

Border Environment Cooperation Commission
Wastewater System Improvements in Mexicali, Baja California

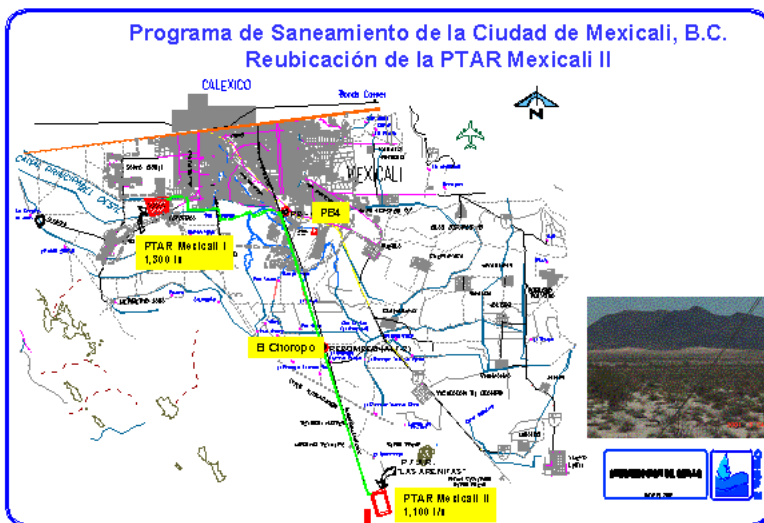
I. General Criteria

1. Type of Project.

The Mexicali Wastewater Collection and Treatment Project falls within BECC priorities, since its intention is to improve the city's environmental situation by providing it with an outfall, a lift station, and a wastewater treatment plant.

2. Location of Project.

The City of Mexicali, capital of the State of Baja California, is located in the State's north-central area. To the north, the city borders with Calexico, California. Mexicali is located in a primarily desert area. Its population is approximately 765,000. The project applicant is the Comisión Estatal de Servicios Públicos de Mexicali (Mexicali's State Commission for Utility Operation or CESPМ.) The following figure shows the project location:



3. Description of Project and Tasks.

In December 1997 the BECC certified a "Wastewater Collection and Treatment Project for Mexicali, B.C." with a cost of US \$50.395 million, to benefit a population of 60,000 residents. The project consisted of 41 tasks intended to upgrade part of Mexicali's wastewater collection and treatment infrastructure, such as the rehabilitation and expansion of the Mexicali I Wastewater Treatment Plant (WWTP), as well as the introduction of wastewater collection to over 46 subdivisions that lacked this service. The project required the construction of Lift Station No. 4 and the Mexicali II WWTP (first phase) to treat wastewater from the city's northeastern area.

This certification allowed the applicant, CESPМ, to obtain in 1998 funding from the North American Development Bank (NADB) to build the aforesaid infrastructure.

CESPМ has been using the above funds to build various structures, such as Lift Station 4, which would convey raw wastewater through an outfall to the Mexicali II WWTP located in El Choropo. Due to opposition faced for the construction of such facility by ejidatarios (farmers, holders of communal land tracts) in El Choropo, CESPМ started reviewing other alternatives. One of such alternatives, which presents several advantages, as will be later described, places the facility at a site called Las Arenitas. This is one of the alternatives previously reviewed.

In order to grant CESPМ the funds considered by NADB for the construction of the Mexicali II WWTP, the BECC needs to accept and certify the new location, along with other project tasks, since the certification of the wastewater collection and treatment program considered a project to which CESPМ is proposing to make relatively significant modifications. This issue had to be presented to the BECC Board of Directors to consider the possibility of re-certifying the Wastewater Collection and Treatment Program.

Mexicali II WWTP, Las Arenitas

The site where the facility is intended to be located, known as Las Arenitas, is located 26 km south of Lift Station 4 (see Figure), in an entirely uninhabited area that neighbors Cerro Prieto. Treatment capacity in Las Arenitas WWTP will be 880 l/s. The effluent from the WWTP will be discharged to a drain that flows north to south towards the Gulf of California (Hardy River).

Regarding the certified project, this alternative comprises the adjustment of LS4 or the construction of a new lift station adjacent to El Choropo area, as well as a 16 km-long outfall from this site to the facility at Las Arenitas.

Following are the benefits and drawbacks of the new proposed site.

Benefits

- *Located outside of the urban zone, in an unpopulated area close to Cerro Prieto.*
- *Neither this land nor any of the adjacent lots are currently being used.*
- *Land is available for sludge processing.*
- *Treated water will finally reach the Gulf of California, thus it will not cross into the U.S., and may be reused.*

- *Opposition by some of the residents will be addressed; in fact this was a proposal presented by the ejidatarios.*

Drawbacks

- *This option that requires more funds than the original proposal.*
- *The facility will be away from the city, and thus its operation will be more complicated.*
- *The lot has to be enhanced to prevent infiltration, since it is comprised of sandy soil.*

4. Conformance with International Treaties and Agreements

The project conforms to existing treaties and agreements. The project falls within the International Boundary and Water Commission Minute 294. The purpose of the project is to provide a solution to the sanitation problems of the New River in order to comply with the standards established by the California Regional Water Quality Board. Also, a Binational Technical Committee was formed to guide the project during the planning stages.

II. Human Health and the Environment

1. Human Health/Environmental Needs.

At present, the City of Mexicali does not have sufficient capacity to treat all the wastewater generated by its residents. Flows from the area known as Mexicali I are conveyed to the Zaragoza lagoons. However, wastewater from in Mexicali II is discharged to a drain that flows into the Rio Nuevo.

The Las Arenitas WWTP, along with the new and available lift station and the proposed outfall, will solve Mexicali's wastewater treatment issues. Additionally, it will reduce the amount of nutrients that flow into the Rio Nuevo and eventually reach the Salton Sea.

The effluent from Las Arenitas WWTP will meet the standards of NOM-001-ECOL-1996.

2. Environmental Assessment.

An Environmental Impact Document (Manifestación de Impacto Ambiental, MIA) was prepared for the project. The MIA was submitted to the SEMARNAT for a finding. The Bureau's finding is expected to be available by early September 2003. The MIA did not identify any significant environmental impacts as a result of the construction and operation of the proposed project.

In addition, an Environmental Impact Study was prepared to comply with the U.S. National Environmental Protection Act (NEPA). The study reviewed the project's impact to the United States, and specifically impacts to the Rio Nuevo and the Salton Sea. The study also discussed impacts related primarily to the reduced amount of water that will flow into the Salton Sea as a result of conveying flows from Mexicali II to the Las Arenitas facility. The annual reduction will range between 15 and 20 cm, until the Salton Sea reaches a balance point three years later.

Furthermore, a significant benefit is expected for the Rio Nuevo and the Salton Sea with the reduction of BOD5, TSS, and phosphates. The reduction in the amount of these contaminants is expected to be 43, 65 and 25 percent, respectively.

The environmental study also discusses the project's cumulative impacts, including the impact of the transfer of irrigation water to the City of San Diego, and the impact that the discharge from Mexicali's power plants will have.

3. Compliance with Ecology and Cultural Laws and Regulations.

The project complies with applicable laws and regulations that govern environmental and cultural resources. As described in Section II, environmental review processes were conducted both in the United States and in Mexico. Applicable agencies were consulted for the protection of cultural resources and endemic species.

III. Technical Feasibility

1. Appropriate Technology.

The project proposes the construction of a wastewater treatment plant at a site known as Las Arenitas. A preliminary plan is available for the facility; since its design and construction will conform to a turnkey scheme, in which the contractor designs, builds and operates the facility during the first year.

Additionally, CESPM started the construction of a 48-inch wide outfall, from Lift Station No. 4 to El Choropo site. The outfall will run 8.9 km long. CESPM will also install 16 kms of outfall from El Choropo to the Las Arenitas facility. Pipes for the outfall are made of K-7 ductile cast iron that meets ISO 2531 specifications.

The last component to be installed will be a lift station at El Choropo site. The lift station will be furnished with Cornell 18NGH-VC20TB vertical pump for 535 lps with a 27.89 total dynamic load.

In addition, pumping equipment will also be purchased to divert flows during emergency events in the city's mains and sewers. The equipment is being evaluated for purchase, along with the number of units and equipment sizing.

2. Operation and Maintenance

CESPM has various operation and maintenance manuals, since it currently operates lift stations, pressure outfalls, and several wastewater treatment facilities. In addition, the design, construction and one-year operation of Las Arenitas facility will be subject to a bidding process. As part of the proposal review process, the companies' operation and maintenance capacity and experience will be considered.

Purchasing emergency pumping equipment will help CESPM prevent untreated wastewater discharges to the drains that flow into the Rio Nuevo. Pumping equipment will enable the utility to divert wastewater from one inspection well to a downstream inspection well when repairs need to be made to mains and sewers.

3. Compliance with applicable design norms and regulations.

CESPM has developed final designs for the lift stations and the Lift Station 4 outfall to Las Arenitas. Final designs meet the standards established by the [Mexican] National Water Commission. In addition, the company selected to prepare the design and build Las Arenitas WWTP will have to conform to standard engineering guidelines as well as those established by regulating agencies.

IV. Financial Feasibility and Project Management

1. Financial Feasibility.

A financial study was developed to determine the utility's debt capacity. The study recommended that the utility increase its revenue to cover the proposed infrastructure's operation and maintenance costs. CESPM is increasing its revenues by making an effort to collect delinquent account balances and above all, by reducing water losses in the system, which enables the utility to have more water available for sale.

The following table shows the costs of the proposed tasks. It must be noted that costs include 8 percent for supervision and 10 percent for contingencies. Additionally, the first phase of the outfall is under construction and the piping used was purchased by EPA as part of the project certified by BECC in 1997. The cost of the pipes for the outfall's first phase has not been included in the project's total cost.

Item	Cost
Outfall (1 st phase)	13,565,405.97
Outfall (2 nd phase)	111,195,594.02
Lift Station	40,500,189.27
Las Arenitas WWTP	125,974,826.65
TOTAL	291,236,015.91

Project funding sources are presented in the following table. It must be mentioned that CESPM's contribution is intended to match funds provided by EPA's Border Environmental Infrastructure Fund (BEIF). CNA's contribution will be matched by EPA in a future project.

Funding Source	Amount
EPA	82,630,594.63
CESPM	82,630,594.63
CNA	62,987,413.32
Japanese Loan	62,987,413.32
TOTAL	291,236,015.91

As mentioned before, this project will not require user fee increases, since CESPM increased its fees by 14 percent in November 2002 and anticipates annual 7 percent increases in 2003 and 2004. This increase, along with higher revenues by CESPM, will make possible the operation and maintenance of the proposed infrastructure.

V. Public Participation

1. Comprehensive Public Participation Plan.

The public process formally started on December 16, 2002, when Mr. Efraín Muñoz Martín, General Director of the Comisión Estatal de Servicios Públicos Municipales de Mexicali (CESPM), acting as project applicant, was provided with the BECC's Guidelines for Community Participation and other reference documents to initiate the public process.

The applicant, based on previous work meetings attended by distinguished community representatives who later joined the Steering Committee, submitted a Comprehensive Community Participation Plan to the BECC for review. The plan was received on March 21, 2003 and was approved by BECC on March 26, 2003.

2. Steering Committee

The Steering Committee was established on March 18, 2003 at a meeting held at CESPM's Meeting Room in Mexicali, BC and attended by 31 representatives of local organizations, labor unions, professional associations, academic institutions, neighbor associations, service clubs, business representatives, public officials, etc. This ensured an expanded, plural and inclusive Steering Committee with a clear idea of the most important currents of opinion in the community. The Steering Committee's Board was selected as follows: Rogelio Blanco Jester, Chairman; Jose Juan Sanchez Soler, Secretary; Francisco Mosqueda Martinez, Ricardo Valenzuela Stevenson, Rene X. Acuña, Roy Blanco Cordero and Armando Aranda Miranda as alternates.

3. Local Organizations

The project sponsor and the steering committee contacted several organizations, including the Chambers of Commerce and Industry, as well as several environmental groups in the area.

4. Public Information

The Steering Committee and the applicant held meetings with local organizations and presented the project before chambers, associations and neighbor organizations. A highlight was the information meeting held on July 10, 2003 with the Asociación Ecológica de Usuarios del Río Hardy-Colorado A.C. [Ecological Association of Users of the Hardy-Colorado River] as well as a meeting with representatives of the Cucapah Indian Tribe, who were explained the project's technical characteristics and environmental benefits.

5. Public Meetings

First Public Meeting: This meeting was held on the afternoon of April 29, 2003 at the National Chamber of Commerce (CANACO) Hall in Mexicali, and had approximately 65 attendees. At this meeting the project's technical scope and proposed site were presented, along with the issue being addressed and the project's approximate cost. The participation of attendees, by its intensity and determination, ratified the community's concern to address the issue. An exit poll as given to 57 attendees, and 98% of those surveyed explicitly expressed their support for the project.

Second Public Meeting: This meeting was held on the afternoon of Thursday, July 17, 2003 and, as well as the previous meeting, it took place at the National Chamber of Commerce (CANACO) Hall in Mexicali. The meeting had 123 people in attendance.

The project defined as the "Cleanup Program for the Rio Nuevo in Mexicali, BC" includes as an important component the construction of a wastewater treatment plant to be located in an area known as "Las Arenitas," in the City of Mexicali. However, this facility, as part of another project, was intended to be located in the area known as "El Choropo" in the same city. However, the community's concern and particularly the opposition of "El Choropo" residents to the facility being built near their houses was such, that the BECC, reflecting its willingness to listen to the voice of a community that presented legitimate and applicable arguments, resolved to redefine the project and identify a new location.

All the above becomes relevant when community leaders from "El Choropo" showed up at this second meeting to express their total support for the "Las Arenitas" project and to voice that, if in the past they vigorously opposed the project that proposed a wastewater treatment facility at "El Choropo," they now came to make justice to the BECC and recognize its willingness to listen to residents with an open, plural and conciliatory spirit.

Just as in the first meeting, the project's technical scope, location, issues addressed and approximate costs were presented at this meeting. Additionally, emphasis was made in also presenting user fee increases required by the project.

After a very rich question and answer session where an opportunity was given to stakeholders to freely express themselves, 97 surveys were applied, and 100% of those surveyed explicitly expressed support for the project.

1. Definition and Principles

The basic principle for sustainable development considered by BECC is: Conservation oriented social and economic development that emphasizes the protection and sustainable use of resources, while addressing both current and future needs, and present and future impacts of human actions. The Mexicali Wastewater System Improvements Project includes among its objectives to expand the wastewater treatment capacity. The project plans to provide this service to the entire population during a 12-year project horizon. The city does not have treatment capacity of the total wastewater generated and this situation impacts the environment negatively.

Overall, the proposed project will promote significant environment and natural resource conservation benefits, inasmuch as the following feasible objectives have been established:

- Treat wastewater generated by city residents.
- Reduction of organic load and nutrients contribution to the New River bi-national watershed, therefore, to the Salton Sea.
- Gradually but significantly reduce raw water infiltration to the ground.

This project intends to provide 100% wastewater treatment coverage by the end of the performance period, substantially improving the overall life conditions for residents who currently lack this service.

In view of the above considerations, it is possible to establish that this project conforms to BECC's sustainability principles.

2. Institutional and Capacity Building

As part of the Mexicali Wastewater System Improvements Project the applicant has identified activities and actions in addition to the construction of infrastructure to enhance CESPM's institutional capacity.

- CESPM has developed a water conservation campaign that will be reinforced during the following years to create public awareness as to the importance of saving and making rational use of water.
- Infrastructure growth will clearly demand greater technical capabilities in CESPM to efficiently operate the system. Hence, the project has considered a staff training program to operate the system in a more efficient manner. An option that has been considered for training is one offered by NADB through the Utility Management Institute (UMI). The above will be incorporated into a comprehensive human resource development program.
- A quality assurance and control program will be established with the purpose of creating quality criteria to operate the system under applicable quality procedures and policies, as well as to establish criteria and standards for the design and construction of new infrastructure.
- Analyses of the legal framework have been made to determine the actions targeted to carry out the necessary legal adjustments for CESPM's institutional capacity building.
- Currently, the NADB develops Financial and Institutional Strengthening programs in CESPM, evaluating administrative and financial performance indicators over time, and measuring their results.
- Among these programs it is included the development of a study to evaluate the tariff structure and create a tool with which CESPM may implement service charges appropriate to the financial conditions to operate, maintain and increase the infrastructure, avoiding the risk of facing an infrastructure backlog in the future.
- An important point that must be highlighted is the infrastructure's maintenance and preservation. The project proposes the development of two types of maintenance programs for the facility: preventive and corrective maintenance.
- Additionally, the training will include a contingency program for the system's construction, start-up and operation phases, which will be provided in writing to all the staff directly or indirectly involved in these activities. A safety program will also be implemented and reinforced by the provision of an appropriate number of quality equipment. The safety program will include enforcement of construction specifications, in addition to general procedures for operating the equipment and facilities that conform the systems, including electrical installations. Also, back-up pumping equipment is included in the project's scope, in order to guarantee continuous operation of the pumping station, even if preventive or corrective maintenance had to be done in the main pumps.

The construction of the Las Arenitas Wastewater Treatment Plant, a 16 km outfall, and the PB4 improvements or the construction of a new one, will improve significantly CESPM's wastewater conveyance and treatment capacity, helping to abate the lack of wastewater treatment that remained with the Choropo Plant project cancellation.

3. Conformance with Applicable Local and Regional Conservation and Development Plans

The Mexicali Wastewater System Improvements Project complies with BECC requirements and is based on the strategic guidelines provided in the Municipal Urban Development Plan and on regional conservation regulations and criteria, which main objective is to improve the quality of life of Mexicali residents within a framework of harmonious and balanced integration by planning urban development and land management. Such policies and guidelines relate to three fundamental issues: growth, conservation, and improvement.

The Mexicali Project complies entirely with the city's urban development planning strategies, both for its current needs as well as for future needs projected, and largely contributes to achieving the objectives of improving the quality of life of city residents, inasmuch as the project proposes tasks considered to be urgent to reduce the current backlog and improve the conditions for people who already reside in the city urban area. In addition, works will be built in the next years to enable the city to provide a suitable way of living to future generations. This is a significant contribution to the sustainable development of Mexicali urban area.

In the area of regional planning, the project incorporates actions and tasks included in the National Water Program (PNH), such as the implementation of projects and actions intended to reduce water contamination in a watershed considered by the PNH to be a priority area because it is a bi-national watershed with significant economic activity. Moreover, the project meets the basic premises of policy guidelines proposed by the PNH, as it targets its efforts to considering the development of the city of Mexicali within a sustainability framework that considers water as a national security resource and incorporates public participation in decision making processes, inasmuch as they are the ones ultimately affected by the implementation of water related policies.

4. Natural Resource Conservation

With the proposed improvements for the wastewater treatment system, wastewater from the sewer system will reach a higher quality level before reaching its final disposal in water bodies, creating safer sanitary conditions for the community.

With the project implementation, it will be reduced considerably the raw wastewater contribution to the New River bi-national watershed, therefore, the organic load and nutrients contribution to the Salton Sea will be reduced. Potentially it will contribute to mitigate this water body current eutrophication levels.

5. Community Development

Results obtained from the implementation of the Mexicali Project, in addition to improving the quality of water and the environment, will create favorable conditions for the city's development, starting with the creation of new jobs for the construction, operation and maintenance of the proposed projects. In addition, the community will be provided with wastewater treatment infrastructure, which will be expanded according to a planned development, in order to avoid future lack of capacity.