

THE NORTHWEST AREA WATER PLAN - TUCSON, ARIZONA

by

Thomas M. McLean, P.E.
Tucson Water

ABSTRACT

In May, 1979, the City of Tucson entered into contractual agreements with three private water companies to ensure 100 year adequacy and to manage scarce water resources within a large area northwest of Tucson. These agreements implemented the Northwest Area Water Plan. The Northwest Area Water Plan provides a mechanism by which local and imported water sources can be cooperatively managed by the City of Tucson and local private water companies within the Northwest Water Service Area. This plan has been developed to complement agreements for water service between the City of Tucson and private water companies and is an integral part of those agreements. The purpose of this plan is to identify those facilities and associated costs which provide, on a regional basis, a permanent, cost-effective water supply to new customers within the Northwest Water Service Area.

The basic plan approach is to utilize existing local groundwater to the fullest extent possible while maintaining local water tables at their present levels. This will be accomplished through the planning, design, and construction of an import water supply system to meet the base demands of customers within the Northwest Water Service Area and the conjunctive management of local well capacity and storage reservoirs to meet the variable peak demands and fire flow requirements.

INTRODUCTION

The City of Tucson, located in southern Arizona, is the largest community in the County of Pima and is the second largest in the state, with a metropolitan population of approximately 470,000 people*. The City of Tucson's Municipal Water Utility, known simply as Tucson Water, is the major purveyor of water in the metropolitan area providing supply to 90 percent of the local population. Tucson Water's facilities cover an area of approximately 320 square miles; however, the overall region served by the Utility encompasses nearly 800 square miles. Additionally, numerous privately owned and operated water companies are in existence with relatively small service areas.

The entire water supply for all water users in the region is obtained from local groundwater sources which makes Tucson one of the largest communities in the country to do so. The underground reserves of water are currently being overdrafted. Far more water is being extracted than is being replenished through natural recharge. In view of the proposed growth of the Tucson community and the diminishing groundwater supply, cooperative management of the local resource along with careful water supply planning becomes an imperative as well as difficult task.

It is anticipated that Tucson Water's service area will indeed grow along with the community, perhaps ultimately to an area of over 1000 square miles. Many factors will contribute towards this expected growth some of which are:

- a. The diminishing groundwater supply.
- b. The recent requirements of the Arizona Water Commission for new subdivision development to demonstrate adequate supply for 100 years.
- c. The Arizona Department of Health Services regulations relating to implementation of the Safe Drinking Water Act.
- d. The City of Tucson's allocation of Central Arizona Project water.
- e. The City's rate base and bonding capability for financing importation projects.

*See Figure 1.

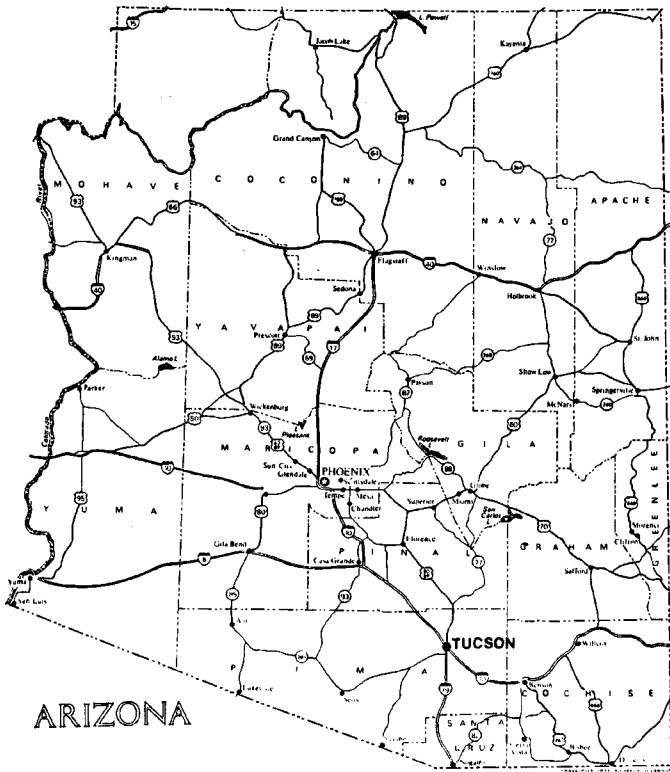


FIGURE 1: LOCATION MAP

It becomes apparent, therefore, that the Water Utility will play a significant role in the establishment of a long-term, reliable potable water supply for the community. Tucson Water engineers embarked on a long-range planning effort by selecting a 50-year planning horizon and utilizing population, land use, and water demand projections to begin formulating an area-wide master plan for water system expansion. A 50-year planning scope seems appropriate since it is compatible with the useful life expectancy of water system facilities, it is a standard approximation used by water system design engineers, and since projections beyond this time frame not only are unavailable but much too speculative for water system sizing. This study assesses, among other things, the impacts of various long-range supply scenarios, including the importation of Colorado River water through the Central Arizona Project.

Recognizing the importance of the water-related issues to the community, the Mayor and Council endeavored to more definitively outline the role of the Utility by adopting a resolution in November of 1978, which set forth official policies relating to the provision of water service in the Tucson metropolitan area. Embodied in this resolution are certain key constituents as follows:

- a. The City of Tucson shall continue to take a leadership role in the quest for basin-wide management and cooperation on water issues. This effort shall focus on cooperation between the various water users and agencies of government. The City, in anticipation of the Central Arizona Project being completed to some as yet undesignated point in Pima County, shall continue to work in cooperation with all potential users of CAP water in Pima County, and with all agencies of government, to facilitate implementation of the Project in Pima County.
- b. The City shall encourage private water companies to financially participate in basin-wide management of water resources. This will include a sharing in the cost of water importation from outside the Tucson Basin.
- c. As an alternative to the future need to purchase private water companies, a study shall be done on the feasibility of the City wholesaling water to private companies. An example of the issues that could be studied include contract mechanisms to enable the City to wholesale water to private companies, which in turn would continue to be responsible for the retailing aspects. The rate charges for such wholesale water should be fully compensatory for the costs the City incurs in developing and delivering such water.
- d. There shall be a system development charge for costs directly attributable to new customers. This charge shall allocate the direct costs for extension of distribution lines to new connections served by such lines, excluding the cost of system additions which will be used in common by old as well as new connections.
- e. Charges for water utility service, insofar as feasible, shall be made in direct proportion to the cost of securing, developing, and delivering water to the various classifications of customers of the Tucson Water Utility.

THE NORTHWEST AREA OF TUCSON

Throughout the 1950's and 1960's, Tucson was experiencing rapid urbanization on its east side. There was little or no pressure to urbanize the area to the northwest compared to that on the east side. However, during the past several years, it is becoming more and more evident that most of the buildable land on the east side is becoming fully developed and growth pressures have demanded that additional land for urbanization be made available. This development trend has now directed its focus on Tucson's northwest side in an area also known as the Tortolita Area. As previously mentioned, Tucson's current metropolitan population is in the vicinity of 470,000 people and is expected to exceed 800,000 by the year 2000. This type of growth rate is placing new demands upon the vacant land on the urban fringe previously considered rural in character.

The Tortolita Area abounds in natural beauty, which enhances its attractiveness as an area for urban development. A new regional park has been established and another State park is proposed, both of which add additional amenities sought by the urban dweller. It seems inevitable, therefore, that this northwest area may be subject to dramatic land use changes in the near future.

The governing body of Pima County responded to this pressure by directing the development of a land use plan for this area which lies directly in the path of Tucson's expanding urban fringe. The formulation of plans and policies were guided by four major goals:

- a. Encourage growth in eastern Pima County where it can be provided for in an efficient manner and create the least negative impact.
- b. Accommodate the expected growth in the northwest area in an orderly manner.
- c. Consider environmental constraints as primary land use determinants to urban development.
- d. Provide for an adequate mix of land uses and an efficient system of providing urban services.

Major land owners and developers began initiating their efforts with the intention of developing large portions of the Tortolita Area thereby precipitating the formulation of more detailed community land use plans such as the adopted Rancho Vistoso and Tortolita Community Plans. An obvious, essential ingredient to the success of land use planning is the incorporation of a plan or plans for the facilities necessary to support the proposed development. The design and implementation of a major sewerage facility plan soon got underway with a similar effort for water supply to follow.

THE NORTHWEST AREA WATER PLAN

The existence of some of Tucson Water's facilities and that of the Metropolitan Water Company, a private company, supported some initial surges of development in the northwest area. However, a large scale water supply plan for the area was not fervently addressed until two major investors began actively pursuing their development concepts. Since two of the investors held interests in significant areas of land, they each explored the concept of forming their own private water companies to attain various advantages foremost of which would be the ability to facilitate their individual rates of development.

The formation of a private water company in the northwest area of Tucson is not an unfeasible proposal. A large portion of the region is a watershed drained by the Canada del Oro River. It is possible to analyze it separately from the Tucson Basin as a sub-basin in itself. Heretofore, the historical pumpage in the vicinity have resulted in little discernible impact on the water table unlike other nearby wellfield areas that have experienced much heavier withdrawals and, in some cases, severe water level declines. Wells that are situated in the immediate vicinity of the Canada del Oro Wash experience very good recharge characteristics due to the favorable nature of the aquifer materials. Large scale development, however, will be accompanied by large scale, long term water demands which is of primary concern to Tucson Water who carries the responsibility of maintaining a regional approach to water supply planning. Not only is Tucson Water concerned with protecting the hydrologic integrity of this sub-basin, but also with ensuring the participation of this area in the long term solution to water supply problems.

On December 4, 1978, Foothills Water Company, representing one of the major developers, made application to the Arizona Corporation Commission to obtain a Certificate of Convenience and Necessity to form a private water company. A portion of the application included an area that the City had the right to serve acquired through previous condemnation of the Citizens Utilities Water Company. The City of Tucson, pursuant to Mayor and Council direction, intervened in the application. The City's position was founded upon the adopted Mayor and Council water policies previously mentioned, and the City's readiness, willingness, and ableness to provide water service to the same area proposed by the applicant private water company.

After two days of hearings before the Corporation Commission the City was approached by representatives of the Foothills Water Company in an attempt to resolve the conflict outside the Commission hearing. The City, having already developed a plan for providing imported supply to the area and alternative mechanisms for financing that imported supply system, entered into negotiations with the attorneys for the proposed Foothills Water Company and the Vistoso Water Company located immediately north of the Foothills area. The negotiations focused on a method to satisfy the needs of the private developers of the Northwest Area while furthering the goals of the City in basin-wide management and water importation cost recovery. The existing City draft Northwest Area Water Plan was modified by City staff and engineers for the proposed private water companies whereby the private water companies would obtain their certificates from the Corporation Commission and utilize existing local groundwater supplies to the fullest extent possible to provide interim service to their specific water customers. The City would provide a long-term, permanent supply to the entire northwest area via a system of pipelines and booster stations delivering imported water from Avra Valley, the Central Arizona Project, or a combination of the two. The Northwest Area Water Plan associated with individual contractual agreements were the culmination of the lengthy settlement negotiations. (See Figure 2)

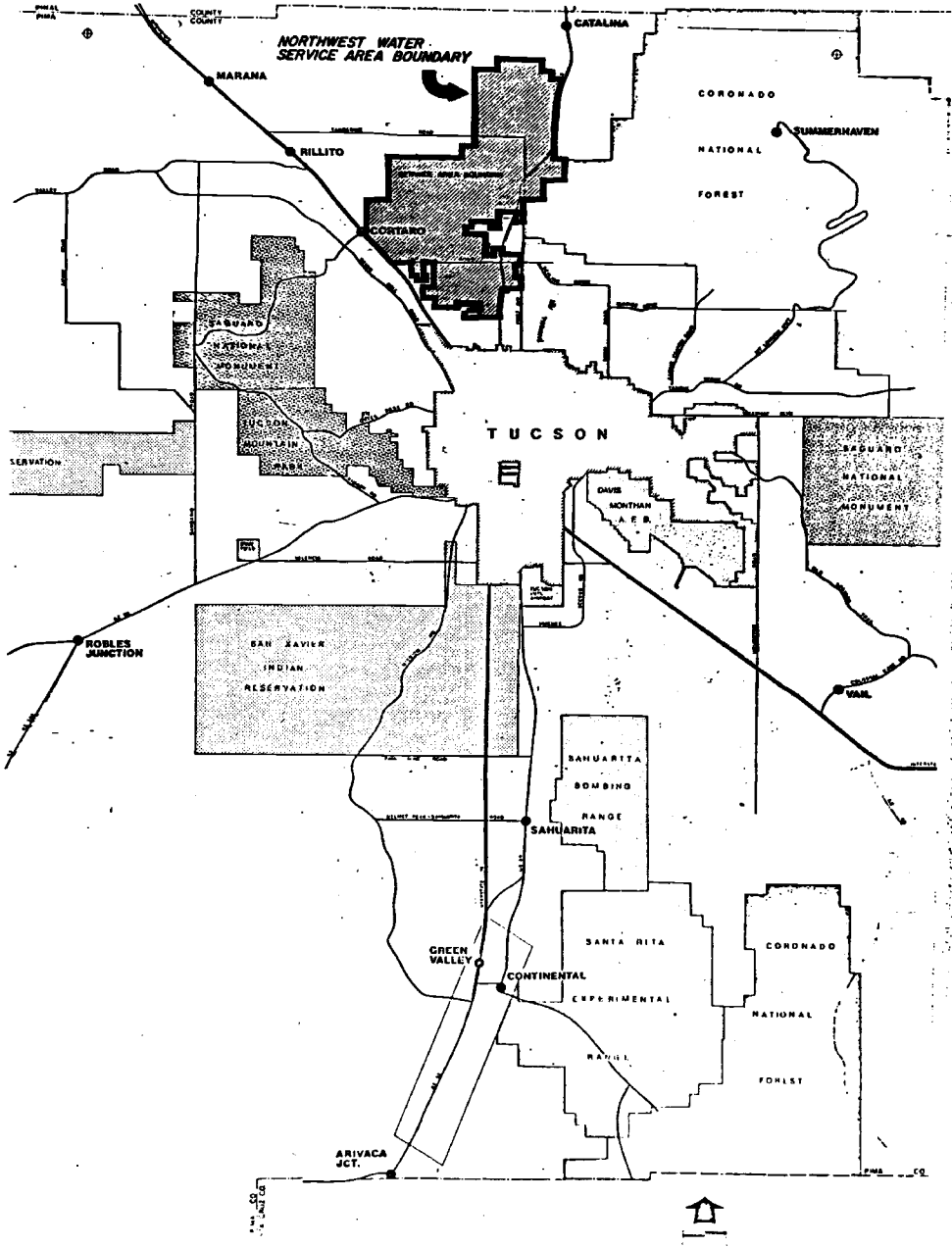


FIGURE 2: NORTHWEST WATER SERVICE AREA

The Northwest Area Water Plan, jointly formulated by City and consulting water engineers, identifies those facilities and associated costs which could provide, on a regional basis, a permanent, cost-effective water supply to new customers within the Northwest Water Service Area. The basic plan is to utilize existing local groundwater to the fullest extent possible while maintaining local water tables at their present levels. This will be accomplished through the planning, design, and construction of an import water supply system to meet the base demands within the Northwest Water Service Area and the conjunctive management of local well capacity and storage reservoirs to meet the variable peak demands and fire flow requirements. (See Figure 3)

Consistent with the Northwest Area Water Plan, contractual agreements for water service have been developed whereby all existing and proposed private water companies can assure themselves of a permanent, cost-effective water supply through participation in a regional financing approach. This approach includes the formation of a "Northwest Area Water Development Account" to accept capital contributions by all customers within the Northwest Water Service Area set aside for construction of the future Northwest Water Supply System and a future wholesale water rate for recovery of each customer's share of the City's operation and maintenance costs and import supply capital costs associated with the Northwest Water Supply System.

Major provisions of the contractual agreements themselves are as follows:

1. The City will not oppose a participating company's application for a Certificate of Convenience and Necessity.
2. Each company will provide interim water service to its own retail water customers.
3. Each customer will collect from each customer and pay to City a "Water Development Fee" to be placed into the "Northwest Area Water Development Account" for construction of the Northwest Water Supply System.
4. The value of the "Northwest Area Water Development Fee" can be adjusted from time to time consistent with changes in the projected service area, number of customers, and water system costs contained within the Northwest Area Water Plan.
5. The City shall initiate construction of the Northwest Water Supply System as identified in the Northwest Area Water Plan on or before January 1, 1989, provided that 25 percent of the company's obligations to the Northwest Area Water Development Account has been received by said account.
6. Upon delivery of water to company through the Northwest Water Supply System, the company will pay to the City a wholesale water rate consisting of three cost components:
 - a. Operation and Maintenance.
 - b. Capital costs for imported supply to boundaries of Northwest Water Service Area.
 - c. Capital cost short fall of development fees to pay debt service on bonded portion of Northwest Water Supply System.

It is the intent of the City to collect a uniform Northwest Area Water Development Fee from all new customers within the boundaries of the Northwest Water Service Area whether in the certificated area of a private water company or served by the City. New City connections within the Northwest Water Service Area are impacted in that each are required to pay the same water development fee as a new customer in a participating private water company. This fee has been initially established at \$130 per each new residential unit including apartment and condominiums.

No immediate budgetary impacts of the agreements on the Water Department Budget were experienced. Funds to construct the Northwest Water Supply System will be provided from the Northwest Area Water Development Account. Separate subsidiary accounts were established to accept contributions from individual private water companies and the City of Tucson customers. The total funds received will be considered deferred revenue by the City water system and can be invested. The Northwest Water Supply System funds and interest earned thereon will be considered revenue to the Water Utility for accounting and bonding purposes.

Since the time frame for initiating the construction of the Northwest Water Supply System is January 1, 1989, provided 25 percent of the system cost is available at that time within the Northwest Area Water Development Account, the City's maximum capital obligation to be bonded could be 75 percent of the total system cost. At today's estimated costs of \$3,687,765, the City's maximum obligation could be as high as \$2,800,000. This could impact the bonding capacity of the City Water Utility as well as bond coverage. It is anticipated that revenues from new connections in the Northwest Water Service Area, supplemented by revenues from wholesale water charges,

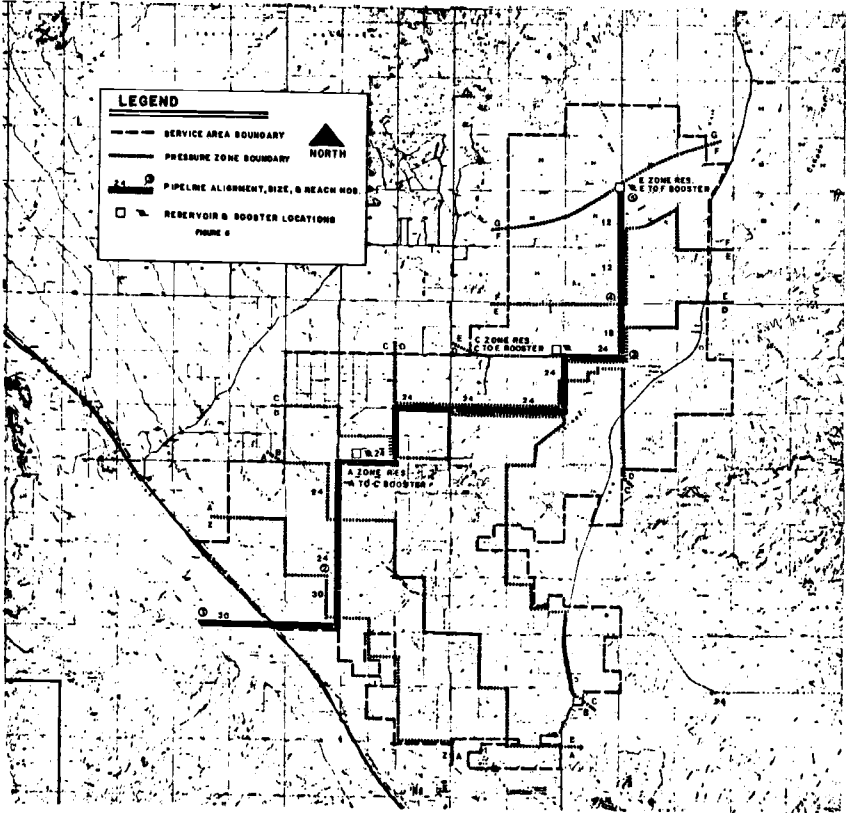


FIGURE 3: CONCEPT OF NORTHWEST AREA WATER SUPPLY SYSTEM

will offset the City's cost of debt service on any bonds issued after January 1, 1989 to cover the difference between the Northwest Water Supply System costs and the revenues received into the Northwest Area Water Development Account.

A cooperative atmosphere existed among the representative engineers and attorneys during the joint preparation of the Plan and the associated contractual agreements. Concepts as well as draft agreements were coordinated with the Southern Arizona Home Builders' Association and all participating parties were supportive of the agreements.

The agreements for water service with the Foothills, Vistoso and subsequently the Metropolitan water companies provide the frame work for a regional approach to water supply planning and management. It is anticipated that similar agreements with other private water companies in the Northwest Water Service Area will be forthcoming. The establishment of a uniform water development fee for the Northwest Area will provide the framework for similar development fees in other portions of the metropolitan Tucson area. Separate water development fees will be recommended for adoption into the water utility cost recovery system. These will be determined upon finalization and adoption of land use plans by Pima County.