Border Environment Cooperation Commission

Marathon Water Supply and Sewer Service Corporation
Water and Wastewater Systems Improvements
in Marathon, Brewster County, Texas

General Criteria
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General Criteria

1. **Type of Project.** The project consists of the expansion of the Marathon Water Supply and Sewer Service Corporation (the Corporation) wastewater treatment plant (WWTP) from 28,000 gallon/day (gpd) to 200,000 gpd. Expansion to the distribution water system to connect existing households in the Corporation' s service area not currently connected to water and/or sewer service.

2. **Location of Project.** The City of Marathon, Texas is located in the north-central portion of Brewster County, on US Hwy 90 between the Cities of Sanderson (east) and Alpine (west), in the West Texas Chihuahuan Desert. Marathon is the second largest town in Brewster County and is on the main route to Big Bend National Park. The WWTP is approximately 4000-feet southwest of the town, located adjacent to Beakley Draw. The project is located within the 100-kilometer border region as defined by the La Paz agreement. The 2000 population has been estimated at 660. The project considers a total project population of 1,237 by the year 2030. The City has a water consumption of 137 gallons per capita per day (gpcd) average.

3. **Description of Project and Tasks.** The project consists of the expansion of the Corporation' s WWTP from 28,000 gpd to 200,000 gpd. Phase One will consist of expanding the WWTP to 100,000 gpd and to bring the plant into compliance with TECQ regulations. Phase Two will expand the WWTP to 200,000 gpd and connect 19 residents to water service and 36 to sewer service. The final treatment method of WWTP effluent will change from evaporation to irrigation.

4. **Compliance with International Treaties and Agreements.** This project complies with the agreements that the United States and Mexico have signed, such as the La Paz Agreement, Border Environmental Comprehensive Plan, Border XXI Program and the North American Free Trade Agreement.

Human Health and the Environment

1. **Human Health/Environmental Needs.** The development of a new WWTP will address several human health and environmental issues for the residents living in the Corporation service area. The existing WWTP was originally built 30 years ago with a treatment capacity of 28,000 gpd. Currently, the WWTP is operating over capacity during most months (36,000 gpd average monthly flow in 1999). The WWTP overflowed its final stabilization pond in January 2000. The TCEQ

issued an Enforcement Order and a fine against the Corporation. The potential contamination of Beakley Draw and the City's water source, Marathon Aquifer, exists. Residents not connected to sewer service increase risks with the use of cesspools and privies for waste disposal.

2. **Environmental Assessment.** An Environmental Information Document (EID) was prepared for the proposed project. The EID satisfied the requirements of the BECC and Environmental Protection Agency (EPA). EPA has issued the FNSI on the project's environment impact.

3. **Compliance with Applicable Environmental and Cultural Resource Laws and Regulations.** As part of the preparation of the EID, comments were solicited from relevant Federal and State agencies including: the Texas Archeological Research Laboratory, the Texas Historical Commission, the US Fish and Wildlife Service, Texas Parks and Wildlife Department, Federal Emergency Management Agency, and the United States Army Corps of Engineers and Texas Parks and Wildlife Department. The project is in compliance with all applicable environmental and cultural resource laws 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, Architectural, Archeological, and Cultural Sites, Air Quality, and Environmental Justice.

Technical Feasibility

1. **Appropriate Technology.** The Existing and Proposed WWTP use the simplest of all wastewater treatment technologies, a lagoon or pond system. In a pond system WWTP waste treatment occurs by digestion of the nutrients in the waste from the bacteria that are also in the waste.

   The waste stream first enters the facultative pond. This pond is deeper than the ponds that follow it. The first part of the pond after the influent pipe is especially deep. This allows the larger particles to settle out, so

they will not settle in the shallower ponds. The Facultative Pond has both aerobic and anaerobic digestion occurring at different levels.

Five preliminary alternatives were evaluated with respect to sludge handling and disposal. All the alternatives, except for the mechanical plant, employ a facultative lagoon, which has an estimated sludge storage capacity of 50 years. The alternatives for constructed wetlands and lagoons with irrigation had the lowest sludge handling and disposal costs of all the alternatives, except the no action alternative. The mechanical activated sludge alternative had the highest cost for sludge handling and disposal, and represented a significant portion of the projected O&M costs for this alternative. The lagoons with evaporative lagoons alternative had higher sludge handling and disposal costs than the two lowest cost options, due to the need to landfill sludge more frequently from the evaporative lagoons. Based on sludge handling and disposal costs, lagoons with irrigation is the preferred alternative.

The existing Plant utilizes a mechanical aerator to increase the level of oxygen in the water and enhance aerobic digestion. The Proposed Facility will not have an aerator, in the interest of less power usage and more simplicity, so it will also need a larger surface area per gallon of influent.

Guidelines on sizing of the ponds and other aspects of their design are located in Chapter 317 of the Texas Administrative Code, Design Criteria for Sewerage Systems.

A portion of the third stabilization pond and the final pond in the proposed system will be used as storage for the irrigation field and to stabilize flows. As the effluent leaves the final storage pond, it will be injected with chlorine to disinfect it. The effluent will then be pumped to the irrigation system, which will distribute it over 40 acres of Bermuda grass. This is a more beneficial use of the effluent as opposed to evaporation.

The Corporation has applied to the TCEQ for an amendment in their Permit to Treat Wastes from TECQ. The Amendment was to expand the WWTP and change it from no discharge to allow irrigation of the effluent. On April 6, 2001 TECQ issued a Draft Permit approving these changes to the Corporation' s Permit to Dispose of Wastes. A Final Permit of approval was issued on November 6, 2001.

2. **Operation & Maintenance Plan.** The design and construction engineer will be responsible for the development of an Operation and Maintenance (O&M) Manual. This O&M Manual will be completed prior to completion of construction. WWTP personnel will receive training prior to the start up of the facility. The Chief Operator has a D license and also is the General Manager for the MWS&SSC. If there are new procedures used in WWTP operation, the company providing the equipment will be required to conduct training on site for staff in operating and maintaining the new equipment.

3. **Compliance with applicable design norms and regulations.** The TCEQ has regulatory authority for wastewater treatment plants in the State of Texas. An Amended Permit to Dispose of Wastes has been approved by the TCEQ. The TCEQ will also have review authority in the final design of the water distribution and sewer collection lines, which must meet State Design Criteria.

Financial Feasibility and Project Management

1. **Financial Feasibility.** The financial analysis determined the following funding structure of the project and the user rates to guarantee the financial sustainability of the operating agency.

Estimated Cost

Table 2-1
Wastewater Treatment Plant, Collection, & Water Distribution Improvements
Budget Phases I & II

CONSTRUCTION COSTS	Phase I TCDP & MWS&SSC Matching Funds	Phase II Other Funds[1]	Total Costs
Treatment lagoons	$110,375.00	$244,245.00	$354,620.00
Miscellaneous Concrete	$9,630.00	$12,000.00	$21,630.00
Duplex irrigation pumps		$29,000.00	$29,000.00
Irrigation piping		$54,000.00	$54,000.00
Outfall to irrigation storage pond		$16,500.00	$16,500.00
Yard piping – lump sum	$26,750.00	$11,000.00	$37,750.00
Electrical – lump sum	$14,439.50	$3,500.00	$17,939.50

Irrigation Control & set-up		$14,500.00	$14,500.00
Weir & drop box	$8,025.00	$4,500.00	$12,525.00
Draining existing stabilization pond	$3,049.50	$0	$3,049.50
Retrofitting existing stabilization pond	$49,605.00	$0	$49,605.00
Acquisition of Site	$10,000.00	$0	$10,000.00
All weather roads		$17,500.00	$17,500.00
Cattle fence around facility	$9,630.00	$21,000.00	$30,630.00
9,905 l.f. of 4" & 6" Sewer Pipe @ $20/l.f.		$208,601.00	$208,601.00
33 Manholes @ $4,000 each		$142,000.00	$142,000.00
7 Cleanouts @ $400 each		$2,800.00	$2,800.00
Lift Station		$50,000.00	$50,000.00
780 l.f. of 3" Forcemain @ $5.50/l.f.		$4,290.00	$4,290.00
36 WW Service Connections @ $1,500 each		$54,000.00	$54,000.00
Water Jetting Machine		$38,000.00	$38,000.00
8,720 l.f. of 2" , 4" , & 6" Water Pipe @ $20/l.f.		$184,400.00	$184,400.00
80 l.f. of 1" Service Line @ $5/l.f.		$400.00	$400.00
160 l.f. of Bore & Casing @ $100/l.f.		$16,000.00	$16,000.00
19 W Service Connections @ $400 each		$7,600.00	$7,600.00
2 Wet Connections @ $500 each		$1,000.00	$1,000.00
Emergency Generator		$6,000.00	$6,000.00
910 l.f. of Pavement Repair @ $30/l.f.		$27,300.00	$27,300.00
Contingency (12%)		$187,620.00	$187,620.00
Sub-total: Construction Costs	**$241,504.00**	**$1,357,756.00**	**$1,599,260.00**
ENGINEERING COSTS			
Basic Engineering Services (TCDP)	$43,910.00	$0	$43,910.00
GPS Mapping (BECC)	$0	$27,295.00	$27,295.00
Preliminary Design (BECC)	$0	$52,520.00	$52,520.00
BECC Certification (BECC)	$0	$45,050.00	$45,050.00
Final Design (BECC)	$0	$21,980.00	$21,980.00
Water Supply Analysis (Other)	$0	$16,000.00	$16,000.00
Construction Management (Other)	$0	$15,015.00	$15,015.00
Resident Inspection (Other)	$0	$15,000.00	$15,000.00
Construction Geotechnical Other)	$0	$5,000.00	$5,000.00
Reimbursable Expenses (Other)	$0	$10,000.00	$5,000.00
Water & Wastewater line Design (BECC)	$0	$58,000.00	$58,000.00
Sub-total: Engineering Costs	**$43,910.00**	**$260,860.00**	**$304,770.00**
PROFESSIONAL SERVICES & OTHER EXPENSES			
Legal & Financial Professional services (5%)	$0	$20,000.00	$20,000.00
Project Administration	$30,000.00	$0	$30,000.00
TOTAL PROJECT COSTS	**$315,414.00**	**$1,638,616.00**	**$1,954,030.00**

Current Water Expenses (Annual)

Financial Source	Amount (US$)
Operating Revenue	$186,905.00
Operating Expenses	$154,902.00
Non-operating Expenses	$14,483.00
Net Income	$17,520.00

Financial Structure

Financial Source	Amount (US$)	%
TCDP Grant/MWS&SSC Matching Funds	$315,415.00	16
BECC	$199,465.00	10
NADB Loan	$210,000.00	11
NADB BEIF Grant	$1,229,150.00	63
Total	$1,954,030.00	100.0

Additional Assistance: NADB BEIF Transition Assistance Grant in the amount of **$219,410.00** will help the Corporation with its debt service for the first six years and creation of required debt service and repair and replacement reserves.

Rate Model: An increase in average combined residential water and wastewater bills can be expected, increasing from $52.89/month to $55.32/month during the first year of the project in 2004. This amount will increase to 56.59 in 2005 and will reach $60.00 in 2008 and 2009 as depicted in the following table.

Average Residential Water & Wastewater User Fees

YEAR	COMBINED BILL	COMBINED BILL

	W/O BEIF	WITH BEIF
2003	52.89	52.89
2004	111.17	55.32
2005	103.75	56.59
2006	86.94	57.91
2007	87.32	59.26
2008	88.85	60.00
2009	88.46	60.00

2. **Project Management.** The Community 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

1. **Comprehensive Public Participation Plan.** The public participation plan was submitted and approved in November 2001.

2. **Steering Committee.** The Corporation developed a Local Steering Committee to be responsible for community outreach, disseminating information, and soliciting public support. The Committee was made up of: Ike Roberts, Agriculture Businessman; Barbara Novovitch, Editor of the Marathon Gazette; Pete Salas, Agriculture Employee; Max Martinez, Laborer; Walt Elliott, Agriculture Employee. Assisting the committee were Steve Houston, County Attorney and Corporation President; the consulting engineers and Bernice Martin, secretary of the Water Corporation.

3. **Local Organizations.** The Local Steering Committee contacted and received letters of support from the Chamber of Commerce, the Brewster County Historical Commission, the Marathon Museum Society,

Marathon Independent School District, Marathon Primary Care Services, Marathon Methodist Church and St. Mary' s Catholic Church.

4. **Public Information.** Copies of the environmental information document and draft BECC Step II document available at the Corporation offices and the Marathon Public Library, as were all meetings notices. The meetings were advertised in the local newspaper and local access TV channel. The local newspaper published several articles of the project.

   Given that Marathon is a small community much informal outreach carried out by word of mouth and informal meetings throughout the community served as one of the principal forms of involvement by the residents. Helping this effort was a fact sheet that included basic technical, environmental and financial information of the project. It was distributed throughout the community to individual residents, at the Corporation offices and local library and stores. A grocery store walk-in survey in support of the project yielded over 60 signatures.

5. **Public Meetings.** Three public meetings were scheduled to discuss the project. The first meeting held on November 15, 2001 was a general information meeting to provide the general public with an update of the project, what the BECC Step II application is designed to accomplish. The second meeting was held later that month on November 27 in conjunction with the public meeting required for the Environmental Assessment. These meetings served to identify residents who were considered part of the original project and not connected to the system to be included in phase two of the project. The final public meeting was conducted to review the financial aspects of the projects and was held on April 30, 2003.

Sustainable Development

1. **Definition and Principles.** The project complies with BECC' s definition of Sustainable Development: " 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." By expanding wastewater treatment capacity and using irrigation to dispose of effluent, the

Corporation will provide a more resilient wastewater treatment facility that will meet the needs of future residents for the next 25 years. Connecting all of the residents in the Corporation' s Service Area to water and sewer services, will eliminate a major public health problem in the area, and fulfill the mission of the Corporation. Present and future generations will benefit from this project by being able to connect to safe and dependable wastewater treatment, since the Corporation will have sufficient treatment capacity to meet current and future demands through 2025. This is something the existing, under-sized facility cannot provide.

2. **Institutional and Human Capacity Building.** The project is and will be managed by the local sponsor and will be constructed and operated in conformance with the requirements of both the regulatory and funding agencies. The process used in the development of this project has followed a planning and public participation process that has developed alternatives and associated costs, solicited public input into the process, established priorities based on the input of the stakeholders and proceeded according to the priorities established in the planning process.

3. **Conformance with Applicable Local/Regional Conservation and Development Plans.** The design engineer prepared a new Operation and Maintenance (O&M) Plan as part of the Design Engineering Contract with the Corporation. Initial startup of the system will include testing of the components prior to acceptance by the owner to assure that they properly perform their intended function. The construction contractor is responsible for repair or replacement of components found to be defective during testing. The contract documents will require the contractor to provide at least a one-year warrantee on the construction and equipment.

   It is the Corporation' s intention to continue to operate the existing WWTP during the start up of the new WWTP so that service will not be interrupted.

   The construction contractor will be required to observe State and Federal Safety Laws during construction of the improvements. The Contractor will be required to provide a written safety plan. Each project component will be quality tested prior to acceptance by the owner. The owner and his construction engineer must also accept the entire project as completed to their satisfaction before the contractor can receive his final payment. Once construction is completed the City is required by TCEQ

to have safety plans developed for the handling of all hazardous materials. The City will also implement the American Water Association's safety plan as part of their safety program and continue to promote a safe work environment.

Once the plant is fully operational, the Corporation will be responsible for its maintenance and the quality of the product. Oversight will be provided by the TCEQ with monthly reports being made by Corporation Staff and a yearly inspection of the facility by TCEQ Personnel.

A pollution protection plan will be required of the contractor before he commences work. Items discussed will be traffic congestion, noise issues, dust abatement, compliance with the storm water run off plans, disposal of wastes, stopping work upon encountering archeological or hazardous waste sites.

The new WWTP will require compliance with all applicable laws as well. The storm water run-off permit will be applicable here, also proper disposal of wastes, and leaving the site in landscaped condition to avoid run-off. The plant will need to undergo start-up monitoring by the Texas Commission on environmental Quality (TCEQ), the governing regulatory agency, the project engineer, contractor, and owner. When the new WWTP becomes operational, it will be required to test water quality parameters daily and present monthly reports to TCEQ. TCEQ will also conduct yearly certification inspection during the lifetime of the facility.

There are closure and post closure requirements by the TCEQ for existing and new WWTPs. For the existing WWTP, the sludge from plant operations will be disposed in compliance with existing regulations at a permitted landfill. Since the site is over 5 acres, an EPA NPDES storm water construction permit will be required. The construction contractor will be required to submit registration information for every waste transporter and the permit number of the landfill where the waste is disposed. Methods will be proscribed in the specifications for removal of demolished building materials and equipment. The contractor will also be required to leave the site landscaped to prevent runoff. There will be no site monitoring required after closing the existing WWTP.

The Corporation does not have a formalized water conservation plan at this time. As part of the TCEQ Agreed Order, which resolved the Enforcement Order, the TCEQ fine of $2,625 was applied towards the

purchase of new meters to replace the old well head meters. The Corporation has instituted a meter change out program, and has installed more than 60 meters in the past two months. The Corporation is monitoring their water losses to determine the effectiveness of the change out program in reducing un-accounted water loss. The Corporation also has escalating rates for increased water consumption, a basic feature of a Water Conservation Plan. The Corporation is preparing a Water Conservation Plan for TCEQ approval.

4. **Community Development.** The development of this new WWTP will provide sufficient capacity to meet the water need of the Corporation' s customers for the next 25 years. With sufficient wastewater treatment capacity, the community will be able to manage growth within its available resources, while providing an affordable water supply and wastewater service to customers.

Available Documents

- EPA FONSI
- TCEQ Discharge Permit
- Water and Wastewater Facility Plan
- Water and Wastewater Improvements Final Design
- Biological Survey for the Marathon Wastewater Treatment Facility
- Property Deed and Survey