

Border Environment Cooperation Commission Construction of a Sanitary Landfill in the Municipality of Los Herreras, Nuevo León

1. General Criteria

1.a Project Type

Project Name: Construction of a Sanitary Landfill in the Municipality of Los Herreras, Nuevo Leon.

Project Sector: Municipal Solid Waste.

1.b Project Category

Category: Municipal Environmental Infrastructure Project – Community-wide Impact.

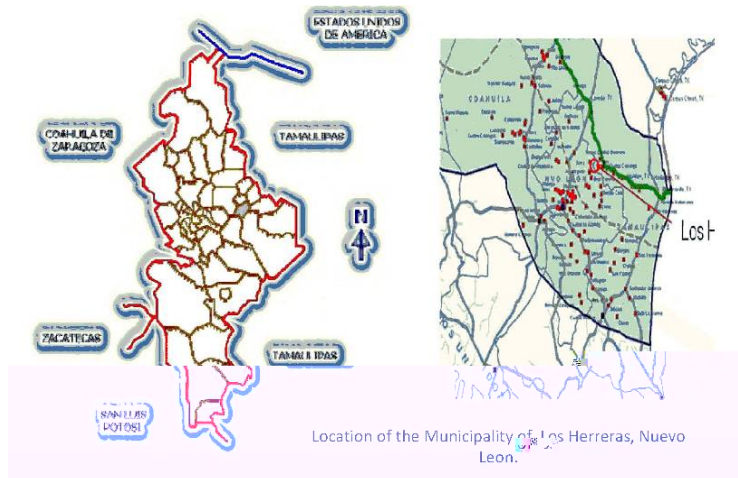
1.c Project Location and Community Profile

Community: Municipality of Los Herreras, Nuevo Leon.

Location: The Municipality of Los Herreras, Nuevo Leon is located northeast of the city of Monterrey in the Gulf Coastal Plain region, in the central-eastern part of the state of Nuevo Leon. It is bordered on the north with the Municipality of Melchor Ocampo, on the south by the Municipality of Los Ramones, on the east by the Municipality of Los Aldama and west with the Municipalities of Cerralvo and The Ramones.

Location within the border: This project is one element of a larger comprehensive regional solid waste technical and financial solution for the region. The project is within the limits of the 100km border zone. The nearest tributary to the Rio San Juan is 650m.

Image:



Demographics	
Current Population:	1,764 inhabitants in the municipality.
Growth Rate::	-0.95 %
Reference:	INEGI, 2000 and CONAPO, 2008
Economically active population:	743 inhabitants
Reference:	- INEGI, 2000 - CONAPO, 2008
Median per capita income:	\$ 6,817 US Dollar
References:	<i>National Institute of Statistics, Geography, and Informatics (INEGI)</i>
Primary economic activities:	Agriculture, Commerce, and Services
Marginalization rate:	Low.
Services	
Municipality:	Los Herreras
Drinking Water System	
Coverage of Drinking water:	90%
Wastewater Collection System	
Coverage of Wastewater Collection System:	81 %
Wastewater Treatment	
Coverage of Wastewater Treatment:	81 %
Solid Waste	
Coverage of Solid Waste:	100%
Additional Comments:	None
1.d Legal Authority	
Sponsor:	Comprehensive System for the Environmental Management and Processing of Solid Waste (SIMEPRODE, by its initials in Spanish).
Legal representative:	Mr. Jorge H. Padilla Olvera, Director of SIMEPRODE
Legal instrument to demonstrate legal authority:	Law for the Decentralized Public Agency named Integral System for the Environmental Management and Processing of Solid Waste (SIMEPRODE).
Date of instrument:	June 6, 1987
Compliance with agreements:	- La Paz Agreement of 1983 or the Border Environmental

- Agreement.
- North American Free Trade Agreement of 1994 (NAFTA).
 - Border 2012 Program.

1.e. Project Summary

Project description and scope:

The project consists of the construction of a new solid waste landfill for the Municipality of Los Herreras, Nuevo Leon. This project is an element of a larger comprehensive regional solid waste technical and financial solution for the region. The proposed project will be implemented according to the specifications and technical requirements for environmental protection, in order to provide adequate solid waste disposal. The design and implementation of the project will be according to Mexican Official Regulation NOM-083-SEMARNAT-2003, which establishes specifications for the environmental protection for site selection, design, construction, operation, monitoring, closure and ancillary works for the proper disposal of municipal solid waste and hazardous materials.

Components:

Construction of a solid waste landfill.

Additional comments:

The solid waste generated in the Municipality of Los Herreras is disposed in an open dumpsite that does not comply with the requirements established in NOM-083-SEMARNAT-2003.

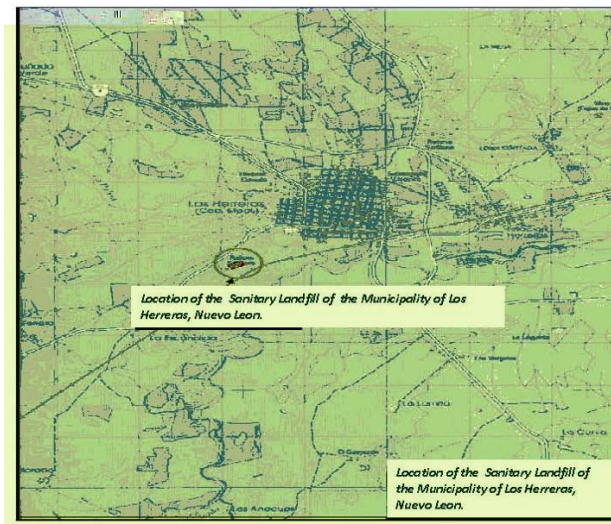
Benefited population:

1,764 inhabitants. .

Project cost:

MX \$ 3,138,039 pesos

Project map:



Location of the Municipal Landfill of Los Herreras. N.L.

Project justification	
Project justification:	<p>The project will improve solid waste management and disposal thus reducing the potential for inadequate confinement and the risk to human health, as well as the potential for leachate infiltration which can pollute groundwater sources.</p> <p>Additionally, the project will allow the closure of the open dumpsite since it does not comply with the guidelines of NOM-083 and the construction of a new solid waste landfill that complies with all the requirements of the law.</p>
Project need or consequences of the no action alternative:	<p>The deficient management of solid waste in the municipality causes environmental problems such as in air quality, underground water, soil, and potential explosion and fire risk in the current dumpsite, as well as the development of vectors.</p>

Pending issues:

None

Criterion summary:

The project falls within BECC's core sectors and complies with the general criteria.

2. Human Health and Environment

2.a Compliance with Applicable Environmental and Cultural Resources Laws and Regulations.

Environmental and public health needs addressed by the proposed project:	<ul style="list-style-type: none"> - The Municipality of Los Herreras does not have a solid waste landfill for the disposal of municipal solid waste and hazardous materials. - The lack of a suitable solid waste landfill to dispose the solid waste generated creates the inadequate disposal of this. The inadequate disposal of solid waste may cause its own dispersion while generating contamination of soil, wastewater pollution, risks of fires, and risks to public health due to the proliferation of vectors and disease transmission to the community. - The problem in the municipality is the lack of a solid waste landfill that complies with the regulatory requirements. Currently all types of waste, including waste considered as hazardous, such as used oil, paint residue, and car batteries, among others, are deposited in ways which do not meet environmental regulations, furthermore, due to a lack of an appropriate operation dump site workers' health is at risk. <p>In the current dumpsite there are potential risks to public health due to the proliferation of vectors and disease transmission to the community.</p>
The project meets the following applicable laws and regulations:	<p>The project complies with Mexican Official Law NOM-083-SEMARNAT-2003, Environmental Protection Specifications for Site Selection, Design, Construction, Operation, Monitoring, Closure, and Ancillary Works for Municipal Solid and Hazardous Waste Disposal.</p>

2.b Human Health and Environmental Impacts

Human Health Impacts

Direct and indirect benefits to human health:	<ul style="list-style-type: none"> - Reduce inadequate solid waste disposal - Reduce the pollution of groundwater sources - Reduce soil contamination
Health statistics:	<p>The following table presents the most frequent diseases in the Municipality of Los Herreras.</p>

20 Causes of Most Frequent Diseases in the Municipality of Los Herreras, N.L.				
Diagnóstico	2007		Jul-08	
	No.	Cases	No.	Cases
Acute Respiratory Infections J00-J06	1	1295	1	704
Intestinal Infections by other organisms	2	222	2	110
Medium Acute Otitis	3	148	4	55
Urinary Tract Infections N30, N34, N39	4	125	3	97
Ulcers Gastritis and Duodenitis K25-K29	5	67	5	32
Conjunctivitis B30, H10.0	6	42	6	27
Urogenital Candidiasis B37.3-B37.4	7	12	7	19
Urogenital Trichomoniasis A59.0	8	11	8	12
Intestinal Amebiasis A06.0-A06.3,A06.9	9	11	13	1
Escabiosis B86	10	9	14	1
Gingivitis and Periodontal Diseases K05	11	8	10	4
Arterial Hipertension I10-I15	12	8	12	3
Diabetes Mellitus No Insulin-dependent	13	4	16	1
Chicken Pox B01	14	3	9	9
Intoxication by Scorpion Bite T63.2	15	2	-	-
Asthma and Asthmatic State J45, J46	16	1	-	-
By snake bite	17	1	-	-
Burns T20-T32	18	1	-	-
Enterobiasis B80	19	1	-	-
Leprosy A30	20	1	-	-
Rest of Diagnostics	21	5	-	5
TOTAL		1977		1080

Source: Health National System; Epidemiology Direction, Secretariat of Public Health and Assistance.

Images of support:

The figure below shows the current condition of solid waste disposal in the Municipality of Los Herreras:



Environmental Impacts

Direct and indirect benefits:

Environmental impacts: Environmental impacts are expected to be minimal during the phases of project development, as long as the project is implemented according to the guidelines and proposed mitigation specified in the Environmental Document clearance. Some of the potential impacts include;

Construction Phase:

- Dust emissions
- Air pollutants emissions from heavy equipment
- Presence of workers in the construction site

Operational Phase:

- Failure during operation

Mitigation measures:

Mitigation measures include:

- Application of water to reduce dust
- Vehicle tune-up to reduce air pollutants emissions
- Placement of preventive signs to avoid risky situations

Impacts

The environmental impact will be, in general, positive due to implementation of the project since:

The inadequate disposal of solid waste, gas emissions due to solid waste burning, the generation of methane gas due to decomposition of organic matter will be reduced. The aesthetic value of the area will be improved. In general, solid waste disposal will be greatly improved, thus reducing pollution to the environment and improving the quality of life for the inhabitants of the region while reducing potential human health risks.

The balance of the environmental impacts will be positive since the overall benefits outweigh the potential negative impacts during the construction and operational phases of the project. In addition, the overall efficiency of solid waste management in the municipality will be increased.

Transboundary Impacts

Transboundary environmental impacts are not anticipated since the location of the landfill is not adjacent to the United States. However, indirect benefits are expected in the region due to the reduction of contagious diseases related to the inadequate disposal of solid waste in the area.

Formal Environmental Clearance

Environmental Clearance:

In accordance with the Regulations of the General Law for Environmental Equilibrium and Protection in terms of environmental impact assessment, the Secretary of Environment and Natural Resources (SEMARNAT) through letter 139.003.03.770/07 delivered on October 25, 2007 determined that

the project does not require a MIA (Environmental Impact Document) because the planned activities will be developed in an area impacted by human activities.

According to the General Law for Environmental Equilibrium and Protection and the Public Administration Law for the State of Nuevo Leon, the State Environmental Protection Agency evaluated and developed an Environmental Preventive Impact Report resolution for the project. This document was prepared and submitted to the State Environmental Agency which issued its ruling of finding of impact on December 10, 2007 in the official letter numbered APMARN/406/2007, control number 5036.

The National Anthropology and History Institute determined through Official Letter D-098/08 dated September 2, 2008 that the construction of the landfill does not impact cultural and historical resources in the State of Nuevo Leon if the project is implemented in the same area where solid waste is currently disposed.

Pending issues:

None

Criterion summary:

The project provides solution for a human health and environmental problem.
The project has all required environmental authorizations and reviews.

3. Technical Feasibility

3.a Technical Aspects

Project Development Requirements:

Design criteria: **The project was developed according to regulations set forth in the Mexican Law NOM-083-SEMARNAT-2003.**

The preliminary engineering studies and final design for the construction of the landfill were prepared according to NOM-083-SEMARNAT-2003 (Environmental Protection Specifications for Site Selection, Design, Construction, Operation, Monitoring, Closure, and Ancillary Works for Municipal Solid and Hazardous Waste Disposal).

The project has the following components:

The project consists of construction of the solid waste landfill for the Municipality of Los Herreras. The project objective is to comply with the specifications and technical guidelines and required environmental control systems to provide adequate solid waste disposal services generated in the municipality.

Solid Waste Generation

The estimated per capita waste generation is in the municipality of Los Herreras is 1.23 lb/person/day.

To determine the rate of per capita generation of municipal solid waste, in addition to the solid waste generated at home, solid waste from other sources such as government offices, hospitals, shops, markets, industries, to name the most important, were considered amounting to 30% of the generation per capita, based on indicators of the Pan American Health Organization (PAHO) and experience in our country.

The following table shows the total generation of municipal solid waste considered in the project:

SOLID WASTE		
Homes	Other sources	Total Municipal
1.23 lb/person/day.	0.368 lb/person/day.	1.594 lb/person/day.

The collection of municipal solid waste in the Municipality of Los Herreras is estimated at 2,998 lb/day.

Solid Waste Collection System

Solid waste collection service is provided by the municipality with one (1) collection truck that makes, on average, 1 trip per day from

Monday to Friday and occasionally collects waste during holidays and special events. Approximately 202,825 lb/month (92 tons/month) is collected including yard waste.

Appropriate Technology

Assessment of alternatives:

The alternatives considered for the construction of the landfill are:

- **Alternative 1.** Construct a new solid waste landfill over the existing site. The proposed facility will comply with the specifications laid out on NOM-083 and will reduce the environmental risk associated with solid waste disposal. This was considered the preferred alternative.

- **Alternative 2.** Construct the landfill in a new site. This alternative consists of constructing a new landfill in a different site than the existing site. This alternative was evaluated and rejected due to the potential impacts to the new site and the high cost of construction.

- **Alternative 3.** No action. The no action alternative implies continuing with the existing conditions, which create a risk to public health and the environment due to the fact that there is no adequate site to dispose solid waste, or having a site that does not comply with current laws and regulations.

Final Disposal Site

The total generation of municipal solid waste received by the municipal landfill is estimated at 2,998 lb/day (1.36 tons per day), which classifies it as a type "D" Landfill that receives less than 10 tons of solid waste daily.

Currently the Municipality of Los Herreras lacks a suitable area to dispose of their solid waste, and make use of an open dumpsite. The municipality proposes the construction of a landfill in the area where they are currently disposing the solid waste and the closure of the current dumpsite according to the guidelines established in the Standard NOM-083-SEMARNAT-2003.

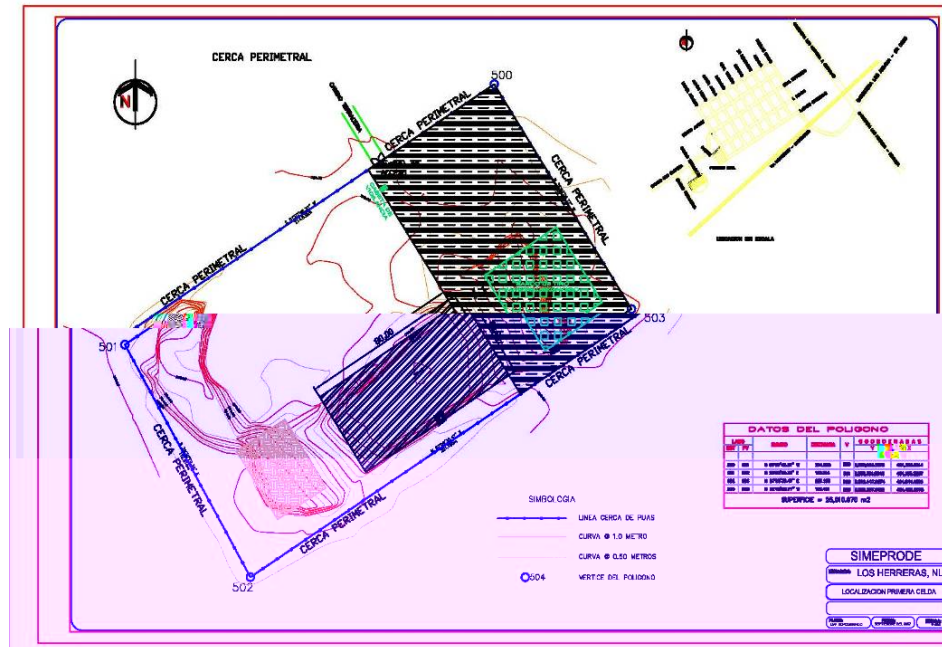
The following pictures below show the current solid waste disposal:



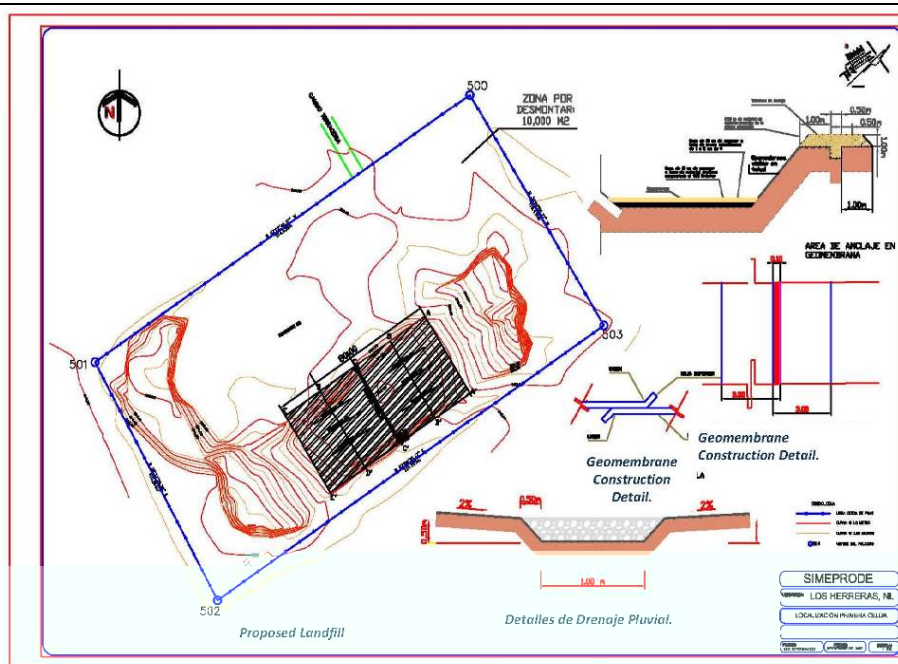
The proposed landfill consists of the construction of a trench of 80m x 40 m. (3200 m²) located in the central part of the site, with a depth of 3 m and 9,600 m³ of capacity in the first phase and a similar amount in the second. To reach the project depth, the earthworks will be redefined in two layers, each one in a depth of 20 centimeters and with product from excavation, compacted to 85% of the Proctor's test and leveled to the required slope. The bottom of the trench will be covered with a high-density polyethylene geomembrane one (1) mm thick to prevent contamination of the aquifers.

The characteristics of the proposed landfill shall comply with regulations in order to prevent pollution in superficial and underground bodies of water, elimination of vectors, smoke and odors, the prevention of soil contamination and respiratory diseases and the elimination of air pollutants.

The construction details are presented in the following figure:



Details of the placement of the geomembrane in the construction of the landfill is presented in the figure below:

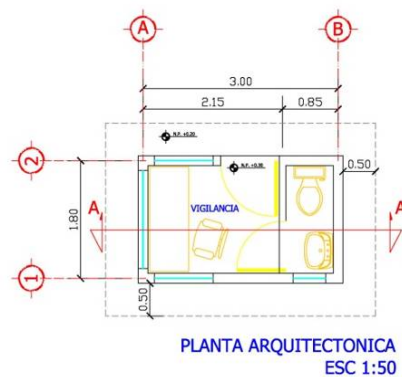


Additional tasks:

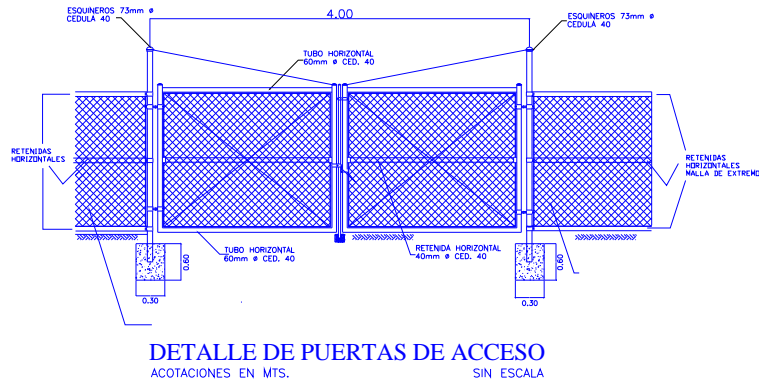
In addition, an inspection and surveillance office of 1.8 m wide x 3 m long will be built to control access of vehicles and restrict access to outsiders. Also, a leachate system and a gateway to the site will be constructed.

The additional tasks are presented in the following figures:

a) Inspection and surveillance office:



b) Fence detail:



The description of the main features of the cell are presented in the following table:

SOLID WASTE LANDFILL CELL SPECIFICATIONS	
Dimensions	80 m x 40 m
Depth	2 m more from the excavated depth.
Estimate Volume (Trench method)	10,200.00 m ³

The land use was determined in the Municipal Council Act #18, regular session, dated on May 29, 2007.

Work Tasks and Schedule

Project Schedule: The proposed calendar for project implementation is as follows:

CONCEPT	1st Month				2nd Month				3rd Month			
	1	2	3	4	5	6	7	8	9	10	11	12
Preparation, design, study												
Permits & Plans												
Permits & Studies												
Acquisition and Installation of City												

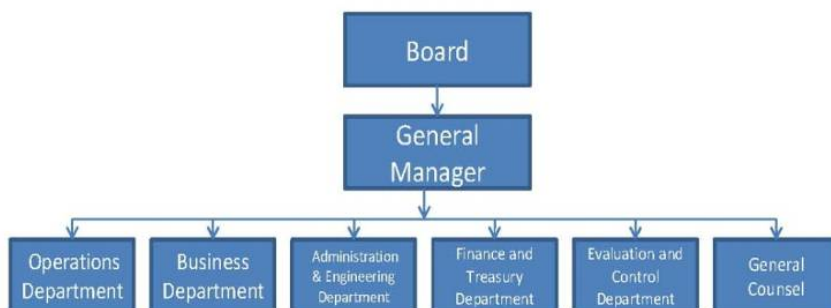
3.b Management and Operations

Project Management

Resources: SIMEPRODE will be responsible for the management, construction, and operation of the sanitary landfill. SIMEPRODE has the adequate level of resources and staff for these tasks

Operation and Maintenance

Organization: In order to carry out its operation and administrative functions, SIMEPRODE has a very straightforward organizational chart. The vehicle operators and the staff responsible of landfill security respond to the Operations Direction. SIMEPRODE's organizational chart is as follows:



Operation Plan:	During the operation phase, SIMEPRODE will develop an operations and maintenance manual. The O&M manual will outline the main activities to guarantee an adequate operation of the landfill and prevention of emergencies on site.
Permits, licenses, and other regulatory requirements:	<p>The project sponsor has the following documentation:</p> <ul style="list-style-type: none">• Technical Review for the Construction of the Solid Waste Landfill issued by the Municipality of Los Herreras, Nuevo Leon. This document was issued in the official letter No. PM 224/200 dated on August 28, 2007.• Change of land use for the construction of the landfill was issued by the Municipal Council Act No. 18.• The construction permit provided by the Municipality of Los Herreras was issued via official letter PM/223/2007, December 10, 2007.
Reviewing agencies:	Technical validation was provided by the Environmental Protection Agency of the State of Nuevo Leon. The technical review corroborated compliance with Mexican Law NOM-083-SEMARNAT-2003. The findings are summarized on Official Correspondence No. APMARN/VII/406/2007 dated December 10, 2007 (Control No. 5036/2007), which provide authorization.

Pending Issues:

None

Criterion Summary:

The final design was reviewed by NADB and BECC.

4. Financial Feasibility

4.a Demonstrating Financial Feasibility

Financial Conditions

Information submitted: Municipal Financial Statements.

Financial analysis results: The municipalities involved in the project are heavily dependent on Federal resources. This limits their capability for investment in new environmental infrastructure and to undertake debt. Since there is one project sponsor for all elements of the comprehensive regional solid waste project, the financing will be considered as one package of which the cost is MX \$ 3,138,039 pesos.

Project Costs, Financial Structure, and Other Plans for Capital Investment

Item:

Construction cost: MX\$ 3,138,039

Final cost: MX\$ 3,138,039

Financial structure:

Source	Type	Amount	%
Mexico	Grant	MX\$ 1,569,020	50
NADB-SWEP	Grant	MX\$ 1,569,020	50
Total:		MX\$ 3,138,039	100

Primary Source of Income

Source of income: SIMEPRODE contributions

4.b Legal Considerations

Project management: The project will be managed by SIMEPRODE, which has the adequate staff to procure, and construct the project, as well as to deal with any potential setbacks during operation of the facilities.

Status of funding agreements: The financing agreements for the project will be signed once the project is certified.

Pending Issues:

None

Criterion Summary:

The project was evaluated and is considered financially feasible.

5. Public Participation

5.a Community Environmental Infrastructure Projects – Community-wide Impact	
Steering Committee	
Date of establishment:	The Steering Committee is comprised of the Board members of SIMEPRODE (the sponsor) and members of the community at large.
Date of approval of Public Participation Plan:	BECC approved the Public Participation Plan on August 2008.
Public Access to Project Information	
Public access to project information:	The local media have provided coverage of solid waste landfills issues in the municipalities with several press articles. Technical and financial information was made available for public review in the offices of the municipality. The information provided the community with project details.
Additional outreach activities:	
Public meeting:	The meeting was held at 10:00 hrs. on September 24, 2008 at Casa de la Cultura of Los Herreras. Attendees included the Mayor and the city council and presented the Project to the public.
Final Public Participation Report	
Final public participation report:	The Steering Committee and the project sponsor prepared the Final Public Participation Report to demonstrate that the proposed objectives were fully met to BECC's satisfaction
Post-Certification Public Participation Activities	
Post-certification activities:	To be developed.

Pending Issues:

None

Criterion Summary:

The project has support from local residents.

6. Sustainable Development

6.a Human and Institutional Capacity Building

Project operation and maintenance: SIMEPRODE as the project sponsor will be responsible for the operation and maintenance of the solid waste disposal system in the Municipality of Los Herreras. The sponsor has adequate institutional capacity and staff to operate and maintain the landfill.

Human and institutional capacity building: SIMEPRODE's institutional and human capacity will be strengthened by improving the construction of the sanitary landfill.

6.b Conformance with Applicable Local, State, and Regional Laws and Regulations and Conservation and Development Plans

Local and regional plans addressed by the project: The proposed project conforms to the Plans and Programs described below:

- State Development Plan (SDP) 2004-2009. The SDP outlines necessary activities to provide adequate solid waste disposal services in the State of Nuevo Leon.

- The project is consistent with the Border 2012 Program, satisfying Objective 3 (Reduce soil pollution) and Goal 1 (Identify needs and develop an action plan focused to improve institutional and solid waste infrastructure capacity and prevent pollution related to solid and hazardous waste in the U.S.-Mexico border. The plan of action will begin in 2005 and will conclude in the year 2012.) One of the main objectives of this program is to reduce risks to public health and conserve and preserve the natural setting.

Laws and regulations addressed by the project

- General Law for Environmental Equilibrium and Protection
- Law for Public Administration for the State of Nuevo Leon
- Environmental Law for the State of Nuevo Leon. State of Nuevo Leon Environmental and Natural Resources Protection Agency Law for the State of Nuevo Leon

6.c Natural Resource Conservation

The project reduces environmental degradation by improving the solid waste collection and disposal system, and by having a sanitary landfill compliant with Mexican Law NOM-083.

6.d Community Development

The project components will reduce the potential for detrimental conditions related to the inadequate management of solid waste that can facilitate spreading contagious diseases.

The construction of the new sanitary landfill promotes community development; since it will reduce the potential for contamination caused by inadequate solid waste disposal and thus will improve the quality of life of the community at large.

Pending Issues:

None

Criterion Summary:

The project complies with all the sustainable development concepts.

Project Documentation Available (in Spanish only):

- Proyecto Ejecutivo para la Construcción del relleno Sanitario en el Municipio de Los Herreras, en el Estado de Nuevo León.
- Resolución de la Evaluación Ambiental realizada por la Agencia de Protección al Medio Ambiente del Estado de Nuevo León.
- Permiso de Construcción otorgado por el Ayuntamiento de Los Herreras.
- Contrato de Comodato y Acta de Aceptación del Comodato por parte del Ayuntamiento de Los Herreras.
- Dictamen técnico del Proyecto realizado por el Ayuntamiento de Los Herreras.
- Acta de cambio de Uso del Suelo otorgada por el Ayuntamiento de Los Herreras.
- Manual de Operación y Mantenimiento del Relleno Sanitario de Los Herreras.
- Informe Final de Participación Pública del Municipio de Los Herreras, Nuevo León.