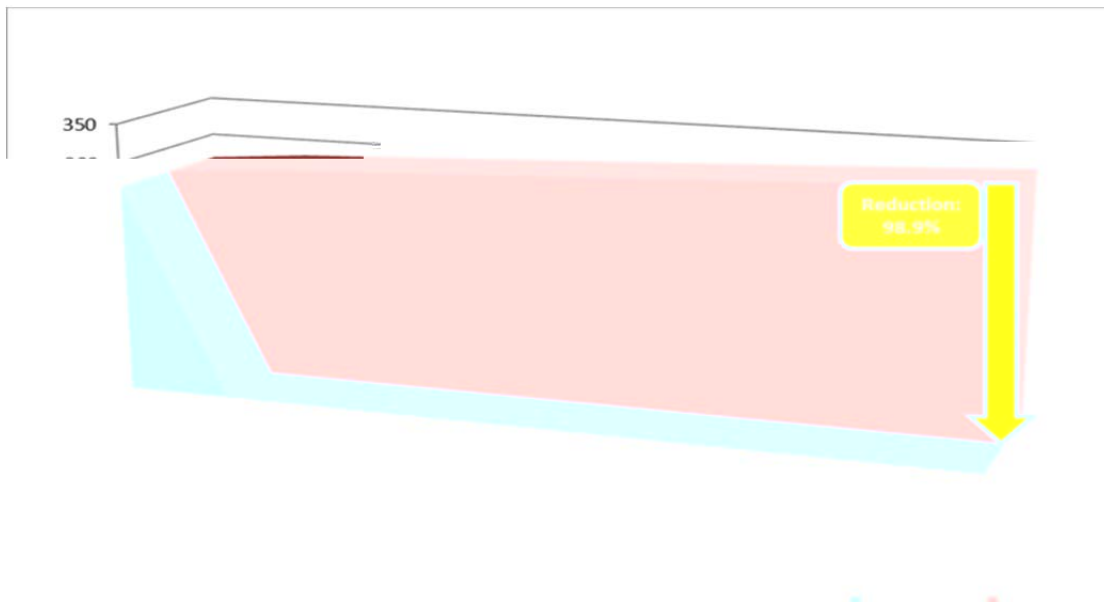
measure." Permissible limit of 11.00 ppm or what is equivalent to 12.595 mg/m<sup>3</sup> averaged over eight hours, once a year.

- Official Mexican Norm NOM-022-SSA1-2010. "Environmental Health. Criteria for evaluating ambient air quality with respect to sulfur dioxide (SO<sub>2</sub>). Regulated value for sulfur dioxide (SO<sub>2</sub>) in ambient air, as a public health protection measure." Permissible limit of 0.110 ppm or 288 mg/m<sup>3</sup> averaged over 24 hours, once a year.
- Official Mexican Norm NOM-023-SSA1-1993. "Environmental Health. Criteria for evaluating ambient air quality with respect to nitrogen dioxide (NO<sub>2</sub>). Regulated value for nitrogen dioxide (NO<sub>2</sub>) in ambient air, as a public health protection measure." Permissible limit of 0.21 ppm or what is equivalent to 395 mg/m<sup>3</sup> in one hour, once a year.

The implementation of the Project supports improved environmental and health conditions in the city. The potential benefits of the Project include the reduction of PM<sub>10</sub> and PM<sub>2.5</sub> emissions and the reduction of motor vehicle combustion gases.

Reduction of PM<sub>10</sub> and PM<sub>2.5</sub> Emissions. Vehicle traffic on unpaved roads causes the suspension of particles that directly impact public health. In addition to these direct impacts related to a lack of pavement, other deficient road conditions contribute to poor air quality effects. Pursuant to the methodology recommended and approved by USEPA AP-42 for estimating PM<sub>10</sub> emissions by vehicles traveling on unpaved roads, it is estimated that newly paved roads will reduce emissions by 98.9%, which equates to 265.4 metric tons/year of PM<sub>10</sub> (see Figure 6) and 96.4%, which equates to 25.6 metric tons/year of PM<sub>2.5</sub>.

**Figure 6**  
**PM<sub>10</sub> EMISSION REDUCTION RESULTING FROM THE CONSTRUCTION OF NEW PAVEMENT**



Reduction of Motor Vehicle Combustion Gases. Due to continuously high traffic volumes, the city suffers from major congestion and mobility problems, which are also a source of air pollution that is further exacerbated by aging vehicles traveling on local roads. The deterioration of existing road surfaces directly impacts Nuevo Laredo residents in many ways, including:

- Traffic jams or slow moving traffic due to lane closures or potholes;
- Increased frequency of automotive accidents;
- Deterioration of underground and surrounding infrastructure; and
- Deterioration of the urban image.

Repaving and road reconstruction contribute to a reduction in PM<sub>10</sub>, as well as help improve mobility. However, the most significant improvement to traffic flows will be achieved with the implementation of the four overpasses. The anticipated benefits associated with this roadway infrastructure were evaluated taking into account vehicle counting information and speed limits observed in the Project sites. Higher vehicle speeds on the overpasses can be expected to reduce combustion gas emissions, including nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs), and carbon monoxide (CO).

According to information provided by IMPLADU and the Department of Public Works, the design speed on the overpasses is 40 km/h (25 mph), whereas the average speed in the Project sites under current traffic conditions is 25 km/h (16 mph). The scenarios analyzed took into consideration improved traffic efficiency resulting from increased speeds by using the overpasses, both on and under the overpasses. Mobility improvements were modeled based on these assumptions and available information from IMPLADU and Department of Public Works. An increase in speed to the maximum limit allowed on the overpasses was considered for vehicles driving on the overpasses. For vehicles driving on the Fundadores and Heroes de la Independencia overpasses, an average increase of 30 km/h (19 mph) to 40 km/h (25 mph) was utilized and 25 km/h (16 mph) to 40 km/h (25 mph) was estimated for the Yucatán and Mazatlán overpasses.

The analyses performed using the Mobile 6.2 Mexico model indicate that the NO<sub>x</sub> emissions will be reduced by 8.2% (253 metric tons/year), VOCs by 13.1% (249.6 metric tons/year), and CO by 5.0% (652.1 metric tons/year). A slight 0.2% (0.2 metric tons/year) increase is expected in SO<sub>x</sub> emissions, due to higher vehicle traffic speeds.

#### Mitigation of Risks

During the implementation of the Project, measures are taken to mitigate temporary effects of construction by introducing the preventive actions recommended by the federal environmental authorities, such as:

- Site preparation of areas to be paved
  - Minimize the emission of dust generated by vehicle traffic by irrigating the areas where work will be performed.

- With regard to air emissions caused by motor vehicles, all vehicles used in the Project must have emission control systems.
- Noise emission caused by the circulation of motor vehicles and the use of heavy machinery
  - All operating vehicles must close their exhaust and operate at low speed around the work areas.
  - All vehicles must comply with Mexican standard NOM-080-ECOL-1994, which establishes the maximum permissible levels of noise from motor vehicles, motorcycles, and 3-wheel motor vehicles, as well as noise measuring methods.
- Site preparation and construction
  - Wastewater collected in portable containers will be disposed of by an authorized company.
  - The use of water should be optimized during construction of the Project. Potable water will be obtained in containers from local suppliers.
  - Only treated water will be used for the Project's different construction activities.
  - The water required during the construction phase should be obtained from a water tap provided by the local utility COMAPA or from an alternative source authorized by CONAGUA.
  - Stone materials required for construction should be obtained from local quarries.
  - Excavations will only be performed in areas previously identified by the Project.
  - In-fill activities will be performed, preferably, with the material from the excavations whenever appropriate.
- Waste management
  - All non-recyclable solid wastes must be disposed of according to applicable procedures and in facilities designated by the authorities for this purpose.
  - The work area will be cleaned periodically.
  - Backfill and compacting materials should be free of hazardous and non-hazardous waste, ensuring that such materials are moved to authorized confinement or treatment sites.
  - In order to avoid ground contamination generated by vehicle, machinery and equipment maintenance and oil changes, these activities will be carried out in authorized service shops.

Natural Resource Conservation

The Project does not in any way interfere with the conservation of natural resources in the region as it will be carried out in an urban area and over existing roadways in urban areas, and will not require any zoning changes.

The Project helps prevent environmental deterioration through the construction of wastewater collection lines that convey sewage to facilities for proper treatment, as well as adequate storm water infrastructure, thus reducing the risk of aquifer or surface water contamination and the human health hazards resulting from exposure to untreated or inadequately treated discharges.

No Action Alternative

The Project is necessary to meet the existing and future urban development needs of Nuevo Laredo. Affordable project financing is important to support the implementation and ongoing investment in adequate basic infrastructure. Without access to affordable financing, the pending works and future investments by the Municipality may be delayed or postponed, creating a threat to the environment and health.

Existing Conditions and Project Impact – Health

Although human health statistics for Nuevo Laredo are very limited, pursuant to information provided by Health Jurisdiction No. 5 of the State of Tamaulipas through the Office of Epidemiological Service Coordination, incidence rate of diseases caused by acute respiratory infections is high.

Health Jurisdiction No. 5 of Tamaulipas reported in May 2012 the most frequent diseases identified in Nuevo Laredo. Based on a total of 384,033 residents in Nuevo Laredo (INEGI 2010) and information generated by the epidemiological surveillance system over a three-year period, yearly incidence rates for respiratory diseases and intestinal infections have been prepared (see Table 3).

**Table 3  
 INCIDENCE RATES OF MOST FREQUENT DISEASES IN NUEVO LAREDO**

Rate	2009	2010	2011
Incidence rate for respiratory diseases	219 x 1,000 residents	193 x 1,000 residents	166 x 1,000 residents
Incidence rate for intestinal diseases	41 x 1,000 residents	39 x 1,000 residents	42 x 1,000 residents

Source: Health Jurisdiction No. 5 of the State of Tamaulipas, Mexican Ministry of Health

Mexican Standard NOM-020-SSA1-1993 establishes that health risks associated with air pollutants are correlated to the time elapsed between the exposure and the onset of adverse effects in exposed individuals and cause changes in pulmonary function that render affected individuals more susceptible to respiratory diseases and infections. Furthermore, with respect to epidemiological surveillance, in Mexican Standard NOM-017-SSA2-1994 potential health impacts

from environmental pollution are defined as poisoning and disorders resulting from contact with or handling of toxic substances and environmental factors.

The Project helps improve environmental conditions associated with health problems such as respiratory and water-borne ailments, by improving access to potable drinking water, decreasing exposure to untreated or inadequately treated wastewater discharges or stagnant water related to uncontrolled storm water, as well as reducing harmful pollutants which affect air quality.

**Transboundary Effects**

No negative transboundary impacts are anticipated as a result of the implementation of this Project; on the contrary, it will enhance urban mobility not only for local traffic but also for transboundary commercial traffic passing through to the international crossings, while reducing environmental pollution and improving the quality of life of local residents on both sides of the US-Mexico border. New paving works are not expected to increase storm run-off conditions affecting the international

**Table 4**  
**PROJECT COST AND SOURCES**  
 (Millions of pesos)

Uses	Amount	%
Construction	\$468.9	100.0
<b>TOTAL</b>	<b>\$468.9</b>	<b>100.0</b>
Sources	Amount	%
NADB Loan	\$175.0	37.3
Federal, State and Municipal funds	293.9	62.7
<b>TOTAL</b>	<b>\$468.9</b>	<b>100.0</b>

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### 3. ACCESS TO PUBLIC INFORMATION

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#### 3.1. PUBLIC CONSULTATION

BECC released the Draft Project Certification and Financing Proposal for a 30-day public comment period beginning May 31, 2012. The following list of available Project documentation is available upon request:

- *Plan de Desarrollo Urbano de Nuevo Laredo (PDU), 2010* (2010 Nuevo Laredo urban development plan)
- *Plan Municipal de Desarrollo de Nuevo Laredo 2011-2013* (Municipal development plan of Nuevo Laredo for 2011-2013)
- *Informe de Plan Integral de Vialidades en Nuevo Laredo* (Nuevo Laredo comprehensive roadway plan)
- *Programa Integral de Pavimentación de Nuevo Laredo (PASO)* (Nuevo Laredo comprehensive paving program)
- Anticipated emission reduction calculations developed by BECC
- Environmental clearance authorizations, if applicable

#### 3.2. OUTREACH ACTIVITIES

In addition to the public comment period, and as is the normal practice, Project information has been available to community residents through general newsletters and media coverage of the Municipality's investment plans. Moreover, as required for projects funded with contributions from federal programs such as HABITAT, public outreach efforts have also been formally conducted, which are summarized below. Finally, a search of local media sources found that Project information was made accessible to the general public.

The Project Sponsor established a neighborhood committee for all project components to be funded through the federal program HABITAT. To date, the Department of Public Works has established six committees related to investments proposed for this program. The bylaws of these committees, as well as attendance records, agreements and comments, are available to the public.

Public meetings were held in the Francisco Villa and Voluntad y Trabajo subdivisions, which have benefited from paving works included in this Project. Approximately 140 residents attended the meetings, which were conducted by the Mexican Ministry of Social Development (SEDESOL) and the Municipality's Department of Public Works. Municipal newsletters and minutes of the meetings presided over by the Chairman of the Steering Committee reflect community support for the Project.

Additionally, relevant information on the issue appeared in numerous press articles. The following are just a few examples:

- <http://www.elmanana.com.mx/notas.asp?id=280133>
- <http://www.elmanana.com.mx/notas.asp?id=281365>
- <http://www.elmanana.com.mx/notas.asp?id=281848>