

# **CERTIFICATION AND FINANCING PROPOSAL**

**CONSTRUCTION OF A WASTEWATER COLLECTOR  
NUEVO CASAS GRANDES, CHIHUAHUA**

## CERTIFICATION AND FINANCING PROPOSAL

### CONSTRUCTION OF A WASTEWATER COLLECTOR NUEVO CASAS GRANDES, CHIHUAHUA

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## EXECUTIVE SUMMARY

### CONSTRUCTION OF A WASTEWATER COLLECTOR NUEVO CASAS GRANDES, CHIHUAHUA

**Project:** The project consists of the construction of a wastewater collector and sewer lines in Nuevo Casas Grandes, Chihuahua (“the Project”).

**Project Objective:** The purpose of the Project is to eliminate exposure to untreated wastewater discharges, contributing to the reduction of pollution and the risk of waterborne diseases.

**Expected Project Outcomes:** The Project is expected to generate environmental and human health benefits related to the following Project outcomes:

- Provide first-time access to and/or improve wastewater collection and treatment services for 3,980 residential connections.
- Eliminate untreated wastewater spills of up to 0.73 million gallons per day (MGD)<sup>1</sup>

**Population Benefitted:** 13,850 residents of Nuevo Casas Grandes, Chihuahua.<sup>2</sup>

**Project Sponsor:** Chihuahua state water agency, *Junta Central de Agua y Saneamiento de Chihuahua* (JCAS)

**Project Cost:** US\$500,000

**NADB Grant:** US\$450,000 from NADB’s Community Assistance Program (CAP)

**Uses & Sources of Funds:**  
(U.S. dollars)

Uses	Amount	%
Construction*	\$500,000	100.0
<b>TOTAL</b>	<b>\$500,000</b>	<b>100.0</b>
Sources	Amount	%
JCAS	\$50,000	11.0
NADB CAP grant	\$450,000	89.0
<b>TOTAL</b>	<b>\$500,000</b>	<b>100.0</b>

\* Includes costs related to construction only.

<sup>1</sup> Estimated at 32 liters per second (0.73 MGD) based on 200 liters per capita per day with 3.47 persons per household.

<sup>2</sup> Based on the final design.

# CERTIFICATION AND FINANCING PROPOSAL

## CONSTRUCTION OF A WASTEWATER COLLECTOR NUEVO CASAS GRANDES, CHIHUAHUA

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### 1. ELIGIBILITY

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#### **Project Type**

The project falls within the eligible sector of wastewater treatment.

#### **Project Location**

The project is located in the city of Nuevo Casas Grandes in the state of Chihuahua, 62 miles (100 km) south of the U.S.-Mexico border.

#### **Project Sponsor and Local Authority**

The public-sector Project sponsor is the Chihuahua state water agency, *Junta Central de Agua y Saneamiento de Chihuahua* (JCAS or the "Sponsor"). Pursuant to the Article 1564 of the Administrative Code for the State of Chihuahua, JCAS is the regulatory agency responsible for developing infrastructure improvement projects in Nuevo Casas Grandes.

The local water utility, *Junta Municipal de Agua y Saneamiento* (JMAS), has the legal authority to operate and maintain water treatment, storage, and distribution systems, as well as wastewater collection and treatment systems.

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### 2. CERTIFICATION CRITERIA

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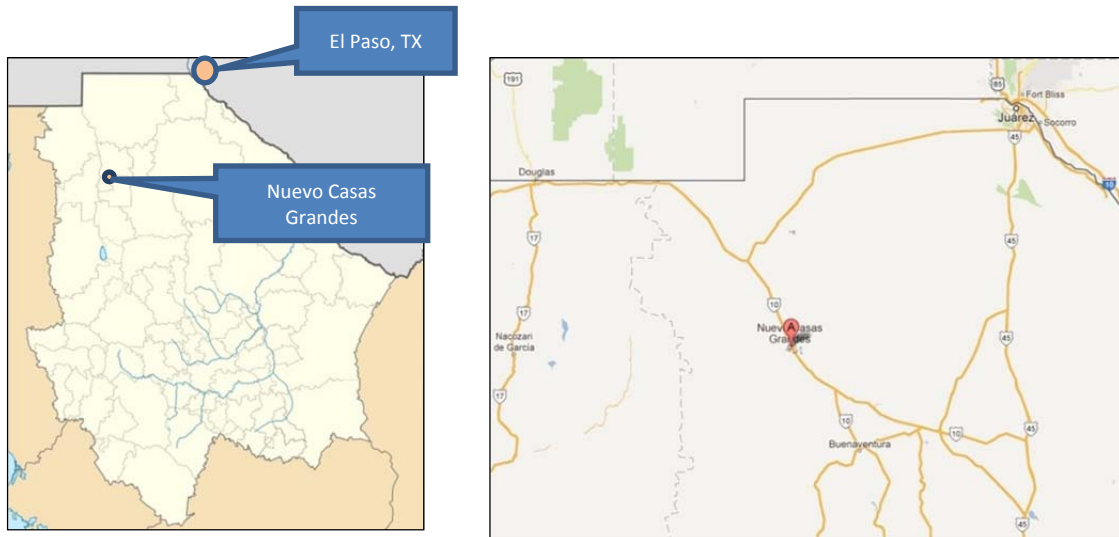
#### 2.1. TECHNICAL CRITERIA

##### 2.1.1. Project Description

#### **Geographic Location**

The city of Nuevo Casas Grandes is located in the northwestern part of the state of Chihuahua, approximately 124 miles southwest of El Paso, Texas and 120 miles southeast of Douglas, Arizona. The Janos Biosphere Reserve lies east of the city. Figure 1 shows the location of Nuevo Casas Grandes.

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



**General Community Profile**

According to the population projections of the Mexican census bureau, the municipality of Nuevo Casas Grandes had 59,337 residents in 2010, having grown at an average annual rate of 0.1 % over the last ten years from a population of 54,390 in 2000.<sup>3</sup> Current estimates have the municipality's population at 59,456 residents.

The municipality's economic activities are based primarily on agriculture, industry and commerce. The economically active population is estimated to be 19,126 inhabitants. Average household income is estimated at US\$5,218, which is 25% lower than the state average of US\$7,015.<sup>4</sup>

The status of public services in the community of Nuevo casas Grandes is described below.

<sup>3</sup> Source: *Instituto Nacional de Estadísticas y Geografía (INEGI)*, Mexican censuses 2010 and 2000, respectively.

<sup>4</sup> Source: INEGI, Mexican Census 2000.

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

<b>Water System</b>	
Coverage	95%
Supply source	12 water supply wells (Casas Grandes Aquifer)
Number of hookups	15,979
<b>Wastewater Collection</b>	
Coverage	70%
Number of connections:	11,824
<b>Wastewater Treatment</b>	
Coverage*	70% (capacity available to treat 100%)
Treatment facilities	Extended aeration, 280 liters per second (6.4 million gallons a day)
<b>Solid Waste</b>	
Collection coverage	100%
Final disposal	Landfill
<b>Street Paving</b>	
Coverage	30%

Source: JCAS, May 2012.

\* Calculated based on the percentage of households with wastewater collection service connected to the existing treatment facility.

### **Local Wastewater System**

The colonia Felipe Angeles in the city of Nuevo Casas Grandes has a sewer system. However, a portion of the collected wastewater is conveyed by an undersized collector and sewer lines that tend to overflow through the manholes discharging sewage into the streets.

In response to this need, in 2011, JCAS completed an alignment study and final design for an adequate wastewater collector to convey all of the wastewater flows to the existing treatment plant. The design capacity of the wastewater treatment plant is 280 liters per second (lps) or 6.4 million gallons a day (MGD), with current inflows of 110 lps (2.5 MGD). The new wastewater collector will collect and convey an estimated 32 lps (0.73 MGD) of raw wastewater flows to the plant. Therefore, the plant has sufficient capacity to treat the additional wastewater flows.

This Project has been considered in JCAS' annual budget since 2012, but has not been implemented due to insufficient funds. Implementation of the proposed Project will improve wastewater treatment coverage and reduce the risk of water pollution and waterborne diseases, directly benefitting an estimated 13,850 residents.

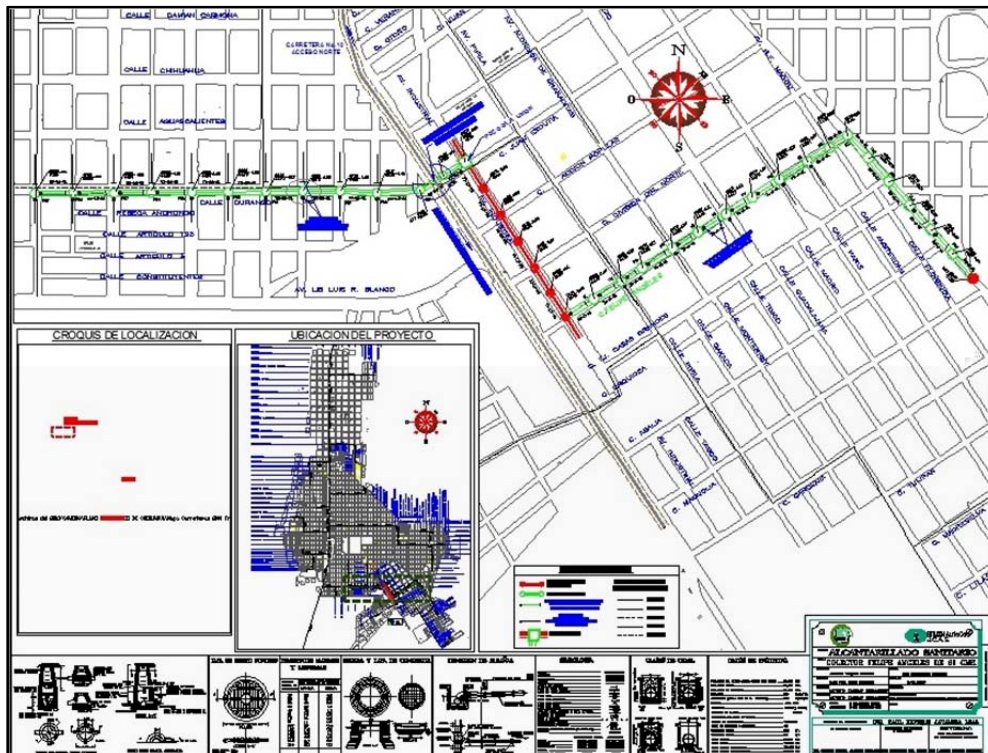
**Project Scope and Design**

The Project consists of the construction of a new wastewater collector and sewer lines, which includes the following components:

- Felipe Angeles Collector: 2,219 linear meters (7,276 ft.) of 24-inch PVC pipe.
- Sewer lines: 1,172 linear meters (3,843 ft.) of 8-inch PVC pipe.
- Manholes: 33
- Residential connections: Installation of 65 new sewer connections.

Figure 2 shows the layout of the Project components within the city of Nuevo Casas Grandes, Chihuahua.

**Figure 2  
 PROJECT LAYOUT**



MAP LEGEND	
	Existing Gomez Morin Collector
	Project collector
	8". PVC sewer line intersection with collector y drop manhole
	Interconnection of existing sewer line collector and drop manhole
	Drop manhole
<b>EXISTING WATERLINES</b>	
	6" pipe
	8" pipe
	2" pipe
	4" pipe
	10" pipe

Construction permits will be the responsibility of the contractor and are considered a construction task. Table 2 shows the proposed schedule for project implementation milestones.

**Table 2**  
**PROJECT MILESTONES**

Key Milestones	Status
Initiation of procurement	Anticipated: 4 <sup>th</sup> quarter 2013
Construction period	Six months

### **2.1.2. Technical Feasibility**

#### **Design Criteria**

The final design of the proposed works was completed in accordance with the technical specifications of the Water, Wastewater Collection, and Treatment Manual developed Mexican federal water agency, CONAGUA.

#### **Selected Technology**

During the hydraulic modeling and final design process, technical options for pipe diameter, material and alignment were evaluated. To identify the most appropriate technology, technical options were evaluated pursuant to the following factors:

- Proposed layout of the collector
- Required connection points for the system components
- Investment cost
- Operation and maintenance cost
- Materials and equipment reliability
- Sustainable practices

The pipe diameter was selected using appropriate slopes and velocities to prevent pipe silting and clogging, septic conditions, over-excavation or the need for pumping facilities that could increase project costs. Peak flow rates and maximum instantaneous flow rates were taken into consideration in order to avoid overflows. The analysis also considered using various pipe materials in compliance with applicable standards and regulations. High-density polyethylene, PVC, and asbestos-cement pipes were evaluated, and their characteristics and suitability for the soil type were reviewed. For the proposed Project, PVC was the selected material, which has proven to be reliable.



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

All the construction tasks of the proposed Project will take place within existing municipal rights of way.

### 2.1.4. Management and Operations

Management and operation of the proposed Project will be responsibility of the municipal water utility, JMAS, which has sufficient resources and staff available for these purposes. JCAS as Project Sponsor and the Chihuahua state regulating agency, will provide procurement and construction supervision during Project implementation.

JMAS has an O&M manual that includes the primary tasks necessary to ensure proper operation of the new infrastructure. The utility serves 15,979 water hookups and 11,824 wastewater connections and provides treatment to approximately 2.5 mgd of wastewater.

According to the Sponsor the new investment will require maintenance once a year, which will cost approximately \$14,760 pesos (US\$1,156). The annual operations budget for 2013 includes funds to accommodate operation and maintenance of the new infrastructure. The 2013 budget is actually lower than the 2012 budget, as the maintenance and clean up activities associated with the overflows have been eliminated. The Sponsor shall demonstrate the sufficient funding and appropriate structure of accounts as a condition of receiving the CAP grant funds.

## 2.2. ENVIRONMENTAL CRITERIA

The improvements to the wastewater system infrastructure will ensure reliable service and eliminate the risks of exposure to untreated wastewater due to overflows. The availability of adequate wastewater infrastructure protects the health of residents and local natural resources from pollution.

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

#### Applicable Laws and Regulations

In accordance with the regulations of the Chihuahua State Ministry of Urban Development and Environment (SEDUE) through its Office of Environment, it was determined that the Project for the city of Nuevo Casas Grandes does not require an environmental impact assessment or authorization (MIA).

Since the Project will be implemented in already disturbed areas, the consultation with the National Anthropology and History Institute (INAH) is not required. No cultural or historical resources are expected to be disturbed.

### **Environmental Studies and Compliance Actions**

According to official letter No. 3263/12 issued by SEDUE on October 5, 2012, no environmental studies are required for this Project.

### **Pending Environmental Tasks and Clearances**

There are no pending environmental tasks or authorizations.

### **Compliance Documents**

Official letter No. 3263/12 issued by SEDUE on October 5, 2012 indicates the Project does not require an environmental impact assessment or authorization (MIA).

## **2.2.2. Environmental Effects / Impacts**

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

A section of the wastewater collection system in the Felipe Angeles neighborhood in Nuevo Casas Grandes is undersized, resulting in sewage overflows from manholes along the sewer lines. The Project will provide adequate infrastructure to collect and convey the wastewater flows to the treatment plant. In addition, homes that do not currently have access to sewer services will be connected to the system.

The Project is expected to generate the following environmental and human health benefits:

- Provide first-time access to and/or improve wastewater collection and treatment services for 3,980 residential connections or approximately 13,850 residents.
- Eliminate the risk of untreated wastewater spills, which could be as much as 0.73 mgd.

The environmental impact resulting from Project implementation will be positive overall, given that it will help prevent sewage spills and increase wastewater treatment coverage.

### **Mitigation of Risks**

Only minor environmental impacts are anticipated during construction of the Project, provided that the tasks are implemented in accordance with best management practices. Potential impacts may be present during the construction phase and include the following:

- Emission of dust particles;
- Combustion gas emissions from construction machinery; and
- Temporary roadway blockages and the presence of workers in the area.

Typical mitigation measures to be practiced include:

- Application of water to reduce the emission of dust particles;
- Vehicle tune-ups to reduce emissions; and

- Placement of warning signs to prevent potentially hazardous situations.

Natural Resource Conservation

The Project contributes to the conservation of natural resources by reducing the risks of soil and water contamination.

No Action Alternative

The no-action alternative was not considered viable since failing to upgrade the collection system would result in ongoing sewage spills, which pose a significant health hazard for residents.

**Existing Conditions and Project Impact – Human Health**

Waterborne diseases are caused by pathogenic microorganisms that are directly transmitted as a result of inadequate wastewater collection and disposal practices and unsafe water supplies. An individual can 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. Table 3 shows waterborne statistics diseases for the state of Chihuahua for the period 2005-2009.

**Table 3  
 WATERBORNE DISEASE STATISTICS FOR THE STATE OF CHIHUAHUA, 2005-2009**

HEALTH SERVICES OF CHIHUAHUA SANITARY JURISDICTION, CHIHUAHUA EPIDEMIOLOGY DEPARTMENT					
GASTROINTESTINAL DISEASES PER TYPE AND YEAR IN THE STATE OF CHIHUAHUA YEARS 2005 TO 2009					
DISEASE	YEAR				
	2005	2006	2007	2008	2009
AMEBIASIS	1723	1234	1198	1345	1190
INTESTINAL ILLNESESS	61123	62376	59992	55212	53232
PARATYPHOID AND OTHER SALMONELLOSIS	678	789	890	765	723
OTHER HELMTHIASIS	5960	5698	4879	4678	4555
TYPHOID FEVER	57	51	40	48	53
SHIGELLOSIS	12	23	17	19	21
VIRAL HEPATITIS-A	190	181	167	197	165
GIARDIASIS	278	225	234	214	210
ASCARIASIS	85	76	59	63	58
OXIURIOS	90	86	81	76	84

SOURCE: WEEKLY REPORT OF DISEASES NEW CASES

There is a risk of exposure to untreated wastewater from sewage spills, which increases the vulnerability of area residents to waterborne diseases. The infrastructure improvements to be implemented under this Project will reduce this risk and thus prevent potential health threats. According to the World Health Organization (WHO), access to safe water and sanitation facilities, as well as better hygiene practices, can reduce ascariasis-related morbidity by 29% and diarrhea-related morbidity by 32%.<sup>5</sup>

**Transboundary Effects**

No negative transboundary impacts are anticipated.

**2.3. FINANCIAL CRITERIA**

**2.3.1. Uses and Sources of Funds**

The total estimated cost for construction of the Project is US\$500,000. The Project Sponsor requested a US\$450,000 grant from NADB through its Community Assistance Program (CAP) to complete the financing of the Project. Table 4 presents a summary of total Project costs, as well as the sources of funds.

**Table 4  
 PROJECT COST AND SOURCES**

Uses	Amount	%
Construction	\$500,000	100.0
<b>TOTAL</b>	<b>\$500,000</b>	<b>100.0</b>
Sources	Amount	%
JCAS	\$ 50,000	11.0
NADB CAP grant	450,000	89.0
<b>TOTAL</b>	<b>\$ 500,000</b>	<b>100.0</b>

**2.3.2 Program Criteria Compliance**

The Project complies with all CAP criteria. It is located within the U.S.-Mexico border region served by BECC and NADB, is being sponsored by a public sector entity and is in an environmental sector eligible for NADB financing. Additionally, as a wastewater project, it is considered a priority under the CAP program. As shown in the above table, the Project Sponsor has agreed to cover slightly more of the project cost than the 10% minimum required under the program.

<sup>5</sup> Source: WHO, Water, Sanitation and Hygiene Links to Health; Facts and figures updated November 2004 ([http://www.who.int/water\\_sanitation\\_health/publications/facts2004/en/](http://www.who.int/water_sanitation_health/publications/facts2004/en/)).

The Project was selected through an evaluation and prioritization process using criteria mainly based on financial need, level of project readiness and number of residents to benefit. The representative degree of financial need in the project area was evaluated by comparing household income. In Mexico, the average household income of a community was compared to the average household income of Mexican communities in the border region. For the current evaluation, the average Mexican border income was US\$12,401. According to 2000 census, the average income in Nuevo Casas Grandes Luis was estimated at US\$5,218, considerably below the average income of Mexican border communities, as well as the average state income of US\$7,015.

The Project Sponsor is ready to initiate bidding for construction once funding has been approved. Upon completion, an estimated 13,850 residents will directly benefit from improved wastewater services and the reduced risk of exposure to sewage spills.

### **2.3.3. Conclusion**

For the above reasons, NADB proposes providing a CAP grant for up to US\$450,000 to JCAS for construction of the Project in the Municipality of Nuevo Casas Grandes, Chihuahua.

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## **3. PUBLIC ACCESS TO INFORMATION**

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### **3.1. PUBLIC CONSULTATION**

BECC published the draft Certification and Financing Proposal for a 14-day public comment period beginning April 29, 2013. The following Project documents were made available for public access:

- Final Design of the Wastewater Collector in Nuevo Casas Grandes, prepared by JCAS and JMAS in 2011.
- Official document No. 3263/12 issued by SEDUE on October 5, 2012, stating that this Project does not require an authorization with respect to environmental impact (MIA).

The public comment period ended on May 13, 2013, with no comments received.

### **3.2. OUTREACH ACTIVITIES**

As a regular business practice, JCAS develops a schedule of proposed projects for the year, which is submitted to the State Congress for approval. During the approval process the Congress consults each city government identified for funding to confirm its acceptance and support for the proposed construction project(s). This Project has been included in JCAS' annual budget since 2012, but has not been implemented due to insufficient funds, which may now be addressed by the proposed CAP grant.