

Water Plan: 2000-2050 was developed to update Tucson Water's long-range water resource plan and to initiate a dialogue between the Utility and the community it serves.

CHAPTER ONE

INTRODUCTION

Water Plan: 2000-2050 was developed to initiate a dialogue between Tucson Water and the community about the water-resource challenges which must be addressed in the coming years. If the community's demand for water continues to grow, Tucson Water's currently available supplies must be fully utilized and additional more expensive supplies must be acquired and developed. Various opportunities and constraints that will impact the Utility's ability to provide adequate supply are discussed. *Water Plan: 2000-2050* identifies several critical decisions that must be made by the community and decision makers at key points in time. This will ensure the timely implementation of desired projects and programs to guarantee long-term sustainability of water resources.

This document provides information to Tucson Water customers and other stakeholders concerning the Utility's resource and system plans through 2050. This report is a comprehensive revision of *Tucson Water Resources Plan 1990-2100* which was prepared by CH2M Hill (1989) in cooperation with Tucson Water. *Water Plan: 2000-2050* also includes analyses and assessments not featured in the original plan. The revised plan assesses how projected population and water demand are spatially distributed within Tucson Water's projected service area. In addition, system planning is incorporated into the resource planning process to assess upgrades to existing systems and extensions into areas currently not served. Finally, a scenario planning approach was utilized to develop a flexible long-range water-resource plan that is structured to address planning uncertainties and possibilities for change.

GEOGRAPHIC SETTING

The City of Tucson is located in the northern semi-arid reaches of the Sonoran Desert in eastern Pima County, Arizona. As shown on Figure 1-1, the City is situated in the center of the Tucson basin which is a broad desert valley surrounded by the Santa Catalina, Rincon, Santa Rita, Sierrita, Tortolita, and Tucson Mountains. Basin elevations in the City of Tucson range from about 2,300 feet above mean sea level (amsl) in the northwest to about 3,200 feet

amsl in the southeast; the surrounding mountains range in elevation from approximately 4,700 to over 9,000 feet amsl.

Various washes and rivers are located throughout the Tucson area as shown in Figure 1-1. When storm flows occur, the Santa Cruz River runs north-northwest, and Rillito Creek runs from southeast to west. The Rillito is formed by the confluence of Tanque Verde Creek and Pantano Wash. In Avra Valley, Brawley Wash is the primary channel and merges with the Santa Cruz River near the Pima County/Pinal County line.

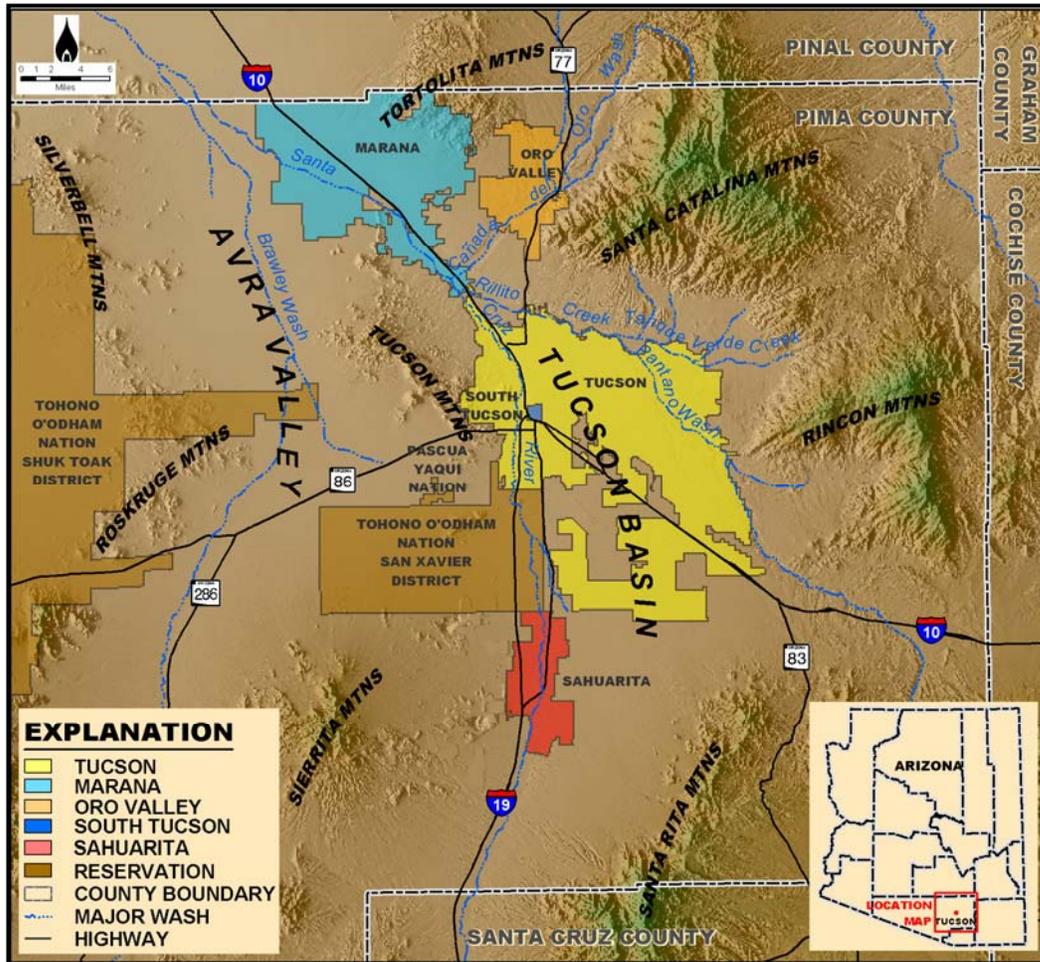


Figure 1-1: Map of the Greater Tucson Area.

The average daily minimum temperature in the City ranges from about 39°F in January to 73°F in July while the average daily maximum temperature ranges from 65°F in January to 100°F in July (National Weather Service, 2004). The local area annually averages about 12 inches of precipitation in the valleys and about 25 inches in the higher elevations. In 2000, the City of Tucson’s population was 486,699, making it the second largest city in Arizona (U. S. Census Bureau, 2002).

Tucson Water is a municipal water provider owned and operated by the City of Tucson. The Utility is subject to the authority of the City of Tucson Mayor and Council, and the Director

of Tucson Water is subject to the authority of the City Manager. Tucson Water is self-supporting and relies totally on revenues generated from water connection fees and water sales. Actual cost of service is used to determine water rates; customers are charged in direct proportion to the cost of developing supplies and delivering water to customers.

Tucson Water is the largest water provider in southeastern Arizona. In 2000, the Utility served a population of 638,936 within a 300-square-mile service area. Its customers are located both inside and outside the jurisdictional boundary of the City. The Utility operates a dual water system that serves potable (drinking) water and reclaimed water for non-potable use. More information about the other local water providers/users can be found in Appendix A: *Other Water Users in the Region*.

THE PLANNING GOALS

Water Plan: 2000-2050 was developed with the following resource management goals:

- **Meet Projected Total Demand.** The Utility's water demand has grown significantly over the years. Current population projections indicate that demand will continue to increase in the foreseeable future.
- **Utilize Renewable Resources.** In order for the community to be sustainable into the future, Tucson Water needs to shift from a historical reliance on "mined" ground water to renewable water supplies. Colorado River water delivered via the Central Arizona Project and treated municipal wastewater effluent are two currently available renewable supplies that must be utilized to the maximum extent possible. It is also a priority to acquire additional renewable supplies as soon as possible.
- **Meet Water-Quality Targets.** In addition to complying with federal, state, and local regulations, Tucson Water must also be responsive to the water-quality expectations and preferences of its customers.
- **Achieve Sustainable Pumpage.** There is a quantifiable volume of ground water that is naturally replenished each year. Pumping ground water at or below this annual rate would be hydrologically sustainable and would not cause additional water-level declines and associated subsidence. Sustainable pumping must be consistent with state regulations that govern the legal authority to withdraw ground water.
- **Manage Costs and Rate Impacts.** Projects and programs must be cost effective to ensure that water remains affordable.
- **Comply with Assured Water Supply Program.** The Assured Water Supply (AWS) Program is the regulatory paradigm administered by the Arizona Department of Water Resources (ADWR) for water-resource management in the municipal water-use sector. The AWS Program limits the amount of ground water that the City of Tucson can legally withdraw.

THE PLANNING PROCESS

Water Plan: 2000-2050 was developed using a scenario planning process. Tucson Water utilized the best available information and planning assumptions to address many possible views of the future. The recommended plan was developed to maintain the maximum flexibility as the future unfolds. Figure 1-2 shows the plan development sequence. Planning assumptions will be revisited periodically to assure reliable, high-quality water supplies continue to be available. The plan may be revised over time in order to respond to changing conditions. Tucson Water in conjunction with the Citizens' Water Advisory Committee (CWAC) will determine when a comprehensive revision should be initiated. Mayor and Council created CWAC in 1977 as the official advisory body to the Council on water issues. Revisions to the plan are submitted to Mayor and Council for adoption.

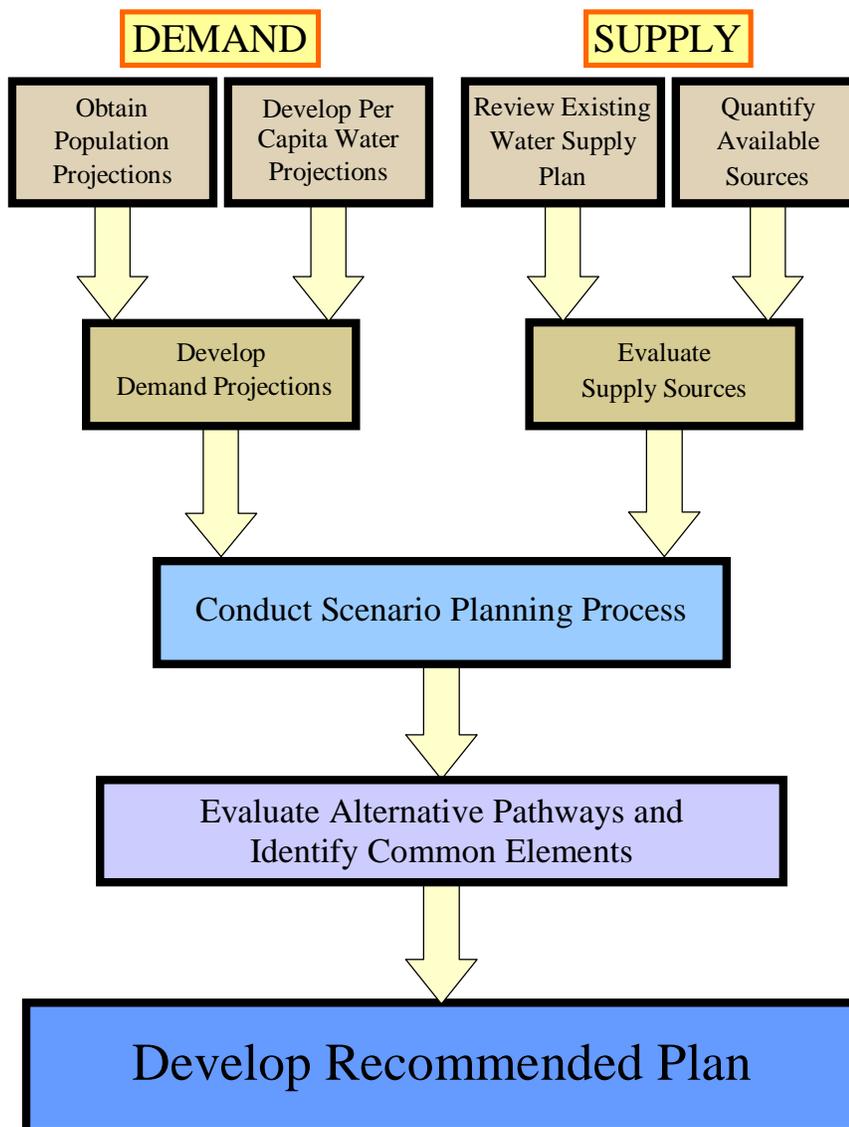


Figure 1-2: Plan Development Sequence.

CONTENTS OF THE REPORT

This report consists of eight chapters and six supporting appendices. Chapters Two through Five summarize the basic information and assumptions used to develop the recommended plan. Chapter Two, *A Community Creates a Demand*, provides a brief overview of the local area's water-resource history and the development of Tucson Water as the largest municipal water provider in the region. Chapter Three, *Projections of Population and Water Demand*, presents the information used to develop a 50-year projection of water demand within Tucson Water's anticipated service area. Chapter Four, *Available Water Resources*, describes and quantifies the various water supplies available to meet demand. Chapter Five, *Water Delivery Systems*, describes the existing potable and non-potable water distribution systems operated by Tucson Water and how the system infrastructure may be upsized and extended to meet future demand.

Chapters Six and Seven describe the application of the scenario planning approach and the development of the long-range water-resource plan. Chapter Six, *The Planning Process*, provides a detailed look at how *Water Plan: 2000-2050* was developed. Chapter Seven, *The Recommended Plan*, is a step-by-step road map that will guide the Utility as the future unfolds. In addition, Chapter Seven summarizes Tucson Water's conclusions regarding the community's water-resource future and presents recommendations for the critical decisions identified in the Recommended Plan. Chapter Eight, *Future Issues and Challenges*, describes opportunities and potential constraints that will become increasingly important over time. The Appendices (A-F) present the detailed information used to develop *Water Plan: 2000-2050*.