Border Environment Cooperation Commission

Water and Wastewater System Improvements in Douglas, Arizona

General Criteria

1. **Type of Project.** The project consists of the rehabilitation and expansion of the existing water and wastewater lines.
2. **Location of Project.** The City of Douglas is located in Cochise County, Arizona, about 105 miles southeast of Tucson. Douglas is bounded by Agua Prieta, Sonora to the South. The project is located within the 100 km border region as defined by the La Paz agreement. According to City estimates, the population in August 2000 was 17,000. In addition, the population in the surrounding areas are estimated at 5,500. The project considers a total project population of 22,500, expected to reach 25,300 by the year 2006, and 33,400 by the year 2020. The city has a water consumption of 102 gallons per capita per day (gpcd) for residential areas and 128 gpcd for the overall city average.
3. **Description of Project and Tasks.** The project considers the installation and rehabilitation of approximately 55,795 linear feet of water lines and 83,770 linear feet of sewer lines.
4. **Compliance with International Treaties and Agreements**. There are currently no international treaties or agreements in place between Agua Prieta, Sonora and Douglas, Arizona regarding wastewater discharge volume or quality, except the general agreements between both sections of the International Boundary and Water Commission, including Minute 261 and the Treaty of 1944. The project complies with these agreements. Also, the City of Agua Prieta has asked the City of Douglas not to chlorinate the effluent. This request is fulfilled by the City of Douglas.

Human Health and Environment

1. **Human Health/Environmental Needs.** Deteriorated sanitary sewage collection lines and failing septic tank systems, coupled with deficient water distribution system, prompted the City of Douglas to take action in order to improve and solve these conditions. Thus, the primary objective of this project is to improve the health and well-being of the residents of the City by improving its aging infrastructure associated with the water distribution system and wastewater collection network. These systems have experienced a series of problems associated with water quality, leaky sewer lines, and substandard on-site sewage treatment units. Thus, the replacement and rehabilitation of the deficient water lines and the expansion of the sewage collection service area to address current needs will promote a healthier community.

2. **Environmental Assessment.** An environmental assessment was prepared for the project by Science Applications International Corporation (SAIC) under contract to the U.S Environmental Protection Agency (EPA) Region IX. Also, CDM prepared a supplemental Environmental Assessment (EA) to discuss the impacts of projects that were not considered in the original EA. According to the EA, the project does not have any significant environmental impacts. Consultation with Arizona State Historic Preservation Office and 4 Arizona Indian tribes has been completed.

3. **Compliance with Ecology and Cultural Laws and Regulations.** EPA reviewed the environmental assessment and submitted their finding of no impact on April 20, 2001. The EA considered any and all cross-cutting environmental and cultural/historical laws, Executive Orders and regulations, including among others, Significant, Unique or Important Farmlands, National Natural Landmarks, Wilderness Protection, Wild and Scenic Rivers, Wetlands Protection, Floodplain Management, Fish and Wildlife Protection, Endangered Species Protection, Historical, Archaeological, and Cultural Sites, Air Quality, and Environmental Justice. The project is in compliance with all applicable environmental and cultural resource laws and regulations, assuming all future consultation, mitigation, and observance of restrictions are followed.

Technical Feasibility

1. **Appropriate Technology**. The proposed facilities adhere to technologies widely accepted and proven in the United States. The existing wastewater collection system of the City of Douglas consists of a gravity-fed network. The proposed sewer improvements will be congruent with this system. The proposed pipe material is polyvinyl chloride. Hence, no additional training will be necessary for City staff to operate the proposed works.

   An adequate level of engineering design has been achieved for the proposed sewer lines. Overall, the project includes the construction of 83,770 linear feet of sewer pipeline and over 170 manholes and fittings.

   The existing water distribution system consists of two pressure zones, with asbestos-cement and cast-iron pipe sizes ranging from 3-inches to 18-inches in diameter, 6 wells, one pressure relief valve, four reservoirs, one abandoned booster station, and four abandoned wells. The proposed pipe material is polyvinyl chloride (PVC). The task encompasses 55,795 linear feet of pipeline, rehabilitation of a booster station, and one pressure reducing station.

A parallel project, though not part of the certification is the rehabilitation of the wastewater treatment plant. The proposed 2.6-mgd plant upgrade for the City of Douglas utilizes a treatment technology widely accepted and proven in the United States. One relevant factor about upgrading the facility is that operations personnel are considerably familiar with the process. This technology has been used in the Douglas Plant since 1978, with some minor adjustments that were required to comply with discharge standards. The main purpose of the project is to improve the quality of the effluent being discharged into Agua Prieta. The anticipated new technology contemplated within the upgrades is the construction of the chlorination/dechlorination system.

The upgrade of the treatment plant consists in the rehabilitation of the following unit processes: inlet parshall flume, aerated grit remover, comminutor, extended aeration basins, secondary clarifier, outlet parshall flume, chlorine contact chamber, and sludge beds.

2. **O&M Plan.** Prior to start-up, training on the operation and maintenance (O&M) of the Supervisory Control and Data Acquisition (SCADA) System will be conveyed to the city operations staff by the equipment supplier. O&M training will also be offered to personnel on the booster and pressure reducing stations. For the sewer and water lines, no additional training will be necessary, since the same methodologies that are being applied to the existing system can be applied to the new system.
3. **Compliance with applicable design norms and regulations.** The preliminary design of the facilities, completed as part of the certification process, was performed following common engineering practices and reference manual. In particular, the water and wastewater pipeline design and SCADA system were performed following ADEQ Bulletins 10 and 11.

Financial Feasibility and Project Management

1. Financial Feasibility.

The NADB completed the financial analysis to determine the funding structure of the project and the user rates to guarantee the financial sustainability of the operating agency.

Estimated Cost

Concept	Amount (US$)
Water system improvements	**2,976,194**
Wastewater system improvements	**3,861,807**
Hook-ups	**620,212**
Mobilization, testing and traffic control	**240,000**
Contingencies (15%)	**1,154,731**
Total	**$8,852,944**

Current Water and Wastewater Expenses (Annual)

Concept	Amount (US$)
Water Office	323,750
Water Field	1,013,440
Wastewater Fund	514,993
TOTAL	1,852,183

Financial Structure

Source	Amount (US$)	%
USDA-Rural Development	1,810,993	20.5
BEIF	3,501,850	39.5
City of Douglas	1,540,101	17.5
City of Douglas Loan/Bond	2,000,000	22.5
Total	$ 8,852,944	100%

2. **Rate Model:** The City of Douglas approved a capital improvements surcharge in 1999. The surcharge will increase by $2 every year for a period of 5 years.

   The user rates, including the surcharge, for the next seven years are presented in the table below.

SINGLE FAMILY RATES (US$)			
	2000	2001	2002
Average Monthly Water Bill	$ 17.90	$ 18.90	$ 19.90
Average Monthly Sewer Bill	$ 10.12	$ 11.12	$ 12.12
	2003	2004	2007
Average Monthly Water Bill	$ 20.90	$ 21.90	$ 21.90
Average Monthly Sewer Bill	$ 13.12	$ 13.12	$ 13.12

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3. **Project Management**. The City has established a surcharge to the user fees to pay for capital improvements and the creation of reserves. The City has adequate personnel to handle the proposed infrastructure and to respond to any potential emergency that might arise during operation and maintenance of the project.

Public Participation

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Comprehensive Public Participation Plan. The City of Douglas submitted a public participation plan (plan) to BECC on August 31, 2000. The plan was based on the BECC public participation guidelines and includes the required criteria elements for certification. Activities carried out thus far in fulfillment of the plan are summarized below.

Steering Committee: The steering committee included Mr. Frank Zepeda, Arizona Public Service Co.; Mr. John Sproule , Southwest Gas; Mr. Jesse Santana, Douglas School District; Mr. Joe Ruterman, Ram Realty; Mrs. Ana Bernal, Bank One; Mr. Howard Henderson, KDAP Radio Station; Mr. Rob Johnson, Retail Trade; Mr. Mike Palmer, Cochise County; Mayor Ray Borane and City Council representatives. The committee was formed in October 1999.

Local Organizations: The sponsor contacted approximately 25 local organizations including the Pirtleville and Sunnyside Fire Districts; the Douglas Unified School District; Catholic Community Services; Douglas Historical Society and others. Sixteen letters of support for the project were received, including the American Red Cross, the Mexican Consulate in Douglas, Compañeros, and the Douglas Public Housing Authority.

Public Information: The Step II document was available at the Douglas City Hall Public Works Department; the Cochise County Board of Supervisors Office (In Bisbee, AZ); and, after work hours, at the Douglas Public Library. Additionally, fact sheets were available at the Douglas Water Department, Gas Company, and Electric Company. The Mayor of Agua Prieta, Sonora, Irma Villabos de Terán, was informed of the project by a personal visit from Douglas Mayor Mr., Borane on September 22, 2000. The Agua Prieta Mayor expressed support for the project. Letters of support have been provided by local citizens.

Public Meetings: BECC required public meetings were held on October 16 and October 23 2000. These meetings covered the technical and environmental aspects of the project as well as project costs.

Sustainable Development

1. **Definition and Principles.** The project complies with BECC□s definition of Sustainable Development: □*An economic and social development based on the conservation and*

protection of the environment and the rational use of natural resources, but considering current and future needs, as well as present and future impacts of human activities□.

The water and wastewater system improvements project is centered on providing an improved quality of life for human beings.

The project provides environmental protection by replacing lines that have frequent leaks, and also by eliminating the use of faulty septic tanks.

Stakeholders for this project include the City Council, City departments that plan and operate the water and wastewater systems, the residents and business that will benefit from the infrastructure improvements, those who will be impacted by the construction activity, and supportive state and federal agencies such as Rural Development and the Arizona Department of Environmental Quality. A Steering Committee comprising members of the general public was formed for review and recommendations on the project.

2. **Institutional and Human Capacity Building.** An aspect of this project that will build institutional capacity is the creation of reserves for any potential emergencies.

3. **Conformance with Applicable Local/Regional Conservation and Development Plans.** The project arose as part of the Master Plan developed by the U.S. Army Corps of Engineers. Also, the water and wastewater improvements are consistent with the City□s General Plan.

4. **Natural Resource Conservation.** This project will likely create an incremental benefit by extending the groundwater supply through replacement of deteriorated pipes, and also by preventing aquifer pollution due to leaks in existing septic systems.

5. Community Development. Without the water and wastewater improvements, a number of negative impacts to the community will continue, hindering community development.

List of Documents

1. Step II application for the improvements to the water distribution and partial replacement and expansion of the wastewater collection system in Douglas, Arizona

2. Final Public Participation Report of the Douglas Water and Wastewater Improvements Project.

3. Environmental Assessment for the Douglas Water and Wastewater Improvements Project

4. U.S. Environmental Protection Agency Region IX. Finding of No Significant Impact for the Douglas Water and Wastewater Improvements Project.

5. Robert, Bein and Associates. Water System Master Plan. 1997

6. Robert, Bein and Associates. Wastewater Treatment and Collection System Master Plan. 1996

7. Consultation letters from EPA Region IX to Arizona State Historic Preservation Office and to the Tohono O□Odham, Hopi, Gila River, and Ak-Chin Indian tribes.

8. Concurrence letters from the Arizona State Historic Preservation Office, and the Tohono O□Odham, Hopi, Gila River, and Ak-Chin Indian Tribes