



CERTIFICATION PROPOSAL

LA CUESTA, FARALLON AND SEDUE-SAAS WASTEWATER COLLECTION SYSTEM IMPROVEMENTS TIJUANA, BAJA CALIFORNIA

Submitted: September 21, 2012

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EXECUTIVE SUMMARY

LA CUESTA, FARALLON AND SEDUE-SAAS WASTEWATER COLLECTION SYSTEM IMPROVEMENTS TIJUANA, BAJA CALIFORNIA

- Project:** The proposed project consists of the construction and rehabilitation of wastewater collection infrastructure, including the construction of the wastewater collection system in the unserved area La Cuesta, the rehabilitation of the Farallon collector, and the rehabilitation of the SEDUE-SAAS force main, known as *Sistema de Alejamiento de Aguas Superficiales (SAAS)* (the “Project”).
- Project Objective:** The purpose of the Project is to increase access to basic wastewater services in unserved areas and reduce exposure to untreated wastewater discharges by rehabilitating some elements of the wastewater collection system, contributing to the reduction of water pollution and the risk of waterborne diseases.
- Expected Project Outcomes:** The environmental and human health outcomes for the Project include:
- The construction of the wastewater collection system in the unserved area of La Cuesta will increase potential access to wastewater collection service to 309 new wastewater connections and reduce 2.50 liters per second (lps) or 0.057 million gallons a day (mgd) of untreated wastewater discharges to open drains.¹
 - The rehabilitation of the Farallon collector will reduce the risk of exposure to approximately 235 lps (5.3 mgd) of untreated wastewater discharges due to leaks or spills.
 - The rehabilitation of the SEDUE-SAAS force main will allow the conveyance of at least 300 lps (6.8 mgd) of treated wastewater and runoff intercepted from the Tijuana River.²
- Population Benefitted:** 116,395 residents of Tijuana, Baja California.

¹ According to the water users census provided by CESPT, to date there are 151 households with water connections. The flow calculation is based on the potential of 309 new wastewater connections.

² Flows were calculated based on the Arturo Herrera and La Morita WWTPs current discharges into the Tijuana River. The SEDUE-SAAS force main has capacity to convey 1,500 lps (34mgd).

Sponsor: *Comisión Estatal de Servicios Públicos de Tijuana (CESPT), Tijuana's water utility.*

Borrower: *Comisión Estatal de Servicios Públicos de Tijuana (CESPT)*

Project Cost: \$40.2 million pesos.

NADB Loan Proceeds: \$21.5 million pesos.

Uses & Sources:
 (Millions of pesos)

Uses	Amount	%
Construction*	\$40.2	100.0
Sources	Amount	%
Federal and State funds	\$18.7	46.4
Proceeds from the COFIDAN-BC4240 loan **	\$21.5	53.6
TOTAL	\$40.2	100.0

*Value added tax included.

** Total undisbursed amount as of July 31, 2012 was \$109.9 million pesos.

Loan terms and conditions:

Established under the original loan authorization by BECC/NADB Board dated July 21, 2009.

CERTIFICATION PROPOSAL

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1. ELIGIBILITY

Project Type

The Project falls within the eligible category of domestic wastewater.

Project Location

The Project is located in the municipality of Tijuana, Baja California, adjacent to the U.S.-Mexico border.

Project Sponsor and Legal Authority

The **public-sector** Project sponsor is the Tijuana’s water utility, *Comisión Estatal de Servicios Públicos de Tijuana* (CESPT, or the “Sponsor”), a public entity legally constituted on decree No. 44 of the V Legislature of the State of Baja California. The document published on December 16, 1966, established the creation of a public authority (CESPT) independent of the state, with legal authority and assets, whose purpose is to provide water, wastewater collection and treatment services to the cities of Tijuana and Playas de Rosarito.

2. CERTIFICATION CRITERIA

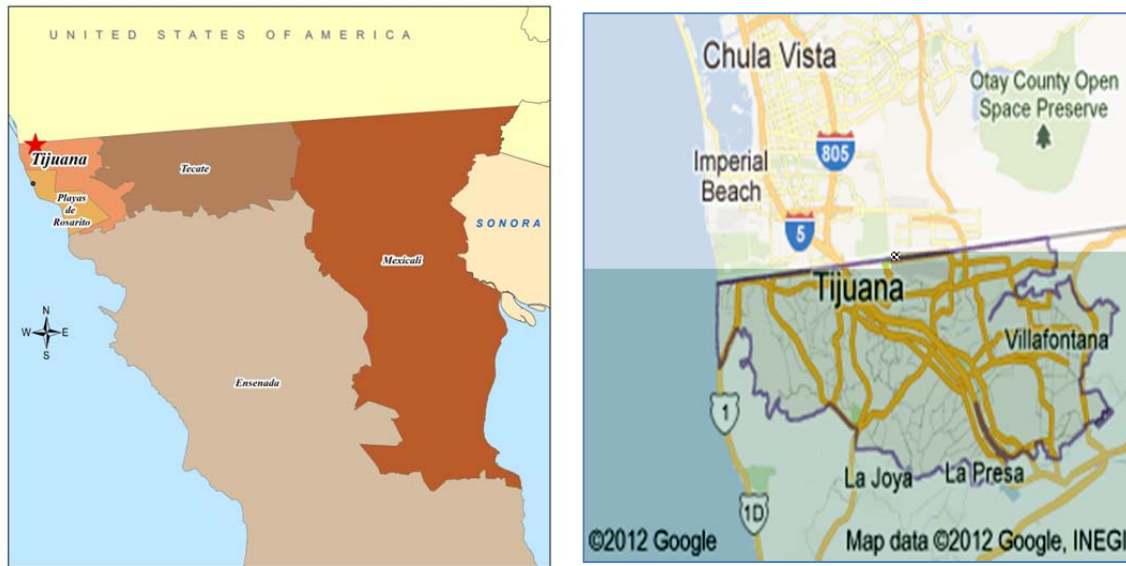
2.1 TECHNICAL CRITERIA

2.1.1. Project Description

Geographic Location

The Project is located in the municipality of Tijuana in the northwestern side of the State of Baja California, Mexico. Tijuana is bordered by the United States–San Diego, California Metropolitan Area– to the north, the municipality of Playas de Rosarito to the south, the Pacific Ocean to the west, and the municipality of Tecate to the east. The Project area is located within the 100 km (62.5 mi) of the US-Mexico border area. Figure 1 shows the location of the community.

Figure 1
PROJECT VICINITY MAP



General Community Profile

According to the 2010 census, the municipality of Tijuana has a population of 1,559,683, which represents 50% of the total population of the state with an average annual growth rate of 2.5%.³

The City's economic activity is largely based on industrial activities, focused on the export of goods (maquiladoras) followed by commerce and tourism and as well as the services and construction industries. The city has an economically active population of 650,723.

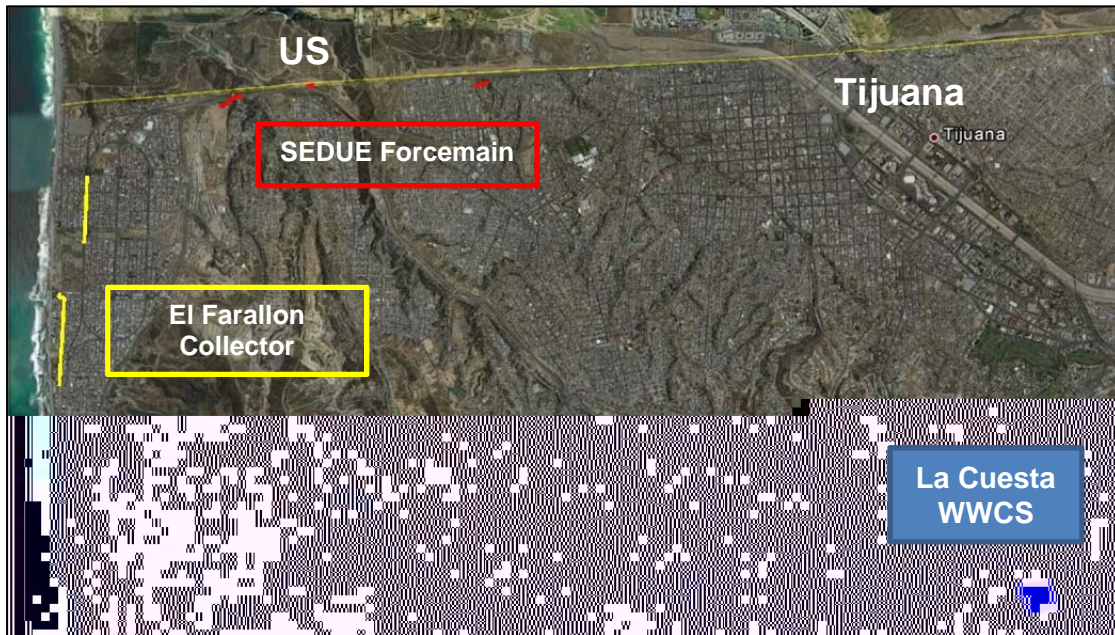
The status of public services in Tijuana is described in Table 1.

³ Instituto Nacional de Estadística, Geografía e Informática (INEGI), 2010.

Table 1
BASIC PUBLIC SERVICES AND INFRASTRUCTURE

Water System*			
Coverage:	99%		
Supply source:	Colorado River		
Number of connections:	533,263		
Wastewater Collection*			
Coverage:	90%		
Number of connections:	488,483		
Wastewater Treatment*			
Coverage:	93%		
Treatment facilities:	Plant	Type	Capacity
	SAB	Activated Sludge	1,100 lps (25 MGD)
	PITAR	"	1,100 lps (25 MGD)
	La Morita	"	254 lps (5.8 MGD)
	Arturo Herrera	"	460 lps (11 MGD)
Solid Waste**			
Collection coverage	83%		
Final disposal	Municipal Landfill		
Street Paving***			

Figure 2
LOCATION OF PROJECTS COMPONENTS



The Project includes the following components:

- Wastewater collection system in the unserved area of La Cuesta
 - Construction of sewer pipelines
 - Total length: 2,689 m (8,822 ft.)
 - Diameter: 20 cm (8 inches)
 - Material: PVC
- Installation of 309 new wastewater residential connections⁵
- Rehabilitation of the Farallon collector
 - Total length: 2,927 m (9,603 ft.)
 - Diameters: 20 to 91 cm (8 to 36 inches)
 - Material: PVC
- Rehabilitation of the SEDUE-SAAS force main
 - Total length: 330 m (1,083 ft.)
 - Diameter: 106 cm (42 inches)
 - Material: Steel

⁵ According to the water users census provided by CESPT, to date, there are 151 households with water connections.

Figures 3, 4 and 5 show the layout of the different components of the proposed Project.

Figure 3
EL FARALLON COLLECTOR ZONES 1 & 2

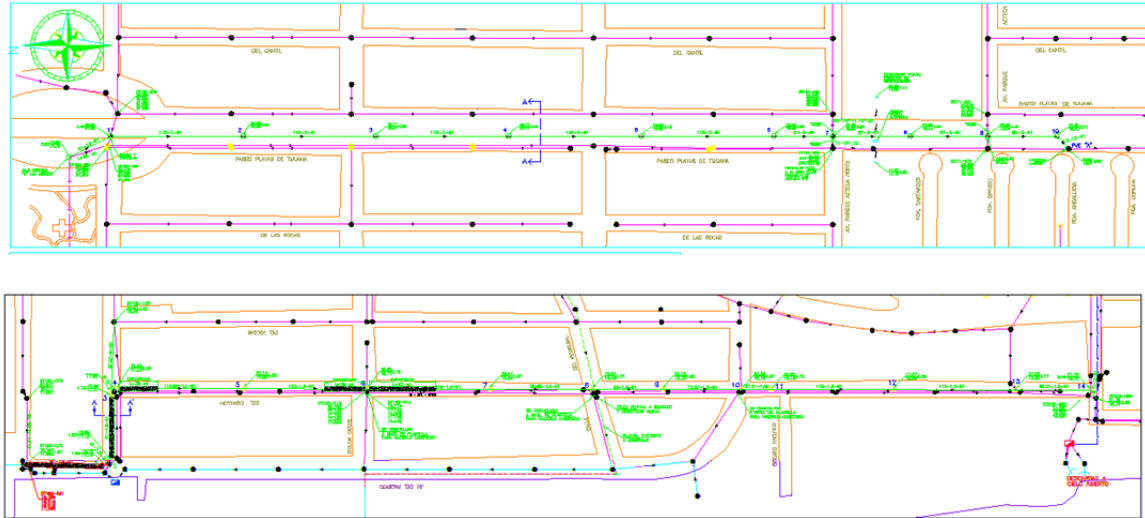


Figure 4
SEDUE-SAAS FORCE MAIN

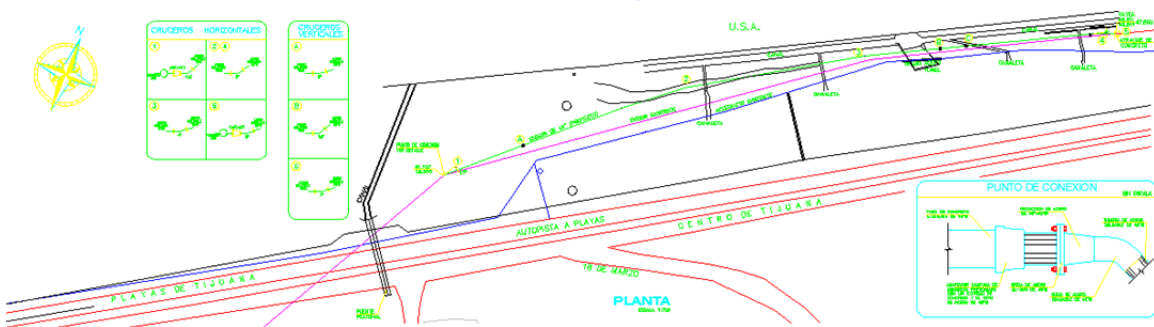
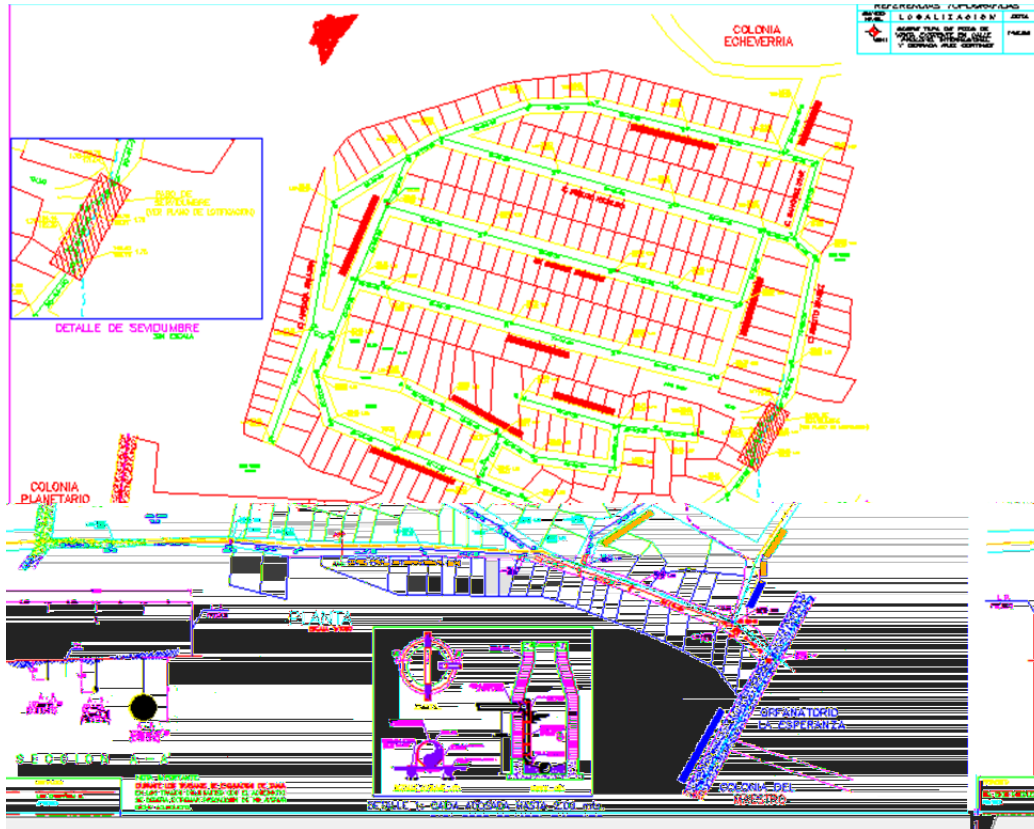


Figure 5
WASTEWATER COLLECTION SYSTEM IN UNSERVED AREA LA CUESTA



The wastewater flows collected at the unserved area of La Cuesta will be discharged to the existing wastewater collection system, from which wastewater flows will be conveyed to the San Antonio de los Buenos WWTP to receive treatment. The wastewater flows from the El Farallon collector will be sent directly to the same treatment plant through an existing pressurized line. The San Antonio de los Buenos (SAB) WWTP is located approximately 6.8 kilometers (4.2 miles) south of the international border and discharges into the Pacific Ocean. Significant increase in flows is not expected as a result of these works. The treated effluent will comply with the Mexican Norms, NOM-001-SEMARNAT-1996 for discharges into the Ocean. The sludge generated in the treatment plant will be managed, treated and disposed according to the norm NOM-004-SEMARNAT-2002.

Currently the flows from the Tijuana River which consists of treated wastewater and storm water runoff, are intercepted by a pump station called "PB-CILA" in order to avoid flows crossing to the U.S side. These flows are sent to an existing collector where they mix with raw sewage, making impossible its reuse. The rehabilitation of the SEDUE-SAAS force main also known as the "old parallel line" will allow the conveyance, in a separate line, of at least 300 lps (6.8 MGD) of treated wastewater and runoff intercepted at the Tijuana River to the area called

Punta Bandera south of the municipality where they will flow directly to the Pacific Ocean.⁶ The capture of these flows in a separate line will offer opportunities for reuse in the near future.

The SEDUE-SAAS force main rehabilitation will serve to have a backup line for the existing force main called “Parallel Line” which conveys approximately 1,100 lps of wastewater flows to the San Antonio de los Buenos WWTP.

The final design considered the use of materials suitable for the Project tasks, which guarantee durability at a low cost; it also considered the use of local materials to avoid transportation costs and emissions. The final design specifications require the use of energy-efficient equipment and sensors for the operation of the electromechanical infrastructure and lighting control.

Table 2 shows the proposed schedule for Project implementation milestones.

Table 2
PROJECT MILESTONES

Key Milestones	Status
Procurement	Anticipated: Third quarter 2012
Construction Period	Anticipated start: September 2012 Anticipated end: December 2013

2.1.2. Technical Feasibility

Design Criteria

The Project final designs were developed pursuant to the wastewater collection technical standards issued by Baja California's Secretariat of Infrastructure and Urban Development, and the technical specifications contained in the Water, Wastewater Collection and Treatment Manual prepared by CONAGUA. The designs also comply with Official Mexican Standard NOM-001-CNA-1995 "Sanitary Sewage System – Specifications for Insulation". Final designs were reviewed by BECC and NADB, and validated by CONAGUA. The works proposed in this Project are included in the FY2012 CONAGUA's financing program for water and wastewater infrastructure (APAZU, by its initials in Spanish)

Selected Technology

As part of the Project development, various routing and materials alternatives were evaluated based on the following parameters:

- Capital and O & M Cost
- Material and Equipment Reliability
- Environmental Impact

⁶ Flows were calculated based on the Arturo Herrera and La Morita WWTPs current discharges into the Tijuana River, the SEDUE-SAAS force main has capacity to convey 1,500 lps (34 mgd).

- Social/Community Acceptance
- Topography

The analysis of alternatives considered the use of pipe materials in compliance with norms and current regulations. The use of high density polyethylene, PVC pipes and concrete was evaluated according to the soil type. In order to reduce costs and make the best use of the Project area topography, the shortest routes were considered for pipe alignments. Crossings through paved avenues were also minimized as well as crossing with underground infrastructure. All the proposed paths run along municipal and state right of ways or CONAGUA federal property.

Pipe diameters were calculated using slopes and velocities accordingly to avoid silt and at the same time avoid over excavation and/or the use of lift stations that might increase costs. Maximum flow rate, full build-out in the Project areas and treatment capacity was also considered for pipe diameter requirements in order to avoid oversized pipelines. Pipe layout was designed based on existing right of ways, according to urban land use plan.

Based on the design criteria mentioned above, an alternative was selected and final design was developed, considering the environmental impacts and mitigation measures according to the specifications of the MIA, authorized by the state of Baja California.

In the case of the rehabilitation projects, surveys and pipe diagnostics were performed to identify the specific segments that require repairs or pipeline replacements compatible with existing material, layout and surrounding conditions.

2.1.3. Land Acquisition and Right-of-way Requirements

The proposed Project is being developed within the urban area and all sewer lines and collectors will be installed within existing municipal or state rights of way and easements. The utility will request the corresponding permits and licenses to construct in the right of ways and for street closures at the startup of the construction process

2.1.4. Management and Operations

Management, construction, and operation of the proposed Project will be the responsibility of the Project Sponsor that has the necessary resources and staff available for these purposes. The sponsor has an Operation and Maintenance manual that includes the primary tasks needed to ensure proper operation of the system and to prevent collapses in the proposed infrastructure.

CESPT serves approximately 500,000 water hook-ups and wastewater connections in the Tijuana and Playas de Rosarito metropolitan area. The utility is organized in various departments, including: Planning, Wastewater Treatment, Operation and Maintenance, Construction, and Administration.

The Project Sponsor has a pretreatment program to control industry and small businesses discharges in coordination with Baja California's Environmental Protection Agency.

2.2 ENVIRONMENTAL CRITERIA

The implementation of the proposed Project will eliminate the discharge of and exposure to untreated wastewater by providing access to wastewater collection and treatment services, and the rehabilitation of aging infrastructure, contributing to the reduction of pollution and the risk of waterborne diseases. The Project will provide access to appropriate wastewater collection and treatment services to approximately 1,225 residents and will improve the existing wastewater collection infrastructure.⁷ By eliminating the use of latrines, septic tanks, and open drains, the proposed Project will contribute to reduce the potential for groundwater and surface water contamination resulting from the inappropriate discharge of untreated wastewater as well as to reliably convey flows and eliminate hydraulic malfunctions throughout the system, which lead to raw wastewater discharges into the ocean.

2.2.1. Compliance with Applicable Environmental Laws and Regulations

Applicable Laws and Regulations

The construction of the wastewater collection system in unserved area of La Cuesta and the rehabilitation of the El Farallon collector are subject to the state environmental clearance authorization in accordance with the regulations of Baja California Law of Environmental Protection. The SEDUE-SAAS force main, as it is located in federal property, requires review from the Mexico's federal environmental protection agency known as the Secretariat of the Environmental and Natural Resources (SEMARNAT).

The Project must also ensure the ability of the infrastructure and utility service to meet the following applicable environmental laws and regulations applied to proper operation of the infrastructure:

- Official Mexican Norm NOM 002 SEMARNAT 1996, which establishes the maximum permissible levels of contaminants for wastewater discharges into urban or municipal wastewater collection systems.
- Official Mexican Norm NOM 001 CNA 1995, which establishes the leak tightness conditions that, must be met by wastewater collection systems.
- Official Mexican Norm NOM 001 SEMARNAT 1996, which establishes the maximum permissible levels of contaminants for wastewater discharges into national waters and territories.
- Official Mexican Norm NOM 004 SEMARNAT 2002, which establishes the maximum permissible levels of contaminants for the utilization and final disposal of biosolids.

⁷ Calculation based on the potential of 309 new wastewater connections.

Environmental Studies and Compliance Activities

Pursuant to the provisions of Baja California's Law of Environmental Protection regarding the environmental impacts of the Project's wastewater collection system in the unserved area of La Cuesta and the rehabilitation of the Farallon collector, the Secretariat of Environmental Protection for the State of Baja California (SPA, for its initial in Spanish) required and Environmental Impact Assessment (MIA, by its initials in Spanish). The studies were prepared and submitted to the SPA on December 9, 2011.

The projects were authorized in the official documents No.SPA-TIJ-12 4.3.0204-MIA/11 and No.SPA-TIJ-12 4.3.0204-MIA/11 issued on March 23, 2012 after a determination was made that the Project complies with all the requirements of the Mexican environmental clearance process.

Pursuant to the provisions of the General Law of Ecological Balance and Environmental Protection and its Environmental Impact Assessment Regulations, SEMARNAT determined through official communication No. DFBC/SGPA/UGA/DIRA/1940/12 that the proposed rehabilitation of the SEDUE-SAAS force main in Tijuana, Baja California does not require a MIA.

Pending Environmental Tasks and Authorizations

There are no formal environmental authorizations pending.

Compliance Documentation

The following formal authorizations have been obtained for the Project:

- SPA MIA Resolutions No.SPA-TIJ-12 4.3.0204-MIA/11 and No.SPA-TIJ-12 4.3.0204-MIA/11.
- SEMARNAT MIA Resolution No. DFBC/SGPA/UGA/DIRA/1940/12.

2.2.2. Environmental Effects/Impacts

Existing Conditions and Project Impact – Environment

Residents from the area of La Cuesta currently have drinking water service but lack wastewater collection services and therefore rely on latrines, septic tanks, or discharges to open drains for their wastewater disposal. The implementation of the proposed Project will provide access to appropriate wastewater collection and treatment services to approximately 1,225 residents. This action will reduce human contact with contaminated water as well as with vectors of waterborne diseases.

Due to aging conditions the Farallon collector have experienced several pipeline breaks and soil collapses which result in untreated wastewater runoff and contamination of beaches in the Pacific Ocean, causing a risk of human contact with raw wastewater and degraded surface water quality. The rehabilitation of wastewater collection infrastructure significantly reduce risks of exposure to raw wastewater and the potential for groundwater and surface water contamination by eliminating leaks and discharges of untreated wastewater.

Due to aging conditions The SEDUE-SAAS force main have experienced several pipeline breaks which impede the conveyance of treated wastewater flows intercepted in the Tijuana River. The rehabilitation of this force main will allow the conveyance of treated effluent that can be reused and will also help to release treatment capacity at the SAB WWTP.

The environmental benefits anticipated for the Project include:

- Increase access to wastewater collection services for 309 new sewer connections;⁸
- Eliminate 2.50 lps (0.057 mgd) of untreated wastewater discharges related to unserved homes;⁹
- Reduce the risk of exposure to approximately 235 lps or 5.3 mgd of untreated wastewater discharges caused by deteriorated infrastructure; and
- Conveyance of at least 300 lps or 6.8 mgd of treated wastewater and runoff to eliminate flows crossing to the Tijuana River Estuary on the U.S side.

Mitigation of Risks

Minor environmental impacts are anticipated from implementation of the different phases of the Project, provided that the tasks are implemented in accordance with the specifications of the MIA and taking into account the mitigation measures established in it. Potential impacts will be present during the construction phase and include the following:

- Fugitive dust emissions
- Gas emissions from construction machinery
- Temporary roadway blockages, presence of workers in the area

Mitigation measures in the MIA include:

- Application of treated wastewater to reduce fugitive dust emissions
- Vehicle tune ups to reduce emissions
- Placement of warning signs to prevent potentially hazardous situations

The environmental impact resulting from the Project implementation will be positive overall, given that it increases wastewater collection and treatment coverage, reducing environmental contamination and improving the quality of life of area residents by curtailing potential health hazards.

Natural Resource Conservation

The Project contributes to reduce environmental deterioration and risks of groundwater and surface waters by expanding and rehabilitating wastewater collection infrastructure providing the necessary means to collect and convey wastewater flows to adequate treatment.

⁸ According to the water users census provided by CESPT, to date, there are 151 households with water connections.

⁹ Calculation based on the potential of 309 new wastewater connections.

No Action Alternative

The no-action alternative was not considered viable, since failing to implement actions to improve the wastewater collection system would significantly limit CESPT’s ability to provide wastewater collection and treatment services as well as to contribute to continued risks of environmental deterioration and threatened health of the region inhabitants.

Existing Conditions and Project Impact – Health

According to the “World Health Organization Water, Sanitation and Hygiene Links to Health FACTS AND FIGURES – *updated November 2004”, sanitation projects can have the following benefits to human health:

- Improved sanitation reduces diarrhea morbidity by 32%.
- Access to safe water and sanitation facilities and better hygiene practice can reduce morbidity from ascariasis by 29%.

Project implementation is expected to eliminate the use of latrines, septic tanks, and discharges to open drains and surface water contributing to the reduction of risks for exposure to untreated discharges and a reduction in the number of cases of waterborne diseases in the unserved areas

Waterborne diseases are caused by pathogenic microorganisms that are directly transmitted as a result of inadequate wastewater disposal practices and unsafe water supplies. Waterborne diseases may be caused by protozoan, viruses, bacteria, and intestinal parasites.

An individual may become ill after drinking water that has been contaminated with these organisms; eating uncooked foods that have been in contact with contaminated water; or through poor hygiene habits that contribute to the dissemination of diseases by direct or indirect human contact. The following table shows waterborne disease statistics for the city of Tijuana. As shown below, the number of cases of diseases such as Amoebiasis has dropped throughout the years despite the population’s growth. Projects to improve wastewater collection and treatment services contribute to improve the community’s public health and the improvements realized in this community are expected to be influenced by the continuous investments by the Project Sponsor to address these basic service needs.

**Table 3
 WATERBORNE DISEASE STATISTICS FOR TIJUANA, BC**

No. of Cases						
Disease	2005	2006	2007	2008	2009	2010
Intestinal diseases other organisms	36930	33084	31858	34354	33966	34312
Other Helmintiases	1812	1651	1928	1679	1586	1802
Intestinal Amoebiasis	1715	1636	1202	1179	1178	1006
Scabiosis	1187	1275	2103	1105	840	938

Source: Secretariat of Health, Epidemiological Surveillance Coordinating Unit, General Morbidity, New Cases. Tijuana

Transboundary Effects

Due to the proximity of Tijuana with various communities in the San Diego County in the United States, there are frequent border crossings between cities. The construction of new wastewater collection systems in currently unserved areas as well as the improvements to the wastewater system will have a positive impact on the health of residents of cities such as San Ysidro and San Diego, California and the entire region, since these actions will reduce the risk of waterborne diseases caused by inappropriate wastewater management. Furthermore, the Project will reduce human contact with raw wastewater and reduce the potential for contamination of local and shared water bodies, such as the Pacific Ocean.

2.3. FINANCIAL CRITERIA

The Project Sponsor has requested NADB loan funding to complement the necessary investments for this Project. The proceeds of the NADB loan for these works will be drawn down from the NADB loan authorized by the BECC/NADB Board on July 21, 2009 and contracted through the *Corporación Financiera de América del Norte, S.A. de C.V. SOFOM E.N.R.* (“COFIDAN”). Since no additional financing is being requested by the Sponsor, no funding authorization is required by the Board.

The uses and sources of the works for consideration for certification are presented in the following table:

Table 4
USES AND SOURCES OF FUNDS
 (Millions of pesos)

Uses	Amount	%
Construction*	\$40.2	100.0
Federal and State funding	18.7	46.4
Proceeds from the COFIDAN-BC4240 loan**	21.5	53.6
TOTAL	\$40.2	100.0

* Value-added tax included.

** Total undisbursed amount as of July 31, 2012 was \$109.9 million pesos.

NADB has verified that the current undisbursed amount of the previously approved loan, and contracted under the loan agreement BC4240, once adjusted by the estimated cost of the originally certified works pending to be completed, is sufficient to cover the loan proceeds requested for the proposed works.

3. PUBLIC ACCESS TO INFORMATION

3.1 PUBLIC CONSULTATION

BECC released the Project proposal for a 30-day public comment period beginning August 9, 2012. The following Project documentation was made available for public access:

- Final Design, Wastewater Collection System for Colonia La Cuesta, 2011
- Final Design, Rehabilitation of El Farallon Collector
- Final Design, Rehabilitation of the “SEDUE-SAAS” Force Main
- *Análisis y proyecciones de agua residual y saneamiento para Tijuana y Playas de Rosarito* (Wastewater generation and treatment analysis and projections).
- Master Plan for Water and Wastewater Management, CDM, 2003
- Environmental Assessment, Tijuana and Playas de Rosarito Potable Water and Wastewater Master Plan, CDM, 2003
- SPA MIA Resolutions No. SPA-TIJ-12 4.3.0204-MIA/11, No.SPA-TIJ-12 4.3.0204-MIA/11.
- SEMARNAT MIA Resolution No. DFBC/SGPA/UGA/DIRA/1940/12.
- 2012 APAZU program

The public comment period ended on September 9, 2012, with no comments received.

3.2. OUTREACH ACTIVITIES

The Project Sponsor conducted extensive outreach efforts related to the original loan program authorization and as a general practice updates the communities to be served by infrastructure improvements as projects are ready for implementation. Outreach efforts include activities such as public meetings, presentations and press releases.

The Project’s technical and financial information was made available to the public for review. A fact sheet and a PowerPoint presentation were prepared to present the Project to the community at one public meeting in February 27, 2012, held at the Project Sponsor’s facilities. This Project was presented along with the Lucio Blanco Wastewater Collection Project, which was submitted to the BECC/NADB board and certified in May 2012.

Activities conducted by the Project Sponsor demonstrate the efforts conducted to provide access to project information for the communities affected by the projects. CESPT has a policy for public communication that includes continuous project promotion to obtain/formalize hookup and connection fees as well as other initiatives such as water conservation.