



**Guidance for the Preparation of  
Drinking Water Engineering Feasibility Reports  
Applies to all funding programs, except EDAP**

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# Guidance for the Preparation of Drinking Water Project Engineering Feasibility Reports

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## Overview

This document provides guidance to applicants about Texas Water Development Board (TWDB) requirements for submission of an Engineering Feasibility Report (EFR) for drinking water related projects financed through TWDB funding programs, except for the Economically Distressed Areas Program (EDAP). EDAP applicants must follow directives from the EDAP Facility Engineering Plan/Scope of Services (WRD-023A).

Applicants seeking financial assistance for planning activities can utilize TWDB funds to finance the preparation of the EFR after a loan commitment has been secured. If detailed planning has already been completed, applicants can submit a complete EFR with the application in lieu of the Preliminary Engineering Feasibility Report (PEFR) required in question 47a. of the application form. For minimum requirements of a PEFR, see section “Preliminary Engineering Feasibility Report” at the end of this document.

The TWDB requires submission of an EFR in support of a financial assistance application when design and/or construction funds will be released during the loan closing process. Submission of an EFR, signed and sealed by a professional engineer registered in the State, is considered a planning phase project requirement. Please note, issuance of an environmental determination by the TWDB is required prior to approval of the EFR and release of design and/or construction funds.

This guidance is consistent with the following Texas Administrative Code (TAC) and Texas Commission on Environmental Quality (TCEQ) rules pertaining to drinking water sources, treatment, storage, and distribution.

1. 31 TAC Chapter 371 – TWDB Drinking Water State Revolving Fund Rules
  - Chapter 371.61 – Engineering Feasibility Report
2. 31 TAC 363 TWDB’s Financial Assistance Program
  - Chapter 363.13 – Preliminary Engineering Feasibility Report
  - Chapter 363.16 – Pre-design Funding Option
3. 31 TAC 365 TWDB’s Rural Water Assistance Fund
  - Chapter 365.23 – Pre-design Funding Option
4. 30 TAC 290, Rules and Regulations for Public Drinking Water

TAC rules can be accessed online at: [http://texreg.sos.state.tx.us/public/readtac\\$ext.viewtac](http://texreg.sos.state.tx.us/public/readtac$ext.viewtac)

This guidance is intended to assist applicants in addressing all relevant project issues during the planning phase of the project. TWDB approval does not negate the need for permits required by the TCEQ or any other agencies.

# Engineering Feasibility Report

The Engineering Feasibility Report (EFR) should form the conceptual basis for the drinking water sources, treatment, storage, and distribution system proposed. Smaller systems proposing substantial improvements should address all applicable outlined issues. Larger systems addressing a particular portion of the system should provide a sufficient description of the need and proposed solution within the context of the larger system.

Please submit an electronic copy of the EFR. The EFR shall be in a high quality, fully searchable PDF format and be sealed, signed, and dated by the engineer responsible for the report. The consulting engineer's firm's Registration Number must also be included. The remainder of this document identifies minimum information which should be included in the EFR.

## General Description:

1. List the project's sponsoring political subdivision, address, telephone number and legal owner
2. List the consulting engineer's name, address, and telephone number
3. Identify the program(s) from which financial assistance is sought
4. Identify entities to be served and current and future population
5. Provide a general description of the existing system. The existing system description should include
  - a. description of existing water supply facilities with information on type of treatment, capacity of facilities, and adequacy regarding water delivery and system pressure;
  - b. existing water source(s), with quantity and quality of water available;
  - c. discussion of the condition of the distribution system, age, pressures, and leakage. If water losses in the system exceed the utility's Water Loss Threshold requirements, explain specifically what the community is doing to address the issue and how (if applicable) the project addresses water loss;
  - d. discussion of any operational problems, at the water supply, treatment, or within the transmission and distribution system;
  - e. discussion of any applicable Environmental Protection Agency (EPA) or TCEQ enforcement actions;
  - f. discussion of any violations of primary or secondary drinking water standards along with physical deficiencies of the system;
  - g. adequate maps to locate existing facilities and service areas.
6. Provide a complete statement explaining the drinking water problems and needs within the planning area, including the following:
  - a. the domestic population of the area to be served (present through 20-year projection) and the design population of the project;
  - b. industrial, commercial and other water needs must be reflected in the projections

- (describe the method);
  - c. projections should describe existing service area, expanded service area for the future, and any community to receive service from the system by contract or consolidation.  
Note: Drinking Water State Revolving Fund (DWSRF) projects cannot be primarily for funding growth for a community;
  - d. the plan should describe and justify the chosen planning horizon. Typically, communities plan for the 20-year needs (or match the term of the funding). Major line work can at times require greater planning horizons. High growth areas can at times require phasing of facilities to fit five or ten-year needs;
  - e. describe current per capita water use along with projected water use/needs;
  - f. historical trends in population and water use may be helpful to explain needs;
  - g. projections should agree with TWDB water plan projections. Where local data is different, provide an explanation of procedures, methodologies and underlying assumptions employed in the formulation for those estimates;
  - h. present and estimated future maximum and minimum water quantity demands. This should include the maximum daily needs along with average annual needs;
  - i. provide water related information for the sources, ownership, and adequacy of water supply for the planning period.
7. Provide a description of the proposed project including an explanation of any proposed phasing of construction. In addition, provide maps and drawings as necessary to locate and describe the project area to be served such as:
- a. geographic limits;
  - b. general location of proposed improvements;
  - c. water and wastewater treatment plant sites;
  - d. existing and proposed streets, parks, drainage ditches, creeks, streams, water mains, and sewer lines;
  - e. drainage area should be clearly defined by contour map at intervals of not more than ten (10) feet.
8. For DWSRF projects: provide sufficient detail to document that the project will remedy the issues and problems that were evaluated for priority ranking on the Intended Use Plan (IUP).

## Alternatives

Provide a description of the proposed project alternatives considered and reasons for the selection of the project proposed:

1. The selection of the preferred project alternative must be fully described and the reasons for selection clearly outlined
2. The selection process should include evaluation of appropriate technologies and full consideration of their costs for the specific project and the potential environmental impacts of the project. See Environmental Data Form TWDB-0800 (for State Programs) and Federal Environmental Review Form TWDB-0801 (for Federal Programs)
3. In some instances, projects described in the State Water Plan involved a detailed analysis of alternatives during the creation of the Regional Water Plan. In many of these instances the EFR will simply be a restatement or update of these materials

#### 4. Cost and Effectiveness Analysis

- a. alternatives analysis should include information showing the project is cost effective. In addition, for projects that implement new systems or significantly alter current systems, a detailed cost-effectiveness analysis, including detailed Operations and Maintenance costs, may be requested;
- b. the Present Worth Method is a viable alternative to provide a cost effectiveness analysis. The Present Worth is the sum which, if invested now at a given interest rate, would provide exactly the funds required to pay all present and future costs. Total project cost, used to compare alternatives, is the sum of the initial capital cost, plus the present worth of operation, maintenance, and repair (OM&R) costs, minus the present worth of the salvage value at the end of the 20-year planning period. A detailed present worth analysis may be required where the project involves the construction of major new facilities. For DWSRF projects, indicate the source of the discount rate to be utilized in the preparation of a Present Worth Analysis.

## Project Specific Requirements

The EFR should address the following specific requirements, as applicable to the project

### 1. New Sources

Where future needs exceed existing supplies, describe the source (or sources), with quantity and quality of water available. This should include a discussion of the adequacy of the supply in times of drought. The supply must agree with the State Water Plan.

### 2. Site

Description of proposed site and surroundings for the water works facilities:

- a. Provide adequate maps to describe the locations and layout of proposed facilities
- b. Detail the location of any existing infrastructure that affects the ability to locate water facilities in the area
- c. Indicate floodplain location, required buffers and easements

### 3. Treatment

Discuss the type of treatment, equipment, and capacity of facilities.

### 4. Design Data

Basic design data, including pumping capacities, water storage and flexibility of system operation under normal and emergency conditions.

### 5. Adequacy:

Adequacy of the facilities regarding delivery capacity and pressure throughout the system.

### 6. Operations and Maintenance

Provide a discussion of the effect of the proposed project on the operation and maintenance budget for the owner.

## **7. Purchase of Facilities – Additional Requirements**

For projects involving purchase of facilities, the following additional information is required

- a. inventory and current valuation of facilities to be purchased;
- b. general description of the capacities and capabilities of the facilities;
- c. historical operating and maintenance records;
- d. information on the 100-year floodplain and development in the project area;
- e. demonstration that facilities were constructed in a manner consistent with all applicable environmental laws and regulations.

## **8. Water Supply Reservoir Projects – Additional Requirements**

The following information needs to be provided for projects that involve a water supply reservoir

- a. an area map showing estimated acreage to be acquired and proposed take-line;
- b. project delineated on a topographic quad sheet with normal, 100-year and maximum probable design water surfaces indicated;
- c. proposed conservation, sediment, flood control and other storage capacities with corresponding areas and elevations;
- d. yield of the project based on efficiency, economics, environmental concerns, 10- to 30-year needs, and expected firm annual yield as proposed;
- e. expected quality of water to be impounded;
- f. existing water rights and purposes of use affected by the project;
- g. estimated total land acquisition cost including provisions for projected appraisal, title search, legal and other associated costs;
- h. description of all improvements (including roads, cemeteries, railroads, and public utilities) to be relocated or protected in the project area;
- i. letters, agreements, or other evidence from owners and/or responsible entities on improvements to be relocated or protected stating their position on acceptable means for such relocation or protection and the estimated cost;
- j. proposed recreational development and management plan, including anticipated buildup in demand, initial facilities to be provided which are proposed to be dedicated to recreational use;
- k. geologic evaluation of the site accompanied by drilling logs showing sufficient details to indicate that a suitable development site has been selected.

## **Alternative Methods for Project Delivery**

An applicant considering the use of alternative delivery methods of construction, should discuss this with the team as early in the process as possible, preferably before an application for funding is submitted. Design build, construction manager at risk and other alternative methods of project delivery are eligible for available financial assistance, including combinations of planning, design, and construction funding, in accordance with programmatic requirements. However, during the planning process, if the community is interested in utilizing an alternative delivery method, the EFR should discuss the benefits of the alternative methods of delivery over the traditional design-bid-build method and taking into account the size and complexity of the project as well as all programmatic requirements. For additional information on alternative delivery project



requirements, see TWDB guidance regarding modifications of the type of financial assistance, review, approval, and release of funds processes (TWDB-0570)

## American Iron & Steel or U.S. Iron & Steel Requirements

Federally funded projects must comply with the American Iron & Steel requirements as described in TWDB-1106. State funded projects must comply with the U.S. Iron & Steel requirements as described in TWDB-1105. Please provide a discussion of any known issues or special considerations that may affect the design or construction because of the applicable iron and steel requirements. In addition, include a discussion of any potential waivers that are being considered.

## Cost of the Project

Provide the total project cost for each project or project phase. Include all sources of funding. The *Project Budget Form (TWDB-1201)* is available for download online at: <http://www.twdb.texas.gov/financial/instructions/index.asp>. Enter TWDB-1201 (or the number 1201) in the search box found under **Guidance and Forms Library**

PROJECT BUDGET - Entity Name _____						
Uses	TWDB Funds Series 1	TWDB Funds Series 2	TWDB Funds Series 3	Total TWDB Cost	Other Funds	Total Cost
<b>Construction</b>						
Construction	\$0	\$0	\$0	\$0	\$0	\$0
<b>Subtotal Construction</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Basic Engineering Fees</b>						
Planning +	\$0	\$0	\$0	\$0	\$0	\$0
Design	\$0	\$0	\$0	\$0	\$0	\$0
Construction Engineering	\$0	\$0	\$0	\$0	\$0	\$0
<b>Basic Engineering Other</b>						
Other	\$0	\$0	\$0	\$0	\$0	\$0
<b>Subtotal Basic Engineering Fees</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Special Services</b>						
Application	\$0	\$0	\$0	\$0	\$0	\$0
Environmental	\$0	\$0	\$0	\$0	\$0	\$0
Water Conservation Plan	\$0	\$0	\$0	\$0	\$0	\$0

## Project Schedule

Include a detailed project schedule with timelines for each phase of the project (as applicable). The projected target dates should include, but are not limited to the following

1. requested loan closing date;
2. completion of planning activities (EFR approval);
3. submit plans and specifications for TWDB approval;
4. advertise for bids on contract(s);
5. open bids and contingently execute contract(s);
6. final project completion.

As necessary, include time for unforeseen delays to obtain easements for land, buffer zones, or right-of-way easements.



## Environmental Document

If the environmental document is to be included within the EFR, provide the information required in the Environmental Data Form TWDB-0800 (for State Programs) or Federal Environmental Review Form TWDB-0801 (for Federal Programs).

## Preliminary Engineering Feasibility Report (PEFR)

As required in TWDB's Administrative Rules, a PEFR is required when the applicant has not completed planning activities or is requesting pre-design funding and an EFR has not been prepared. The PEFR shall be in a high quality, fully searchable PDF format and be sealed, signed, and dated by the engineer responsible for the report. The consulting engineer's firm's Registration Number must also be included. The format of a PEFR should follow the EFR format discussed above, and should address, as a minimum, the following components

- a. a description and purpose of the project;
- b. the entities to be served and current and future population;
- c. the cost of the project;
- d. a description of alternatives considered and reasons for the selection of the project proposed;
- e. sufficient information to evaluate the engineering feasibility of the project;
- f. maps and drawings as necessary to locate and describe the project area; and
- g. any other information the executive administrator determines is necessary to evaluate the project.

## Document References

Texas Administrative Code rules listed in the overview section of this guidance can be accessed online at: [http://texreg.sos.state.tx.us/public/readtac\\$ext.viewtac](http://texreg.sos.state.tx.us/public/readtac$ext.viewtac)

Environmental Data Form for State Programs (TWDB-0800)  
Federal Environmental Review Form for Federal Programs (TWDB-0801)

Guidance for use of Construction Manager at Risk and Design-Build Project Delivery Methods (TWDB-0570)

United States Iron and Steel (U.S. I&S) Guidance for Projects Funded Through State Programs (TWDB-1105)

American Iron and Steel (AIS) Guidance for Clean Water & Drinking Water State Revolving Fund Projects (TWDB-1106)

Budget Template for Projects (TWDB-1201)