Border Environment Cooperation Commission

Construction of the Wastewater System for El Paso County Tornillo Water Improvement District (EPCTWID)
(Tornillo, Texas)

I. General Criteria

1. **Type of Project.** The proposed project falls under the BECC priority area of wastewater treatment. The community of Tornillo does not have sanitary sewer service. Sewage is disposed using various onsite systems. Many of these on-site systems are substandard and failing. This project will provide wastewater collection and treatment facilities for the community of Tornillo. The EPCTWID (Tornillo District) is the project sponsor.
2. **Location of Project.** The project is located in the unincorporated community of Tornillo, Texas approximately 32 miles southeast of the City of El Paso approximately 2 miles north of the Rio Grande River. The proposed project is within the 62-mile limit from the border that the BECC requires for certification of a project.

3. Description of Project and Tasks.

Background - The EPCTWID's wastewater facility plan was originally developed in 1996 as a Phase I Study under Texas Water Development Board's (TWDB) Economically Distressed Areas Program (EDAP). The plan provided for wastewater collection and treatment facilities to serve the older, more densely developed area of Tornillo. The plan was amended twice in 2000 to provide a more effective system and extend the population and flow projections to the year 2020.

In early 2001, the former directors of the utility, the Tornillo Water Supply Corporation, requested assistance from the BECC to amend the facility plan to include eight adjacent, EDAP ineligible areas and to certify the overall project for future financing by the North American Development Bank (NADB). The current design project is a joint TWDB and BECC funded effort. Construction funding support is proposed to be proportioned between TWDB and the NADB based on the portion of total flow generated from EDAP eligible areas and from the EDAP ineligible areas, respectively.

Original and Expanded Project Area - The original project area is centered on the older, developed areas of the Tornillo; i.e., areas that are EDAP eligible. The expanded areas include seven platted and partially developed subdivisions, and one centrally located un-platted/undeveloped area that is a candidate for future development.

Population Projections - Table 1 shows the population projections for the project. All of the new subdivisions are projected to attain build-out by about 2010. This is shown graphically in the table where shading indicates build-out population in particular years.

Table 1: Population Projections

Areas / Subdivisions	Occupied Lots	Population				
		2001	2005	2010	2015	2020
Original Project, Adjusted [1]	---	1,540	1,828	2,241	2,657	**3,489[2]**
Expanded Areas:						
Drake No. 2	50	200	216	216	216	216
Drake No. 3	6	24	27	32	32	32
Drake No. 4	49	196	223	232	232	232
Drake No. 5	97	388	441	508	508	508
Drake No. 6	72	288	328	364	364	364
Drake No. 7	68	272	309	363	364	364
Ranchitos Arco Iris	67	268	305	352	352	352
Proposed Subdivision			575	676	794	932
TOTALS	409	3,176	4,252	4,984	5,519	**6,489[2]**

[1] Population projection adjusted to reflect current population served by EPCTWID water system
[2] Basis of design projections

Flow Projections - Table 2 shows current and projected wastewater flows for the overall system. The average daily flow rate for this system is based on an average per capita wastewater production rate of 91.2 gpcd and four people per household. The system is designed to pass peak flows that are four times the average daily flow rate. The treatment plant peaking factor of 4 is equivalent to the 2-hour peak flow adjustment used in the 1996 Facility Plan and is consistent with the collection system peaking factor.

Table 2 Projected Wastewater Flows

Flow Parameter	2001 (MGD)	2005 (MGD)	2010 (MGD)	2015 (MGD)	2020 (MGD)
Average Daily Flow (MGD)	0.29	0.40	0.46	0.51	0.59
Treatment Plant Design Flow (MGD); PF = 1.24	0.36	0.49	0.57	0.63	0.73
Peak Flow (MGD); PF = 4	1.17	1.58	1.85	2.03	2.37

MGD= Million Gallons per Day

Proposed Collection System Improvements- The proposed wastewater collection system is designed to serve both the original and expanded project areas. It consists of 78,087 LF of gravity sewer ranging from 6 to 18-inches in diameter, 500 LF of 12-inch diameter force main, 239 manholes, and one 1,650-gpm-sewage lift station.

Proposed Wastewater Treatment Plant- The proposed wastewater treatment plant is a 734,000 gpd capacity, extended aeration, oxidation ditch type based treatment system located at the intersection of Henderson Road and Tornillo Drain. The facility consists of an influent pump station, screenings and grit removal, an extended aeration facility (oxidation ditch type), a secondary clarifier, chlorination facilities, sludge dying beds, and a 200 ft. outfall line to Tornillo Drain.

The project is planned for completion in 2005. Based on population and flow projections, in 2005 approximately 43 percent of the flow will be generated from the EDAP eligible area of the project and 57 percent from EDAP ineligible areas.

4. **Compliance with international Treaties and Agreements.** The implementation of this project will comply with all the current International Treaties and Agreements between the United States of America and Mexico that are related to environmental problems along the international border.

II. Human Health and the Environment

1. **Human Health and Environment**. Diseases generally associated with developing countries have been problematic in colonia communities on the U.S. side of the Texas/Mexico border due to poor health care and groundwater contamination. Human health is impacted by environmental infrastructure deficiencies. Municipal water and wastewater systems are typically limited, being undersized and sub-standard in these border communities. This contributes to high rates of disease in the border region. Texas counties bordering Mexico have waterborne disease rates often two to three times greater than the statewide average.

   Many of the existing sewage disposal systems in the unincorporated community of Tornillo do not comply with the El Paso County requirements for construction and operation of on-site sewage systems. Over 80% of septic tanks in the area are currently not registered with the county, according to a Tornillo District representative. These regulations prohibit use of septic tank systems on lots of less than one-half acre in size.

   Many of the homes in the older areas of Tornillo use cesspools, constructed of a cinder block or brick. A small percentage of homes dispose wastes directly onto the ground or into irrigation canals. Any of the systems relying on soil absorption will continually fail due to the characteristics of the soil that do not favor such activity. High groundwater table in some of the project areas accentuate the shortage of absorption capacity. Ponding of effluent in yards and alleys can be a common occurrence. These practices contribute to groundwater and surface water contamination.

   The proposed wastewater collection and treatment system will provide a modern, centralized, compliant resource for the community's sewage disposal. In properly handling wastes, issues resulting from substandard on-site systems, such as surface ponding and direct discharge into waterways, will be eliminated. After-effects such as illness from water-borne diseases and groundwater and soil contamination will be prevented.

2. **Environmental Assessment:** The original Environmental Information Document was prepared in December 1997 by Blanton and Associates, Inc., Hicks and Company and Michael Sullivan and Associates, Inc. consultants. It was revised in early 2001 to include the expanded area. This assessment concludes that there are no negative long-term impacts expected as a result of this project. EPA issued a Finding of No significant Impact (FNSI) on December 26, 2001, and the NEPA process has concluded.

   An evaluation of environmental impacts associated with the revised wastewater improvements determined that environmental impacts would be minimal and consistent with impacts of the 1997 Project, provided that mitigate measures regarding erosion control during and after construction are followed.

   The majority of the pipeline work associated with the proposed projects will be placed within the existing right-of-way of dedicated public streets and irrigation canals. No significant landform alterations are expected to be necessary for the construction of the proposed collection system. No soils classified as Prime Farmlands occur within the proposed project area.

3. **Compliance with Environmental and Cultural Resources Law and Regulations.** The planning and design of the proposed wastewater collection and treatment system comply with all applicable environmental and cultural laws and regulations. The new wastewater collection system will meet TNRCC and EPA's regulations.

III. Technical Feasibility

1. **Appropriate Technology.** The Tornillo wastewater facility plan was originally developed in 1996 for the project through TWDB funds. The facility plan included a planning horizon of 20 years and included modeling of the proposed wastewater system for average demands and peak demands to determine the appropriate phasing of the proposed infrastructure for the immediate needs, 2010 needs, and 2020 needs. The average per capita residential production used was 91.2 gpd for wastewater. The facility plan also contained various alternative analyses whereby the selected alternative was the most cost effective and provided ease of operation. The following summarizes the alternative analyses:

   Wastewater Treatment System

   Wastewater Collection

   Design Criteria. The design criteria used to develop the collection system for Tornillo comply with Texas Natural Resources Conservation Commission (TNRCC) guidelines for the design of sanitary sewer systems in the Texas Administrative Code (TAC), Chapter 317-Design Criteria for Sewerage Systems. Key criterion used in the collection system planning effort include:

   - Minimum gravity sewer line size shall be 6 inches in diameter.
   - Sewers shall be designed and constructed with sufficient slope to give a velocity when flowing full of no less than 2 feet per second (fps) and no greater than 10 fps.
   - The minimum Manning's ''n'' factor for design of sewer lines shall be 0.013.
   - Sewer lines shall be laid at grades within the minimum and maximum slope criteria delineated in the TAC.
   - Minimum cover for gravity sewer lines and force mains is 5 feet.
   - Sewer force mains shall be designed and constructed so that flow velocities range between 3 and 5 feet per second at lift station firm pumping capacity.

   Hydraulic Analysis. The system is designed to pass peak flows that are four times the average daily flow rate. The average daily flow rate for this system is based on an average per capita wastewater production rate of 91.2 gpcd and four people per household. Wastewater contributions are primarily residential but also include schools, and limited light industrial and commercial. Current and projected wastewater flows for the overall system are shown below. The year 2020 flows are the basis for the plant design, as illustrated in the *Facility Plan Amendment No. 3*, PSC, May 2002.

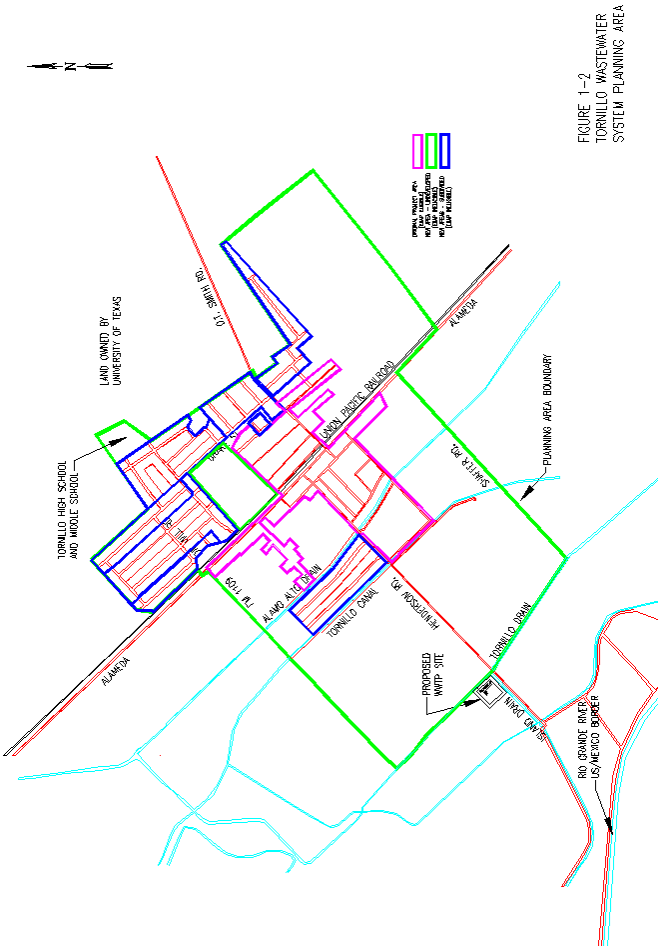

FIGURE 1-2
TORNILLO WASTEWATER
SYSTEM PLANNING AREA

Wastewater Treatment. Tornillo currently does not have a wastewater treatment system. Individual on-site facilities serve as the only means of treatment. The proposed plant is a 734,000 gpd, extended aeration, oxidation ditch based wastewater treatment plant located at the intersection of Henderson Road and Tornillo Drain. The facility consists of an influent pump station, screenings and grit removal, an oxidation ditch, a secondary clarifier, chlorination facilities, sludge dying beds, and a 200 ft. outfall line to Tornillo Drain.

Design Flows/Characteristics. Table 3-3 lists the population and influent flow and load projections that serve as the basis for design for the WWTP. The plant and its unit processes are to be designed to treat a 2020 projected design flow of 0.73 MGD and to hydraulically process a 2020 projected 2-hour peak flow of 2.37 MGD.

Table 3-3. Flow Characteristics

Design Year	**2020**
Population	6,489
Average Daily Flow, MGD	0.59
30-d Wet Weather Flow, MGD [1]	0.73
2-Hour Peak Flow, MGD [2]	2.37
BOD_5, mg/L [3]	200
BOD_5, lb/d	990
TSS, mg/L [3]	200
TSS, lb/d	990

1-Design flows; 2- WWTP peak 2-hour flow; 3- 1996 Facility Plan

System Description. The collection system consists of 78,087 feet of gravity sewer ranging from 6 to 18-inches in diameter, 500 feet of 12-inch diameter force main, 239 manholes, and one 1,650 gpm sewage lift station.

Three main interceptors (labeled Interceptors I, II, and III) serve the system.

- Interceptor I conveys the flow from the northwest part of the planning area including Drake Subdivision Units 5, 6, and 7 as well as the partially developed 58 acre tract near the intersection of Henderson Rd. and the Alamo Alto Drain.
- Interceptor II conveys the flow from Drake Subdivision Unit 4 in the northeast part of the project area down the existing facility plan line in Highland Street to Interceptor III at O.T. Smith Rd.
- Interceptor III transmits flow from Drake Subdivision Units 1, 2, and 3 via residential streets in the north central part of the project area, to O.T. Smith Rd., and to the lift

station on Henderson Rd. The downstream reaches of Interceptors I and III carry the incremental flows from the EDAP eligible areas.

- The lift station lifts the total flow to a gravity sewer line located south of Tornillo Canal on Henderson Rd. This line carries these flows to the WWTP at Henderson Rd. and Tornillo Drain.
- Sewer depths range from five feet at upstream manholes to 24.5 feet at Alamo Alto Drain and Tornillo Canal.

2. **Operation and Maintenance Plan**. The Tornilllo District will get a comprehensive Operation and Maintenance Plan. The contractor for the wastewater treatment plant project will be required to provide an operations manual and training associated with the equipment.

3. **Compliance with applicable design norms and regulations.** This project complies with applicable design standards and regulations that are required by the state of Texas and County of El Paso.

IV. Financial Feasibility and Project Management

1. Financial Feasibility.

The project has a total project cost is $12,743,402. The following table illustrates the details of the estimated project cost.

Project Cost Summary

Item	**Total Project**	**EDAP Eligible**	**EDAP Ineligible**
Construction			
Wastewater Collection System	$8,234,330	$3,540,762	$4,693,568
Wastewater Treatment Plant	$3,066,802	$1,304,580	$1,762,222
Sub-Total Construction	**$11,301,132**	**$4,845,442**	**$6,455,790**
Land and Easement Acquisition			
Crossing Permit Acquisition	$3,000	$3,000	$0
Land for Lift Station	$9,960	$9,960	$0
Land for WWTP	$105,000	$105,000	$0

Sub-Total Land and Easement	**$117,960**	**$117,960**	**$0**
Engineering and Administration			
Design Phase Services	$779,300	$335,099	$444,201
Construction Inspection & Legal	$436,780	$187,815	$248,965
Management & Administration	$108,130	$46,496	$61,634
Sub-Total Engineering Services	**$1,324,210**	**$569,410**	**$754,800**
GRAND TOTAL	**$12,743,402**	**$5,532,812**	**$7,210,590**

The following table summarizes the financial structure of the project.

Source	Amount
BEIF-NADB (Grant)	$5,255,441
TWDB (Grant)	$5,334,961
TWDB (Loan)	$164,000
NADB Loan (Low Interest)	$1,500,000
BECC (Grant)	$489,000
Total	**$12,743,402**

Additionally, Transition Assistance from the BEIF program is included to allow for the gradual increase in the rates. The Transition Assistance is not a project cost and therefore is not listed in the above financial structure.

Source	Amount
Transition Assistance (BEIF Grant)	$425,621

2. Rate Model:

The average monthly rate for water is $26.0. A starting rate of about $48.00, for the combined water and sewer rate, will be needed for the project. In order to increase the rate in a gradual manner transition assistance from the BEIF program is needed in the amount of $425,621 over a seven year period to reach a combined rate of $62.00.

3. Project Management. The existing organizational structure of a General Manager, an Operations Department, and an Administrative Department will be increased by two new employees to operate the proposed expanded infrastructure.

IV. Public Participation

1. Comprehensive Public Participation Plan: The Tornillo Water Supply Corporation and the project steering committee submitted a public participation plan to the BECC on October 14th and approved by BECC on October 15th, 2001. The plan comprises the development of a steering committee, meeting local organizations, providing project information to the public, holding public meetings and submitting a final report for the project. Activities carried out in fulfillment of the plan are presented below.

2. Steering Committee: The committee is formed with: Estela Pacheco, President; Edis Delgado, resident; Norma Morales, resident; Sebastian Hernandez, resident; and Ofelia Bosquez and Jose Rodriguez of the Tornillo Independent School District; and Laurencio Bosquez, business owner

3. Local Organizations: Organizations and groups contacted include the Tornillo Independent School District; local churches; County Commissioner; the Volunteer Fire Department; Wencho's Gas and Food Mart; Lupita's Grocery Store; Tornillo Trading Post; Flamingo's Dance Hall; San Jose Bakery; Tornillo Parent Teacher Organization; Guitierrez' Septic Tank; Elias Welding Shop; Gardea's Well Service; Archuleta's Farm Equipment; Tornillo Dollar Store and Maria's Beauty Shop. Javier Escalante, Tornillo Water Supply Corporation; Francelia Vega, technical secretary; Mike Pink and Horacio Juárez, engineering consultants form the technical work group.

4. Public Information: The Facility Plan was available at the Tornillo Water Supply Corporation offices and at Wencho's Gas and Food Mart after hours. Immediately prior to the first public meeting, door-to-door visits were carried out by steering committee and the volunteer fire department to deliver bilingual fact sheets and carry out a survey. Public meeting notices were also sent via the water bill to all customers and followed up via phone calls. During these visits 137 surveys were completed resulting in 129 supporting the proposed project and 4 against with 4 no answers. The public meeting notices were also posted in El Paso Times and The Courier, a local newspaper.

5. Public Meetings: The first public meeting was held on November 15, 2001 at the High School. Approximately 200 people were present. The second public meeting was held on July 25,2002 at the local High School. Approximately 110 people attended the meeting. Survey results at the meeting showed 106 in support of the rate increase and3 against.

V. Sustainable Development

1. Definition and Principles

Principle 1: The project will improve the quality of life for residents of the Town of Tornillo by providing safe, desirable wastewater collection and treatment for current and future residents.

Principle 2: The proposed project includes changes to the system that would insure the protection of human health and the environment with population changes projected through the year 2020. Development in the Town of Tornillo will be hindered without implementation of the proposed wastewater system, putting the socioeconomic well-being of the community, already poor, at further risk. The existing wastewater infrastructure of on-site systems is not safe and can not sustain the projected population increase.

Principle 3: An Environmental Information Document was prepared documenting the development of alternatives and which included the consideration and analysis of environmental issues. Environmental protection is integral to the project.

Principle 4: Stakeholders have been involved and have had the opportunity to participate in the decision-making process. This not only includes the local residents, but also local, regional, state, and federal agencies with statutory interest and standing in the issues at hand.

2. Institutional and Human Capacity Building.

The Tornillo District currently does have the basic institutional and human capacity to operate and maintain the proposed improvements. However, it will need an additional two employees to operate the proposed improvements.

- The District will be upgrading its existing operation and maintenance plan, and the safety and contingency plan to include the new facilities.
- The District has also implemented a plan to encourage the current employees to seek the highest level certification possible.
- The District's Board of Directors have set the goal for all operators to obtain a minimum Class "C" license.
- The District's Board of Directors has approved monetary incentives and will pay all expenses for employees to attend seminars and courses out of town to obtain certification.

3. Conformance with Applicable Local/Regional Conservation and Development Plans.
The project is in conformance with the State Implementation Plan (SIP) for the County of El Paso, with Section 208 of the Clean Water Act of 1977, and with the Water Quality Management Plan developed by the Texas Water Development Board, the TNRCC and the Rio Grande Council of Governments.

4. Conservation of Natural Resources.

The proposed wastewater system will result in natural resource protection and conservation of water resources. Contamination of groundwater and soil will be prevented through centralized control of operations and maintenance for the community sewage disposal system. Additionally, controlled discharge of treated wastewater will contribute water volume to irrigation sources that was formerly lost in the form of evaporation and/or percolation.

5. Community Development.

The implementation of this project is crucial for community development. A wastewater collection and treatment system is important for the safe existence of current and future population.

The County of El Paso is planning to expand the nearby existing Fabens International Port of Entry from two lanes to four, more than doubling the width of the bridge from 60 feet to 150 feet. Without the proposed improvements to the wastewater system, the projected economic development from the expansion of the bridge may not occur, because new businesses will be unable to locate within the boundaries of the Tornillo District.