208
Water Quality Management Plan

MARICOPA ASSOCIATION of GOVERNMENTS

FINAL

October 2002

208 Water Quality

Management Plan Update

MARICOPA ASSOCIATION of GOVERNMENTS

October 2002

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Maricopa Association of Governments

208 WATER QUALITY MANAGEMENT PLAN UPDATE

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ACKNOWLEDGMENTS

The completion of a complex project such as the Maricopa Association of Governments (MAG) 208 Water Quality Management Plan requires the participation and assistance of many agencies and individuals. The following individuals, agencies, and firms contributed to the success of this endeavor.

ADVISORY GROUPS

Throughout the project various advisory groups and organizations assisted in the review and development of the plan. These groups and organizations include:

MAG Regional Council

The MAG Regional Council serves as the governing body of MAG and is responsible for establishing and directing all MAG policies and activities. Membership is composed of one elected official, appointed from each member agency.

MAG Management Committee

The MAG Management Committee serves as the primary advisory body to the Regional Council. Membership is composed of the chief administrator from each member agency.

MAG Water Quality Advisory Committee

The MAG Water Quality Advisory Committee provides recommendations to the MAG Management Committee and Regional Council on water quality issues that affect the MAG region such as the update of the MAG 208 Water Quality Management Plan. MAG serves as the designated regional planning agency for water quality management planning in the Maricopa County area.

Other Agency Participation

Other agencies who provided personnel, review, and guidance on the project are:

- Arizona Department of Environmental Quality.
- Arizona Department of Water Resources.
- Maricopa County Planning and Development Department.
- Maricopa County Environmental Services Department.
- Flood Control District of Maricopa County.
- U.S. Environmental Protection Agency.

Funding was provided to the program through a grant from the EPA, by ADEQ, and by the Maricopa Association of Governments.

Consultants

Carollo Engineers, P.C. was contracted as consultant and prepared the 208 Plan Revision in conjunction with MAG staff. Subconsultants for portions of the project were:

- Damon S. Williams and Associates, LLC,
- Kenneth D. Schmidt and Associates, and
- Engineering Mapping Solutions.

EXECUTIVE SUMMARY

This document is a comprehensive revision of the Maricopa Associations of Governments "208" Water Quality Management Plan (WQMP). This is the second such complete revision since the Plan was first issued in 1979. Numerous changes have occurred since the 1993 revision to the 208 Plan was prepared, including:

- Major population growth in the metropolitan Phoenix area.
- Passage of Growing Smarter Initiative and Growing Smarter Legislation requiring extensive planning for growth by municipal agencies.
- Extensive number of amendments to the 1993 208 Plan as a result of growth.
- Revisions to state and federal regulations affecting permitting of wastewater systems, including discharge, reuse, recharge, and sludge disposal.
- A continued trend through urbanized areas of Maricopa County away from large, regionalized wastewater treatment plants and towards more numerous, small local water reclamation plants to produce reclaimed water for reuse.

The Federal Water Pollution Control Act Amendments of 1972, 1977, and 1987 (Clean Water Act) require, under Section 208, that states develop and implement areawide water quality management plans for pollution control. Plans prepared to meet the requirements of Section 208 must: a) identify the treatment works needed to meet anticipated municipal and industrial waste treatment needs of the area over a 20-year period, including construction priorities and schedules; b) establish a regulatory program to implement the plan; c) identify an implementation plan; d) identify non-point sources of pollution; e) identify mine-related sources of pollution, construction activity-related sources of pollution, and salt water intrusion into fresh waters; f) identify a process to control residual waste disposal; and g) identify a process to control disposal of pollutants on land or in subsurface excavations.

The "208 planning process" provides an opportunity for a designated area to identify its specific areawide waste treatment and water quality management problems and set forth a management program to alleviate those problems. The Maricopa Association of Governments (MAG) has been designated as the areawide water quality management planning agency for the Maricopa County area.

Major issues identified during the preparation of this 208 Plan Revision include:

- The Growing Smarter Initiative and Growing Smarter Plus have initiated requirements for extensive growth planning by municipal agencies.
- The population of the Maricopa County area is expected to continue to grow significantly over the next 20 years. This growth will require expanded wastewater collection, treatment, and reuse systems to handle increased flows.

- Reclamation of wastewater for non-potable reuse and aquifer recharge continues to be an important element both in wastewater treatment and water resources planning in the study area.
- The pollution impacts of stormwater discharges is extensively regulated by National Pollutant Discharge Elimination System (NPDES) permits. Passage of House Bill 2426 of the 2001 Legislative session created the Arizona Pollutant Discharge Elimination System (AZPDES) program and ADEQ proposed new rules for implementation of the permitting program, which were approved by the Governor's Regulatory Review Council on December 4, 2001.
- Sludge disposal continues to be an increasingly important issue, and was addressed in Section 503 Rules for Land Application of Sludge by the federal government.
- A State Solid Waste Management Planning Program is in place to extensively regulate disposal of solid wastes. The MAG Regional Solid Waste Management Plan is designed to provide guidance for systems level regional solid waste management planning, and future development of programs and facilities in the MAG region.
- The federal government has initiated new focus on regional water quality standards through the Total Maximum Daily Load (TMDL) program.
- Unified permit process adopted by ADEQ is designed to streamline procedures for permitting of wastewater treatment plants.
- Air quality issues are becoming increasingly important and have resulted in greater enforcement of setbacks and odor treatment in wastewater treatment plants.
- Surface water quality standards have been made more stringent, forcing consideration of alternative disposal or reuses rather than discharges.
- Shallow groundwater is becoming an increasing issue in the Salt and Gila Basins as its level is rising due to decrease in pumping for agricultural uses and the increase in recharge of treated wastewater effluent.

The 208 program includes of two major elements: the Point Source Plan and the Non-Point Source Plan. During development of the original 208 Plan, issued in July 1979, a planning process was established which has been in effect for over 20 years and is now well-established. The original 208 Plan has been amended several times since 1979.

The major effort of this 208 Plan Revision was in the Point Source Plan. Point source planning is primarily directed at compiling the preferred wastewater collection and treatment system for the Maricopa County area through the year 2020. Toward this end, the Point Source Plan examines population and wastewater flow projections, treatment methods, effluent disposal, reclaimed water reuse, and sludge management.

Development of the Point Source Plan has been heavily based on the wastewater management plans developed by the cities and towns of the study area. Consistent with the 1993 MAG 208 Plan Update, most of the cities and towns maintain detailed, carefully analyzed plans for the wastewater management within their planning areas. Wastewater management planning in the study area is a combination of regional and local approaches, as reflected in the Point Source Plan.

The selected point source plan has also been analyzed for its environmental impacts and impacts on the water resources in the area. The most important areas reviewed were:

- Surface water and groundwater quality and quantity.
- Aesthetics and public acceptability.
- Land use and population changes.
- Public health.
- Public facilities and economic activities.

During the period since 1993, considerable additional study has been made of the study area's groundwater. Seven regulatory programs, including the federal Superfund and State Water Quality Assurance Revolving Fund (WQARF), have been fully implemented. These have resulted in much greater knowledge of non-point source pollution in the state and have been incorporated in the Non-Point Source Plan Element.

Several agencies have responsibilities in the MAG 208 planning process. The U.S. Environmental Protection Agency and the Arizona Department of Environmental Quality have broad regulatory responsibilities. Others, such as the local municipalities and wastewater utilities, deal with the specific wastewater management concerns of individual communities. All have provided input to the regional planning effort. The efforts of the agencies involved have been coordinated and integrated in this MAG 208 Water Quality Management Plan for the Maricopa County area. The public participation process is described in Chapter 7.

STUDY AREA DESCRIPTION

Fifty-nine percent of Arizona's population resides in Maricopa County, the 9,130 square mile area encompassed by this report. The MAG 208 Water Quality Management Plan includes all cities, towns, and areas within Maricopa County.

The planning area has experienced the largest net increase of population between 1990 and 1997 of any county in the United States. Development continues to favor a low-density urban form, with much of the urban growth occurring as a result of the retirement of agricultural lands. Physical and political boundary features have contained growth in relatively few areas; namely Indian Community boundaries, mountain ranges, and regional parks. However, a movement toward growth management has arisen. New legislation and voter initiatives are designed to manage urban sprawl with the goals of preserving open space and improving the quality of life in the Valley. Population growth has exceeded that predicted in the 1993 MAG Water Quality Management Plan Revision. Growth has occurred so rapidly and the urban landscape has changed so dramatically during the nineties that a Special Census was performed in 1995 to update socioeconomic data for the study area.

Maricopa County is the most populous of Arizona's fifteen counties. Since 1950, the population of the County has increased from 331,770 to over 2.9 million in 1999. Migration accounted for approximately two-thirds of the population growth during the 1990s. This migration consisted primarily of people relocating to the area from the Midwest and western United States.

The economic environment during the 1990s was exceptionally strong with an increase of approximately 580,600 jobs since 1989. Construction and finance, insurance and real estate (FIRE) sectors led the growth of new non-farm jobs in Maricopa County. These sectors are expected to continue to grow for the next several years, although the rate of growth will slow somewhat from recent years. The largest sectors of the local economy are trade (includes retail) and services. These two components comprise more than half of the total employment in Maricopa County. Manufacturing, including high-tech industries, is expected to continue to grow throughout the planning period. Only two sectors of the local economy have not shown significant growth in recent years: mining and agriculture. In the coming years of the planning period, the economic outlook for the MAG planning area and the State of Arizona as a whole is for continued growth in nearly all sectors of the non-farm economy.

In Arizona, as well as other states, there is a trend toward more managed growth of urban areas. Recent legislation has been signed into law that establishes roles of local and state government in planning and management of new development and provides conservation of State Trust lands for open space. The legislative acts include House Bill 2361 (Growing Smarter Act of 1998) and Senate Bill 1001 (Growing Smarter Plus Act).

For the purposes of the 208 Plan Revision, the boundaries of the study area coincide with the boundaries of Maricopa County. The MAG 208 planning area is the Maricopa County boundary and jurisdictions or portions of jurisdictions outside of Maricopa County are within other planning areas for all 208 planning purposes and processes.

Maricopa County is increasing its importance as a center of business activity. The economic emergence of the Pacific Rim is affecting the area, with California firms expanding and relocating here to serve that market. The traditional economic base of tourism, government, and construction is being broadened by the addition of high technology manufacturing, defense/aerospace, and corporate regional offices. Agricultural employment is declining as a percentage of the total largely due to urbanization and mechanization.

DESCRIPTION OF WATER RESOURCES

The development of Maricopa County into a major agricultural and population center of the Southwest U.S. is due in large part to its favorable location with respect to supplies of surface water. Maricopa County lies at the confluence of the Salt and Verde Rivers, two rivers that drain the most prolific watersheds in the State.

Other developed surface water resources of historical importance in the planning area include: (1) the Agua Fria River, and (2) the Lower Salt River and the main stem of the Gila River below the confluence with the Salt. The Hassayampa and Santa Cruz Rivers are tributaries to the Gila River in the planning area, but their normal flows are fully appropriated by upstream users and they carry only floodwaters into the planning area.

In addition to the traditional water sources from the planning area's rivers, Colorado River water and treated wastewater effluent are increasing their role in meeting the needs of the planning area. The Arizona Department of Water Resources (ADWR) reported that 677,000 acre-feet of Colorado River water was delivered to the Phoenix Active Management Area (AMA) in 1997. Of this volume, 277,000 acre-feet were used directly for municipal, industrial, and agricultural purposes; 400,000 acre-feet were stored in underground storage facilities and groundwater savings facilities. In 1995, approximately 100,000 acre-feet of the 286,000 acre-feet of effluent produced was recharged into underground storage facilities or reused. The ADWR has stressed the need to fully utilize these water sources to assist in achieving the safe yield goal defined in the 1980 Groundwater Code by the year 2025.

Waters in the Salt and Verde Rivers have excellent chemical quality. The watersheds are largely undeveloped and man-made sources of pollution are not widespread. Certain Segments of the Verde River sometimes have concentrations of arsenic that exceed 10 mg/L, which is above the Maximum Contaminant Level (MCL) per EPA water quality standards for public water supply systems.

Lake Pleasant is a large man-made reservoir constructed along the Agua Fria River in the northwestern portion of the planning area. The Waddell Dam forms Lake Pleasant. The Bureau of Reclamation constructed the New Waddell Dam as part of the Central Arizona Project (CAP). The commingled water stored in Lake Pleasant, during an average year of inflow, will be mostly representative of Colorado River water.

The water quality of the Agua Fria River above Lake Pleasant is similar to the quality of the Colorado River. However, the Agua Fria River typically has a lower TDS concentration than the Colorado River water.

Water quality in the Gila River is generally poor. Water flow in the perennial reaches of the Middle Gila Basin are predominantly effluent, releases from impoundments, and agricultural return flows. The water quality is impacted by upstream discharges of irrigation tailwaters, inflows of groundwater containing high concentrations of TDS, and water from mine tailings.

The CAP includes a 336-mile long aqueduct system that consists of canals, pipelines, tunnels, pumping facilities, check structures, and turnouts. The system allows the CAP to deliver water from Lake Havasu on the Colorado River to municipal and agricultural irrigation users in Maricopa, Pinal, and Pima counties. The aqueduct system was completed in 1993 making the CAP the largest supplier of surface water in Arizona.

The CAP aqueduct is also interconnected to the SRP canal system at Granite Reef Dam near the Salt-Gila Pumping Station. The Granite Reef interconnection is used to import CAP water into the SRP canal system as a means of delivering water to users in the Phoenix area who are remote from the CAP aqueduct.

In 1986, the Arizona legislature established the Underground Water Storage and Recovery Program to allow the storage of surplus water supplies underground for recovery and use by the storer at a later time. In 1994, the legislature developed a unified program to consolidate the various water storage programs by enacting the Underground Water Storage, Savings and Replenishment Act. Two types of facilities are used for this purpose including underground storage facilities (USF) and groundwater savings facilities (GSF). The distinction between the two is that groundwater savings facilities are using a source of water for their needs, typically irrigation, in place of groundwater thereby creating a savings. In 1996, the State Legislature created the Arizona Water Banking Authority (AWBA) to store Arizona's unused allotment of Colorado River water for future use during times of drought.

In the planning area, wastewater treatment plant effluent is used to supply water for irrigation, industrial uses, recreational purposes including lakes and ponds, artificial recharge, and wetlands. To meet the requirements of the Assured Water Supply rules, it is likely that the use of effluent as a renewable water source will continue to increase in the future.

Municipalities within the planning area have implemented constructed wetlands to provide tertiary treatment of secondary treated effluent, polishing treatment of tertiary treated effluent, and wildlife habitat development. Effluent is also used as a source water to fill and maintain scenic and recreational lakes and ponds associated with various parks and golf courses throughout the planning area.

The 91st Avenue and 23rd Avenue Wastewater Treatment Plants are the largest sources of effluent in the planning area. This effluent is supplied to Palo Verde Nuclear Generating Station via pipeline to irrigate districts through the irrigation canal system and excess flow is discharged to the Gila River channel.

Groundwater resources in the planning area are significant but not unlimited. Despite the relative abundance of groundwater in the planning area, long-term declines in water levels have resulted in parts of the area from imbalance between recharge and pumpage. The recognition of this imbalance provided the impetus for the enactment of the Groundwater management Act of 1980. The Act led to the establishment of Active Management Areas

(AMAs) which are subject to regulation by the Arizona Department of Water Resources (ADWR). Within the AMAs, the right to pump groundwater and develop new groundwater supplies are regulated by ADWR. Most of the Salt River Valley lies in the Phoenix AMA. Within the Phoenix AMA, a permit is needed to legally withdraw groundwater for most uses, and increasing the base of agricultural land is limited.

In the Phoenix AMA, the depth to groundwater varies from less than 10 to more than 600 feet below land surface. In general, the greatest depths occur in the sloping alluvial fans close to the major mountain ranges. Groundwater is shallowest near the Salt, Verde, and Gila Rivers ranging from as shallow as 4 feet to less than 50 feet below land surface.

In most of the planning area, groundwater is more mineralized than surface water. Shallow mineralized groundwater is often “hard,” or it may have a salty taste. Its usefulness for domestic, industrial, and agricultural purposes is reduced. However, deeper groundwater that has not been influenced by irrigation is developed by most cities.

In Arizona, the Arizona Department of Environmental Quality (ADEQ) has responsibility for establishing and enforcing water quality standards. There are three sets of relevant standards that have been established:

- Surface waters
- Public water supplies
- Aquifers

POINT SOURCE PLAN

The objective of the Point Source Plan is to identify the preferred wastewater collection and treatment, and effluent reuse or disposal systems for the study area. Applicable regulations and permit requirements are discussed with respect to their role in wastewater system planning. This is followed by specific plans developed for each community in the Study Area.

Permits and Protected Uses

The regulatory framework for management of water quality is comprised of permit compliance and monitoring of protected uses.

The ADEQ defines, monitors, and enforces water quality standards for protected uses of surface waters, aquifers, and public water supplies. The total maximum daily loads (TMDL) program is a program that has been established since the last 208 Plan revision. This program is another tool that allows the State to establish pollutant loads permissible for water quality limited surface waters bodies.

The permit framework for point source management has changed. The framework consists of three primary elements consisting of NPDES, APP, and Reclaimed Water. The administration of the NPDES program has not changed substantially. However, the State of Arizona is seeking primacy for administration of the AZPDES program. On December 4, 2001, the Governor's Regulatory Review Council approved new rules to implement the permitting program passed in the 2001 session of the Arizona Legislature. Currently, USEPA Region 9 is considering the submittal package forwarded in early January 2002. ADEQ anticipates program approval by July 1, 2002. However, the APP and Reclaimed Water Permit program rules were recently revised. In addition, a new rule has been added that addresses water quality management planning.

The purpose of the NPDES and AZPDES permit programs is to regulate the quality of point source discharges into "Waters of the United States".

Based on these criteria, discharges to the Salt, Verde, Gila, and Agua Fria Rivers, tributaries to these rivers including typically dry washes, and several lakes and canals within the planning area are subject to the NPDES and AZPDES permit program provisions.

The ADEQ has established Surface Water Quality Standards (SWQS) as required to meet the goals of the federal CWA and to protect the quality of the surface waters in the state. The EPA incorporates the SWQS and federal regulation related to surface water quality and effluent discharge quality into the NPDES and AZPDES permits. Pollutant levels established by the NPDES and AZPDES permit programs vary among wastewater reclamation facilities depending upon the designated use of the receiving water. The NPDES and AZPDES permits include monitoring requirements for chemical and biological constituents. Permits are typically issued for a term of five years.

EPA is developing rules that will regulate discharges from sanitary sewer collection systems. These discharges are called sanitary sewer overflows. Currently, EPA plans to implement the rules through NPDES permits.

The Aquifer Protection Permit (APP) program was established by the Environmental Quality Act of 1986 (A.R.S. § 49-101, *et seq.*) and implemented by rule in 1989. The purpose of the APP program is to protect the groundwater quality and public health from potential environmental risks posed by the facilities that discharge pollutants to the land surface, underlying soil, or groundwater that have the potential for reaching an aquifer. The APP permitting requirements are determined based on the type of facility or land use, capacity of the facility, and/or the type of discharges that facility will produce. The most crucial requirements for obtaining an APP are demonstrating that the Best Available Demonstrated Control Technology (BADCT) will be used to minimize the discharge of pollutants, Aquifer Water Quality Standards will not be violated at a point of compliance, and that the facility possesses the financial and technical capability to comply with the permit conditions.

The Environmental Quality Act (ARS 49-243B.1.) requires that all domestic wastewater and disposal facilities requiring an APP use the Best Available Demonstrated Control Technology (BADCT) as part of their wastewater treatment process. "Best" is defined as the optimum method for the intended purpose. "Available" refers to being commonly procurable. "Demonstrated" is defined as proven reliability under comparable circumstances. "Control Technology" is defined as a wastewater treatment process or pollutant concentration that represents the result of a selected treatment process. The overall objective of BADCT is to reduce the pollutant load on the state's aquifers to the greatest extent that is technically feasible.

As part of the Unified Water Quality Permit Process, the ADEQ adopted BADCT requirements for new sewage treatment facilities. The design review of sewage treatment facilities has been consolidated into the APP application review process. The BADCT requirements are defined within the rules for secondary treatment, pathogen removal for new facilities and major modifications to older facilities. The APP rule also establishes four types of general permits that have varying notification requirements. The modifications to the APP process better defines the design standards and monitoring requirements for small on-site wastewater treatment systems. The APP rules took effect in January 2001.

The reclaimed water reuse permit program, established in 1985, allows the reuse of reclaimed water for a variety of applications such as agriculture, urban lakes, golf course irrigation, ponds, and industrial uses. Water reclamation plants are required by rule to have a reuse permit for the release of reclaimed water for reuse purposes.

A companion rule adopted Reclaimed Water Quality Standards and established five classes of reclaimed water expressed as a combination of minimum treatment requirements and a limited set of numeric reclaimed water quality criteria.

There are two main categories of reclaimed water reuse including direct nonpotable reuse and indirect reuse. Direct reuse consists of irrigation and makeup water for urban lakes. Indirect reuse typically involves aquifer recharge and recovery. Reclaimed water quality requirements for irrigation and recharge follow the SWQS and AWQS requirements. Direct potable reuse of reclaimed water is prohibited by law.

The indirect reuse of reclaimed water usually involves recharge to an aquifer for storage and future recovery. The reclaimed water is typically allowed to infiltrate through the dry soils above the aquifer allowing for additional treatment. Recharge projects using reclaimed water are required to obtain an APP. The APP requirements and procedures are discussed in Section 4.1.2 of this document. Recharge projects are also required to obtain an Underground Storage Facility Permit and Water Storage Permit from the ADWR. However, recharge projects do not require a reclaimed water reuse permit.

Reuse has gained popularity in light of water conservation requirements and incentives, and increasingly stringent stream discharge standards. Water conservation measures established by the ADWR for the Phoenix AMA encourage the reuse of reclaimed water in lieu of groundwater supplies. Reclaimed water may be used for irrigation without recharging an aquifer. Reclaimed water quality requirements vary for different irrigation uses, but generally they are less stringent compared to those governing groundwater recharge.

In 1986, the Arizona legislature established the Underground Water Storage and Recovery Program to allow the storage of surplus water supplies underground for recovery and use at a later time. In 1994, the legislature developed a unified program to consolidate the various water storage programs by enacting the Underground Water Storage, Savings and Replenishment Act. Two types of facilities are used for the storage of excess water supplies including underground storage facilities (USF) and groundwater savings facilities (GSF). The distinction between the two is that groundwater savings facilities are using a source of water for their needs, typically irrigation, in place of groundwater, thereby creating a savings. By permitting and implementing a storage facility, applicants are able to accumulate storage credits for use in the future.

There are two types of USF that are permitted by the ADWR including constructed and managed USF. A constructed USF consists of a facility that includes constructed features that contain recharge water to allow infiltration to occur within the constructed boundaries of the facility. A managed facility employs the use of the unmodified natural channel of a stream to recharge water, therefore, construction at a managed facility is minimal.

In Arizona, the Arizona Department of Environmental Quality (ADEQ) has responsibility for establishing and enforcing water quality standards. There are three sets of relevant standards that have been established:

- Surface waters
- Public water supplies
- Aquifers

The surface and aquifer water quality standards are defined in two categories including narrative and numeric standards. The narrative category provides broad standards that protect the aesthetics and prevent degradation of the water and wildlife.

The Unified Water Quality Permit Process (UWQPP) was initiated by the State to reduce the regulatory review burden and eliminate redundancy in the aquifer protection and wastewater facility construction review and reuse permitting processes. The modifications and additions to the existing regulations governing the reuse of wastewater are expected to encourage the reuse of treated wastewater and conserve potable sources for domestic purposes. The new rules took effect in January 2001.

The ADEQ is required to establish Total Maximum Daily Loads (TMDL) for lakes, rivers and streams that do not meet water quality based standards as a requirement of Section 303 (d) of the CWA. The water quality limited waters are identified and prioritized according to the pollutants and designated use of the water. For each pollutant identified, the State must determine a TMDL that specifies the amount of pollutant that may be present in a water body without exceeding the water quality standard. The TMDL takes into account the pollutant source, seasonal variation, and a margin of safety. The program goal is to delist waters within 13 years of the first listing. Because the TMDL establishes maximum allocations of pollutants loadings, the NPDES and AZPDES permitting process for point and nonpoint sources is affected by this program.

On August 9, 2001, EPA published a notice in the Federal Register for an 18 month delay of the recently published TMDL Rule. The Federal Register also included a delay for states to submit impaired water lists [303(d)] until October 2002.

Selected Point Source Plan

The Point Source Plan in this 208 Plan Revision is an update of that presented in the 1993 208 Water Quality Management Plan. The Point Source Plan reflects the major advances which have been made by the communities of the Study Area in wastewater management planning. Nearly all of the communities have developed carefully-analyzed, detailed wastewater master plans. The plans have been developed by individual municipalities and agencies, but they reflect a thorough awareness of the water quality management issues facing the region.

Because of the importance of highly-treated effluent or reclaimed water as a source of supply, almost all of the communities in the Study Area have at least considered the possibility of effluent reuse. Because of the cost of distributing water to users, a local approach to reclamation and reuse is in most cases the most cost effective. This has led many communities to plan local, smaller treatment plants to retain the water in their community and minimize the cost of delivering reclaimed water.

The discussion for each community describes:

- Planning area.
- Population and wastewater flow projections.
- Existing wastewater collection and treatment systems.
- Effluent disposal and/or reuse.
- Sludge management.
- Planned improvements.
- Improvement costs.

Presented on Table ES.1 is a summary of the selected wastewater projects for each community. A composite map of the Point Source Plan is reflected in Figure ES.1. There are currently 25 treatment plants over 2 mgd in capacity and 51 small plants (76 total). By year 2020, the count is expected to increase to 47 larger plants and 50 small plants (97 total).

Modifications to the MAG 208 Plan

The MAG 208 Plan is subject to change in accordance with these established procedures:

- Periodic Major Revision of the 208 Plan.
- 208 Plan Amendment Process.
- Small Plant Review and Approval Process.

Each of these procedures have been utilized multiple times since the original plan was developed.

In order to ensure that the MAG 208 Water Quality Management Plan remains an up-to-date document, MAG member agencies have been requested to submit copies of their adopted Capital Improvement Programs (CIPs) annually to MAG. Though this procedure has not been rigorously followed, a renewed intent exists to seek this annual information by MAG. The intent is to review the CIPs to determine if changes to the wastewater treatment systems have occurred. The changes will then be presented to the MAG Water Quality Advisory Committee. If appropriate, the MAG Water Quality Advisory Committee may make a recommendation to the MAG Management Committee that the 208 Plan be amended to include the updated information.

Periodic Major Revision of the MAG 208 Plan

The MAG 208 Water Quality Management Plan is periodically updated through a major revision in accordance with provisions of Section 208 of the Federal Clean Water Act. These updates to the original 208 Plan (July 1979) have been occurring on an approximate 10 year cycle (1982, 1993, and the current update to be completed in 2001/02).

Interim Revision of the MAG 208 Plan

Modifications to the MAG 208 Plan are incorporated in each major revision. Two procedures exist to modify the approved 208 Plan between revision cycles:

- 208 Amendment Process
- Small Plant Review and Approval Process

MAG 208 Plan Amendment Requirements

Plants greater than 2.0 million gallons per day and those with a discharge requiring an NPDES permit or AZPDES permit which are not specifically identified in the MAG 208 Plan would be required to go through a formal 208 analysis or amendment.

Table ES.1 Point Source Plan Summary
MAG 208 Water Quality Management Plan Update

AREA	MEMBER AGENCY	TREATMENT PLANTS NAME	CURRENT MGD	FUTURE[1] ADD MGD	ULTIMATE MGD	OTHER IMPROVEMENTS	ESTIMATED COSTS[2]
Central	**Phoenix**	23d Ave. WWTP	63.0	0.0	78.0		$166,220,000
		91st Ave. WWTP (SROG)	179.25	25.25	239.97[3]		$215,414,800
		Cave Creek WRP	8.0	8.0	32.0		$43,150,000
		North Gateway WRP	-	4.0	32.0		$30,000,000
						Collection System	$150,178,000
						Lift Stations	$7,825,000
						Estrella WW System	$20,000,000
						Multi-City Sewers	$96,925,000
						Tres Rios	$28,021,000
		Misc. WWTP Facilities (13 small)	0.2	-	0.2		-
Southwest	**Avondale**	Avondale WWTP	3.5	2.9	20.0		$30,800,000
		Northside WRP	-	6.0	6.0		$8,000,000
		Package WWTP	-	1.0	1.0		$1,000,000
						Sewer Extensions	$2,000,000
						Trunk Sewers	$8,635,000
	Buckeye	Buckeye WWTP	0.6	1.4	2.0		$3,500,000
		Sundance WWTP		3.6	3.6		$18,000,000
		Blue Horizons WWTP	-	0.8	2.0		$3,500,000
		ADOC Lewis Prison	0.75	-	0.75		-
		Verrado WRF	-	0.45	3.35		$3,000,000
	Goodyear	Goodyear WWTP	3.0	8.0	11.0		$66,475,000
		Gila River Basin-Cotton Lane WRP	-	4.0	4.0		
		Lockheed Martin WWTP	0.45	-	0.45		-
		AZ Equest Center	0.12	-	0.12		-
		LPSCO Palm Valley WRF	-	4.1	8.2		$19,174,000
		LPSCO Sarival WRF	-	4.1	8.2		$19,174,000
		Rainbow Valley (Lum Basin) WRF	-	1.0	9.2		$46,000,000
		Corgett Basin WRF	0.8	1.4	2.2		$11,000,000
		Waterman Basin WRF	-	2.8	5.5		$27,500,000
	Litchfield Park	-	-	-	-		-

Table ES.1 Point Source Plan Summary
MAG 208 Water Quality Management Plan Update

AREA	MEMBER AGENCY	TREATMENT PLANTS NAME	CURRENT MGD	FUTURE[1] ADD MGD	ULTIMATE MGD	OTHER IMPROVEMENTS	ESTIMATED COSTS[2]
	Tolleson	Tolleson WWTP	17.5	7.4	24.9		$49,175,000
Northwest	**El Mirage**	El Mirage WWTP	1.0	2.6	3.6		$11,500,000
	Glendale	Arrowhead Ranch WRF	4.5	-	4.5		-
		West Area WRF	4.3	10.7	15.0		$20,000,000
		Desert Gardens II WWTP	0.05	-	0.05		
		Casitas Bonitas WWTP	0.05	-	0.05		
		AAWC Russell Ranch WWTP	-	0.06	-		$1,199,000
		AAWC WRP	-	0.50	8.0		$3,000,000
		Desert Gardens II WWTF	-	0.06	0.06		$442,000
						Sewer Lines	$18,600,000
						Reuse Lines	$11,300,000
	Luke AFB	Luke AFB WWTP	1.0	-	1.0		-
	Peoria	Beardsley WWTP	3.0	13.0	16.0		$65,000,000
		South Peoria WRP	-	2.8	13.0		$13,220,000
		Pleasant Harbor WWTP	0.063	-	0.189		-
		Jomax WRP	-	6.7	9.0		$33,500,000
		Paddelford WRP	-	0.6	1.0		$3,000,000
		Saddleback WRP	-	0.5	0.9		$3,000,000
		Quintero WWTP	-	0.07	0.15		$420,000
						S. Collection System	$156,000
						99th Ave. Int. Parallel	$6,920,000
						N Cent Collection System	$16,500,000
						NW Collection System	$8,500,000
	Surprise	Litchfield Road WWTP	1.32	-	1.32		
		South Surprise WWTP	3.2	4.0	36.0		$45,000,000
		North Surprise WWTP					$41,000,000
	Youngtown		-	-	-	-	-
Northeast	**Carefree**	BMSC WWTP	0.12	-	0.16		-
	Cave Creek	Rancho Manana WWTP	0.233	-	0.233		-

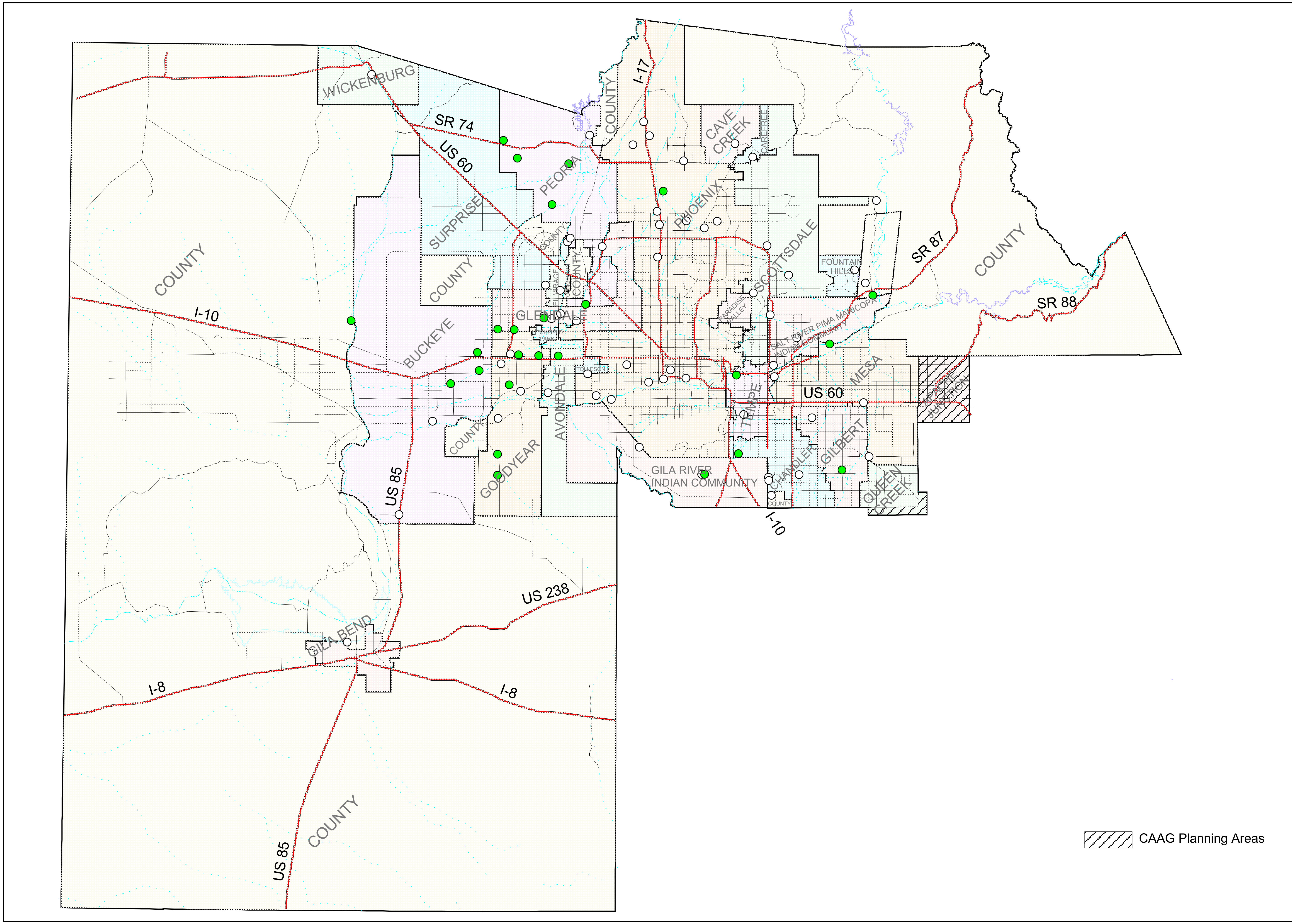
Table ES.1 Point Source Plan Summary
MAG 208 Water Quality Management Plan Update

AREA	MEMBER AGENCY	TREATMENT PLANTS				OTHER IMPROVEMENTS	ESTIMATED COSTS[2]
		NAME	CURRENT MGD	FUTURE[1] ADD MGD	ULTIMATE MGD		
Northeast	**Fountain Hills**	Fountain Hills WWTP	2.6	0.6	3.2		$10,000,000
(continued)						Infrastructure	$2,400,000
	Paradise Valley	-	-	-	-		-
	Scottsdale	Gainey Ranch WRP	1.7	-	1.7		-
		Water Campus WRP	12.0	12.0	24.0		$24,500,000
		Water Campus AWTP	10.0	12.0	22.0		
		Taliesen West WWTP	0.015	-	0.015		-
						Sewer System Improvement	$5,229,000
Southeast	**Guadalupe**	-	-	-	-		-
	Chandler	Lone Butte WRF	10.0		10.0		-
		Ocotillo WRF	10.0		20.0		-
		Airport WRF	6.5	10.0	20.0		$54,600,000
		Industrial WWTP	2.8	-	2.8		-
						Collection System	$18,200,000
						Reclaimed Water System	$31,900,000
						Recharge Facilities	$47,700,000
	Gilbert	Neely WRF	8.5	2.5	11.0		$10,200,000
		Mesa-Gilbert South WRP	-	10.0	19.0		$78,250,000
						Sewer/Lift Station	$3,593,300
						Reclaimed Water System	$4,710,000
	Mesa	Northwest WRP	18.0	12.0	30.0		$50,000,000
		Southeast WRP	8.0	8.0	16.0		-
		Mesa-Gilbert South WRP	-	20.0	30.0		$30,000,000
						WW System Expansion	$52,000,000
	Queen Creek	-	-	-	-	Collection System	$10,250,000
	Tempe	Kyrene WRP	4.5	5.5	10.0		$25,000,000
		Rio Salado WRP	-	-	11.0		-
						Infrastructure Improve.	$40,900,000

Table ES.1 Point Source Plan Summary
MAG 208 Water Quality Management Plan Update

AREA	MEMBER AGENCY	TREATMENT PLANTS: NAME	CURRENT MGD	FUTURE[1] ADD MGD	ULTIMATE MGD	OTHER IMPROVEMENTS	ESTIMATED COSTS[2]
Outlying	**Gila Bend**	Gila Bend WWTP	0.13	0.57	0.7		$1,000,000
	Wickenburg	Wickenburg WWTP	0.8	0.4	1.2		$1,613,000
						Infrastructure Improve	$3,859,600
	Gila River Indian Community	Wild Horse Pass WRP	2.0	8.0	10.0		-
		Vee Quiva WWTP	0.1	-	0.1		-
	Salt River Pima-Maricopa Indian Community	Roadrunner WWTP	0.1	-	-		
		Victory Acres WWTP	0.4	-	-		
		Pavilions WWTP	0.12	-	-		
						Sewer Improve	$3,000,000
	Ft McDowell Yavapai Nation	Casino WWTP	0.06	-	-		
		Beeline Highway WWTP	-	0.24	0.24	Sewer Improve	$10,000,000
	Maricopa County	Anthem (AAWC)	0.5	4.0	4.5		$17,500,000
		Belmont	-	4.5	4.5		$18,500,000
		Lakeland Village	-	2.9	2.9		$17,400,000
		Mountainwood	-	0.37	0.37		$2,200,000
		Rio Verde Utilities	0.3	0.6	0.9		$4,700,000
		Sun City West (AAWC)	2.14	1.16	6.44		$7,000,000
		Sun Lakes	2.4	-	2.4		-
		Wigwam Creek	-	2.4	2.4		$14,400,000
		Misc. Small WWTP (15 WWTPs)	0.42	-	0.42		-
Totals			400.12	245.53	873.07		$1,977,528,700

[1] Defined expansions/additions within 20-year plan.
[2] Costs from CIP or estimated future additional mgd capacities of treatment plants.
[3] Year 2020 planning period only.



Maricopa Association of Governments
208 Water Quality Management Plan
2002

carollo engineers
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N

NO SCALE

LEGEND:
Existing Treatment Facility
Future Treatment Facility

Existing & Planned
WWTP Locations

03/22/02

FIGURE ES-1

For plants required to go through a formal 208 analysis and amendment, the jurisdiction (MAG member agency) in which the facility would be located initiates a request to include the new wastewater treatment plant in the 208 Plan. It is recommended that the jurisdiction making the request contact any adjacent community if the proposed development is within three miles of the boundary between the two communities.

According to federal regulations, public participation requirements are applicable for 208 Plan Amendments. The MAG Water Quality Advisory Committee reviews the draft 208 Plan amendment and then authorizes a public hearing to be conducted. The hearing must be advertised 45 days in advance and the document must be available for public review 30 days prior to the hearing. A hearing notice is also sent to interested parties 30 days prior to the public hearing. The public hearing is conducted by MAG. A court reporter prepares an official transcript of the hearing. If written or verbal comments are received, a response to comments is prepared by the entity requesting the amendment.

The MAG Water Quality Advisory Committee reviews the response to comments and then makes a recommendation to the MAG Management Committee. The MAG Management Committee reviews the recommendation from the Water Quality Advisory Committee and then makes a recommendation to the MAG Regional Council. As the decision-making body of MAG, the Regional Council reviews the recommendation from the Management Committee and then takes official action to approve the 208 Plan amendment.

The State Water Quality Management Working Group reviews the 208 Plan amendment approved by the Regional Council and then makes a recommendation to the Arizona Department of Environmental Quality (ADEQ). ADEQ submits the 208 Plan amendment to the U.S. Environmental Protection Agency (EPA) for approval and EPA approves the 208 Plan amendment and notifies the State of the approval action.

The Arizona Department of Environmental Quality maintains a 208 amendment checklist for use in preparing 208 Plan Amendments. Copies of the current checklist can be provided by ADEQ upon request.

Small Plant Process

Part of the Multi-City SROG selected point source plan in 1982 was to provide an option to further expansion of the 91st Avenue WWTP and other major treatment plants. This option was the construction of small reclamation plants. Rather than amend the MAG 208 Plan to include every acceptable new small plant, the communities developed a small plant review process.

Using this process, a small plant not specifically identified in the Point Source Plan can be approved as part of the 208 Plan if the plant goes through the Small Plant Review and Approval Process. A small plant is a reclamation plant with an ultimate capacity of 2.0 million gallons per day (mgd) or less with no discharge requiring an NPDES or AZPDES permit. By requiring proposed plants in the area to obtain approval using this formal process, an uncontrolled proliferation of small plants that could cause problems in the future should be prevented. The communities adopted a small plant process goal of allowing the cities and towns the maximum level of control in the approval of small plants. The County must consider the comments of the nearby city or town concerning proposed small plant facilities within three miles of their borders. Plants greater than 2.0 mgd and those with a discharge requiring an NPDES or AZPDES permit which are not specifically identified in the MAG 208 Plan would be required to go through a formal 208 analysis or amendment.

Small plants that are specifically identified in the MAG 208 Plan are required to go through the Small Plant Review and Approval Process for an expansion of the facility, even when the expanded facility would still meet the small plant threshold of 2.0 mgd or less.

Environmental Assessment of Point Source Plan

The MAG WQMP Revision revisited environmental impacts and issues previously considered at both site-specific and areawide levels with the emphasis on assessment of areawide impacts. Impacts were reviewed within various environmental categories: air quality, geology/soils, surface water, groundwater, biological resources, cultural resources, aesthetics, public health, land use, population, public facilities and services, economic activity, and public and institutional acceptability, and nominal updates were developed.

NONPOINT SOURCE PLAN

Nonpoint sources are considered the single largest cause of water pollution in the nation. The USEPA recently indicated that over 50 percent of the nation's current water quality degradation is now attributable to nonpoint sources of pollution. Nonpoint sources of pollution are those discharges that do not originate from a specific single location. In areas such as Maricopa County, the distinction between point and nonpoint sources is not clear. Although groundwater is the receiving water for many nonpoint sources, it is also impacted by many point sources. In the MAG planning area, the major water quality impact due to nonpoint sources is on groundwater. This is due to heavy reliance on groundwater supplies and the relative absence of natural surface water in the County, except during flood flows. Impacts to groundwater are more difficult to assess and manage than impacts to surface water.

The State of Arizona has developed two NPS Water Quality Management Plans in recent years. SMP I focused on nonregulatory watershed-based implementation efforts. The 1997 NPS State Water Quality Management Plan (SMP II) identified Arizona's goals and objectives for NPS program implementation for State Fiscal Years 1998-2003. The SMP II reflects the national trend for NPS program implementation within a watershed framework, stressing partnering efforts, the nine key elements of an effective NPS program and measurements of success for nonpoint source pollution reduction. At the present time, ADEQ is preparing a major revision to SMP II for NPS Water Quality.

Nonpoint sources of urban pollution include discharges of storm runoff to surface water and groundwater. Phase I (1990) and Phase II (1999) of the NPDES Storm Water Permit Program have driven local and state agencies to implement new management and testing procedures related to storm water quality. Sediment in storm runoff and drywells used for storm water disposal are two primary areas of focus in addressing pollution from urban runoff. Pollutants associated with agriculture include sediment, pesticides, bacteria, viruses, nitrates from both fertilizer and animal wastes, and salinity. Some of these pollutants can be discharged to surface waters in irrigation return flows and storm runoff, and to groundwater by percolation of irrigation water to the water table.

The presence of shallow groundwater is an important issue in many parts of the planning area. As a result of urbanization and other factors, agricultural irrigation has ceased in large parts of the Valley in recent decades. This has had major impacts on groundwater discharge and recharge.

Nonpoint sources associated with land disposal activities in the planning area include landfills, wastewater ponds, and septic tanks. Contaminants associated with some of these sources include salinity, bacteria, heavy metals, nitrates, ammonia, phosphates, pesticides, and volatile organic compounds (VOCs).

Disposal of liquid wastes at landfills and in industrial wastewater lagoons is another documented source of nonpoint pollution in the planning area. Disposal of industrial wastes in unlined lagoons, pits, or drywells was a commonly used disposal alternative in parts of the planning area prior to the availability of sewers.

Septic tanks in combination with a leach bed or a drywell are used for onsite disposal of domestic liquid wastes in unsewered parts of the planning area. There have been few documented groundwater quality problems attributable to the use of these systems in the MAG planning area. However, industrial use of septic tanks and leach beds is a suspected source of contamination in some areas.

Use of effluent for irrigation, disposal of effluent to stream channels, or groundwater recharge using effluent has potential to impact surface water or groundwater quality in parts of the planning area. Contaminants of major concern include nitrate and pathogens. In recent years, groundwater recharge has become a popular option for effluent disposal in the planning area.

The Best Available Demonstrated Control Technology (BADCT) component of the 1986 Environmental Quality Act stipulates that specific technologies be incorporated in the processes of wastewater treatment facilities required to obtain an APP. The principal processes impacted by BADCT requirements for most wastewater treatment plants are disinfection, turbidity removal, and nitrogen removal.

Water quality impacts due to hydrologic modification, man-made alterations to or withdrawals from surface waters or aquifers, in the planning area are significant. NPS pollution issues related to these modifications include lowering of the water table and changes in groundwater flow directions, mounding of shallow groundwater, and quality degradation in shallow groundwater. The water quality and quantity impacts of hydrologic modifications are difficult to anticipate and are difficult to manage. Historically, they have been relegated to a position of secondary importance due to overriding water quantity concerns.

During the period after the 1979 edition of the Plan was completed, leaks and spills from underground storage tanks and hazardous waste containments emerged as a groundwater quality problem of major proportions in the planning area. The magnitude of the problem began to be identified in the mid-1980s, when state and federal regulations for upgrading underground storage tanks (USTs) were enacted.

Although much data existed in 1979 for work done in other areas of the country, it became apparent that nonpoint sources are very site specific and data from one part of the country (particularly in the humid eastern U.S.) cannot be readily used in another (i.e., in an arid or semi-arid area). That proved especially true in the arid southwest, due in part to the fact that much of the previous work dealt with impacts on perennial flowing surface waters and little with impacts on groundwater. This information guided formulation of a new approach to nonpoint source pollution assessment in the MAG planning area. Historical changes in chemical constituents present in the groundwater were evaluated relative to surface activities or natural influences to identify nonpoint sources of groundwater pollution in the area.

Shallow groundwater in the Salt River Valley (Valley) was evaluated for the Maricopa Association of Governments in the early 1980s, as part of a drywell study, and again in 2000 to support this plan update. In recent years, shallow groundwater levels in most parts of the planning area either have remained relatively constant or have risen. The two most important factors causing observed water level rises are decrease in pumpage (Groundwater Management Act of 1980), and the wetter years beginning in the late 1970s that resulted in more stream flow down the Salt River and less pumpage from SRP wells compared to previously.

The primarily long-term impacts of the shallow groundwater on the quality aspects are:

1. Degradation of the quality of groundwater in the middle alluvium unit (MAU) and lower alluvium unit (LAU) that is now pumped by many City wells.
2. Increased salinity due to extremely shallow groundwater.

The occurrence of VOCs and pesticides in groundwater has been investigated by ADEQ and MAG. The pesticide dibromochloropropane (DBCP) was detected in areas of citrus production, including East Mesa, Chandler Heights, South Phoenix, and Glendale. VOCs were detected in groundwater in the Mesa area. However, no drinking water wells had been affected by the VOCs, and therefore no municipal supply wells were threatened.

The Water Quality Assurance Revolving Fund (WQARF) was created by the Arizona Legislature in 1986 to provide a financial resource for the remediation of contaminated soil and water that poses an actual or potential risk to the public or environment. New WQARF legislation was adopted in 1997. In December 2000, ADEQ listed 18 sites within the MAG 208 Planning Area on the WQARF registry.

The Voluntary Remediation Program (VRP) can be used to begin remedial actions at a site by a property owner, prospective property buyer, or other interested party. Currently in the planning area, there are 18 active sites participating in the VRP.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as the Superfund, was established in 1980 to provide for the clean up of sites contaminated with hazardous substances. Sites that are known to have or threaten the release of hazardous substances are proposed for the National Priority List (NPL). In the planning area, there are 5 locations listed as general Superfund sites and two facilities listed as Federal sites on the NPL.

The EPA issued regulations in the late 1980s requiring owners and operators of underground storage tanks to upgrade, replace, or close USTs that do not meet technical standards specified by the EPA. In the planning area, there are 3,188 closed LUST cases involving 1,745 locations. Currently, there are 1,322 active LUST cases involving 715 different locations. A total of 482 of these cases involve groundwater. The ADEQ adopted a new rule package that governs USTs in 2001. The rule addresses notification/reporting standards, classifications, and remediation.

ADEQ's Aquifer Protection Permit (APP) program is the principal management program for regulating discharges to groundwater and most other sources that are considered nonpoint under federal definition. In late 2000 the Governor's Regulatory Review Council approved three rule packages that are a part of the ADEQ Water Quality Division's unified water quality permit initiative. One of the three, the Unified Water Quality Permit Rule, consolidated the existing Sewerage System rules into the APP program, thereby eliminating duplicate permits and streamlining processes. ADEQ has two regulatory tools to control pollutant discharges under the APP program: BADCT (best available demonstrated control technology) and BMPs (best management practices).

Under ADEQ's new Unified Permit Program, permits for drywells are considered Type 2, General Aquifer Protection Permit (APP). ADEQ has developed and adopted rules for the location, design, construction, operation and maintenance of drywells (A.A.C. R18-9-C301).

The federal and state hazardous waste management programs are among the oldest and most highly developed of nonpoint source control programs in the planning area. The Resource Conservation and Recovery Act of 1976 (RCRA Subtitle C) has been amended several times since its enactment.

Currently, Arizona has approximately twenty active Treatment, Storage and Disposal (TSD) Hazardous Waste Facilities. Arizona does not have a TSD facility open for hazardous waste disposal. Generally, hazardous wastes that are not recycled or treated are only stored in Arizona for one year or less to be transported outside the state for disposal. An instate disposal facility for hazardous waste could improve the degree of compliance and reduce nonpoint pollution.

The 1986 Arizona Environmental Quality Act (EQA) mandated that ADEQ adopt a program of Pesticide Contamination Prevention (PCP) for agricultural use pesticides. The PCP program integrates six regulatory mechanisms as defined in statute in the Arizona EQA to accomplish the goal of protecting Arizona groundwater from NPS agricultural use pesticide contamination.

The ADEQ Water Quality Assessment and Management program carries out mandates for water quality management and protection in Arizona. The mission of the program is to assess water quality conditions and pollution problems across the state, establish water quality standards and management plans, provide technical assistance, and develop an integrated planning strategy for all water programs.

Every two years the ADEQ publishes a report on the status of surface and groundwater resources in Arizona in relation to state water quality standards. The report fulfills requirements of the federal Clean Water Act Section 305(b). The latest 305(b) report for Arizona ("The Status of Water Quality in Arizona") was published in June 2000.

Section 303(d) of the federal Clean Water Act requires states/tribes to submit to the EPA a list of the surface water bodies for which the designated use (e.g., irrigation, fish consumption) of that waterbody is impaired or is "water quality limited". For each waterbody on the 303(d) list, a load analysis (total maximum daily load or TMDL) must be completed to determine the allowance amount of pollutants that can be assimilated by the waterbody without causing an exceedance of water quality standards. On the 1998 303(d) list for Arizona, 102 surface waters are listed as Water Quality Limited.

ADEQ is the lead agency designated to implement Section 319 of the 1987 Amendment to the federal Clean Water Act in Arizona. Section 319, "Nonpoint Source Management Programs," directs states to prepare a nonpoint source assessment report and a nonpoint source management program.

ADEQ completed its 1988 Nonpoint Source Assessment Report in 1990. A Nonpoint Source Water Quality Management Plan (SMPI) was approved by EPA and certified in January 1990. SMP II, completed in 1997, focuses on a watershed approach to NPS management.

The NPDES permit program is the basis for the NPDES Storm Water Permitting Program. The purpose of the program is to regulate pollutant discharges to Waters of the United States contributed by storm water runoff. The NPDES Storm Water Program is implemented in two phases. Phase 1 was promulgated in 1990. Phase 2 became final in December of 1999.

208 PROGRAM ORGANIZATION

The Federal Water Pollution Control Act as amended by the Water Quality Act of 1987 (Clean Water Act) is a significant commitment by the federal government to the elimination of pollution of the nation's waters. Each state is required, under Section 208 of the Act, to develop and implement area-wide water quality management plans for pollution control.

Plans prepared to meet the requirements of Section 208 must:

- Identify the treatment works needed to meet anticipated municipal and industrial waste treatment needs of the area over a 20-year period, establish construction priorities for those treatment works, and establish time schedules for the initiation and completion of all treatment works.
- Establish a regulatory program to implement the plan, regulate any facilities which may discharge in the area, and assure that industrial wastes meet applicable pretreatment standards.
- Identify those agencies needed to implement the plan and develop an implementation plan.
- Identify agriculturally and/or silviculturally non-point sources of pollution and measures to control them.
- Develop a process to identify mine-related sources of pollution, construction activity-related sources of pollution, and salt water intrusion into fresh waters and identify methods to control them.
- Identify a process to control residual waste disposal which could affect water quality in the area.
- Identify a process to control disposal of pollutants on land or in subsurface excavations to protect ground and surface water quality in an area.

The "208 planning process" as defined in the Act and its subsequent regulations, guidelines, and amendments, provides an opportunity for a designated area to identify its specific area-wide waste treatment and water quality management problems and set forth a management program to alleviate those problems.

In Arizona, six Councils of Government (COGs), and La Paz County have been designated by the Governor as "Water Quality Management Planning Agencies" under Section 208, of the Clean Water Act. These agencies and their designated planning area boundaries are depicted on Figure 1.1. The Maricopa Association of Governments (MAG) has been designated by the Governor and the Environmental Protection Agency (EPA) as the area-wide water quality management planning agency for the Maricopa County area. Mohave County is currently requesting to be the Designated Planning Agency (DPA) for the Mohave

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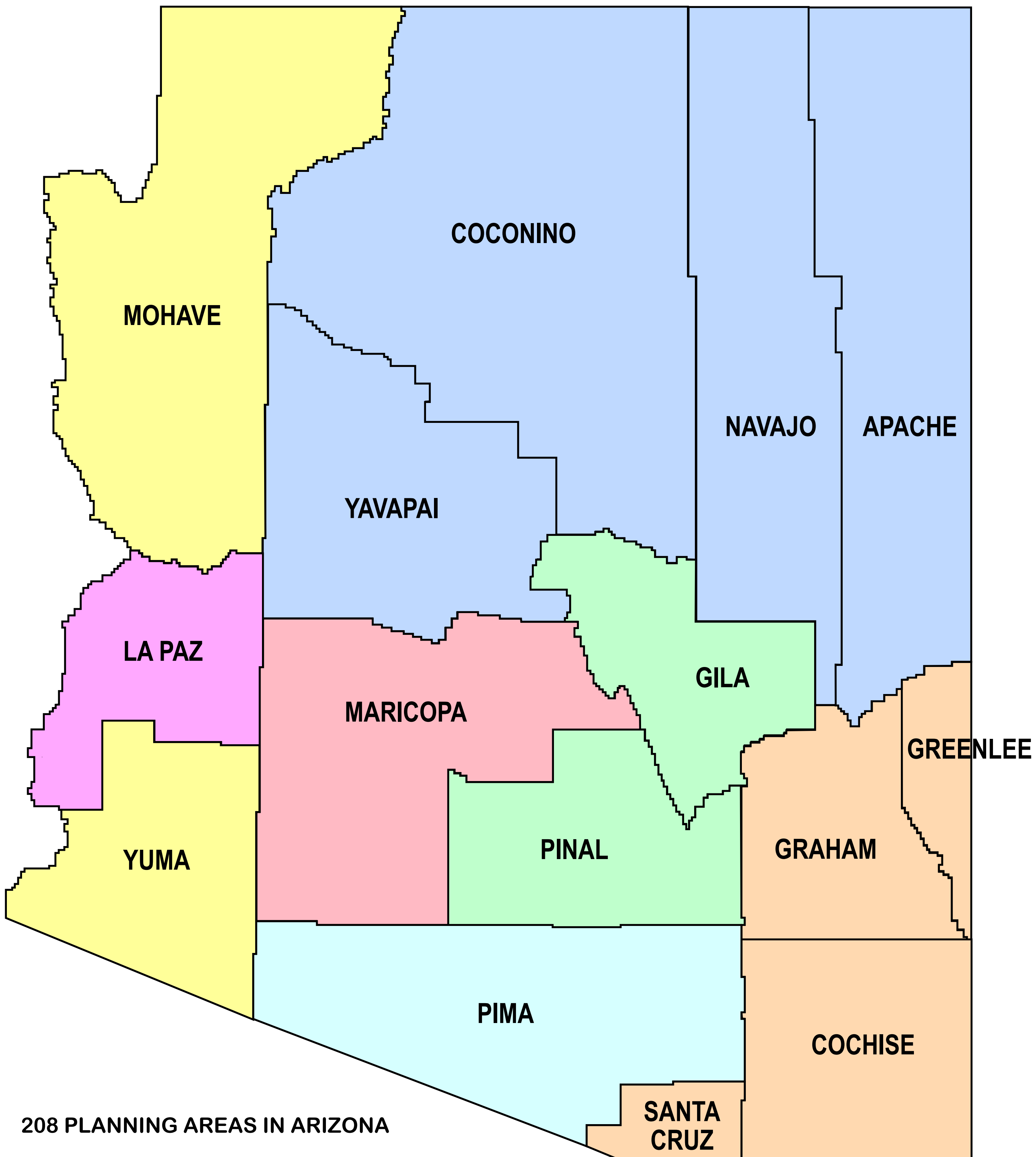
Map of Arizona
Councils of Governments/Designated Planning Agencies



208 PLANNING AREAS IN ARIZONA

CAROLLO ENGINEERS
2001

Councils of Governments:

	Central Arizona Association of Governments (CAAG) (Gila and Pinal Counties):	(520) 689-5004 (602) 253-7941
	Maricopa Association of Governments (MAG) (Maricopa County)	(602) 254-6300
	Northern Arizona Council of Governments (NACOG) (Apache, Coconino, Navajo and Yavapai Counties)	(520) 774-1895
	Pima Association of Governments (PAG) (Pima County)	(520) 792-1093
	South Eastern Arizona Governments Organization (SEAGO) (Cochise, Graham, Greenlee and Santa Cruz Counties)	(520) 432-5301

Design and Planning Agencies:

	Arizona Department of Environmental Quality (Yuma and Mohave Counties)	(602) 207-4630 1-800-234-5677 x4630
	La Paz (La Paz County)	(520) 669-6115

For more information call ADEQ Regional Planning Coordinator
(602) 207-4630 or 1-800-234-5677 x4630

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FIGURE 1.1

County area. Until such designation is obtained, the State will continue to serve as the DPA for the area.

1.1 MAG 208 PLANNING PROCESS

The guidelines for 208 planning set forth in the Act are fairly broad so that the various water quality issues existing in different areas of the United States can be addressed appropriately. Each 208 Plan must, therefore, identify the water quality management needs in its planning area and provide a program to develop solutions. The MAG 208 planning process has become an ongoing effort in response to changing water resource issues, regulations, treatment technologies, and demographics. Major issues identified during preparation of this 208 Plan Revision include:

- The Growing Smarter Initiative and Growing Smarter Plus have initiated requirements for extensive growth planning by municipal agencies.
- The population of the Maricopa County area is expected to continue to grow significantly over the next 20 years. This growth will require expanded wastewater collection, treatment, and reuse systems to handle increased flows.
- Reclamation of wastewater for non-potable reuse and aquifer recharge continues to be an important element both in wastewater treatment and water resources planning in the study area.
- The pollution impacts of stormwater discharges is extensively regulated by National Pollutant Discharge Elimination System (NPDES) permits. Passage of House Bill 2426 of the 2001 Legislative session created the Arizona Pollutant Discharge Elimination System (AZPDES) program and ADEQ proposed new rules for implementation of the permitting program, which were approved by the Governor's Regulatory Review Council on December 4, 2001.
- Sludge disposal continues to be an increasingly important issue, and was addressed in Section 503 Rules for Land Application of Sludge by the federal government.
- A State Solid Waste Management Planning Program is in place to extensively regulate disposal of solid wastes. The MAG Regional Solid Waste Management Plan is designed to provide guidance for systems level regional solid waste management planning, and future development of programs and facilities in the MAG region.
- The federal government has initiated new focus on regional water quality standards through the Total Maximum Daily Load (TMDL) program.
- Unified permit process adopted by ADEQ is designed to streamline procedures for permitting of wastewater treatment plants.
- Air quality issues are becoming increasingly important and have resulted in greater enforcement of setbacks and odor treatment in wastewater treatment plants.

- Surface water quality standards have been made more stringent, forcing consideration of alternative disposal or reuses rather than discharges.
- Shallow groundwater is becoming an increasing issue in the Salt and Gila Basins as its level is rising due to decrease in pumping for agricultural uses and the increase in recharge of treated wastewater effluent.

The 208 program includes two major elements: the Point Source Plan and the Non-Point Source Plan. During development of the original 208 Plan, issued in July 1979, a planning process was established which has been in effect for over 20 years and is now well-established. The original 208 Plan has been amended several times since 1979.

The major effort of this 208 Plan Revision was in the Point Source Plan. Point source planning is primarily directed at compiling the preferred wastewater collection and treatment system for the Maricopa County area through the year 2020. Toward this end, the Point Source Plan examines population and wastewater flow projections, treatment methods, effluent disposal, reclaimed water reuse, and sludge management.

Development of the Point Source Plan has been heavily based on the wastewater management plans developed by the cities and towns of the study area. Consistent with the 1993 MAG 208 Plan Update, most of the cities and towns maintain detailed, carefully analyzed plans for the wastewater management within their planning areas. Wastewater management planning in the study area is a combination of regional and local approaches, as reflected in the Point Source Plan.

The selected point source plan has also been analyzed for its environmental impacts and impacts on the water resources in the area. The most important areas reviewed were:

- Surface water and groundwater quality and quantity.
- Aesthetics and public acceptability.
- Land use and population changes.
- Public health.
- Public facilities and economic activities.

During the period since 1993, considerable additional study has been made of the study area's groundwater. Seven regulatory programs, including the federal Superfund and State Water Quality Assurance Revolving Fund (WQARF), have been fully implemented. These have resulted in much greater knowledge of non-point source pollution in the state and have been incorporated in the Non-Point Source Plan Element.

1.2 AGENCY RESPONSIBILITIES

Several agencies have responsibilities in the MAG 208 planning process. The U.S. Environmental Protection Agency (EPA) and the Arizona Department of Environmental Quality have broad responsibilities. Others, such as the local municipalities and wastewater utilities, deal with the specific wastewater management concerns of individual communities. All have provided input to the regional planning effort. The efforts of the agencies involved are coordinated and presented in this MAG 208 area-wide water quality management plan for Maricopa County.

1.2.1 U.S. Environmental Protection Agency (EPA)

On the federal level, the EPA has the responsibility of overseeing the planning efforts necessary to meet the specific requirements of Section 208 and the overall goals of the Clean Water Act.

For the MAG 208 Program, EPA Region IX provides guidance in terms of policy and procedure, and review of documents to assure adherence to the requirements of the Act. EPA also has a review and certification function. Once the water quality management planning is completed and certified by the State, EPA will make final review of the plan for approval.

1.2.2 State of Arizona

The Arizona Department of Environmental Quality (ADEQ) administers both the basin-wide planning and water quality monitoring programs. In addition, ADEQ is responsible for reviewing and enforcing water quality standards for the State and part of the MAG 208 program was to assist in this process.

1.2.3 Maricopa Association of Governments (MAG)

The Maricopa Association of Governments, as a designated 208 planning agency, has the overall area-wide planning and implementation responsibility for all of Maricopa County. MAG currently serves as the regional planning agency in the Maricopa County area, and the 208 program is part of its overall Regional Water Quality Management Planning Program.

MAG provides for the integration and coordination of its programs through an established planning structure. MAG also provided staff assistance as well as in-kind services from its member agencies to assure the development of a reasonable, flexible and coordinated water quality management plan. MAG also has ultimate responsibility for the adoption of the final plan. The 208 Plan is primarily implemented by the local jurisdictions within Maricopa County.

1.2.4 Cities, Towns, and Indian Communities

Cities, towns, and Indian communities are responsible for planning to provide the collection and treatment facilities necessary to meet the needs of the individual community. At the local level, throughout the 208 planning process, the municipalities assisted by providing information in development of planning boundaries, service areas, and future needs of the community relative to area-wide planning. Some members of city staff also served on advisory groups reviewing and selecting preferred alternatives, and assisted with technical and financial data. As stated above, local governments implement the 208 Plan as well as their respective facility plans and master plans.

1.2.5 Maricopa County

The Maricopa County Environmental Services Department (MCESD) and the Maricopa County Planning and Development Department assisted with preparation of the section of the Point Source Plan pertaining to those areas not incorporated as municipalities. MCESD also reviewed the Point Source Plan and Non-Point Source Plan. MCESD's delegation agreement with ADEQ to perform plan reviews, issue approvals to construct and approvals to operate wastewater treatment facilities throughout Maricopa County, including unincorporated and incorporated municipal areas, has expired. MCESD continues to perform these functions in accordance with the Public Health Code.

1.3 FUNDING

Funding for the MAG 208 program was provided through a grant from the EPA administration, by ADEQ and with funds from MAG member agencies.

STUDY AREA DESCRIPTION

The purpose of this chapter is to describe the study area for the MAG 208 Water Quality Management Plan Revision.

Fifty-nine percent of Arizona's population resides in Maricopa County, the area encompassed by this report. The 9,130 square mile County is the seat of government for the state, and is an economic and financial hub for the southwestern United States. The population density of Maricopa County has increased from approximately 225 persons per square mile to approximately 320 persons per square mile in the past 10 years.

The MAG 208 Water Quality Management Plan includes all cities, towns, and areas within Maricopa County.

The planning area has experienced the largest net increase of population between 1990 and 1997 of any county in the United States. Development continues to favor a low-density urban form, with much of the urban growth occurring as a result of the retirement of agricultural lands. Physical and political boundary features have contained growth in relatively few areas; namely Indian Community boundaries, mountain ranges, and regional parks. However, a movement toward growth management has arisen. New legislation and voter initiatives are designed to manage urban sprawl with the goals of preserving open space and improving the quality of life in the Valley.

Population growth has exceeded that predicted in the 1993 MAG Water Quality Management Plan Revision. Growth has occurred so rapidly and the urban landscape has changed so dramatically during the nineties that a Special Census was performed in 1995 to update socioeconomic data for the study area.

This chapter includes the following elements: planning area boundaries, population growth, economic growth, and land use.

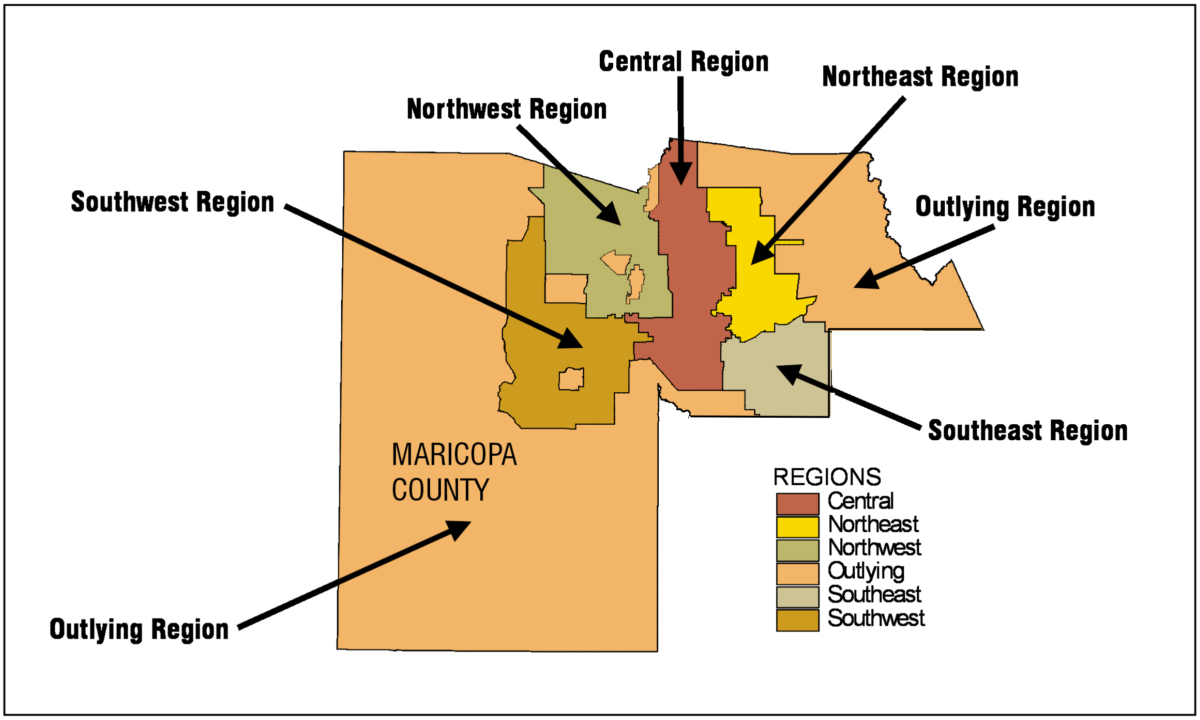
2.1 PLANNING AREA BOUNDARIES

For the purposes of the 208 Plan Revision, the boundaries of the study area coincide primarily with the boundaries of Maricopa County. The MAG 208 planning boundary is the Maricopa County boundary and jurisdictions or portions of jurisdictions outside of Maricopa County are within other planning areas for all 208 planning purposes and processes. The regional planning area is divided by MAG into Municipal Planning Areas (MPAs). The 27 MPAs generally correspond to the jurisdictions for which they are named. Minimally, the planning area for each city or town includes all of its incorporated area plus portions of the County surrounded by strip annexation.

The MPAs are further split into 145 Regional Analysis Zones (RAZs). Each RAZ is further subdivided into Traffic Analysis Zones (TAZs). There are currently 1,862 TAZs in the MAG 208 Planning Area.

The planning area is divided into five regions and outlying areas as shown on Figure 2.1. The five regions include the central, northeast, northwest, southwest, and southeast. These five regions make up the urban core of the MAG planning area. The remainder of the study area consists of smaller, outlying communities and large unincorporated tracts of generally undeveloped lands.

Figure 2.1 MAG Planning Area Regions



2.2 POPULATION GROWTH

Maricopa County is the most populous of Arizona's fifteen counties. Since 1950, the population of the County has increased from 331,770 to over 2.9 million in 1999. Migration accounted for approximately two-thirds of the population growth during the 1990s. This migration consisted primarily of people relocating to the area from the Midwest and western United States. Table 2.1 summarizes the population growth of Maricopa County during the 1990s.

Table 2.1	Population Growth of Maricopa County, 1990-1999 MAG 208 Water Quality Management Plan Update
July 1990	2,130,400
July 1991	2,179,975
July 1992	2,233,700
July 1993	2,291,200
July 1994	2,355,900
July 1995	2,528,700
July 1996	2,634,625
July 1997	2,720,575
July 1998	2,806,100
July 1999	2,913,475
Source: Arizona Department of Economic Security, Population Statistics Unit, October 1999.	

In Arizona, the Department of Economic Security (DES), Population Statistics Unit, is responsible for making population projections for each county. The Maricopa Association of Governments then works with the member communities to allocate the county-wide projections as received from the DES. In 1995, a Special Census was conducted by the Maricopa Association of Governments. The results of the census were used as the base to update the MAG population projections. This plan is based on the MAG population projections adopted by the Regional Council in 1997 and covers the planning period from year 2000 to year 2020. Table 2.2 summarizes the projected Maricopa County Population growth for the duration of the study period. These projections include both resident and seasonal populations. The population estimates prepared by MAG for DES in July 1999 indicate that the resident population had already surpassed the projection for year 2000 used in the previous 208 Plan Update (1993). However, the population growth rates for the current projections are similar to those used in the previous 208 Plan Update.

Table 2.2 Population Projections for Maricopa County, 2000–2020
MAG 208 Water Quality Management Plan Update

Year	Resident	Seasonal	Total
2000	2,954,150	53,056	3,007,206
2005	3,329,550	56,704	3,386,254
2010	3,709,575	62,153	3,771,728
2015	4,101,775	70,903	4,172,678
2020	4,516,100	79,901	4,596,001

MAG POPTAC Population and Socioeconomic Projections, July 1997.

2.2.1 Northeast Region

The northeast region of the MAG Planning Area is comprised of the MAG member agencies of Carefree, Cave Creek, Fountain Hills, Paradise Valley, Scottsdale, and the Salt River Pima-Maricopa Indian Community. These communities are shown on Figure 2.2. Additionally, there are unincorporated areas in the northeast region that are included in the summary population projections but not shown on Figure 2.2. These unincorporated areas include the adult community of Rio Verde and the Fort McDowell Indian Community. The population projections for the northeast region are summarized in Table 2.3. The northeast region is expected to modestly increase its share of the County total population from 8.5 percent in 2000 to 8.9 percent in 2020.

Figure 2.2 MAG Northeast Region

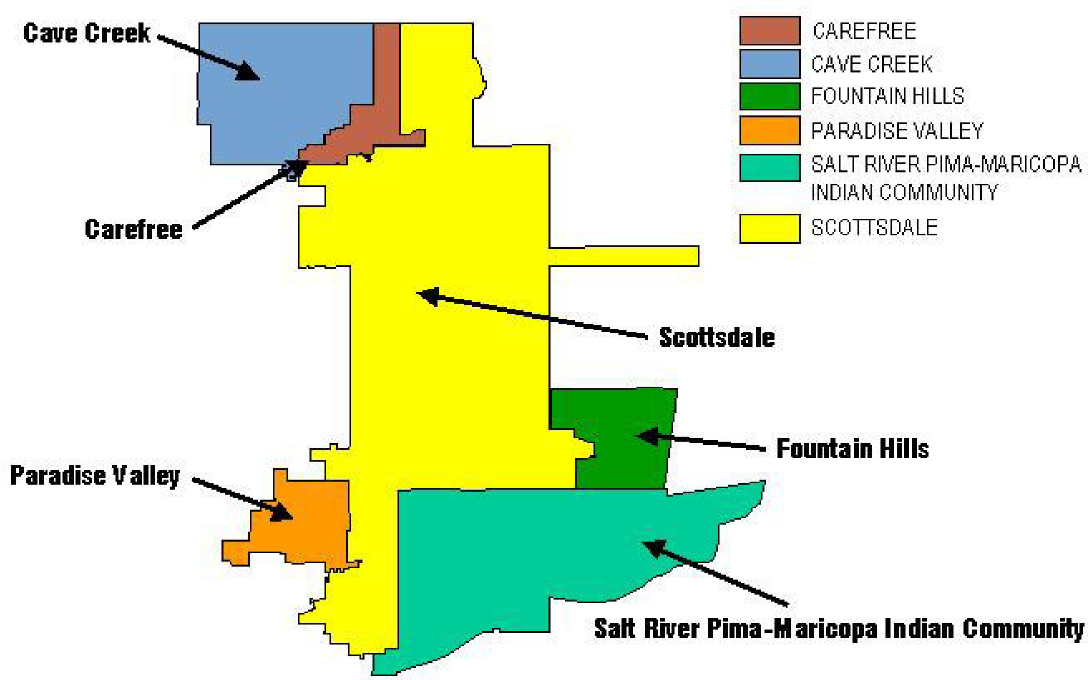


Table 2.3 Population Projection: Northeast Region
MAG 208 Water Quality Management Plan Update

Planning Area	2000	2005	2010	2015	2020
Cave Creek	4,231	6,463	9,188	11,398	13,288
Carefree	3,041	3,578	4,760	5,196	5,564
Scottsdale	206,429	244,556	273,343	297,940	311,047
Fountain Hills	18,745	26,113	34,939	52,860	54,999
Paradise Valley	13,353	13,388	13,587	13,734	13,760
Salt River Pima-Maricopa Indian Community	6,851	6,975	7,024	7,162	7,467
Fort McDowell Indian Community	750	838	944	1,097	1,174
County	1,210	1,237	1,274	1,311	1,344
Total	254,610	303,148	345,059	390,698	408,643

MAG POPTAC Population and Socioeconomic Projections, Interim Report, July 1997.

2.2.2 Northwest Region

The northwest region of the MAG Planning Area is comprised of the MAG member agencies of Surprise, Peoria, Glendale, Luke Air Force Base (AFB), El Mirage, and Youngtown. These communities are shown on Figure 2.3. Additionally, there are large unincorporated areas that are included in the region. These unincorporated areas include the master-planned communities of Sun City, Sun City Grand, and Sun City West. The population projections for the northwest region are summarized in Table 2.4. The northwest region's share of the County total population is projected to remain nearly constant at 14.2 percent in 2000 and 14.4 percent in 2020.

Figure 2.3 MAG Northwest Region

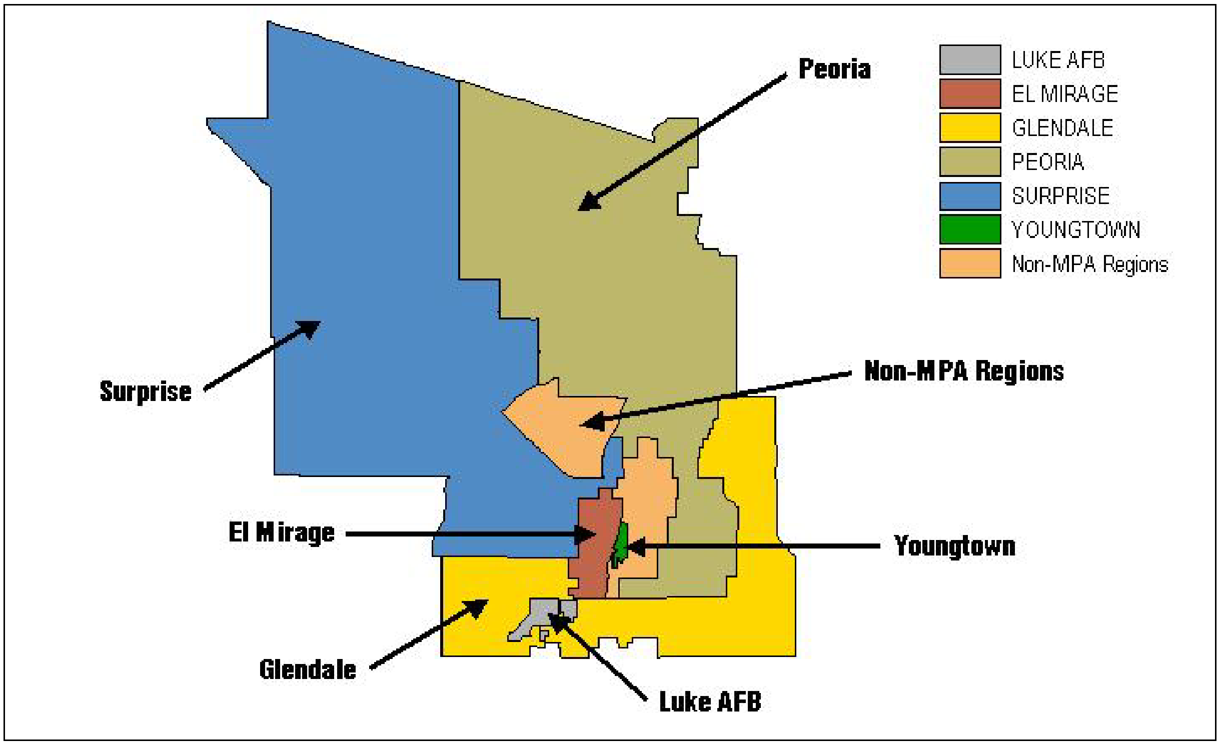


Table 2.4	**Population Projection: Northwest Region MAG 208 Water Quality Management Plan Update**				
Planning Area	**2000**	**2005**	**2010**	**2015**	**2020**
Peoria	96,974	130,910	145,797	172,138	188,834
Surprise	27,739	38,486	43,105	49,205	64,143
El Mirage	6,605	6,678	6,702	6,869	8,148
Youngtown	2,978	3,040	3,119	3,206	3,286
Glendale	215,477	235,863	259,808	287,873	305,529
Luke AFB	3,794	3,796	3,815	3,815	3,821
County	71,944	73,551	75,536	79,332	86,462
Total	425,561	492,324	537,882	602,438	660,223
MAG POPTAC Population and Socioeconomic Projections, Interim Report, July 1997.					

2.2.3 Southeast Region

The southeast region of the MAG Planning Area is comprised of the MAG member agencies of Guadalupe, Tempe, Mesa, Chandler, Gilbert, and Queen Creek. The MAG 208 planning boundary is the Maricopa County boundary and jurisdictions or portions of jurisdictions outside of Maricopa County are within other planning areas for all 208 planning purposes and processes. These communities are shown on Figure 2.4. Not shown on Figure 2.4 is the unincorporated adult community of Sun Lakes, south of Chandler. The population projections for the southeast region are summarized in Table 2.5. This region is projected to lose a small portion of its share of the County total population over the planning period. The southeast region's share of the County total is projected to decrease from 30.5 percent in 2000 to 29.7 percent in 2020.

Figure 2.4 MAG Southeast Region

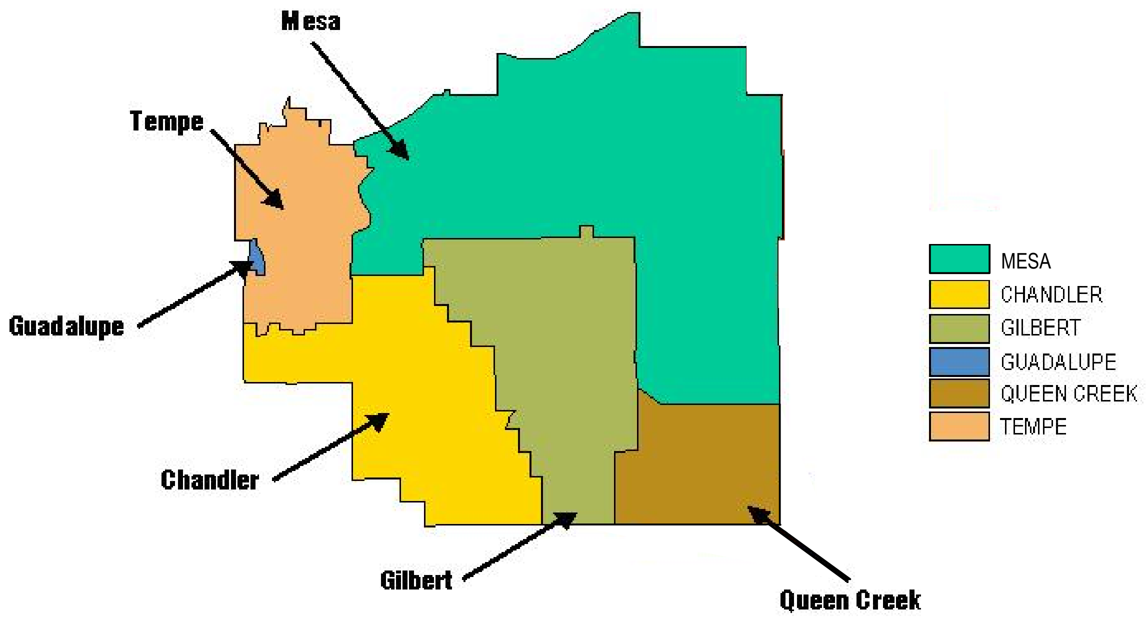


Table 2.5	Population Projection: Southeast Region MAG 208 Water Quality Management Plan Update				
Planning Area	**2000**	**2005**	**2010**	**2015**	**2020**
Mesa	444,643	500,151	561,764	591,196	619,228
Tempe	166,207	172,458	176,878	183,392	185,862
Guadalupe	5,506	5,665	5,724	5,731	5,736
Chandler	171,099	199,967	223,398	242,995	261,587
Gilbert	108,688	132,978	174,856	201,616	245,440
Queen Creek	7,452	10,735	14,042	17,283	20,584
County (Sun Lakes)	13,241	15,900	18,539	22,169	26,839
Total	916,836	1,037,854	1,175,201	1,264,382	1,365,276
MAG POPTAC Population and Socioeconomic Projections, Interim Report, July 1997.					

2.2.4 Southwest Region

The southwest region of the MAG Planning Area is comprised of the MAG member agencies of Buckeye, Goodyear, Litchfield Park, Avondale, and Tolleson. These communities are shown on Figure 2.5. Additionally, there are unincorporated areas within this region. The population projections for the southwest region are summarized in Table 2.6. This area is projected to significantly increase its share of the County total population from 2.6 percent in 2000 to 6.4 percent in 2020.

Figure 2.5 MAG Southwest Region

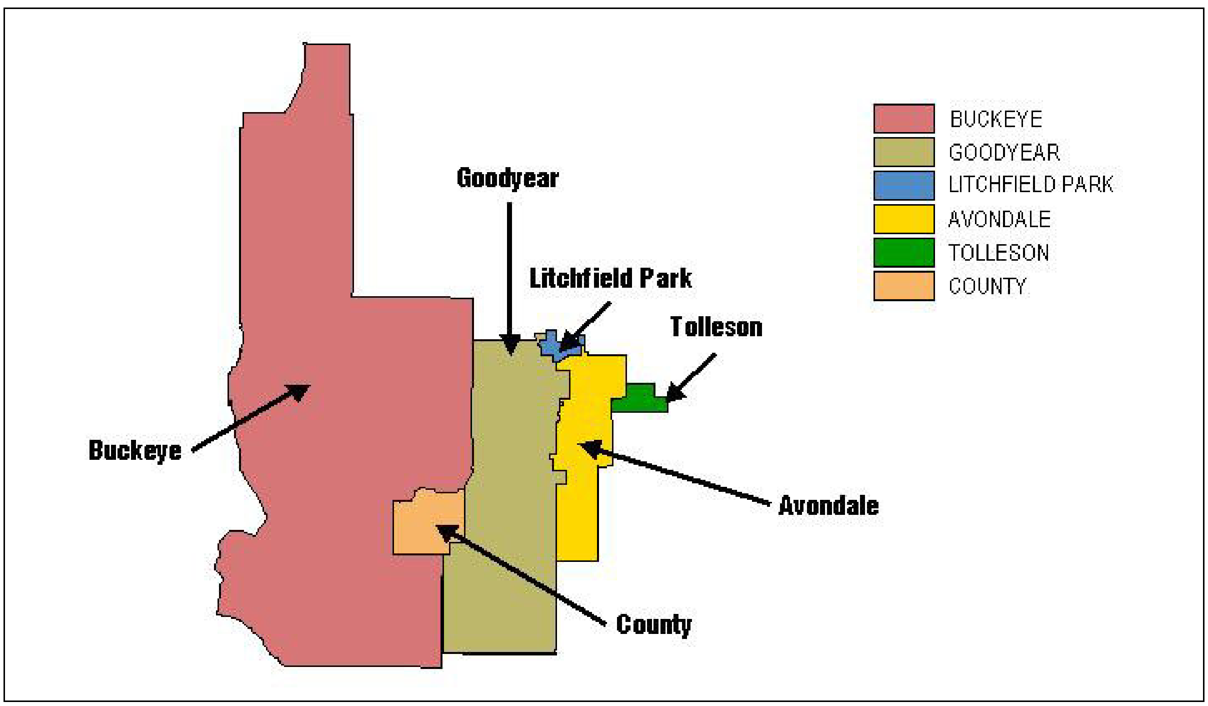


Table 2.6	Population Projection: Southwest Region MAG 208 Water Quality Management Plan Update				
Planning Area	**2000**	**2005**	**2010**	**2015**	**2020**
Buckeye	18,084	22,385	28,176	51,446	82,416
Goodyear	19,939	28,504	38,425	58,712	93,396
Litchfield Park	4,942	6,583	8,519	12,629	14,778
Avondale	29,450	32,922	37,909	52,307	85,294
Tolleson	4,525	4,783	6,955	7,603	8,267
County	1,471	2,509	3,472	5,166	7,816
Total	78,411	97,686	123,456	187,863	291,967
MAG POPTAC Population and Socioeconomic Projections, Interim Report, July 1997.					

2.2.5 Central Region

The City of Phoenix incorporated limits comprise the entire Central Region as shown on Figure 2.6. The population projections for the planning period are summarized in Table 2.7. This region is the most fully developed and populated of the five regions. The Central Region's share of the County total population is projected to decrease from 43.6 percent in 2000 to 39.4 percent in 2020. Despite the decreased share of total population, the Central Region will maintain the largest share of the total population compared to the Southeast Region over the planning horizon.

Figure 2.6 MAG Central Region

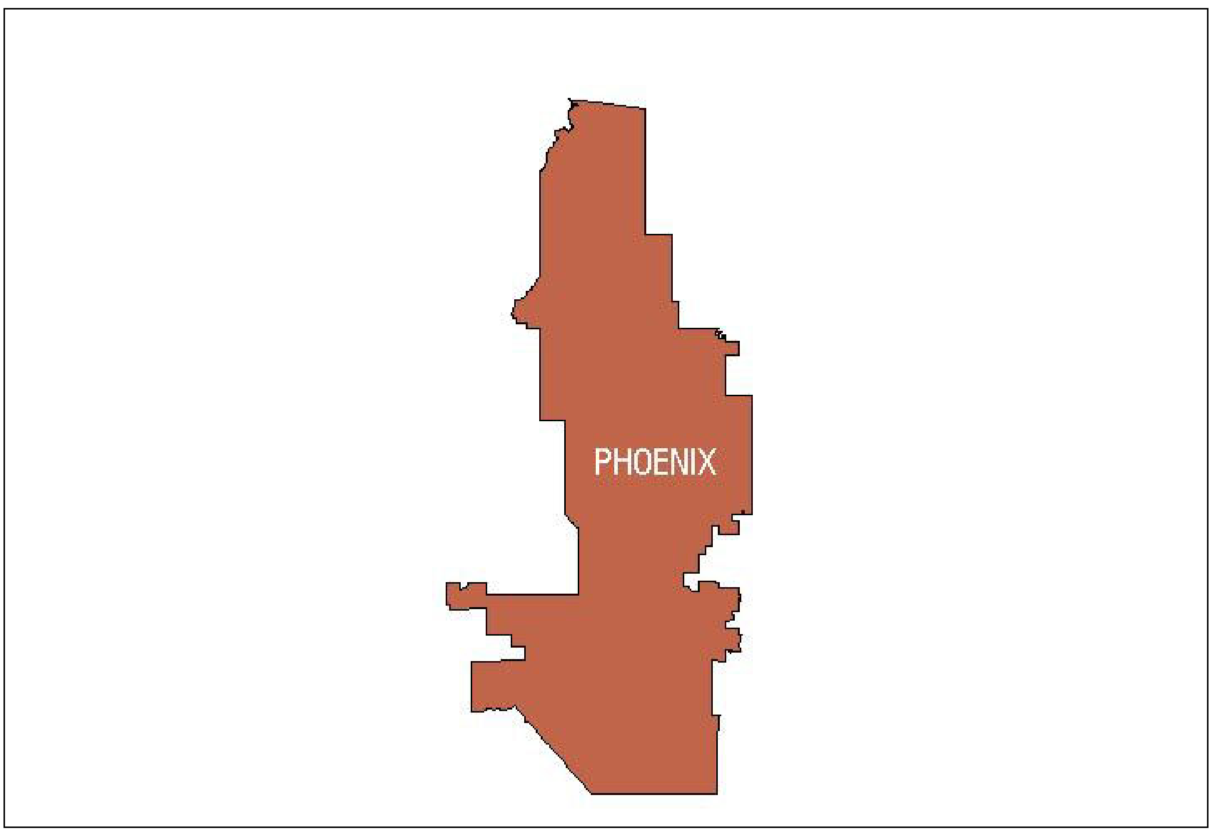


Table 2.7 Population Projection: Central Region MAG 208 Water Quality Management Plan Update					
Planning Area	**2000**	**2005**	**2010**	**2015**	**2020**
Phoenix	1,309,799	1,427,315	1,557,858	1,687,240	1,812,784
MAG POPTAC Population and Socioeconomic Projections, Interim Report, July 1997.					

2.2.6 Outlying Areas

The outlying regions of the MAG Planning Area include the MAG member agencies of Gila Bend, Wickenburg, and the Gila River Indian Community. These communities are shown on Figure 2.7. This region consists of all areas that are outside the urban core of the MAG planning area. The remainder of the outlying areas consist of unincorporated county areas. The population projections for the outlying regions are summarized in Table 2.8. This area is projected to increase its share of the County total population from 0.7 in 2000 to 1.2 percent in 2020.

Figure 2.7 MAG Outlying Areas

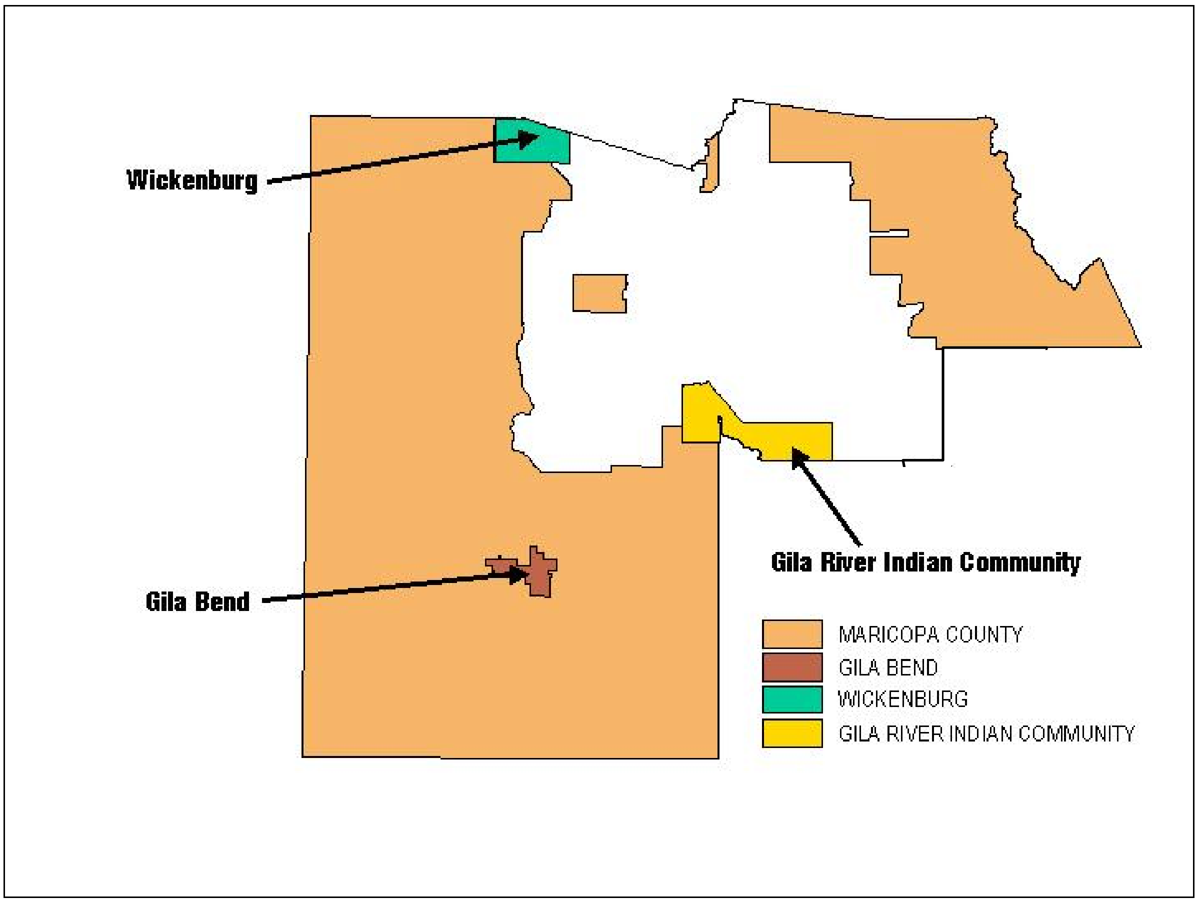


Table 2.8	Population Projection: Outlying Areas MAG 208 Water Quality Management Plan Update				
Planning Area	**2000**	**2005**	**2010**	**2015**	**2020**
Wickenburg	8,495	8,967	9,516	10,070	10,582
Gila Bend	2,124	2,249	2,393	2,548	2,742
Gila River Indian Community	2,708	2,764	2,832	2,919	3,101
County	8,662	13,947	17,531	24,520	40,683
Total	21,989	27,927	32,272	40,057	57,108
MAG POPTAC Population and Socioeconomic Projections, Interim Report, July 1997.					

2.3 ECONOMIC GROWTH

The economic environment during the 1990s showed a substantial recovery from the slump of the 1980s. Total non-farm employment in Maricopa County was estimated to be approximately 1,513,700 in January 2000 and the unemployment rate was 2.8 percent. This is an increase of approximately 72,700 jobs since January 1999 and an increase of approximately 580,600 jobs since 1989. Construction and finance, insurance and real estate (FIRE) sectors led the growth of new non-farm jobs in Maricopa County. This economic surge was largely fueled by low interest rates. These sectors are expected to continue to grow for the next several years, although the rate of growth will slow somewhat from recent years. The largest sectors of the local economy are trade (includes retail) and services. These two components comprise more than half of the total employment in Maricopa County. Manufacturing, including high-tech industries, is expected to continue to grow throughout the planning period.

Only two sectors of the local economy have not shown significant growth in recent years: mining and agriculture. Due to regulations promulgated by the Arizona Department of Water Resources (ADWR) that prohibit new lands from being brought into irrigation, an increase in the base of agricultural lands is limited. Consequently, as the existing agricultural lands are urbanized, the agricultural sector of the economy will continue to diminish. Mining also continues to decline and is projected to continue to do so over the next several years.

In the coming years of the planning period, the economic outlook for the MAG planning area and the State of Arizona as a whole is for continued growth in nearly all sectors of the non-farm economy. The economic growth will be led by the services sector followed by trade; FIRE; government; transportation, communications and public utilities (TCPU); manufacturing, and construction. Other factors, such as the increasing reliance on computers and other information technologies, will affect nearly all sectors of the economy.

2.4 LAND USE

The total land area of Maricopa County is 9,130 square miles. Less than 30 percent of the land in Maricopa County is in private ownership. Federal lands, county and city parks comprise 55 percent of the area. The bulk of federal lands consists of the Tonto National

Forest, the Barry M. Goldwater Gunnery Range, and Bureau of Land Management tracts. State lands comprise 11 percent of Maricopa County and are widely scattered among the outlying areas and fringes of development. Indian communities account for approximately 5 percent of land area in Maricopa County and include the Tohono O'Odham, Gila River Pima-Maricopa, Salt River Pima Maricopa, Fort McDowell, and Gila Bend Indian communities.

For urban planning and statistical purposes, the urban core includes all of the MPAs except Gila Bend, Gila River Indian Community, and Wickenburg. The future development of the urban core will include mostly private lands within the 1,768 square mile urban core of the planning area. The majority of growth is projected to occur to the north, west and southeast of the urban core. Much of the urban development in the southeast and western areas will occur on retired agricultural lands, as has been the trend for much of the Valley's history. Table 2.9 summarizes the current and projected land uses within the urban core of the planning area.

Table 2.9 Land Uses in MAG Urban Core
MAG 208 Water Quality Management Plan Update

	Area (Square Miles)		
Category	**1995 Estimates**	**Planned**	**Change**
Low Density Residential	53	203	+150
Residential	398	780	+382
Commercial	40	79	+39
Industrial/Warehouse	60	163	+103
Public Facilities	46	45	-1
Agricultural/Vacant	936	10	-926
Open Space	173	408	+235
Water/Drainage	44	37	-7
Other/Mixed Use	(1)	32	-
Total	1,750	1,757	+7

(1) Category not listed.
Source: Urban Atlas, Phoenix Metropolitan Area, July 1998. MAG General Land Use Plan, 1995.

The far north and northeast portions of the planning area are expected to develop into low-density residential areas with large areas of open space. Nearly all of the other residential area developments will be at densities greater than one unit per acre. Much of the residential development will occur in large-scale housing developments (those developments greater than 1,000 acres). The active and planned large-scale developments in the urban core area total 134 square miles. Nearly all of these developments are outside the existing urban area where such large tracts of land are still available.

Industrial land use is anticipated to grow in the vicinity of airports and major transportation corridors such as I-10 in the West Valley, I-17 in North Phoenix, Grand Avenue (US 60) and proposed freeway alignments in Scottsdale and the East Valley.

Commercial development is anticipated to spread in a similar fashion to historic patterns; most commercial development will occur along arterial streets and intersections of arterial streets. Commercial development is generally closely associated with residential development, providing retail, services and employment to the surrounding neighborhoods.

A significant portion of developed lands will be designated as open space and recreational uses. These open space areas include county and city parks, mountain preserves, and recreational areas. The planned land use includes approximately 23 percent open space in the MAG urban core alone.

2.5 GROWTH MANAGEMENT LEGISLATION

In Arizona, as well as other states, there is a trend toward more managed growth of urban areas. Recent legislation has been signed into law that establishes roles of local and state government in planning and management of new development and provides conservation of State Trust lands for open space. The legislative acts include House Bill 2361 (Growing Smarter Act of 1998) and Senate Bill 1001 (Growing Smarter Plus Act). A third component, an amendment to the State constitution, set aside lands held by the State Land Trust for preservation purposes. This measure did not pass in the general election of November 2000. These legislative acts will impact the way that the MPAs extend infrastructure to new development. It has been speculated that this legislation might reduce growth, although this effect has not been factored into the population projections adopted for the MAG 208 Water Quality Management Plan Update. The following paragraphs briefly summarize the key elements of this legislation.

2.5.1 House Bill 2361 - Growing Smarter Act of 1998

The Growing Smarter Act was signed into law in 1998. The Growing Smarter Act amended existing legislation related to municipal, county, and state land use planning and zoning. The Act includes five major components:

1. Require municipalities and counties to adopt general and comprehensive plans to serve as guides to future development. These plans are to be based upon a 10 year planning horizon. Major revisions to the plans require a majority vote by the governing body and may be referred to voters by petition. Planning elements must include Open Space Planning, Growth Area Planning, Environmental Planning and Cost of Development Planning.

2. Require the State Land Department to develop land use plans for all State Trust Lands within urban areas. The plans must be coordinated with general and comprehensive plans and must consider Open Space Planning. The plans are to include the disposition of State Trust Lands in 5-year increments.

3. Approve State funding of $20 million a year for eleven years to be matched with local government or private funds to purchase or lease State Trust Lands through the Arizona Preserve Initiative or purchase development rights for the purpose of preservation of open space.

4. Create a 15 member "Growing Smarter Commission" to study several issues pertaining to State Trust Lands, long term land conservation, regional planning laws, rural economic development, and infill development.

2.5.2 Senate Bill 1001 Growing Smarter Plus

The Growing Smarter Plus legislation is an extension to the 1998 Growing Smarter Act that includes changes to planning requirements, additional growth management authority and property rights. The following components are included in this legislation:

1. General plan updates must be adopted by Planning Commission, Council, and majority vote of registered voters in an election to be held before the deadline dates. Deadline dates for General plan updates are on two tracks: Cities and towns with populations greater than 50,000 must have adopted plans by December 31, 2001. Cities and towns with populations less than 50,000 must have adopted plans by December 31, 2002.

2. Require coordination between adjacent planning jurisdictions for major amendments to general and comprehensive plans.

3. Include a Water Resource Element for general plans of municipalities with populations over the compliance threshold populations (see below). This water resource element must identify all water supplies physically and legally available to the municipality and must include an analysis of water availability for growth.

4. Require public notice and hearing for all major amendments to general and comprehensive plans.

5. Authorize the establishment of publicly financed infrastructure service boundaries.

6. Require a public process for re-zoning.

7. Permit municipalities to establish minor subdivision ordinances applicable to subdivisions of 10 or less lots.

8. Permit municipalities to develop infill incentive districts. Incentives may include expedited zoning procedures, expedited processing of plans and proposals, waivers of development fees and relief from certain development standards.

Voter approval of general plans is required for municipalities above the compliance threshold.

In addition, Senate Bill 1001 redefined the compliance threshold populations established in the 1998 Growing Smarter legislation. The following criteria apply to the threshold populations:

- For municipalities, cities and towns with populations greater than 2,500 but less than 10,000 that have had a growth rate of 2 percent or more per year and all cities and towns with a population greater than 10,000 persons.
- For counties, all with a population exceeding 125,000 as of the most recent decennial census (2000).

2.5.3 House Bill 2601 Cities and Counties Growing Smarter

On May 6, 2002, HB 2601 Cities and Counties; Growing Smarter was signed into law. The bill made a variety of changes to the Growing Smarter legislation including extending the timeframes for the adoption of plans, clarifying the water resources element and clarifying the time in which the governing body of a municipality submits the plan to the voters.

Regarding the water resources element, the bill requires that the element address:

1. The known legally and physically available surface water, groundwater and effluent supplies.

2. The demand for water that will result from future growth projected in the general plan, added to existing uses.

3. An analysis of how the demand for water that will result from future growth projected in the general plan will be served by the legally and physically available water supplies or a plan to obtain additional necessary water supplies.

The bill further indicates that entities are not required to perform new independent hydrological studies and are not required to be a water service provider. The Arizona Department of Water Resources is also included in the review and comment on the water resources element, if a water resources element is required.

2.6 REFERENCES

Arizona Department of Economic Security, Population and Statistics Unit, various publications.

Arizona Department of Economic Security, Arizona Occupational Employment Forecasts, 1996 – 2006, February 1999.

Maricopa Association of Governments, MAG 208 Water Quality Management Plan – 1993.

Maricopa Association of Governments, MAG POPTAC Population and Socioeconomic Projections, Interim Report, July 1997.

Maricopa Association of Governments, Urban Atlas – Phoenix Metropolitan Area, July 1998.

Population Estimates and Projections, Center for Business Research, College of Business, Arizona State University, December 1999.

DESCRIPTION OF WATER RESOURCES

This chapter provides an overview of the planning area's water resources, which include local and imported surface waters, groundwater, and reclaimed water. Water quality standards, current at the time the plan was prepared, are also reviewed. The water quality standards review includes the introduction of changes to the standards that are currently in the process of becoming law.

Portions of the Arizona Department of Environmental Quality's (ADEQ) *Arizona Water Quality Assessment Report 2000* pertaining to the planning area are also included as an appendix to this report.

3.1 LOCAL SURFACE WATERS

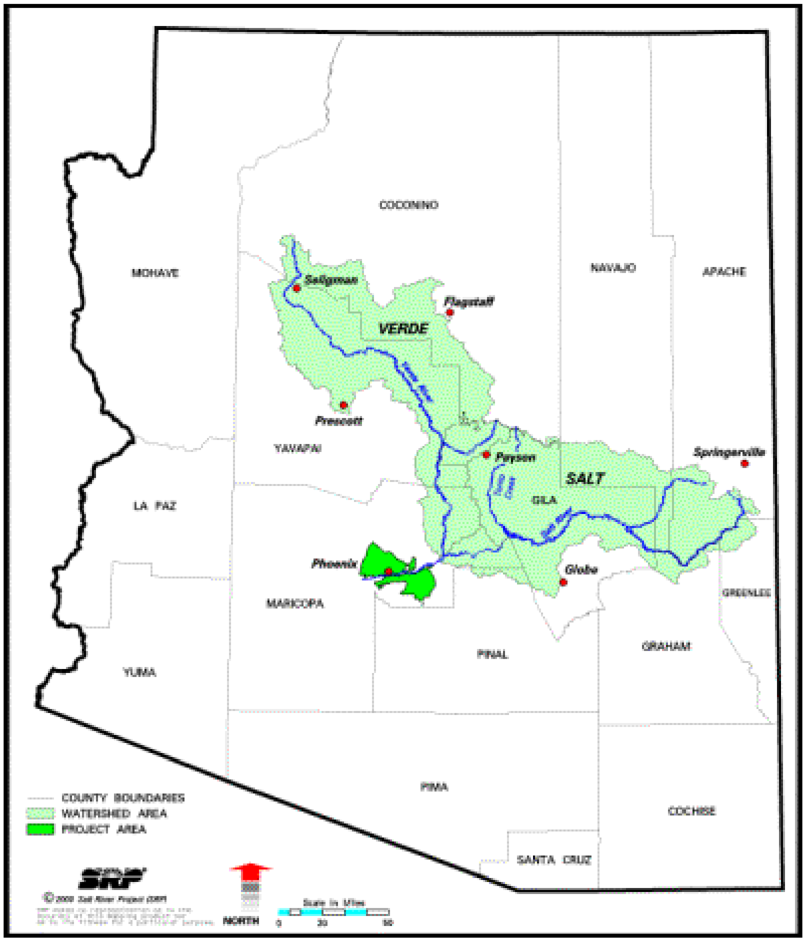
3.1.1 Introduction

The development of Maricopa County into a major agricultural and population center of the Southwest U.S. is due in large part to its favorable location with respect to supplies of surface water. Maricopa County lies at the confluence of the Salt and Verde Rivers, two rivers that drain the most prolific watersheds in the State. Water user organizations in the planning area have the legal right to use most of the flow. Prior to the importation of Colorado River water through the Central Arizona Project canal system, the Salt and Verde Rivers represented more than 90 percent of the developed surface water supply of Maricopa County.

Other developed surface water resources of historical importance in the planning area include: (1) the Agua Fria River, and (2) the Lower Salt River and the main stem of the Gila River below the confluence with the Salt. The Hassayampa and Santa Cruz Rivers are tributaries to the Gila River in the planning area, but their normal flows are fully appropriated by upstream users and they carry only floodwaters into the planning area. Figure 3.1 shows the major local and imported surface water sources of the planning area.

In addition to the traditional water sources from the planning area's rivers, Colorado River water and treated wastewater effluent are increasing their role in meeting the needs of the planning area. The Arizona Department of Water Resources (ADWR) reported that 677,000 acre-feet of Colorado River water was delivered to the Phoenix Active Management Area (AMA) in 1997. Of this volume, 277,000 acre-feet was used directly for municipal, industrial and agricultural purposes; 400,000 acre-feet was stored in underground storage facilities and groundwater savings facilities. In 1995, approximately 100,000 acre-feet of the 286,000 acre-feet of effluent produced was recharged into underground storage facilities or reused. The ADWR has stressed the need to fully utilize these water sources to assist in achieving the safe yield goal defined in the 1980 Groundwater Code by the year 2025.

Figure 3.1 Surface Water Supplies and Watershed Boundaries



Source: Adapted from SRP Watershed Boundary Map, 2000 and MAG 208 Water Quality Management Plan, 1993

3.1.2 Salt and Verde Rivers

The Salt and Verde Rivers drain an area of approximately 13,000 square miles of east-central and north-central Arizona. The Salt and Verde River watersheds are shown on Figure 3.1. Elevations within the watersheds vary from about 1,300 feet above mean sea level near the confluence of the rivers to approximately 13,000 feet at the highest mountains. The two watersheds provide two-thirds of the water supply for the Salt River Project (SRP).

The Salt River begins in eastern Arizona and drains 6,000 square miles in east-central Arizona. The river enters Maricopa County's eastern boundary to the north of the Goldfield Mountains. The Salt River channel passes to the southwest through the East Salt River Valley and West Salt River Valley Sub-basin boundaries and the cities of Mesa, Tempe, and Phoenix; and converges with the Gila River outside of Laveen. Downstream from the 23rd Avenue and 91st Avenue Wastewater Treatment Plants, the Salt River is considered to be perennial due to effluent discharges to the river from these facilities. Between the Granite Reef Diversion Dam and 23rd Avenue, the river is ephemeral. Except for periods of excess runoff when the storage capacities of the reservoirs are exceeded, the channel of the Salt River in this portion of the planning area is typically dry.

The Verde River begins in central Arizona north of Prescott. The river enters Maricopa County north of Fountain Hills. The Verde River flows to the south until it converges with the Salt River above Granite Reef Diversion Dam.

3.1.2.1 Reservoirs and Canals

By the late 1800s, diversion dams, canals and laterals had been constructed in the then perennial Salt River as a method for regulating flood waters and providing a water source for irrigation purposes. In 1903, the Salt River Valley Water Users Association was formed to develop a system that could adequately provide water, power and drainage for participating users in the Salt River Valley. The system initially developed by this association currently includes six reservoirs and seven dams located along the Salt and Verde Rivers. This system of dams and reservoirs is operated by the Salt River Project (SRP). The reservoirs offer a combined conservation storage capacity of 2,335,411 acre-feet. The reservoirs provide approximately 1,956,647 acre-feet of additional storage capacity for flood waters of which Roosevelt Lake provides 1,800,000 acre-feet. Table 3.1 provides a listing of the dams, reservoirs, and reservoir capacities in the SRP service area.

Table 3.1 Reservoir Storage Capacity for Salt/Verde River Watershed
MAG 208 Water Quality Management Plan Update

River	Dam	Reservoir	Conservation Storage Capacity acre-feet	Maximum Storage Capacity (includes flood surcharge) acre-feet
Salt	Roosevelt	Roosevelt	1,653,043	3,455,245[1]
	Horse Mesa	Apache	245,138	245,138
	Mormon Flat	Canyon	57,852	57,852
	Stewart Mountain	Saguaro	69,765	69,765
	Granite Reef	Diversion Dam	N/A	N/A
Verde	Bartlett	Bartlett	178,186	249,686[1]
	Horseshoe	Horseshoe	131,427	214,372[1]
		TOTAL	**2,335,411**	**4,292,058**

Source: Salt River Project, Daily Water Reports, June 2000.

1. Maximum storage capacity data obtained from the United States Department of Interior, Bureau of Reclamation, Dam Fact Sheets, 1998.

Water is released from the reservoirs on the Salt and Verde Rivers in response to irrigation and municipal demands in the planning area. The water is diverted into the SRP distribution system at Granite Reef Diversion Dam that lies about 3 miles downstream of the confluence of the Salt and Verde Rivers.

The SRP operates 131 miles of canals including the Arizona, Consolidated, Crosscut, Eastern, Grand, South, and Tempe Canals. At Granite Reef Diversion Dam, water is diverted into the north and south side canal systems via the Arizona Canal and South Canal. The Arizona Canal feeds the Crosscut and Grand Canals, and the South Canal feeds the Roosevelt Water Conservation District (RWCD), Eastern, Consolidated, Tempe, and Western Canals. All of the canals are owned and operated by the SRP except for the RWCD Canal, which is owned by the Roosevelt Water Conservation District. Figure 3.2 provides a layout of the canal system. The Buckeye Canal, owned and operated by the Buckeye Water Conservation and Drainage District, is used to deliver Salt and Verde River water along with effluent discharged from the 91st Avenue Wastewater Treatment Plant to its members in south central Maricopa County. The St. John's Irrigation District and Peninsula Ditch Water Company also are eligible to receive a portion of the Salt and Verde River system supply through adjudication or delivery agreement.

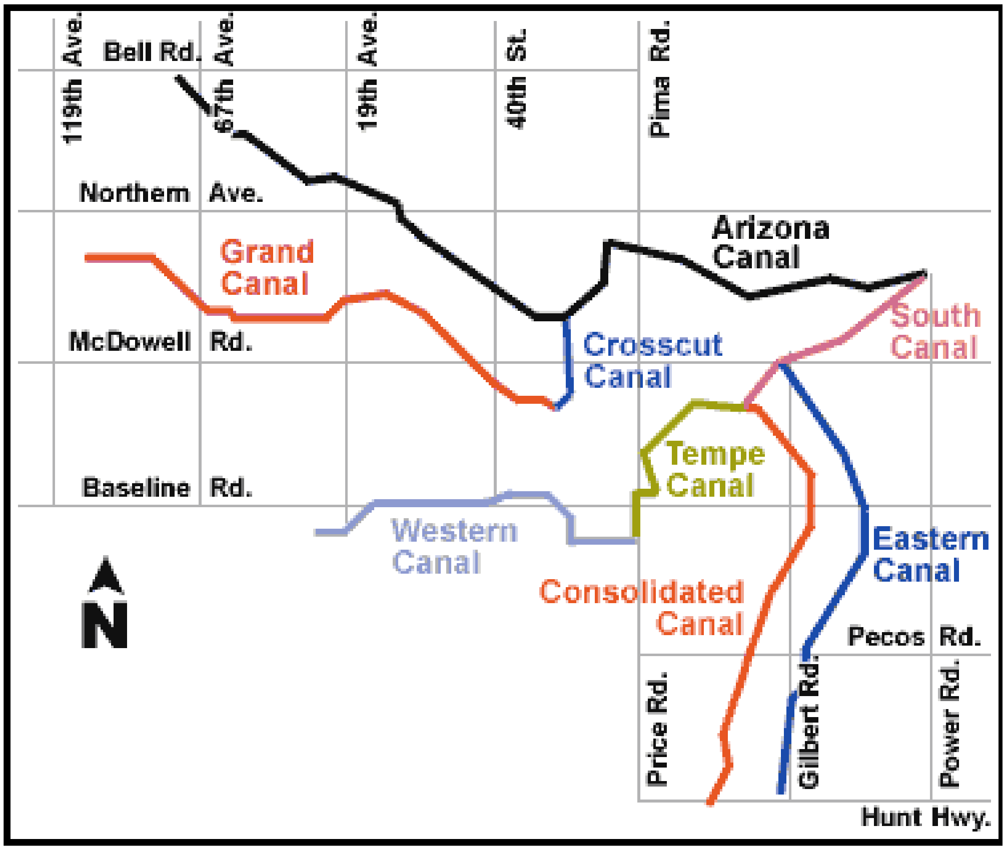
Water in the canals is used to meet agricultural, irrigation, and municipal needs. In 1998, SRP delivered a total of 975,177 acre-feet of water. Approximately 760,638 acre-feet was delivered to cities for municipal use, and 214,539 acre-feet was supplied to agricultural customers for irrigation.

3.1.2.2 Flows

The combined average annual inflow of the Salt and Verde Rivers to the reservoir system is approximately 1,231,240 acre-feet for the 87-year period ending in 1999, but extremes in flow are common. For example, in the highest flow year of record, 1905, the inflow was 5.2 million acre-feet, which was more than 10 times the inflow of the previous year. Long periods of relative drought have also been recorded. Between 1942 and 1964, a period which included much of the rapid post-war growth of the planning area, the average inflow was only 794,000 acre-feet per year. However, extended periods of above-average inflows have also been recorded. In the seven-year period between 1978 and 1984, the average inflow to the reservoir system was 2.1 million acre-feet per year, or nearly twice the average.

Outflows from the Salt and Verde Reservoir system due to losses from evaporation, seepage, and spills are smaller than the inflows. At Granite Reef Diversion Dam, the average diversion was about 844,000 acre-feet per year for the 10 year period ending in 1998 (SRP, 2000). During this period, a total of 6,092,268 acre-feet was spilled due to insufficient storage capacity in the reservoir system. In this 10-year period, the average spill was 609,000 acre-feet. The majority of this spill occurred in 1993 when a volume of 4,072,030 acre-feet was released. Also, in five of the years comprising that period there was no spill or a spill of less than 1,000 acre-feet. The inflow during this period averaged 1,352,830 acre-feet with the high in 1993 of 4,144,577 acre-feet and a low in 1996 of 348,165 acre-feet.

Figure 3.2 SRP Canal System



Source: Salt River Project, www.srpnet.com, July 2000.

Water that is spilled from the Salt and Verde Reservoirs is released into the Salt River channel and flows through the planning area. Historically peak flows released over Granite Reef Diversion Dam have come from the Verde River. The Verde watershed is about the same size as the Salt, but the reservoir storage capacity is smaller. (SRP, 2000) The Roosevelt Dam is operated to allow a maximum rate of release below Granite Reef Diversion Dam of 180,000 cubic feet per second. In the past, large releases have caused significant damage to facilities and structures that were built in the floodplain. During several releases in the 1980s and early 1990s, portions of landfills that border the river channel were eroded or submerged. Most of the Salt River bed throughout the metropolitan Phoenix has undergone the construction of low flow channels and main bank channel stabilization. The flood control measures were implemented to limit erosion of the banks and minimize the disturbance of landfill material that may be present. The channelization was designed to withstand flows from a 100-year flood event. Several well-known landfills have been closed due to issues related to the effects of flood flows passing these facilities.

Releases from the reservoir system on the Salt and Verde Rivers also have impacts on groundwater. The soils deposited in the riverbed are highly permeable. The depth to groundwater in some areas of the river channel can be as shallow as 4 feet below land surface or as great as 200 to 300 feet below land surface. As a result, large volumes of river water infiltrate during releases. Measurements that were made during and after a release in 1965 indicated that the average infiltration rate in the Salt River channel through the planning area is 1.0 to 2.5 ft/day (Briggs and Werho, 1966). During a documented release in 1973, infiltration contributed an estimated 500,000 acre-feet to the groundwater beneath the river channel, and the water levels in wells near the river rose as much as 52 feet (Babcock, 1975). As part of the Granite Reef Underground Storage Project, infiltration rates were measured between the Granite Reef Diversion Dam and Gilbert Road during releases in January of 1992. The infiltration rates for this reach of the Salt River ranged from 2.4 to 2.7 feet per day. The north side of the channel in this reach is now the location of the Granite Reef Underground Storage Project.

The Granite Reef Underground Storage Project (GRUSP) was constructed by SRP in the 1990s to store excess Salt River, Verde River, and CAP water. GRUSP consists of a series of four recharge basins supplied by the South Canal. The facility permitted to recharge up to 200,000 acre-feet annually. GRUSP is owned and operated by SRP who provides storage capacity to Chandler, CAWCD, Gilbert, Mesa, Peoria, Phoenix, Scottsdale, and Tempe. The total volume of water stored at GRUSP through 1998 was 165,782 acre-feet.

The City of Tempe constructed the Tempe Town Lake in a 2-mile reach of the Salt River bed between McClintock and Priest Roads. The construction of the project implements a portion of the Rio Salado Project designed by ASU architectural students in the 1960s. Tempe Town Lake is primarily used for recreational purposes but will enhance economic development as private development proceeds along the surrounding banks as part of the Rio Salado Project. Inflatable dams are used contain the 2,500 acre-feet of lake water and control the lake level during releases during flood events. SRP is responsible for the operation of the inflatable dams and monitoring the flows into and out of the lake. The Town Lake was filled with water purchased from CAP and delivered using the SRP canal system. The lake level is maintained by pumping seepage water back into the lake and supplementing evaporative losses with SRP water that the City obtained in an exchange for reclaimed water.

3.1.2.3 Water Quality

Waters in the Salt and Verde Rivers have excellent chemical quality. The watersheds are largely undeveloped and man-made sources of pollution are not widespread. However, dissolved inorganic constituents are present, and in both rivers, concentrations of the inorganic constituents are inversely proportional to the flows. During periods of high flow, the concentrations of dissolved constituents are lowest due to the predominance of surface runoff and precipitation. During periods of low inflow, concentrations of dissolved constituents are higher due to the increased percentage of groundwater and discharge from springs. Certain segments of the Verde River sometimes have concentrations of arsenic that exceed 10 mg/L, which are above the Maximum Containment Level (MCL) per EPA water quality standards for water supply systems.

The mean concentrations of selected dissolved inorganic constituents in waters of the Salt and Verde Rivers at two sampling stations above the confluence are listed in Table 3.2. In comparison to water in the Salt River, Verde River water is lower in total dissolved solids (TDS) and higher in bicarbonate (HCO_3). The water of the Salt River has higher concentrations of sodium (Na) and chloride (Cl), mainly due to discharges from naturally occurring salt springs north of Roosevelt Lake into the river channel.

Table 3.2 provides historical water quality data for the Verde and Salt Rivers for the 10-year period ranging from 1989 to 1999. These data show the variation in constituents that can occur due to changes in inflow to the watershed.

Table 3.2 Water Quality in Salt and Verde River Systems, 1989 through 1999
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Constituents	Verde River at Beeline Highway mg/L			Salt River below Stewart Mountain Dam mg/L		
	Mean	**Min**	**Max**	**Mean**	**Min**	**Max**
TDS	315	207	393	593	244	849
Calcium	41	32	48	49	36	67
Magnesium	28	17	35	14	8.4	19
Sodium	35	19	47	154	41	228
Alkalinity (as $CaCO_3$)	224	153	380	157	106	255
Sulfate	49	7	64	56	35	69
Chloride	25	14	45	237	53	340
Fluoride	0.36	0.19	0.58	0.32	0.2	0.55
Nitrate (as N)	0.3	0.01	0.68	0.13	0.05	0.6

Source: Salt River Project, Water Operations Department, 2000.

Table 3.3 shows the historical water quality data from the Arizona and South Canals for the 10-year period ranging from 1989 to 1999. These data show the similarity of the water quality in the canals after mixing occurs above the Granite Reef Diversion Dam. Variations in water quality occur as the inflow into the river system changes. When differences in concentrations in the two systems are apparent, they are due to incomplete mixing of the river water in the 3-mile reach between the confluence and Granite Reef Diversion Dam during periods when high flows occur. In this case, the water diverted from Granite Reef Diversion Dam to the South Canal retains the water quality characteristics of the Salt River. The water diverted to the Arizona Canal from Granite Reef Diversion Dam may resemble Salt River water but tends to have the lower TDS concentration found in the Verde River system. The greater the combined flow rate of the rivers, the lower the degree of mixing (SRP, 1998).

Table 3.3 Water Quality in the Arizona and South Canals, 1989 through 1999 MAG 208 Water Quality Management Plan Update						
Constituents	**Arizona Canal at Granite Reef mg/L**			**South Canal at Granite Reef mg/L**		
	Mean	**Min**	**Max**	**Mean**	**Min**	**Max**
TDS	445	156	863	456	163	882
Calcium	45	26	65	45	27	64
Magnesium	18	9	37	18	7	36
Sodium	96	14	226	101	15	243
Alkalinity (as $CaCO_3$)	157	89	265	157	72	275
Sulfate	52	17	164	51	10	89
Chloride	136	9	316	144	10	316
Fluoride	0.3	0.17	0.49	0.3	0.14	0.51
Nitrate (as N)	0.19	0.04	1.05	0.23	0.09	1.29
Source: Salt River Project, Water Operations Department, 2000.						

3.1.3 Agua Fria River

The Agua Fria River originates northeast of Prescott and drains an area of approximately 1,500 square miles in central Arizona. Elevations in the watershed vary from about 900 feet at the confluence of the Agua Fria and Gila Rivers to about 8,000 feet in the Bradshaw Mountains. Because of the smaller watershed and lower elevation, flows in the Agua Fria River are lower than the flows in the Verde and Salt Rivers. The Agua Fria is classified as an intermittent to ephemeral stream. The river enters Maricopa County north of Lake Pleasant. Downstream of New Waddell Dam, the Agua Fria passes through the communities of Surprise, El Mirage, Youngtown, Glendale, and Avondale before joining the Gila River to the south. During periods of high runoff, the flow from the New River enters the Agua Fria River. The New River Basin, which is mainly unregulated, includes Skunk Creek.

3.1.3.1 Reservoirs and Canal

Lake Pleasant is a large man-made reservoir constructed along the Aqua Fria River in the northwestern portion of the planning area. The Waddell Dam forms Lake Pleasant. The Bureau of Reclamation constructed the New Waddell Dam as part of the Central Arizona Project (CAP). The old Waddell Dam was replaced to provide increased storage capacity for CAP water in addition to storage of stormwater runoff and flood protection. The conservation storage capacity of the New Waddell Dam is 812,100 acre-feet. The maximum storage capacity of the dam with flood surcharge is 1,108,600 acre-feet. The New Waddell Dam and the CAP canal are operated by the Central Arizona Water Conservation District (CAWCD).

The CAWCD uses Lake Pleasant as a seasonal storage reservoir for Colorado River water. The Waddell Canal is a 5-mile long reversible canal that allows the CAWCD to transport Colorado River water to and from Lake Pleasant. The water is pumped into the reservoir during periods when energy costs and water demands are at a minimum, typically October through June. When the Colorado River water is released from the lake to service CAWCD and Maricopa Water District (MWD) customers, hydroelectric power is generated.

The MWD appropriates the entire flow from the Agua Fria River for irrigation use. The MWD receives Colorado River water in exchange for Agua Fria water that flows into Lake Pleasant. The MWD customers receive water through the Beardsley Canal, which is supplied from the CAP canal through the MWD turnout.

3.1.3.2 Flows

The first full-year of record since the CAWCD began operating the New Waddell Dam is 1993. In the 7 year period between 1993 through 1999, the total inflow into Lake Pleasant from the Agua Fria River was 908,025 acre-feet. The majority of this inflow occurred in 1993 during a year of record precipitation resulting in an inflow from the Agua Fria of 466,369 acre-feet.

During this time period, the total outflow to MWD was 399,393 acre-feet. The average annual volume from this source to MWD customers is approximately 57,000 acre-feet. The MWD uses a portion of the Agua Fria River inflow to maintain the Lower Lake (Hank Raymond Lake) below New Waddell Dam. The Lower Lake is used for recreational purposes.

The CAWCD began importing CAP water into Lake Pleasant in September of 1992. During the 7½ year period between September 1992 through 1999, the total inflow of CAP water into Lake Pleasant was 2,957,547 acre-feet. During this time period, 2,539,547 acre-feet of CAP water was released from Lake Pleasant to the CAP canal for delivery to CAWCD customers.

3.1.3.3 Water Quality

The commingled water stored in Lake Pleasant, during an average year of inflow, will be mostly representative of Colorado River water. Water releases downstream from the New Waddell Dam into the Lower Lake will reflect the water quality of Lake Pleasant. CAP water is supplied to the MWD for customer use in exchange for Agua Fria River water stored in Lake Pleasant. The CAP water is delivered to the Beardsley Canal through the MWD turnout. Additional information on the CAP water quality is provided in the Section 3.2.

The water quality of the Agua Fria River above Lake Pleasant is similar to the quality of the Colorado River. However, the Agua Fria River typically has a lower TDS concentration than the Colorado River water. Table 3.4 provides the water quality data for the Agua Fria River, Lake Pleasant, and Colorado River collected in July 1999.

Table 3.4 Agua Fria River, Lake Pleasant and Colorado River Water Quality Data MAG 208 Water Quality Management Plan Update				
Constituents	**Agua Fria River above Lake Pleasant mg/L[1]**	**Agua Fria River above Lake Pleasant mg/L[2]**	**Lake Pleasant mg/L**	**Colorado River Water at Lake Havasu mg/L**
TDS	397	360	620	556 low
Calcium	50	51	70	71
Magnesium	24	23	29	28
Sodium	35	NT	93	NT
Alkalinity (as $CaCO_3$)	196	220	129	129
Sulfate	89	57	225	237
Chloride	25	32	79	74 low
Nitrate	NT[3]	NT	0.20	NT
pH	8.5	8.9	8.2	8.2
Turbidity, NTU	3.65	0.85	0.45	1.5

1 Source: CAP Annual Water Quality Report, 1998.

2 Source: CAP Annual Water Quality Report, 1999.

3 Not tested.

3.1.4 Lower Salt River and Gila River

The Salt River channel downstream of the Granite Reef Dam to approximately 19th Avenue is mostly dry. However, further downstream of 19th Avenue and closer to the confluence with the Gila River, the channel carries a perennial flow that is a combination of gravel quarry pumpage, wastewater treatment plant effluent, irrigation tail water, natural groundwater discharge, and water from miscellaneous sources.

Water in the Lower Salt and Gila Rivers is diverted for irrigation use at three locations. At the Buckeye Heading, near the confluence of the Salt and Gila Rivers, a portion of the flow is diverted into the Buckeye Canal for irrigation use in the Buckeye Water Conservation and Drainage District. Further downstream in the Gila River channel, water is diverted into the Arlington Canal by the Arlington Canal Company, and at Gillespie Dam, most of the remaining flow in the Gila is diverted into the Enterprise and Gila Bend Canals.

3.1.4.1 Flows

In the 10-year period from 1987 to 1997, the total volume flowing in the Gila River above the diversions at Gillespie Dam was 8,647,647 acre-feet. During this period, approximately 7,845,555 acre-feet was discharged and 802,092 acre-feet was diverted. The majority of the flow took place in 1993 when record rainfall occurred. In 1993, the measured flow in the Gila River above Gillespie Dam was 5,729,912 acre-feet. A total of 5,647,275 acre-feet was released through the dam. Heavy flows also occurred in 1992 and 1995 with a combined volume of 1,854,346 acre-feet. The total discharge through Gillespie Dam for 1992 and 1995 was 1,709,957 acre-feet. The flows that occurred in 1992, 1993 and 1995 account for the majority of inflow and outflow at Gillespie Dam over this 10-year time period.

The average annual flow in the Gila River above the diversions at Gillespie Dam is approximately 151,900 acre-feet. The average annual discharge and diversion at Gillespie Dam are approximately 65,900 acre-feet and 86,000 acre-feet, respectively. During the summer months when irrigation demand is highest, the flow recorded in the Gila River below Gillespie Dam is typically zero. (USGS, 2000)

3.1.4.2 Water Quality

Water quality in the Gila River is generally poor. Water flow in the perennial reaches of the Middle Gila Basin are predominantly effluent, releases from impoundments, and agricultural return flows. The water quality is impacted by upstream discharges of irrigation tailwaters, inflows of groundwater containing high concentrations of TDS, and water from mine tailings.

In 1991, a public health fish consumption advisory was issued for the Painted Rock Lake watershed including portions of the Gila, Salt, and Hassayampa Rivers. The advisory was issued due to elevated levels of organochlorine pesticides found in fish tissue samples. Subsequent testing completed by the Clean Lakes Program 1993, ADEQ's Priority Pollutant Program 1994, and the United States Fish and Wildlife Service 1997 indicate that the levels of this pollutant may be declining in this area. A fish consumption advisory was also issued for the Dysart Drain in 1995 due to elevated levels of DDT metabolites found in fish tissue. The advisory was issued although fish consumption is not a designated use for this canal (or for any canal in Arizona). The Dysart Drain is an agricultural return flow drain that collects runoff from Luke Air Force Base and agricultural fields that had historically high rates of DDT application (ADEQ, 1998). The drain discharges into the Agua Fria River.

Table 3.5 lists the water quality data for the Gila River at Gillespie Dam. The salinity (TDS) of the Gila River is three to nine times higher than the salinity of the CAP water, Salt River, Verde River, or Agua Fria River. The increased TDS concentration of the Gila River is due primarily to increased concentrations of calcium, sodium, sulfate, and chloride. The concentration of nitrate reported in 1997 and 1998 exceed the EPA's Maximum Contaminant Level (MCL) for drinking water of 10 mg/L.

The concentrations of heavy metals are also monitored in the Gila River at Gillespie Dam. Heavy metal concentration for cadmium exceeded the EPA MCLs and Arizona Health Based Guideline (HBGL) during 1998. The HBGL for arsenic was exceeded for samples taken from 1995 through 1998. The lead concentration in the Gila River water also exceeded the HBGL in 1997 and 1998.

Table 3.5 Water Quality for Gila River at Gillespie Dam MAG 208 Water Quality Management Plan Update									
Constituent	**1/26/95**	**9/27/95**	**1/30/96**	**9/30/96**	**1/23/97**	**9/23/97**	**1/27/98**	**7/22/98**	**Average**
TDS	2,210	2,040	2,190	2600	2,390	3,120	2,700	1,920	2,396
Calcium	150	140	150	180	150	200	180	130	160
Magnesium	69	63	66	81	67	92	81	58	72
Sodium	540	540	560	660	562	765	631	465	590
Alkalinity (as $CaCO_3$)	250	210	263	230	235	300	282	166	242
Sulfate	430	420	430	600	540	740	620	410	524
Chloride	800	740	810	930	890	1100	980	720	871
Fluoride	1.6	1.6	2.1	2.1	2.0	2.2	2.1	1.5	2
Nitrate (as N)	6.79	7.6	8	9.8	8.58	10.16	10.6	8.58	9
PH	8.1	8.1	8.1	8.4	8.0	8.3	8.2	8.2	8
Source: Maricopa Water District files.									

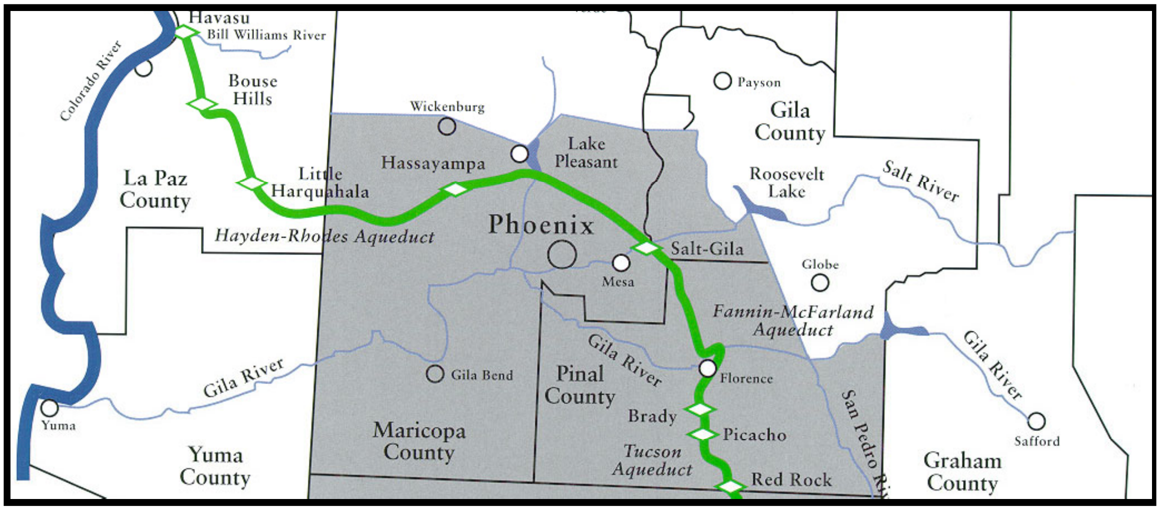
3.2 CENTRAL ARIZONA PROJECT

3.2.1 Introduction

The CAP includes a 336-mile long aqueduct system that consists of canals, pipelines, tunnels, pumping facilities, check structures, and turnouts. The system allows the CAP to deliver water from Lake Havasu on the Colorado River to municipal and agricultural irrigation users in Maricopa, Pinal and Pima counties. The aqueduct system was completed in 1993 making the CAP the largest supplier of surface water in Arizona. Within the planning area, the aqueduct is known as the Hayden-Rhodes Aqueduct and includes the Hassayampa and Salt-Gila Pumping Stations. Because the CACWD limits the monthly deliveries to the water users to a maximum of 11 percent of the annual allocation in any one month, the water users must provide facilities to address seasonal water demand peaking factors. A two-way canal (Waddell Canal) connects the aqueduct to Lake Pleasant for seasonal storage of CAP allocations. Figure 3.3 provides the layout of the CAP canal in Maricopa County.

The CAP aqueduct is also interconnected to the SRP canal system at Granite Reef Dam near the Salt-Gila Pumping Station. The Granite Reef interconnection is used to import CAP water into the SRP canal system as a means of delivering water to users in the Phoenix area who are remote from the CAP aqueduct.

Figure 3.3 CAP Canal System Route through Maricopa County



◊ - Pumping Station
Source: Central Arizona Water Conservation District, 2000

3.2.2 Allocations and Flows

The Cities of Glendale, Phoenix, Chandler, Scottsdale, Mesa, Peoria, the Town of Gilbert and Fountain Hills (served by the Chaparral City Water Co.) and Anthem master planned community (served by Arizona American Water Co.) have municipal water treatment plants (WTPs) on the CAP canal system. In 1995, approximately 151,791 acre-feet of CAP water was delivered to municipal water organizations in the planning area, meeting about 17.5 percent of the total municipal water use demand. The use of CAP water for municipal purposes has increased significantly since 1989 when only 79,000 acre-feet was delivered to the planning area. The CAP municipal water usage has increased by approximately 92 percent from 1989 to 1995.

During the 8-year period between 1990 and 1997, the CAWCD delivered 2,732,593 acre-feet of CAP water to municipal, industrial and agricultural customers in the planning area. Table 3.6 provides a list of the CAP allocations for the planning area as of 1998.

Table 3.6 Central Arizona Project Allocations, Phoenix Active Management Area, 2000 MAG 208 Water Quality Management Plan Update

Subcontracts	**Allocation (acre-feet/yr)**
<u>Municipal and Industrial Subcontracts</u>	
Arizona-American Water Company (Paradise Valley)	3,231
Arizona Water Company – White Tanks	968
City of Avondale	4,746
Berneil Water Company	200

Table 3.6 Central Arizona Project Allocations, Phoenix Active Management Area, 2000 MAG 208 Water Quality Management Plan Update

Subcontracts	Allocation (acre-feet/yr)
Town of Buckeye	25
Carefree Water Company	400
Cave Creek Water Company	1,600
Circle City Water Company	3,932
City of Chandler	3,668
Chandler Heights Citrus Irrigation District	315
Chaparral City Water Company	6,978
Arizona American Water Co. (Agua Fria)	11,093
Arizona American Water Co. (Sun City)	4,189
Town of Gilbert	7,235
City of Glendale	14,183
City of Goodyear	3,381
Litchfield Park Service Company	5,580
Maricopa County Parks and Recreation Department	665
City of Mesa	36,388
New River Utility Company	1,885
City of Peoria	18,709
City of Phoenix	113,914
Phoenix Memorial Park	84
Queen Creek Water Company	348
Rio Verde Utilities, Incorporation	812
San Tan Irrigation District	236
City of Scottsdale	48,529
Arizona American Water Co. (Sun City)	2,372
Sunrise Water Company	944
City of Surprise	7,373
City of Tempe	4,315
Water Utilities Community Facilities District	2,919
Water Utility of Greater Buckeye	43
Water Utility of Greater Tonopah	64
West End Water Company	157
SUBTOTAL	**311,481**

Table 3.6 Central Arizona Project Allocations, Phoenix Active Management Area, 2000 MAG 208 Water Quality Management Plan Update	
Subcontracts	**Allocation (acre-feet/yr)**
Indian Subcontracts	
Ak-Chin Indian Community	58,300
Fort McDowell Indian Community	4,300
Gila River Indian Community[1]	173,100
Salt River Pima – Maricopa Indian Community	13,300
SUBTOTAL	**249,000**

Source: CAP Subcontracting Status Report, February 9, 2000 and May 22, 2000 and ADWR, Third Management Plan, 1999

1. The Gila River Indian Community is partially located in Maricopa County.

3.2.3 Underground Water Storage and Recovery Program

In 1986, the Arizona legislature established the Underground Water Storage and Recovery Program to allow the storage of surplus water supplies underground for recovery and use by the storer at a later time. In 1994, the legislature developed a unified program to consolidate the various water storage programs by enacting the Underground Water Storage, Savings and Replenishment Act. Two types of facilities are used for this purpose including underground storage facilities (USF) and groundwater savings facilities (GSF). The distinction between the two is that groundwater savings facilities are using a source of water for their needs, typically irrigation, in place of groundwater thereby creating a savings. In 1996, the State Legislature created the Arizona Water Banking Authority (AWBA) to store Arizona's unused allotment of Colorado River water for future use during times of drought. The AWBA uses the Granite Reef Underground Storage Project, Vidler MBT Ranch, and the groundwater savings facilities for storage of excess CAP water.

During the time period between 1988 through 1998, approximately 516,191 acre-feet of CAP water has been stored in USF or GSF. Table 3.7 provides a listing of underground storage and groundwater savings facilities that are current storing CAP water.

Table 3.7 USF and GSF Permitted to Store CAP Water
MAG 208 Water Quality Management Plan Update

Facility	Type	Annual Permitted Volume (AF)
Granite Reef Underground Storage Project	USF	200,000
Scottsdale/Water Campus	USF	8,400
Vidler MBT Ranch[1]	USF	100,000
San Tan Irrigation District	GSF	5,000

Table 3.7 USF and GSF Permitted to Store CAP Water MAG 208 Water Quality Management Plan Update		
Facility	**Type**	**Annual Permitted Volume (AF)**
Salt River Project	GSF	200,000
Aqua Fria (CAWCD)	USF	100,000
Westworld (City of Scottsdale)	USF	1,000
West Maricopa Combine	USF	25,000
Avondale	USF	10,000
Sun City Grand	USF	4,000
Queen Creek Irrigation District	GSF	28,000
Chandler Heights Citrus Irrigation District	GSF	3,000
Roosevelt Water Conservation District	GSF	100,000
Tonopah Irrigation District	GSF	15,000
Maricopa Water District	GSF	18,000
New Magma Irrigation District	GSF	54,000
TOTAL		**871,400**

Source: Phoenix AMA Third Management Plan, ADWR, 1999

[1] Vidler MBT Ranch is located approximately 3 miles outside of Maricopa County's western boundary. The facility is used by the AWBA to store surplus CAP water that can be recovered, returned to the CAP canal, and transported to the planning area during periods of drought on the Colorado River.

3.2.4 Water Quality

Water quality in the CAP canal is monitored by the CAWCD. The mean concentrations of selected constituents for samples collected during 1996 through 1999 are summarized in Table 3.8. The TDS concentration of the CAP water during this period of record was higher than that of the Verde River, but similar to the TDS concentration of the Salt River. The concentration of sulfate is several times higher in the CAP water than the concentration of sulfate in the Salt or Verde River.

The TDS concentration of the CAP water is typically above the secondary MCL of 500 mg/L. High concentrations of TDS can cause water to have a salty taste and contribute to scaling and mineral accumulation in water distribution systems. The use of water with high TDS concentrations for turf irrigation can reduce the quality of the turf. Harmful effects related to human consumption of water with high TDS concentrations have not been observed.

Table 3.8 Water Quality for CAP Aqueduct MAG 208 Water Quality Management Plan Update						
Constituent	**99th Avenue**			**McKellips Road**		
	Mean	**Min**	**Max**	**Mean**	**Min**	**Max**
TDS	626	491	750	619	513	705
Calcium	75	60	85	75	65	93
Magnesium	29	25	35	29	24	37
Sodium	NT	NT	NT	NT	NT	NT
Alkalinity (as $CaCO_3$)	132	115	159	131	118	156
Sulfate	239	181	272	240	210	269
Chloride	82	62	101	81	68	95
Nitrate (as N)	NT	NT	NT	NT	NT	NT
pH	8.44	7.6	9.2	8.5	7.9	9.3
Source: Central Arizona Project, Annual Water Quality Reports, 1996 - 1999 NT = Not Tested.						

3.3 WASTEWATER TREATMENT PLANT EFFLUENT

In the planning area, wastewater treatment plant effluent is used to supply water for irrigation, industrial uses, recreational purposes including lakes and ponds, artificial recharge, and wetlands. In 1995, approximately 109,731 acre-feet of effluent was used for agricultural, municipal and industrial purposes. The volume of effluent used for these purposes in 1995 is approximately 2.5 times the volume used in 1985. To meet the requirements of the Assured Water Supply rules, it is likely that the use of effluent as a renewable water source will continue to increase in the future. In addition, the ADWR has provided incentives to encourage the use of this water source for recharge and irrigation. For example, each acre-foot of effluent used for irrigation or other reuse purposes will be counted as 0.6 acre-feet when determining compliance with a municipality’s maximum annual water allotment. Also, public and private organizations have begun constructing facilities to recharge excess reclaimed water to the groundwater for storage and recovery in the future. The volume of reclaimed water recharged through 1996 is approximately 47,565 acre-feet.

3.3.1 Wetlands

Municipalities within the planning area have implemented constructed wetlands to provide tertiary treatment of secondary treated effluent, polishing treatment of tertiary treated effluent, and wildlife habitat development. The constructed wetlands in some instances are operated in conjunction with an underground storage facility. In these cases, the aquifer is recharged with the effluent after additional treatment by the wetlands. Examples of constructed wetlands in the planning area include:

- Multi-City Subregional Operating Group's (SROG) Tres Rios Project located at the 91st Avenue Wastewater Treatment Plant,
- Town of Gilbert's Neely Ranch and Riparian Preserve at Water Ranch, and
- City of Avondale's Crystal Springs (treats CAP and SRP water to decrease nitrate concentration).

In addition to the treatment capabilities, the constructed wetlands also serve as a habitat for wildlife including birds, fish and mammals. The projects usually include amenities for public education and recreation.

3.3.2 Lakes and Ponds

Effluent is also used as a source water to fill and maintain scenic and recreational lakes and ponds associated with various parks and golf courses throughout the planning area. Recreational lakes generally consist of water bodies provided for urban fishing and other non-body contact uses; swimming is typically prohibited. Based on A.R.S. § 45-132, the regulatory constraints on the use of other possible source waters for this purpose is an incentive for using effluent. The Phoenix AMA Third Management Plan provides a one-time allotment of 6.2 acre-feet per acre for filling water bodies.

3.3.3 Industrial and Irrigation Reuse

The 91st Avenue Wastewater Treatment Facility, owned by the Subregional Operating Group (SROG) is the largest producer of effluent in the planning area averaging 159,000 acre-feet annually. The combined annual treatment capacity of the 91st Avenue and 23rd Avenue Wastewater Treatment Plants is approximately 246,450 acre-feet. These facilities are the two largest sources of effluent in the planning area. The Palo Verde Nuclear Generating Station has a contract with SROG to receive up to 105,000 acre-feet of effluent per year for use as cooling water. To date, the maximum annual amount used by the generating station was approximately 60,000 acre-feet. The Buckeye Water Conservation and Drainage District receives a contracted volume of 30,000 acre-feet of effluent per year for irrigation purposes. The Roosevelt Irrigation District is also entitled to use up to 30,000 acre-feet of effluent per year. The effluent is supplied to Palo Verde Nuclear Generating Station via pipeline, while irrigation districts receive their flow through the irrigation canal system, and excess flow is discharged to the Gila River channel.

In the planning area, smaller amounts of effluent from other wastewater treatment plants are reused elsewhere. These plants and their associated uses of effluent are discussed in the Point Source Plan (Chapter 4).

3.3.4 Artificial Recharge

Two types of facilities are used for the storage of excess water supplies including underground storage facilities (USF) and groundwater savings facilities (GSF). The distinction between the two is that groundwater savings facilities are using a source of water for their needs, typically irrigation, in place of groundwater thereby creating a savings. By permitting and implementing a storage facility, applicants are able to accumulate storage credits for use in the future. Chapter 4 provides details on the permitting requirements for constructing and operating USF and GSF.

There are two types of USF that are permitted by the ADWR including constructed and managed USF. A constructed USF consists of a facility that includes constructed features that contain recharge water to allow infiltration to occur within the constructed boundaries of the facility. A managed facility employs the use of the unmodified natural channel of a stream to recharge water, therefore construction at a managed facility is minimal.

The storage credits received for the recharge of effluent are governed differently than other source waters. If storage occurs at a constructed facility, recharged effluent is credited one hundred percent to a long-term storage account, if storage occurs at a constructed facility. A managed facility recharging effluent receives only 50 percent credit for the volume recharged. Also, credits for effluent recharged at a managed facility cannot be used in demonstration of an Assured Water Supply under the Arizona Groundwater Code. Therefore, the maximum benefit is achieved by recharging effluent at a constructed facility.

3.4 GROUNDWATER

3.4.1 Introduction

Groundwater resources in the planning area are significant but not unlimited. In 1975, the Arizona Water Commission estimated that 153.6 million acre-feet of groundwater was stored in the alluvial deposits of the Salt River Valley above a depth of 1,200 feet. Deeper deposits contain a greater volume.

Despite the relative abundance of groundwater in the planning area, long-term declines in water levels have resulted in parts of the area from imbalance between recharge and pumpage. The recognition of this imbalance provided the impetus for the enactment of the Groundwater management Act of 1980. The Act led to the establishment of Active Management Areas (AMAs) which are subject to regulation by the Arizona Department of Water Resources (ADWR). Within the AMAs, the right to pump groundwater and develop new groundwater supplies are regulated by ADWR. Most of the Salt River Valley lies in the Phoenix AMA. Within the Phoenix AMA, a permit is needed to legally withdraw groundwater for most uses, and increasing the base of agricultural land is limited.

3.4.2 Geologic Setting

Groundwater in the planning area occurs mainly in unconsolidated to consolidated basin-fill deposits of sand, gravel, silt and clay. These sediments were eroded from bedrock in the tributary watershed by rivers. Because wells haven't penetrated the full thickness of the basin fill in the planning area, the total thickness of the basin fill deposits is not known. In the Salt River Valley, the maximum thickness is estimated to be more than 10,000 feet.

In a 1977 report for the Central Arizona Project, the Bureau of Reclamation divided the basin fill deposits of Maricopa County into three units consisting of the Upper Alluvial Unit, the Middle Fine-Grained Unit, and the Lower Conglomerate Unit. Each of the units has different water-bearing characteristics.

The Upper Alluvial Unit varies in thickness from less than 200 to more than 1,200 feet. The Upper Unit is the most permeable and, where it is saturated, yields large quantities of water to wells. However, in parts of the planning area, the water quality has been degraded by contaminants.

The Middle Fine-Grained Unit, generally referred to as the Middle Alluvial Unit by ADWR, consists of finer-grained sand, silty clay, and evaporite deposits such as gypsum and halite. The Middle Unit is absent near the mountains at the margins of the basins, but it may be 1,500 to 2,000 feet thick near the centers of the basins. Although interbeds of coarse-grained sands yield moderate quantities of water to wells in parts of the planning area, the most important feature of this unit is that it acts as a confining bed to limit vertical flow of groundwater.

The Lower Conglomerate Unit, also referred to as the Lower Alluvial Unit by ADWR, consists of pebble to cobble sized rock fragments in a finer-grained matrix of sand, silt, and clay. Some of the Unit is highly cemented and is often conglomerate. The thickness of the Unit varies. It is absent or indistinguishable from the Upper Alluvial Unit near the margins of the basins and is thickest near the centers. The Unit has been drilled to a depth of more than 2,000 feet in some areas. The Unit mainly provides water to wells located closest to the margins of the basins, because near the center of the basins it is deeply buried. The Lower Conglomerate Unit is the most prolific aquifer in the Valley, in terms of public supply wells.

3.4.3 Groundwater Basins

The planning area includes all or part of the following major groundwater basins:

- East Salt River Valley
- West Salt River Valley
- Rainbow Valley
- Hassayampa
- Lake Pleasant
- Carefree
- Fountain Hills

The locations of the basins are shown on Figure 3.4. Together, these basins comprise the Phoenix AMA. Portions of other groundwater basins are in Maricopa County, including the Gila Bend Basins, Lower Gila Basin and Harquahala Basin. The East Salt River Valley Subbasin and the West Salt River Valley Subbasin are the two largest basins in the planning area comprising 1,710 and 1,330 square miles, respectively. Table 3.9 provides the size of each of the subbasins within the planning area.

Figure 3.4 Locations of Basins

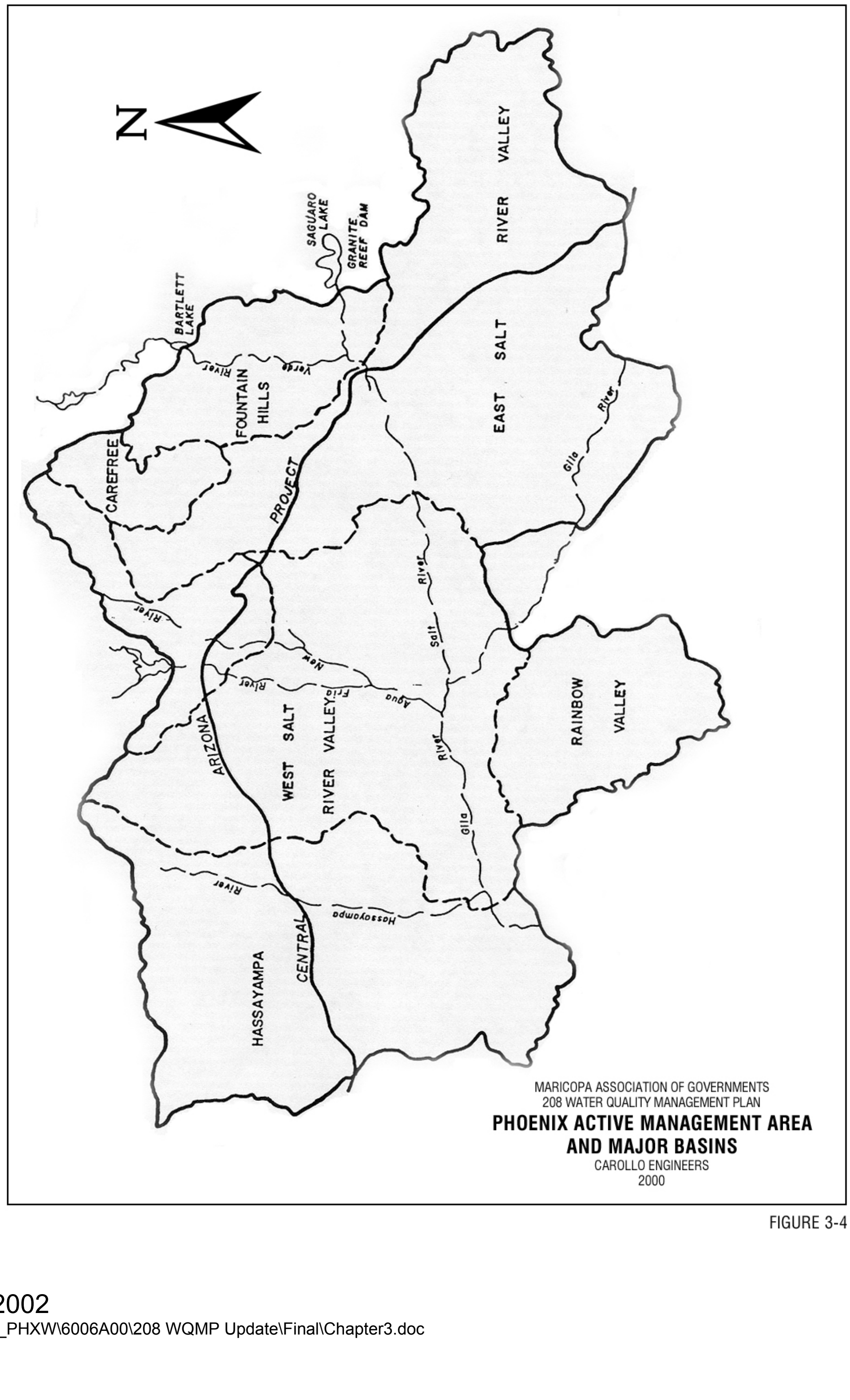


FIGURE 3-4

Table 3.9 Subbasin Coverage MAG 208 Water Quality Management Plan Update	
Groundwater Basin	**Coverage, Square Miles**
East Salt River Valley	1,710
West Salt River Valley	1,330
Hassayampa	1,200
Rainbow Valley	420
Fountain Hills	360
Lake Pleasant	240
Carefree	140
TOTAL	**5,400**
Source: Phoenix AMA, Third Management Plan, ADWR, 1999.	

3.4.4 Depth of Groundwater and Direction of Flow

In the Phoenix AMA, the depth to groundwater varies from less than 10 to more than 600 feet below land surface. In general, the greatest depths occur in the sloping alluvial fans close to the major mountain ranges. Groundwater is shallowest near the Salt, Verde, and Gila Rivers ranging from as shallow as 4 feet to less than 50 feet below land surface.

Shallow groundwater conditions also occur in the West Salt River Valley Subbasin including areas in the vicinity of the Buckeye Water Conservation and Drainage District, St. Johns Irrigation District, and Arlington Canal Company. The shallow conditions in this area are related to the lack of pumping and oversupply of surface water applied to crops. In order to continue agricultural production, the waterlogged areas must be dewatered and drained. Central Phoenix has also experienced shallow groundwater conditions in some areas (ADWR, 1999).

Carefree and Cave Creek, located within the Carefree Subbasin, have committed all of their groundwater resources for existing and future developments. Apache Junction, located outside of the planning area, has also guaranteed their groundwater resources for existing and planned developments. Under AWS rules, these communities are limited in their ability to expand without securing other water supplies.

The direction of groundwater flow in the Phoenix AMA has been greatly influenced by groundwater pumpage. In the 1900s, the direction of groundwater flow was generally towards the Salt River. In several areas, pumpage has created particularly significant depressions in the water table surface including eastern Mesa, North Scottsdale, near Luke Air Force Base, Queen Creek, and Waterman Wash. These depressions have caused the natural flow of groundwater to be reversed in some areas. In 1998, the direction of groundwater flow is typically away from the Salt River throughout the planning area.

3.4.5 Groundwater Quality

In most of the planning area, groundwater is more mineralized than surface water. Shallow mineralized groundwater is often “hard,” or it may have a salty taste. Its usefulness for domestic, industrial, and agricultural purposes is reduced. However, deeper groundwater that has not been influenced by irrigation is developed by most cities.

The inorganic constituent that occurs most widely in concentrations greater than its established MCL is nitrate. Less commonly, concentrations of fluoride, chromium, and arsenic exceed the corresponding MCLs. These are generally a problem in the deeper groundwater. However, the MCL for arsenic could be reduced to a point where this may be the largest problem.

The highest concentrations of nitrate in groundwater generally occur in areas with a long history of irrigated agriculture where the total dissolved solids concentration is also high. The highest concentrations of nitrate occur in west Phoenix, Buckeye, Glendale, and Chandler. Nitrate in concentrations greater than the MCL also occurs in parts of other groundwater basins in the planning area. This water is usually only in the Upper Alluvial Unit.

Sulfate has a secondary MCL of 250 mg/L and is currently under review by the EPA for conversion to a primary MCL. Aquifers in the planning area with sulfate concentrations above the secondary MCL are located in west Phoenix, Buckeye, and the East Salt River Valley Subbasin (ADWR, 1999). High sulfate concentrations are usually associated with evaporite deposits in the central parts of geologic basins.

Since the time that the first MAG 208 Plan was prepared, increased attention has been focused on organic constituents in groundwater, and MCLs have been established for a number of volatile organic compounds (VOCs). Some VOCs are carcinogenic, and MCLs are several orders of magnitude lower than the MCLs for inorganic constituents. Therefore, the reliability and accuracy of sampling and analytical techniques for VOCs are extremely important.

VOCs that have been detected in groundwater in concentrations greater than established MCLs in the planning area are listed in Table 3.10 along with the applicable MCL. Commonly used acronyms are also listed. Other organic compounds that occur less commonly in concentrations greater than corresponding MCLs include carbon tetrachloride, vinyl chlorides, and p-dichlorobenzene.

Table 3.10 VOCs Detected in Groundwater in the Planning Area MAG 208 Water Quality Management Plan Update	
Compounds (Acronym)	**MCL microgram per liter (µg/L)**
Trichloroethylene (TCE)	5
Tetrachloroethylene (PCE)	5
1,1,1-Trichloroethane (TCA)	200
1,1-Dichloroethylene (DCE)	7
1,1-Dichloroethane (DCA)	5
Benzene	5

VOCs in concentrations greater than corresponding MCLs have been detected in some groundwater, primarily in the urbanized and industrialized parts of the planning area including, but not limited to, Phoenix, south Scottsdale, north Tempe, and Goodyear. Industrial uses of chemicals in the older parts of the metropolitan area predate the enactment of strict regulations that govern their uses. On-site disposal was not uncommon. In some places the occurrences of VOCs in groundwater are the result of known discharges of chemicals, and remedial projects are under way to reduce or eliminate these contaminants. In other areas, the sources of VOCs have not been identified, and investigations are underway. These investigations and remedial projects are discussed further in Chapter 5 covering non-point sources. In most cases the contaminants primarily affected the shallow groundwater.

Other contaminants found in the planning area include petroleum hydrocarbons and pesticides. Areas with elevated levels of petroleum hydrocarbons are reported with the VOC concentrations. Concentrations of dibromochloropropane (DBCP) have been detected above the primary MCLs in groundwater in areas formerly developed as citrus orchards, such as in Mesa, Arrowhead Ranch in Glendale, and Citrus Heights.

In those parts of the planning area where groundwater quality does not meet MCLs due to human activity, the shallowest groundwater has been the most seriously affected. As a result, municipal drinking water wells supplied from deeper strata have not been significantly affected. With few exceptions, poorer quality groundwater is sealed off from new wells using special well construction practices. If groundwater from a municipal water supply well exceeds MCLs, the water is treated, blended or the well is taken out of service. Abandonment procedures for old, out-of-service wells are monitored by the ADWR to minimize the potential for cross-contamination.

Groundwater pumped from irrigation wells more frequently exceeds MCLs. Historically, irrigation wells have been constructed primarily for obtaining large well yields at minimal costs, and water quality was a minor consideration, except for TDS. In this case, well casings may be perforated from top to bottom, and poorer quality water from shallower depths is therefore pumped with the deeper water.

3.4.6 Groundwater Budget

The main components of the water budget for a groundwater basin are recharge, withdrawal, and change in storage. Under undisturbed conditions, recharge and discharge are in close balance in groundwater basins, and the amount of groundwater in storage does not change significantly from one year to the next. However, in parts of the Phoenix AMA basin, groundwater withdrawals exceeded recharge prior to the 1970s. Storage has been depleted and the water table has declined. The greatest declines have occurred outside of the area served by the Salt River Project and have created the cones of depression.

In the Phoenix AMA, components of groundwater recharge can be divided into general categories. These categories and the estimated quantities for 1995 are listed in Table 3.11, based on data obtained from the Phoenix AMA Third Management Plan.

Table 3.11 Phoenix AMA Groundwater Budget, 1995
MAG 208 Water Quality Management Plan Update

Recharge	Volume, acre-feet[1]
Agricultural	360,000
Municipal	60,000
Industrial	8,000
Natural Inflow	110,000
Effluent	50,000
Artificial Recharge Cut to Aquifer	5,000
Total Recharge	**583,000**
Withdrawals	**Volume, acre-feet[1]**
Municipal (includes Indian Use)	250,000
Agricultural (includes Indian Use)	570,000
Industrial	70,000
Total Withdrawals	**890,000**

Source: Phoenix AMA Third Management Plan, ADWR, 1999
(1) Estimated only – accuracy ±70%

The estimated difference between recharge and discharge for the Phoenix AMA in 1995 was 310,000 acre-feet. This deficit is less than those estimated for earlier years. The estimated difference between recharge and discharge for the Phoenix AMA in 1985 was 430,000 acre-feet. The difference between the two figures may be the result of decreased groundwater pumpage due to increased availability of surface water as well as decreases in irrigated acreage. The groundwater deficit is made up of water that is withdrawn from storage in the aquifer.

Smaller amounts of groundwater are withdrawn by processes for which quantity estimates are not readily available. These processes include pumpage for dewatering at sand and gravel quarries (mainly along the lower reaches of the Salt River), natural discharge to rivers and drains, evapotranspiration and subsurface outflow to adjacent basins.

3.5 WATER QUALITY STANDARDS

In Arizona, the Arizona Department of Environmental Quality (ADEQ) has responsibility for establishing and enforcing water quality standards. There are three sets of relevant standards that have been established:

- Surface waters
- Public water supplies
- Aquifers

The surface and aquifer water quality standards are defined in two categories including narrative and numeric standards. The narrative category provides broad standards that protect the aesthetics and prevent degradation of the water and wildlife. The standards for surface and aquifer waters are discussed in the following sections.

3.5.1 Surface Water Quality Standards

3.5.1.1 Designated Uses

As a requirement of the Clean Water Act, ADEQ conducts a triennial review of the Arizona’s surface water quality standards and boundaries. The purpose of the Triennial Review is to determine if changes in the surface water standards are required to protect the quality of these waters. The current standards were promulgated in March 2002.

The surface waters within the planning area cover four (4) river basins and seventy-four (74) water body segments as defined in the State Water Quality Assessment Report (305b Report). These surface water body segments include the local surface water bodies described in this chapter, man-made lakes and canals, and intermittent and ephemeral streams. Water quality standards and designated uses for water courses not defined by the State are established by the tributary rule.

The standards for surface waters are established according to the designated use that is existing or obtainable. The ADEQ has defined the following designated uses:

- Aquatic and wildlife such as cold or warm water fishery, ephemeral, and effluent dominated waters
- Recreational including full body contact, partial body contact, and fish consumption
- Agricultural including agricultural irrigation and agricultural livestock watering
- Domestic water source
- Unique waters

Most lakes, rivers, streams, and canals in Arizona have at least one designated use, and numeric standards have been established for each use. With the exception of lakes and river reaches above Stewart Mountain Dam (Saguaro Lake) on the Salt River, all perennial water bodies in the planning area are designated for Aquatic and Wildlife-warm water. The Salt River lakes and interconnecting reaches include Aquatic and Wildlife-cold water among their designated uses. Generally, all perennial water bodies are also designated for Full Body Contact.

For the unique water designation of surface waters, standards are established on a case-by-case basis. Surface waters are classified as unique waters by ADEQ rule upon a finding that they constitute an outstanding public resource or that they are associated with a threatened or endangered species or its habitat. No unique waters have been designated in the planning area.

Surface waters are classified as "effluent-dependent" by ADEQ rule if they consist primarily of discharges of treated wastewater. Generally, effluent-dependent waters also sustain a Partial Body Contact designated use. The following surface water bodies are designated by ADEQ as effluent-dominated waters in the MAG planning area:

- Agua Fria River (El Mirage Wastewater Treatment Plant (WWTP) to 2 km downstream from the outfall)
- Gila River (Salt River confluence to Gillispie Dam)
- Salt River (23rd Avenue WWTP to Gila River confluence)
- Unnamed Wash (Gila Bend WWTP to the Gila River confluence)
- Unnamed Wash (Luke Air Force Base WWTP to the Agua Fria River confluence)

The following surface waters have been designated as Domestic Water Supplies by the ADEQ in the MAG planning area:

- Agua Fria River (State Route 169 to Lake Pleasant)
- Apache Lake
- Phoenix area canals (Granite Reef Dam to all municipal WTP intakes)
- Salt River (Granite Reef Dam to 2 km downstream)
- Saguaro Lake
- Salt River (Theodore Roosevelt Dam to the Verde River)
- Salt River (Confluence of Verde River to Granite Reef Dam)
- Bartlett Lake
- Verde River (below Bartlett Dam)

3.5.1.2 Water Quality Standards

Numeric water quality standards for water supply systems, known as maximum contaminant levels (MCLs), have been established for six general categories of contaminants including:

- Microbiological
- Inorganic chemicals
- Turbidity
- Organic chemicals
- Radiochemicals
- Volatile organic chemicals and trihalomethanes

In addition to contaminants for which MCLs have been established, monitoring for other contaminants and characteristics is required for certain types of water systems. Community and non-community water systems are required to monitor for 13 organic contaminants and physical characteristics. Community water systems are required to monitor for 7 corrosivity characteristics. Community and non-transient non-community water systems are required to monitor for 20 unregulated volatile organic chemicals and 13 unregulated synthetic organic chemicals. No enforceable standards have been established for these contaminants and characteristics. However, for many of them, guidance levels have been established in the form of secondary MCLs or action levels.

3.5.2 Public Water Supplies

The ADEQ rules for public water supplies, or drinking water standards, have been adopted by ADEQ in accordance with the Federal Safe Drinking Water Act (SDWA). The United States Environmental Protection Agency (EPA) and ADEQ implemented new standards as a result of the SDWA Amendments of 1986. These rules apply to all public and semi-public (serving more than four connections) water systems involved in the collection, treatment, storage, and/or distribution of potable water. These rules do not apply to private agricultural water systems or semi-public water systems unless a health hazard has been identified.

Three categories of water systems are defined in ADEQ's rules on water supply systems:

- Public (subdivided into community, non-transient non-community, and transient non-community)
- Semi-public
- Private agricultural

The most restrictive water quality standards generally apply to public systems.

The U.S. EPA adopted 10 micrograms per liter MCL for arsenic in November 2001. Water systems must meet this standard by January 2006. The naturally occurring arsenic concentration of the surface waters in the planning area ranges from approximately 4 to 18 micrograms per liter (MWD, CAP, SRP). Drinking water providers will be tasked with mitigation of high arsenic levels within the planning period.

3.5.3 Aquifer Water Quality Standards

ADEQ has established numeric water quality standards for aquifers using a procedure that is similar to that which has been used for surface waters. However, there is one exception; all aquifers in Arizona have been classified for drinking water protected use by statute. Reclassification is possible only for the following:

- Hydrologically isolated aquifers,
- Aquifers that are not being used for drinking water, or
- If the public benefits significantly outweigh the public costs for allowing degradation of an aquifer below standards.

No aquifers in the planning area have been reclassified, and reclassification is unlikely. All aquifers are presently being used for drinking water, and no hydrologically isolated aquifers are known to occur naturally in the planning area. However, reclassification is theoretically possible for parts of aquifers that can be isolated by artificial means.

Water quality standards for aquifers that have been classified for the drinking water protected use are the same as MCLs as primary drinking water standards. These standards include the following:

- Microbiological constituents,
- Inorganic chemicals,
- Turbidity,
- Organic chemicals,
- Pesticides,
- Polychlorinated biphenyls,
- Radionuclides, and
- Volatile organic chemicals.

The MCL for arsenic was revised by U.S. EPA in November 2001 to 10 micrograms per liter. The new MCL will impact the use of groundwater from wells where typical arsenic concentrations are above the 10 micrograms per liter or the water is used as a direct source of drinking water. Arsenic concentrations above the new arsenic MCL have been reported throughout the planning area.

No aquifer standards have been established for those constituents for which secondary MCLs, guidance levels, or action levels have been established. For reclassified aquifers, the standards would be established by rule.

Aquifer water quality standards are used as the basis for regulating discharges to aquifers and to guide remedial actions in contaminated aquifers. Discharges to aquifers that are regulated under the Aquifer Protection Permit program are not allowed if they create a violation of standards at an applicable point of compliance. Remedial actions are also required to attain aquifer water quality standards to the extent practicable.

3.6 REFERENCES

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Dam Fact Sheets, 1998, United States Department of the Interior, Bureau of Reclamation.

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U.S. EPA, 2000, Office of Groundwater and Drinking Water, www.epa-gov.com/safewater/arsenic.html.

POINT SOURCE PLAN

The objective of the Point Source Plan is to identify the preferred wastewater collection and treatment, and effluent reuse or disposal systems for the study area. Applicable regulations and permit requirements are discussed with respect to their role in wastewater system planning. This is followed by specific plans developed for each community in the Study Area.

There are two processes to add or modify a wastewater treatment facility, which is not currently described in the MAG 208 Water Quality Management Plan, to the Plan: The MAG 208 Amendment Process and the MAG 208 Small Plant Review Process. A description of each process for making changes to the MAG 208 Plan is provided in this section.

Discharges from storm sewer collection systems in urban areas are regulated under criteria defined in Chapter 5, NONPOINT SOURCE PLAN.

4.1 PERMITS AND PROTECTED USES

The regulatory framework for management of water quality is comprised of permit compliance and monitoring of protected uses. This section describes the programs that will be in effect during the planning period.

The ADEQ defines, monitors, and enforces water quality standards for protected uses of surface waters, aquifers, and public water supplies. These uses and their associated standards are discussed in Section 4.1.6. The total maximum daily loads (TMDL) program is a program that has been established since the last 208 Plan revision. This program is another tool that allows the State to establish pollutant loads permissible for water quality limited surface waters bodies.

The permit framework for point source management has changed. The framework consists of three primary elements consisting of NPDES, APP, and Reclaimed Water. The administration of the NPDES program has not changed substantially. However, the State of Arizona is seeking primacy for administration of the AZPDES program. On December 4, 2001, the Governor's Regulatory Review Council approved new rules to implement the permitting program passed in the 2001 session of the Arizona Legislature. Currently, USEPA Region 9 is considering the submittal package forwarded in early January 2002. ADEQ anticipates program approval by July 1, 2002. However, the APP and Reclaimed Water Permit program rules were recently revised and are discussed in Section 4.1.7. In addition, a new rule has been added that addresses water quality management planning.

The relationship of protected uses and permits is reflected in Table 4.1.

Table 4.1	Protected Uses and Associated Permits MAG 208 Water Quality Management Plan Update		
	Unified Water Quality Permit Process		
NPDES	**APP**	**Reuse**	**Water Quality Management Planning**
SWQS	AWQS	Reclaimed Water Quality Standards	APP
TMDL			208 Consistency

4.1.1 NPDES Permits

The National Pollutant Discharge Elimination System (NPDES) permit program is established by Section 402 of the Federal Clean Water Act (CWA). The NPDES permit program regulates discharges of pollutants into federally designated navigable waters referred to as "Waters of the United States". The United States Environmental Protection Agency (EPA) is responsible for regulating the NPDES permit program unless the EPA has approved a State NPDES program. Arizona is currently working to revise statutory authority and develop program rules to obtain EPA approval to manage the NPDES program locally. Currently, many NPDES permits are researched and drafted by ADEQ and issued by the EPA.

The purpose of the NPDES and AZPDES permit programs is to regulate the quality of point source discharges into "Waters of the United States". The term "Waters of the United States" has been the subject of several definitions. The following is per 40 CFR §122.2:

> Waters of the United States or waters of the U.S. means:
>
> (a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
>
> (b) All interstate waters, including interstate "wetlands";
>
> (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands", sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
>
> (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes;
>
> (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
>
> (3) Which are used or could be used for industrial purposes by industries in interstate commerce;
>
> (d) All impoundments of waters otherwise defined as waters of the United States under this definition;

(e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;
(f) The territorial sea; and
(g) “Wetlands” adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Based on these criteria, discharges to the Salt, Verde, Gila, and Agua Fria Rivers, tributaries to these rivers including typically dry washes, and several lakes and canals within the planning area are subject to the NPDES and AZPDES permit program provisions.

The ADEQ has established Surface Water Quality Standards as required to meet the goals of the federal CWA and to protect the quality of the surface waters in the state. The EPA incorporates the SWQS and federal regulation related to surface water quality and effluent discharge quality into the NPDES and AZPDES permits. Pollutant levels established by the NPDES and AZPDES permit programs vary among wastewater reclamation facilities depending upon the designated use of the receiving water. The NPDES and AZPDES permits include monitoring requirements for chemical and biological constituents. Permits are typically issued for a term of five years. Table 4.2 provides a listing of the current NPDES permits in the planning area.

Table 4.2 Current NPDES Permits in Planning Area
MAG 208 Water Quality Management Plan Update

Permit Number	Facility Name	Expiration Date	Receiving Water
AZ0023159	APS – West Phoenix Power Plant	01/21/04	SRP Irrigation Lateral
AZ0023281	Avondale, City of – Wastewater Plant	10/26/03	Gila River
AZ0024724	Blue Horizons WWTP	In Process	Roosevelt Irrigation Canal
AZ0022900	Buckeye, Town of	10/25/04	Arlington Canal
AZ0024074	Cave Creek, Town of – WWTP	01/18/02	Cave Creek Wash
AZ0023124	Foothills Community	01/18/02	Unnamed Wash – Tributary To Gila River
AZ0024020	Fountain Hills Sanitary District	In Process	Powder Wash – Tributary to Salt River
AZ0020231	Gila Bend, Town of	07/02/04	Gila River
AZ0023469	Glendale, City of – Cholla WTP	02/28/04	Arizona Canal
AZ0022357	Goodyear, City of	02/21/05	Gila River
AZ0023582	Goodyear, City of – Estrella WWTP	6/13/05	Corgett Wash – Tributary to Gila River
AZ0000108	Lockheed Martin Tactical Defense Systems (aka Loral)	10/25/04	Unnamed ditches – Tributary to the BID

Table 4.2	Current NPDES Permits in Planning Area MAG 208 Water Quality Management Plan Update		
Permit Number	**Facility Name**	**Expiration Date**	**Receiving Water**
AZ0024031	Mesa, City of – NWWRP	11/31/01	Salt River
AZ0024210	NIBW Area 12 (Motorola)	05/08/03	SRP irrigation lateral Tributary to McKellips Lake
AZ0023868	One Camelback, Incorporated	12/06/06	Storm sewer – Tributary to Salt River
AZ0024139	P.V. Water Company – NIBW Cleanup	12/11/01	Arizona Canal
AZ0020559	Phoenix, City of – 23rd Avenue WW Plant	12/31/03	Salt River
AZ0020524	Phoenix, City of – 91st Avenue WW Plant	12/31/03	Salt River
AZ0024465	Phoenix, City of – Cave Creek WRP	01/23/05	Tributary to Cave Creek Wash
AZ0023434	Phoenix, City of – Deer Valley WTP	07/24/03	Arizona Canal
AZ0023426	Phoenix, City of – Squaw Peak WTP	07/24/03	Arizona Canal
AZ0023442	Phoenix, City of – Val Vista WTP	07/24/03	Southern Canal
AZ0023540	SRP – Kyrene Generating Station	12/31/02	Western Canal
AZ0024341	SRP – Production Wells	10/30/04	SRP canals
AZ0023558	SRP – Santan Generating Plant	12/31/02	SRP irrigation lateral – Tributary to Western Canal
AZ0023248	Tempe, City of – Kyrene Reclamation Plant	01/02/03	Salt River
AZ0023451	Tempe, City of – Papago Water Treatment Plant	10/25/03	Papago Park Pond – Tributary to Salt River
AZ0020338	Tolleson, City of – Wastewater Utilities	11/01/04	Salt River
AZ0024457	United Dairymen of Arizona	10/25/04	SRP irrigation lateral
AZ0022730	United Metro Materials – 15th Avenue Aggregate Pit	01/05/06	Salt River
AZ0110469	USAF – Luke AFB Auxiliary Field (Gila Bend)	10/25/04	Quilitosa Wash – Tributary to Gila River
AZ0024171	West Osborn Complex	01/08/03	Grand Canal
AZ0023272	El Mirage, City of – WW Plant	In Process	Agua Fria
AZ0023531	SRP – Agua Fria Generating Plant	12/31/02	SRP Irrigation lateral #20
AZ0110221	USAF – Luke AFB (Litchfield)	05/11/01	Agua Fria
AZ0020044	Wickenburg, Town of	10/25/04	Hassayampa River

EPA is developing rules that will regulate discharges from sanitary sewer collection systems. These discharges are called sanitary sewer overflows. Currently, EPA plans to implement the rules through NPDES permits. Implementation will require owners and operators of sanitary sewer collection systems to develop capacity, management, operation and maintenance (CMOM) programs.

4.1.2 Aquifer Protection Permits

The Aquifer Protection Permit (APP) program was established by the Environmental Quality Act of 1986 (A.R.S. § 49-101, *et seq.*) and implemented by rule in 1989. The purpose of the APP program is to protect the groundwater quality and public health from potential environmental risks posed by the facilities that discharge pollutants to the land surface, underlying soil, or groundwater that have the potential for reaching an aquifer. The APP permitting requirements are determined based on the type of facility or land use, capacity of the facility, and/or the type of discharges that facility will produce. The most crucial requirements for obtaining an APP are demonstrating that the Best Available Demonstrated Control Technology (BADCT) will be used to minimize the discharge of pollutants, Aquifer Water Quality Standards will not be violated at a point of compliance, and that the facility possesses the financial and technical capability to comply with the permit conditions.

The applicant can submit a request for "Determination of Applicability" to the ADEQ to determine if they qualify for a General APP rather than an Individual APP. The determination is generally made within 45 days after the receipt of the request. In the past, the general APP was issued by rule and did not require an application. However, the revised APP rules provide 4 types of general permits. Only Type 1 General Permits allow a facility that meets the general permit requirements to be automatically permitted and allowed to operate under specific conditions such as Best Management Practices (BMPs). Sewage collection systems are included as a Type 4 General APP under the revised APP rules.

A facility or activity that requires an Individual APP can schedule a pre-application meeting with the ADEQ to discuss the permit requirements. The pre-application meeting provides an opportunity to inform the ADEQ about the facility design and operation, and to discuss anticipated permit requirements.

The ADEQ established licensing time frames that became effective in 1999 for the permits that they administer. The licensing time frames dictate the maximum amount of time the ADEQ has to complete their review and approve or deny the APP application. The licensing time frames cover two review components including the Administrative Completeness Review (ACR) and Substantive Review (SR). The ACR is used to determine that the applicant has submitted all the required application components and the application is complete. The ACR time frame is 35 business days but may be suspended if the application is deemed incomplete. The ACR licensing time frame is suspended until the applicant submits the additional information requested by ADEQ. The SR time frame begins when the application has been found to be complete and correct. The SR licensing time frame varies from 186 to 295 business days dependent on whether the facility is standard or complex and if a public hearing is required. The SR is suspended if the ADEQ determines that additional information is required to complete the application review.

The APP application should include the following general information:

- Name and mailing address of the applicant, facility owner, and facility operator,
- Legal description of the facility location,
- Operating life of the facility, and
- Any Federal or State environmental permits issued to or applied for by the applicant.

The APP application is required to include:

- Topographic map showing facility layout and surrounding area,
- Facility site plan, and
- Facility design plans including design details relevant to discharge control and BADCT.

The applicant must characterize and quantify the discharge by providing:

- Chemical, biological, and physical characteristics of discharges,
- Rates, volumes, duration, and frequency of discharge,
- Material safety data sheets (MSDS) for all chemicals used in the operation and treatment processes, and
- Location of past and proposed discharges.

The applicant is required to demonstrate that AWQS will not be violated at a point of compliance and, if a pollutant level has already been exceeded, that no further degradation of the aquifer will occur due to the proposed project. A full description of the BADCT to be employed including a description of considerations leading to the BADCT selection will be submitted.

The applicant must demonstrate the technical capability to design, construct, and operate the sewage treatment facility according to the conditions of the permit. All professional documents including plans, specifications, and reports in support of the permit application and related to the design and construction of the sewage treatment facility must be prepared and sealed by a registrant of the Arizona State Board of Technical Registration. Technical capability is demonstrated for each person involved in the design, construction, and operation of the facility by providing relevant licenses, certifications, professional training, and work experience. The demonstration of technical capability also requires the names of the individuals responsible for the design, construction, operation, and closure of the facility and basis for the individual's technical capability.

The applicant must also demonstrate the financial capability to construct, operate, close, and maintain post closure care of the facility. To demonstrate financial capability, the applicant must submit the estimated cost of construction, operation, closure, and post closure care. The applicant must also provide a statement from the organization's chief financial officer that indicates the applicant is financially capable of meeting the costs of construction, operation, closure, and post closure.

The ADEQ also requires detailed information concerning alert levels, discharge limitations, monitoring requirements, contingency plans, and closure and post closure. The ADEQ may require the applicant to provide information concerning compliance schedules and temporary closures. A hydrogeologic study is typically required to define the discharge impact area for the operational life of the facility and to demonstrate that the facility will not violate AWQS.

The APP may set requirements for pollutant alert levels. The alert levels are based on site-specific conditions described in the application. The alert level may be based upon a pollutant that indicates the potential appearance of another pollutant. Alert levels are usually set at 80 percent of a discharge limit and aquifer water quality limit (e.g. aquifer water quality standard). The APP may prescribe measurement of an alert level at the point of release, point of compliance, or any intervening point. The APP requires notification of the ADEQ and implementation of the appropriate contingency plan if an alert level is exceeded.

The APP requires the permittee to conduct any monitoring activity necessary to assure compliance with any other APP condition and applicable water quality standards. The permittee is also required to report the results of monitoring activities to the ADEQ. The permittee must also notify the ADEQ within five days after the permittee becomes aware of a permit condition violation or an exceedance of an alert level with a written report of the violation of a permit condition or alert condition submitted within 30 days of the incident.

The APP requires that a contingency plan be implemented in the event that a discharge results in a violation of a permit condition, violation of AWQS, an exceedance of an alert level, or imminent and substantial endangerment to the environment or public health. The contingency plan will provide emergency response on a 24-hour basis in the event that a condition arises that results in imminent and substantial endangerment of the environment and public health. An emergency coordinator will be designated for the activation of the contingency plan and emergency response measures. The emergency response coordinator is required to notify the ADEQ immediately in the event that emergency response measures are taken or those portions of a contingency plan that addresses an imminent and substantial endangerment are activated.

Certain facilities have been given class exemption status including facilities that treat, store, or dispose of hazardous waste, have a permit, or have been issued an interim status pursuant to the Resource Conservation and Recovery Act or hazardous waste management rules pursuant to A.R.S. § 49-922. Underground storage tanks containing a regulated substance per A.R.S. § 49-1001, solid waste disposal facilities per A.R.S. § 49-701.01 located in unincorporated areas that serve four or fewer households, and land application of biosolids complying with 18 A.A.C. 13, Article 15 are also exempt. Additional facilities that are exempt from the APP program requirements are listed in A.R.S. § 49-250.

Table 4.3 provides a listing of the APPs within the planning area as of October 2000.

Table 4.3 Current Aquifer Protection Permits in Maricopa County
MAG 208 Water Quality Management Plan Update

Permit Number	Facility Name	APP Effective Date
100091	Peoria, City of – Beardsley Road Sewerage Mgmt. System	6/30/2000
100140	Chandler, City of – WWRF	08/26/1997
100197	Rio Verde Utilities	12/01/1994
100243	Surprise, Town of – Sun Village Sewage Plant	10/01/1996
100254	Mesa, City of – Southeast Water Reclamation Plant	10/21/1993
100369	Mesa, City of – NW Water Reclamation Plant	06/18/1997
100385	Glendale, City of – Arrowhead Ranch WWTP	05/03/1995
100395	Gilbert, Town of – Parsons Gilbert Association	06/16/1998
100405	Tempe, Town of – Kyrene Plant	07/21/2000
100557	Sun Lakes WWTP – Pima Utilities	06/30/1995
100563	USAF-Luke AFB Litchfield Park	04/27/1999
100564	USAF-Williams AFB Chandler	08/30/1996
100573	Avondale, City of – Wastewater Treatment Plant	02/12/1991
100574	Buckeye, Town of – WWTP	06/10/2000
100576	Gila Bend, Town of- WWTP	05/01/2000
100578	Phoenix, City of – 23rd Avenue WWTP	04/29/1999
100603	Citizens Utilities – Sierra WWTP	08/10/2000
101563	Fountain Hills San District	10/04/1996
101969	Salt River Valley Water Users Assoc.- Granite Reef USR	08/13/1991
103308	Ocotillo Mgmt. Group – USR Facility	10/21/1991
102633	Scottsdale, City of – Water Campus WRP	07/02/1997
102667	Sun City West WWTP	08/11/1994
102716	Gilbert, Town of, USR	09/28/1993
102865	Chandler, City of – Effluent Treatment and Recharge Facilities	11/10/1994
102889	MCT Correctional Treatment Facilities, WWTP	09/08/1994
102996	Arizona Factory Shops WWTP	09/19/1997
103130	Cave Creek, Town of – WWTP	05/01/1998
103170	Chandler, City of – Airport Reclamation Plant	11/26/1997
103205	Goodyear, City of – Recharge Project/ SAT Facilities	03/28/1997

Table 4.3	Current Aquifer Protection Permits in Maricopa County MAG 208 Water Quality Management Plan Update	
Permit Number	**Facility Name**	**APP Effective Date**
103259	Anthem, Arizona	03/23/1999
103320	Phoenix, City of – Cave Creek WRP	12/14/1998
103339	Gilbert, Town of – Greenfield/Guadalupe Recharge Facility	03/16/1998
103580	Glendale, City of – West Area WWRP	02/16/1999
103611	Glendale, City of – West Area Aquifer Recharge Facility	03/16/2000
103681	Sun Lake Village WWTP	01/20/2000
101836	Cotton Lane RV and Golf Resort WWTP	03/18/1999
103182	Paradise Peak West WWTP	06/29/2000
102424	AMCOR Investments – Estrella WWTP	10/26/1992
103226	ADDA/ASPC – Lewis WWTP	12/26/1997
103615	Pebble Creek Phase SW Retention/Vadose Zone Well	04/14/1999
102478	Surprise, Town of - South Water Reclamation Facility	11/10/1997

4.1.3 BADCT Requirements

The Environmental Quality Act (ARS 49-243B.1.) requires that all domestic wastewater and disposal facilities requiring an APP use the Best Available Demonstrated Control Technology (BADCT) as part of their wastewater treatment process. “Best” is defined as the optimum method for the intended purpose. “Available” refers to being commonly procurable. “Demonstrated” is defined as proven reliability under comparable circumstances. “Control Technology” is defined as a wastewater treatment process or pollutant concentration that represents the result of a selected treatment process. The overall objective of BADCT is to reduce the pollutant load on the state’s aquifers to the greatest extent that is technically feasible.

BADCT addresses procedures for determining the design alternatives for wastewater treatment facilities. BADCT requires all parties who treat wastewater to implement the best feasible treatment technology for the specific site. All wastewater treatment facilities, regardless of flow rate, are required to obtain an APP, however many facilities may qualify for general APPs. Wastewater treatment facilities, surface impoundments, sewage/sludge ponds, septic tanks of capacities greater than 3,000 gallons per day, point source discharges to navigable waters, and land treatment facilities are required to obtain an individual APP with BADCT incorporated into the design. This requirement applies to all new and existing facilities. While underground storage facilities that recharge effluent are required to adhere to the APP process, they are not required to demonstrate BADCT. Only the water reclamation plant that produces the effluent to be recharged is required to demonstrate BADCT as part of the APP process.

In evaluating BADCT for a treatment plant, the ADEQ considers pollutant removals achieved and other impacts due to the site characteristics and operational processes of recharge facilities that receive effluent. Site-specific factors that may influence BADCT include hydrogeologic characteristics, soil properties, vadose zone properties, depth to groundwater, location, and quality of surface water, and climate. However, reduction of pollutant discharges to an aquifer based solely on the site-specific characteristics does not, in itself, constitute BADCT.

New facilities, whose construction or contracting began after August 13, 1986, are required to implement BADCT. Existing facilities are to be evaluated for economic and technical feasibility of retrofitting the facility with more effective discharge controls. BADCT is determined by starting with an effluent limit based on the application of treatment technologies to meet “optimum” pollutant reductions. Table 4.4 provides a listing of the current required effluent water quality requirements. The fecal coliform concentrations are for sewage treatment facilities with a design flow greater than 250,000 gallons per day. For sewage treatment facilities with design flows less than 250,000 gpd, the fecal coliform limits are 200 cfu/100 mL (seven sample median) and 800 cfu/100 mL (single sample maximum), if the depth to groundwater is greater than 20 feet below land surface and the facility is not located above karstic or fractured bedrock.

As part of the Unified Water Quality Permit Process, the ADEQ adopted BADCT requirements for new sewage treatment facilities. The design review of sewage treatment facilities has been consolidated into the APP application review process. The BADCT requirements are defined within the rules for secondary treatment, pathogen removal for new facilities and major modifications to older facilities. The APP rule also establishes four types of general permits that have varying notification requirements. The modifications to the APP process better defines the design standards and monitoring requirements for small on-site wastewater treatment systems. The APP rules took effect in January 2001.

Table 4.4 BADCT Effluent Limits
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Parameter	Value
Fecal Coliform, CFU/100 mL 7-sample median Single sample maximum	 2.2 <23
Total Nitrogen as N, mg/L	10 (5-month rolling geometric mean)
BOD_5, mg/L 30-day average 7-day average	 <30 <45
TSS, mg/L 30-day average 7-day average	 <30 <45
pH, Standard Units	6 to 9

Table 4.4 BADCT Effluent Limits MAG 208 Water Quality Management Plan Update	
Parameter	**Value**
Regulated Constituents (R18-11-406(B) through (E)	Aquifer Water Quality Standard
Hazardous Substances	Safe Drinking Water Act MCL
Hazardous Substances without MCLs	Action level or concentration without MCLs representing 1×10^{-6} cancer risk, whichever is less
Hazardous Substances pursuant to ARS 49-243.D & I	None detectable

These optimum limits may be modified by the application of site characteristics and other specific pollutant control processes while considering engineering feasibility, water conservation, non-groundwater environmental effects, and cost. Regardless of the BADCT selected, facilities may not violate AWQS at the applicable point of compliance. The principal processes impacted by BADCT requirements for most water reclamation plants are disinfection, turbidity removal, and nitrogen removal.

Historically, effluent disinfection has been accomplished by chlorination. Though effective disinfection is accomplished, residual chlorine can combine with organic material to form trihalomethanes (THMs), a number of which are suspected to be carcinogens. Alternate disinfection technologies include chlorination followed by dechlorination, bromine chloride, and chlorine dioxide. BADCT design for new facilities discourages the use of chlorine derivatives for treatment uses. However, when it is used, the design must also include the final treatment process of dechlorination, in order to reduce the formation of THMs in the receiving waters. Ozone and ultraviolet (UV) disinfection are the preferred practice for new facilities. For large plants, the UV process is probably less expensive.

Turbidity removal typically is accomplished by filtration. Most filtration at water reclamation plants is accomplished by granular media or diatomaceous earth filtration. Filtration is considered to be an available and established wastewater treatment technology. BADCT stipulates that in most cases site-specific characteristics will modify turbidity requirements. However, turbidity will usually not be a pollutant of concern for discharge to groundwater due to the tertiary filtering capacity of the granular soils in the vadose zone. In some extreme cases where the water table is at a depth less than 20 feet and the soil substrate is a coarse sand, gravel, or cobbles, turbidity removal by filtration may be incorporated into BADCT. It may be necessary to provide chemical addition facilities such as polymers or coagulants to meet the turbidity removal criteria when the conventional treatment process is not maintaining the removal goals.

Nitrogen related compounds, specifically ammonia and nitrates, must be removed to levels below 10 mg/L as N to meet BADCT. In order to denitrify wastewater, the nitrogen in the wastewater must be converted to the nitrate rather than ammonia, ammonium, nitrite, and organic nitrogen that are the typical forms of nitrogen found in primary effluent. The conversion of the primary effluent nitrogen forms to nitrate is the process of nitrification. Denitrification involves biological processes where denitrifying bacteria use the nitrate in the wastewater as a food source. The nitrification-denitrification process is carried out in either suspended growth reactors or fixed growth reactors. In some cases, removal to below 5 mg/L has been demonstrated.

4.1.4 Reclaimed Water Reuse Permits

The reclaimed water reuse permit program, established in 1985, allows the reuse of reclaimed water for a variety of applications such as agriculture, urban lakes, golf course irrigation, ponds, and industrial uses. Water reclamation plants are required by rule to have a reuse permit for the release of reclaimed water for reuse purposes.

The ADEQ revised the reclaimed water permit rules to simplify the permitting process thereby encouraging its use and conserving potable water resources for human consumption and domestic purposes. The rule places the burden of assuring reclaimed water quality on the facility where wastewater is treated. Monitoring and reporting requirements are conditions of the individual APP for the sewage treatment facility or alternative source. During the APP engineering review, the sewage treatment facility may be classified regarding the quality of reclaimed water produced. End users will be able to apply for a general permit that relies on site controls in the application and use of reclaimed water to ensure protection of human health and the environment. General permits match site and water management requirements with the particular quality of reclaimed water. Although individual permits remain available, most end users of reclaimed water are expected to opt for the general permit approach if they can meet the conditions of the general permit.

A companion rule adopted Reclaimed Water Quality Standards and established five classes of reclaimed water expressed as a combination of minimum treatment requirements and a limited set of numeric reclaimed water quality criteria. Class A reclaimed water is required for reuse applications where there is a relatively high risk of human exposure to potential pathogens in the reclaimed water. For uses where the potential for human exposure is lower, Classes B and C are acceptable.

The Reclaimed Water Quality Standards rule includes two “+” categories of reclaimed water, Class A+ and Class B+. Both categories require treatment to produce reclaimed water with a total nitrogen concentration of less than 10 mg/L. These categories of reclaimed water will minimize concerns over nitrate contamination of groundwater beneath sites where reclaimed water is applied. As a result, the general permits for the direct reuse of Class A+ and Class B+ reclaimed water do not include nitrogen management as a condition of the reuse.

The ADEQ recognized that reclaimed water may change hands between the place of treatment and the final end user. Therefore, the rule provides permitting options for reclaimed water blending facilities and reclaimed water agents. A reclaimed water blending facility receives reclaimed water of a certain class and improves the quality by blending the reclaimed water with water from one or more additional sources. The improved quality of the resultant reclaimed water allows more or different reuse applications than the original quality would have allowed. The rule also provides an option for a person or entity to act as a reclaimed water agent for multiple end users. The reclaimed water agent operates under a general or individual reclaimed water permit and allows end users to receive reclaimed water for appropriate reuse applications without having to notify the ADEQ to obtain permit coverage.

Type 1 General Permits do not require any notice to the ADEQ. Type 2 and Type 3 General Permits require an applicant to file a notice with the ADEQ, but only Type 3 General Permits require an applicant to receive a written verification from the ADEQ before operating. Type 2 and Type 3 General Permits and individual permits are valid for five years. A Type 1 General Permit does not expire if the general permit conditions are continually met.

This rule also includes a Reclaimed Water Individual Permit for the reuse of industrial wastewater that contains a component of reclaimed water from a sewage treatment facility. This permit also applies when industrial wastewater is treated and used in the production and processing of any crop or substance that may be used as human or animal food. The ADEQ does not intend this requirement to apply to industrial wastewater that is recycled or used in industrial processes. Rather, this permit applies where the industrial wastewater is provided for a reuse application beyond the normal industrial process. The rule makes clear that use of reclaimed water in an industrial workplace is not governed if Occupational Safety and Health Administration or Mine Safety and Health Administration requirements apply.

There are two main categories of reclaimed water reuse including direct nonpotable reuse and indirect reuse. Direct reuse consists of irrigation and makeup water for urban lakes. Indirect reuse typically involves aquifer recharge and recovery. Reclaimed water quality requirements for irrigation and recharge follow the SWQS and AWQS requirements. Direct potable reuse of reclaimed water is prohibited by law.

The indirect reuse of reclaimed water usually involves recharge to an aquifer for storage and future recovery. The reclaimed water is typically allowed to infiltrate through the dry soils above the aquifer allowing for additional treatment. Recharge projects using reclaimed water are required to obtain an APP. The APP requirements and procedures are discussed in Section 4.1.2 of this document. Recharge projects are also required to obtain an Underground Storage Facility Permit and Water Storage Permit from the ADWR. However, recharge projects do not require a reclaimed water reuse permit.

Reuse has gained popularity in light of water conservation requirements and incentives, and increasingly stringent stream discharge standards. Water conservation measures established by the ADWR for the Phoenix AMA encourage the reuse of reclaimed water in lieu of groundwater supplies. Reclaimed water may be used for irrigation without recharging an aquifer. Reclaimed water quality requirements vary for different irrigation uses, but generally they are less stringent compared to those governing groundwater recharge. Crops that may be consumed raw can be irrigated with Class A reclaimed water. Golf courses, parks, and other public areas are restricted to irrigating during off-hours to avoid direct human contact. In addition, public areas irrigated with reclaimed water are required to post warning signs. Irrigation pipe is color coded or labeled to indicate nonpotable water. Reuse of industrial wastewater is not subject to reuse regulations if it does not contain or originate from domestic human waste, or if it is not used for processing food products. Due to the wide variety of industrial reuses, quality criteria are determined on an individual basis.

Table 4.5 provides a listing of the current reclaimed water permits in the planning area.

Table 4.5 Current Reclaimed Water Permits
MAG 208 Water Quality Management Plan Update

Permit Number	Facility Name	Permittee
R103236	ADOC/ASPC – Lewis	Arizona Department of Corrections
R103259	Anthem Phoenix	Anthem Arizona
R102996	Arizona Factory Shops	
R100388	Arizona Public Service Company	Arizona Public Service Company
R100523	Avondale, City of – WWTP	City of Avondale
R100351	BMSC-Carefree Sewer Co.	Boulders Joint Venture
R103130	Cave Creek	Town of Cave Creek
R102865	Chandler, City of	City of Chandler
R103170	Chandler, City of – Airport WWRP	City of Chandler
R100140	Chandler Ocotillo	City of Chandler
R103103	Chuparosa Golf Course	GNP Holdings, LLC
R103696	Clear Skies West	Craig Emerson, 371 on 167, LLC
R101836	Cotton Lane RV and Golf Course	Roles Inn of America
R104136	Dove Valley Ranch Golf Club	Dove Valley Ranch Golf Club Association
R101943	El Mirage, City of	City of El Mirage
R102424	Estrella WRP	City of Goodyear
R101563	Fountain Hills Sanitary District	Fountain Hills Sanitary District
R100393	Gilbert, Town of – WWTP	Town of Gilbert
R100385	Glendale, City of – Arrowhead Ranch	City of Glendale

Table 4.5 Current Reclaimed Water Permits MAG 208 Water Quality Management Plan Update		
Permit Number	**Facility Name**	**Permittee**
R101324	Goodyear, City of	City of Goodyear
R103711	Grand Horizons RV Resort	Philip Polich
R104022	Holy Redeemer Cemetery	Phoenix Diocese
R100310	Litchfield Park Service Company	Litchfield Park Service Company
R100254	Mesa, City of – SE WWTP	City of Mesa
R102182	Paradise Peak West	Sierra National Corporation
R103615	Pebble Creek Properties	Pebble Creek Properties Ltd. Partnership
R104162	Phoenix, City of – Cashman Park	City of Phoenix
R103320	Phoenix, City of – Cave Creek	City of Phoenix
R104152	Phoenix, City of – Desert Willow Park	City of Phoenix Parks Rec., and Library Dept.
R100579	Phoenix, City of – 91st Avenue, WWTP	City of Phoenix
R104164	Pinnacle High School	Paradise Valley Unified School District #69
R100197	Rio Verde Utilities	Rio Verde Utilities, Inc.
R102439	Ruth Fisher School	Ruth Fisher School District
R100422	Scottsdale, City of – Gainey Ranch	City of Scottsdale
R102633	Scottsdale, City of – Water Campus	City of Scottsdale
R100557	Sun Lakes	Pima Utilities
R100243	Surprise – Litchfield Rd. WWTP	City of Surprise
R104154	Tatum Ranch Golf Club	National Golf Operating Partnership, L.P.
R100405	Tempe, City of – Ken McDonald Golf Course	City of Tempe
R100339	Tolleson, City of	City of Tolleson
R100563	USAFB – Luke	United States Air Force – Luke AFB
R100363	USDOJ – Black Canyon	USDOJ Federal Bureau of Prisons
R104151	Wildfire Golf Club	NPP Golf Associates
R100364	Williams Gateway WWTP	City of Mesa

Table 4.6 summarizes the applicable reclaimed water requirements for open access irrigation.

Table 4.6 Reclaimed Water Quality Standards
MAG 208 Water Quality Management Plan Update

	Class A+	**Class A**	**Class B+**	**Class B**	**Class C**
Treatment Requirements	Secondary Treatment Filtration Nitrogen Removal Disinfection[1] Chemical Addition[2]	Secondary Treatment Filtration Disinfection[1] Chemical Addition[2]	Secondary Treatment Nitrogen Removal Disinfection[3]	Secondary Treatment Disinfection[3]	Secondary Treatment with Multiple Cell Stabilization Ponds[1]
Pathogen Removal, CFU/100 mL					
7-Sample Median	None Detectable	None Detectable	200	200	1000
Single Sample Maximum	<23	<23	800	800	4000
Turbidity, NTU					
24-Hour Average	2	2			
Not to Exceed at any time	5	5			
Total Nitrogen as N, mg/L					
5-Sample Geometric Mean	<10		<10		
pH, Standard Units			6.0 to 9.0	6.0 to 9.0	
Retention Time, days					20

1. Disinfection criteria is based on the detection of fecal coliform organisms.
2. Chemical addition facilities must be available to provide the capability of polymer or coagulant addition if the 24-hour turbidity criteria is not met.
3. Disinfection criteria is based on the detection of *e. coli* organisms.

APPs define requirements for effluent quality, storage, and monitoring. The individual APPs require reclamation facilities to provide storage of effluent for periods when no demand for direct reuse exists or when effluent quality does not meet the reclaimed water quality standards (R18-9-703.C.2.d). Irrigation sites must prevent runoff of reclaimed water mixed with stormwater.

4.1.5 Underground Water Storage and Recovery Program

In 1986, the Arizona legislature established the Underground Water Storage and Recovery Program to allow the storage of surplus water supplies underground for recovery and use at a later time. In 1994, the legislature developed a unified program to consolidate the various water storage programs by enacting the Underground Water Storage, Savings and Replenishment Act. Two types of facilities are used for the storage of excess water supplies including underground storage facilities (USF) and groundwater savings facilities (GSF). The distinction between the two is that groundwater savings facilities are using a source of water for their needs, typically irrigation, in place of groundwater, thereby creating a savings. By permitting and implementing a storage facility, applicants are able to accumulate storage credits for use in the future.

There are two types of USF that are permitted by the ADWR including constructed and managed USF. A constructed USF consists of a facility that includes constructed features that contain recharge water to allow infiltration to occur within the constructed boundaries of the facility. A managed facility employs the use of the unmodified natural channel of a stream to recharge water, therefore, construction at a managed facility is minimal.

The storage credits received for the recharge of effluent are governed differently than other source waters. Recharged effluent is credited one hundred percent to a long-term storage account, if storage occurs at a constructed facility. A managed facility recharging effluent receives only 50 percent credit for the volume recharged. Also, credits for effluent recharged at a managed facility cannot be used in demonstration of an assured water supply under the Arizona Groundwater Code. Therefore, the maximum benefit is achieved by recharging at a constructed facility.

The USF permit applicant must demonstrate that they are financially and technically capable of designing, constructing and operating the recharge facility. The ADWR reviews the technical aspects of the permit for such items as unreasonable harm to land and other water users from the proposed project and hydrologic feasibility of the site to store the permitted volume of water. This includes review of the impact analysis for the facility, monitoring plan, plan of operation, hydrology of the site and area, facility design and water quality aspects of the proposed sites.

For a project that would ultimately be recharging large volumes of water and there is limited hydrogeologic data available, the ADWR would suggest that the applicant permit the facility in two stages by first obtaining a pilot permit and then a full scale permit. The pilot permit allows the applicant to collect site-specific data related to the hydrogeologic aspects at the site. The pilot permit allows for recharging 10,000 acre-feet over a two-year period, or approximately 4.46 mgd. It is important to note that receipt of a pilot permit does not guarantee the approval of a full-scale underground storage facility in the future. Table 4.7 provides a listing of the permitted facilities in the planning area that are recharging reclaimed water.

The Water Storage (WS) permit allows the storage of a specified amount of eligible water for later use. The permit requires that the permit applicant has a right to the use of the proposed recharge water, a USF permit has been obtained or is being applied for simultaneously, and the applicant has applied for the necessary water quality permits. The applicant is required to obtain an Aquifer Protection Permit from the ADEQ, if effluent is the source water being recharged. The applicant must show that the source water cannot be used directly to be eligible for receiving long-term storage credits. If this determination is not made, the eligibility is made on a yearly basis.

A recovery well permit is required if the applicant plans on recovering water for future use. If the applicant intends to use the stored water in demonstration of an Assured Water Supply (AWS), the recovery well is required. The applicant must show that the infrastructure exists to recharge and recover water that is being used in demonstration of an AWS.

If stored water is recovered within a one-mile radius (safe harbor) or the annual area of impact of the USF facility, the recovery does not have to be consistent with the goals and management plans of the active management area in which the facility is located. If recovery occurs outside of these areas of impact, then the recovery may be deemed to be inconsistent with the AMA management plan.

Table 4.7 Current USF Permits for Facilities Recharging Effluent
MAG 208 Water Quality Management Plan Update

Facility	Type	Permitted Annual Volume (AF)
City of Surprise/South WWTP	USF	3,584
City of Goodyear WWTP	USF	3,360
City of Chandler/Regional Park	USF	5,600
City of Chandler/Intel	USF	3,100
Del E. Webb/Sun City West	USF	3,042
City of Peoria/Beardsley	USF	2,470
City of Chandler/Ocotillo	USF	2,500
Town of Gilbert	USF	3,314
Pima Utilities	USF	628
City of Mesa Northwest Wastewater Reclamation Plant	USF	8,963

Table 4.7 Current USF Permits for Facilities Recharging Effluent MAG 208 Water Quality Management Plan Update		
Facility	**Type**	**Permitted Annual Volume (AF)**
City of Scottsdale Water Campus	USF	8,400
City of Tempe/Kyrene	USF	3,400
Litchfield Park Service Company/Suncor Farms	GSF	840
Pima Utilities/Sun Lakes	GSF	1,500
Roosevelt Water Conservation	GSF	100,000
TOTAL		**150,701**

4.1.6 Water Quality Standards

In Arizona, the Arizona Department of Environmental Quality (ADEQ) has responsibility for establishing and enforcing water quality standards. There are three sets of relevant standards that have been established:

- Surface waters
- Public water supplies
- Aquifers

The surface and aquifer water quality standards are defined in two categories including narrative and numeric standards. The narrative category provides broad standards that protect the aesthetics and prevent degradation of the water and wildlife. The standards for surface and aquifer waters are discussed in the following sections.

4.1.6.1 Surface Water Quality Standards

As a requirement of the Clean Water Act, ADEQ conducts a triennial review of the Arizona's surface water quality standards and boundaries. The purpose of the Triennial Review is to determine if changes in the surface water standards are required to protect the quality of these waters. The current standards were promulgated in March 2002.

The surface waters within the planning area cover four (4) river basins and seventy-four (74) water body segments as identified in the State Water Quality Assessment Report (305b Report). These surface water body segments include the local surface water bodies described in this chapter, man-made lakes and canals, and intermittent and ephemeral streams. Water quality standards and designated uses for water courses not identified by the State are established by the tributary rule.

4.1.6.1.1 Designated Uses

The pollutant standards for surface waters are established according to the designated use that is existing or obtainable. The ADEQ has defined the following designated uses:

- Domestic Water Source (DWS)
- Full Body Contact (FBC)
- Partial Body Contact (PBC)
- Aquatic and Wildlife, warm water fishery (A&Ww)
- Aquatic and Wildlife, effluent dominated water (A&Wedw)
- Aquatic and Wildlife, cold water fishery (A&Wc)
- Aquatic and Wildlife, ephemeral (A&We)
- Agricultural Irrigation (AgI)
- Agricultural Livestock Watering (AgL)
- Fish Consumption (FC)
- Unique Waters

Most lakes, rivers, streams, and canals in Arizona have at least one designated use, and numeric standards have been established for each use. With the exception of lakes and river reaches above Stewart Mountain Dam (Saguaro Lake) on the Salt River, all perennial water bodies in the planning area are designated for Aquatic and Wildlife-warm water. The Salt River lakes and interconnecting reaches include Aquatic and Wildlife-cold water among their designated uses. Generally, all perennial water bodies are also designated for Full Body Contact.

For the unique water designation of surface waters, standards are established on a case-by-case basis. Surface waters are classified as unique waters by ADEQ rule upon a finding that they constitute an outstanding public resource or that they are associated with a threatened or endangered species or its habitat. No unique waters have been designated in the planning area. However, ADEQ has received nominations for the classification of 7 surface waters as unique waters within the planning area.

Surface waters are classified as “effluent-dependent” by ADEQ rule if they consist primarily of discharges of treated wastewater. Generally, effluent-dependent waters also sustain a Partial Body Contact designated use. The following surface water bodies are designated by ADEQ as effluent-dependent waters in the MAG planning area:

- Agua Fria River (El Mirage Wastewater Treatment Plant (WWTP) to 2 km downstream from the outfall)
- Gila River (Salt River confluence to Gillespie Dam)
- Salt River (23rd Avenue WWTP to Gila River confluence)
- Unnamed Wash (Gila Bend WWTP to the Gila River confluence)

- Unnamed Wash (Luke Air Force Base WWTP to the Agua Fria River confluence)

The ADEQ is currently proposing changes to the EDW definition as part of the Triennial Review process. The EDW definition would be modified to repeal the word “primarily” and require demonstration that the receiving water is ephemeral in the absence of the treated wastewater.

The following surface waters have been designated as DWS by the ADEQ in the MAG planning area:

- Agua Fria River (State Route 169 to Lake Pleasant)
- Apache Lake
- Phoenix area canals (Granite Reef Dam to all municipal WTP intakes)
- Salt River (Granite Reef Dam to 2 km downstream)
- Saguaro Lake
- Salt River (Theodore Roosevelt Dam to the Verde River)
- Salt River (Confluence of Verde River to Granite Reef Dam)
- Bartlett Lake
- Verde River (below Bartlett Dam)

The ADEQ is proposing the addition of Canyon Lake and Lake Pleasant as domestic water sources, as part of the current triennial review. The Tempe Town Lake will also be given designated uses of Full Body Contact, Aquatic and Wildlife Warmwater, and Fish Consumption, as part of the review process.

As part of the Triennial Review process, the tributary rule is being modified. The proposed modifications to the tributary rule include deletion of references to unlisted tributaries as effluent dependent waters (EDW) because an EDW can only be classified as such by rule. The tributary rule is also modified to conform the definition of “aquatic and wildlife (cold water)” and “aquatic and wildlife (warm water)” to revisions to the definition of these designated uses. The proposed modifications include a repeal of application of the nearest downstream surface water quality standards to unlisted tributaries that are neither ephemeral waters or EDWs. In addition, the ADEQ is proposing the addition of definitions for perennial surface waters and intermittent surface waters, and modifications to the definition of ephemeral water.

4.1.6.1.2 <u>Water Quality Standards</u>

Numeric water quality standards for water supply systems, known as maximum contaminant levels (MCLs), have been established for six general categories of contaminants including:

- Microbiological
- Inorganic chemicals

- Turbidity
- Organic chemicals
- Radiochemicals
- Volatile organic chemicals and trihalomethanes

In addition to contaminants for which MCLs have been established, monitoring for other contaminants and characteristics is required for certain types of water systems. Community and non-community water systems are required to monitor for 13 organic contaminants and physical characteristics. Community water systems are required to monitor for 7 corrosivity characteristics. Community and non-transient non-community water systems are required to monitor for 20 unregulated volatile organic chemicals and 13 unregulated synthetic organic chemicals. No enforceable standards have been established for these contaminants and characteristics. However, for many of them, guidance levels have been established in the form of secondary MCLs or action levels.

The ADEQ is proposing to repeal the numeric criteria for turbidity removal and amend the narrative standards to address the impacts of excessive sedimentation of surface waters (or bottom deposits) and suspended solids in the water column. In addition, the triennial review also proposes a modification in the criteria for monitoring bacteria concentrations. The ADEQ proposes monitoring bacteria levels on the basis of *Escherichia* coli (E. coli) in place of the existing fecal coliform indicator.

4.1.6.2 Public Water Supplies

The ADEQ rules for public water supplies, or drinking water standards, have been adopted by ADEQ in accordance with the Federal Safe Drinking Water Act (SDWA). The EPA and ADEQ are developing new standards as a result of the SDWA Amendments of 1996. These rules apply to all public water systems involved in the collection, treatment, storage, and/or distribution of potable water. Public water systems are those which have at least 15 service connections or regularly serve at least 25 persons for at least 60 days per year.

The EPA adopted the MCL for arsenic of 10 micrograms per liter in November 2001. The EPA has indicated that water systems will be required to comply with the change to the MCL by January 2006.

4.1.6.3 Aquifer Water Quality Standards

ADEQ has established numeric water quality standards for aquifers using a procedure that is similar to that which has been used for surface waters. However, there is one exception; all aquifers in Arizona have been classified for drinking water protected use by statute. Reclassification is possible only for the following:

- Hydrologically isolated aquifers,
- Aquifers that are not being used for drinking water, or

- If the public benefits significantly outweigh the public costs for allowing degradation of an aquifer below standards.

No aquifers in the planning area have been reclassified, and reclassification is unlikely. All aquifers are presently being used for drinking water, and no hydrologically isolated aquifers are known to occur naturally in the planning area. However, reclassification is theoretically possible for parts of aquifers that can be isolated by artificial means.

Water quality standards for aquifers that have been classified for the drinking water protected use are the same as MCLs for primary drinking water standards. These standards include the following:

- Microbiological constituents,
- Inorganic chemicals,
- Turbidity,
- Organic chemicals,
- Pesticides,
- Polychlorinated biphenyls,
- Radionuclides, and
- Volatile organic chemicals.

The EPA adopted the MCL for arsenic of 10 micrograms per liter in November 2001. The new MCL will impact the use of groundwater from wells where typical arsenic concentrations are above the 10 micrograms per liter or the water is used as a direct source of drinking water. Arsenic concentrations above the proposed EPA MCL have been reported throughout the planning area.

No aquifer standards have been established for those constituents for which secondary MCLs, guidance levels, or action levels have been established. For reclassified aquifers, the standards would be established by rule.

Aquifer water quality standards and BADCT are used as the basis for regulating discharges to aquifers and to guide remedial actions in contaminated aquifers. Discharges to aquifers that are regulated under the Aquifer Protection Permit program are not allowed if they create a violation of standards at an applicable point of compliance. Remedial actions are also required to attain aquifer water quality standards to the extent practicable.

4.1.7 Unified Water Quality Permit Process

The Unified Water Quality Permit Process (UWQPP) was initiated by the State to reduce the regulatory review burden and eliminate redundancy in the aquifer protection and wastewater facility construction review and reuse permitting processes. The modifications and additions to the existing regulations governing the reuse of wastewater are expected to encourage the reuse of treated wastewater and conserve potable sources for domestic purposes. The new rules took effect in January 2001.

As part of the UWQPP, the APP requirements were amended to incorporate additional general permit classifications and detailed BADCT requirements. The BADCT requirements specify minimum process unit setbacks from property lines, treatment performance requirements, information submittal requirements, application review guidelines, and BADCT requirements for existing facilities, new facilities, or facilities undergoing an expansion. The treatment performance requirements for achieving BADCT include nitrogen and pathogen removal criteria, maintenance of AWQS, and maximum seepage rate from containment structures.

The revisions to the reclaimed water permitting process modified the end user permitting and reporting requirements. The regulations also incorporate technical standards for the conveyance of reclaimed water, and definition and permitting requirements for reclaimed water blending facilities and reclaimed water agents. The producer of reclaimed water will be responsible for the monitoring and reporting requirements related to the reclaimed water. Several types of reclaimed water general permits will be available for the end user dependent on the classification of reclaimed water being used. The monitoring and reporting requirements are included in the individual APP.

Reclaimed water blending facilities can be permitted under a Type 3 Reclaimed Water General Permit that will allow the permittee to receive reclaimed water of a certain classification and improve the quality by blending with other water sources. The reclaimed water agent would also operate under the Type 3 permit that would allow the agent to act as a supplier of reclaimed water for multiple end users. The agent is responsible for the reporting requirements associated with the distribution of the reclaimed water to the end users.

The UWQPP also integrated Clean Water Act Section 208 Water Quality Management Planning with the new Aquifer Protection Permit rules. Under the new rules, the Department shall not publish a Notice of Preliminary Decision to issue an individual permit or amendment for a sewage treatment facility that is not in conformance with the Certified Areawide Water Quality Management Plan and the Facility Plan. Please refer to the appendices for the Water Quality Management Planning Rules and the Water Pollution Control Aquifer Protection Permits Rules.

4.1.8 TMDL Program

The ADEQ is required to establish Total Maximum Daily Loads (TMDL) for lakes, rivers and streams that do not meet water quality based standards as a requirement of Section 303 (d) of the CWA. The water quality limited waters are identified and prioritized according to the pollutants and designated use of the water. For each pollutant identified, the State must determine a TMDL that specifies the amount of pollutant that may be present in a water body without exceeding the water quality standard. The TMDL takes into account the pollutant source, seasonal variation, and a margin of safety. The program goal is to delist waters within 13 years of the first listing. Because the TMDL establishes maximum allocations of pollutants loadings, the NPDES and AZPDES permitting process for point and nonpoint sources is affected by this program.

On August 9, 2001, EPA published a notice in the Federal Register for an 18 month delay of the recently published TMDL Rule. The Federal Register also included a delay for states to submit impaired water lists [303(d)] until October 2002. The modifications would have affected the time frame for completing cleanups of impaired waters and the manner in which polluted waters are given priority. Waters that are drinking water sources or support endangered species would have been given the highest priority status. The states would have been required to submit an Implementation Plan that specifies the actions required to achieve the TMDL, schedule for implementation, monitoring plan, and contingency plan to revise the TMDL if the proposed action was not showing the effectiveness required to meet the schedule compliance goal.

In 1996, the ADEQ began evaluating two watersheds each year to complete the evaluation of the ten watersheds within the State within five years. The watersheds that impact the planning area were evaluated in 1996 and 1997. Each watershed will be evaluated three times during the 15-year time period that began in 1996. The ADEQ will use the 15-year time frame to develop TMDLs and prepare compliance schedules for the water bodies in the State's watershed.

Table 4.8 provides a listing of water bodies in the planning area included on the 1998 Water Quality Limited Waters List (303(d) List) in the planning area. The water bodies are evaluated based on physical and chemical data collected from October 1992 through September 1997. The monitoring data is compared to the numeric and narrative standards to determine if the designated use of the water body was supported or impaired. For a water body to be listed, a standard must be exceeded more than once. Actions are prepared immediately for toxic stressors, however actions for nontoxic stressors are delayed until that watershed becomes active. If the exceedance of a pollutant is caused solely by a natural source, it is not considered a violation of water quality standards.

Table 4.8 Water Quality Limited Waters in the MAG 208 Planning Area, 1998 MAG 208 Water Quality Management Plan Update

Name of Water Body	Segment	Stressor	Designated Use	Source	Action Plan
Gila River	Sand Tank Wash to Painted Rock Reservoir	Chlordane DDT Metabolites Dieldrin Toxaphen	Fish Consumption	Historic use of pesticides	Attempting to define WQARF Remediation Action

Table 4.8 Water Quality Limited Waters in the MAG 208 Planning Area, 1998 MAG 208 Water Quality Management Plan Update					
Name of Water Body	**Segment**	**Stressor**	**Designated Use**	**Source**	**Action Plan**
Gila River	Rainbow Wash to Sand Tank Wash	Chlordane DDT Metabolites Dieldrin Toxaphen	Fish Consumption	Historic use of pesticides	Attempting to define WQARF Remediation Action
Gila River	Centennial Wash to Rainbow Wash	Chlordane DDT Metabolites Dieldrin Toxaphen	Fish Consumption	Historic use of pesticides	Attempting to define WQARF Remediation Action
Gila River	Gillespie Dam to Centennial Wash	Boron Selenium Fecal Coliform Turbidity			Active watershed
		Chlordane DDT Metabolites Dieldrin Toxaphen	Fish Consumption	Historic use of pesticides	Attempting to define WQARF Remediation Action
Gila River	Hassayampa River to Gillespie Dam	Chlordane DDT Metabolites Dieldrin Toxaphen	Fish Consumption	Historic use of pesticides	Attempting to define WQARF Remediation Action
Gila River	Waterman Wash to Hassayampa River	Chlordane DDT Metabolites Dieldrin Toxaphen	Fish Consumption	Historic use of pesticides	Attempting to define WQARF Remediation Action
Gila River	Agua Fria River to Waterman Wash	Chlordane DDT Metabolites Dieldrin Toxaphen	Fish Consumption	Historic use of pesticides	Attempting to define WQARF Remediation Action
Gila River	Salt River to Agua Fria River	Chlordane DDT Metabolites Dieldrin Toxaphen	Fish Consumption	Historic use of pesticides	Attempting to define WQARF Remediation Action
Hassayampa River	Buckeye Canal to Gila River	Chlordane DDT Metabolites Dieldrin Toxaphen	Fish Consumption	Historic use of pesticides	Attempting to define WQARF Remediation Action

Table 4.8 Water Quality Limited Waters in the MAG 208 Planning Area, 1998 MAG 208 Water Quality Management Plan Update					
Name of Water Body	**Segment**	**Stressor**	**Designated Use**	**Source**	**Action Plan**
Painted Rock Reservoir		Chlordane DDT Metabolites Dieldrin Toxaphen	Fish Consumption	Historic use of pesticides	Attempting to define WQARF Remediation Action
		pH Turbidity		Floodplain reservoir	Repeat testing of pH and Turbidity may remove these stressors due to Natural Background Rule
Salt River	23rd Avenue WWTP to Gila River	Chlordane DDT Metabolites Dieldrin Toxaphen pH	Fish Consumption	Historic use of pesticides	Attempting to define WQARF Remediation Action
Bartlett Lake		Dissolved Oxygen Turbidity		New data shows standards exceeded	Added to 303 (d) List

4.2 SELECTED POINT SOURCE PLAN

The Point Source Plan in this 208 Plan Revision is an update of that presented in the 1993 208 Water Quality Management Plan. The Point Source Plan reflects the major advances which have been made by the communities of the Study Area in wastewater management planning. Nearly all of the communities have developed carefully-analyzed, detailed wastewater master plans. The plans have been developed by individual municipalities and agencies, but they reflect a thorough awareness of the water quality management issues facing the region.

Because of the importance of highly-treated effluent or reclaimed water as a source of supply, almost all of the communities in the Study Area have at least considered the possibility of effluent reuse. Because of the cost of distributing water to users, a local approach to reclamation and reuse is in most cases the most cost effective. This has led many communities to plan local, smaller treatment plants to retain the water in their community and minimize the cost of delivering reclaimed water.

The Point Source Plan is based on discussions with the review of planning documents and records provided by the individual MAG member agencies. In addition, the Multi-City

Subregional Operating Group (SROG) was contacted to obtain its regional perspective. The Multi-City SROG consists of the cities of Glendale, Mesa, Phoenix, Scottsdale and Tempe, and operates the regional 91st Avenue Wastewater Treatment Plant. The Point Source Plan is organized to provide individual discussions of each community, so that all of the components of the Plan can be conveniently found in one location in the documents. It is also organized regionally, in six groups: (1) central area (Phoenix), (2) southwest area, (3) northwest area, (4) northeast area, (5) southeast area, and (6) outlying communities beyond the immediate Phoenix area.

The discussion for each community describes:

- Planning area.
- Population and wastewater flow projections.
- Existing wastewater collection and treatment systems.
- Effluent disposal and/or reuse.
- Sludge management.
- Planned improvements.
- Improvement costs.

Information sources included MAG population projections, meetings and discussions with each MAG member community in the study area, and review of the communities' wastewater planning document. The meetings with the communities provided information on waste flows, treatment processes, permits, intergovernmental agreements, and planned facilities. Existing reports provided information on the collection system, treatment facilities, effluent disposal, and effluent reuse.

The MAG 208 Water Quality Management Plan contains three types of population estimates and projections. The three types are:

1. <u>Municipality Resident Population Estimates and Projections *approved* by the MAG Regional Council in June 1997</u> – To cover the planning period of year 2000 to year 2020. In approving these figures, it was noted by MAG that the projections are interim and are subject to the following conditions:
   - The projections were prepared to be consistent with the October 27, 1995 Special Census.
   - These projections have been prepared by MAG to be consistent with the County population control totals developed by the Arizona Department of Economic Security (DES) and approved by the director of DES in January 1997, as required by Executive Order 95-2.
   - The projections were based on planned and proposed development and adopted land use plans.

- These projections should be used with caution. They are subject to fluctuation as a result of recent changes in economic and development conditions.

2. Seasonal Population Projections – The seasonal population data was approved by the MAG Regional Council in June 1997. Seasonal population includes people who are in the local area for up to 6 months. Transient population, people who are in the local area for 2 weeks or less, was not estimated. Since wastewater treatment capacity is needed to serve the seasonal population, these population figures have been included in the 208 Plan. The seasonal population projections are included in the same appendix as the resident estimates and projections.

3. Other Population Projections – As noted by MAG in approving 1997 population estimates and projection, population figures should be used with caution because they are subject to fluctuation as a result of changing economic conditions. In some cases, the MAG approved population projections have not yet taken into account some of the master plans recently approved by local jurisdictions. In other cases, the MAG approved projections may not reflect the same timing of the population growth as identified in approved master plans. Consequently, other population projections are sometimes used in the MAG 208 Plan as appropriate and necessary to adequately address wastewater treatment needs in the region.

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4.2.1 Central Area

4.2.1.1 Phoenix

The Planning Area for Phoenix consists of Regional Analysis Zones (RAZ) 203, 205, 206, 216 through 219, 223 through 228, 241 through 246, 259 through 261, 267 through 271, 275, 276, 283 through 287, 296, 304 through 306, 313 and 314, and is depicted on Figure 4.1. The City of Phoenix is the designated wastewater management agency for this area. Phoenix provides wastewater collection and treatment service to almost all of this area. Some low-density areas, including most of the city west of 67th Avenue and some of the far northern areas are served by septic tanks.

Population and Flow Projections. Table 4.9 presents the 2001 SROG service population and flow projections for the Phoenix municipal planning area.

Table 4.9 Phoenix Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population[1]	Flow, mgd[1]
2000	1,238,253	130.64
2005	1,405,768	148.31
2010	1,582,887	166.99
2015	1,758,456	185.52
2020	1,930,981	203.72

1 Based upon projected SROG service populations and flow, Appendix C, Influent Conditions of 91st Avenue WWTP 25-year Facilities Master Plan, December 2001.

Existing Collection System. All wastewater generated in Phoenix south of the CAP Aqueduct or Jomax Road is collected and conveyed to either the 23rd Avenue or 91st Avenue Wastewater Treatment Plants (WWTPs). In general, flows from the central portion of Phoenix are conveyed to the 23rd Avenue WWTP. The recently completed 23rd Avenue WWTP expansion project will allow the plant to treat all the flows projected to reach the plant. Flows from north, south, and portions of west Phoenix are collected and transported to the 91st Avenue WWTP, along with wastewater from the other communities belonging to the Multi-City Subregional Operating Group (SROG). The Multi-City SROG members own treatment capacity on the 91st Avenue WWTP under a Joint Exercise of Powers Agreement. The Agreement provides that the City of Phoenix is the lead agency and owns and operates the plant.

Expansions to the collection system north of the CAP Aqueduct are planned for connection to the Cave Creek WRP and a future North Gateway WRP.

The collection system for the Tatum Ranch development in far northeast Phoenix is connected to the rest of the Phoenix system and wastewater is now treated at Cave Creek WRP. The Tatum Ranch WWTP has been closed.

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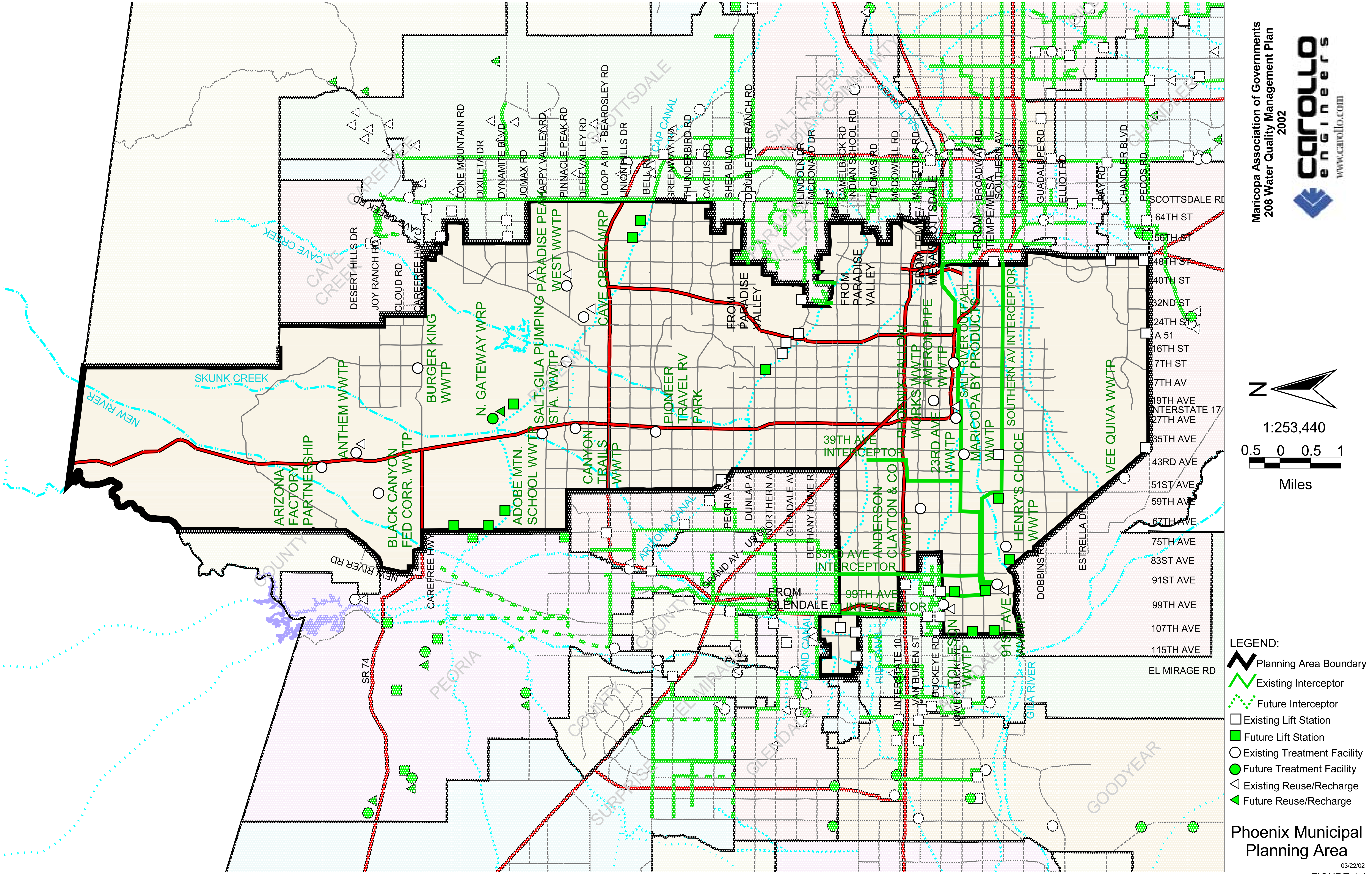

Phoenix Municipal Planning Area

FIGURE 4.1

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Existing Wastewater Treatment. The 23rd Avenue and 91st Avenue Plants provide the vast majority of wastewater treatment for the study area. Two small plants have been closed (Tatum Ranch WRP and Foothills WRP) and the Cave Creek WRP has been constructed to service areas north of the CAP Aqueduct.

The 91st Avenue Wastewater Treatment Plant currently provides a total of 179.25 mgd treatment capacity. The City of Phoenix portion is 101.17 mgd. The 91st Avenue WWTP includes the following unit processes: screening, grit removal, primary sedimentation, fine-bubble aeration, secondary clarification, effluent chlorination, and dechlorination plus solids treatment with anerobic digesters. The digestion process is being upgraded to a multiphase process at both the 23rd and 91st Avenue WWTPs. The plant performs secondary treatment using the nitrification/denitrification process. A portion of the effluent from the 91st Avenue WWTP is delivered to the Palo Verde Nuclear Generating Station (PVNGS) under an agreement that ends in 2027. The SROG is obligated to make up to 105,000 acre-feet per year of 91st Avenue WWTP effluent available to PVNGS on an annual basis. Effluent not delivered to PVNGS is discharged to the Salt River for delivery to Buckeye Irrigation Company for reuse. Some of the discharge to the Salt River is directed into the Tres Rios Wetlands, a demonstration project to evaluate benefits from a wetlands for flow regulation, habitat restoration and flood control. A full scale Tres Rios project has been authorized by Congress and is in the preliminary engineering design phase. Construction is scheduled for FY 2004.

The 23rd Avenue WWTP is being expanded and upgraded to treat an annual average capacity of 63 mgd. The planned ultimate capacity is 78 mgd. The modified plant performs biological nutrient removal as well as filtration and dechlorination, in addition to the other treatment processes of screening, primary sedimentation, secondary sedimentation, and chlorination plus anaerobic digestion. Effluent from the 23rd Avenue WWTP is discharged to a Roosevelt Irrigation District canal or to the Salt River depending on the irrigation demand. Studies are under way to assess the feasibility of eliminating the discharge to the Salt River from the 23rd Avenue WWTP.

Residual solids from both the 91st and 23rd Avenue treatment plants are stabilized and dewatered, and then removed by a contract hauler from the treatment plants for agricultural land application.

The Cave Creek WRP is an 8-mgd facility planned for an ultimate capacity of 32 mgd. This plant includes the following unit processes: screening, primary sedimentation, nitrification-denitrification, secondary sedimentation, filtration, and UV disinfection. The effluent system includes storage, pumping, and pipelines to enable delivery of effluent to users such as golf courses and parks. Effluent may also be discharged to a wash that is tributary to Cave Creek Wash and recharge to either spreading basins or vadose zone injection wells.

No solids processing facilities are included in the initial 8-mgd facility and all solids are discharged to the plant drain for conveyance to the 91st Avenue WWTP.

The Ahwatukee/Foothills WRP has been taken out of service and replaced with pumping stations and force mains that deliver wastewater to the city sewer system.

Additional small wastewater treatment plants, not operated by the City of Phoenix but within the Phoenix Planning Area, are summarized in Table 4.10.

Table 4.10 Small Wastewater Treatment Plants (Within Phoenix Planning Area) MAG 208 Water Quality Management Plan Update

Facility Name	Design Capacity (gpd)	Process
Paradise Peak West	75,000	--
Arizona Dept. of Corrections – Adobe Mountain School	--	--
Ameron Inc. Pipe Division	--	--
Anderson, Clayton & Co.	--	--
Central Arizona Project – Gila/Salt Pumping Station	5,000	Activated Sludge
Maricopa Byproducts	--	--
Phoenix Tallow Works (Baker Commodities)	30,000	Lagoons
Arizona Factory Shops	50,000	Activated Sludge
Burger King Restaurant	15,000	Activated Sludge
Black Canyon Federal Detention Center	--	--
Henry's Choice	17,000	Facultative Lagoons
Pioneer Travel RV Park	35,000	Activated Sludge

***Future Wastewater System Development*.** As underdeveloped areas are urbanized, wastewater collection and treatment service will be extended to those areas. It is planned that areas south of the Central Arizona Project (CAP) aqueduct or Jomax Road will continue to be served by the 23rd and 91st Avenue WWTPs. The remaining area north of either the CAP aqueduct or Jomax Road (Desert View and North Gateway) will be served by the Cave Creek WRP and the proposed North Gateway WRP. The Cave Creek WRP, planned for an ultimate capacity of 32 mgd, will be expanded as the Desert View area develops.

The North Gateway WRP, identified in the 1993 MAG 208 Plan as the proposed Biscuit Flats WRP with an ultimate capacity of 12.5 mgd, is now planned for an ultimate capacity of 32 mgd. The initial phase of 4 mgd will be constructed by year 2005, with ultimate development of the plant completed by year 2032. The processes to be performed by this Plant are yet to be defined, but for planning purposes, the following unit processes have been identified: screening, primary sedimentation, nitrification/denitrification, treatment, filtration, and UV disinfection. It is planned that all effluent from this WRP will initially be discharged to Skunk Creek aquifer recharge and will later be reused for turf irrigation. Effluent reuse plans will be refined as development proceeds. Residual solids from the WRP will be discharged to the city's collection system tributary to the 91st Avenue WWTP. In the future, North Gateway WRP may include a regional solids handling facility.

Treatment expansions will also be necessary in the existing service area. SROG is currently designing an additional expansion to the 91st Avenue WWTP, but the actual size of the expansion will not be determined until the conceptual design is completed in 2001. The expansion should be constructed by 2004-2005. A future Estrella Wastewater Pumping and Conveyance system is planned to serve new developments in the Estrella area. Treatment would be at the 91st Avenue WWTP. In addition, there is a planned expansion to the Tres Rios project along the Salt River west of 91st Avenue WWTP.

Wastewater flow projections (annual average flow in mgd) for each potential treatment plant service area are presented in Table 4.11, based on flow projection requirements from Table 4.9.

Table 4.11 Phoenix Wastewater Flow Allocation Projections MAG 208 Water Quality Management Plan Update

Year	Cave Creek WRP[1]	North Gateway WRP[1]	23rd Ave. WWTP[1]	91st Avenue WWTP[2]	Total Treated Flow
2000	0.31	--	50.48	79.85	130.64
2005	5.90	1.75	63.00	77.66	148.31
2010	8.21	3.59	63.00	92.19	166.99
2015	12.69	5.40	63.00	104.43	185.52
2020	14.48	8.55	63.00	117.69	203.72

[1] Local WRP flow less residual (effluent total).
[2] Annual average daily flows. Includes residuals from WRPs.

Preliminary indications are that the current arrangements for sludge disposal will remain in place for the foreseeable future.

Summary of Proposed Improvements

Item	Estimated Cost[1]
Collection System	$150,178,000
Booster Stations	7,825,000
Cave Creek WRP (8 mgd expansion)	43,150,000
North Gateway WRP (4 mgd initial)	30,000,000
Estrella WW System	20,000,000
23rd Avenue WWTP Improvements	166,220,000
91st Avenue WWTP Improvements (includes other city participation)	215,414,800
Multi-City Sewers (includes other city participation)	96,925,000
Tres Rios (includes other city participation)	28,021,000
Total	$757,733,800

[1] August 2000 Dollars (ENR Cost Construction Index = 6,238).

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4.2.2 Southwest Area

4.2.2.1 Avondale

Wastewater collection and treatment service is provided by the City of Avondale. In 1988, Avondale completed a 201 Facility Plan for development of a new treatment plant and expansion of the collection system. The existing Avondale service area is comprised of Regional Analysis Zones (RAZ) 273, 282 and 303 as depicted on Figure 4.2. The service area encompasses approximately 55 square miles, bounded by Indian School Road on the north, 99th and 107th Avenues on the east, Litchfield and Dysart Roads on the west, and extending approximately 12 miles south of the Sierra Estrella mountain range. The City of Avondale is the designated wastewater management agency for this area.

At one time, the Cities of Avondale and Goodyear had formed the Avondale-Goodyear Sub-regional Operating Group. The SROG, however, was subsequently dissolved.

Population and Flow Projections. The significant growth experienced in the City of Avondale in recent years is expected to continue through the current planning period. It is expected that all development within the boundaries of the service area will receive sewerage service provided by the city. Table 4.12 presents the population and flow projections based on current city population projections and 100 gpcd unit flow. According to city records, actual year 2000 population exceeds 35,000 with an associated average daily sewage flow of approximately 3.0 mgd.

Table 4.12 Avondale Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Flow, mgd[1]
2000	29,450	2.95
2005	57,546	5.75
2010	79,173	7.92
2015	100,834	10.08
2020	122,495	12.25

[1]Based on 100 gpcd unit flow.

Existing Collection System. The existing collection system serves the developed area of Avondale. As recommended by the Facility Plan, Avondale's old treatment plant, located near Lower Buckeye Road on the west bank of the Agua Fria River, was abandoned. The new treatment plant is sited east of the Agua Fria, near the intersection of Broadway and Dysart Roads. Conveyance of wastewater to the new treatment plant included construction of an interceptor sewer from the old plant to the new plant site. The construction of this interceptor was completed in 1992. In 1996 a major interceptor was constructed in El Mirage Road and extending west on Broadway Road to the treatment plant. Planned for

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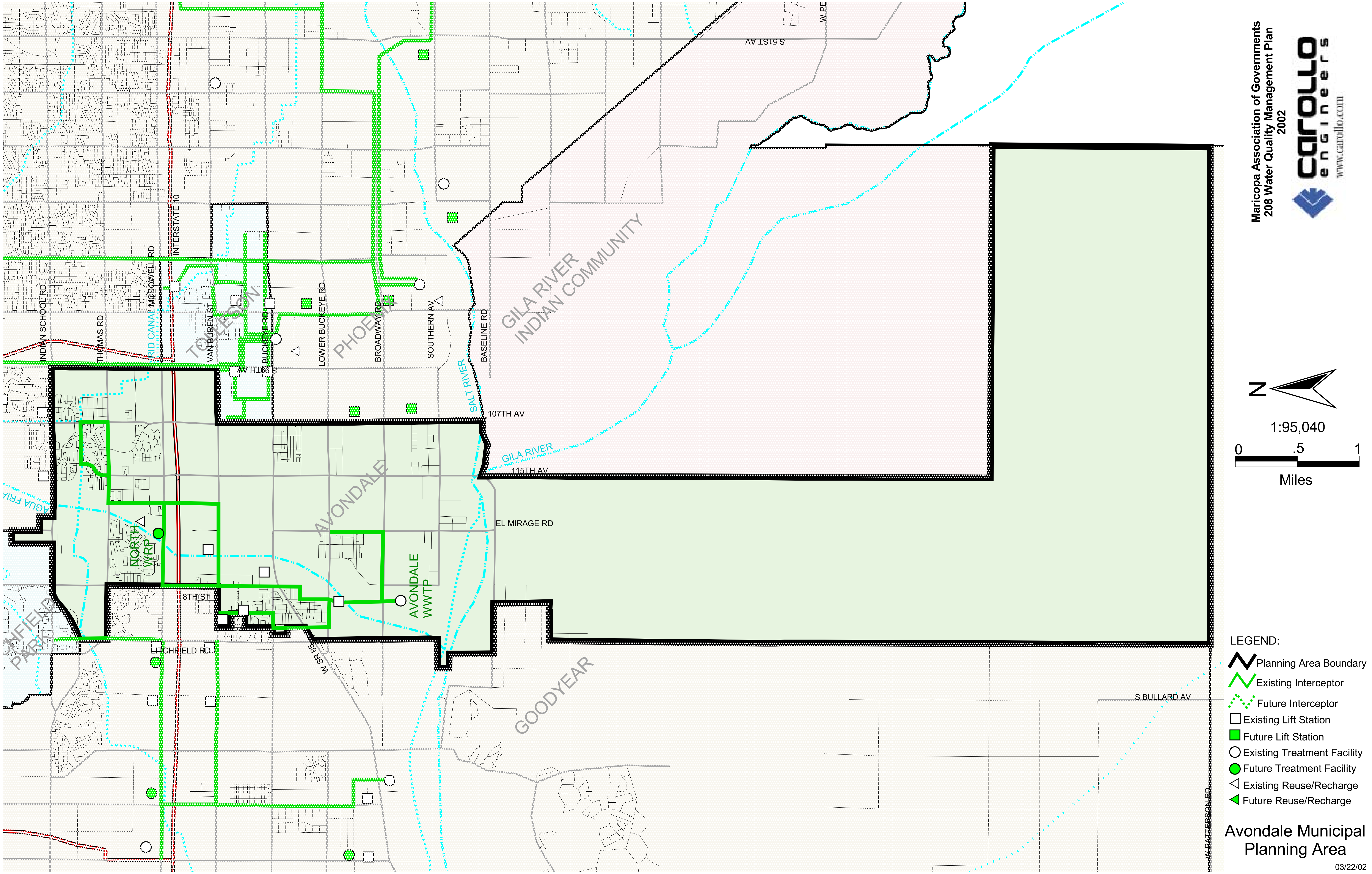

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Future Lift Station
Existing Treatment Facility
Future Treatment Facility
Existing Reuse/Recharge
Future Reuse/Recharge
Avondale Municipal Planning Area
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GILA RIVER INDIAN COMMUNITY
AVONDALE
AVONDALE WWTP
NORTH WRP
GOODYEAR
TOLLESON
PHOENIX
SALT RIVER
GILA RIVER
EL MIRAGE RD
107TH AV
115TH AV
BASELINE RD
SOUTHERN AV
BROADWAY RD
LOWER BUCKEYE RD
BUCKEYE RD
VAN BUREN ST
MCDOWELL RD
THOMAS RD
INDIAN SCHOOL RD
INTERSTATE 10
8TH ST
LITCHFIELD RD
W SR 85
S BULLARD AV
W PATTERSON RD
S 51ST AV
AGUA FRIA

FIGURE 4.2

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construction by year 2004-05 is a major interceptor sewer near the west bank of the Agua Fria. The existing collection system includes five pump stations. The lift station on Van Buren Street was abandoned as part of the trunk sewer project in 1996. When the area south of the new treatment plant develops, additional pump station(s) will be required to transmit flow to the plant site.

Existing Treatment Facilities. Construction of Avondale's new treatment plant was substantially completed, and the plant became operational on August 5, 1992.

Plans developed for this new plant to replace the existing facility were processed by MAG and ADEQ and approved by EPA in June 1988. An amendment to the 208 Plan was made by MAG to enable the new plant to proceed. After the new treatment facility was constructed, the old plant was closed.

The initial treatment plant process is designed to treat 3.5 mgd and consists of mechanical screening, grit removal, extended aeration in an oxidation channel, secondary clarification, chlorination, dechlorination, and discharge to the Agua Fria River. The aeration process also performs nitrification/denitrification.

Avondale is currently disposing of waste solids from the treatment process via land application on a dedicated site within the perimeter of the wastewater treatment facility on a contract basis with a private hauler.

Future Wastewater System Development. The existing treatment plant capacity of 3.5 mgd will meet projected requirements through approximately year 2001. Construction of additional capacity began in 2001 to bring total treatment capacity to 6.4 mgd. Additional phases of the current expansion concept are planned at the existing site to increase hydraulic treatment capacity to 20 mgd. The city is currently constructing a new dewatering system for waste solids and is considering seeking approval to dispose of the solids in a landfill.

The city is also considering the construction of a 6 mgd ultimate capacity water reclamation plant in the northern portion of the city, north of Interstate 10. The reclaimed water produced by the facility would be used for landscape irrigation, aquifer storage/recovery, and other purposes.

Currently, effluent from the city's treatment facility is discharged to the Agua Fria River. The city has expressed interest in a future recharge project involving discharge to or near the Agua Fria River. An option being considered is to develop an effluent pipeline that would extend from the wastewater treatment facility to a recharge site north of I-10. Another alternative that is being considered for the future is effluent reuse to irrigate parks and recreation facilities. An ADEQ effluent reuse permit would be required.

The Facility Plan states that several of the existing sewers have limited capacity due to flat grades and small diameters. It will be necessary to replace or parallel these sewers to provide for future increases in flow. Installation of future pump stations may be required to serve three areas, including south of the treatment plant, west of the Aqua Fria River and south of Lower Buckeye Road, and the Phoenix International Raceway area south of the Gila River.

Depending on the pace of development and the required needs of the area, a 1 mgd package plant may be the preferred option to treat wastewater south of the Gila River. To accommodate future conveyance of sewage or effluent across the Gila River, a pipe sleeve was incorporated in construction of the 116th Avenue Bridge across the river. Population density is planned to be low south of the Gila River so a package plant could be a feasible alternative. Effluent produced from the package plant could be reclaimed for use in landscaping, golf courses, lake systems, or recharging of the aquifer.

Summary of Proposed Improvements

Item	Estimated Cost[1]
Wastewater Treatment Plant Expansion from 3.5 to 6.4 mgd	$10,800,000
Wastewater Treatment Plant Expansions (future)	20,000,000
Sewer Extension: West Avondale Interceptor	2,000,000
115th Avenue/Broadway Trunkline	8,100,000
Coldwater Springs Boulevard Trunkline	535,000
Northside Reclamation Plant	8,000,000
Package Wastewater Plant south of the Gila River	1,000,000
Total	$50,435,000

[1] All costs are in December 2001 dollars (ENR Construction Cost Index = 6390)

4.2.2.2 Buckeye

The Town of Buckeye Planning Area corresponds to Regional Analysis Zones (RAZ) 253, 277, 278, 279, 340, 341, and 343. The Town of Buckeye is the designated wastewater management agency for this area. Encompassing approximately 120 square miles of planning area, the town has concentrated their planning efforts in a core planning area bounded by Interstate 10, Beloat Road, Jackrabbit Trail, and Turner Road, corresponding to RAZ 278 and 279. The Town of Buckeye Sewer Master Plan developed in 2000 addresses only the core planning area; however, Buckeye is projected not only to experience growth in their core planning area but also in the surrounding perimeter planning areas. Preliminary plans for development in the perimeter planning areas within the Town of Buckeye are in progress. Figure 4.3 depicts the Town of Buckeye planning area in its entirety.

Population and Flow Projections. Table 4.13 presents population projections, based on 1997 MAG-adopted population projections for the town. Based on the MAG-adopted populations and a 100 gpcd unit flow rate, wastewater flow projections are also presented in Table 4.13.

Table 4.13 Buckeye Population and Flow Projections MAG 208 Water Quality Management Plan Update

	Core Planning Area (RAZ 278 & 279)		Future Planning Areas			
Year	**Population**	**Flow (mgd)**	**Population**	**Flow (mgd)**	**Total Population**	**Total Wastewater Flow (mgd)**
2000	10,279	1.03	7,773	0.78	18,084	1.81
2005	12,252	1.23	10,101	1.01	22,385	2.24
2010	14,630	1.46	13,514	1.35	28,176	2.82
2015	24,914	2.49	26,500	2.65	51,446	5.14
2020	36,356	3.64	46,028	4.60	82,416	8.24

Based on 100 gpcd.

Existing Collection System. The existing collection system is in the center of the core planning area, primarily located to the south of Interstate 10 and north of Beloat Road, between Miller Road on the west and Apache Road on the east. There is one sewer trunk line along Apache Road from Broadway to the treatment plant, providing the backbone of the existing collection system. The collection system requires no pumping for transport of wastewater to the treatment plant.

Existing Treatment System. The Town of Buckeye Wastewater Treatment Plant is located south of Beloat Road, between Miller Road and Apache Road. The wastewater facility currently has a capacity of 0.6 mgd, with a build-out capacity of 2.0 mgd. In 2000 peak daily flows were only reaching an average of 0.35 mgd, much less than the wastewater flow

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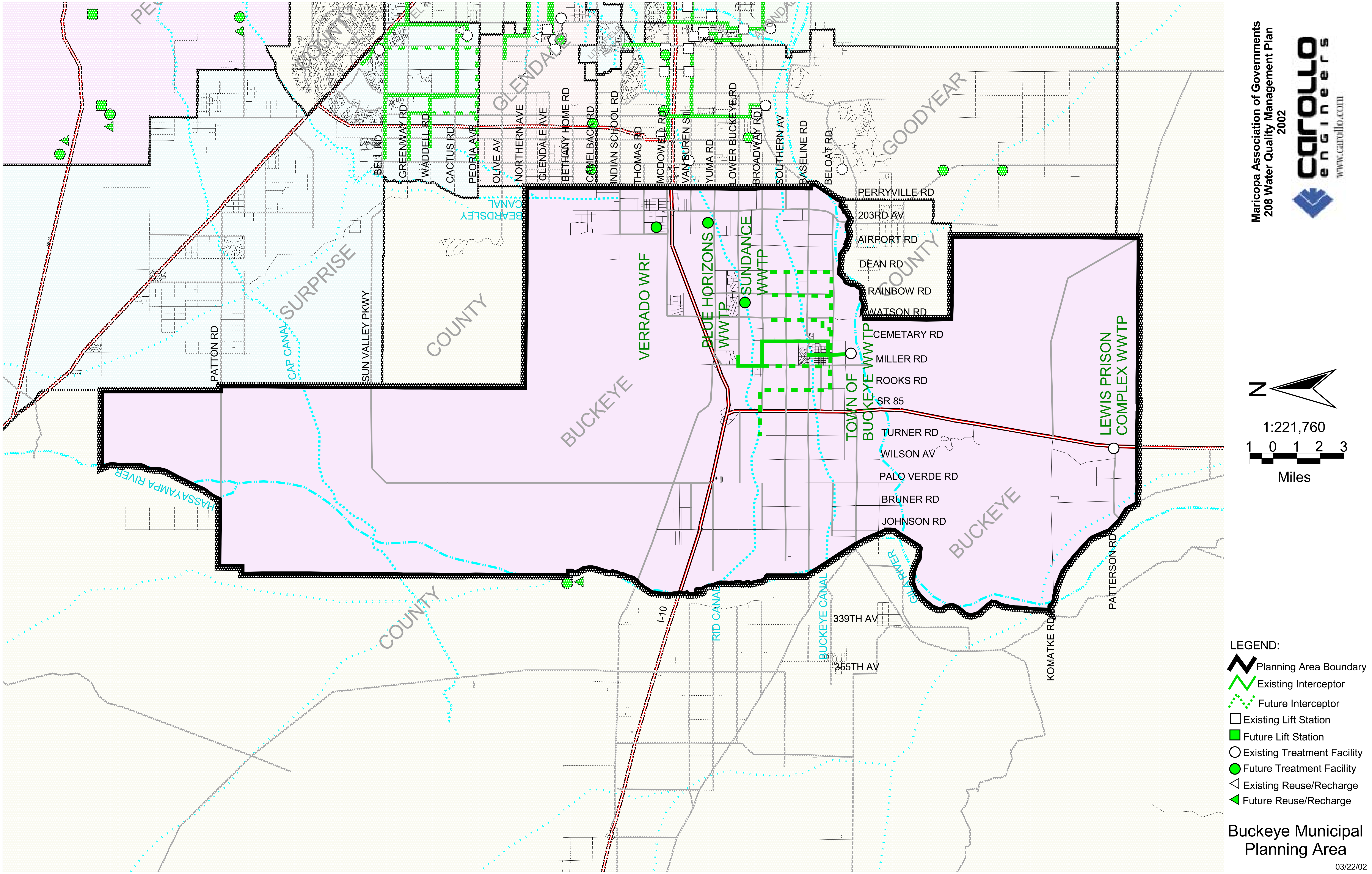

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BLUE HORIZONS WWTP
SUNDANCE WWTP
LEWIS PRISON COMPLEX WWTP
BELL RD
GREENWAY RD
WADDELL RD
CACTUS RD
PEORIA AVE
OLIVE AV
NORTHERN AVE
GLENDALE AVE
BETHANY HOME RD
CAMELBACK RD
INDIAN SCHOOL RD
THOMAS RD
MCDOWELL RD
VAN BUREN ST
YUMA RD
LOWER BUCKEYE RD
BROADWAY RD
SOUTHERN AV
BASELINE RD
BELOAT RD
PERRYVILLE RD
203RD AV
AIRPORT RD
DEAN RD
RAINBOW RD
WATSON RD
CEMETARY RD
MILLER RD
ROOKS RD
SR 85
TURNER RD
WILSON AV
PALO VERDE RD
BRUNER RD
JOHNSON RD
339TH AV
355TH AV
PATTON RD
SUN VALLEY PKWY
CAP CANAL
BEARDSLEY CANAL
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Existing Interceptor
Future Interceptor
Existing Lift Station
Future Lift Station
Existing Treatment Facility
Future Treatment Facility
Existing Reuse/Recharge
Future Reuse/Recharge
Buckeye Municipal Planning Area
03/22/02

FIGURE 4.3

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projections based on population for the same year. This difference is due to a significant amount of residents still using septic tanks.

The plant performs the extended aeration version of the activated sludge process by means of an oxidation ditch. The oxidation ditch is equipped with a "boat" clarifier for solids removal. Effluent is chlorinated for disinfection, dechlorinated, and discharged to the Gila River under their current NPDES permit. Sludge is dried on sand beds and is removed from the plant periodically for agricultural reuse.

In the future, filters will be added to the plant to enable production of reclaimed water for turf irrigation as demand for reclaimed water occurs. A proposed municipal golf course may become the reuse site. Recharge is another viable discharge alternative the town may use if there is not a sufficient reclaimed water demand nearby. The plant is designed with provisions for future expansions by adding oxidation ditches and additional chlorination facilities.

In the perimeter planning area of Buckeye is the Lewis Complex Wastewater Treatment Plant, located on Patterson Road and State Route 85. With a capacity of 0.75 mgd, the treatment facility is intended only to service the Lewis Prison Complex. The treatment process includes an extended aeration, activated sludge process, with clarification, tertiary filtration, and ultraviolet disinfection. Effluent is directly reused on softball fields, gardens, recreational fields, and turf farms, located on-site. Sludge is aerobically digested and dried.

***Future Wastewater System Development*.** Depending upon the rate at which sewerage service is expanded and residents on septic tanks connect to Buckeye's planned wastewater collection system, the 0.6-mgd capacity of the Buckeye wastewater treatment plant will be exceeded. When capacity of the first phase is reached, it is planned that a second and third treatment train will be added to ultimately provide a total of 2.0-mgd treatment capacity. Based upon the flows projected herein, 2.0 mgd should be adequate to about year 2015, assuming a portion of the residents will still be using septic tanks.

Also, two future treatment plants, Sundance Wastewater Treatment Plant and the Blue Horizons Wastewater Treatment Plant, are planned in the north portion of the core planning area. The addition of these two treatment plants will alleviate some flows that would otherwise go to the Town of Buckeye WWTP. With the addition of these two treatment plants and the full expansion of the Town of Buckeye WWTP, the wastewater generated in the core planning will be sufficiently serviced through the planning period.

The Sundance WWTP will be located on Lower Buckeye Road between Dean Road and Rainbow Road and service the future Sundance Development. The ultimate capacity of this facility is planned at 3.6 mgd. The plant will use an activated sludge system followed by filtration and UV disinfection. The effluent will be reused at a proposed golf course, recharged in a proposed recharge basin, or discharged to the Roosevelt Irrigation District Canal, the Buckeye Canal, the South Extension Canal, and the Gila River. The appropriate permits will be obtained for these discharges. The waste sludge will be treated in anaerobic reactors, followed by gravity thickeners and centrifuges. The thickened, dewatered sludge will then be disposed in a landfill.

The Blue Horizons WWTP will be located on the north side of Yuma Road between Jackrabbit Trail and Tuthill Road. The treatment plant, with a build-out capacity of 2.0 mgd, will service the Blue Horizons Development as well as developments to the north and east. The treatment process consists of an activated sludge system including nitrogen removal, tertiary filtration, and ultraviolet disinfection. A majority of the effluent will be reused for landscaping and parks in and around the development, and a portion will be discharged into the Roosevelt Irrigation District Canal. An NPDES permit will be obtained for this discharge. Sludge will be stabilized and dewatered.

A third future treatment plant, Verrado Water Reclamation Facility, is planned for a location near Tuthill Road and McDowell Road, and will service the future Verrado Development. The initial capacity will be 0.45 mgd and ultimate capacity of 3.35 mgd. Initial phase treatment processes will consist of influent pumping, grit removal screening, secondary treatment with biological nitrogen removal, chlorination, effluent pumping and sludge dewatering for landfill disposal. The effluent will be recharged and reused as golf course irrigation.

Developments are emerging outside the core planning area, in the perimeter planning areas of Buckeye, like Festival Ranch, Sun Valley, Sun Valley South, Tartesso, and Tartesso North. Planning for development of a sewer service area in the perimeter planning areas remains in the preliminary stages. The very preliminary nature of these plans make it difficult to include these potential facilities in the 208 Plan.

Summary of Proposed Improvements. Currently, the Town of Buckeye does not have a Capital Improvement Plan, but is planning to use development sewer impact fees to generate the capital required to accommodate projected growth. These impact fees will be reserved first for funding expansion of the treatment facilities and second for extending trunk mains. In addition, sewer impact fees may be reserved for reclaimed water main installation and recharge facilities.

4.2.2.3 Goodyear

The City of Goodyear comprises approximately 115 square miles of incorporated land. The total planning area for wastewater services consists of Regional Analysis Zones 265, 280, 281, 302, and 323. The city boundaries are generally described as west of Litchfield, south of Camelback, east of Perryville, and north of Patterson Roads.

The city has established three (northern, central, and southern) wastewater service areas. Each area is or will be served by separate wastewater treatment facilities in the city as described herein. The boundaries between the northern, central, and southern planning and service areas have been revised since the 1993 208 Plan. Currently the southern area is that portion south of the Gila River, the central area is everything north of the Gila River and south of McDowell, and the northern area includes the land north of McDowell Road. Figure 4.4 depicts the total Goodyear Planning Area.

Population and Flow Projections. Goodyear has an opportunity to exceed the growth conditions experienced in the past ten years in the east Phoenix valley. This is due to its location and proximity to the Pacific Rim and West Coast; its rail and air transportation; its freeway and road systems; availability of land; and infrastructure and political climate.

Table 4.14 below describes the MAG projected population and the resulting wastewater flow rates for the period 2000 through 2020. An estimated 9.3 mgd of total treatment facility capacity will be needed to serve almost 93,000 people in the next 20 years. This is based upon the 1997 MAG-adopted population projections for the City of Goodyear, within each municipal planning area district, and the projected total city wastewater flow rates assuming a per capita flow rate of 100 gpcd.

Table 4.14 Goodyear Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)
2000	19,939	1.99
2005	28,504	2.85
2010	38,425	3.84
2015	58,712	5.87
2020	93,396	9.34

The 1993 208 Plan referenced the 1989 population projections. While the updated (1997) population projections show a decrease in the rate of growth for the Northern (RAZ 265) and the Central (RAZ 280 and 281) Planning Areas, the Southern Planning Area (RAZ 302 and 323) is growing much more rapidly than expected in 1989. This is principally due to development of Estrella Mountain Ranch, a large master-planned community that occupies much of the Southern Area. A 208 Amendment for the Goodyear South Planning and Service Area was approved by the MAG Regional Council in January 2001.

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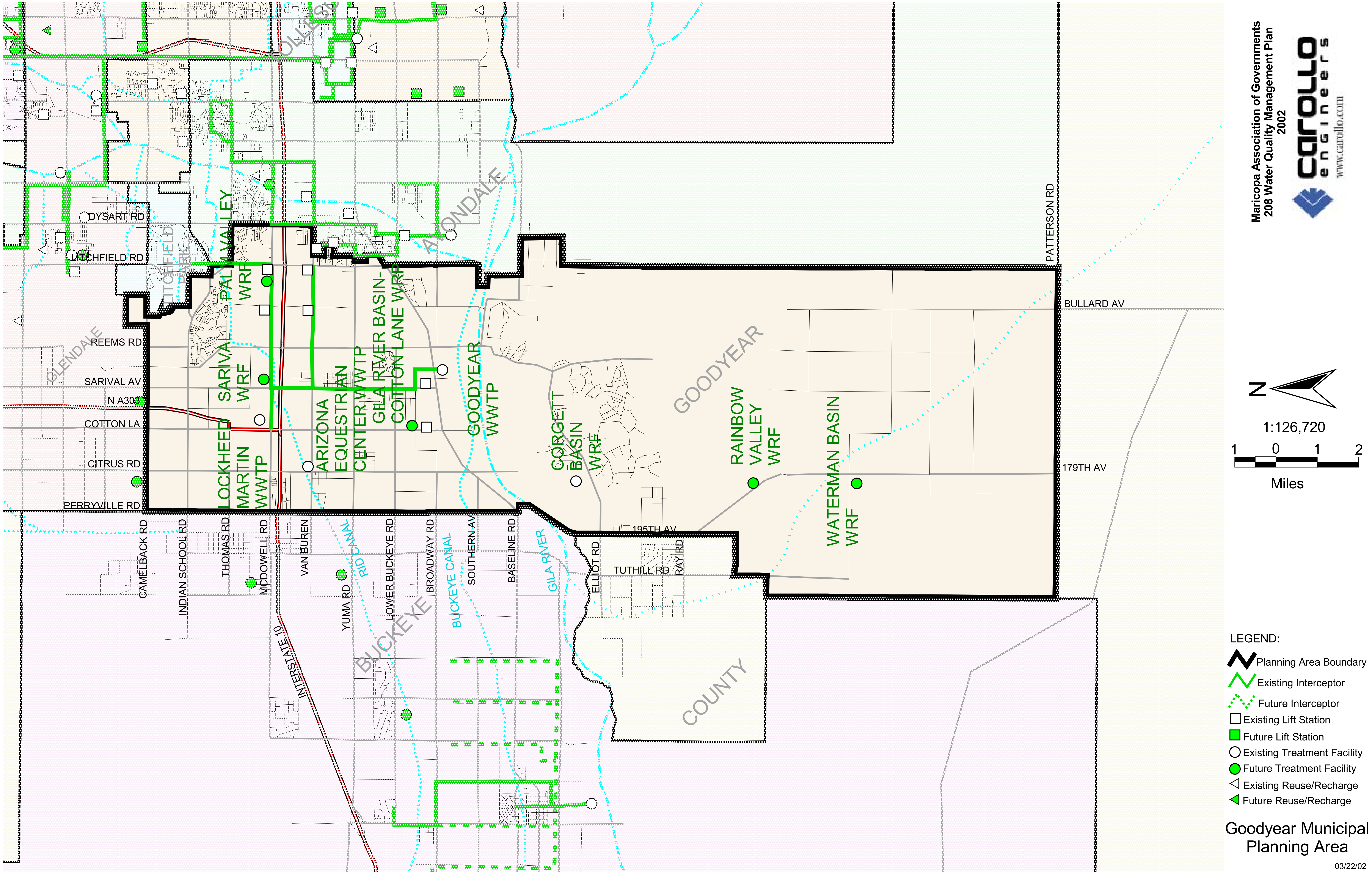

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REEMS RD
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COTTON LA
CITRUS RD
PERRYVILLE RD
PATTERSON RD
BULLARD AV
179TH AV
195TH AV
TUTHILL RD
RAY RD
ELLIOT RD
CAMELBACK RD
INDIAN SCHOOL RD
THOMAS RD
MCDOWELL RD
VAN BUREN
YUMA RD
RID CANAL
LOWER BUCKEYE RD
BROADWAY RD
BUCKEYE CANAL
SOUTHERN AV
BASELINE RD
GILA RIVER
INTERSTATE 10
GLENDALE
LITCHFIELD PARK
AVONDALE
GOODYEAR
BUCKEYE
COUNTY
PALM VALLEY WRF
SARIVAL WRF
LOCKHEED MARTIN WWTP
ARIZONA EQUESTRIAN CENTER WWTP
GILA RIVER BASIN-COTTON LANE WRF
GOODYEAR WWTP
CORGETT BASIN WRF
RAINBOW VALLEY WRF
WATERMAN BASIN WRF

FIGURE 4.4

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Wastewater planning and development has also changed significantly in the Northern Area since the 1993 update. Litchfield Park Service Company (LPSCo) currently utilizes 1.1 mgd of the 1.4 mgd capacity that they own in the City of Goodyear 157th Avenue plant. LPSCo is planning to sell that capacity back to the city and to build two new water reclamation facilities in the Northern Area. A 208 Plan Amendment for the Goodyear/LPSCo Palm Valley and Sarival Water Reclamation Facilities was approved by the MAG Regional Council in January 2001.

Including these new and proposed developments, the city will require the following treatment plant capacities at ultimate build-out:

- Northern 16.4 mgd
- Central 15.0 mgd
- Southern 33.4 mgd
- Total 64.8 mgd

Northern Planning and Service Area. The reconfigured northern wastewater planning and service area is now generally bounded by Perryville Road to the west, Camelback Road to the north, Dysart Road to the east, and McDowell Road to the south. The northern planning area is currently served by the City of Goodyear 157th Avenue wastewater treatment plant. However, a 208 Plan Amendment for two new water reclamation facilities (WRF) to serve the northern area received MAG Regional Council approval in January 2001.

The proposed Palm Valley WRF, to be located on McDowell Road between Bullard Avenue and Litchfield Road, will have an ultimate capacity of 8.2 mgd. It will serve to reclaim wastewater flows from the current LPSCo service area and portions of RAZ 265 and 266. It will serve an area generally bounded south to north by the I-10 freeway and Camelback Road, and west to east by Bullard Avenue and Dysart Road. The proposed Sarival WRF will also have an ultimate capacity of 8.2 mgd, and will be located near the intersection of Sarival Avenue and McDowell Road. It will be used to reclaim wastewater flows from portions of RAZ 265. The service area for the Sarival WRF will have a general boundary from the I-10 freeway north to Camelback Road, west from Bullard Avenue to Cotton Lane, and sections between Cotton Lane and Perryville Road. Flows from the Glendale MPA, which are currently directed to the Casitas Bonitas WWTF, will be routed to the Goodyear/LPSCo system upon closure of the facility.

Both new facilities will include an ADEQ Effluent Reuse Permit for irrigation of existing golf courses and parks, as well as Aquifer Protection Permits for both reuse and recharge. In the event that not all effluent can be reused and recharged, a NPDES Permit will be in place to allow a secondary point of discharge. LPSCo will own and operate both of the reclamation facilities.

Central Planning and Service Area. The area presently designated as the central planning and service area was included as part of the northern planning area at the time of the 1993 208 Plan. The current boundaries of the central area are generally defined as McDowell Road on the north, the Gila River on the south, Litchfield Road to the east, and Perryville Road to the west.

The central area is served by the City of Goodyear treatment plant at 157th Avenue, built in 1983. Its original capacity of 0.75 mgd was expanded to a current operating capacity of approximately 3 mgd. The facility consists of raw sewage pumps, static screens, 2 aeration basins, 2 oxidation ditches, clarifiers, chlorination, sludge tanks, and sludge drying beds. The facility includes tertiary treatment with zero-discharge of treated effluent. Effluent disposal includes irrigation reuse on landscaping, open spaces, and golf courses, and groundwater recharge. There is an NPDES permit to discharge to the Gila River.

A new Gila River Basin-Cotton Lane WRF is planned to treat 4.0 mgd of the planned ultimate capacity of the 157th Avenue WWTP. Specific process configuration, location of the WRP and effluent disposal options are not yet defined by the City.

The Goodyear collection system serves the entire original city in the central area. As development occurs, the collection system is being expanded to provide required service. Septic tanks are still serving some of the existing residential areas west of the original town. As development occurs, sewers will be extended in the planning area and the use of septic tanks will be gradually phased out. The existing wastewater collection system that serves the city comprises approximately 90 miles of sewers. The interceptor conveying wastewater to the treatment facility has been in service for approximately 15 years and is operating at or near its design capacity.

Since the 1993 208 Plan, new sewers, such as the Sarival Avenue line, to serve the Perryville prison and adjacent residential development have been installed. This line has an 8.0-mgd peak flow capacity. In addition, the Bullard outfall and reuse lines were constructed to permit discontinuing the LPSCo Wastewater Treatment Plant. The city's 1999 sewer master plan update for the central area includes alignments and sizing for major interceptor sewers in Cotton Lane, Bullard Wash/Avenue, Broadway Road, Sarival Avenue, Citrus Lane, and along State Route 85.

Lockheed Martin owns and operates a wastewater treatment facility at its Goodyear site. The treatment facility has a design capacity of 0.45 mgd. Currently, the plant is operating at much less than this rated capacity. The owner holds a NPDES permit for the treatment facility.

The MAG small plant inventory indicates that a small, privately-owned wastewater treatment facility is located on Citrus Road north of Van Buren Street. The facility is owned by the Arizona Equestrian Center and receives an average flow of 115,000 gallons per day.

Southern Planning and Service Area. Since the 1993 208 Plan, the boundary between the Southern and Northern Planning Areas has been moved northward to the Gila River. The river forms a natural division and becomes a logical boundary for wastewater planning. The City of Goodyear is the only wastewater service provider in the Southern Planning Area. Within the Southern Planning Area, growth is now occurring at a rate that exceeds MAG 1989 and 1997 projections. The 1997 MAG projections for the area in year 2020, including RAZ 302 and 323, is 16,033, whereas, year 2000 master planning shows 151,082 in year 2020. The increased growth rate is largely driven by development of Estrella Mountain Ranch, a large master-planned community which occupies much of the Southern Planning Area.

Topography divides the Southern Planning Area into three distinct drainage basins; the Corgett Basin, Lum Basin, and Waterman Basin. To serve this area, the 1993 MAG 208 Plan showed two treatment plants, the Estrella WWTP (existing) in the Corgett Basin, and the Rainbow Valley WWTP (proposed) in the Waterman Basin. These plants have since been renamed the Corgett Basin WRF and the Waterman Basin WRF, respectively, to correspond with the drainage basin which they serve. A wastewater master plan that principally covered the Corgett and Lum Basins was completed in 1998 and updated in 1999. A second master plan is being prepared for the Waterman Basin.

Development has begun within the Lum Basin and a third reclamation plant, the Rainbow Valley WRF, is proposed to treat wastewater collected within the Lum Basin. Pumping wastewater from the Lum Basin to the Corgett Basin WRF or to the Waterman Basin WRF was determined to not be practical due to restrictions at the Corgett WRF site and the distance to the Waterman Basin site. The following plants will serve the Southern Planning Area:

Water Reclamation Facility	Year 2020 Flow Rate
Corgett Basin WRF	2.2 mgd
Rainbow Valley WRF (Lum Basin)	9.2 mgd
*Waterman Basin WRF	5.5 mgd

*Ultimate capacity of 22 mgd sometime beyond 2020.

The Corgett Basin WRF exists and has a year 2000 capacity of 0.8 mgd. The Rainbow Valley WRF is under design and is scheduled for completion in 2002 with an initial capacity of 1.0 mgd. The first phase of the Waterman Basin WRF is expected to be required approximately year 2010. In the future, the economics of operation and maintenance may favor elimination of the Waterman Basin WRF and pumping wastewater generated in the Waterman Basin to the Rainbow Valley WRF for treatment. Under this option, the Rainbow Valley WRF could reach an ultimate capacity of 31.2 mgd (9.2 + 22.0).

Summary of Proposed Improvements

Northern Area (LPSCo)	Estimated Cost[1]
Palm Valley WRF-Phase I-Capacity 4.1 mgd	$12,526,000
Palm Valley WRF Expansion to 8.2 mgd Capacity	6,648,000
Sarival WRF-Phase I-Capacity 4.1 mgd	12,526,000
Sarival WRF Expansion to 8.2 mgd Capacity	6,648,000
Area Subtotal	$38,348,000
Central Area (157th Avenue WWTP)	
Phase IV Expansion to 3.60 mgd (2000)	$ 4,900,000
Phase V Expansion to 7.6 mgd (2006)	19,700,000
Phase VI Expansion to 11.6 mgd (2010)	22,000,000
Phase VII Expansion to 15 mgd (2015)	22,000,000
Area Subtotal	$68,600,000
Southern Area (Estrella Ranch)	
Rainbow Valley WRF – Initial Capacity of 1 mgd (2002)	$5,000,000
Waterman Basin WRF Expansion to 0.8 mgd (2005)	4,000,000
Corgett Basin WRF Expansion to 1.8 mgd (2005)	9,000,000
Rainbow Valley WRF Expansion to 4.0 mgd (2010)	15,000,000
Corgett Basin WRF Expansion to 2.2 mgd Capacity (2012)	2,000,000
Rainbow Valley WRF Expansion to 9.2 mgd Ultimate Capacity (2020)	26,000,000
Waterman Basin WRF Capacity of 2.8 mgd (2010)	10,000,000
Waterman Basin WRF Expansion to 5.5 mgd Intermediate Capacity (2020)	13,500,000
Area Subtotal	$84,500,000
Grand Total:	$191,448,000

[1]All costs are in June 2000 dollars (ENR Construction Cost Index = 6,238).

Note: Costs of wastewater collection systems for each area are not included.

4.2.2.4 Litchfield Park

The planning area for Litchfield Park, depicted on Figure 4.5, consists of the existing incorporated limits of the Town of Litchfield Park, Regional Analysis Zone (RAZ) 266. Wastewater service in this area, as well as some other areas in the vicinity, is provided by Litchfield Park Service Company (LPSCo), a privately owned utility. The Town of Litchfield Park does not operate any wastewater facilities. Because the town is completely bordered by other incorporated areas, it is not expected that this planning area will expand in the future. Litchfield Park is the designated wastewater management agency for this area.

Population and Flow Projections. The population of the incorporated Town of Litchfield Park is projected to increase by a significant percentage, although its small size is a limiting factor. Assuming a per capita wastewater flow rate of 100 gpcd, population and flow projections for the Town of Litchfield Park are presented in Table 4.15.

Table 4.15 Litchfield Park Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)
2000	4,942	0.49
2005	6,583	0.66
2010	8,519	0.85
2015	12,629	1.26
2020	14,778	1.48

***Existing Collection System*.** The existing collection system operated by Litchfield Park Service Company (LPSCo) serves all of Litchfield Park, as well as adjoining areas that also are in LPSCo's certificated service area. Flows entering the LPSCo collection system are conveyed with wastewater from outside Litchfield Park to an existing treatment plant owned and operated by the City of Goodyear.

Existing Treatment Facilities. Litchfield Park's wastewater, as well as wastewater from some adjoining areas, is treated at the City of Goodyear’s 157th Avenue WWTP. LPSCo owns 1.4 mgd of capacity in Goodyear’s plant.

Future Wastewater System Development. Plans are underway for major development in Litchfield Park and vicinity. Wastewater flow from these developments would greatly exceed LPSCo’s current capacity rights in the Goodyear plant. LPSCo, through the City of Goodyear, has received approval on a MAG 208 Amendment that impacts the entire Northern Planning Area in the City of Goodyear.

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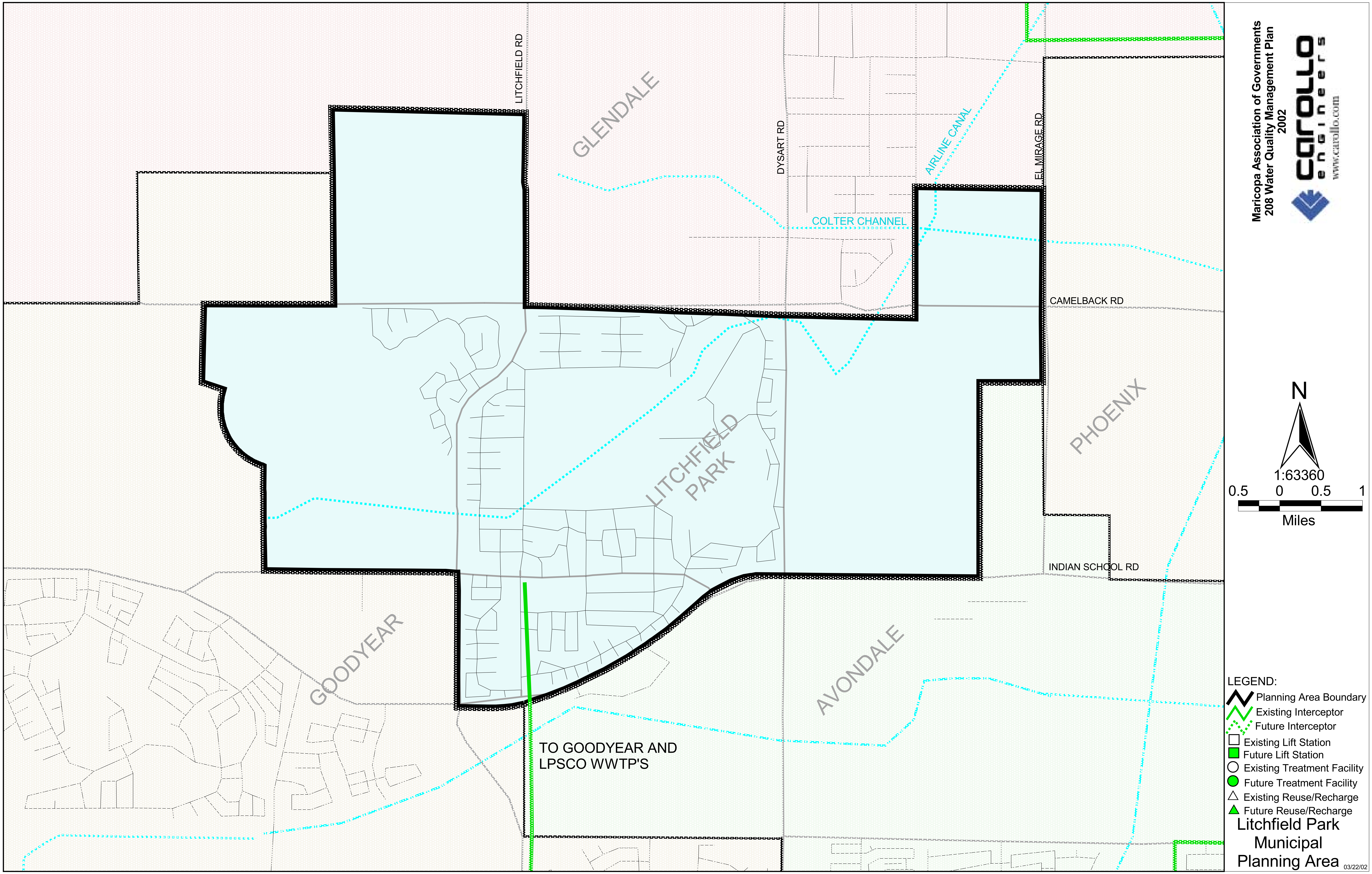

Litchfield Park Municipal Planning Area

03/22/02

FIGURE 4.5

LPSCo's plan is to develop two new water reclamation facilities and then sell its 1.4 mgd capacity in the Goodyear 157th Avenue Treatment Facility. The current and future wastewater flows from Litchfield Park will be treated by LPSCo in the new water reclamation facilities. The proposed facilities will each have an ultimate capacity of 8.2 mgd. They are the Palm Valley WRF, to be located on McDowell Road between Bullard Avenue and Litchfield Road, and the Sarival WRF, to be located near the intersection of Sarival Avenue and McDowell Road.

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4.2.2.5 Tolleson

The City of Tolleson service area consists of the city's incorporated area, Regional Analysis Zone (RAZ) 274. The City of Tolleson is the designated wastewater management agency for this area. Tolleson provides collection and treatment for all wastewater generated in the city. The Tolleson Planning Area approximately covers 6 square miles, and is depicted on Figure 4.6.

Wastewater collected in Tolleson is treated at a wastewater treatment plant owned and operated by the city. This treatment plant also treats wastewater from Peoria and Sun City. Peoria and Tolleson form a Subregional Operating Group (SROG), the Peoria-Tolleson SROG.

Population and Flow Projections. According to city records, Tolleson's annual average daily wastewater flow to the treatment plant was approximately 1.4 mgd during 2000. The MAG 2000 population estimate for Tolleson was 4,467. Based on these figures, wastewater flow in Tolleson is approximately 313 gallons per capita per day (gpcd). This is considerably higher than the 100 gpcd used for planning purposes by most other communities in the 208 Plan. Much of the flow received by the Tolleson wastewater system is discharged by a large industrial customer. This flow has a large effect on the per capita flow rate because of the city's relatively small population. In the future, if the industrial discharge volume remains constant and population increases as projected, per capita wastewater flow rates will decrease. Table 4.16 presents flow projections for Tolleson based on a per capita flow of 100 gpcd, plus a constant additional wastewater flow from the industrial customer.

Table 4.16 Tolleson Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Projected Flow at 100 gcd (mgd)	Flow from Industrial Discharger[1] (mgd)	Tolleson Total Flow (mgd)
2000	4,525	0.45	0.70	1.15
2005	4,783	0.48	1.33	1.81
2010	6,955	0.70	1.96	2.66
2015	7,603	0.76	2.59	3.35
2020	8,267	0.83	3.22	4.05

[1] Tolleson reports a current industrial discharge of 0.7 mgd and a projected discharge of 3.22 mgd at the end of the planning period. A linear flow increase was assumed over the planning period.

Any future changes in industrial flows generated in Tolleson would have significant impact on these flow projections at the end of the planning period.

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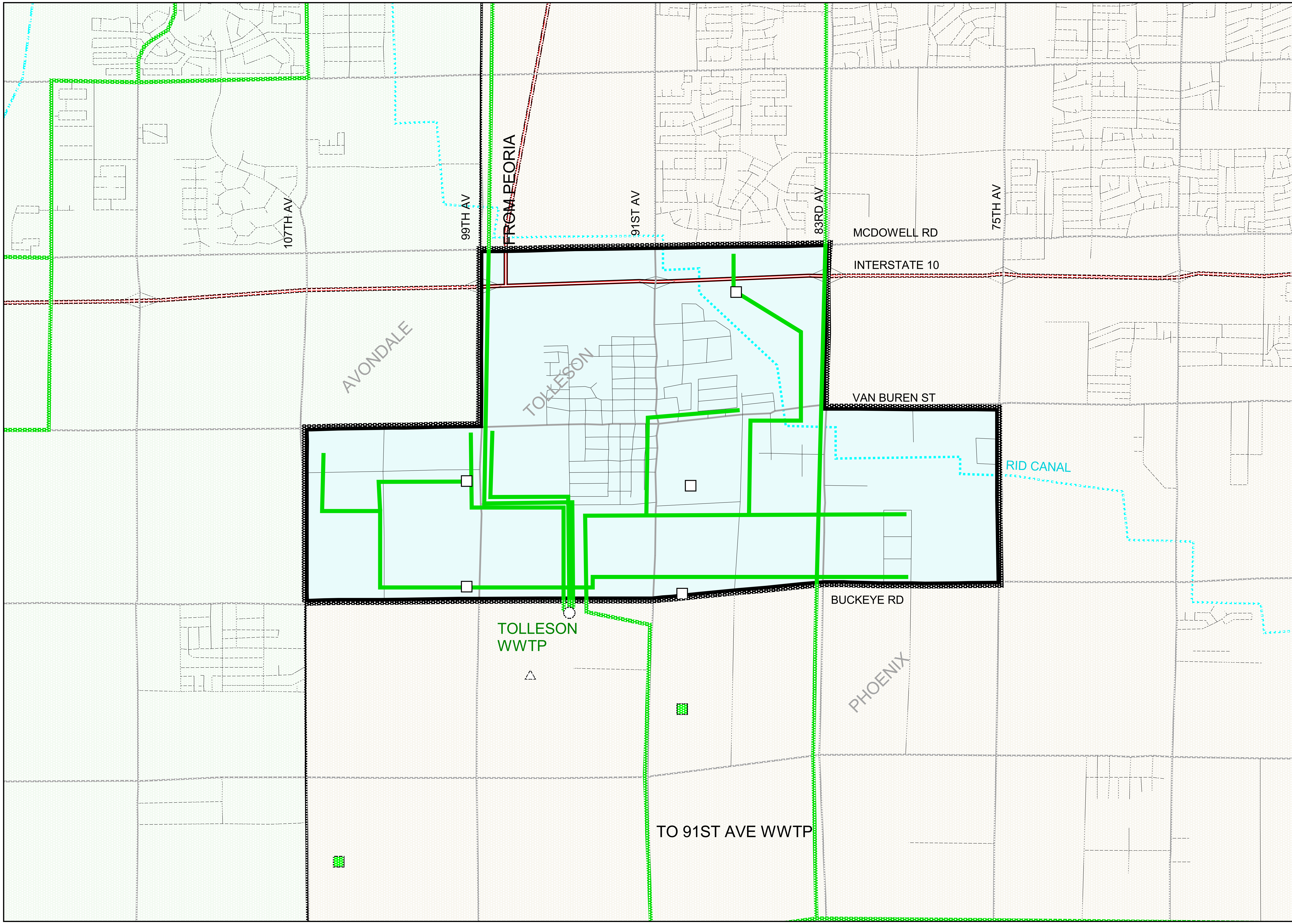

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LEGEND:
- Planning Area Boundary
- Existing Interceptor
- Future Interceptor
- Existing Lift Station
- Future Lift Station
- Existing Treatment Facility
- Future Treatment Facility
- Existing Reuse/Recharge
- Future Reuse/Recharge

Tolleson Municipal Planning Area

03/22/02

FIGURE 4.6

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Existing Collection System. The major source of influent flow to the Tolleson WWTP is the 99th Avenue interceptor. The Tolleson-Peoria SROG owns 11.9 mgd capacity in the interceptor, and Sun City owns capacity for an average daily flow of 5.2 mgd. The interceptor is shared with the Multi City SROG, which uses it to convey flow to be treated at the 91st Avenue Treatment Plant. Flow is diverted to the Tolleson WWTP from the 99th Avenue interceptor by a splitter structure located at the intersection of 99th Avenue and Van Buren Street. Tolleson then takes off its contracted amount of flow for Sun City and Peoria from the 99th Avenue interceptor and diverts the remainder to the Multi-City SROG 91st Avenue WWTP. This is done at the Tolleson WWTP through a diversion structure.

The collection system includes five pumping stations. A collection system study performed for the city reported that the existing interceptors, sewers, and pump stations have adequate capacity for future flows. Major sewers have been partially lined with corrosion-resistant material to protect against deterioration.

Existing Treatment System. The Tolleson WWTP currently has a capacity of 17.5 mgd. Tolleson's share of the existing treatment capacity is 2.9 mgd. Table 4.17 summarizes the allocation of treatment capacity at the Tolleson WWTP among all current participants.

Table 4.17 Tolleson WWRP Capacity Allocation
MAG 208 Water Quality Management Plan Update

Community	Current Flow (6/00) (mgd)	Additional Capacity Available (mgd)	Total Capacity Available (mgd)
Tolleson	1.4	1.5	2.9
Peoria	6.5	2.9	9.4
Sun City	3.9	1.3	5.2
Total	11.8	5.7	17.5

The treatment process includes the following:

- Headworks: bar screens and aerated grit removal basins.
- Primary clarifiers.
- Secondary treatment: first-stage trickling filters, intermediate clarifiers, second-stage trickling filters, solids contact channel, sludge reaeration basins, and secondary clarifiers.
- Sludge treatment: anaerobic digesters, belt thickener, sludge drying beds, facultative sludge basin, and belt filter press.

The effluent from the treatment plant is reused by the Palo Verde Nuclear Generating Station (PVNGS). Tolleson has an agreement with PVNGS under which PVNGS pays for as much effluent as Tolleson can provide, however Tolleson reserves the right to keep

10 percent of their effluent for reuse in and around the plant. Tolleson has an NPDES permit for an alternate discharge to the Salt River in the event that PVNGS is shut down.

Future Wastewater System Development. The Tolleson Planning Area is not expected to expand in the future. Flows are, however, expected to increase significantly in the future due to increased populations within the existing service area. Flow projected for year 2020 is 4 mgd. Tolleson's treatment capacity at the WWTP is 2.9 mgd; therefore, an increase in capacity will be needed to meet Tolleson's needs for the duration of the study period. The overall plan for the WWTP is to ultimately increase capacity to 24.9 mgd to meet future capacity requirements for the participating communities.

Tolleson's collection system is reported to be in good condition with adequate capacity in existing facilities to transport current and future flows. Expansion of the collection system will consist of extending branch and lateral sewers to serve areas as they develop.

Summary of Proposed Improvements for Years 2000 – 2010

Item	Estimated Cost[1]
Upgrade and Expansion of Solids Handling Facility:	
Modify digester and add new digesters, new gravity belt thickener, two new belt filter presses, add gas scrubber and methane storage, and new Dewatering Building(s)	$15,680,000
Install Backup Power Supply	4,000,000
WWTP Improvements and Upgrades	$29,495,000
Total	$49,175,000

[1] August 2000 costs (ENR Construction Cost Index = 6233)

4.2.3 Northwest Area

4.2.3.1 El Mirage

The City of El Mirage corresponds to Regional Analysis Zone (RAZ) 235. The planning area is approximately bounded by Dysart Road to the west, the west bank of the Agua Fria River to the east, Greenway Road on the north, and Northern Avenue on the south. Figure 4.7 depicts the planning area. El Mirage is the designated wastewater management agency for this area.

Population and Flow Projections. Table 4.18 presents a comparison of 1997 MAG population projections for El Mirage and more recent projections based on new housing developments. The housing-based projections and corresponding flow estimates were copied from the City of El Mirage 208 Amendment, dated December 2000. The population estimates are based on 2.5 persons per home, and the estimated wastewater flows were calculated using 220 gallons per day per housing unit.

Table 4.18 El Mirage Population and Flow Projections
MAG Water Quality Management Plan Update

Year	No. of Homes	Est. Population	MAG RAZ Population	Wastewater Flow (mgd)
2000	1,209	3,023	6,605	0.4
2005	6,313	15,783	6,678	1.9
2010	7,057	17,643	6,702	2.1
2015	7,802	19,505	6,869	2.3
2020	8,546	21,365	8,148	2.6

Existing Collection and Treatment. El Mirage obtained an amendment to the MAG 208 Plan in 1985. The amendment was for construction of a new collection system and a treatment plant with a 0.75-mgd initial capacity. The existing oxidation ditch facility was designed in 1986, with operations start-up in 1987.

The treatment facility is located on the west bank of the Aqua Fria River, southeast of the Peoria Avenue and El Mirage Road intersection. Unit processes include two oxidation ditches (parallel), two circular clarifiers, two travelling bridge filters, gas chlorination, an effluent pump station with storage pond, and sludge drying beds. Effluent is stored in effluent ponds for reuse on golf courses, parks, and other irrigated lands. The facility also has a NPDES permit for effluent disposal as backup to reuse.

***Future Collection and Treatment*.** The City of El Mirage will continue to expand the collection system to serve development. The existing treatment facility is nearing its design capacity and must be expanded to serve the city's growing population. The city has begun implementation of a three-phase plan to significantly expand the treatment facility. Phase I was completed in October 2000 and included the recommissioning of an existing 0.25 mgd

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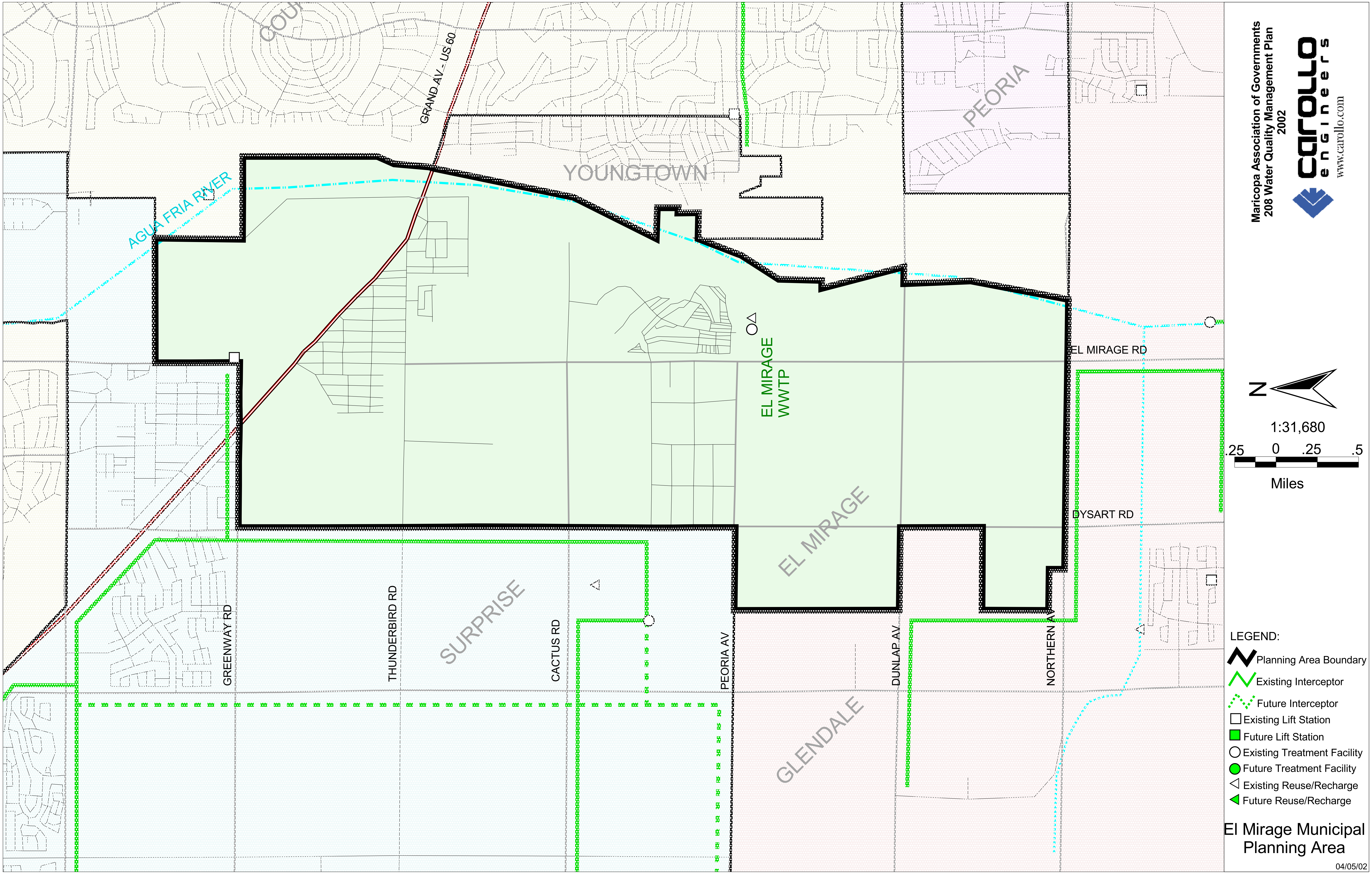
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EL MIRAGE WWTP
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THUNDERBIRD RD
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Planning Area Boundary
Existing Interceptor
Future Interceptor
Existing Lift Station
Future Lift Station
Existing Treatment Facility
Future Treatment Facility
Existing Reuse/Recharge
Future Reuse/Recharge
El Mirage Municipal Planning Area
04/05/02

FIGURE 4.7

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package plant, with connection to the existing traveling bridge filters. Phase II expansion will provide an additional 0.8 mgd of average day tertiary capacity with the addition of a two-tank Sequential Batch Reactor (SBR) design. The Phase II facility will include additional influent pumps, new secondary SBR treatment basins, new filters, and an UV disinfection system. The Phase II facility is scheduled to be completed and operational in March 2001.

Phase III expansion will occur in two separate subphases. The Phase IIIA facility will be constructed using an SBR process identical to that utilized in Phase II and will include new headworks (enclosed screening and grit removal), additional filters, additional UV disinfection and pumping equipment. In Phase III, the Phase II secondary treatment facility will be converted into anaerobic and aerobic digestion. The total additional average day capacity will be increased to 1.8 mgd by Phase IIIA and will be complete and operational by August 2001.

The Phase IIIB facility will consist of the addition of two more SBR reactors. At the completion of Phase IIIB, the total additional monthly peak capacity of the El Mirage WRF will be 4.32 mgd and the average day capacity will be 3.6 mgd. Construction of Phase IIIB will be complete and the facility will be operational by October 2001. Decommissioning of the old oxidation ditch and package plants will commence upon acceptance of the complete Phase III facility.

Summary of Proposed Improvement

Phase II WRF Expansion (2001)	$3,450,000
Phase IIIA WRF Expansion (2001)	4,600,000
Phase IIIB WRF Expansion (2001)	3,450,000
Total	$11,500,000

Costs are at current (June 2000) dollars, ENR = 6238.

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4.2.3.2 Glendale

The City of Glendale provides wastewater collection and treatment service within the incorporated limits of the city. In addition, in the 1980s the city has developed a facilities plan to provide wastewater service to what is referred to as the Western Area; however, the plan has not been implemented. The Western Area is bounded by Glendale's strip annexation. The approximate boundaries are 115th Avenue on the east, Perryville Road on the west, Peoria Avenue from Perryville Road to 1/2 mile east of Litchfield Road, and Northern Avenue from that point to the east. On the south, the Western Area is bounded by Camelback Road, with the exception of the area from Reems Road to 115th Avenue, which has boundaries between Camelback to Bethany Home Road.

The Glendale Planning Area, consisting of Regional Analysis Zones (RAZ) 222, 240, 254, 255, 256, 257, and 258, is depicted on Figure 4.8. The City of Glendale is the designated wastewater management agency for this area.

Population and Flow Projections. The MAG Municipal Planning Area (MPA) for Glendale includes the incorporated city and all areas within strip annexations, including Luke Air Force Base (AFB). Because Luke AFB operates and intends to continue to operate its own wastewater system, population and flow projections for the Base are not considered in this discussion. Actual flow data from Glendale indicates their per capita wastewater flow rate is 97 gpd (rather than the 100 gpd often used for planning purposes of flow projections). Table 4.19 presents projected SROG service population and flow, exclusive of Luke AFB.

Table 4.19 Glendale Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population[1] (not including Luke AFB)	Flow[1] (mgd)
2000	202,309	19.71
2005	228,045	22.22
2010	244,045	23.78
2015	260,045	25.34
2020	276,045	26.90

[1] Based upon projected SROG service populations and flow, Appendix C, Influent Conditions of 91st Avenue WWTP 25-year Facilities Master Plan, December 2001.

Existing Collection System. The city's current master study of its sewerage system dates back to 1988. The study reviewed the existing collection system and identified a program of improvements for implementation through year 2010.

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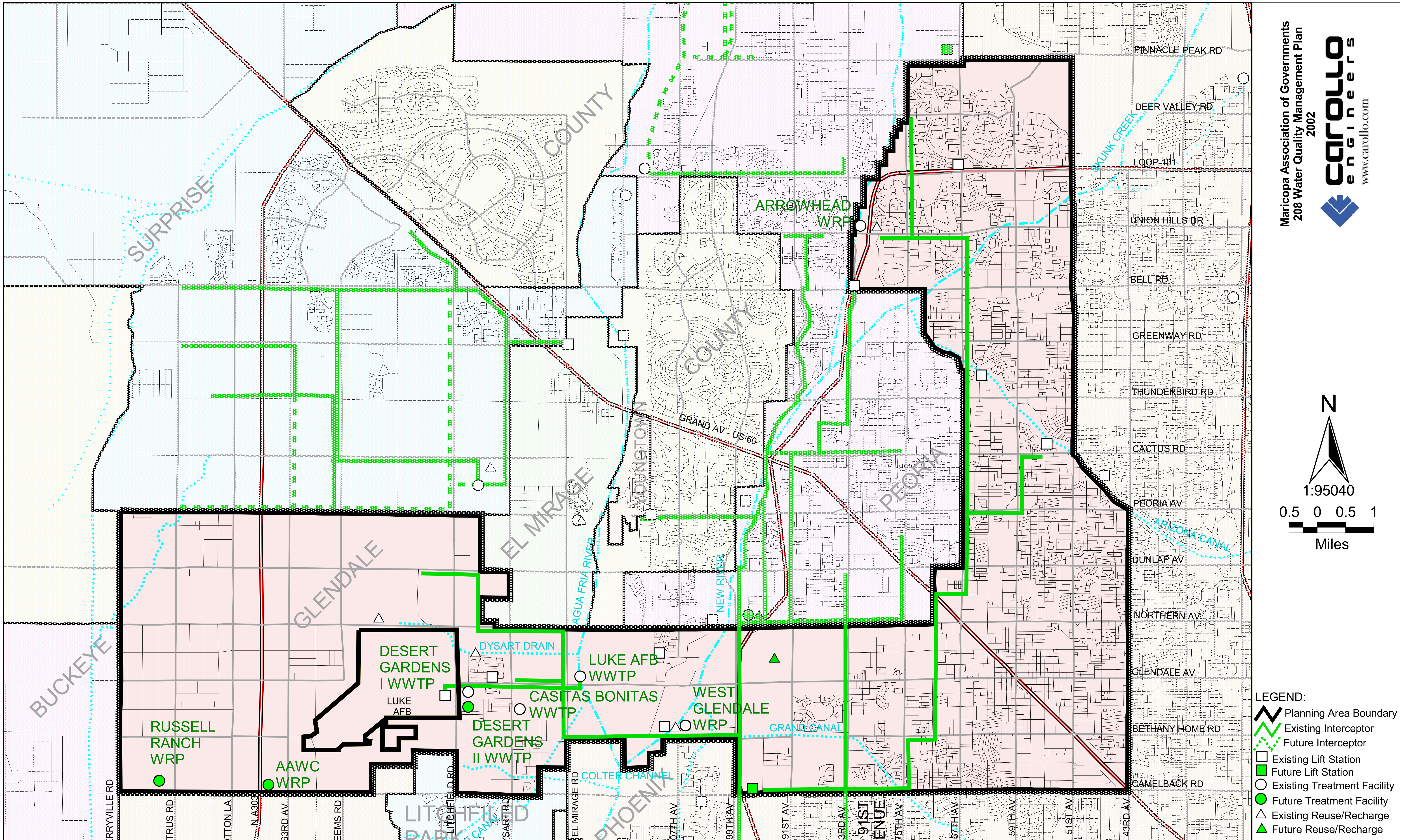

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Glendale Municipal Planning Area

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FIGURE 4.8

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The Glendale collection system serves the existing incorporated areas of the city and west to 115th Avenue. It currently is divided into two tributary areas, the North Area (north of Skunk Creek) and the South Area (the remainder of the existing system). The North Area approximately corresponds to RAZ 222. The West Area consists of RAZ 254 and 255. The South Area comprises the remainder of the incorporated areas.

Flows collected in the North Area are conveyed primarily by a gravity main to the Arrowhead Ranch Water Reclamation Facility (WRF). Flows from the South Area are collected by interceptors in 67th Avenue, 71st Avenue, Camelback Road, 83rd Avenue, and 99th Avenue. They are then conveyed to the 91st Avenue WWTP through interceptors in 83rd and 99th Avenues. The North Area has two existing pumping stations, and there are two lift stations in the South Area.

Existing Treatment Facilities. Glendale is a member of the Multi-City Subregional Operating Group (SROG) which owns the 91st Avenue Wastewater Treatment Plant. Currently, wastewater generated in the South Area of Glendale is split between the West Area Water Reclamation Facility (WAWRF) and the 91st Avenue WWTP. A lift station at 99th Avenue and Camelback Road diverts 4.3 mgd from the Camelback Interceptor sewer to the WAWRF. The remaining flow continues in the 99th Avenue Interceptor to the 91st Avenue WWTP. Glendale now owns 13.2 mgd of capacity at 91st Avenue.

The area north of Union Hills Drive in Glendale is served by the Arrowhead Ranch Water Reclamation Facility (WRF). The Arrowhead Ranch WRF has been expanded to its ultimate capacity and is a 4.5 mgd facility which includes activated sludge treatment using the bioreactor process, secondary clarifiers, effluent filtration and ultraviolet disinfection. Screenings and sludge are returned to the collection system and transported to the 91st Avenue WWTP. Effluent will be used for urban lakes and irrigation of golf courses, parks, common areas, and street rights-of-way. Excess effluent during winter months will be recharged up to 2.3 mgd.

The Glendale West Area Water Reclamation Facility (WRF) was placed into service in mid-2000. The WRF is fed by a force main from a diversion structure and lift station located on the Camelback Road Trunk Sewer east of 99th Avenue. The 4.3 mgd WAWRF includes screening, grit removal, extended air activated sludge and secondary sedimentation, filtration and ultraviolet (UV) disinfection. The effluent is pumped to an aquifer recharge site that includes recharge basins, vadose-zone recharge wells and seepage trenches. Reuses are to include irrigation of parks, golf courses, street rights-of-way, and other direct reuses within the West Area of the city. Solids are returned to the 99th Avenue interceptor for treatment at the 91st Avenue WWTP.

Desert Gardens Apartments (formerly named Desert Eagle Apartments) located in the western area, has a treatment facility with a design capacity of 52,500 gpd. American Public Service operates a 50,000-gpd WWTP at Casitas Bonitas. The Casitas Bonitas facility will be shut down and flows within the Glendale MPA currently directed to this facility will be redirected to the Goodyear LPSCo system as identified in the 208 Plan Amendment for Goodyear/LPSCo. Both of these small treatment plants discharge effluent via seepage pits.

Future Wastewater System Development. A portion of the wastewater from the South Area will continue to be discharged to the SROG system. The Glendale West Area Water Reclamation Facility is planned to treat its ultimate capacity of 15 mgd of wastewater from the South Area. The first expansion of the WAWRF is planned within the 2002-2010 period.

The City of Glendale is firmly committed to maximizing the recharge and reuse of treated effluent. The city's goal is to reclaim up to 80 to 85 percent of the total wastewater flow for recharge or reuse.

Wastewater flow projections (annual average flow in mgd for each treatment plant service area) are presented in Table 4.20 based on flow projections from Table 4.19.

Table 4.20 Glendale Wastewater System Projected Flow Allocations to WWTPs MAG 208 Water Quality Management Plan Update

Year	SROG Facility (mgd)[1]	ARWRF (mgd)[2]	WAWRF (mgd)[2]	Total Projected Flow
2000	14.75	2.63	2.33	19.71
2005	11.95	3.49	6.78	22.22
2010	4.96	4.30	14.52	23.78
2015	6.28	4.54	14.52	25.34
2020	7.84	4.54	14.52	26.90

1 Annual average daily flows. Includes residuals from WRP.
2 Annual average effluent flow (local WRP flow less residuals).

The sewerage master study identified a number of collection system improvements to be constructed, principally relief sewers 12 or 15 inches in diameter. The Ocotillo Road relief sewer will be 2.75 miles of 30-inch diameter sewer, required before year 2005.

A new wastewater treatment plant is planned for the Russell Ranch development on a site near Camelback Road and Citrus Road. The treatment facilities will consist of influent pumping and headworks, conventional extended aeration activated sludge with nitrogen removal, tertiary filtration, and UV disinfection. Capacity of the initial facility will be 0.06 mgd with ultimate capacity of 0.40 mgd. Effluent will be recharged or reused for landscape irrigation. Once the plant is constructed and operational, ownership will be taken over by Arizona American Water Company under the Arizona Corporation Commission.

Within the western portion of the Glendale MPA, Arizona American Water Company is planning a sewer service for an area called the Arizona American Water Company (AAWC) Service Area. The AAWC SA is defined on the north by Peoria Avenue, on the west by Perryville Road, on the south by Camelback Road, and on the east by Loop 303 and

Reems Road. A treatment plant of ultimate capacity of 8 mgd (annual average day) is planned to be constructed in phases to match rate of area development, with initial sizing to be 0.5 mgd. Although AAWC is still in the process of evaluating options to select the best location for the plant site within the service area, a possible location is in the northwest quadrant of Camelback Road and Loop 303. The AAWC Water Reclamation Plant is planned to ultimately serve as the regional plant and will replace the initial Russell Ranch WWTP facility, which will be decommissioned after the initial WRP startup and sewer connection is complete. The WRP will consist of process units including preliminary treatment, activated sludge, flow equalization, filtration, disinfection, sludge stabilization or anaerobic digestion, and gravity belt or belt press thickening. Effluent will be recharged or reused for landscape irrigation and sludge will be hauled to landfill.

A new wastewater treatment plant is planned for the Desert Gardens II Apartment Complex on Glendale Avenue west of 135th Avenue. The 60,000 gpd WWTP will consist of a sewage lift station, primary settling, extended aeration, denitrification, clarification, tertiary filtration and disinfection. Sludge disposal will be to State-approved landfill and effluent disposal will be through deep sewage pits. An Aquifer Protection Permit will be required.

Summary of Proposed Improvements

Capital improvements through the year 2010 are summarized below.

Item	Estimated Cost[1]
Glendale West Area WRP Expansion	$20,000,000
SROG Treatment Plant Upgrades	$28,300,000
Sewer Line Installation and Rehabilitation	$18,600,000
New Reuse Lines	$11,300,000
Total	$78,200,000

[1] Costs are at current (June 2000) dollars, ENR = 6238.

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4.2.3.3 Luke Air Force Base

Luke Air Force Base corresponds to Regional Analysis Zone (RAZ) 256. Wastewater collection and treatment within this area is provided by the Luke Air Force Base (AFB) system, which serves the entire Base. The Luke AFB Planning Area is depicted on Figure 4.9. The Base is in the City of Glendale; however, Luke AFB is responsible for its own wastewater treatment and planning.

Population and Flow Projections. The MAG population projection for RAZ 256, which corresponds to Luke AFB, remains relatively constant over the duration of the planning period through year 2020; therefore, the wastewater flow projections, assuming 100 gpcd, also remain constant, as shown in Table 4.21.

Table 4.21 Luke Air Force Base Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Wastewater Flow (mgd)
2000	3,794	0.38
2005	3,796	0.38
2010	3,815	0.38
2015	3,815	0.38
2020	3,821	0.38

Existing Collection System. The collection system serving the Base is divided into two primary areas, the main Base west of Litchfield Road and the housing area located east of Litchfield Road. The portion of the collection system serving the main Base drains into a lift station located south of the main gate. That lift station discharges into the Base's primary trunkline sewer. The trunkline exits the main Base south of the main gate, turns south down Litchfield Road, then turns east along Glendale Avenue and extends to the treatment facility site. The treatment facility is located approximately 1-1/2 miles east of the main Base at the northeast corner of Glendale Avenue and El Mirage Road. The collection system serving the housing areas drains into four lift stations that discharge to the trunkline in Glendale Avenue.

Recent upgrades to the collection system include reconstruction of the main Base lift station and replacement of the sewer trunkline in Glendale Avenue. Planned improvements to the system include replacement and repair of the housing area collection lines and consolidation of the housing area lift stations. Future improvements to the collection system will primarily be repairs and replacements.

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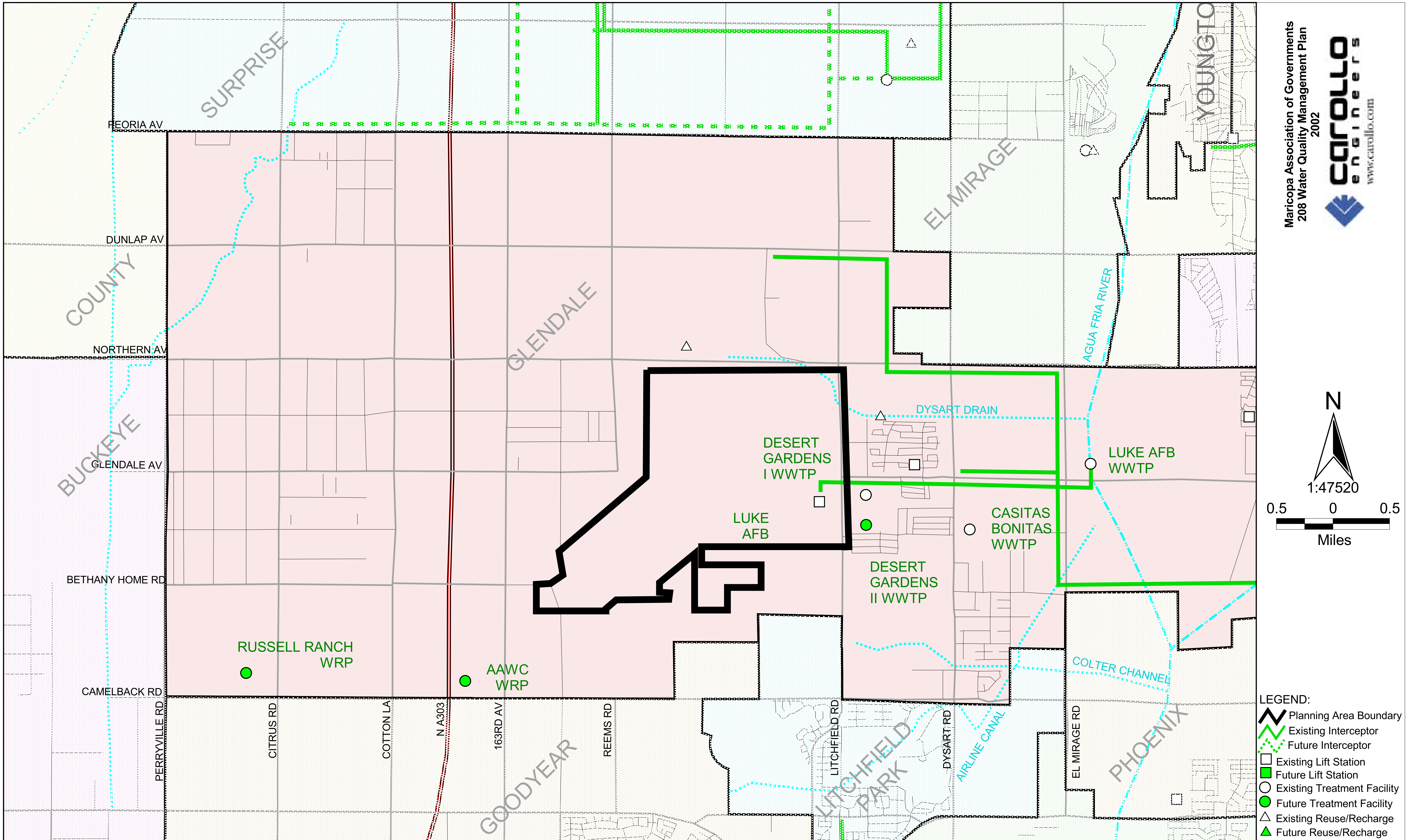

Luke AFB Municipal Planning Area

03/22/02

FIGURE 4.9

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<u>Existing Treatment System</u>. The wastewater treatment facility is owned and operated by Luke AFB. The original World War II vintage trickling filter plant has been upgraded to produce landscape irrigation quality effluent. The treatment facility includes influent screens, lift stations, oxidation ditch with attached anoxic basins, secondary clarifiers (reused from the original facility), tertiary sand filtration, UV disinfection, and an effluent pump station. Waste solids are dewatered in solar beds and landfilled.

Luke AFB utilizes two options for effluent disposal: surface discharge and irrigation reuse. Discharged effluent flows to an unnamed wash tributary to the Agua Fria River. The Base holds an NPDES permit for this discharge. In conjunction with the treatment facility improvements the Base constructed a reuse system. An effluent pipeline delivers water to an open storage reservoir located on the north side of the Base, east of Litchfield Road. Water is pumped from that location for landscape irrigation on the Base. Effluent is also pumped from the reservoir to the Base golf course, located north of the Base on Northern Avenue, west of Litchfield Road.

The capacity of the Base's treatment facility is approximately 1.0 mgd.

<u>Future Wastewater System Development</u>. It is not planned that the capacity of the plant will need expansion during the study period.

<u>Summary of Proposed Improvements (years 2000-2010)</u>. No improvements are planned during the study period.

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4.2.3.4 Peoria

The Planning Area for Peoria consists of three adjoining geographic areas, southern, north central, and northwest areas. The southern geographic area is generally bounded by Beardsley Road on the north, 67th Avenue on the east, Northern Avenue to the south and 115th Avenue to the west. The north central area generally is bounded by Beardsley Road on the south, Agua Fria River to the west, Lake Pleasant area to the north and 67th Avenue to the east. The northwest area is generally bounded by Circle Mountain Road on the north, Cotton Lane to the west, Pinnacle Peak Road on the south, and Agua Fria River to the east. The Peoria wastewater planning area, consisting of Regional Analysis Zones (RAZ) 202, 213, 214, 215, 238, and 239, is depicted on Figure 4.10. The City of Peoria is the designated wastewater management agency for this area.

Population and Flow Projections. Based upon a per capita wastewater flow of 100 gpcd, flow projections for Peoria are presented in Table 4.22 using the 1997 MAG adopted population projections. At present the flow projections include some flows not treated by Peoria, including unincorporated areas and small areas served by the Sun City Sewer Company.

Population projections for the City of Peoria were evaluated in detail as part of the City's Water Resource Master Plan, July 2000. The City developed updated projections for water resources planning uses and to reflect anticipated growth in outlying areas of the City. Based on an estimated 2000 population of 101,000, the updated projections are 182,000 for 2010 and 240,000 for 2020.

Table 4.22 Peoria Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)
2000	96,974	9.70
2005	130,910	13.09
2010	145,797	14.58
2015	172,138	17.21
2020	188,834	18.88

Existing Collection System. The existing sewage collection system for the City of Peoria consists of collector sewers, interceptor sewers, the 99th Avenue Interceptor Sewer from Northern Avenue to the Tolleson Wastewater Treatment Plant, and various sewage pump stations.

Existing interceptors are located in the southern and north central planning areas. The main interceptor in the north central area runs east to west along Beardsley Road from 83rd Avenue to 111th Avenue and conveys wastewater to the Beardsley WWTP. This main interceptor ranges in size from 24 inches to 36 inches in diameter. There are five north to south interceptors ranging in size from 12 inches to 18 inches in diameter located along

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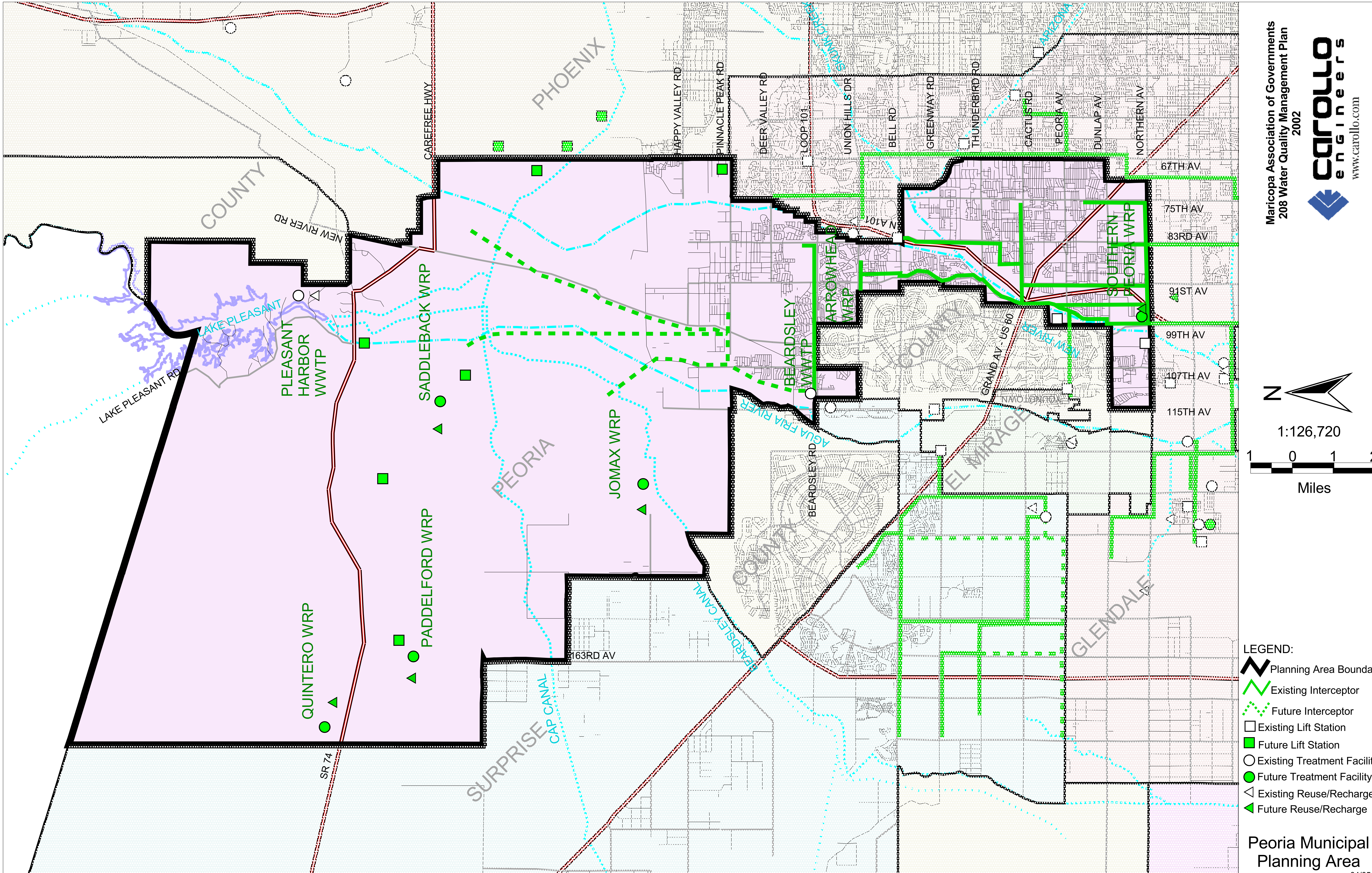
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PEORIA AV
DUNLAP AV
NORTHERN AV
67TH AV
75TH AV
83RD AV
91ST AV
99TH AV
107TH AV
115TH AV
163RD AV
SR 74
GRAND AV - US 60
BEARDSLEY RD
AGUA FRIA RIVER
NEW RIVER
BEARDSLEY CANAL
CAP CANAL
ARIZONA
PLEASANT HARBOR WWTP
SADDLEBACK WRP
JOMAX WRP
PADDELFORD WRP
QUINTERO WRP
BEARDSLEY WWTP
ARROWHEAD WRP
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LEGEND:
Planning Area Boundary
Existing Interceptor
Future Interceptor
Existing Lift Station
Future Lift Station
Existing Treatment Facility
Future Treatment Facility
Existing Reuse/Recharge
Future Reuse/Recharge
Peoria Municipal Planning Area
04/05/02
FIGURE 4.10

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83rd Avenue, 87th Avenue, 91st Avenue, 95th Avenue, and 107th Avenue which convey wastewater to the Beardsley interceptor sewer. There is also one pump station and force main system in the north central area. This system is located approximately 0.5 miles south of Beardsley Road at 111th Avenue and pumps wastewater to the Beardsley WWTP from the area east of 111th Avenue and south of the plant. Interceptors in the southern planning area collect sewage from the developed areas and convey it to the 99th Avenue Interceptor at Northern Avenue for treatment at the Tolleson WWTP. The major existing interceptor sewers in the southern planning area which make up the backbone of the wastewater conveyance system are shown on Figure 4.10.

There are also four wastewater pump stations and force main systems in the southern planning area. These pump stations are located at 111th Avenue and Orangewood Road, 108th Avenue and Northern Avenue, Northern Avenue west of the New River, and north of Peoria Avenue and just west of the New River (Apollo pump station). These lift stations convey wastewater east to the 99th Avenue Interceptor system, which conveys flow to the Tolleson WWTP.

Existing Treatment Facilities. Wastewater collected from the southern region of Peoria is conveyed to the Tolleson Wastewater Treatment Plant through the 99th Avenue Interceptor. Peoria is joined with Tolleson in the Tolleson-Peoria Subregional Operating Group (SROG) for its use of the Tolleson WWTP. Currently, all wastewater generated in the southern region of Peoria is treated at the Tolleson WWTP. Peoria's currently allocated treatment capacity is 9.4 mgd. It is anticipated that ultimate build-out of the southern region of Peoria will produce flows of approximately 13.0 mgd. As a result, another treatment plant will be required to make up for the deficit in treatment capacity.

Wastewater collected in the north central area of Peoria is currently treated at the Beardsley WWTP, a 3.0 mgd facility with a 16 mgd ultimate capacity, which is located at 111th Avenue and Beardsley Road. The facility produces effluent for groundwater recharge using the activated sludge process with nitrification/denitrification, tertiary filtration, and UV disinfection. The effluent is disposed of through recharge basins and the sludge is conveyed to the Tolleson WWTP for treatment. It is projected that ultimate development of the northern area will generate wastewater flows of approximately 16 mgd, all of which can be treated at the Beardsley WWTP when it is at ultimate capacity.

The north central region has the potential to reuse the ultimate 16 mgd of treated effluent for recreation, irrigation, or recharge purposes. Effluent may be reused on 14,000 acres of irrigable land in the upper portion of the northern region.

The northwest region of Peoria is beginning to develop. Private development master plans include water reclamation plants that will eventually be Peoria facilities as part of the City’s wastewater system. Some of these facilities are being constructed to serve new developments prior to the City’s collection system reaching these sites.

The Pleasant Harbor WRP was built in 1995 to treat wastewater generated by the Pleasant Harbor development, which consists mainly of an RV Park, commercial enterprises, and a marina. The WRP located on Lake Pleasant on the eastern side of New Waddell Dam has a current capacity of 0.063 mgd with a planned ultimate capacity of 0.189 mgd. Unit processes include: aeration basins with nitrification/denitrification, secondary sedimentation, filtration, and UV disinfection. The effluent is reused for on-site irrigation of landscaping. Sludge is stored in a holding tank and periodically pumped out and disposed of at an authorized disposal site.

Future Wastewater System Development. Wastewater collected from the southern area is conveyed to the Tolleson Wastewater Treatment Plant through the 99th Avenue Interceptor. Currently, Peoria has rights to 9.4 mgd at the Tolleson WWTP; however, the City has a limiting capacity of 7.29 mgd in the 99th Avenue Interceptor used to transport flows to Tolleson. One potential alternative is an additional pipeline, parallel to the 99th Avenue Interceptor, planned to convey flows from the southern region of Peoria in excess of 7.29 mgd, up to a combined total of 9.4 mgd.

The ultimate development of the southern region of Peoria, expected to occur by 2035, is projected to produce an average daily wastewater flow of 13.0 mgd. One alternative would be development of a new South Peoria water reclamation plant in the general vicinity of 99th and Northern Avenue. It would have an ultimate capacity up to 13.0 mgd and would send solids to the Tolleson WWTP. The effluent would be used for irrigation, groundwater recharge, and NPDES discharge to the New River. The southern region planning area has enough park and open space to utilize the effluent, but a distribution system would be required to deliver the effluent.

As wastewater flows increase in the north central region and exceed the existing 3.0 mgd treatment capacity at the Beardsley WWTP, additional treatment capacity will be necessary. The Beardsley WWTP has a planned ultimate capacity of 16 mgd and will undergo a series of expansions until reaching this capacity. Future phases should be initiated as actual growth dictates based on measured flows into the facility. Future effluent management for Peoria’s water reclamation facilities will include alternatives for landscape irrigation, ornamental lakes, water exchanges, and groundwater recharge. Another option will be NPDES discharge to the Agua Fria River. Effluent quality will satisfy requirements for open access reuse and indirect recharge.

The northwest area of Peoria will be served by a new proposed Jomax Water Reclamation Facility, to be located near Jomax Road and 131st Avenue. Projected build-out capacity for the proposed Jomax WRF is 9.0 mgd. The Jomax WRP is being planned and designed as part of Pleasant Point, a 7,100-acre master planned community in northwest Peoria. The WRF will be constructed in phases to serve the development as it expands.

The Phase I capacity of the Jomax WRF will be 1.5 mgd, with initial capacity being 0.75 mgd. At build-out the plant will include headworks (preliminary treatment), activated sludge process, filtration, and disinfection. Solids handling includes dewatering (centrifuge or belt filter process) followed by hauling to landfill. The Jomax WRF will be designed to permit effluent disposal by reuse, groundwater recharge or surface discharge. Following completion of construction, the facility ownership will be transferred to the City of Peoria who will operate and maintain the facility.

Two other privately developed and operated treatment plants will be constructed to serve the Pleasant Point Community (White Peak Ranch and Lakeland Village developments) and the surrounding areas including parts of the Lake Pleasant Heights development. They are the Paddelford and Saddleback WRPs, with ultimate capacities of 1.0 and 0.9 mgd, respectively. Effluent from both WRPs (Paddelford and Saddleback) will be disposed of through a combination of irrigation and recharge.

When the Peoria sewer system is eventually extended into the northwest areas, the Paddelford and Saddleback WRPs may be retired from service or operated and maintained by the City.

The Quintero development is a master-planned golf and country club of 827 acres. The build-out in six years is planned for 283 dwelling units and a population of 700 people, located five miles west of Lake Pleasant and 3/4 mile north of Highway 74.

Wastewater will be collected and conveyed to an on-site, 0.07 mgd (0.15 mgd Ultimate) tertiary treatment facility using the sequential batch reactor system, effluent filtration and UV disinfection. Effluent is to be reused for golf course irrigation. No permits have yet been applied for.

Summary of Proposed Improvements (1995-2015)

Item	Estimated Cost[1]
Southern Region	
Collection System	$156,000
South Peoria WRP (2.8 mgd)	13,220,000
99th Ave. Interceptor—Parallel line	6,920,000
North Central Region	
Collection System	16,500,000
Beardsley Road Treatment Plant Expansion to 16 mgd	65,000,000
Northwest Region	
Collection System	8,500,000
Jomax Water Reclamation Facility (6.7 mgd)	33,500,000
Total	$143,796,000

[1] Costs are September 2001 (ENR Construction Cost Index = 6300).

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4.2.3.5 Surprise

The Planning Area for the City of Surprise is comprised of Regional Analysis Zones (RAZ) 204, 211, 212, 232, 233, and 234. It is depicted on Figure 4.11. The City of Surprise is the designated wastewater management agency for this area. Because the City of Surprise covers more than 227 square miles, the city divided the Planning Area into five smaller planning areas that correspond to the direction of growth planned for Surprise.

Planning Area 1 includes the existing developed portion of the city as well as an area expected to experience immediate development. The boundaries of Planning Area 1 are the Beardsley Canal, Grand Avenue, Bell Road, El Mirage Road, Greenway Road, Dysart Road, and Peoria Avenue.

The City of Surprise intends to control and plan development in each of the five different planning areas sequentially. Planning Area 1 is almost fully developed. As a result of the high rate of growth, Surprise is already dealing with active development in Planning Areas 2 and 3.

Planning Area 2 and Planning Area 3 are both northwest of Planning Area 1. They are both bounded on the northwest by the CAP and on the southeast by the Beardsley Canal. Planning Area 2 is on the northeast side of Grand Avenue and Planning Area 3 is on the southwest side of Grand Avenue. Planning Areas 4 and 5 continue this pattern by both being northwest of Planning Areas 2 and 3 extending out to the city limits. Planning Area 4 is on the northwest side of Grand Avenue while Planning Area 5 is on the southwest side of Grand Avenue.

Population and Flow Projections. Projected populations and wastewater flows for Surprise are presented in Table 4.23. The population projections are based on populations from the City of Surprise, as they are experiencing higher growth rates than anticipated in the 1997 MAG population projections. Sewage flows are projected based on 100 gpcd.

Table 4.23 Surprise Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)
2000	36,500	3.65
2005	80,200	8.02
2010	149,900	15.00
2015	236,900	23.69
2020	315,100	31.51

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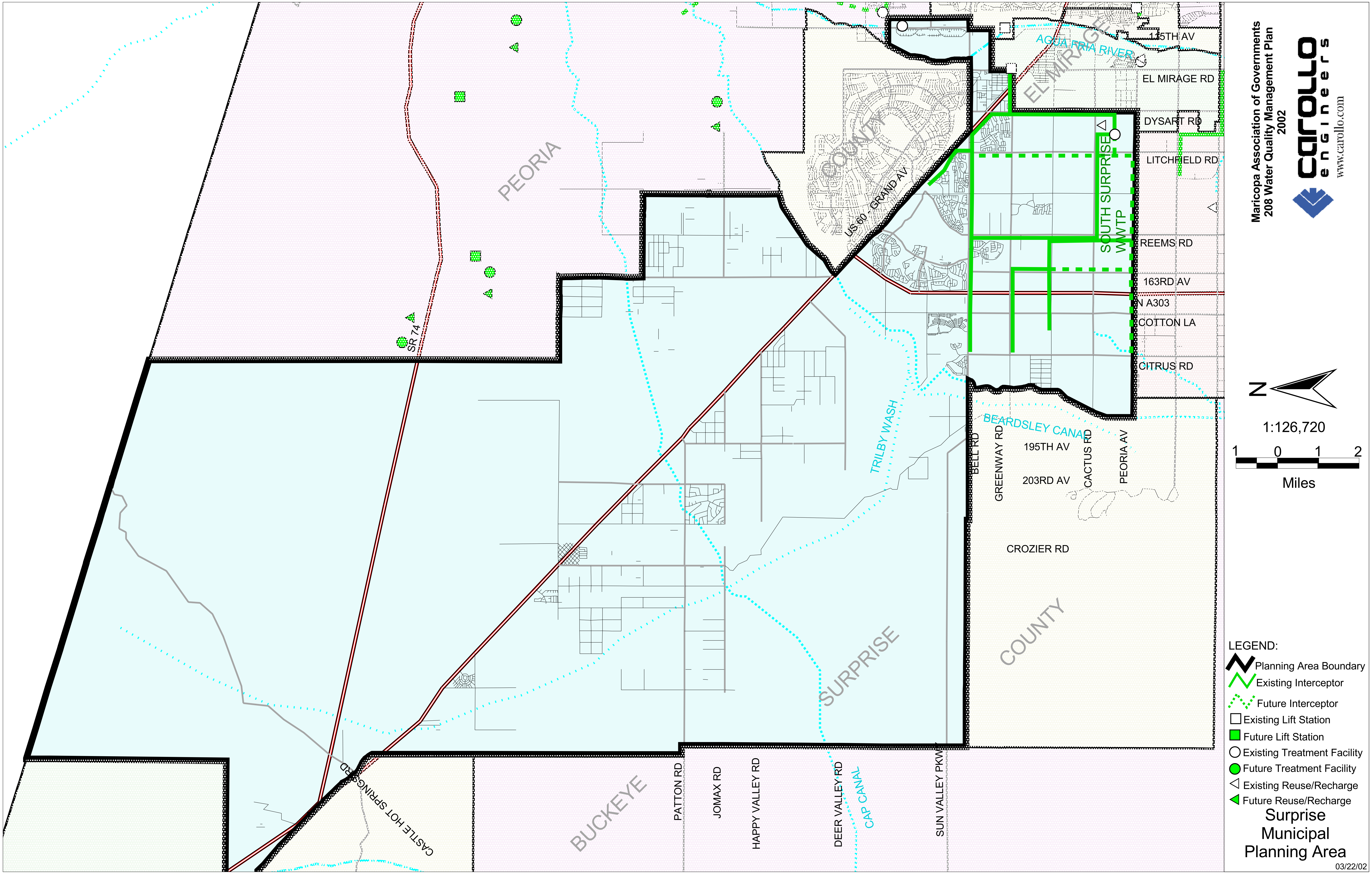

Surprise Municipal Planning Area

03/22/02

FIGURE 4.11

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Existing Wastewater System. The collection system in the City of Surprise is concentrated in Planning Area 1 where most of the existing development resides. The main interceptors in the southeast portion of the city form a loop in the center of Planning Area 1. The first interceptor starts at Citrus Road and runs along Bell Road to the Litchfield Road WWTP. From the Litchfield WWTP, an interceptor runs down Dysart Road to the South Surprise WWTP. Another interceptor starts at Bell Road, conveys flow down Reems Road where it turns east, and directs flow to the South Surprise WWTP along Cactus Road.

Existing Wastewater Treatment. The City of Surprise has two wastewater treatment facilities. The Litchfield Road WWTP is located on Litchfield Road just north of Bell Road and has an ultimate capacity of 1.32 mgd. The second treatment plant is the South Surprise WWTP located on Litchfield Road and Cactus Road with a current operating capacity of 3.2 mgd.

The Litchfield Road WWTP unit processes include a bar screen, oxidation ditch, in-line clarifier, filters, and chlorine disinfection. The Litchfield Road WWTP no longer treats wastewater, instead for the past two years only the influent pump station has been operating to divert flows to the South Surprise WWTP. The City of Surprise plans to officially deactivate the Litchfield Road WWTP by the year 2002, when the Litchfield Road interceptor is installed.

The South Surprise WWTP is and will continue to be the only operating wastewater treatment facility for the service area in Planning Area 1. With a build-out capacity of 36 mgd, the South Surprise WWTP includes rotary screens, grit removal, oxidation ditches with nitrification/denitrification, secondary clarifiers, filters, and UV disinfection. The majority of effluent is discharged into groundwater recharge basins located on-site. A portion of the effluent is used for irrigation on the treatment facility site. Sludge is treated through auto thermal thermophyllic aerobic digestion(ATAD) to produce Class A sludge that is hauled from the site for land application.

Future Wastewater System Development. The South Surprise WWTP will be expanded to 36 mgd and will continue to serve the entire Planning Area 1, which has an expected, corresponding build-out flow of 36 mgd. The expansions will occur in 4-mgd phases, and the plant is expected to be built at ultimate capacity by the year 2020. The first expansion to 7.2 mgd capacity is in design and is scheduled for construction in 2002.

The wastewater system infrastructure is expanding in conjunction with active development in Planning Area 1. The City has a development agreement with Rancho Gabriella that will include a new sewer main. It will be located in Peoria Avenue from Bullard Avenue east to Litchfield Road, then turn north in Litchfield Road to the South Plant. Another new sewer will be constructed in Litchfield Road, from Bell Road to the South Plant, by the end of 2002. In order to expand their opportunities for effluent reuse, the City is planning a reclaimed pipeline that will extend from the South Plant north in Litchfield Road to approximately Bell Road. This future line will deliver effluent for irrigation to a planned City project site, the Surprise Center.

High growth rates are expected as seen in the population projections for the city. To keep up with the growth and the associated wastewater generation, the city is planning to purchase property to build a North Surprise WWTP. It will serve both Planning Areas 2 and 3, just northwest of the current developed Planning Area 1. After the acquisition of land, the initial phase of the plant is expected to be constructed by year 2005. In the short-term, it will not be technically feasible or cost effective to build the first phase of the North Plant. As small pockets of development occur, developers will most likely build interim treatment systems through the proper 208 planning process until such time that the area infrastructure is constructed and the developments have access to the North Surprise WWTP.

Summary of Proposed Improvements

Item	Estimated Cost[1]
Interceptor Improvements (2001)	$1,000,000
South Surprise WWTP Expansions (2001-2003)	25,000,000
North Surprise WWTP Land (2001)	2,000,000
North Surprise WWTP Design and Construction (2002-2004)	41,000,000
Total	$69,000,000

[1] August 2000 Dollars (ENR Construction Cost Index = 6233).

4.2.3.6 Youngtown

The Planning Area for Youngtown consists of the incorporated limits of the town, corresponding to Regional Analysis Zone (RAZ) 236, and is depicted on Figure 4.12. The approximate boundaries of Youngtown are Grand Avenue on the north, 115th Avenue to the east, Olive Avenue on the south and 111th Avenue on the west. Because the town is completely bordered by other incorporated areas, it is not expected that this planning area will expand in the future.

Population and Flow Projections. The population of the incorporated Town of Youngtown is projected to increase minimally over the duration of the study period. Based on information provided by the town, a per capita wastewater flow rate of 90 gpcd is used for projecting future wastewater flows. Using the adopted MAG population projections for Youngtown, Table 4.24 presents projected wastewater flows.

Table 4.24 Youngtown Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)
2000	2,978	0.27
2005	3,040	0.27
2010	3,119	0.28
2015	3,206	0.29
2020	3,286	0.30

Existing Collection System. The existing collection system serving the incorporated area of Youngtown is operated by Arizona American Water Co. Wastewater from this collection system is conveyed from the Youngtown Lift Station to the Arizona American Water Company Meter Station at the 99th Avenue interceptor sewer to the Tolleson WWTP.

Existing Treatment Facilities. Youngtown, formerly a member of the Multi-city Subregional Operating Group (SROG), sold its wastewater system to Arizona American Water Co. in 1995. Arizona American Water Co. has sewer capacity in the 99th Avenue Interceptor and treatment capacity in the Tolleson WWTP sufficient to meet the needs of the town for the duration of the planning period.

Future Wastewater System Development. The existing facilities have adequate rated capacity for the population increases expected for Youngtown over the next twenty years. Therefore, no major system developments are expected. Arizona American Water Co. has adequate capacity for Youngtown flows to be treated in the Tolleson WWTP over the planning period.

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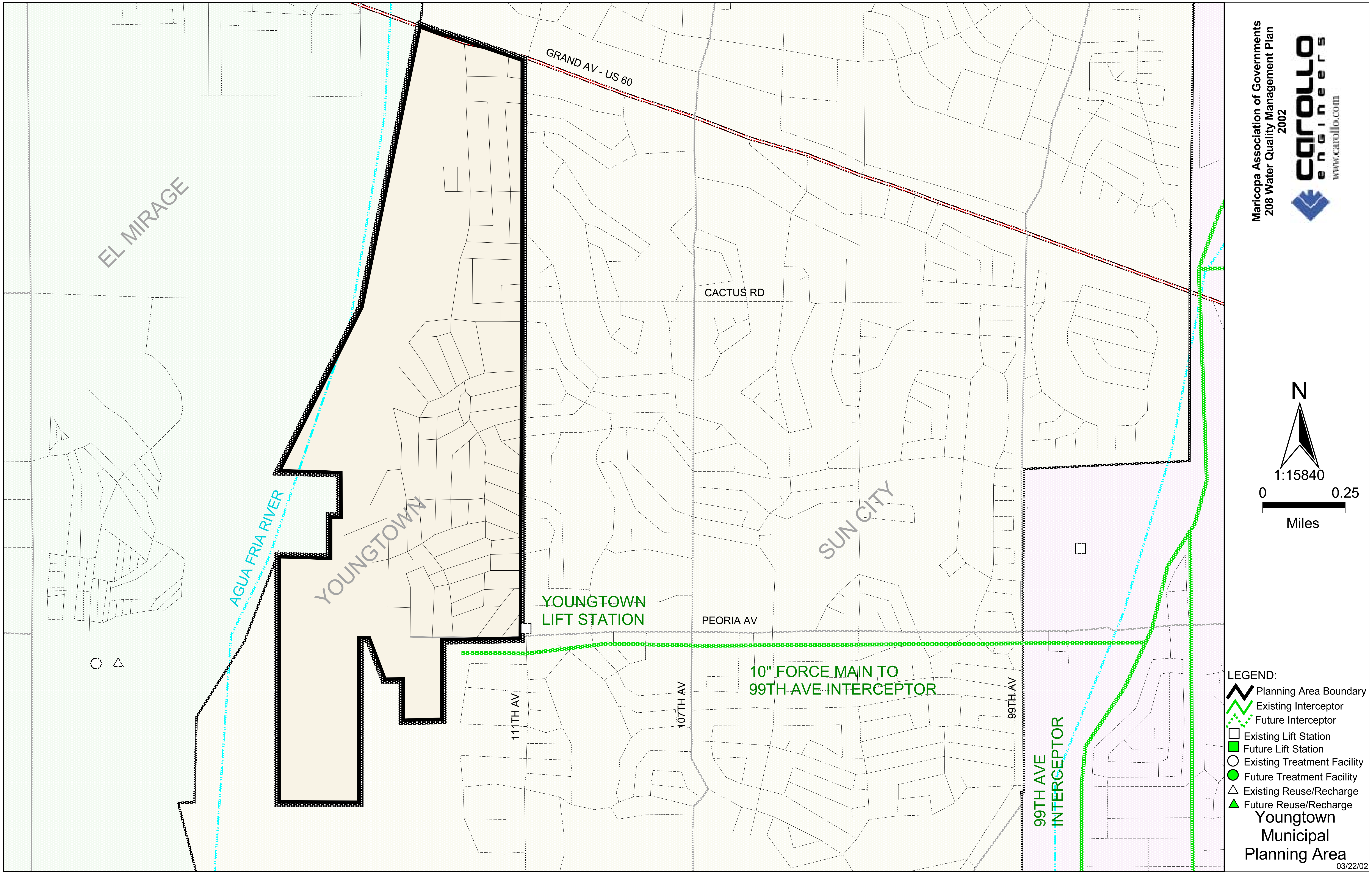
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Youngtown
Municipal
Planning Area
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FIGURE 4.12

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4.2.4 Northeast Area

4.2.4.1 Carefree

The Town of Carefree corresponds to Regional Analysis Zone (RAZ) 208. Approximately 75 percent of the Carefree area's population is served by the Black Mountain Sewer Corporation (BMSC), a private wastewater utility. The remaining 25 percent is served by on-site septic tanks. The BMSC certificated service area covers approximately 5 square miles, including a portion of northern Scottsdale. The Town of Carefree intends to continue with this arrangement and does not plan to provide wastewater collection and treatment service. It is anticipated that BMSC will continue to serve approximately 75 percent of the area as development proceeds. Figure 4.13 depicts the Carefree planning area.

Population and Flow Projections. Wastewater generated in Carefree is from residential and light commercial sources, as well as the Boulders Resort. It is likely that this will remain the case in the future. Discussions with representatives of the wastewater utility indicate that the average day per capita of wastewater generated is 117 gpcd. For planning purposes, this study will assume an annual average daily per capita flow of 120 gpcd. Seasonal peak flows are approximately 50 percent greater due to the influx of visitors during winter months. The peak flows, presented in Table 4.25, are used by the utility to size its facilities. Projected populations and wastewater flows are based on the current MAG population projections adopted in 1997.

Table 4.25 Carefree Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Planning Area Population	Population Served[1]	Flow Projections, mgd	
			Average Day	Seasonal Peak
2000	3,041	2,281	0.27	0.41
2005	3,578	2,684	0.32	0.48
2010	4,760	3,570	0.43	0.64
2015	5,196	3,897	0.47	070
2020	5,564	4,173	0.50	0.75

[1] Population served is estimated to be 75 percent of the planning area population.

Existing Collection System. The collection system serving Carefree has been substantially developed. Approximately 75 percent of the population is served. The more sparsely-populated areas are served by septic tanks and are likely to remain outside the collection system. Further expansion of the collection system during the study period is expected to be minimal.

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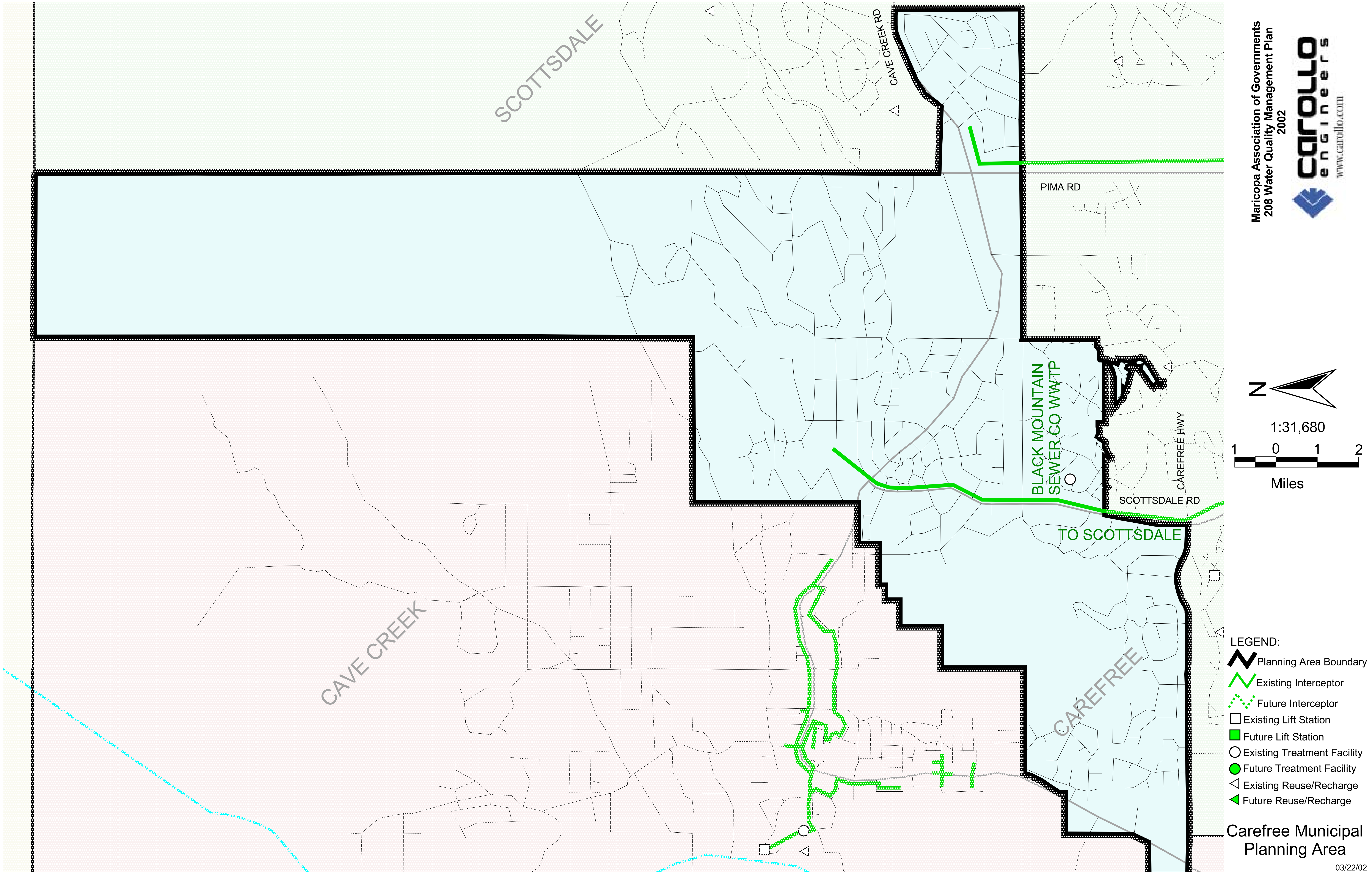

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LEGEND:
Planning Area Boundary
Existing Interceptor
Future Interceptor
Existing Lift Station
Future Lift Station
Existing Treatment Facility
Future Treatment Facility
Existing Reuse/Recharge
Future Reuse/Recharge
Carefree Municipal Planning Area
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FIGURE 4.13

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A 12-inch diameter trunk sewer along Scottsdale Road connects the BMSC system to Scottsdale's. This line conveys flows exceeding the capacity of the BMSC treatment plant, plus residual solids from the BMSC plant.

Existing Treatment System. Treatment capacity requirements for Carefree are dictated by the sustained seasonal peak flows. The BMSC wastewater treatment plant, currently rated at 0.12 mgd, is a package facility, which performs the activated sludge process with tertiary filtration and chlorine disinfection. Effluent from the plant is reused for turf irrigation. Sludge is discharged into the Scottsdale municipal collection system and ultimately treated at the 91st Avenue WWTP.

Flows exceeding the capacity of the plant will be bypassed and discharged to the Scottsdale system using the 12-inch trunk sewer. An intergovernmental agreement allows Black Mountain Sewer Corporation to discharge up to 1 mgd into Scottsdale’s wastewater collection system.

Future Wastewater System Development. No major expansions of the collection system are anticipated. The treatment plant will either remain at 0.12 mgd or be expanded to an ultimate capacity of 0.16 mgd. It is planned that effluent will continue to be reused for golf course irrigation. Sludge will continue to be discharged to the Scottsdale collection system and treated at the 91st Avenue WWTP. Wastewater flows in excess of 0.12 mgd will continue to discharge into the Scottsdale collection system for treatment.

Summary of Proposed Improvements. None planned.

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4.2.4.2 Cave Creek

The Town of Cave Creek, corresponding to Regional Analysis Zone (RAZ) 207, currently operates a wastewater system consisting of a package wastewater treatment plant, a sewage lift station and force main, and a limited sewage collection system in the downtown commercial area and in the Rancho Manana Golf Club area. Much of this sewered area was acquired by the town from the Cave Creek Sewer Company private utility in the mid-1990s. Arizona American Water Company is the contract operator for the wastewater treatment facilities. The rest of the town is served by septic tanks.

The planning area depicted on Figure 4.14 consists of the incorporated town plus county land to the north. The total area includes approximately 42 square miles, bounded by the Tonto National Forest on the north, and on the east by the Town of Carefree. The western boundary extends along the 28th Street alignment from Carefree Highway to Joy Ranch Road, then along 24th Street alignment to the northern boundary at the Tonto National Forest. To the south of Carefree Highway, an irregular area exists bounded approximately by the 40th Street alignment to the west, Montgomery Road to the south, and 56th Street to the east.

Population and Flow Projections. Existing development in Cave Creek consists of low-density residential areas, and a more densely developed commercial center in the downtown area. Several significant developments are in various stages of planning, but it is expected that most densities will remain lower than typical densities in the Phoenix area.

Table 4.26 presents the current MAG population projections (adopted 1997), and flow projections based on 100 gpcd per capita flow using the MAG projections.

Table 4.26 Cave Creek Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)[1]
2000	4,231	0.42
2005	6,463	0.64
2010	9,188	0.92
2015	11,398	1.14
2020	13,288	1.33

[1] For entire service area.

It is likely that some of the more remote, lower density areas will continue to be served by septic tanks due to the high cost of extending wastewater collection facilities to these areas.

Existing Wastewater Collection and Treatment. The Town of Cave Creek has a collector sewer system to serve the primarily commercial development in the downtown area on both sides of Cave Creek Road from Rancho Manana Road to the eastern town limits.

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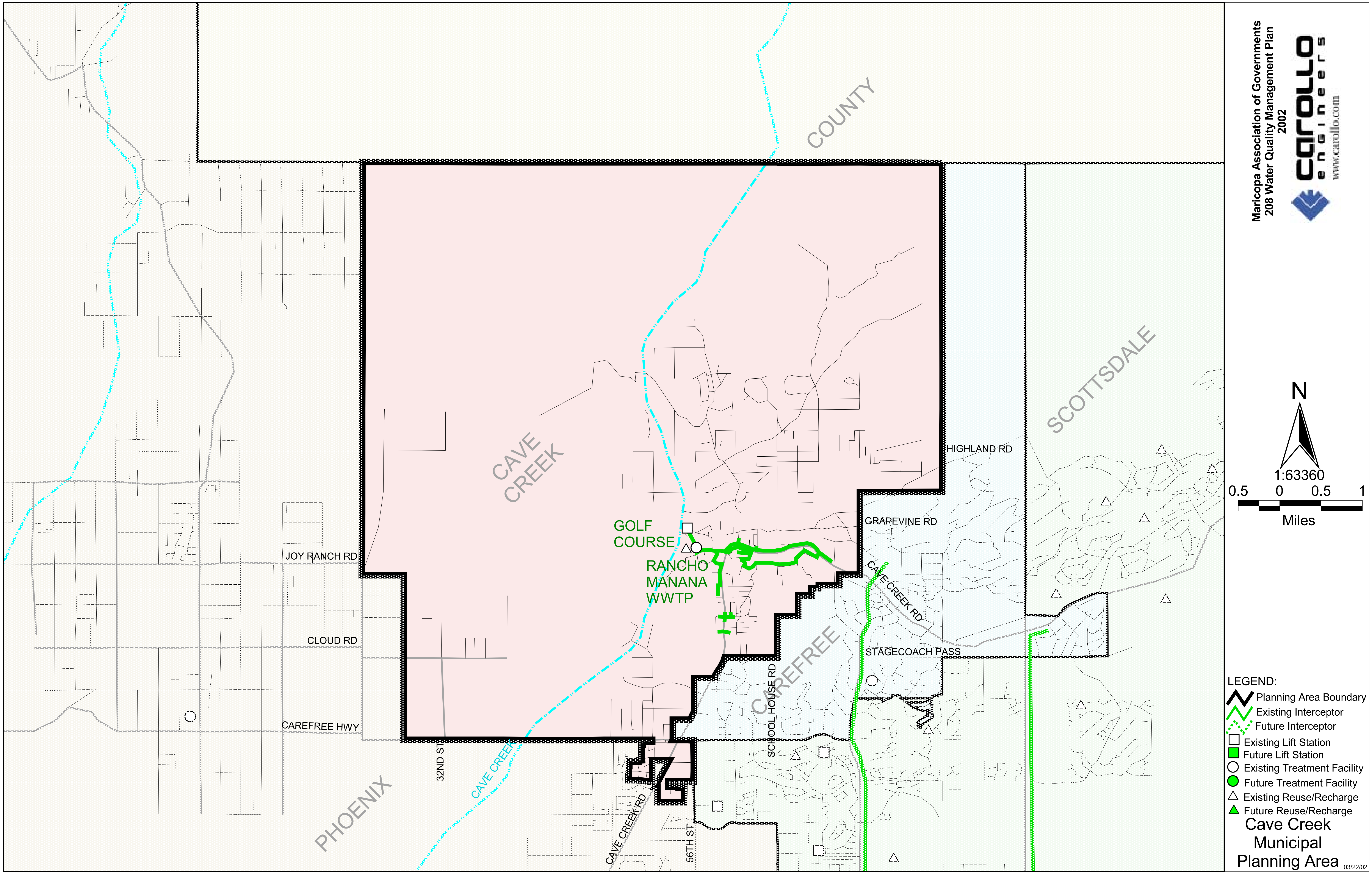

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SCOTTSDALE
CAREFREE
PHOENIX
HIGHLAND RD
GRAPEVINE RD
CAVE CREEK RD
STAGECOACH PASS
JOY RANCH RD
CLOUD RD
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Existing Lift Station
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Existing Treatment Facility
Future Treatment Facility
Existing Reuse/Recharge
Future Reuse/Recharge
Cave Creek Municipal Planning Area
03/22/02

FIGURE 4.14

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The Rancho Manana treatment facility serves the Rancho Manana development and the commercial development area and has a design capacity of 233,000 gallons per day. The plant uses the activated sludge process to produce effluent for reuse as irrigation water for the golf course. Sludge is currently hauled to a landfill or to the Phoenix 23rd Avenue WWTP as non-hazardous liquid waste. The Rancho Manana WWTP is operated on a contract basis by Arizona American Water Co. Unit processes include bar screen, aeration basin, secondary sedimentation, filtration, ultraviolet disinfection, and gravity sludge thickening.

The former Cave Creek Sewer Company was acquired by the town and the old WWTP was abandoned and demolished in 1995.

Future Wastewater System Development. The Town of Cave Creek has no current plans to expand their sewage collection or the wastewater treatment systems. Zoning is generally one unit per five acres that would allow continued use of septic tanks. The town has reached an accord with owners of the Spur Cross Ranch to limit development zoning densities or to preserve current land uses.

The town is interested in discussing regional wastewater treatment and disposal options with neighboring communities of Carefree or Phoenix.

Summary of Proposed Improvements. The town does not have a Capital Improvements Program.

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4.2.4.3 Fountain Hills

The Town of Fountain Hills corresponds to Regional Analysis Zone (RAZ) 250. Wastewater collection and treatment service is provided in Fountain Hills by the Fountain Hills Sanitary District. The entire community is sewered. The Sanitary District is a local government agency whose Board of Directors is elected by the public. The Town of Fountain Hills itself does not operate any wastewater facilities. The Fountain Hills Sanitary District serves the incorporated town and 405 acres known as Eagle Ridge, which was previously annexed by the City of Scottsdale. The Sanitary District service area is depicted on Figure 4.15.

Population and Flow Projections. Table 4.27 presents projected wastewater flows as calculated by the Town of Fountain Hills. The town is expected to be at build-out by the year 2015.

Table 4.27 Fountain Hills Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Wastewater Flow (mgd)
2000	18,745	1.69
2005	26,113	2.19
2010	34,939	2.69
2015	52,860	3.20
2020	54,999	3.20

Existing Collection System. All wastewater generated in Fountain Hills is collected and conveyed to the Sanitary District treatment plant. Because of the hilly terrain, most of the wastewater is pumped at least once, and often several times, before reaching the treatment plant. The collection system includes 16 lift stations with force mains.

Existing Treatment Facility. The Sanitary District operates a wastewater treatment plant, currently rated at 1.9 mgd, but the plant is under construction to expand the rated capacity to 2.6 mgd annualized average daily flow by early 2001. The facility's average day in the maximum month of flow is approximately 15 percent higher than the annualized average daily flow. The plant performs the activated sludge process and includes the following:

- Influent pump station.
- Magnetic flow metering.
- Rotating drum fine screen (plus a manual bypass).
- Grit removal chamber.
- Aeration basins with diffused aeration and biological nitrogen removal.
- Clarifiers.
- Filters.

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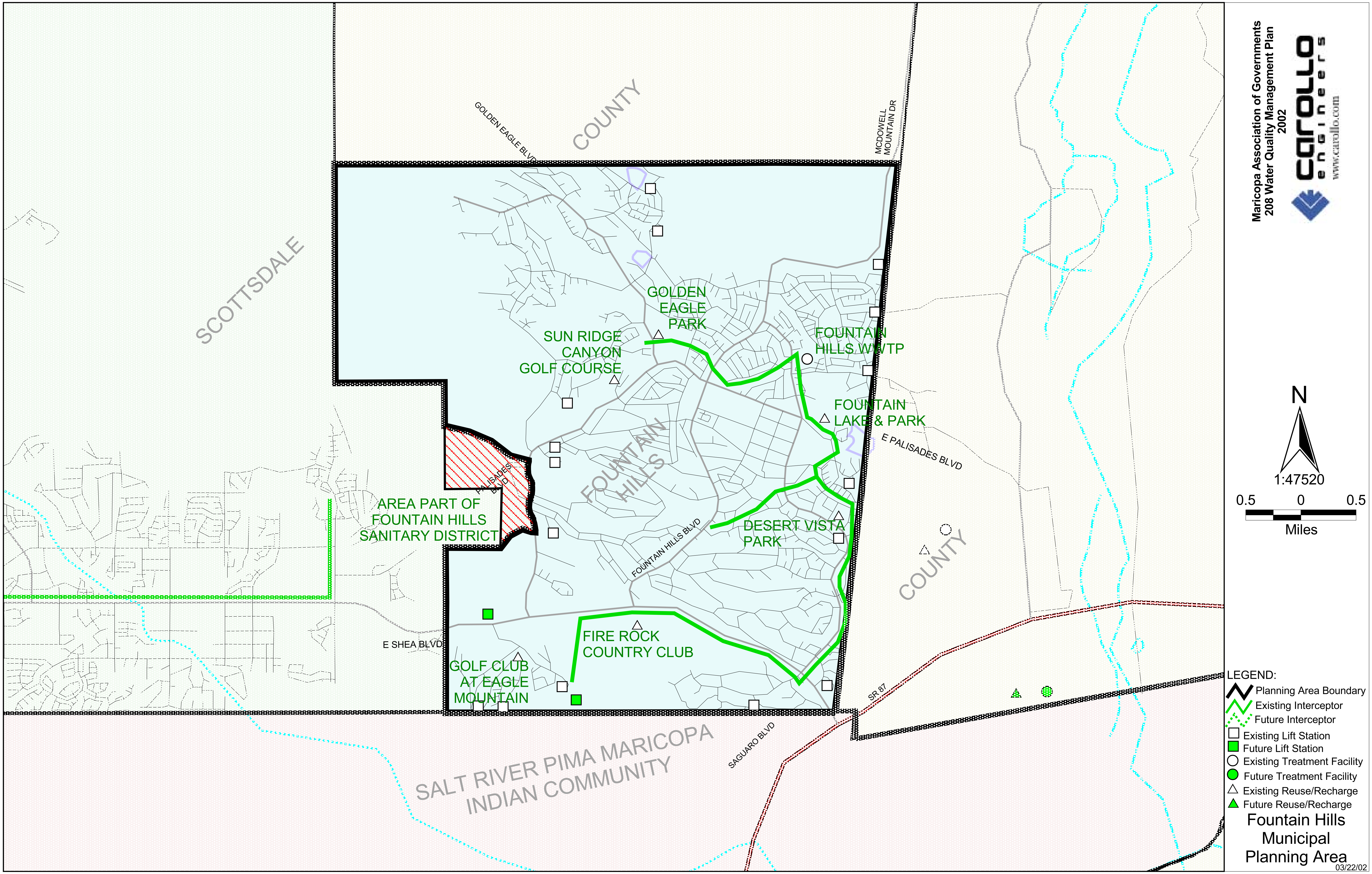

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COUNTY
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MCDOWELL MOUNTAIN DR
GOLDEN EAGLE PARK
SUN RIDGE CANYON GOLF COURSE
FOUNTAIN HILLS WWTP
FOUNTAIN LAKE & PARK
E PALISADES BLVD
FOUNTAIN HILLS
PALISADES BLVD
AREA PART OF FOUNTAIN HILLS SANITARY DISTRICT
FOUNTAIN HILLS BLVD
DESERT VISTA PARK
COUNTY
E SHEA BLVD
FIRE ROCK COUNTRY CLUB
GOLF CLUB AT EAGLE MOUNTAIN
SR 87
SAGUARO BLVD
SALT RIVER PIMA MARICOPA INDIAN COMMUNITY
LEGEND:
Planning Area Boundary
Existing Interceptor
Future Interceptor
Existing Lift Station
Future Lift Station
Existing Treatment Facility
Future Treatment Facility
Existing Reuse/Recharge
Future Reuse/Recharge
Fountain Hills Municipal Planning Area
03/22/02

FIGURE 4.15

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- Chlorine disinfection.
- Aerobic sludge digester, with diffused aeration and mechanical mixers.
- Odor controls.
- Microfiltration plant.

Effluent from the treatment plant is reused to irrigate golf courses, parks, and other turf areas, and to fill Fountain Lake and other decorative lakes. A recharge/recovery site at Fountain Park, with a maximum capacity of 2 mgd, takes effluent that is not reused for irrigation. The aerobically-digested sludge is thickened, dewatered, and then hauled to the Tri-City Landfill.

Future Wastewater System Development. The Sanitary District will continue to replace or provide relief for existing collection system components as the need arises in the future. A number of lift stations, force mains and relief sewer projects are planned.

The Sanitary District treatment plant will be expanded at its current location in approximately 2007 to an ultimate capacity of 3.2 mgd annualized average daily flow (3.68 mgd average day in maximum month). Many of the unit processes are already rated at 3.2 mgd; therefore only certain unit processes, i.e. flow equalization and aerobic digestion facilities, will need expansion. State requirements for redundancy may impact the expansion of additional unit operations at the plant.

The District will pursue an NPDES permit for use only if failure of the reuse and recharge/ recovery systems dictate a discharge.

Summary of Proposed Improvements. The following proposed improvements are only those scheduled through year 2006.

Item	Estimated Costs[1]
WWTP Expansion to 2.6 mgd	$8,200,000
Recharge/Recovery	10,000,000
Pump Station, Pipelines, and Lift Station Improvements	2,400,000
Total	$20,600,000

[1] All costs are in March 2000 dollars (ENR Construction Cost Index = 6202).

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4.2.4.4 Paradise Valley

The Planning Area for the Town of Paradise Valley consists of Regional Analysis Zone (RAZ) 262, and is depicted on Figure 4.16.

The City of Phoenix, the City of Scottsdale, and SROG provide collection and treatment of wastewater flows from portions of Paradise Valley, for a combined total of about 50 percent of the population of the town. In general, the area west of 54th Street and south of Roadrunner Road is served by the City of Phoenix, along with that part of Traffic Analysis Zone (TAZ) 325 west of Indian Bend Wash. Most of TAZ 325 east of Indian Bend Wash is served by the City of Scottsdale with discharge to the Scottsdale Road Interceptor. A portion of the flow conveyed to Scottsdale is diverted to 91st Avenue WWTP, a SROG facility. Customers served by Phoenix are billed directly by the City of Phoenix, and the Town of Paradise Valley is not involved. The remainder of the sewered areas are served by a town owned sewer system which is operated and maintained by the City of Scottsdale. The Town of Paradise Valley bills these customers and discharges to the Scottsdale system as a contract customer. Fifty (50) percent of the town is currently unsewered and relies on on-site waste disposal systems.

Population and Flow Projections. The population of Paradise Valley has a wide range of seasonal variation. For the purposes of this study, the 1997 MAG-adopted population will be applied as an annual average.

For the purposes of projecting wastewater flows, the Town of Paradise Valley uses 480 gpd per lot, with 2.1 people per lot. This is approximately 230 gpcpd, which is considerably higher than the 100 gpcpd traditionally used by other cities for wastewater flow projections. The town stipulates that the high wastewater generation is due to the 1-acre lots and large homes. This report will be consistent with the Town and will also assume a per capita flow of 230 gpd. In making flow projections, it is assumed that existing unsewered developments will not receive sewer service over the duration of the planning period. Table 4.28 presents population and flow projections for the sewered portion of Paradise Valley.

Table 4.28 Paradise Valley Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Total Population	Unsewered Population	Sewered Population	Sewered Wastewater Flow (mgd)
2000	13,353	7,313	6,040	1.39
2005	13,388	7,313	6,075	1.40
2010	13,587	7,313	7,313	1.44
2015	13,734	7,313	6,421	1.48
2020	13,760	7,313	6,447	1.48

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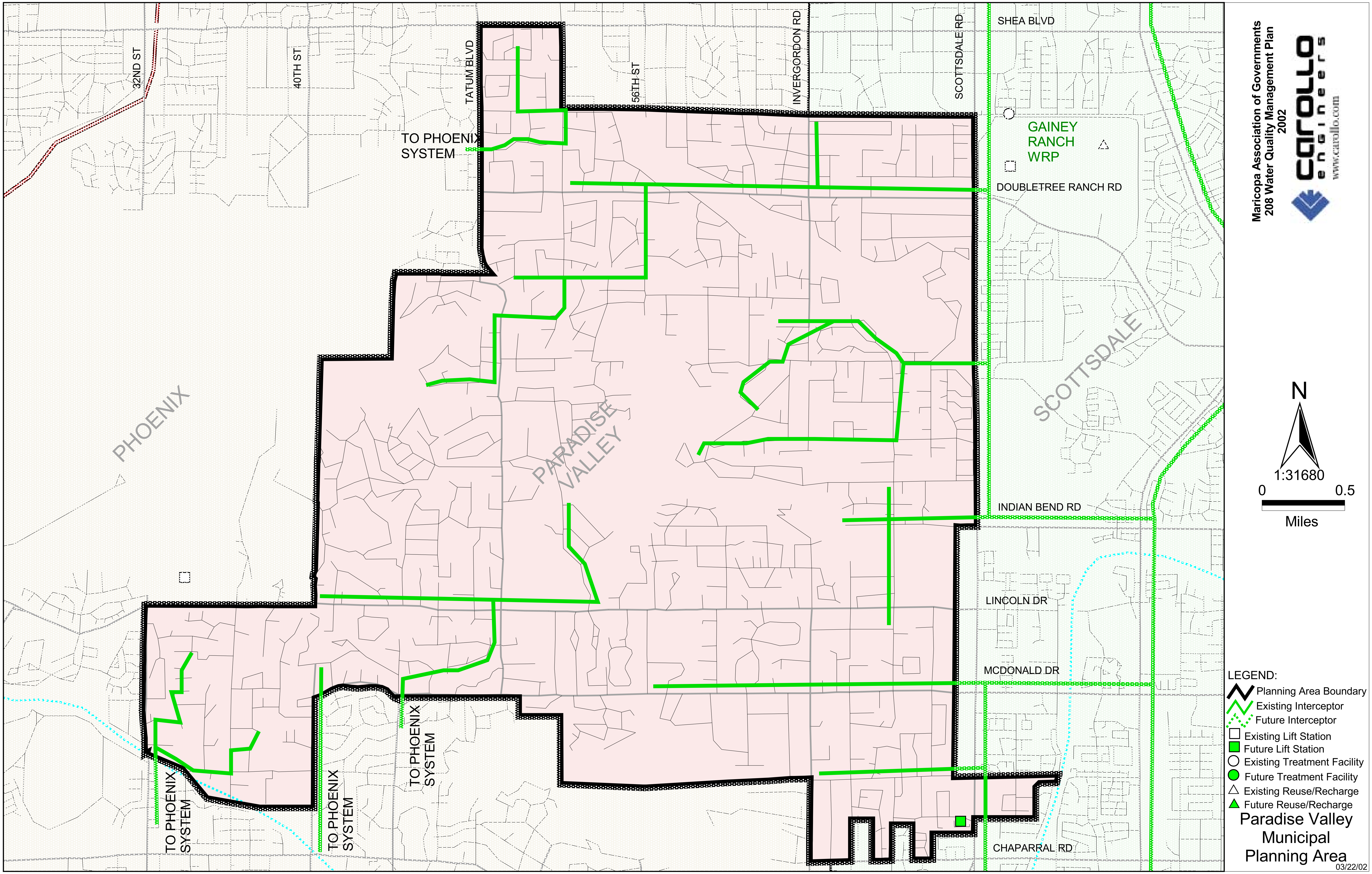

Paradise Valley Municipal Planning Area

03/22/02

FIGURE 4.16

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Existing Collection and Treatment System. Flows from the southwest area served by the City of Phoenix enter the Phoenix system on McDonald Drive and 44th Street, and at 32nd Street and Stanford Drive. This flow is conveyed to the 23rd Avenue WWTP for treatment. Flows from the area just west of Indian Bend Wash (IBW) are discharged to the Shea Boulevard Interceptor and delivered to the 91st Avenue WWTP. The remainder of the City of Phoenix flows from this area is discharged to the Scottsdale Road Interceptor at Doubletree Ranch Road.

The Scottsdale system has several points of connection to the Scottsdale Road Interceptor (SRI). Portions are collected at Doubletree Ranch Road and discharged to the SRI at Doubletree Ranch Road. Two small connections to the SRI serve a small area north of IBW and south of Doubletree Ranch Road. Areas south of IBW discharge to the SRI just south of the wash. An interceptor at Indian Bend Road collects flows from 59th Street, the north slopes of Camelback Mountain, and the Judson School neighborhood. The Kiva School neighborhood also discharges to the Scottsdale system. All flows collected by the Scottsdale Road Interceptor are conveyed either to the Scottsdale treatment plant or to the 91st Avenue WWTP for treatment.

Approximately 0.42 mgd of the flow is currently going to the City of Phoenix system for treatment at the 23rd Avenue WWTP, 0.5 mgd is delivered to 91st Avenue WWTP per an agreement with SROG, and the remaining flow, up to 0.88 mgd, is treated at the Scottsdale treatment plant per an Intergovernmental Agreement, signed in 1998. Scottsdale is currently only treating about 0.3 mgd. Table 4.29 shows the wastewater capacity at each of the plants for the Town of Paradise Valley.

Table 4.29 Paradise Valley Wastewater Flow Distribution MAG 208 Water Quality Management Plan Update

City of Scottsdale (mgd)	City of Phoenix (mgd)	SROG (mgd)	Total (mgd)
0.88	0.42	0.50	1.80

Future Wastewater System. With the existing capacity rights at Scottsdale, Phoenix, and SROG treatment plants, the Town of Paradise Valley will not have to provide any improvements to their wastewater system. As wastewater flows increase, a pump station located in the area of Scottsdale Road and Jackrabbit Road may be constructed to convey flows to Scottsdale, but only if the current capacity rights are renegotiated and increased above 0.88 mgd. Based on population projections, the pump station will probably not be needed.

Paradise Valley is landlocked with only a very few empty lots for future development. Any new development in Paradise Valley will most likely be put on septic tanks due to the high cost of connecting to the sewer system.

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4.2.4.5 Scottsdale

Wastewater collection and treatment service is provided by the City of Scottsdale. For this 208 Plan, the Scottsdale Planning Area consists of Regional Analysis Zones (RAZ) 209, 210, 229, 230, 247, 248, 249, 263, and 272. The Scottsdale Planning Area is depicted on Figure 4.17.

The Scottsdale Planning Area covers approximately 190 square miles. The Planning Area is generally divided into two parts: north of the Central Arizona Project (CAP) canal and south of the CAP canal. The area north of the CAP canal is bounded by Scottsdale Road and 56th Street on the west, Cave Creek Road on the north, 136th Street on the east, and Doubletree Ranch alignment and the CAP Canal on the south. In addition, the Desert Mountain area is bounded by Cave Creek Road on the south, Pima Road on the west, the Tonto National Forest on the north, and 112th Street on the east. The area south of the CAP canal is bounded by the City of Phoenix and the Town of Paradise Valley on the west, the City of Tempe on the south, the Salt River Pima Maricopa Indian Community on the east and the CAP canal on the north.

The City of Scottsdale is the designated wastewater management agency for this area.

Population and Flow Projections. Significant growth is projected to occur in the portion of Scottsdale north and east of the CAP canal. It is expected that all development within the boundaries of the municipal planning area will receive sewerage service provided by the City. Scottsdale has Inter-Governmental Agreements (IGA) with Boulders-Carefree (BMSC), and Paradise Valley to treat up to 1 mgd and 0.88 mgd, respectively. Scottsdale also conveys 10 mgd of Phoenix flows through the Scottsdale Road Interceptor to the Salt River Outfall.

Table 4.30 presents the population and flow projections as developed by SROG. Population projections are based on current City of Scottsdale population projections. These projections are used due to development changes that have occurred since the last MAG population projections in 1997.

Table 4.30 Scottsdale Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Scottsdale*[1] Population	Scottsdale Flow[1] (mgd)	External Flow (mgd)	Total Flow (mgd)
2000	209,878	23.93	1.88	25.81
2005	241,766	27.56	1.88	29.44
2010	264,432	30.15	1.88	32.03
2015	273,572	31.19	1.88	33.07
2020	274,253	31.27	1.88	33.15

* Includes portions of Paradise Valley population served by Scottsdale.
[1] Based upon projected SROG service populations and flow, Appendix C, Influent Conditions of 91st Avenue WWTP 25-year Facilities Master Plan, December 2001.

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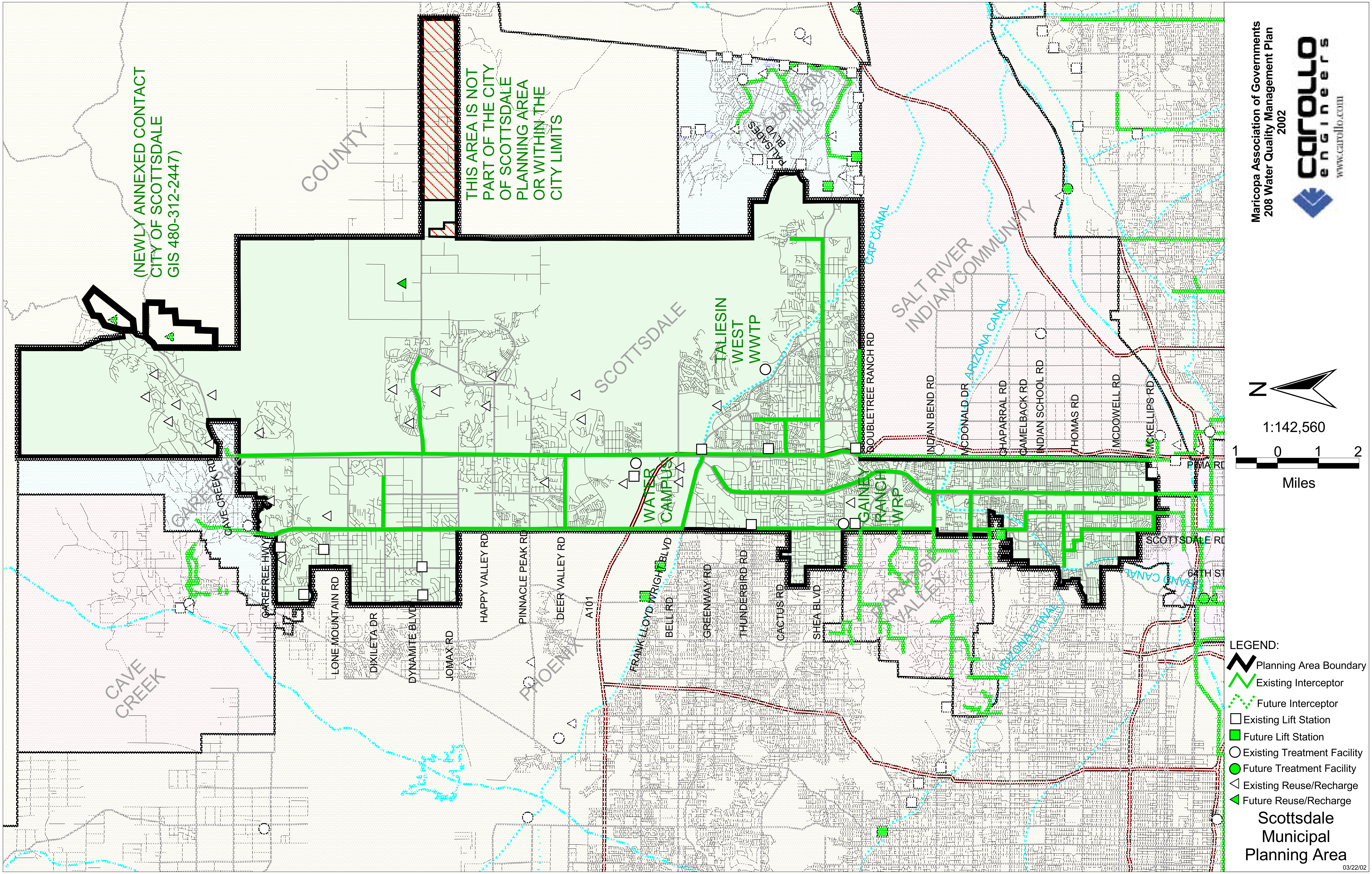
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Future Interceptor
Existing Lift Station
Future Lift Station
Existing Treatment Facility
Future Treatment Facility
Existing Reuse/Recharge
Future Reuse/Recharge
Scottsdale Municipal Planning Area
03/22/02
(NEWLY ANNEXED CONTACT
CITY OF SCOTTSDALE
GIS 480-312-2447)
COUNTY
THIS AREA IS NOT
PART OF THE CITY
OF SCOTTSDALE
PLANNING AREA
OR WITHIN THE
CITY LIMITS
FOUNTAIN HILLS
PALISADES BLVD
SCOTTSDALE
TALIESIN WEST WWTP
CAP CANAL
SALT RIVER INDIAN COMMUNITY
ARIZONA CANAL
WATER CAMPUS
GAINEY RANCH WRP
PARADISE VALLEY
PHOENIX
CAVE CREEK
CAREFREE
CAVE CREEK RD
CAREFREE HWY
LONE MOUNTAIN RD
DIXILETA DR
DYNAMITE BLVD
JOMAX RD
HAPPY VALLEY RD
PINNACLE PEAK RD
DEER VALLEY RD
A101
FRANK LLOYD WRIGHT BLVD
BELL RD
GREENWAY RD
THUNDERBIRD RD
CACTUS RD
SHEA BLVD
DOUBLETREE RANCH RD
INDIAN BEND RD
MCDONALD DR
CHAPARRAL RD
CAMELBACK RD
INDIAN SCHOOL RD
THOMAS RD
MCDOWELL RD
MCKELLIPS RD
PIMA RD
SCOTTSDALE RD
64TH ST
GRAND CANAL

FIGURE 4.17

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Existing Collection System. Scottsdale's collection system does not only collect wastewater generated in Scottsdale. Flows currently originating from outside of Scottsdale come from Phoenix, Paradise Valley, and BMSC-Carefree. Phoenix discharges wastewater to a sewer line jointly owned by Phoenix and Scottsdale, and their IGA signed in 1963 allows Phoenix to discharge up to 10 mgd to be transported to the SRO in the Scottsdale Road Interceptor.

BMSC-Carefree discharges residential wastewater and sludge from its reclamation plant to Scottsdale sewers at about Westland and Scottsdale Roads. This agreement was finalized on April 1, 1996 and runs for 20 years. It allows the BMSC-Carefree to discharge up to 1 mgd.

Paradise Valley discharges residential wastewater to Scottsdale at a number of sites along Scottsdale Road. The most recent IGA started in 1998, allowing Paradise Valley to discharge up to 0.88 mgd into Scottsdale's collection system and to their wastewater treatment facility.

The bulk of the existing wastewater collection system is located south of the CAP canal in developed Scottsdale. The wastewater is conveyed through the Miller Road and Hayden Road trunk sewers to the multi-city Salt River Outfall interceptor sewer which conveys flows through the Princess Road metering station to the 91st Avenue WWTP. Flows from the City of Phoenix and the Town of Paradise Valley are also conveyed through the Hayden Road system. Most of these flows are metered prior to entering the Scottsdale collection system in Scottsdale Road.

The collection system north of the CAP canal is limited. A sewer is located on Scottsdale Road from the Carefree Highway south to Bell Road. At Bell Road the sewer parallels the CAP canal to Pima Road. The Pima Road interceptor begins on Cave Creek Road, travels south down Pima Road and terminates on Doubletree Road. An interceptor on Shea Boulevard serves the northeast area of the city along Shea Boulevard east of the CAP canal.

Scottsdale has a pump-back system to deliver wastewater to the WRP portion of the Water Campus. All wastewater flows generated south of Union Hills Drive are directed by gravity and then pumped north to the Water Campus for treatment via five pump stations. There are three pump stations on Pima Road, one at Doubletree Ranch Road, one at Sweetwater Avenue, and at Frank Lloyd Wright Boulevard. Two additional pump stations are on Scottsdale Road, one at Doubletree and one at Thunderbird.

Existing Treatment System. As a member of the Multi-City SROG, Scottsdale currently owns 13.13 mgd of treatment capacity at the 91st Avenue WWTP. In addition to capacity at the 91st Avenue WWTP, two water reclamation plants are located in Scottsdale. These plants are the Gainey Ranch WRP and the Scottsdale Water Campus. The effluent from the reclamation plants is used for turf irrigation and groundwater recharge. The City has reuse permits covering turf irrigation with effluent from each of those facilities it owns and operates.

__Gainey Ranch WRP__. The Gainey Ranch WRP is located on Scottsdale Road between Doubletree Ranch Road and Shea Boulevard and supplies reclaimed water for irrigation of Gainey Ranch Golf Course. The Gainey Ranch WRP has a capacity of 1.7 mgd and includes the following treatment units: preliminary treatment; extended aeration with nitrification/denitrification and biological phosphorus removal; final sedimentation; filtration; UV disinfection.

Residuals from the Gainey Ranch WRP are returned to the Scottsdale sewer system and conveyed to the 91st Avenue WWTP for processing. The City of Scottsdale owns and operates the Gainey Ranch WRP and holds an effluent reuse permit for the facility.

__Scottsdale Water Campus__. The Scottsdale Water Campus includes both a Wastewater Reclamation Plant and Advanced Water Treatment Plant with current capacities of 12 mgd and 10 mgd, respectively. It is located north of the CAP aqueduct near Pima Road. An ultimate capacity of 24 mgd is planned for the Wastewater Reclamation Plant and 22 mgd for the Advanced Water Treatment Plant. Effluent from the Water Reclamation Plant will be used for direct turf irrigation and effluent from the Advanced Water Treatment Plant will be used for aquifer storage and recovery. Residual solids will be conveyed through the existing collection system to the 91st Avenue WWTP for processing. Permits for reuse, aquifer protection, and aquifer storage and recovery have been acquired for the new facility. Major plant components of the Water Reclamation Plant include the following: preliminary treatment; primary sedimentation; activated sludge with and without nitrification and denitrification; secondary sedimentation; filtration; and chlorine disinfection. The Advanced Water Treatment Plant takes the reclaimed wastewater and further treats it through the following treatment processes: microfiltration; reverse osmosis; and recharge through dry well injection located on-site. The issue of the brine reject to the collection system will need to be addressed in the future.

__Taliesin West__. The only wastewater treatment plant not owned or operated by the City of Scottsdale is the Taliesin West (Frank Lloyd Wright Foundation) WWTP with a capacity of only 15,000 gallons per day. This plant is equipped with aeration basins and clarifiers. The effluent is discharged into ponds for natural evaporation and percolation. The solids are treated through an aerobic digester and placed in drying beds.

Water reclamation is a strong focus in the two existing Scottsdale treatment plants. The major components of the reuse system include a transmission main and pump stations along Pima Road north of the CAP aqueduct to convey reclaimed effluent to golf courses. This system is used to transport effluent from the wastewater reclamation plant at the Water Campus to reuse sites.

Future Wastewater System Development. Scottsdale is proceeding with implementation of the recommendations as outlined in the 2001 master plan including expansion of the Scottsdale Water Campus Water Reclamation and Advanced Water Treatment Plants.

Future treatment capacity (through planning year 2020) will be provided at the SROG facility, Scottsdale Water Campus, and the satellite water reclamation plants, as shown on Table 4.31. The Gainey Ranch WRP will be maintained as a permanent facility.

Scottsdale is planning to construct a water treatment plant to treat Salt River Project water supply. Residuals from that WTP are planned to be discharged to the sanitary sewer system for treatment at the SROG facility at 91st Avenue.

Table 4.31 Scottsdale Wastewater Flow Allocation Projections
MAG 208 Water Quality Management Plan Update

Year	SROG[1] Facilities (mgd)	Water Campus WRP[2] (mgd)	Gainey Ranch WRP[2] (mgd)	Residuals BMSC and SRP[2] (mgd)	Total Treated Flow (mgd)
2000	12.53	10.43	1.15	0.18	23.93
2005	14.38	13.20	1.15	1.17	27.56
2010	13.39	16.78	1.15	1.17	30.15
2015	9.10	22.14	1.15	1.20	31.19
2020	9.18	22.14	1.15	1.20	31.27

[1] Annual average daily flows. Includes residuals from WRPs.
[2] Local flow less residuals (treated flow).

Water Reclamation will remain a strong focus.

Summary of Proposed Improvements

Item	Estimated Cost[1]
Water Campus Expansion to 16 mgd (2002-2004)	24,500,000
91st Avenue WWTP 3B Expansion (2000-2002)	4,490,000
91st Avenue WWTP Improvements (2000-2004)	41,010,000
Sewer System Improvements and Expansion (2000-2004)	5,229,000
Total	$75,229,000

[1] All costs are in June 2001 dollars (ENR Construction Cost Index = 6318).

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4.2.5 Southeast Area

4.2.5.1 Guadalupe

The Planning Area for the Town of Guadalupe is entirely within Regional Analysis Zone (RAZ) 307. The area is bounded on the west by Interstate 10 except from Mineral Road to Carmen Street where the boundary is 56th Street. The City of Tempe's incorporated area forms the rest of the boundaries. Figure 4.18 depicts the Guadalupe Planning Area. No expansion of the Guadalupe Planning Area is predicted since the town is surrounded by incorporated areas. The town provides collection of wastewater which is then discharged to the City of Tempe collection system for treatment at the 91st Avenue WWTP. The town of Guadalupe plans to continue this arrangement with Tempe through the planning period.

Population and Flow Projections. Table 4.32 depicts the 1997 MAG-adopted population projections for the Town of Guadalupe and wastewater flow projections based on 100 gpcd.

**Table 4.32 Guadalupe Population and Flow Projections
MAG 208 Water Quality Management Plan Update**

Year	Population	Flows (mgd)
2000	5,506	0.55
2005	5,665	0.57
2010	5,724	0.57
2015	5,731	0.57
2020	5,736	0.57

Existing Collection System. Guadalupe operates an independent wastewater collection system. Major components are complete.

Existing Treatment Facilities. None.

Future Wastewater System Development. None identified.

Summary of Proposed Improvements. None identified.

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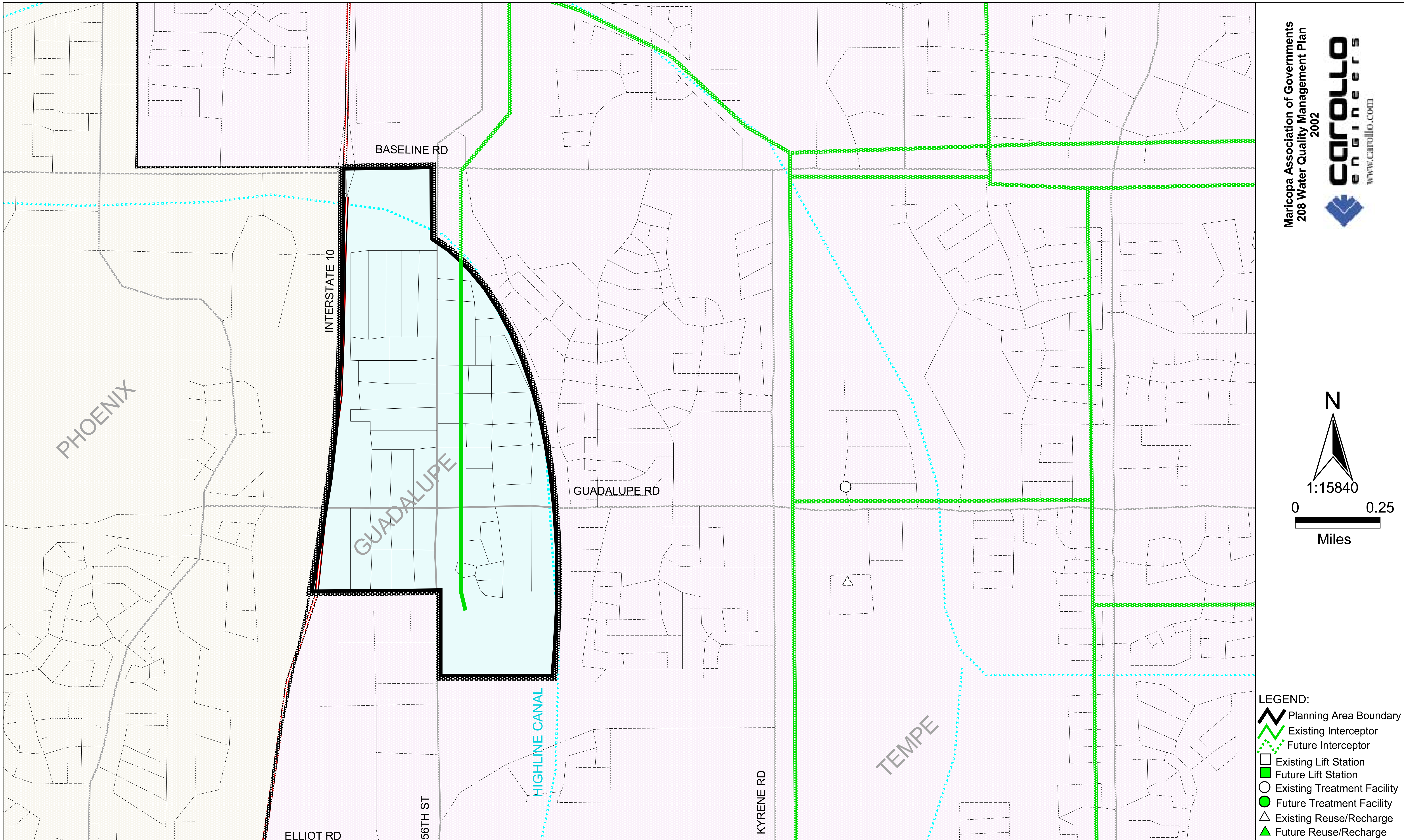

Guadalupe Municipal Planning Area

03/22/02

FIGURE 4.18

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4.2.5.2 Chandler

The Planning Area for the City of Chandler is comprised of Regional Analysis Zones (RAZ) 310, 315, 316, 317, 325, 327, and 328. The City of Chandler provides wastewater collection and treatment for this area. The southern area is bounded by Pecos Road from I-10 to Price Road, by Chandler Heights Road from Price Road to Alma School Road and by Hunt Highway from Arizona Avenue to Val Vista Drive on the south. The Sun Lakes development and the Gila River Indian Community bound the southwest corner of Chandler. The western boundary is defined as Arizona Avenue from Hunt Highway and Riggs Road, Price Road from Chandler Heights Road to Pecos Road, and I-10 from Pecos Road to Knox Road and Price Road from Knox Road to the Western Canal. Tempe and Mesa bound Chandler on the north while Gilbert forms portions of the eastern boundary.

Figure 4.19 depicts the Chandler Planning Area. The City of Chandler is the designated wastewater management agency for this area.

Population and Flow Projections. Table 4.33 depicts population and wastewater flow projections over the planning period. Wastewater flow is assumed to be approximately 126 gpcd to agree with wastewater flow projections made by Chandler. For planning periods 2000 through 2010, flow projections were based on the City of Chandler's internal 2000 population and industrial projections. For the remaining planning periods, 2015 and 2020, flows were projected using the 1997 MAG adopted population projections.

Table 4.33 Chandler Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Wastewater Flow (mgd)
2000	171,099	17.0
2005	199,967	22.0
2010	223,398	25.0
2015	242,995	30.6
2020	261,587	33.0
Build Out	319,852	40.3

Existing Collection System. There are several major interceptors that serve the currently developed areas. In northeast Chandler, the McQueen Road Interceptor North along McQueen Road feeds the Pecos Road Interceptor East along Pecos Road together collect flow east of McQueen Road and some of the flow north of Pecos Road. The sewer discharges to a 66-inch interceptor known as the Price Road Interceptor South serving the Ocotillo WRF.

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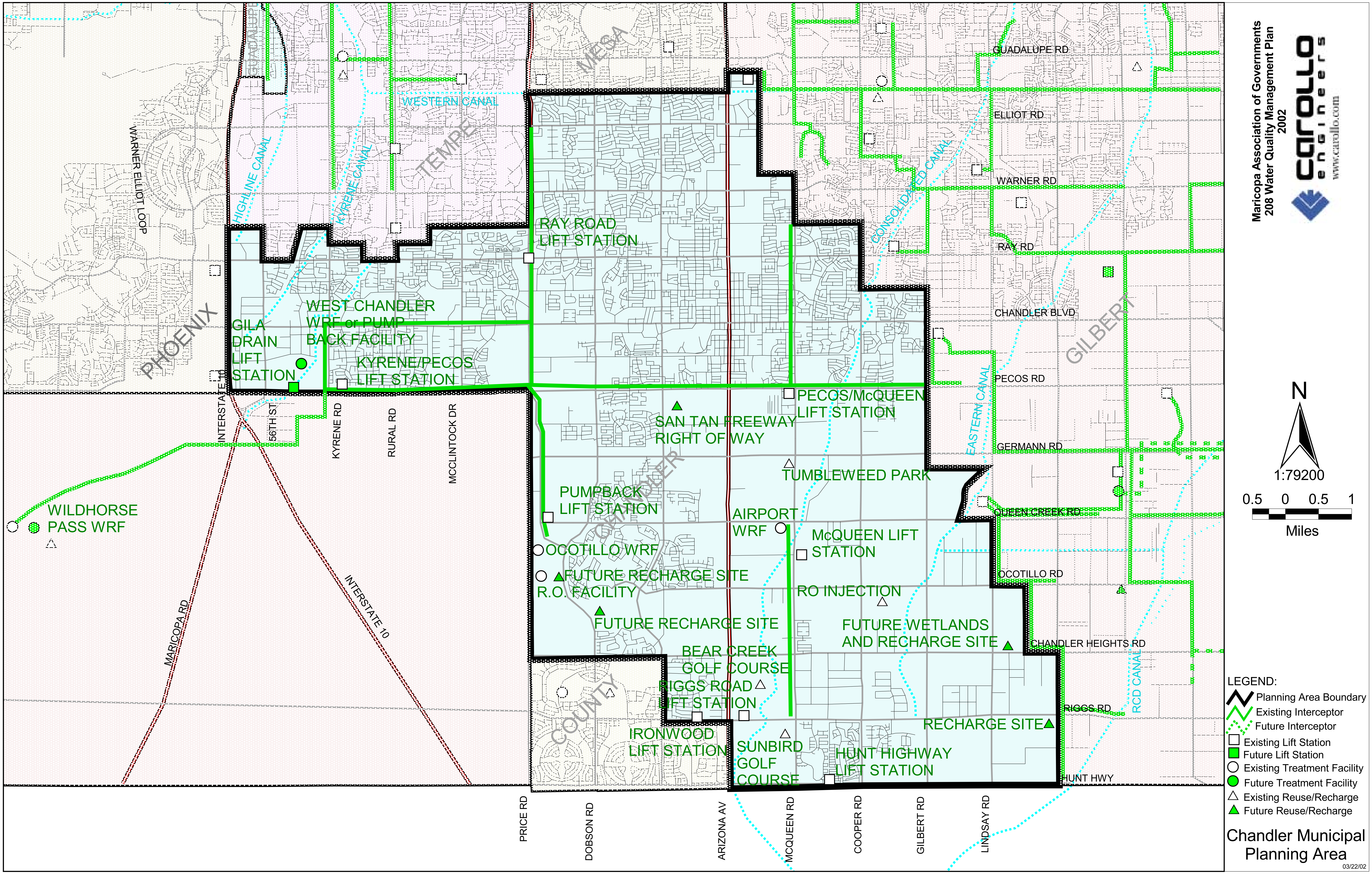

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QUEEN CREEK RD
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RIGGS RD
HUNT HWY
PRICE RD
DOBSON RD
ARIZONA AV
MCQUEEN RD
COOPER RD
GILBERT RD
LINDSAY RD
WARNER ELLIOT LOOP
INTERSTATE 10
56TH ST
KYRENE RD
RURAL RD
MCCLINTOCK DR
MARICOPA RD
INTERSTATE 10
WESTERN CANAL
HIGHLINE CANAL
KYRENE CANAL
CONSOLIDATED CANAL
EASTERN CANAL
RCD CANAL
GUADALUPE
MESA
TEMPE
PHOENIX
CHANDLER
GILBERT
COUNTY
RAY ROAD LIFT STATION
WEST CHANDLER WRF or PUMP BACK FACILITY
GILA DRAIN LIFT STATION
KYRENE/PECOS LIFT STATION
PECOS/McQUEEN LIFT STATION
SAN TAN FREEWAY RIGHT OF WAY
TUMBLEWEED PARK
PUMPBACK LIFT STATION
AIRPORT WRF
McQUEEN LIFT STATION
OCOTILLO WRF
FUTURE RECHARGE SITE
R.O. FACILITY
RO INJECTION
FUTURE RECHARGE SITE
FUTURE WETLANDS AND RECHARGE SITE
BEAR CREEK GOLF COURSE
RIGGS ROAD LIFT STATION
IRONWOOD LIFT STATION
SUNBIRD GOLF COURSE
HUNT HIGHWAY LIFT STATION
RECHARGE SITE
WILDHORSE PASS WRF
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LEGEND:
Planning Area Boundary
Existing Interceptor
Future Interceptor
Existing Lift Station
Future Lift Station
Existing Treatment Facility
Future Treatment Facility
Existing Reuse/Recharge
Future Reuse/Recharge
Chandler Municipal Planning Area
03/22/02

FIGURE 4.19

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The North Chandler Interceptor along Price Road feeds the Price Road Interceptor North and together these interceptors serve the rest of the area north of Pecos Road and east of Price Road. This sewer can discharge into the 66-inch Price Road Interceptor going to the Ocotillo WRF or one of two interceptors conveying flows through west Chandler to the Lone Butte WRF.

One of the interceptors in west Chandler is the Pecos Road Interceptor West collecting flow north of Pecos Road and west of Price Road. Also in west Chandler is the Kyrene/Chandler Interceptor which collects flows west of Price Road and north of Chandler Boulevard. Both the Pecos Road Interceptor West and the Kyrene/Chandler Interceptor discharge into the Lone Butte Interceptor going to the Lone Butte WRF.

The newest addition is the McQueen Road Interceptor South located on McQueen Road between Riggs Road and Queen Creek Road. All flows in this interceptor are taken to the Airport WRF.

In addition to the interceptors, four major diversion structures help to control and distribute flow among the treatment plants within Chandler. The Price/Pecos Diversion Structure can divert flows to the Lone Butte WRF or the Ocotillo WRF. The Ocotillo Diversion Structure diverts flow going to the Ocotillo WRF to the Airport WRF. The Pecos/McQueen Lift Station and Diversion Structure can divert flows collected in northeast Chandler down the Pecos Road Interceptor East or directly to the Airport WRF via an 18-inch force main. Chandler Boulevard Diversion Structure located at Chandler Boulevard and Price Road can divert flow to the Kyrene/Chandler Interceptor or down the southern portion of the Price Road Interceptor North.

In addition to the interceptors and diversion structures, the Chandler collection system has nine lift stations. The Gila Drain Lift Station, located just west of the intersection of the Gila Drain and Pecos Road, serves an area that extends from I-10 to the Gila Drain and from approximately Chandler Boulevard in the north, to Pecos Road in the south. This lift station has a capacity of 3 mgd and pumps wastewater under the Gila Drain to a gravity line that ties to the confluence at the Kyrene/Chandler Interceptor just prior to the Lone Butte Interceptor. The Ray Road Lift Station, located at Ray Road and Price Road, raises the hydraulic grade of the flow from the east of the lift station and from the Price Road Interceptor North, and it has a capacity of 10 mgd. The Hunt Highway Lift Station, located midway between the McQueen Road and Cooper Road on Hunt Highway collects flows from an area bounded by Riggs Road, Hunt Highway, McQueen Road, and Pecos Road, and it pumps the wastewater to the Airport WRF with a capacity of 0.7 mgd. The Ironwood Lift Station, on Riggs Road between Alma School Road and Arizona Avenue, collects the wastewater generated by the Ironwood Country Club, with a capacity of 1.73 mgd, and pumps it to the Ocotillo WRF via a 12-inch force main discharging to a 27-inch sewer. Other lift stations include the Kyrene/Pecos Lift Station, McQueen Lift Station, and Pumpback Lift Station.

Existing Treatment System. Three major treatment plants currently serve the wastewater flows from the Chandler wastewater service area. The 10 mgd Lone Butte WRF is located on the Gila River Indian Community (GRIC) 3 miles southwest of Interstate 10 and Pecos Road. Only 8.8 mgd of capacity belongs to Chandler at the Lone Butte WRF. The Ocotillo WRF has a capacity of 10 mgd and is located south of Queen Creek and Price Roads. The Airport WRF treats 5 mgd and is located on the southwest corner of Queen Creek Road and McQueen Road.

The Lone Butte WRF unit processes include bar screening, aeration lagoons, rapid sand filtration and chlorination. The facility is operated under a lease agreement with GRIC which stipulates that Chandler has rights to 8.8 mgd of the treatment capacity and it is assumed that this lease agreement will be renegotiated with the GRIC when it expires in 2017. Sludge is collected in lagoons and can be removed as necessary to a landfill. The effluent is used for agricultural irrigation by the GRIC on the 3,000 acre Lone Butte Ranch located on the Indian Reservation.

The Ocotillo WRF is a tertiary treatment plant utilizing the activated sludge process. The major unit processes at this facility consist of fine screening, biological nutrient removal, clarification, filtration, and disinfection with sodium hypochlorite. This is now owned by the city and operated by Severn Trent Environmental. Sludge produced at the Ocotillo WRF is landfilled at the Butterfield Landfill.

The effluent produced at the Ocotillo WRF is discharged through a pump station to the lake system in the Ocotillo Development. The City of Chandler, by agreement with the Ocotillo Management Group (OMG), delivers the majority of the effluent produced at the Ocotillo WRF for reuse within the nine square mile OMG service area. The city has rights to 1 mgd and 20 percent of the remaining capacity (1.0 mgd + 0.2 * 9.0 mgd) which is 2.8 mgd, and OMG will receive and utilize 7.2 mgd (10.0 mgd - 2.8 mgd) of the effluent. OMG uses or delivers effluent to irrigate city rights-of-way, common areas (including park sites), apartment complexes, commercial properties, and approximately 500 homeowners that utilize it for landscape irrigation. OMG also supplies reclaimed water to the Ocotillo Golf Course, and adjacent agricultural land, along with major industrial reusers such as Intel (Fab 12) and Orbital Sciences which use the reclaimed water for cooling towers, landscape irrigation, or ornamental lakes. Additionally, OMG recharges a minimal amount of the reclaimed water through drywells located on the golf course, immediately adjacent to the lakes.

In addition to the above mentioned effluent reuse and recharge, a future recharge facility is being designed and constructed in 2001, south of the OWRF. This facility will recharge additional effluent from the OWRF into the upper aquifer.

The Airport WRF is the city's newest reclamation facility, owned and operated by the City of Chandler, and has a treatment capacity of 6.5 mgd and is master planned to be expanded to 20 mgd. The major unit processes consist of fine screening, biological nutrient removal, clarification, flocculation, filtration, and ultraviolet light disinfection. The effluent produced at this facility is pumped to the City's Tumbleweed Park recharge facility (capacity of 5 mgd) located one-half mile north of the facility or into the reclaimed water delivery system for irrigation use on golf courses and green-belt areas. The effluent is then recharged into the upper unit aquifer through the use of "drywells" (vadose zone wells), injection wells, and aquifer storage and recovery wells (ASR wells). The sludge is dewatered with belt presses and disposed in a landfill.

In addition to the three main treatment plants, the City of Chandler owns and operates an industrial wastewater treatment facility with a capacity of 2.8 mgd, which treats industrial wastewater from the Intel Fab 12 and Fab 22 facilities, located near Old Price Road and Queen Creek Road. The major unit process consists of reverse osmosis (RO) membranes. The effluent produced at this facility is pumped to a recharge site located approximately six miles to the east at Gilbert Road and Ocotillo Road. The effluent is recharged to the aquifer through middle alluvial unit injection wells. The RO reject water from the facility is pumped to a sewer that is tributary to the Lone Butte WRF and is also discharged to evaporation ponds located at the recharge site.

Future Wastewater Collection. The future collection system elements will be primarily located in the south Chandler service area. The major interceptors have already been constructed. The majority of the future pipelines tie into the McQueen Road Interceptor South, with the exception of smaller collector lines in the Ocotillo region of South Chandler.

The city has completed its major interceptor construction throughout the Planning Area. The remaining collection system pipelines are scheduled to be constructed by developers. The city will dictate the size of the future collection system pipelines to the developers so that they can construct the proper sized collector lines.

A future lift station will be located east of the Southern Pacific Railroad north of Riggs Road and will utilize a new force main in Riggs Road to connect to the McQueen Road Interceptor South going to the Airport WRF. The service area will include the area that extends from Chandler Heights Boulevard south to Hunt Highway between Arizona Avenue and the Consolidated Canal north of Riggs Road and between Arizona Avenue and McQueen Road south of Riggs Road. This project is also changing the Ironwood Lift Station to flow through a new force main to the Riggs Road Lift Station.

Future Wastewater Treatment. Current projections predict wastewater flows beyond the existing combined capacities of the Lone Butte WRF, Ocotillo WRF, and Airport WRF. To accommodate these flows, Chandler plans to expand the Airport WRF, build a potential new WRF, or expand the Ocotillo WRF. The Lone Butte WRF is not planned for expansion beyond the current capacity. There is enough land at the Ocotillo WRF to expand to 20 mgd, and enough land to expand the Airport WRF to 30 mgd, if necessary.

The Airport WRF is currently treating 5 mgd, but is master planned for expansion up to 20 mgd of average daily flows. Chandler plans to continue sending 5 mgd to the Tumbleweed Park Recharge facility. The Bear Creek Golf Course, on the west side of the Consolidated Canal between Riggs Road and Hunt Highway can use another 0.9 mgd. The city estimates that future recharge and various future irrigation sites will account for the remaining reclaimed water from the Airport WRF. New reclaimed water distribution lines will be constructed to facilitate the utilization of the new recharge and irrigation sites.

The city has also taken one further step to address treatment capacity needs by reserving land near the Pecos Road alignment and Kyrene Road for the construction of a future West Chandler WRF and/or a pumpback facility in West Chandler in the event the Lone Butte lease could not be maintained or, in the event that development dictated its need. The pumpback facility would pump raw sewage from West Chandler back to the treatment facilities located in the southeastern portion of the city. The WRF would be a zero-discharge facility and the effluent would be used for irrigation of golf courses and parks and recharge.

Table 4.34 summarizes the available capacity in each plant through year 2020:

Table 4.34 Flow Allocation (mgd) to WRF/WWTP
MAG 208 Water Quality Management Plan Update

Year	Lone Butte	Airport WRF	Ocotillo WRF[1]	New WRF West Chandler WRF	Total Available
2000	8.8	6.5	10.0	--	25.3
2005	8.8	15.0[2]	10.0[2]	--[2]	33.8
2010	8.8	20.0[2]	10.0[2]	--[2]	38.8
2015	8.8	20.0	10.0	--	38.8
2020	8.8	20.0[3]	10.0	--	38.8

[1] Site could allow expansion to 20 mgd.
[2] Expansion could occur at Airport WRF, Ocotillo WRF, or at West Chandler WRF.
[3] Site could allow expansion to 30.0 mgd.

Summary of Wastewater System Improvements

Item	Estimated Cost[1]
2000-2005	
Collection System Improvements	$3,200,000
Airport WRF Expansion (10 mgd)	$18,600,000
Reclaimed Water Transmission	$12,700,000
Surface Recharge Facility (5 mgd)	$12,000,000
Recharge/Recovery Wells (4 mgd)	$9,700,000

Item	Estimated Cost[1]
2005-2010	
Collection System Improvements	$5,000,000
Airport WRF Expansion (15 mgd)	$18,000,000
Reclaimed Water Transmission	$13,900,000
Recharge Facilities	$13,000,000
2010-2015	
Collection System Improvements	$5,000,000
WRF Expansion	$18,000,000
Reclaimed Water Transmission	$5,300,000
Recharge Facilities	$13,000,000
2015-2020	
Collection System Improvements	$5,000,000
Total	$152,400,000

[1] All costs are in 1998 dollars (ENR Construction Cost Index = 5,920).

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4.2.5.3 Gilbert

The Town of Gilbert Planning Area, depicted in Figure 4.20, consists of Regional Analysis Zones (RAZ) 311, 312, 318, 319, and 329. The Planning Area is approximately bounded by Baseline Road to the north, Power Road to the east, Hunt Highway to the south and the City of Chandler to the west. The three square miles between Ocotillo Road and the Hunt Highway, immediately east of Recker Road, are mostly excluded from the planning area. The only exception is a portion of TAZ 1580 (the Seville Development), recently annexed by the town.

<u>Population and Flow Projections</u>. The Town of Gilbert experienced record growth during the nineties with population surpassing 100,000 in 1999. With continuing rapid development and continuing infrastructure improvement, the town can expect similar trends in the future. Presently, a majority of the town's population resides in the northern half of the Planning Area. Although future growth in the south is somewhat controlled by provisions of the San Tan Area Plan, which establishes land use and population densities for a majority of the Planning Area south of Germann Road, pockets throughout the south and west continue to grow rapidly as new developments draw residents into formerly agricultural regions. Although a few areas, mainly county islands, are still served by septic tanks, a vast majority of the town is sewered. There are two small segments in the northeast and northwest corners of Gilbert that are currently serviced by the City of Mesa.

This study applies MAG population projections generated in the year 2000, and a unit wastewater flow of 80 gpcd as used by the Town of Gilbert for planning purposes. The per capita flow figure is generated based on actual flow data from the town and recent specific master planning. MAG population projections were recently updated for 2000, 2010, and build out. Those numbers were interpolated for the five-year incremental populations, assuming build out at 2040. Table 4.35 depicts population and wastewater flow projections through the planning period.

Table 4.35 Gilbert Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Flows (mgd)
2000	114,274	9.14
2005	163,002	13.0
2010	211,729	16.9
2015	228,389	18.3
2020	245,049	19.6
Build Out	311,690	24.9

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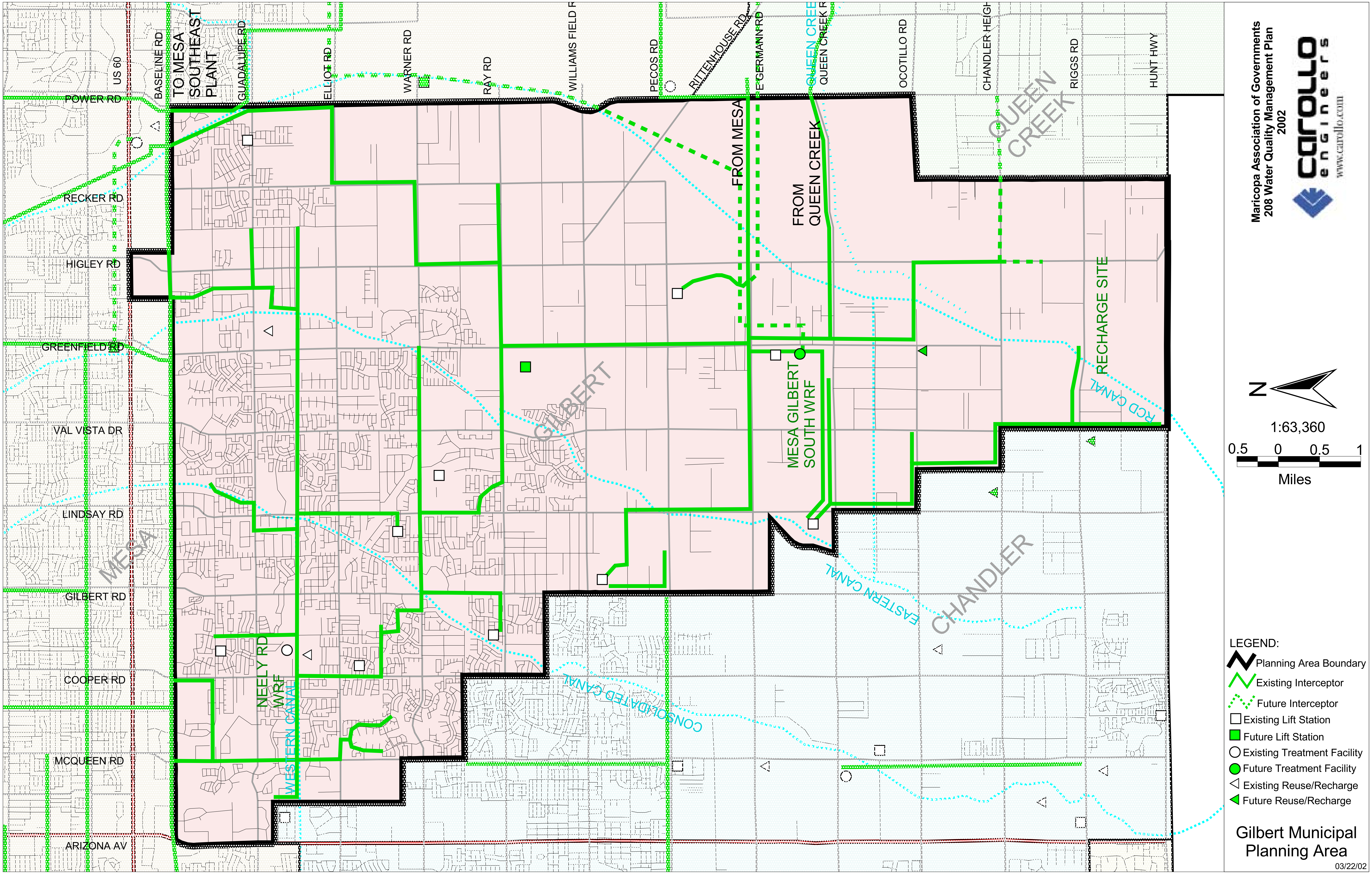

Maricopa Association of Governments
208 Water Quality Management Plan
2002
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POWER RD
RECKER RD
HIGLEY RD
GREENFIELD RD
VAL VISTA DR
LINDSAY RD
GILBERT RD
COOPER RD
MCQUEEN RD
ARIZONA AV
US 60
BASELINE RD
TO MESA SOUTHEAST PLANT
GUADALUPE RD
ELLIOT RD
WARNER RD
RAY RD
WILLIAMS FIELD R
PECOS RD
RITTENHOUSE RD
GERMANN RD
QUEEN CREEK RD
OCOTILLO RD
CHANDLER HEIGH
RIGGS RD
HUNT HWY
QUEEN CREEK
FROM MESA
FROM QUEEN CREEK
RECHARGE SITE
RCD CANAL
GILBERT
MESA GILBERT SOUTH WRF
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CHANDLER
EASTERN CANAL
CONSOLIDATED CANAL
NEELY RD WRF
WESTERN CANAL
N
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Miles
LEGEND:
Planning Area Boundary
Existing Interceptor
Future Interceptor
Existing Lift Station
Future Lift Station
Existing Treatment Facility
Future Treatment Facility
Existing Reuse/Recharge
Future Reuse/Recharge
Gilbert Municipal Planning Area
03/22/02

FIGURE 4.20

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Existing Collection System. The existing collection system continues to expand south and east as new developments spread to formerly undeveloped regions of the Planning Area. The current system serves a majority of the area north of Queen Creek Road and west of Recker Road. Most of the flows originating in the northern half of the Planning Area are collected in an interceptor on the mid-section line between Guadalupe and Elliot Roads. A majority of the flows from the east are conveyed by gravity.

The Islands, Neely and Candlewood Lift Stations are responsible for pumping a bulk of the flows from the northwest portion of the Planning Area to the existing wastewater reclamation facility, located on Neely Road approximately one-half mile north of Elliot Road (Neely WRF). The Islands Lift Station, located on the western edge of the Planning Area between Guadalupe and Elliot Roads, pumps flows to the existing Neely WRF via an 18-inch force main. The Neely Lift Station, located on Neely Road at Guadalupe Road, pumps flows to the Neely WRF via a 12-inch force main. The Candlewood Lift Station, located on Cooper Road north of Warner Road, discharges to a 42-inch interceptor along Cooper Road, which ultimately discharges to the Neely WRF.

The Rancho Del Verde Lift Station, located on Ray Road between Cooper and Gilbert Roads, and the Western Skies Lift Station, located south of Warner between Lindsay and Val Vista Roads, assist in transferring flows from several new developments to the Neely WRF. Although neither station acts as a "pumper," both are capable of raising the hydraulic grade line, thereby allowing gravity flow to the treatment facility. The Gilbert Commons Lift Station, located on Gilbert Road, north of Pecos Road, pumps flows from several western developments to the future Mesa-Gilbert South Water Reclamation Plant (MGSWRP) (currently functioning only as a pump station) via an 18-inch force main. The San Tan Lift Station, located on Higley and Pecos Roads, pumps flows from the San Tan Ranch Development to the MGSWRP.

Several other small lift stations, including the Spring Meadows and Commerce Lift Stations, deliver flows from several new smaller developments in the northern half of the Planning Area to the Neely WRF.

In addition, two major lines were recently installed in the southern portion of the Planning Area. A large trunk line, which runs along the western portion of the Planning Area, transfers flows from the southwest portion of the Planning Area to the West San Tan Lift Station located near the intersection of Queen Creek and Lindsay Roads. Flows entering this lift station are pumped to the MGSWRP site. A second new trunk line, which runs from Chandler Road, across Ocotillo Road to Greenfield Road, assists in transferring flows from the southeast portion of the Planning Area to the MGSWRP site.

The Town of Queen Creek delivers flows from a portion of its Planning Area to the MGSWRP site via a 24-inch line on Queen Creek Road. The City of Mesa also has the ability to deliver flows to the MGSWRP site via a 21-inch line, which runs along Germann Road.

Existing Treatment System. The town's existing wastewater treatment plant, the Neely WRF, is an 8.5 mgd facility located on Neely Road between Guadalupe and Elliot Roads. Unit processes at the facility include biological nutrient removal through the use of oxidation ditches and separate denitrification basins, secondary clarification, filtration, and chlorination. At the start of the year 2000, average influent flow to the WRF was approximately 7 mgd. Expansion to its ultimate capacity of 11.0 mgd will begin in June 2001 in order to meet projected future demands.

Reclaimed water from the Neely WRF is reused in several capacities including irrigation of landscaping, golf courses and agriculture as well as filling of recreational lakes. During the summer months when demand for reclaimed water is high, most or all of the flow from the Neely WRF is distributed directly to reclaimed water users. During this time, very little water is recharged. However, during winter months, when reclaimed water use is somewhat diminished and production exceeds demand, reclaimed water that cannot be reused directly may be recharged in a Riparian Preserve located southwest of the facility. The town's only municipal recharge well is also located near the WRF site. If desired, reclaimed water from the Neely WRF can also be pumped to a second Riparian Preserve located on the southeast corner of Guadalupe and Greenfield Roads near the town's Water Treatment Plant. The town also recently added a 1.25 million gallon reclaimed water storage tank near Elliot and Greenfield Roads. It is proposed that this facility will be operated as a pump station to provide more reliable service to larger users at the eastern end of the reclaimed water distribution system.

Waste sludge from the Neely WRF is currently pumped to the Baseline Road Interceptor (BRI) for treatment at the 91st Avenue WWTP.

Construction was recently completed on the initial stages of a second wastewater treatment plant, the Mesa-Gilbert South Water Reclamation Plant (MGSWRP), located just west of Greenfield Road, approximately one-half mile north of Queen Creek Road. Currently, the facility functions only as a pump station, with a capacity of approximately 4.3 mgd. Although the plant presently has no treatment responsibility, bar screens and equalization basins are in use at the site to optimize operation of the pump station. The existing equalization basins will be converted to primary clarifiers upon expansion. Until completion of Phase Two, when the facility will have treatment capability, flows entering the facility are being pumped to Mesa's Southeast WRF for treatment.

Future Collection System. The Town of Gilbert plans to extend its existing collection system to meet projected growth patterns. In keeping with current development trends, most of the near future expansion and improvements will be concentrated in the eastern and southern regions of the wastewater Planning Area.

The town will continue to work with developers to construct new sewers, which will connect formerly undeveloped regions to the collection system. In addition, the town plans to construct relief sewers and rehabilitate existing lines in presently developed regions. Planning is near completion for construction of a lift station and force main in the vicinity of Ray and Greenfield Roads. This lift station, known as the Crossroads Lift Station, will deliver flows to the new MGSWRP and greatly enhance system flexibility. An updated version of the town's master plan is being completed which will identify areas of need and determine implementation schedules. Opportunities for optimizing treatment plant capacities will be built into the collection system.

Future Treatment System. The final phase of development primarily involves improving and expanding the town's wastewater treatment facilities. A contract was recently awarded to expand the Neely WRF to its ultimate capacity of 11 mgd. In addition, the town plans to construct a reclaimed water reservoir and pump station at the treatment facility. This structure will be capable of storing reclaimed water before distribution to end users, thereby increasing system flexibility. Overflows from the reservoir will be sent to one of the town's existing Riparian Preserves.

During the planning period, the town also plans to complete construction on the second phase of the MGSWRP. The facility will have an initial treatment capacity for the Town of 9 mgd, with the ability to expand to an ultimate capacity of 19 mgd (initial total with City of Mesa of 12 mgd and ultimate 49 mgd). Unit processes at the new facility will include primary clarification, biological nutrient removal through the use of aeration basins, secondary clarification, filtration, and chlorination. The proposed design also includes odor control and gas recovery facilities. Solids generated by the plant will be handled on-site through the use of thickeners, digesters and mechanical dewatering. It is expected that most of the reclaimed water from the plant will be sent directly to end users. However, excess reclaimed water may be pumped to one of the Town's Reclaimed Water Reservoirs or Riparian Preserves for recharge. Additional recharge facilities are also planned. Upon completion of the facility, flows will no longer regularly be sent to the Mesa Southeast Plant for treatment.

The next phase of development primarily involves improving and expanding the town's Reclaimed Water System. The demand for reclaimed water has steadily risen in recent years and continuing development promises to increase the number of end users. Construction of an injection and monitor well and a recovery well should help meet future demands. In addition, the town plans to install three new reclaimed water transmission lines; one line which runs from Recker Road to the RWCD Canal and the East Maricopa Floodway, a parallel line which runs from Lindsay to the Eastern Canal along the Olney alignment, and a line on Greenfield Road between Warner and Williams Field Roads. The town also has plans to construct a reclaimed water reservoir and booster station at Elliot Park. In addition, the town plans to add injection and recovery wells in the eastern portion of the distribution system to increase flexibility and reliability. These facilities, along with the installation of pressure sustaining and flow control valves should assist in alleviating existing pressure and supply issues.

The eventual goal of the town is to connect the north and south reclaimed water distribution systems, thereby increasing flexibility and promoting more efficient and reliable service.

Summary of Proposed Improvements

Item	Estimated Cost[1]
Sewer Rehabilitation	$1,093,300
Reclaimed Water System Improvements	4,230,000
Lift Station & Force Main Installation	2,500,000
Well Construction	480,000
Neely WRF Expansion & Improvements	10,200,000
Mesa-Gilbert South Water Reclamation Plant Design and Construction	
Initial 9 mgd Treatment Capacity	38,250,000
Expansion to 19 mgd Capacity	40,000,000
Total	$96,753,300

[1] All costs are in January 1999 dollars (ENR Construction Cost Index = 6000).

4.2.5.4 Mesa

Wastewater collection and treatment service is provided by the City of Mesa. In 1996, Mesa completed a Sewer Master Plan Update. The document updated Mesa's needs for wastewater collection and treatment. The Mesa planning area covers approximately 164 square miles, and is depicted on Figure 4.21. It is generally bounded by the Salt River Indian Reservation on the north; the Maricopa County line on the east; the Western Canal (from Price Road to Country Club Drive), Baseline Road (from Country Club Drive to Power Road) and Germann Road (from Power Road to the Maricopa County line) on the south; and by the City of Tempe (from the Western Canal to the Salt River) and Power Road (from Germann Road to Baseline Road for the southeastern section of the Planning Area) on the west. The Planning Area includes all the incorporated City of Mesa (including Williams Gateway Airport), corresponding to Regional Analysis Zones (RAZ) 289, 290, 291, 292, 293, 294, 295, 298, 299, 300, 309, 320, 321, and 322. The City of Mesa is the designated wastewater management agency for this area.

Sources of flow from outside the Planning Area include the Town of Gilbert, the Salt River Pima Maricopa Indian Community (SRPMIC), and the Town of Queen Creek. Mesa and the Town of Gilbert have an agreement for regional wastewater treatment at the proposed South Water Reclamation Plant.

Population and Flow Projections. Significant growth is projected within the Mesa service area. Table 4.36 presents the population and flow projections based on projected SROG service populations and flow.

Table 4.36 Mesa Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population[1]	Flow, mgd[1]
2000	375,552	42.26
2005	430,984	48.49
2010	491,428	55.30
2015	551,872	62.10
2020	612,316	68.90

[1] Based upon projected SROG service populations and flow, Appendix C, Influent Conditions of 91st Avenue WWTP 25-year Facilities Master Plan, December 2001.

Existing Collection System. The Planning Area served by the City of Mesa municipal wastewater collection system consists of more than 1,300 miles of collection and interceptor sewers.

The major interceptors serving Mesa include:

- Baseline Road Interceptor (BRI).
- Baseline Road Relief Interceptor (BRRI).

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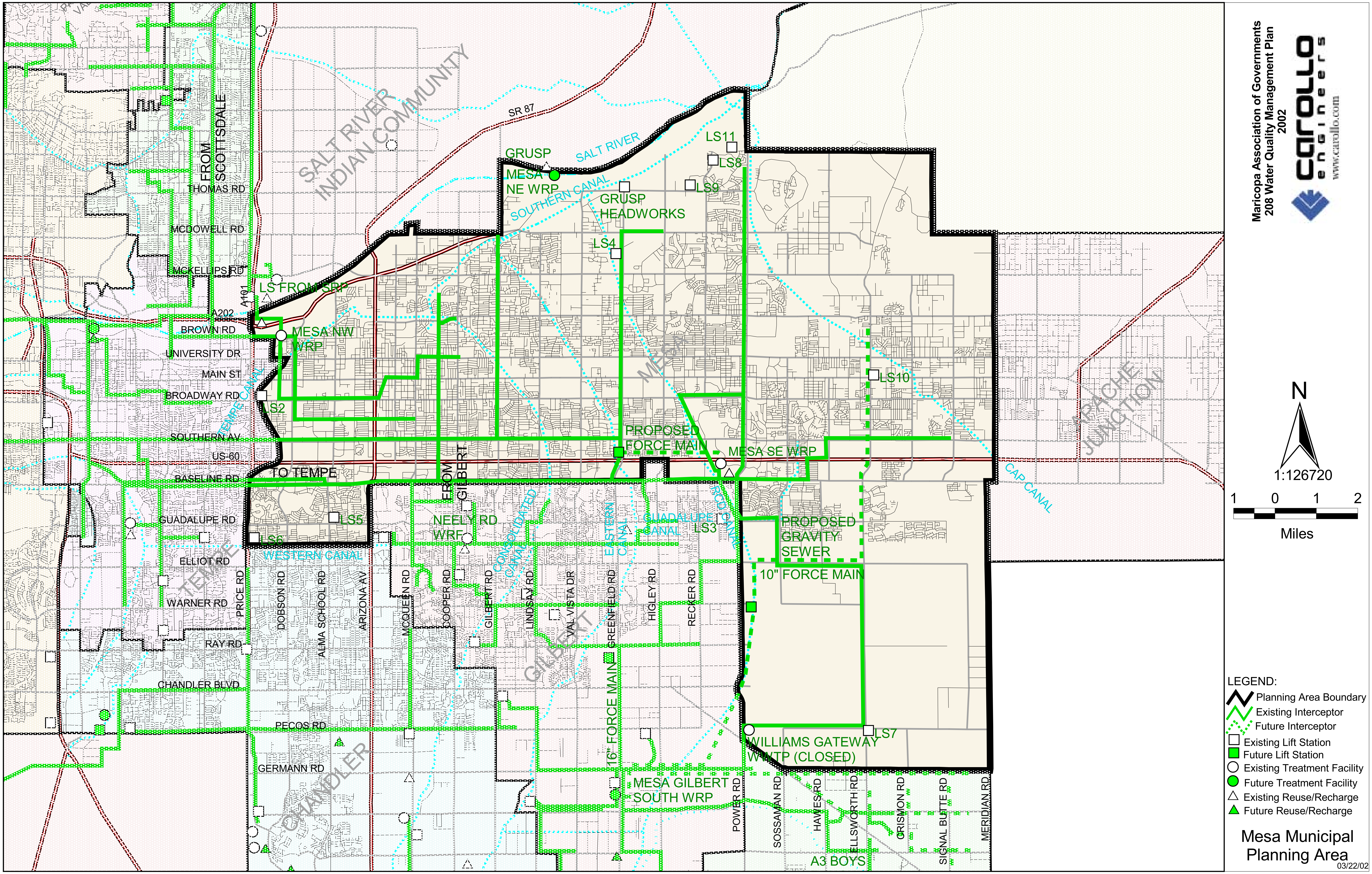

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208 Water Quality Management Plan
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Planning Area Boundary
Existing Interceptor
Future Interceptor
Existing Lift Station
Future Lift Station
Existing Treatment Facility
Future Treatment Facility
Existing Reuse/Recharge
Future Reuse/Recharge
Mesa Municipal
Planning Area
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SALT RIVER INDIAN COMMUNITY
MESA
APACHE JUNCTION
TEMPE
GILBERT
CHANDLER
FROM SCOTTSDALE
SR 87
SALT RIVER
SOUTHERN CANAL
CAP CANAL
TEMPE CANAL
WESTERN CANAL
CONSOLIDATED CANAL
EASTERN CANAL
GUADALUPE CANAL
GRUSP
MESA NE WRP
GRUSP HEADWORKS
LS11
LS8
LS9
LS4
LS FROM SRP
MESA NW WRP
LS2
LS10
PROPOSED FORCE MAIN
MESA SE WRP
TO TEMPE
FROM GILBERT
LS5
LS6
LS3
NEELY RD WRF
PROPOSED GRAVITY SEWER
10" FORCE MAIN
16" FORCE MAIN
LS7
WILLIAMS GATEWAY WWTP (CLOSED)
MESA GILBERT SOUTH WRP
A3 BOYS
THOMAS RD
MCDOWELL RD
MCKELLIPS RD
A101
A202
BROWN RD
UNIVERSITY DR
MAIN ST
BROADWAY RD
SOUTHERN AV
US-60
BASELINE RD
GUADALUPE RD
ELLIOT RD
WARNER RD
RAY RD
CHANDLER BLVD
PECOS RD
GERMANN RD
PRICE RD
DOBSON RD
ALMA SCHOOL RD
ARIZONA AV
MCQUEEN RD
COOPER RD
GILBERT RD
LINDSAY RD
VAL VISTA DR
GREENFIELD RD
HIGLEY RD
RECKER RD
POWER RD
SOSSAMAN RD
HAWES RD
ELLSWORTH RD
CRISMON RD
SIGNAL BUTTE RD
MERIDIAN RD

FIGURE 4.21

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- 8th Street Interceptor.
- Southern Avenue sewer line.

These interceptors convey wastewater from Mesa (through Tempe) to the Salt River Outfall (SRO) line, the Southern Avenue Interceptor (SAI), and eventually to the SROG 91st Avenue WWTP. The Cities of Tempe, Scottsdale and Phoenix also own capacity in the SRO and SAI.

Upstream of the 91st Avenue WWTP, the City of Mesa owns a total of 40 mgd average conveyance capacity of purchased capacity in the SRO and SAI.

Flows from the Town of Queen Creek are sent to the Mesa-Gilbert South Lift Station (MGSLS) to the Southeast Water Reclamation Plant (SEWRP), and/or the 91st Avenue WWTP for treatment. Flow can be sent to the MGSLS from the SEWRP and vice versa. Flow from the SRPMIC is sent to the Northwest Water Reclamation Plant (NWWRP) or the 91st Avenue WWTP for treatment.

<u>Existing Treatment System</u>. The City of Mesa owns and operates the NWWRP and SEWRP. Biosolids from the NWWRP are treated on site. Biosolids from the SEWRP are sent to the 91st Avenue WWTP for treatment. Mesa owns 29.2 mgd capacity at the 91st Avenue WWTP.

Capacities and facilities at each reclamation plant are summarized below:

<u>Northwest Water Reclamation Plant</u>

- Capacity: 18 mgd (30 mgd ultimate).
- Bar screens.
- Primary sedimentation.
- Activated sludge with nitrification and denitrification.
- Secondary sedimentation.
- Chlorine disinfection.
- Dual media filtration.
- Declorination.
- UV Disinfection.
- Groundwater recharge basins.
- Biosolids Solids Treatment.
- Existing NPDES, APP and (2) USF Permits.

Biosolids treatment consists of single stage anaerobic digesters with primary and secondary sludge thickening and sludge dewatering.

Southeast Water Reclamation Plant

- Capacity: 8 mgd (16 mgd ultimate).
- Comminutors.
- Primary sedimentation.
- Activated sludge with nitrification and denitrification.
- Secondary sedimentation.
- Dual media filtration.
- UV disinfection.
- Chlorine disinfection.
- Dechlorination.
- Existing APP and Reuse Permits (future permits if needed: NPDES and USF).

Mesa-Gilbert South Lift Station (MGSLS) 4.4 mgd. The MGSLS is constructed as the beginning of a wastewater treatment plant (MGSWRP). The facility currently consists of headworks, air scrubbers, grit removal, and primary clarifiers. The primary clarifiers are used as flow equalization basins in the lift station. Flows are sent to the SEWRP and/or the 91st Avenue WWTP for treatment.

Williams AFB WWTP 0.9 mgd. The plant has been decommissioned and replaced with a lift station. Flows are sent to the MGSLS. The site is being prepared for possible construction of a new wastewater treatment plant with an ultimate capacity of 18 mgd and biosolids treatment.

Future Wastewater System Development. The City of Mesa is implementing the improvements recommended in the most current Sewer Master Plan Update. Future sewerage system improvements will include providing service to undeveloped areas and upgrades to existing areas. The improvements will extend service and increase capacity within the system.

Based on the 1996 Sewer Master Plan Update and current population projections, future wastewater treatment capacity will be provided by the NWWRP, the SEWRP, the SROG 91st Avenue WWTP, and the Mesa-Gilbert South WRP (MGSWRP). An estimate of the projected flows through the planning period are summarized in Table 4.37.

Table 4.37 Mesa Wastewater Flow Allocation Projections MAG 208 Water Quality Management Plan Update						
Year	**SROG Facilities[1] (mgd)**	**NWWRP[2] (mgd)**	**SEWRP[2] (mgd)**	**MGSWRP[2] (mgd)**	**Gilbert Residuals[3] (mgd)**	**Total Treated Flow (mgd)**
2000	30.31	7.67	4.74	--	0.46	42.26
2005	28.24	15.9	5.01	--	0.66	48.49
2010	24.25	20.0	11.11	0.6	0.66	55.30
2015	24.25	22.51	12.00	4.0	0.66	62.10
2020	24.25	22.51	14.80	8.0	0.66	68.90

[1] Annual average daily flows. Includes residuals from WRPs.
[2] Local flow less residuals (treated flow).
[3] The Town of Gilbert only sends its residuals to be treated at 91st Avenue WWTP.

The Mesa-Gilbert South WRP (MGSWRP) will have an initial capacity for Mesa of 3 mgd, and an ultimate capacity of 30 mgd (initial total including Town of Gilbert 12 mgd, 49 mgd ultimate). Unit processes at the new facility will include primary clarification, biological nutrient removal through the use of aeration basins, secondary clarification, filtration, and disinfection. The proposed design also includes odor control and gas recovery facilities. Solids generated by the plant will be handled on-site through the use of thickeners, digesters and mechanical dewatering. It is expected that most of the reclaimed water from the plant will be sent directly to end users. This facility will obtain permits for NPDES, APP and USF.

Throughout Mesa and properties not owned by Mesa, effluent from the NWWRP, SEWRP, and MGSWRP will be used for groundwater recharge and/or reuse, and/or discharge. Mesa has or will acquire all required permits. Biosolids treatment facilities are being constructed at the NWWRP and will also be constructed at the MGSWRP.

Water rights settlements with the Gila River Indian Community (GRIC) will involve conveyance of treated effluent from any or all of Mesa's WRPs to GRIC land. Mesa may use capacity owned in the RWCD conveyance system to deliver effluent to the GRIC. Mesa may use the Salt River Project (SRP) conveyance system to deliver effluent. Effluent can be delivered to the RWCD, the GRIC or SRP.

If by agreement between Mesa and Gilbert, the Mesa-Gilbert South Water Reclamation Plant is used exclusively for the Gilbert service area, then Mesa will construct its own South Water Reclamation Plant with a capacity of up to 18 mgd at the Williams Gateway site. If the Mesa Master Plans calls for the construction of the facility Mesa will acquire the appropriate permits for its construction.

Mesa currently owns property off Thomas Road between Lindsay and Val Vista Roads for the construction of a Northeast Water Reclamation Plant with a capacity of up to 15 mgd. If the Mesa Master Plans calls for the construction of the facility Mesa will acquire the appropriate permits for its construction.

Reclaimed Water Distribution System. Effluent from the NWWRP is delivered for groundwater recharge of up to 8.0 mgd on Mesa land and 32 mgd on SRPMIC land, the GRUSP and the Salt River.

Effluent from the SEWRP is delivered to Leisure World, Superstition Springs Golf Course, and the RWCD for the following reuse purposes:

- Open Access Landscape Irrigation,
- Food Consumed Raw,
- Orchards,
- Fiber, Seed and Forage,
- Pastures,
- Livestock Watering, and
- Incidental Human Contact.

The SEWRP can discharge to the East Maricopa Floodway under an Aquifer Protection Permit and agreement with the Maricopa County Flood Control District.

Summary of Proposed Wastewater System Improvements

Estimated Capital improvements through the year 2005 are summarized below:

Item	Estimated Costs[1]
MGSWRP Phase II	$ 30,000,000
Wastewater System Expansion	102,000,000
Expansion at 91st Avenue	28,000,000
Total	$160,000,000

[1] June 2000 costs (ENR Construction Cost Index = 6238)

Contract Customer Service. In addition to wastewater collection and treatment for the Mesa service area, the City may provide service to contract customers outside the designated service area. Mesa has an agreement with the Town of Gilbert to convey residual solids from Gilbert's wastewater treatment facilities to the 91st Avenue WWTP through the BRI and through SAI. Mesa and Gilbert may have other agreements regarding the SEWRP or any other of Mesa's WWTPs. Other contract customers, including the Town of Queen Creek and the SRPMIC, have Intergovernmental Agreements with Mesa specifically for the purpose of wastewater treatment.

4.2.5.5 Queen Creek

The Planning Area for Queen Creek is composed of the incorporated limits of the Town, as depicted on Figure 4.22, corresponding to Regional Analysis Zones (RAZ) 339 and 342. The MAG 208 planning boundary is the Maricopa County boundary. Portions of Queen Creek outside of Maricopa County are within Central Arizona Association of Governments planning area for 208 planning purposes and processes.

Population and Flow Projections. The Town of Queen Creek has not yet experienced significant urban development, although it is expected to grow tremendously by year 2020. The 1997 MAG-adopted population projections for Queen Creek, as well as wastewater flow projections, are presented in Table 4.38. Flow projections are based on a per capita flow of 100 gpcpd.

Table 4.38 Queen Creek Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)
2000	7,452	0.75
2005	10,735	1.07
2010	14,042	1.40
2015	17,283	1.73
2020	20,584	2.06

Existing Wastewater System. At present, there are no treatment facilities in Queen Creek with the exception of a privately-owned 20,000-gpd treatment facility serving the Rancho Del Rey subdivision and the 20,000 gpd treatment facility at the Canyon State Academy. Both plants were deactivated in year 2001, and the flows generated in these areas were then connected to the town's collection system.

The collection system has been divided in three separate zones, each with a network of sewers leading to an outfall for conveyance and treatment elsewhere. Collector sewers will be constructed along one-mile section line roads with laterals extending into developments in the individual sections. Only one zone has been developed, while the remaining two zones are in the planning stage.

Zone 1 is an area southwest of Rittenhouse Road and northwest of the Queen Creek Wash and includes the Town Center and portions of Queen Creek located southwest of the Southern Pacific Railroad. The major infrastructure required for this zone is in place. The Rancho Del Rey subdivision and the Canyon State Academy will be connected to this collection system as soon as their existing treatment plants are deactivated. The sewers from this zone combine at the Queen Creek Road Outfall where the flow is then conveyed to a pump station on the west side of Greenfield Road, 1/2 mile north of Queen Creek Road. This pump station will serve as the influent pump station to the future regional Mesa-Gilbert South Water Reclamation Plant. Queen Creek is planning to purchase capacity rights in this plant when it is in operation. Until the regional facility is constructed, this pump station conveys flows to the Mesa Southeast WRP.

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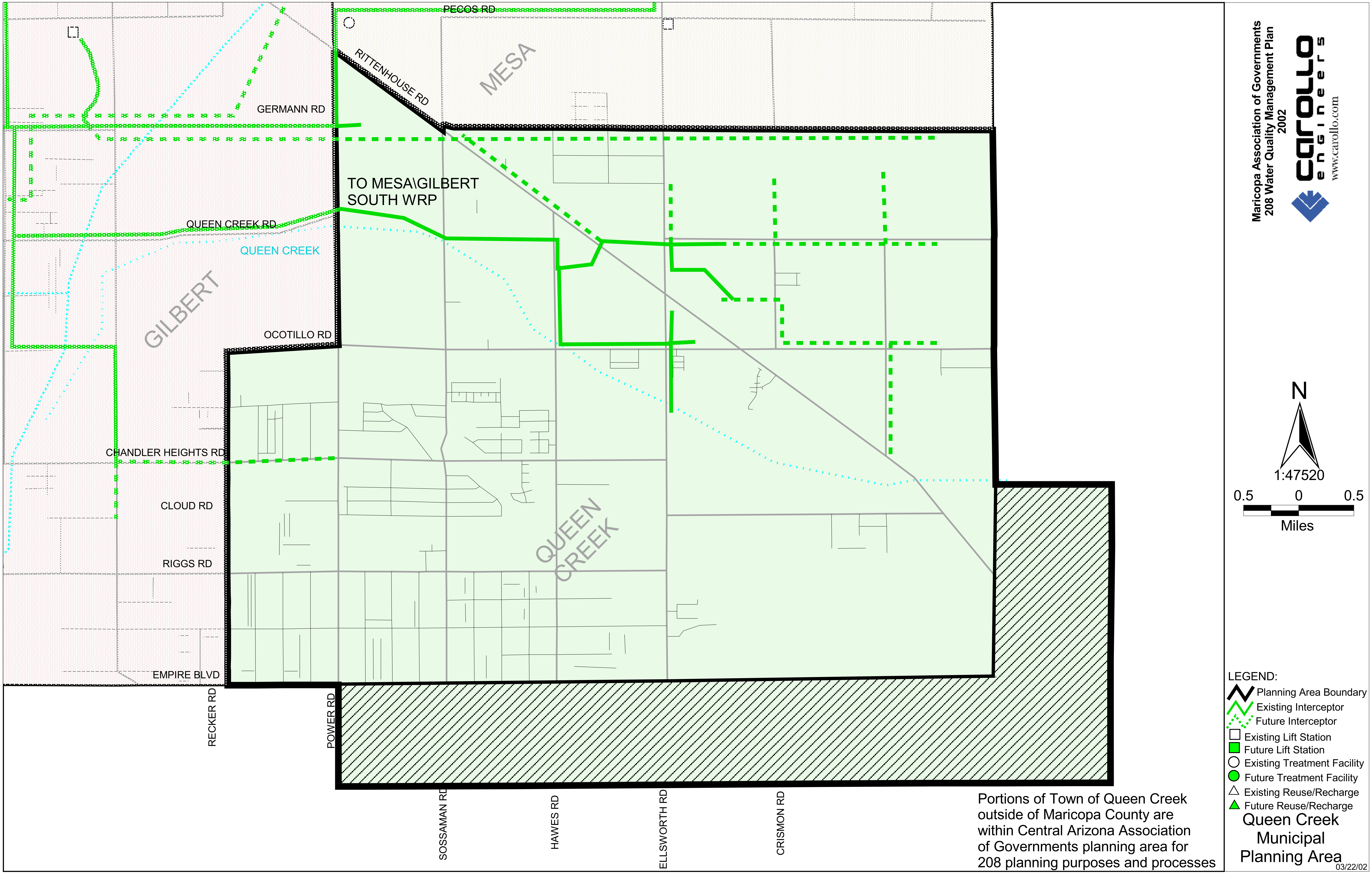

PECOS RD
RITTENHOUSE RD
MESA
GERMANN RD
TO MESA\GILBERT
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QUEEN CREEK RD
QUEEN CREEK
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OCOTILLO RD
CHANDLER HEIGHTS RD
CLOUD RD
RIGGS RD
EMPIRE BLVD
QUEEN
CREEK
RECKER RD
POWER RD
SOSSAMAN RD
HAWES RD
ELLSWORTH RD
CRISMON RD
Portions of Town of Queen Creek
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Planning Area Boundary
Existing Interceptor
Future Interceptor
Existing Lift Station
Future Lift Station
Existing Treatment Facility
Future Treatment Facility
Existing Reuse/Recharge
Future Reuse/Recharge
Queen Creek
Municipal
Planning Area
03/22/02

FIGURE 4.22

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Future Wastewater System Development. As urban development of Queen Creek occurs, two more zones of the planned wastewater collection system will be constructed. The configuration of the collection system will be determined by the size and location of the developments.

Zone 2 will be located in the northeast section of Queen Creek, east of Ellsworth Road and northeast of the Southern Pacific Railroad. It is tentatively planned that the sewage generated by Zone 2 will be collected at the future Germann Road Outfall and conveyed to the Mesa Gilbert South WRP site where it will be treated on site or diverted to the Mesa Southeast WRP until the construction of the new Mesa Gilbert plant. The collection system infrastructure for Zone 2 has been located and sized, but has not yet been constructed.

Zone 3 will consist of the area south of Queen Creek Wash, in the southwestern section of Queen Creek. Sewers will be constructed to convey wastewater generally west to the future Ocotillo Road Outfall and on to the Mesa Gilbert South WRP. The collection system infrastructure has not yet been designed.

Zone 4 will consist of a 1/2 mile wide industrial zoned corridor along the south side of Germann Road from the County Line to Ellsworth Road; the area from Hawes Road to Sossaman Road north of the Southern Pacific Railroad and south of Germann Road and the area north of Germann Road–south of the railroad between Sossaman Road and Power Road. This area will have an outfall that will be sized to handle 50 percent of the flow from Zone 1. The outfall will be to the Gilbert-Mesa South WRP.

Depending on the time of development and collection system construction, individual developers may want to connect to the town system or install a temporary treatment facility and connect to the town system at a later date. Individual sewer mains or treatment facilities have not been sized.

Summary of Wastewater System Improvements. Costs presented below are based on the assumption that Queen Creek's wastewater will be conveyed to the Mesa-Gilbert South WRP where it will be treated on-site or diverted to the Mesa Southeast WRP for treatment. The cost of increased capacity within the Mesa South WRP cannot be determined until it is developed in further detail. The sewer collection system will be constructed using development and impact fees, as the town does not yet have the tax base to finance the new infrastructure.

Item	Estimated Cost[1]
Zone 2 Collection System	$3,600,000
Zone 3	To be Determined
Zone 4 Collection System	$6,650,000
Total	$10,250,000

[1] December 1998 Dollars (ENR Construction Index = 5991).

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4.2.5.6 Tempe

The Planning Area for Tempe consists of Regional Analysis Zones (RAZ) 288, 297, and 308. The City of Tempe is the designated wastewater management agency for this area. Tempe provides wastewater collection and treatment service to all development in the city. Because Tempe is completely surrounded by other incorporated cities, the service area will not increase in size in the future. Tempe also provides wastewater treatment to the Town of Guadalupe on a contract basis. Figure 4.23 depicts the Tempe Planning Area.

<u>Population and Flow Projections</u>. Table 4.39 presents the SROG total population and flow projections (including Guadalupe).

Table 4.39 Tempe Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population[1]	Flow (mgd)[1]
2000	166,456	21.99
2005	175,525	26.22
2010	184,132	30.45
2015	188,932	33.17
2020	193,732	35.59

[1] Based upon projected SROG service populations and flow, Appendix C, Influent Conditions of 91st Avenue WWTP 25-year Facilities Master Plan, December 2001.

<u>Existing Collection System</u>. Tempe, Guadalupe, and ASU each operate individual wastewater collection systems. The major components of the Tempe system are complete. No new interceptors are planned. Future development of the Tempe collection system will mostly consist of constructing local sewers to serve new developments as they are built. Some changes will be necessary if flows are diverted to a new water reclamation plant (discussed below). There are four pumping stations in the Tempe system, all of which have adequate capacity for ultimate flows.

<u>Existing Wastewater Treatment</u>. Tempe is a member of the Multi-City Subregional Operating Group (SROG) and currently obtains a substantial portion of its wastewater treatment at the SROG's 91st Avenue wastewater treatment plant (WWTP). Tempe owns 22.53 mgd of treatment capacity at the 91st Avenue WWTP.

Tempe's Kyrene Water Reclamation Plant (WRP) is located near the intersection of Kyrene and Guadalupe Roads. The Kyrene WRP treats wastewater generated in southern Tempe and has a capacity of 4.5 mgd. Kyrene performs the following unit processes: screening and grit removal, activated sludge, nitrification/denitrification, chemical coagulation, secondary clarification, filtration, and ultraviolet disinfection. The Kyrene WRP has obtained an aquifer protection permit and an NPDES permit. Reclaimed water produced by the plant is used for turf irrigation pursuant to a Type 2 Reclaimed Water General Permit and for aquifer storage and recovery, and will be used by the Salt River Project in the near future as cooling water for the expanded Kyrene generating stations. Reuse sites are parks,

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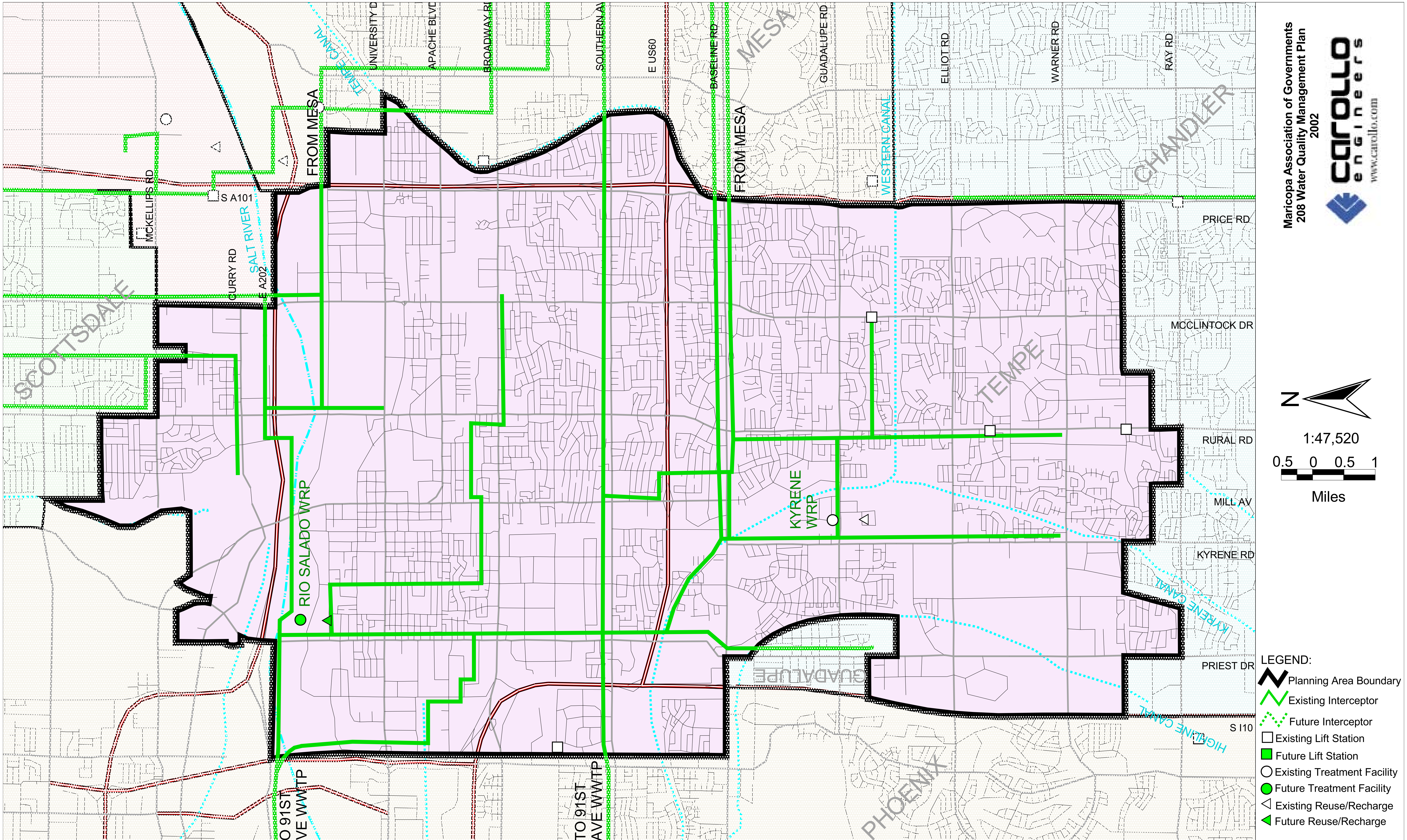

Tempe Municipal Planning Area

04/05/02

FIGURE 4.23

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recreational facilities, golf courses, freeway greenbelts, and school grounds. Residual solids and sludge are discharged into the SROG system and conveyed to the 91st Avenue WWTP.

***Future Wastewater System Development*.** The Kyrene WRP can be expanded to an ultimate capacity of 10 mgd as flows increase in the future. The WRP treatment capacity will be significantly influenced by seasonal peak demands for reclaimed water.

To treat wastewater in excess of its 18.5 mgd of flow to SROG facilities, Tempe plans to renegotiate its contract with SROG for more capacity at 91st Avenue WWTP, and in interceptor sewers, up to 32.5 mgd.

Although the City does not anticipate that its future capacity at 91st Avenue WWTP will be limited to less than 32.5 mgd, the City owns land on which a second WRP, the Rio Salado WRP, could be constructed if the facility became necessary. The Rio Salado WRP would receive wastewater diverted from the Priest Road and First Street sewers up to an ultimate capacity of 11 mgd. Rio Salado WRP would perform unit processes similar to those employed at the existing Kyrene WRP: screening and grit removal, activated sludge, nitrification/denitrification, chemical coagulation, secondary clarification, filtration, and ultraviolet disinfection.

If this plant became necessary to meet future demand for treatment capacity, Tempe would apply for NPDES, reclaimed water, and aquifer protection permits for the Rio Salado WRP. Reclaimed water would be used for turf irrigation and aquifer storage and recovery. Residual solids and sludge from the WRP would be discharged into the SROG system and conveyed to the 91st Avenue WWTP.

Projections of flows to be treated at the various treatment plants are presented in Table 4.40. An assumption is made that negotiations for capacity rights with SROG will be successful, eliminating the need for the Rio Salado WRP.

Table 4.40 Tempe Wastewater Flow Allocation Projections
MAG 208 Water Quality Management Plan Update

Year	SROG Facilities (mgd)[1]	Kyrene WRP (mgd)[2]	New WRP (mgd)[3]	Total Treated Flow
2000	19.51	2.48	0	21.99
2005	20.79	5.43	0	26.22
2010	23.65	6.80	0	30.45
2015	25.97	7.20	0	33.17
2020	28.39	7.20	0	35.59

1 Annual average daily flows. Includes residuals from WRP.
2 Local WRP flow less residuals (effluent total) (treated flow).
3 Capacity will depend on outcome of Tempe and SROG capacity negotiations.

Future improvements of the collection system will consist of extending branch lines to newly developing areas within the city limits, and modifications to divert flow to the new WRP or to 91st Avenue WWTP, depending on what is negotiated with SROG.

Summary of Proposed Wastewater System Improvements

Capital improvements planned through year 2020 are summarized below:

Item	Estimated Cost[1]
Kyrene WRP expansion	$25,000,000
Infrastructure installation and improvements	22,400,000
Capacity rights to 91st Avenue WWTP	40,500,000
General system improvements	18,500,000
Total	$106,400,000

[1] December 2000 costs (ENR Construction Cost Index = 6281)

4.2.6 Multi-City SROG Summary

The Sub-Regional Operating Group (SROG) was formed by a joint exercise of powers agreement in 1979 (Agreement No. 22699). The SROG is made up of five member communities: Cities of Glendale, Mesa, Phoenix, Scottsdale, and Tempe. The Town of Youngtown withdrew from SROG in 1995 and now its flows are treated with Sun City's by Citizens Water Resources Co. (now Arizona American Water Co.). The SROG provides wastewater treatment for its member communities at the 91st Avenue Wastewater Treatment Plant (WWTP). In addition, some communities that are not SROG members discharge various flows into the SROG system. The Town of Gilbert sold its purchased SROG capacity to Mesa in 1981; but continues to discharge sludge to the SROG facilities through the Mesa collection system. The Town of Paradise Valley and Boulders-Carefree (BMSC) are not SROG members, but are served by the cities of Phoenix and Scottsdale and ultimately by SROG facilities. Similarly, the Town of Guadalupe is served by the City of Tempe and ultimately by SROG facilities. The City of Phoenix acts as the lead agency, and acting as permittee or applicant, is responsible for compliance with all environmental permits and federal controls. The City of Phoenix is also responsible as lead agency for the construction, operation, maintenance, and replacement of the 91st Avenue WWTP and appurtenant facilities.

The City of Phoenix also operates the 23rd Avenue WWTP, which serves only the City of Phoenix and is not a SROG facility. Each of the SROG members now own and operate Water Reclamation Facilities (WRF) which treat wastewater for local reuse. Solids are discharged from the WRFs for treatment at 91st Avenue WWTP.

The service area includes all of the wastewater service areas of the five member communities. The SROG provides service for most of these areas except for the 23rd Avenue WWTP service area, a few areas served by septic tanks, and flows treated by the member cities' local water reclamation plants. Table 4.41 provided by the lead agency, City of Phoenix, depicts expected annual average flows to 91st Avenue, adjusted for planned local WRPs.

Table 4.41 Projected SROG Service Areas Annual Average Flow, mgd
MAG 208 Water Quality Management Plan Update

Community	2000	2005	2010	2015	2020
Mesa					
Total Flow, mgd	42.26	48.49	55.30	62.10	68.90
Local WRP/WWTP Treated	11.95	20.25	31.05	37.85	44.65
91st Ave. WWTP Flow, mgd	30.31	28.24	24.25	24.25	24.25

Table 4.41 Projected SROG Service Areas Annual Average Flow, mgd MAG 208 Water Quality Management Plan Update					
Community	**2000**	**2005**	**2010**	**2015**	**2020**
Glendale					
Total Flow, mgd	19.71	22.22	23.78	25.34	26.90
Local WRP/WWTP Treated	4.96	10.27	18.82	19.06	19.06
91st Ave. WWTP Flow, mgd	14.75	11.95	4.96	6.28	7.84
Phoenix					
Total Flow, mgd	130.64	148.31	166.99	185.52	203.72
Local WRP/WWTP Treated	50.79	70.65	74.80	81.09	86.03
91st Ave. WWTP Flow, mgd	79.85	77.66	92.19	104.43	117.69
Scottsdale					
Total Flow, mgd	23.93	27.56	30.15	31.19	31.27
Local WRP/WWTP Treated	11.41	13.18	16.76	22.09	22.09
91st Ave. WWTP Flow, mgd	12.52	14.38	13.39	9.10	9.18
Tempe					
Total Flow, mgd	21.99	26.22	30.45	33.17	35.59
Local WRP/WWTP Treated	2.48	5.43	6.80	7.20	7.20
91st Ave. WWTP Flow, mgd	19.51	20.79	23.65	25.97	28.39
Total					
91st Avenue WWTP Flow	156.94	153.02	158.44	170.03	187.35

Existing Treatment Facilities. The current capacity of the 91st Avenue facility is 179.25 mgd. This capacity is allocated among SROG members as shown in Table 4.42.

Table 4.42 Sub-Regional Operating Group (SROG) Treatment Capacity Allocations MAG 208 Water Quality Management Plan Update			
	Treatment Capacity, mgd		
Community	**Current**	**UP01**	**2020**
Phoenix	101.17	112.80	144.8
Mesa	29.22	29.22	29.22
Tempe	22.53	29.03	32.50
Glendale	13.20	13.20	13.20
Scottsdale	13.13	20.25	20.25
Total	179.25	204.50	239.97

Unit processes at the 91st Avenue WWTP include: screening, grit removal, primary sedimentation, fine-bubble aeration, secondary clarification, chlorination, and dechlorination. Secondary treatment uses the nitrification/denitrification process. The 91st

Avenue WWTP at present also receives sludge from some non-SROG treatment facilities. The sludge is transported through the interceptor system to the treatment plant and is therefore mixed in the influent wastewater. The solids treatment at 91st Avenue WWTP is by anaerobic digestion and centrifuge dewatering. The process is being upgraded to multiphase digestion.

The NPDES permit for the 91st Avenue WWTP has a current expiration date of December 31, 2003, but SROG plans to renew the NPDES upon expiration.

There are two contracts which provide for reuse of effluent generated at the 91st Avenue WWTP. The Palo Verde Nuclear Generating Station (PVNGS) has contract options for 105,000 acre-feet per year of effluent under an agreement that ends in 2027. During 1989, the PVNGS took 57,000 acre-feet of effluent. The City of Phoenix entered into a contract on June 1, 1971 with Buckeye Irrigation Company (BIC) to provide 30,000 acre-feet/year of reclaimed water for a period of forty years. On August 19, 1994 the SROG cities and BIC signed an agreement to extend the contract. When the original contract expires in the year 2011, the new agreement will be in effect, which consists of a series of five-year options which gives the BIC the right to purchase a specific amount of reclaimed water per calendar year for the option period subject to a minimum of 20,000 acre-feet/year and a maximum of 40,000 acre-feet/year. Some of the discharge to the Salt River is diverted into the Tres Rios Wetlands, a demonstration project, to evaluate benefits from wetlands for flow regulation, habitat restoration, and flood control.

Residual solids from the 91st Avenue WWTP are stabilized, dewatered, and then removed for agricultural reuse by a privately owned company.

Future Treatment Facilities. Significant modifications were completed to the 91st Avenue WWTP to conform to evolving regulatory considerations. Future expansions are being planned in consideration of the change in philosophy from each SROG city sending all their wastewater to the 91st Avenue WWTP for treatment to one in which decentralized water reclamation plants treat wastewater closer to points of reuse. For economic and aesthetic reasons, most of these WRPs do not have on-site facilities to treat residuals, but the concentrated residuals are discharged to SROG interceptors for treatment at 91st Avenue.

As a result of this changed philosophy, ownership in the SROG treatment facility is now being expressed in both hydraulic (flow capacity) and loading conditions (Biochemical Oxygen Demand [BOD] and Total Suspended Solids [TSS]). Current, near future (after expansion by Plant 3B) and projected (after expansion by Plant UP01) ownership is shown for each of these parameters in Table 4.43.

Table 4.43 Ownership Parameters MAG 208 Water Quality Management Plan Update				
Community	**Parameter**	**Current**	**Projected (after UP01 expansion)**	**Projected[1] 2020**
Phoenix	Hydraulics BOD TSS	101.17 mgd 229,000 lbs/day 264,000 lbs/day	112.80 mgd 279,600 lbs/day 288,000 lbs/day	
Mesa	Hydraulics BOD TSS	29.22 mgd 74,300 lbs/day 82,000 lbs/day	29.22 mgd 74,300 lbs/day 88,000 lbs/day	
Tempe	Hydraulics BOD TSS	22.53 mgd 76,100 lbs/day 52,000 lbs/day	29.03 mgd 96,100 lbs/day 86,000 lbs/day	
Glendale	Hydraulics BOD TSS	13.20 mgd 33,600 lbs/day 44,000 lbs/day	13.20 mgd 48,000 lbs/day 61,600 lbs/day	
Scottsdale	Hydraulics BOD TSS	13.13 mgd 36,400 lbs/day 54,500 lbs/day	20.25 mgd 53,600 lbs/day 88,000 lbs/day	
Total	Hydraulics BOD TSS	179.25 mgd 449,400 lbs/day 496,500 lbs/day	204.50 mgd 551,600 lbs/day 611,600 lbs/day	239.97 mgd 669,200 lbs/day 723,000 lbs/day

1 If planned reclamation facilities expansions are not constructed as planned by the Multi-Cities, the projected 2020 totals would be

Hydraulics	254.97 mgd
BOD	692,700 lbs/day
TSS	750,000 lbs/day

The proposed UP01 expansion will include headworks components, primary sedimentation, aeration basins, secondary sedimentation, chlorination/dechlorination, thickening and dewatering, and digestion.

4.2.7 Outlying Areas

4.2.7.1 Gila Bend

The Town of Gila Bend is located in southwestern Arizona. The geography is that of a relatively flat, desert environment. Wastewater collection and treatment service is provided by the Town of Gila Bend. The Town of Gila Bend corresponds to Regional Analysis Zone (RAZ) 331. The Town is agriculturally based, with a small commercial/industrial center adjacent to Interstate 8. Two new peaking power plants are planned. The planning area for the Facility Plan in 1977 proposed service and planning area comprising the incorporated area as well as an approximately one-mile wide unincorporated area around the Town's periphery. It includes the San Lucy Village, which has developed an independent wastewater system. The Luke Air Force Base Auxiliary Field is served by its own wastewater system and will remain independent of the Gila Bend municipal system.

In 1993, flooding along the Gila River encroached on the WWTP and the plant was damaged. The plant was then rebuilt to original design and capacity. The resident population is currently served by a 0.13 mgd capacity wastewater treatment plant (WWTP) which the Town owns and operates. The WWTP consists of three treatment lagoons, which discharge to the Gila River via an overflow ditch. Engineering plans for the modification to the plant have been approved which will increase capacity to 700,000 gpd and convert on pond to a wetland. The Town is awaiting funding for construction.

Population and Flow Projections. The MAG Population Projections were reviewed to estimate the growth in and around Gila Bend over the next 20 years. Based on the projected growth for the Town and assuming 20 percent of the growth in the surrounding County areas will be concentrated near the Town Boundaries, the overall population for the Town Planning Area is estimated to increase from the current project population of 2,714 by 153 percent, to 5,642 residents by the year 2020.

Total planning area and sewered populations, as well as wastewater flows, are projected in Table 4.44. The table assumes that 90 percent of the total community is sewered. A unit flow of 100 gpcd is used for flow projections.

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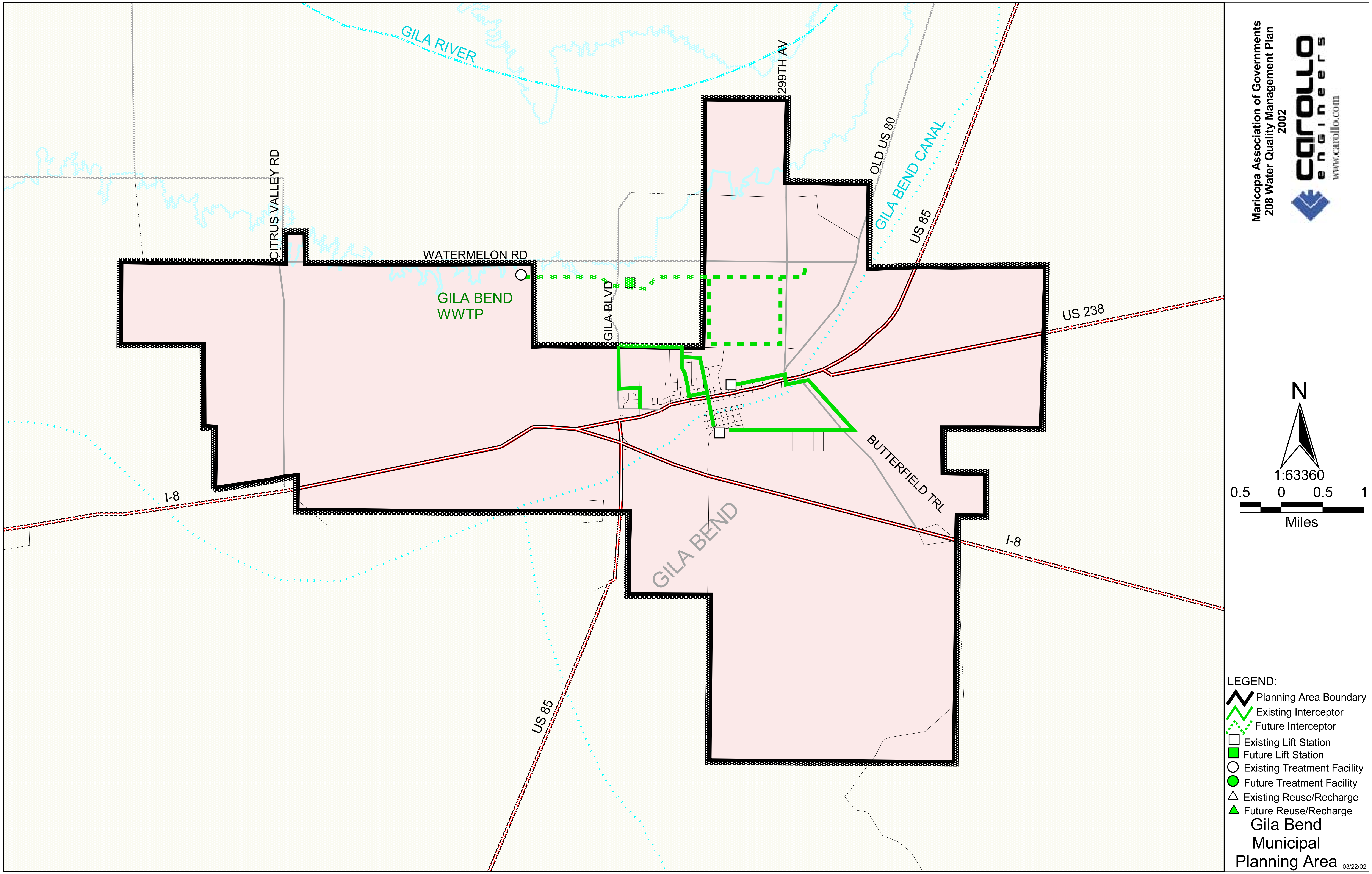
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GILA BEND CANAL
US 85
CITRUS VALLEY RD
WATERMELON RD
GILA BEND
WWTP
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BUTTERFIELD TRL
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Existing Interceptor
Future Interceptor
Existing Lift Station
Future Lift Station
Existing Treatment Facility
Future Treatment Facility
Existing Reuse/Recharge
Future Reuse/Recharge
Gila Bend
Municipal
Planning Area
03/22/02
FIGURE 4.24

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Table 4.44 Gila Bend Population and Flow Projection MAG 208 Water Quality Management Plan Update			
Year	**Planning Area Population**	**Sewered Population**	**Projected Flow**
2000	2714	2,442	0.24
2005	3178	2,860	0.29
2010	3493	3,143	0.31
2015	4192	3,772	0.38
2020	5642	5077	0.51

The measured flow (peak month in 1998) was 168,823 gpd.

Existing Collection System. The Gila Bend collection system consists of gravity sewers of 10-inch and 8-inch diameter, plus one 12-inch trunk sewer conveying collected sewage 1-1/2 miles to the treatment plant. Another sewer trunk line was completed in early 2000, which serves the Main Street and Business 8 area south and southeast of the Town Center. A 12-inch and 8-inch gravity sewer was installed from the location of the existing businesses near the eastern Business 8/Interstate Highway 8 interchange to a new lift station located at Main Street and Washington Street. The new lift station pumps into the existing gravity sewer system a short distance away.

A second lift station is being installed by a developer to serve a small, developing residential subdivision located at St. Louis Avenue and Stout Street.

The adequacy of the collection system was reviewed in the 1977 Facility Plan. It was found that approximately 3 blocks of the "Southern Pacific Railroad" sewer were in need of replacement. Also, it was projected that a parallel relief sewer would be necessary to supplement the flow carrying capacity of the 12-inch trunk sewer for peak flows exceeding 1.35 mgd. Because projected flows have decreased; the need for this project during the next 20 years should be re-evaluated. Other collection system projects planned for the future consist of extensions to serve previously unsewered areas.

A 12-inch sewer main and pump station is being installed in Watermelon Road to serve the new Panda Generating Facility and future development.

Existing Treatment System. The current plant was rebuilt after the 1993 flood. Flooding along the Gila River encroached on the WWTP and the plant was damaged. The plant was rebuilt and the lagoon's berms were raised to an elevation of 668 feet, above the Painted Rock Dam spillway elevation. The existing 0.13 mgd facility consists of three facultative lagoons. Two of the lagoons are equipped with three, 5 horsepower aerators and are operated in parallel, accepting raw sewage from a splitter box. The two lagoons discharge into a third lagoon, which acts as a settling pond and overflows into a ditch that eventually discharges into the Gila River.

The Gila Bend WWTP is currently producing an effluent with high BOD5 and TSS. The effluent is discharged to the Gila River, via an open ditch. The effluent meets the old NPDES permit fecal coliform standards without disinfection. The new NPDES Permit has stricter NPDES fecal coliform standards, which can only be met by adding disinfection to the facility.

<u>Future Wastewater System</u>. Plans and Specifications were approved by the County for the modifications to the wastewater treatment plant approximately June 2000. Construction costs still need to be negotiated. Improvements to the existing facility will consist of additional aerators to provide improved BOD_5 and suspended solid concentrations in the lagoon effluent and increase capacity to 700,000 gpd. Current flows average 0.135 mgd. Over the next 20 years, the Town's service area population is expected to increase to 5,624. Assuming flows of 125 gpd/person, which would include a reserve for commercial and industrial growth, the WWTP would need to handle a flow of 700,000 gpd. Proposed modifications to the system include piping so the lagoons can operate in series to improve treatment performance. Other modifications include allowing a lagoon to be taken out of service to remove sludge and adding new headworks to provide improved screening and flow control by the operator for disinfection. Effluent from the second lagoon will be polished in the constructed wetlands, which will provide water quality improvement in various ways including filtration and adsorption, plant uptake, oxygen transfer to root zones of the plants, microbial activity, and the control of algal growth by limiting light penetration into the effluent. A pond doctor will be installed to reduce solid production.

The berms of the lagoon below the soil cement treatment need to be repaired. This upgrade should meet or exceed proposed NPDES permit requirements and provide the Town with a facility that should meet sewage treatment requirements for the next 20 years. Upgrading the facility will also enhance environmental resources by providing a wetland habitat for native species.

<u>Summary of Proposed Wastewater System Improvements</u>

Item	Estimated Cost
WWTP Upgrades	$1,000,000

4.2.7.2 Wickenburg

Wastewater collection and treatment service is provided by the Town of Wickenburg to portions of the incorporated Town, which corresponds to Regional Analysis Zone (RAZ) 201. The Town of Wickenburg is the designated wastewater management agency for this area. Much of the planning area is currently undeveloped. A master plan was prepared in 1977 for extension of trunk sewers to new areas as they develop. In addition, a substantial portion of developed area, including much of the lower density residential areas in rocky terrain, are unsewered. The homes in these areas are served by onsite septic tanks. Sewer system master plan updates completed in 1985 and 2000 indicate that the extension of the collection system to such areas is unlikely unless the septic systems begin to fail. Figure 4.25 depicts the Wickenburg planning area and current service area.

Population and Flow Projections. Wickenburg is projected to continue to grow at a moderate pace. As noted above, it is likely that a significant portion of the population will not be served by the collection system. Currently, most flow is from residences with some flow contributed by commercial and light industrial sources. Table 4.45 presents current MAG population projections for Wickenburg as well as projections of the population to be served by the wastewater system and the resulting wastewater flows, as provided by the Town. The projections are based on the assumption that approximately 95 percent of future population growth will be served by the wastewater system.

For planning purposes, this study estimates per capita flow at 100 gpcd.

Table 4.45 Wickenburg Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Planning Area Population	Estimated Population Served	Projected Flow (mgd)
2000	8,495	5,030	0.50
2005	8,967	5,478	0.55
2010	9,516	6,000	0.60
2015	10,070	6,525	0.65
2020	10,582	7,011	0.70

If the Town decides to expand service to additional developed areas, or if water-intensive commercial/industrial development occurs, wastewater flows would increase beyond the figures presented in Table 4.47. If the entire Town were served, projected flow would reach 1.06 mgd by year 2020.

Existing Collection System. The Wickenburg collection system serves the developed core of the community. Several sewer projects have been completed to improve and expand the collection system. These include extending service in 1986 to the relatively small area of Wickenburg lying east of the Hassayampa River, as well as adding a small area north of

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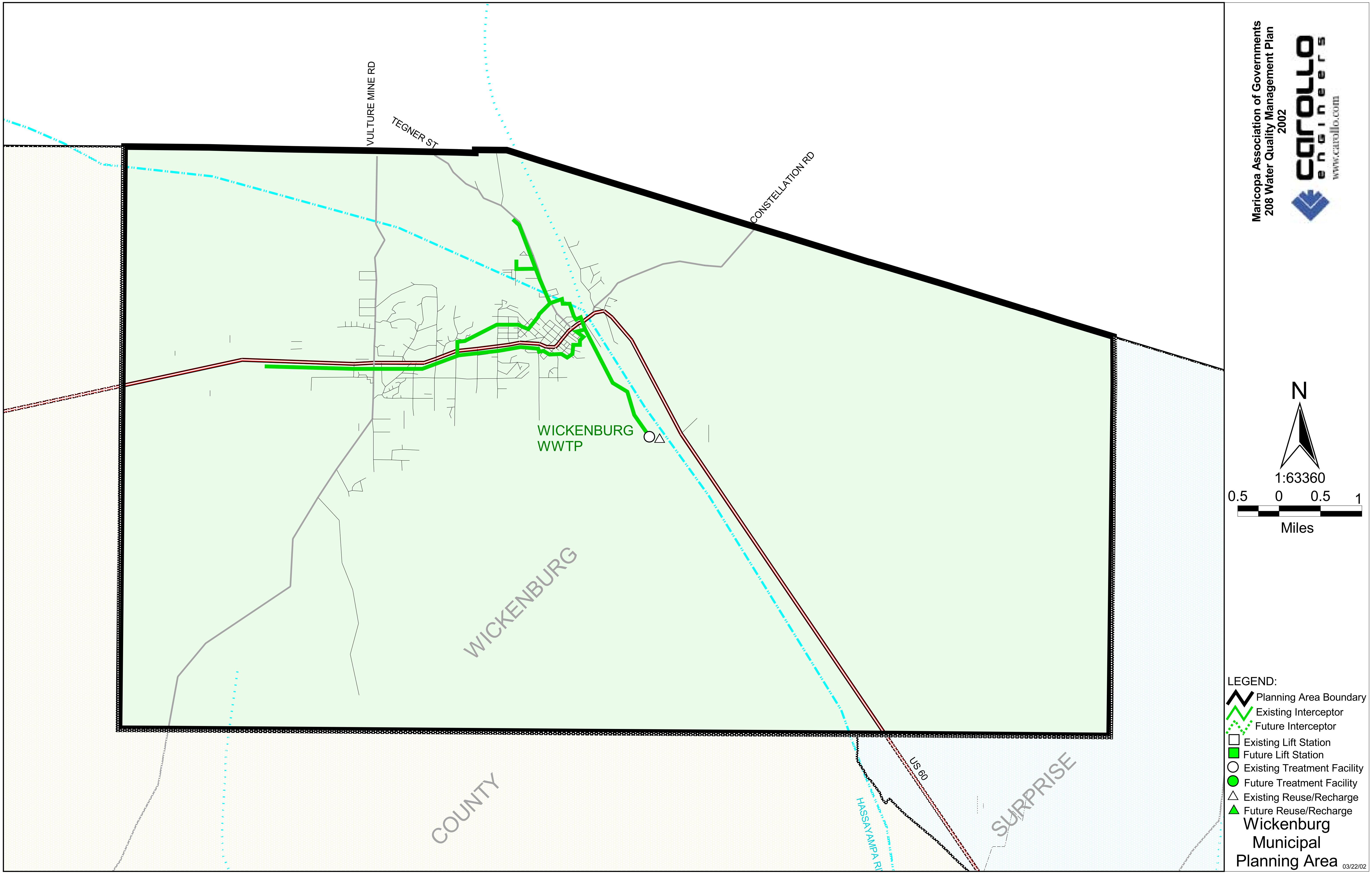
Maricopa Association of Governments
208 Water Quality Management Plan
2002
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VULTURE MINE RD
TEGNER ST
CONSTELLATION RD
WICKENBURG
WWTP
WICKENBURG
COUNTY
SURPRISE
US 60
HASSAYAMPA RI
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Miles
LEGEND:
Planning Area Boundary
Existing Interceptor
Future Interceptor
Existing Lift Station
Future Lift Station
Existing Treatment Facility
Future Treatment Facility
Existing Reuse/Recharge
Future Reuse/Recharge
Wickenburg
Municipal
Planning Area
03/22/02
FIGURE 4.25

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Sols Wash. In 1987, sewer service was extended approximately one mile north along U.S. Highway 89. The Casandro Wash interceptor was constructed to relieve an overloaded sewer serving the western area. Sewer service was extended to new subdivisions west of Vulture Mine Road in 1998, and west to serve the Airport Industrial Park in 2000.

Existing Treatment Facilities. The existing wastewater treatment plant was placed into service in April 1980, with an average flow capacity of 0.8 mgd. Current average flow to the plant is approximately 0.4 mgd. The original plant included: a manual bar screen, aerated grit chamber, comminutor, two extended aeration activated sludge basins equipped with surface aerators, two secondary clarifiers, and effluent chlorination facilities. Improvements to the facility were completed in 1997 to comply with Aquifer Protection Permit requirements. These included the addition of anoxic basins for nitrogen removal, installation of UV disinfection, and lining the existing sludge drying beds.

The Town holds an NPDES permit for effluent discharge to the Hassayampa River. However, effluent is typically disposed of through infiltration basins located in a wash upstream from the river. A final Aquifer Protection Permit has been issued for the facility.

Sludge is withdrawn from the secondary clarifiers and aerobically digested. Residual solids are dewatered using drying beds. The digested, dewatered solids are disposed of in the Northwest Regional Landfill.

Future Wastewater System Development. The existing treatment facility is currently loaded at approximately one-half of its design capacity. Based on flow projections alone, the existing Wickenburg treatment plant's capacity is adequate to meet the needs of the Town through year 2010. However, the existing plant has no redundancy in the major treatment components. Therefore, the Town is planning to proceed with the plant expansion, as detailed in the October 2000 Wastewater Master Plan. The expansion will include primary clarifier, secondary clarifier, anoxic tanks, and an aerobic digester. If a reuse project is undertaken or discharge standards become more stringent, treatment process improvements may also become necessary.

Additional treatment capacity may be necessary if there is water-intensive commercial/ industrial development, or if the collection system is expanded to serve developed but unsewered areas. The latter is not expected unless septic tank failures begin to occur.

Future plans for development of the collection system include sewer extension to Remuda Ranch; modifications to the east side lift station; a new Weaver Street sewer and lift station; a Vulture Mine Road interceptor; a Flying “E” Wash sewer; a collector sewer along Sabin Brown Road at the Airport Industrial Park; a new sewer to serve the high school; the Whipple Court sewer; a lift station and force main to serve the AmericInn; and upsizing a segment of the treatment plant outfall sewer. Master planning has been performed for trunk sewers for the entire potential service area. As long as the outlying areas' population densities remain low, it is unlikely that they will be provided sewer service.

Summary of Proposed Wastewater System Improvements

Item	Estimated Cost[1]
Sewer Extension to Remuda Ranch	$80,700
Modify East Side Lift Station	100,800
Weaver St. Sewer and Lift Station	67,000
Vulture Mine Road Interceptor	910,700
Flying “E” Wash Sewer	573,600
Airport Industrial Park-Collector Sewer	93,800
New High School Sewer	71,600
Whipple Court Sewer	34,800
AmericInn Sewer	140,500
Outfall Sewer to Plant	786,100
WWTP Expansion to 1.2 mgd-Design & Construction	1,613,200
Total	$4,472,800

[1]Costs obtained from the “Town of Wickenburg Wastewater Master Plan”, October 2000.

4.2.7.3 *Gila River Indian Community*

The Gila River Indian Community (GRIC) includes areas in both Maricopa and Pinal Counties. The GRIC is a member of the Maricopa Association of Governments. However, this community prepared a 208 Plan covering the entire GRIC reservation, which was approved by EPA in 1982. The GRIC is the designated wastewater management agency for this area. Because the GRIC has established its own 208 Plan, it shall not be included as part of the Maricopa Association of Governments 208 Plan. This discussion is presented for reference only.

Population Projections. The projected future population of the portion of the GRIC within Maricopa County, corresponding to RAZ 324, is presented in Table 4.46, based on adopted MAG population projections.

Table 4.46 Gila River Indian Community Population Projections MAG 208 Water Quality Management Plan Update

Year	Population
2000	2,708
2005	2,764
2010	2,832
2015	2,919
2020	3,101

Wastewater System Development. The selected plan for wastewater treatment at the GRIC falls under the jurisdiction of the GRIC 208 Plan.

The GRIC has an agreement with the City of Chandler (through 2017) to receive effluent from the Lone Butte WWTP for agricultural reuse.

GRIC operates two casinos which include WWTPs. The WWTPs are as follows:

Location	Capacity	Treatment System	Effluent Disposal	Notes
Vee Quiva (St. Johns)	100,000 gpd	Aerated Lagoon	Evaporation	
Wild Horse Pass	--	--	--	Treatment at Lone Butte WWTP

GRIC is presently constructing the filtration and disinfection portions of a 2 mgd (10 mgd ultimate) Wild Horse Pass WRP (activated sludge, BNR, with filtration and UV disinfection) with effluent disposal by turf irrigation (golf course) or agricultural reuse. Initially, this facility will provide "polishing" of effluent from the Lone Butte WWTP for irrigation reuse. Figure 4.26 shows the current and future WWTP facilities that have been identified.

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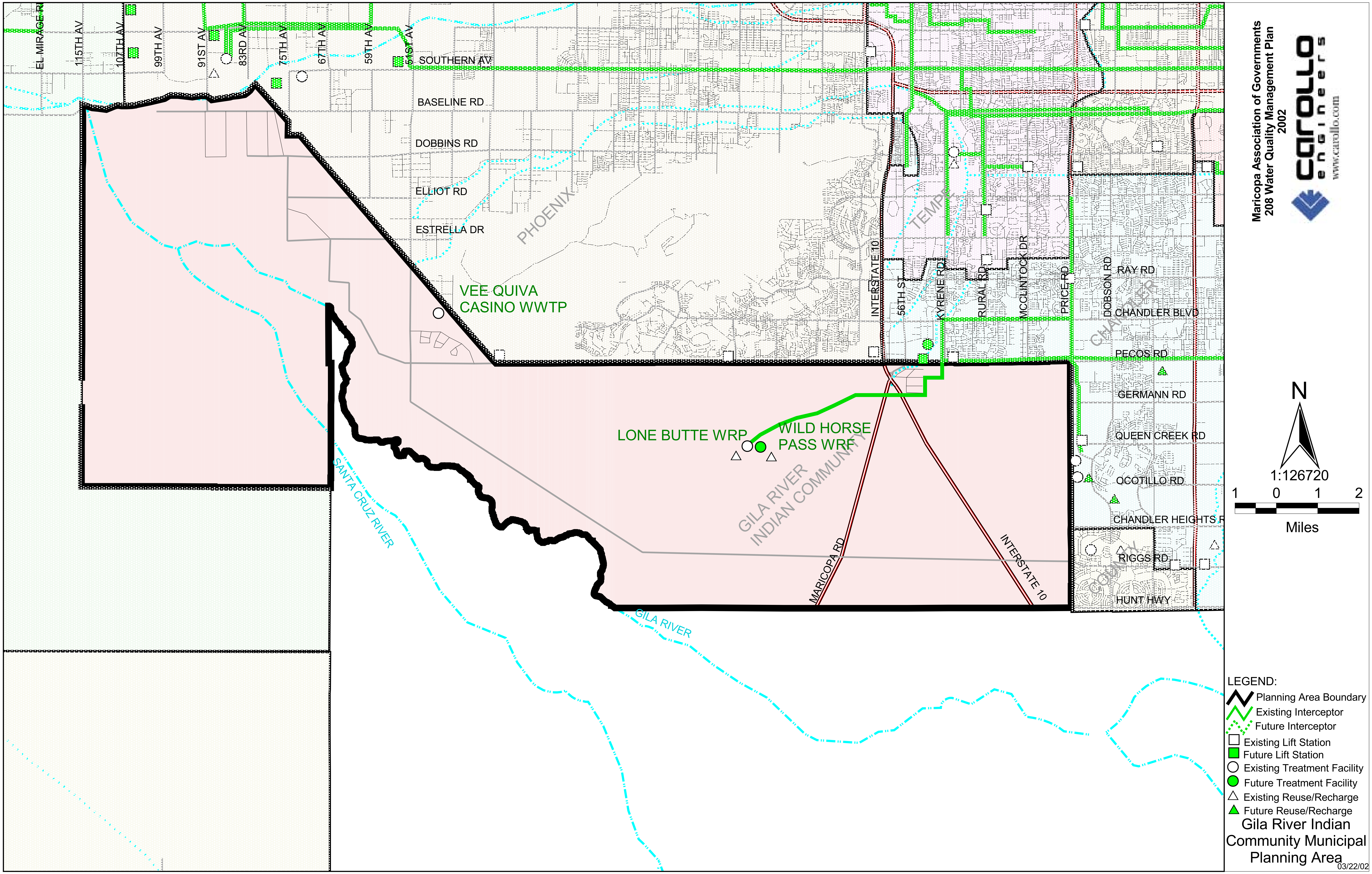
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EL MIRAGE RD
115TH AV
107TH AV
99TH AV
91ST AV
83RD AV
75TH AV
67TH AV
59TH AV
51ST AV
SOUTHERN AV
BASELINE RD
DOBBINS RD
ELLIOT RD
ESTRELLA DR
PHOENIX
TEMPE
VEE QUIVA
CASINO WWTP
INTERSTATE 10
56TH ST
KYRENE RD
RURAL RD
MCCLINTOCK DR
PRICE RD
DOBSON RD
RAY RD
CHANDLER BLVD
CHANDLER
PECOS RD
GERMANN RD
QUEEN CREEK RD
OCOTILLO RD
CHANDLER HEIGHTS RD
RIGGS RD
HUNT HWY
COUNTY
LONE BUTTE WRP
WILD HORSE
PASS WRF
GILA RIVER
INDIAN COMMUNITY
MARICOPA RD
INTERSTATE 10
SANTA CRUZ RIVER
GILA RIVER
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Miles
LEGEND:
Planning Area Boundary
Existing Interceptor
Future Interceptor
Existing Lift Station
Future Lift Station
Existing Treatment Facility
Future Treatment Facility
Existing Reuse/Recharge
Future Reuse/Recharge
Gila River Indian
Community Municipal
Planning Area
03/22/02

FIGURE 4.26

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4.2.7.4 Salt River Pima-Maricopa Indian Community

The Salt River Pima-Maricopa Indian Community (SRPMIC) is a member of the Maricopa Association of Governments. SRPMIC is the designated wastewater management agency for this area and is responsible fully for planning and development of wastewater systems. The SRPMIC Planning Area covers approximately 82 square miles and is depicted on Figure 4.27. It is generally bounded on the south by the Salt River, on the west by Pima Road, and on the north by Double Tree Ranch Road alignment and the Ft. McDowell Mohave-Apache Indian Community.

Population and Flow Projections. The projected future population of the SRPMIC corresponds to MAG Regional Analysis Zone (RAZ) 264. Table 4.47 shows population forecast through the year 2020. Wastewater generation as estimated in the 1997 Master Plan is 4.95 mgd at build-out (estimated year 2040), with 3.85 mgd from commercial/ industrial development.

Table 4.47 Salt River Pima-Maricopa Indian Community Population Projections MAG 208 Water Quality Management Plan Update

Year	Population	Alternate Population Projection*
2000	6,851	7,863
2005	6,975	
2010	7,024	11,900
2015	7,162	
2020	7,467	17,650

*Spoonhunter projections (Ref. SRPMIC Community Water Master Plan, August 2000).

Existing Wastewater Collection and Treatment. SRPMIC has a major interceptor sewer (full pipe capacity approximately 23 mgd) constructed along the Pima Road corridor to service current and projected development in the corridor. A lift station and force main delivers wastewater across the Salt River to the City of Mesa Northwest Water Reclamation Plant (NWWRP).

The SRPMIC has an agreement with the City of Mesa for treatment of up to 6 mgd of wastewater in the Mesa NWWRP. In exchange for treatment, the City of Mesa is allowed to utilize recharge basins on SRPMIC lands on the north side of the Salt River.

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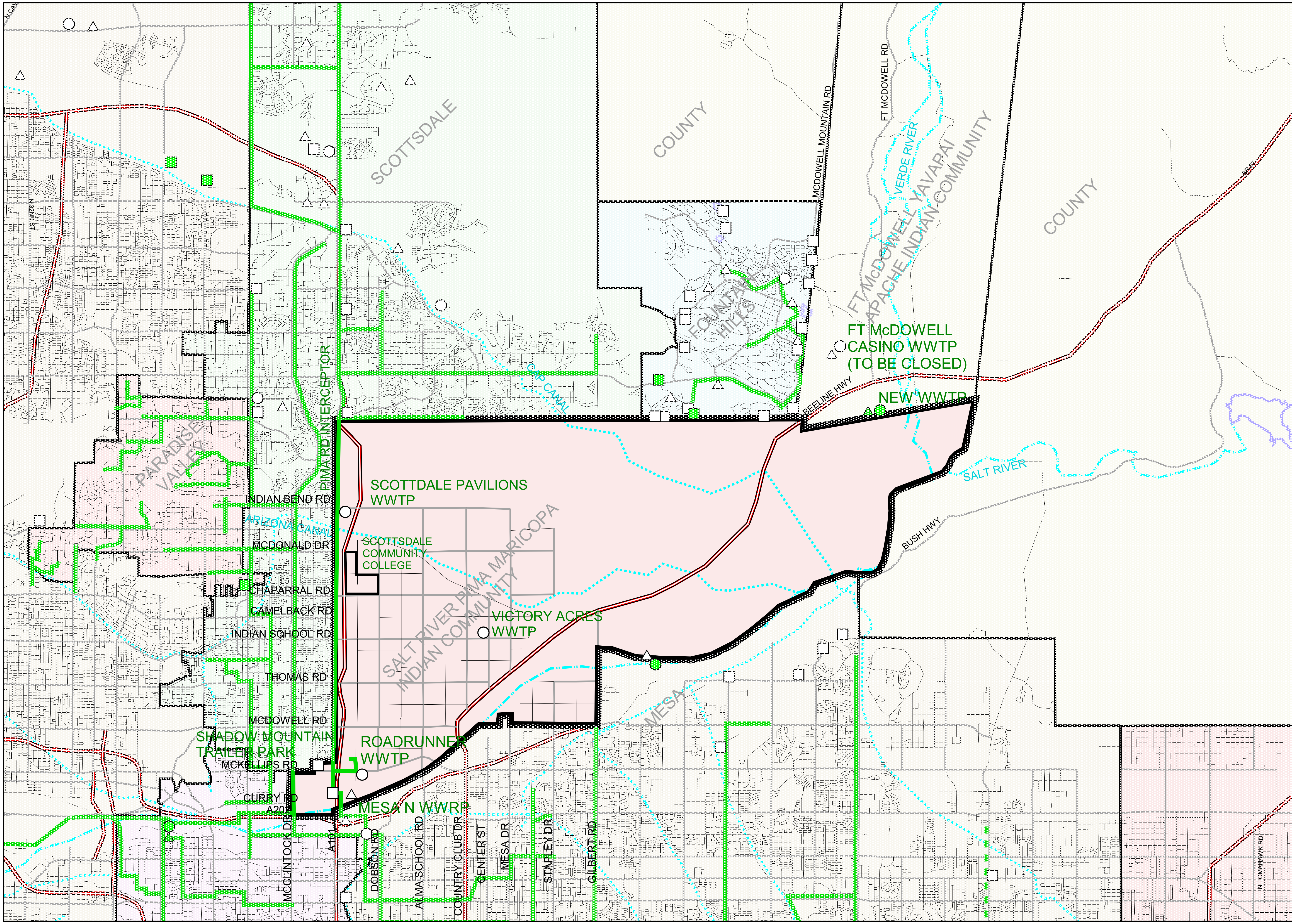

Maricopa Association of Governments
208 Water Quality Management Plan
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LEGEND:
Planning Area Boundary
Existing Interceptor
Future Interceptor
Existing Lift Station
Future Lift Station
Existing Treatment Facility
Future Treatment Facility
Existing Reuse/Recharge
Future Reuse/Recharge

Salt River Pima Maricopa Indian Community Municipal Planning Area

03/22/02

FIGURE 4.27

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SRPMIC operates two small wastewater treatment plants as follows:

Name/Location	Capacity	Treatment System	Effluent Disposal
Roadrunner WWTP (McKellips and 92nd St.)	100,000 gal/day	Oxidation Ditch, UV Disinfection	Evaporation/Percolation
Victory Acres WWTP Indian School Rd. and Center St.	400,000 gal/day	Facultative Lagoons	Evaporation/Percolation

The remainder of wastewater treatment is provided by septic tanks and leaching field.

The Scottsdale Community College and the Shadow Mountain Trailer Park are currently connected to the City of Scottsdale sewer system.

Future Wastewater System Development. The Pavilions development currently utilizes a small package wastewater treatment plant (capacity of 120,000 gpd). In the future, this facility will be retired and the Pavilions will be connected into the Pima Road Interceptor. Similarly, the Roadrunner WWTP may be retired and sewers connected to the Pima Road Interceptor. A sewer on Indian School Road is also planned to convey flows to the Pima Road Interceptor.

Summary of Proposed Improvements. The FY 2001 Capital Improvement Plan includes the following project:

Item	Estimated Cost[1]
Indian School Sewer Line	$3,000,000

[1] August 2000 costs (ENR Construction Cost Index - 6233).

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4.2.7.5 Fort McDowell Yavapai Nation

The Fort McDowell Community (Fort McDowell Yavapai Nation) is not currently a member of the Maricopa Association of Governments. The Community is responsible for planning and development of wastewater systems within its boundaries. The Fort McDowell Yavapai Nation covers approximately 40 square miles and straddles the Verde River from its boundary with the Salt River Pima-Maricopa Indian Community on the south to the northern boundary along Tonto National Forest as shown on Figure 4.28. The western boundary includes the Town of Fountain Hills and McDowell Mountain Regional Park. The eastern boundary is the Tonto National Forest.

Population and Flow Projections. The projected population of the Fort McDowell Community corresponds with MAG Regional Analysis Zone (RAZ) 251 Table 4.48 shows population forecast through the year 2020. Wastewater generation as estimated in the Facility Plan of August 1997 is 1.9 mgd at build-out.

Table 4.48 Fort McDowell Yavapai Nation
MAG 208 Water Quality Management Plan Update

Year	Population
2000	750
2005	838
2010	944
2015	1,097
2020	1,174

Existing Wastewater Collection and Treatment. The Fort McDowell Yavapai Nation currently operates a 60,000 gpd wastewater treatment plant that serves the Fort McDowell Casino. The remainder of the Community is served by septic tanks.

Future Wastewater System Development. The Fort McDowell Yavapai Nation is currently (January 2001) beginning construction of a 238,000 gpd wastewater treatment plant on a site south of the Beeline Highway. A gravity sewer system from housing and commercial developments is also being constructed. The Fort McDowell Casino WWTP will be closed when the sewer connection and new WWTP is operational. The new WWTP will be a sequential batch reactor with effluent filters and UV disinfection. Effluent will be reused to irrigate a new golf course or recharged. Solids are to be aerobically digested, dewatered, and sent to landfill for disposal. The plant is planned for modular expansion as flows increase.

Summary of Proposed Improvements

Item	Estimated Cost[1]
WWTP and collection system	$10,000,000

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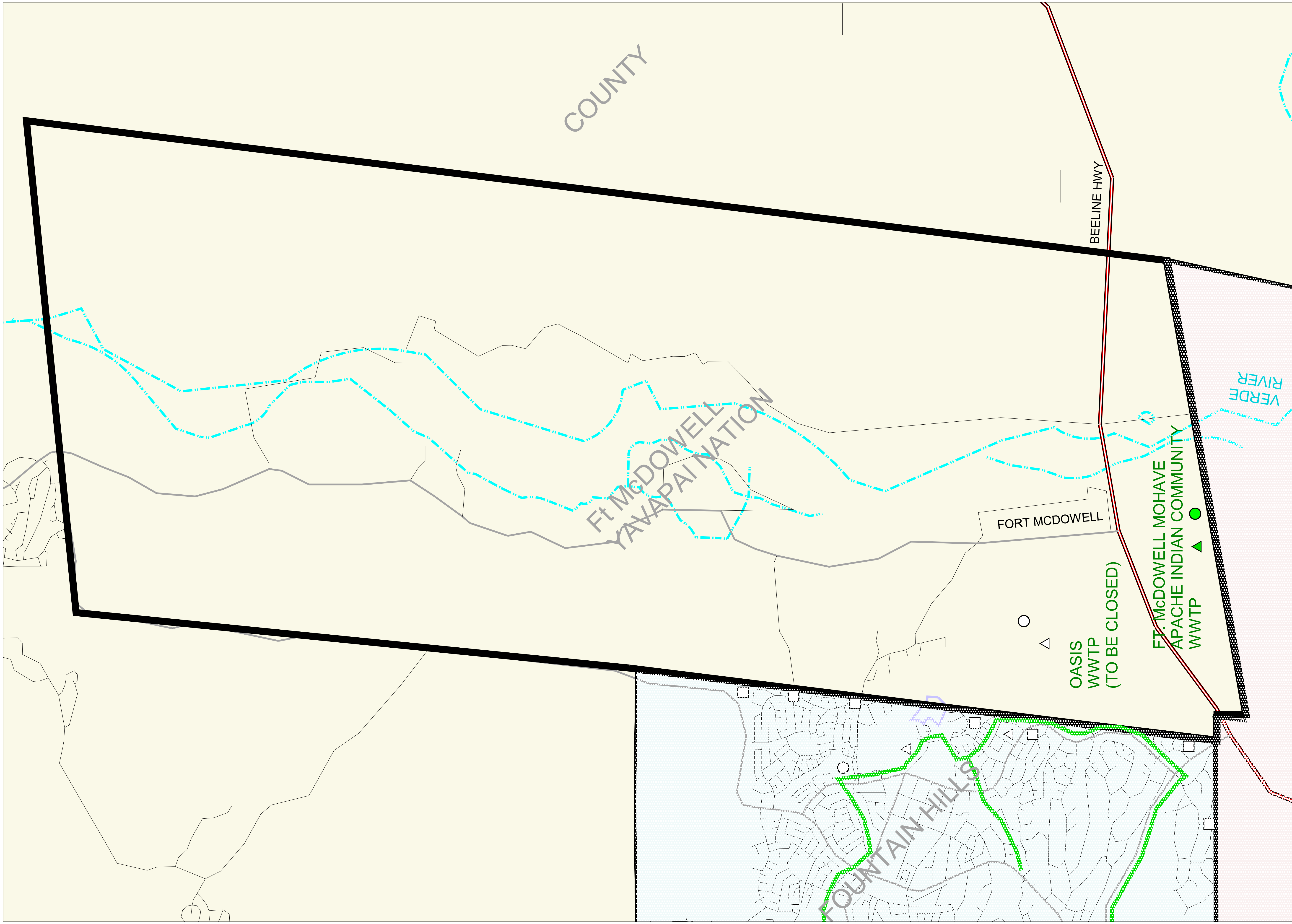

Maricopa Association of Governments
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LEGEND:

- Planning Area Boundary
- Existing Interceptor
- Future Interceptor
- Existing Lift Station
- Future Lift Station
- Existing Treatment Facility
- Future Treatment Facility
- Existing Reuse/Recharge
- Future Reuse/Recharge

Ft McDowell Yavapai Nation Municipal Planning Area

03/22/02

FIGURE 4.28

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4.2.7.6 Unincorporated Communities

Much of the land area of Maricopa County is not designated within other agencies' planning areas. This area corresponds to the bulk of the unincorporated areas in the County with the exception of Indian Communities, areas enclosed within municipal strip-annexations and some other areas at the periphery of municipalities that have developed plans to serve those areas.

Existing or approved master-planned developments in unincorporated areas of the County are the following:

- Anthem
- Belmont
- Lakeland Village
- Mountainwood
- Rio Verde, Tonto Vista, and Tonto Verde.
- Sun City and Sun City West
- Sun Lakes
- Wigwam Creek

Wastewater from Sun City is treated by the Tolleson WWTP, as described in Point Source Plan Element for Tolleson. Wastewater plans for the remainder of the communities listed above are described below, based on information provided by the Maricopa County Planning & Development Department. Figure 4.29 shows the entire Maricopa County and Figure 4.30 identifies the location of master-planned developments that have, or are expected to develop, wastewater treatment facilities.

Population and Flow Projections. Projected populations for year 2020 and corresponding wastewater flow for each approved master planned community are summarized in Table 4.49. A unit wastewater flow of 100 gallons per capita per day (gcd) is used for flow projections, with the exception of Rio Verde. Rio Verde flow projections were based upon Rio Verde planning studies.

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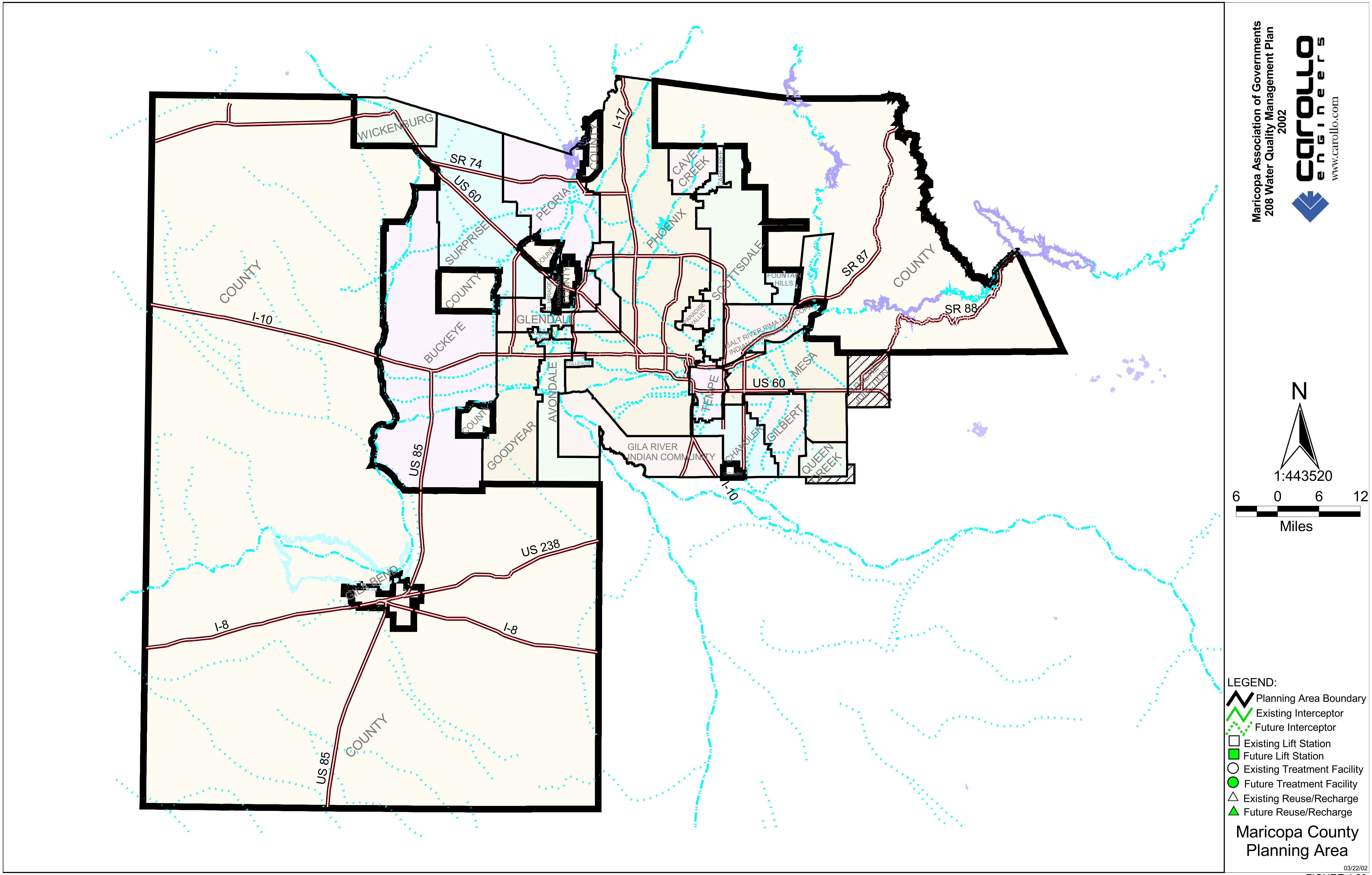

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FIGURE 4.29

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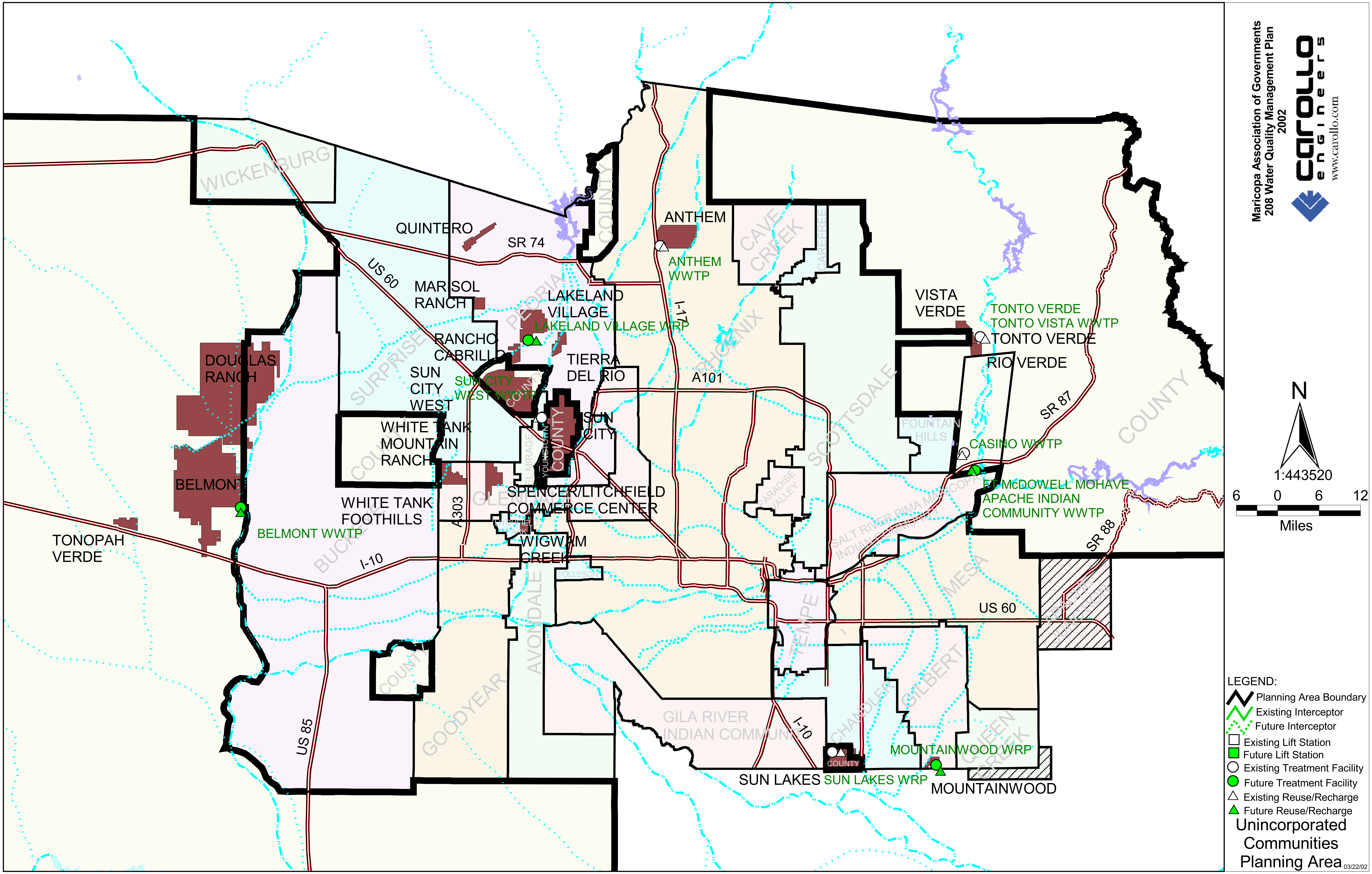
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ANTHEM WWTP
CAVE CREEK
CAREFREE
US 60
MARISOL RANCH
PEORIA
LAKELAND VILLAGE
LAKELAND VILLAGE WRP
I-17
PHOENIX
VISTA VERDE
TONTO VERDE
TONTO VISTA WWTP
TONTO VERDE
RIO VERDE
RANCHO CABRILLO
TIERRA DEL RIO
DOUGLAS RANCH
SURPRISE
SUN CITY WEST
SUN CITY WEST WWTP
A101
SCOTTSDALE
SR 87
COUNTY
WHITE TANK MOUNTAIN RANCH
SUN CITY
YOUNGTOWN
EL MIRAGE
FOUNTAIN HILLS
CASINO WWTP
BELMONT
SPENCER/LITCHFIELD COMMERCE CENTER
PARADISE VALLEY
FT. McDOWELL MOHAVE APACHE INDIAN COMMUNITY WWTP
SALT RIVER PIMA MARICOPA INDIAN COMMUNITY
WHITE TANK FOOTHILLS
A303
GLENDALE
BELMONT WWTP
TONOPAH VERDE
BUCKEYE
WIGWAM CREEK
I-10
TOLLESON
SR 88
MESA
AVONDALE
US 60
TEMPE
GOODYEAR
GILBERT
GILA RIVER INDIAN COMMUNITY
CHANDLER
I-10
QUEEN CREEK
US 85
MOUNTAINWOOD WRP
SUN LAKES
SUN LAKES WRP
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LEGEND:
Planning Area Boundary
Existing Interceptor
Future Interceptor
Existing Lift Station
Future Lift Station
Existing Treatment Facility
Future Treatment Facility
Existing Reuse/Recharge
Future Reuse/Recharge
Unincorporated Communities Planning Area
03/22/02
FIGURE 4.30

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Table 4.49 Maricopa County Master-Planned Developments Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Community	Projected Year 2020 Population	Projected Year 2020 Flow mgd
Anthem	40,000	4.00
Belmont	37,000[1]	3.70
Lakeland Village	24,800	2.48
Mountainwood	3,693	0.37
Rio Verde Area	7,924	0.79
Sun City West	33,000	3.30
Sun Lakes	16,849	1.70
Wigwam Creek	20,000	2.00
Total	183,609	18.41

[1] Ultimate projected population is 150,964, projected for year 2040. Belmont has not been active in development to date (November 2000).

Note: These population figures may exceed the MAG population projections for the regional analysis zones in the Maricopa County unincorporated area in which the developments are located. The MAG population projections were adopted by the MAG Regional Council in 1997. In preparing these projections, MAG noted that the projections are interim and subject to various conditions, including the following:

1. The methodology for preparing these projections is based on a model developed in 1989 and does not reflect recent changes in economic conditions.
2. These projections should be used with caution. They are subject to fluctuation as a result of recent changes in economic conditions.

Wastewater System Development

Anthem. Anthem is a master-planned development of 5,860 acres approved in 1999. It is located two miles north of the Carefree Highway on the east side of Interstate 17. Build-out is expected in 2015 with 15,025 dwelling units and a population of 40,000.

A single wastewater treatment facility with an initial capacity of 0.5 mgd has been constructed along with a collection and interceptor sewer system for the current development phase. Expansion to an ultimate capacity of 4.5 mgd is planned to occur with modular units phased in accordance with growth. The treatment system is a membrane system providing tertiary treatment. The effluent is reused for landscape irrigation and maintaining water in lakes. As the phases are developed, excess effluent will be used for groundwater recharge. If flows exceed reuse and recharge capacity, discharge will be to an ephemeral reach of New River or Deadman Wash, which is tributary to New River. An NPDES permit will be required for this type of discharge. Solids are currently dewatered and disposed at an approved landfill.

Arizona American Water Co. is the owner/operator of the wastewater system and holds APP, Reclaimed Water Permit.

Belmont. Belmont is a master-planned community of 20,805 acres to be located approximately 40 miles west of downtown Phoenix. The development will be constructed in five phases over a 50-year period. Originally planned in the early 1990's, Belmont has not yet begun development. It is possible that Phases I and II could occur during the MAG 208 planning period.

Under this assumption, Phase I would occur by year 2010, consisting of collection system, interceptor sewers, and a temporary wastewater treatment plant near 306th Avenue and Bethany Home Road. Treatment would be to tertiary standards with effluent to be reused for landscape irrigation. Phase II development would occur from year 2010 to year 2020 and consist of extensions of the collection system and interceptor sewers, addition of a lift station and force main, and the initial stages of a 4.5 mgd treatment facility. The treatment facility would provide tertiary treatment with effluent reused on landscape and golf course irrigation.

All effluent is expected to be reused for irrigation of golf courses and landscaping. If flows are to be discharged to stream or wash, an NPDES permit will be required. It is planned that sludge be dewatered with a sludge press and deposited at the Hassayampa Landfill during the early phases of the development, and deposited at the Southwest Regional Landfill in later phases. Agricultural reuse of sludge has also been proposed in the wastewater plan. No permits have yet been applied for.

Lakeland Village. Lakeland Village is a 3,126 acre master-planned community located on the north by Lone Mountain Road alignment, on the south by Jomax Road alignment, on the east by 113th Avenue alignment, and by 131st Avenue alignment on the west. At the end of phase 3 development in years 2007 to 2012, a build-out population of 24,800 people is anticipated.

A wastewater treatment facility of 2.9 mgd is planned to be constructed in phases matching rate of development. The development may form a sewer service district and facility operation may be contracted. Treatment processes have not yet been identified. No permits have yet been applied for.

Mountainwood. Mountainwood is a master-planned community of 535 acres approved for development to occur. It is located as follows: On the north by Riggs Road; on the south by Hunt Highway and Gila River Indian Community: on the west by the Maricopa County Floodway and Roosevelt Conservation District Canal; and on the east by the alignment of 164th Street. Development is planned in three phases for a total of 1,478 dwelling units and 3,693 population.

Wastewater service is being planned with the Town of Gilbert, but treatment could be consolidated with other adjacent developments or by way of a self-contained package plant. Collection systems for each phase and interceptor sewers, lift stations and force mains are planned to connect to the selected wastewater treatment plant option. APP and Reclaimed Water Permits have not been applied for.

Rio Verde Utilities. Rio Verde Utilities provides wastewater collection and treatment services for Rio Verde, Tonto Vista, and Tonto Verde developments. All wastewater is treated at the Rio Verde WWTP located near the southeast corner of Rio Verde. The current treatment capacity is 300,000 gpd. Secondary treatment is accomplished by an oxidation ditch, followed by tertiary treatment by sand filtration. Effluent is reused for golf course irrigation. Sludge is dewatered and landfilled. As the population increases, treatment capacity will be added in 150,000 gpd increments. Effluent will be distributed for reuse on new and existing golf courses. The ultimate wastewater treatment capacity will be 0.9 mgd. Rio Verde Utilities is holder of APP and Reclaimed Water Permits.

Sun City West. Wastewater collection and treatment for Sun City West are provided by the Arizona American Water Co. The Phase I treatment facility has a capacity of 2.14 mgd. The site is sized for an ultimate treatment plant capacity up to 6.44 mgd. The existing WWTP consists of a headworks, primary clarifiers, trickling filters, and secondary clarifiers. Sludge is digested and disposed of by a land application operation by Arizona American Water Co. With Arizona American Water Co. next expansion solids will be dried and hauled off site by a licensed contractor. Effluent is disposed of in spreading basins. If future expansions exceed recharge basin capacity, discharge will be to an adjacent ephemeral reach of the Agua Fria River. An NPDES permit will be required for this type of discharge.

Sun Lakes. Wastewater collection and treatment for Sun Lakes is provided by Pima Utilities Company. The treatment process is a sequential batch reactor system with a capacity of 2.4 mgd. Effluent is filtered and UV disinfected suitable for groundwater injection. Effluent is reused throughout the development in decorative lakes, golf course irrigation, or groundwater injection. Solids are aerobically digested, dewatered by centrifuge and disposed of in landfill. Pima Utilities is holder of APP and Reclaimed Water Permits.

Wigwam Creek. Wigwam Creek is an 846 acre single-family development of 3,421 to 4,257 dwelling units, initially approved for development in 1989. The Phase I portion is defined by Dysart Road on the west, Gun Club and El Mirage Road on the east, Indian School Road on the south and Camelback Road on the north. Phase II is the area north of Camelback Road to 1,200 feet north of Bethany Home Road, El Mirage Road on the east, to 1/2 mile of the west boundary.

Sewer service is to be provided by the Litchfield Park Service Company. Capacity of 2.4 mgd at build-out is anticipated

Other Facilities

Table 4.50 summarizes additional small wastewater treatment facilities in unincorporated areas of Maricopa County.

Table 4.50 Maricopa County Small Wastewater Treatment Facilities MAG 208 Water Quality Management Plan Update			
Facility Name & Location	**Design Capacity, gpd**	**Process**	**Disposal**
Arizona Rendering, Laveen	-	Lagoon	Percolation
Arizona Nuclear Power Project	60,000	Activated sludge	-
	150,000,000	Physical-chemical	Cooling
ADOT-Sentinel Rest Area Eastbound	-		-
ADOT-Sentinel Rest Area Westbound	-		-
Canyon Lake Marina	18,000	Activated sludge	NPDES
Gila Compressor Station, Arlington	-		-
Salt-Gila Pumping Station	3,800	Activated sludge	Percolation
Palo Verde Mobile Home Park, Tonopah	200,000	Activated sludge	Percolation
Pioneer RV Park – Pioneer Road	35,000	Activated sludge	Percolation
Rip Griffin Truck Stop	80,000	Activated sludge	Percolation
Ruth Fisher School – Tonopah	15,000	Activated sludge	Irrigation
St. John's Mission – Laveen	-	-	-
Tortilla Flat Campground – U.S. Forest Service	10,000	Activated sludge	Irrigation
Tortilla Flat Resort – Tortilla Flat	5,000	Activated sludge	Mound System

Wastewater System Costs. Table 4.51 summarizes the estimated costs associated with wastewater system development in Maricopa County. The costs presented are based upon costs of $6 per gpd for capacities less than 3 mgd and $5 per gpd for capacities greater than or equal to 3 mgd.

Table 4.51 Maricopa County Master-Planned Developments Estimated Wastewater System Cost (Expansion through Year 2020) MAG 208 Water Quality Management Plan Update		
Development	**Treatment Capacity mgd**	**Cost[1]**
Anthem	3.5	17.5
Belmont	3.7	18.5
Lakeland Village	2.9	17.4
Mountainwood	0.37	2.2
Rio Verde Utilities	0.79	4.7
Sun City West	1.16	7.0
Sun Lakes	0.0	0.0
Wigwam Creek	2.4	14.4
Total	14.82	$81.70
[1]August 2000 Dollars (ENR Construction Cost Index = 6000)		

4.3 MODIFICATIONS TO THE MAG 208 PLAN

The MAG 208 Plan is subject to change in accordance with these established procedures:

- Periodic Major Revision of the 208 Plan.
- 208 Plan Amendment Process.
- Small Plant Review and Approval Process.

Each of these procedures have been utilized multiple times since the original plan was developed.

4.3.1 Periodic Major Revision of the MAG 208 Plan

The MAG 208 Water Quality Management Plan is periodically updated in accordance with provisions of Section 208 of the Federal Clean Water Act. These updates to the original 208 Plan (July 1979) have been occurring on an approximate 10 year cycle (1982, 1993, and the current update to be completed in 2001/02).

4.3.2 Interim Revision of the MAG 208 Plan

Modifications to the MAG 208 Plan are incorporated in each update. Two procedures exist to modify the approved 208 Plan between revision cycles:

- 208 Amendment
- Small Plant Review and Approval Process

Each of these procedures is defined in detail in the following sections.

4.4 MAG 208 PLAN AMENDMENT REQUIREMENTS

Plants greater than 2.0 million gallons per day and those with a discharge requiring an NPDES permit or AZPDES permit which are not specifically identified in the MAG 208 Plan would be required to go through a formal 208 analysis or amendment.

For plants required to go through a formal 208 analysis and amendment, the jurisdiction (MAG member agency) in which the facility would be located initiates a request to include the new wastewater treatment plant in the 208 Plan. It is recommended that the jurisdiction making the request contact any adjacent community if the proposed development is within three miles of the boundary between the two communities.

According to federal regulations, public participation requirements are applicable for 208 Plan Amendments. The MAG Water Quality Advisory Committee reviews the draft 208 Plan amendment and then authorizes a public hearing to be conducted. The hearing must be advertised 45 days in advance and the document must be available for public review 30 days prior to the hearing. A hearing notice is also sent to interested parties 30 days prior to the public hearing. The public hearing is conducted by MAG. A court reporter prepares an official transcript of the hearing. If written or verbal comments are received, a response to comments is prepared by the entity requesting the amendment.

The MAG Water Quality Advisory Committee reviews the response to comments and then makes a recommendation to the MAG Management Committee. The MAG Management Committee reviews the recommendation from the Water Quality Advisory Committee and then makes a recommendation to the MAG Regional Council. As the decision-making body of MAG, the Regional Council reviews the recommendation from the Management Committee and then takes official action to approve the 208 Plan amendment.

The State Water Quality Management Working Group reviews the 208 Plan amendment approved by the Regional Council and then makes a recommendation the Arizona Department of Environmental Quality (ADEQ). ADEQ submits the 208 Plan amendment to the U.S. Environmental Protection Agency (EPA) for approval and EPA approves the 208 Plan amendment and notifies the State of the approval action.

The Arizona Department of Environmental Quality maintains a 208 amendment checklist for use in preparing 208 Plan Amendments. Copies of the current checklist can be provided by ADEQ upon request.

4.5 SMALL PLANT REVIEW AND APPROVAL PROCESS

4.5.1 Introduction

In the 1982 MAG Point Source Plan Update an alternative to continue expansion of the 91st Avenue WWTP and other major treatment plants was the construction of small reclamation plants. Rather than amend the MAG 208 Plan to include every acceptable new small plant, the communities developed a small plant review and approval process.

Using this process, a small plant not specifically identified in the Point Source Plan can be approved as part of the 208 Plan if the plant goes through the approved Small Plant Review and Approval Process. By requiring proposed plants in the area to obtain approval using this formal process, an uncontrolled proliferation of small plants that could cause problems in the future should be prevented. The communities adopted a small plant process goal of allowing the Cities and Towns the maximum level of control in the approval of small plants. A Small Plants Technical Steering Committee was formed in 1982, composed of representatives from the cities, state, county, and homebuilders. This committee, in conjunction with consultants and MAG staff, developed the Small Plant Review and Approval Process.

4.5.1.1 Small Plant Definition

A small plant is a reclamation plant with an ultimate capacity of 2.0 mgd or less with no discharge requiring an National Pollutant Discharge Elimination System or Arizona Pollutant

Discharge Elimination System permit. Plants greater than 2.0 mgd and discharges requiring an National Pollutant Discharge Elimination System or Arizona Pollutant Discharge Elimination System permit which are not specifically identified in the MAG 208 Plan would be required to go through a formal 208 analysis and amendment.

Small plants that are specifically identified in the MAG 208 Plan are required to go through the Small Plant Review and Approval Process for an expansion of the facility, even when the expanded facility would still meet the small plant threshold of 2.0 mgd or less.

4.5.1.2 Municipal Small Plant Planning Area Boundaries

For the purposes of the 208 Plan, the Municipal Small Plant Planning Areas are the same as the MAG Municipal Planning Areas (MPAs). The 27 MPAs generally correspond to the jurisdictions for which they are named. Minimally, the planning area for each city or town includes all of its incorporated area plus portions of the County surrounded by strip annexation to allow municipalities to plan for those unincorporated areas.

4.5.1.3 Areas of Responsibility

Three areas of responsibility are defined. One is the Municipal Small Plant Planning Area. This is the area identified by the municipality within which the City or Town would have responsibility for the first review and approval of proposed wastewater facilities. The second area is the County Planning Area and within this area, the County would have the responsibility for deciding which wastewater facilities were constructed.

Between the two areas is a third area. This is the area in the County that is within three miles of a Municipal Small Plant Planning Area. Although this area is within the County's area of responsibility, the County must consider the comments of the nearby City or Town concerning proposed facilities in this three-mile area. Figure 4.31 schematically illustrates the relationship between the three areas of responsibility.

4.5.1.4 Review and Approval Process

In the process developed for a proposed facility within a Municipal Small Plant Planning Area, the City or Town would work with a developer to come up with a suitable small plant concept. When an acceptable concept has been worked out, the City would send a letter to MAG stating that the proposed small plant is in keeping with the City's wastewater plans for the area.

MAG would then review the proposal and send a letter to the Arizona Department of Environmental Quality (ADEQ) stating whether the small plant is compatible with the overall 208 Plan. The ADEQ has the legal authority to identify compliance with the 208 Plan. Therefore, the final 208 letter of compliance must come from ADEQ. This letter would go to the developer and the Maricopa County Environmental Services Department (MCESD). Upon receiving an approval letter, MCESD would review the plans and specifications for the construction of the wastewater system in the proposed development.

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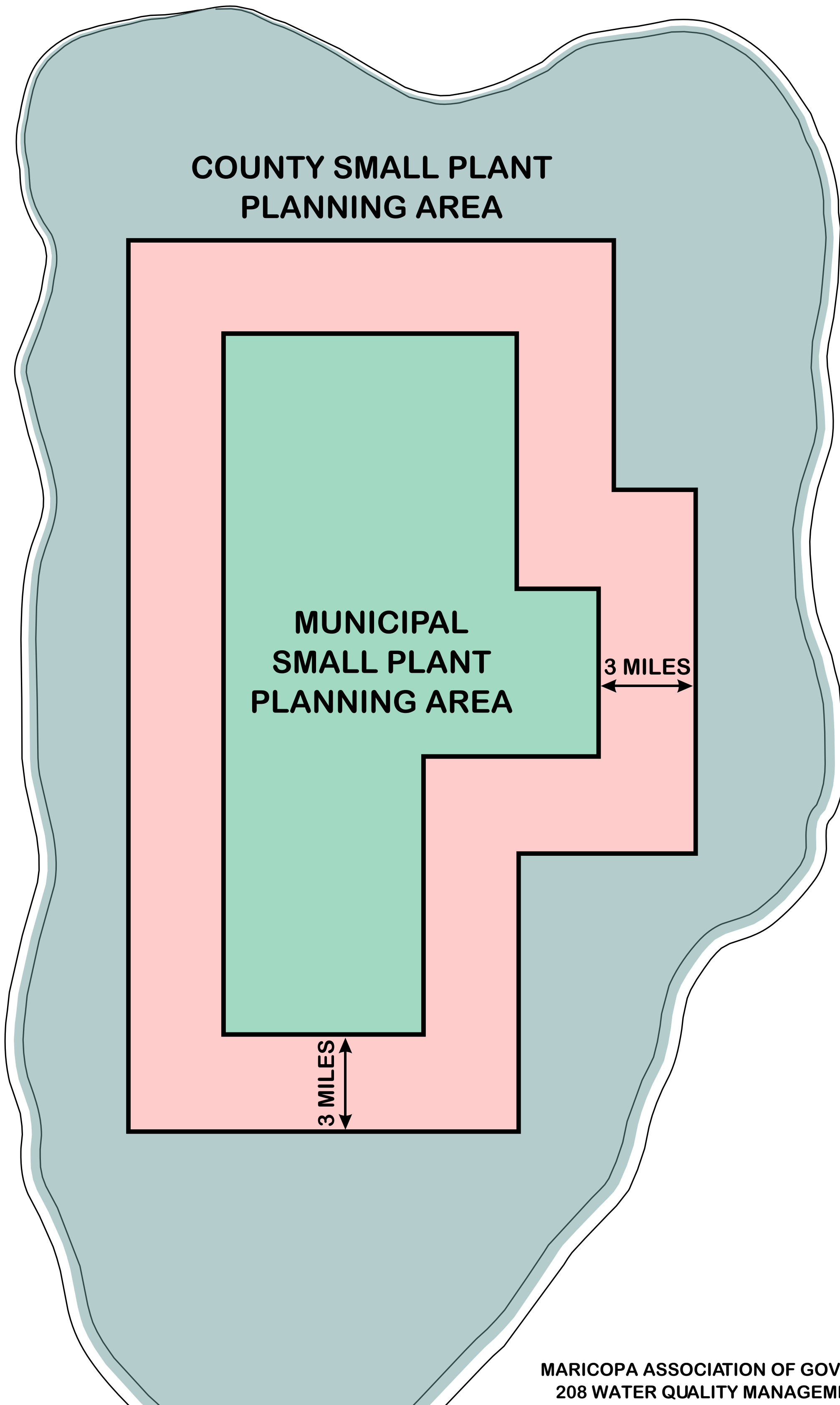

MARICOPA ASSOCIATION OF GOVERNMENTS
208 WATER QUALITY MANAGEMENT PLAN

SCHEMATIC: AREAS OF RESPONSIBILITY FOR SMALL PLANT PLANNING

CAROLLO ENGINEERS
2001

N:\Client40\MAG\Reports\6006A.00\Graphics\Small Plant.cdr

FIGURE 4.31

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Should a developer not be able to work out the details of its proposed small plant with the particular City or Town, it would not be able to proceed. The County would not approve the plans and specifications without the compliance letter from the ADEQ. The state will not give a letter of compliance unless they receive the approval letters from the City and MAG. In accordance with R18-9-B201(H), the Arizona Department of Environmental Quality shall not publish a Notice of Preliminary Decision to issue an individual permit or amendment for a sewage treatment facility that is not in conformance with the Certified Areawide Water Quality Management Plan and the Facility Plan (see the Appendices). For a proposed project in the County, the County would play the same role as the City in the early project review and development. Projects within three miles of a Municipal Small Plant Planning Area would be reviewed and commented on by the affected City or Town. Projects with major problems to the City or Town which could not be resolved, would not receive compliance from ADEQ. The specific process adopted in the MAG 208 Plan in 1982 is set forth below.

4.5.2 MAG Small Plant Process

No wastewater treatment plant greater than 2.0 mgd ultimate capacity is considered to be in compliance with this plan unless it is specifically named in the Plan or added through 208 Plan Amendments.

Wastewater treatment plants with an ultimate capacity of 2.0 mgd or less are considered to be in compliance with this plan if they are approved using the following processes:

1. Within Municipal Planning Area

   To be approved for construction, a small wastewater treatment plant (2.0 mgd ultimate capacity or less) not otherwise mentioned in the MAG 208 Plan but located within a Municipal Small Plant Planning Area must:

   1. Have the approval of the municipality in whose planning area it will be located;

   2. Not adversely affect the operation or financial structure of existing or proposed wastewater treatment plants;

   3. Be consistent with State and County regulations and other requirements; and,

   4. Be otherwise consistent with the MAG 208 Plan.

   The process for approval of a small plant is as follows:

   1. Developer prepares an engineering report on the proposal and submits the report to the City.

2. City reviews the proposal based upon the guidelines in the attached list (Table 4.52) and any others depending upon the needs and desires of the specific City or Town. If the City or Town does not have the staff capability to perform this review, the review process used would be that for small plants outside a Municipal Planning Area. It is also recommended that the City or Town reviewing a proposed development contact any adjacent community if the proposed development is within three miles of boundary between the two communities.

Table 4.52 **Guidelines for Small Plants Within Municipal Small Plant Planning Area** **MAG 208 Water Quality Management Plan Update**
1) Plant Justification • Why Plant is Required - Limited capacity at existing plant or sewer - Too far from trunk sewer - Temporary plant - Soil limitations - Effluent reuse or water conservation - Sludge management options - Other
• Master Plan Compatibility - Is plant compatible with future plans for the area? - Will proposed plant impact existing or proposed plants? - Will proposed plant impact existing or proposed reuse plans in the region?
• Benefits of Plant - Net water saving - Delays major capital expenditures - Better scheduling and project control - Allows development
• Potential Problems - High capital and operational costs - Impacts on groundwater - Impacts on surface water - Inability to meet State regulations - Financial failure of operation - Poor operation and maintenance (O&M)

Table 4.52	Guidelines for Small Plants Within Municipal Small Plant Planning Area MAG 208 Water Quality Management Plan Update
•	Financial - Who will fund construction? - Who will fund O&M costs - short term? - Who will fund O&M costs - long term? - Financial security
•	Operation - Who will operate plant - short term? - Who will operate plant - long term?

3. If the proposal fits into the City's Master Plan, then the City sends a letter and a summary of the proposal to MAG (copy to the developer) stating the proposal is approved by the City and it is compatible with the 208 Plan covering the City's Planning Area.

4. MAG reviews the proposal for overall 208 Plan compliance to ensure that the Small Plant Process is followed, and to ensure that regional impacts are addressed. This evaluation will be coordinated by the MAG Water Quality Advisory Committee. Recommendations from the Water Quality Advisory Committee will be presented to the MAG Management Committee. Recommendations from the Management Committee will be presented to the Regional Council.

5. Based on Regional Council actions, MAG sends a letter to ADEQ and the proposal summary (copies to developer, City, and MCESD) stating whether the proposed project is compatible with the overall 208 Plan.

6. Upon receipt and review of the letter from MAG, ADEQ submits a letter and proposal summary to MCESD and developer stating whether the proposed project is in conformance with the MAG 208 Plan.

7. The developer, after receiving an approval letter from ADEQ, submits plans and specifications to MCESD for review together with a copy of the approved design concept.

8. MCESD reviews, based on ADEQ Bulletin #11 and County regulations, the plans and specifications and issues permit to construct.

For the purpose of this process, a Sanitary District is treated in the same fashion as a Municipality.

2. Outside of Municipal Planning Areas

To be approved for construction, a small wastewater treatment plant (2.0 mgd ultimate capacity or less) not otherwise mentioned in the MAG 208 Plan and located outside a Municipal Small Plant Planning Area must:

1. Have the review and comment of any municipality whose Small Plant Planning Area is within three miles of the proposed plant location or service area;
2. Not adversely affect the operation or financial structure of existing or proposed wastewater treatment plants;
3. Be consistent with State and County regulations and other requirements;
4. Be otherwise consistent with the MAG 208 Plan; and,
5. Be evaluated and approved, or modified by Maricopa County Environmental Services Department (MCESD).

The process for approval of a small plant is as follows:

1. Developer submits engineering report to Maricopa County and any cities whose Municipal Small Plant Planning Areas are within three miles of the proposed plant's service areas. This report would contain sufficient information for evaluation of the report based upon the attached guidelines as set forth in Table 4.53.

Table 4.53 Criteria for Feasibility Report for Small Plants Outside of Municipal Small Plant Planning Area MAG 208 Water Quality Management Plan Update
1) Technical Criteria • Why is small plant desired? - Depth to groundwater less than _____ ft. - Soil limitations prevent use of septic tanks - Potential for reuse or water conservation - Lot size one acre or less - Area not planned for regional service for ______ years - Density of projected population - Will serve industrial or commercial area

Table 4.53 (con't.)	Criteria for Feasibility Report for Small Plants Outside of Municipal Small Plant Planning Area MAG 208 Water Quality Management Plan Update
	• What is the anticipated quality of the wastewater? - Domestic - Commercial and/or Industrial - If commercial and/or industrial wastes are anticipated, what provisions are being taken to ensure no toxic substances will be discharged?
	• How and why was small plant design and capacity selected? - What criteria were used? - What alternatives were considered? - What are benefits, problems of alternatives? - Will there be problems meeting State or County regulations? - What sludge management options were considered?
2)	Planning Criteria • Is proposed plant compatible with County adopted master plans, guidelines, etc., for the area? - What plans apply? - What guidelines or policies apply?
	• Can the proposed plant be expanded to serve growing population? - What population is projected for the service area? - Would certain areas lend themselves, topographically or hydrologically, by planned use or density to being included in the service area?
	• Will proposed plant adversely impact existing or approved nearby land uses? - What are land uses within ______ miles? - What is zoning for the surrounding area? - What are reactions of nearby landowners to proposed facility?
	• Will there be a net water saving from effluent reuse? - How will effluent be disposed of? - What is the estimated water saving?
	• Do nearby existing or proposed land uses indicate a need for a larger capacity sewage plant than that proposed? - Should nearby areas be sewered or otherwise join the proposed plant for water quality or economic reasons? - Do these areas wish to join the proposed plant?

Table 4.53 (con't.)	Criteria for Feasibility Report for Small Plants Outside of Municipal Small Plant Planning Area MAG 208 Water Quality Management Plan Update
3)	Development Criteria • Who will fund construction? • Who will fund operation and maintenance costs? • Is there adequate financial security to assure continual and proper operation and maintenance? • Who will operate and maintain the plant and system? • What are anticipated capital and operation and maintenance costs?

2. The involved Cities evaluate the report and send a letter containing their recommendations to Maricopa County (copies to MAG and developer).

3. Maricopa County incorporates City's concerns and sends a letter and summary of the proposal to MAG (with copies to involved Cities and developers), stating whether the proposal for wastewater is acceptable to the County.

4. MAG evaluates the proposed plant for overall MAG 208 Plan conformance to ensure that the Small Plant Process is followed and to ensure that regional impacts are addressed. This evaluation will be conducted by the MAG Water Quality Advisory Committee. Recommendations from the Water Quality Advisory Committee will be presented to the MAG Management Committee. Recommendations from the MAG Management Committee will be presented to the Regional Council. Based upon Regional Council action, MAG submits letter on 208 compliance to ADEQ (with copies to Maricopa County, the developer and any involved cities).

5. After review of the MAG Submittal, ADEQ submits letter to MCESD (with copy to the developer) indicating 208 Plan compliance.

6. After receipt of an approval letter from ADEQ, MCESD reviews and approves plans and specifications based upon Bulletin # 11 and issues permit to construct.

It should be noted that before a development proceeds, approval has to be obtained for the entire master plan. Approval by the State and County Departments only constitutes one part of the approval process.

4.6 ENVIRONMENTAL ASSESSMENT OF POINT SOURCE PLAN

Environmental impacts and issues were considered on an areawide basis. This section provides an overview of existing conditions, followed by an assessment of the following categories: air quality, geology and soils, surface waters, groundwater, biological resources, cultural resources, public health and aesthetics, land use, public facilities and services, economic activity, public and institutional acceptability, and socioeconomic impacts.

4.6.1 Existing Conditions

4.6.1.1 Climate

The climate of Phoenix is semiarid, characterized by low annual rainfall, hot summers, and mild winters. Maximum daily temperatures range from 65 degrees Fahrenheit (18 degrees Celsius) in January to 105 degrees Fahrenheit (41 degrees Celsius) in July. Average daily low temperatures range from 78 degrees Fahrenheit (26 degrees Celsius) in July to 38 degrees Fahrenheit (3 degrees Celsius) in January. The annual rainfall in Phoenix averages approximately 7 inches.

4.6.1.2 Air Quality

Phoenix has experienced serious air pollution problems, largely as a result of automobile emissions. The location of the metropolitan area in a broad valley is conducive to the accumulation of air pollutants. In addition, general atmospheric conditions favor the development of temperature inversions that may persist for extended periods of time, allowing ambient pollutant concentrations to exceed levels defined in State and Federal standards. Three kinds of air pollutants generally exceed standards in the Phoenix area: ozone, carbon monoxide, and particulate matter, which is 10 microns in size or less (PM-10). Because of problems with these air pollutants, the Maricopa County area was designated a "nonattainment" area for photochemical oxidants (ozone), carbon monoxide, and PM-10 particulate pollution under requirements of the Clean Air Act Amendments of 1990.

Minor local, short-term air quality changes will occur during construction phases of the wastewater management plan. These changes will consist principally of increases in fugitive dust. Increases in dust will occur most often during excavation and laying of interceptor lines. Dust associated with construction is subject to State fugitive-dust-control regulations, which will be complied with during facility construction.

4.6.1.3 Geology and Soils

The Maricopa County area is within the Basin and Range Physiographic Province of the western United States, characterized by wide, flat, alluvium-filled valleys surrounded by rugged, low-relief mountain ranges. Phoenix lies within the Salt River Valley and is surrounded by the Phoenix, Salt River, McDowell, Usury, Sierra Estrella, and White Tank Mountains. Uplifting and down faulting of the land surface formed these fault block mountains. Erosion filled the valley with alluvium, which consists of silts, clays, sands, and gravels deposited in layers.

Valley soils are deep, mixed in texture, and low in organic material. Most soils contain adequate amounts of nutrients, and when irrigation is available, good cropland can usually be developed. General soil types are sandy loams, limy clay loams, and limy loams.

The Point Source Plan is not expected to have any significant impact with respect to geology and soils.

4.6.1.4 Biological Resources

The Maricopa County area is part of the lower Sonoran Life Zone, which is part of the Sonoran Desert Formation, one of four desert formations in North America. Natural vegetation in the area is mainly composed of desert communities, although small areas of deciduous forest occur along the banks of water bodies. The major desert communities are palo verde-saguaro on mountain slopes, creosote bush-bursage in the lower drier areas, and desert saltbush in the fine-grained alluvium that fills the valley in the area. Riparian vegetation is present along stream channels and associated terraces and in areas of shallow groundwater.

A great diversity of desert fauna also exists within the area. Most of the fauna occupy the creosote bush-bursage and palo verde-saguaro communities and include the desert kangaroo rat, desert pocket mouse, Gambel's quail, black-throated sparrow, desert horned lizard, the Harris' antelope squirrel, cactus mouse, gila woodpecker, desert tortoise, desert iguana, zebra-tailed lizard, and western diamondback rattlesnake.

Cropland, which constitutes approximately one-third of the metropolitan area, provides habitat for certain adaptable wildlife species, particularly many species of songbirds and game birds. Other wildlife associated with cropland include the cotton tail rabbit, valley pocket gopher, and gopher snake.

Artificial surface impoundments associated with agricultural lands also support a number of riparian communities. These agricultural storage ponds tend to have a beneficial effect on the local biologic community in that they support a wider variety of species than would be found without the presence of surface water.

Construction of treatment facilities under the selected plan will result in removal of small portions of cropland, saltbush, and creosote bush-bursage communities. Many of these saltbush and creosote bush-bursage communities that will be removed are of poor quality, primarily as a result of intensive human encroachment in the study area. These communities, along with the palo verde-saguaro and riparian communities, will also undergo changes due to plant operations and associated habitat management schemes.

4.6.1.5 Community Facilities

4.6.1.5.1 Transportation

Rapid growth in the Maricopa County area has strained the existing transportation network, as automobile traffic and congestion have increased. Since 1985, the Arizona Department of Transportation has been constructing an urban freeway and expressway program to serve the metropolitan Phoenix area. The current plan is expected to be fully implemented by 2007. Ballot initiatives to create a regional light rail transit system were recently approved by Phoenix, Tempe, and Mesa. Implementation is expected to occur over the next 5 to 10 years.

4.6.1.5.2 Water Supply

The Salt River Project distributes water from the Salt and Verde Rivers via canals to the Phoenix area for municipal and agricultural use. The Central Arizona Project imports Colorado River water to the Phoenix area and elsewhere. Municipal and industrial water is also supplied by private and public wells in the study area. A number of communities in the metropolitan area rely on groundwater sources alone. Treatment of groundwater supplies varies from no treatment to chlorination to desalination. Treatment of surface water typically includes sedimentation, filtration, and chlorination. Most surface water treatment facilities now include solids dewatering and disposal unit processes.

4.6.1.5.3 Wastewater Treatment

Wastewater treatment plants serving the metropolitan area are described elsewhere in this chapter.

4.6.1.5.4 Energy

Electricity in the metropolitan area is provided primarily by the Arizona Public Service Company (APS) and the Salt River Project (SRP). Each operates a number of electric generating stations. SRP also generates hydropower. APS and SRP are participants in an energy consortium, the Arizona Nuclear Power Project (ANPP), which operates the Palo Verde Nuclear Generating Station west of Buckeye. Several new electric power generating facilities are being planned within Maricopa County to augment power supply.

4.6.1.6 Archaeological Resources

The Phoenix metropolitan area was a major population center during portions of the prehistoric past and contains abundant archaeological remains. Earliest archaeological sites in the area belong to local variants of the Archaic tradition. Archaic sites have been found in the area but are few in number. The Hohokam tradition, which appears about 350 B.C., is the principal cultural complex represented within the area. Known Hohokam sites within the Salt River Valley are reported to be in excess of 800. The majority of these sites, located both along the area's major and tributary river systems and on irrigable lands adjacent to rivers, consist of villages or large permanent habitation sites, or of medium to large-sized shard areas which may also be the remains of habitation sites. In addition, at least seven major prehistoric irrigation canal systems (totaling more than 315 miles in length) are known to have existed within the Salt River Valley. Each of these canal systems is generally associated with one or several major Hohokam village sites.

While many of these sites have been destroyed due to urbanization and agricultural development, others have been excavated and reported by archaeologists, thus providing a permanent record of their existence. In addition, the remains of several major sites have been preserved and restored and are accessible to the general public. Several prehistoric sites, including the Pueblo Grande Ruin (Phoenix), Hohokam-Mormon Canals (Mesa), and Hohokam-Pima Irrigation Sites (Phoenix), have been entered on the National Register of Historic Places. Numerous other archaeological sites have either been nominated to or are considered to be potentially eligible for inclusion in the State or National Registers of Historic Places.

4.6.1.7 Historical Resources

An initial survey of historic sites in metropolitan Phoenix prepared for the U.S. Army Corps of Engineers during preparation of the 1979 208 Plan identified more than 550 existing historic sites. Seven sites had been entered on the National Register of Historic Places. They are: Hackett House, Tempe; Farmer Goodwin House, Tempe; Taliesin West, Scottsdale; Rosson House, Phoenix; the Phoenix Carnegie Library and Library Park, Phoenix; Evans House, Phoenix; and the Arizona State Capitol Building, Phoenix. There are currently 299 sites entered on the National Register of Historic Places in Maricopa County.

4.6.2 Environmental Consequences of Point Source Plan

Environmental consequences of the Point Source Plan were evaluated by comparing these alternatives to a "No Action" alternative. The No Action alternative represents present and projected conditions in the study area under the assumption that there would be no new construction or expansion of municipally owned wastewater treatment facilities. Wastewater treatment would be provided by means of the existing system and individually owned home treatment units or privately owned and operated package plants.

In general, the No Action alternative would mean the expansion of low density urbanization, because much of the population would rely on septic tanks or private package plants for wastewater treatment under this alternative. A proliferation of single-family dwellings on relatively large homesites (to accommodate septic tank use) would occur.

4.6.2.1 Air Quality

Air quality impacts are defined in terms of the consistency or inconsistency between data in the State Implementation Plan and the 208 plan. Population projections used in the 208 program are the same as those used to forecast the effect of control strategies on air quality parameters in the NAAP. No major discrepancies are apparent between the NAAP and the project alternatives on this account. In addition, there are construction site controls in place in the Maricopa County area, which are designed to reduce particulate pollution.

4.6.2.2 Geology and Soils

Geological impacts focus on the exclusion of sand and gravel or other valuable geological materials from extraction due to location of facilities in minable areas. Major impacts in this category are not apparent.

4.6.2.3 Surface Waters

Environmental changes are related to the availability of treated wastewater, which is related to the location of treatment plants. Impacts are mainly seen as beneficial (augmenting community and agricultural water supplies), with the exception of potential instances where effluent does not meet water quality standards or affects public health and aesthetics. ADEQ regulatory programs for surface and groundwater protection are designed to protect these types of situations from occurring.

All alternatives would result in more beneficial effects to surface water supplies than would the No Action alternative.

4.6.2.4 Groundwater

Effects on groundwater center around changes in quality and quantity that can occur depending on the location of wastewater discharge in the area. Under the No Action alternative, groundwater quantity might benefit because there would be more recharge and less export of pumped water. However, groundwater quality would be affected adversely if septic tanks were used at too great a density. Also, many of the planned or operating treatment facilities are designed to recharge aquifers with high-quality reclaimed water.

4.6.2.5 Biological Resources

Changes in biological resources can occur through introduction of surface waters into the desert environment of the study area and through removing, degrading, or improving existing terrestrial habitat. Biological resources would be improved by all project alternatives, in comparison to the No Action alternative. Improvements in biological resources consist primarily of creation of wetland habitat, which is of high value in the area, through the addition of surface water in the form of aerated lagoons, stabilization ponds, and impoundments for storing treated wastewater for irrigation.

Some loss of terrestrial habitat would occur under all alternatives. Despite losses in terrestrial habitat associated with the project alternatives, biological advantages related to surface water augmentation outweigh disadvantages in this category.

4.6.2.6 Cultural Resources

Project actions can disturb archaeological or historical sites, mainly through direct removal of artifacts or structures by construction of facilities or interceptor lines. No historically sensitive sites are known to be located in areas affected by proposed expansion or construction of facilities.

Adverse impacts to archaeological resources would occur with all project alternatives due to urbanization. Losses of artifacts would be less extensive than with the No Action Alternative because the area of urbanization assumed for the project alternatives is not as great as for the No Action Alternative. Additional archaeological impacts could occur during construction of sewage treatment systems.

4.6.2.7 Public Health and Aesthetics

In general, providing improved wastewater treatment and reducing the use of on-site treatment facilities will have a significantly positive impact on public health. The incidence of mosquitoes around surface water areas, the likelihood of intentional or inadvertent contact with wastewater, and the likelihood of odors are potential negative consequences of operation of treatment plants. Mitigative measures can reduce or eliminate these impacts. Particular mitigative measures include pesticide control applications, odor suppression techniques, and proper designation of wastewater areas by posting of signs and fencing of enclosures to deter public access.

4.6.2.8 Land Use

Effects on land use depend on the degree of compatibility of existing and projected land uses employed in the local wastewater treatment master or facility plan with the local comprehensive land use plan. Several local jurisdictions are ensuring that small wastewater treatment plants are designed to be compatible with nearby residential areas.

4.6.2.8.1 Agricultural Land Use

The consequences of the project alternatives on agricultural land use fall into two main categories: the loss of farmland for treatment facility sites, and the continued support of farming due to availability of effluent for irrigation. The more significant impacts are associated with the latter category, and are considered positive.

4.6.2.8.2 Urban Land Use

The Point Source Plan is compatible with the adopted MAG Regional Development Guide, which anticipates continued urbanization of the Phoenix metropolitan area.

4.6.2.8.3 Recreation and Open Space

Wetlands associated with the treatment and storage of effluent for irrigation or other purposes not only provide an important natural resource but also provide opportunities for recreational land uses such as hunting, picnicking, and bird watching. Under the No Action Alternative, no creation of significant wetland is anticipated, whereas the project alternatives contribute to wetland formation.

The use of reclaimed water for irrigation of turfed areas enables parks and recreational areas to be developed which otherwise might not be.

4.6.2.9 Public Facilities and Services

These impacts concern the extent to which the proposed project action would affect existing or proposed public facilities or the operation of service delivery systems. Consideration is also given to secondary impacts in which project actions may alter future revenues to public agencies without a compensating change in the cost or level of services they must provide. The project alternatives support planning based upon the local land use and development plans. The project alternatives are also compatible with the MAG Regional Development Guide.

4.6.2.10 Economic Activity

Major changes in the level and nature of area economic activity, employment, income, and property values can be attributed to construction and operation of wastewater treatment facilities. These effects are often closely linked to changes in land use and population. The project alternatives would be accompanied by changes in the economy which include reduction in scale of agricultural activity, but not as rapidly as under the No Action Alternative. Most sectors of the economy would increase, but the public service sector would not grow as large as under the No Action Alternative. A major portion of the costs for the various alternatives would be spent within the region for construction, supplies, and labor. Direct long-term impacts include employment at facilities and loss in revenues from agricultural production from land required for plant sites, both of which are relatively insignificant.

4.6.2.11 Public and Institutional Acceptability

All of the project alternatives will meet the demand for areawide wastewater treatment, so public acceptability issues focus on the local communities' choice of individual sites for treatment and potential reuses of effluent.

4.6.2.12 Socioeconomic Impacts

The principal socioeconomic impacts of the selected plan are discussed in the following categories:

- Impacts of proposed facilities.
- Impacts of proposed effluent reuses.
- Impacts of plan implementation.

4.6.2.12.1 <u>Impacts of Proposed Facilities</u>

Construction of proposed facilities will primarily affect agricultural areas by conversion of agricultural land for use for treatment facilities. Much of this land would eventually be urbanized in any case.

Site availability is another important consideration. Several of the plants included in the selected plan will not be needed for five to ten years. To ensure their availability when required, these sites should be acquired or optioned well before they can be utilized and land acquisition costs may be substantial.

4.6.2.12.2 <u>Impacts of Proposed Effluent Reuse</u>

Although construction of treatment facilities in some cases will remove a small amount of farmland from production, use of reclaimed water for irrigation may support agriculture. This type of reuse may include (1) provision of additional agricultural water supplies, (2) requirements that may include the long-term commitment of land irrigated with effluent to agricultural purposes under reuse agreements, and (3) improvement of groundwater supplies through additional recharge.

Under the terms of the existing agreement effluent is used at the Palo Verde Nuclear Generating Station in energy production.

4.6.2.12.3 <u>Impacts of Plan Implementation</u>

One area of concern is the impact of user charges. Construction and operation costs of the new treatment system components may be financed through user charges. Section 204 of the Clean Water Act specifies the types of use charges, which can be levied by operating entities to pay for wastewater treatment within their service areas. In general, charges must be proportional to use, and a separate schedule is provided for industries. This system is designed to achieve equity such that the users of the services provided are the ones who pay for it.

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NONPOINT SOURCE PLAN

5.1 DESCRIPTION OF NONPOINT SOURCE PLAN

This chapter generally defines nonpoint source water pollution and describes the major nonpoint sources in the MAG planning area. The history, current status, and projected future of nonpoint source related studies and regulatory programs are summarized and discussed.

Over the past 25 years, water quality programs, activities, and resources have been primarily focused on point sources of pollution. While these efforts have resulted in significant improvements, waters in the MAG planning area are still being impacted by nonpoint sources of pollution. Nonpoint sources are considered the single largest cause of water pollution in the nation. The USEPA recently indicated that over 50 percent of the nation's current water quality degradation is now attributable to nonpoint sources of pollution.

The 1979 MAG 208 Plan defined nonpoint sources as "sources of pollution other than municipal and industrial discharges of wastewater." More recently, nonpoint sources of pollution were defined as those discharges that "do not originate from a specific single location such as a single pipe" (U.S. Environmental Protection Agency, 1987). In areas such as Maricopa County, the distinction between point and nonpoint sources is not clear. Although groundwater is the receiving water for many nonpoint sources, it is also impacted by many point sources. In the MAG planning area, the major water quality impact due to nonpoint sources is on groundwater. This is due to heavy reliance on groundwater supplies and the relative absence of natural surface water in the County, except during flood flows. Under the Environmental Quality Act (§49-203), ADEQ's principal statutory authorization for nonpoint source control, either an individual or general aquifer protection permit is required for all nonexempt discharges to groundwater, regardless of the source.

Impacts to groundwater are more difficult to assess and manage than impacts to surface water. Sampling locations are limited, and due to the depth to groundwater, which can vary from less than 30 feet to more than 350 feet, the expense of installing monitor wells for additional sampling locations is considerable. Furthermore, in Maricopa County, the aquifers are heterogeneous, and the directions of groundwater flow are not precisely known unless many more wells are present. Unlike surface water, for which flow is mainly one-dimensional, the movement of groundwater is three-dimensional and can change in response to pumping and recharge. Large scale reversals of flow direction have occurred in parts of the planning area during the past 50 years.

Two inventories of nonpoint source (NPS) pollution that served as background documents for the 1993 MAG 208 Plan update were the 1979 NPS report for the MAG 208 Program

(Maricopa Association of Governments, 1979); and the 1988 NPS Assessment Report completed by the Arizona Department of Environmental Quality (ADEQ). The ADEQ Assessment Report emphasized NPS impacts to surface water over the entire state, whereas, the MAG study emphasized groundwater impacts in Maricopa County only. A more recent study that specifically relates to NPS pollution in the MAG planning area is the Middle Gila River Watershed Management Study, prepared in 1998 for the Multi-City Subregional Operating Group in the Phoenix area. The study was completed as part of the 91st Avenue WWTP NPDES Permit renewal, and included a partial inventory and assessment of existing surface and groundwater quality data.

The State of Arizona has developed two NPS Water Quality Management Plans in recent years. The first NPS state management plan, SMP I, guided Arizona's NPS program from 1990 through June 1997. SMP I focused on nonregulatory watershed-based implementation efforts. Specific achievements of ADEQ's Nonpoint Source Program under SMP I included:

- Development and implementation of the NPS watershed zone management program which integrated Arizona's NPS water quality implementation efforts with local community efforts in targeted watersheds;
- Implementation of Section 319(h) demonstration projects targeted to address nonpoint source pollution issues;
- Formalization of Memoranda of Understanding (MOUs) and Partnering Agreements for NPS water quality programs with the U.S. Forest Service, Bureau of Land Management, Natural Resource Conservation Service, Arizona Department of Transportation, Arizona Game & Fish Department, and the San Carlos Apache Tribe;
- Development of a national NPS short term staff exchange program to share innovative NPS program implementation approaches with other NPS programs;
- Implementation of a draft Intergovernmental Agreement for establishing Nitrogen Ground Water Alert Levels for rural communities and sanitary districts;
- Development of draft best management practices (BMPs) for NPS storm water discharges from NPS business, municipal, and residential urban runoff sectors;
- Development of draft BMPs for NPS livestock grazing activities;
- Development of draft BMPs for NPS sand and gravel activities;
- Development of a BMP guidance document to assist owner/operators of Concentrated Animal Feeding Operations (CAFOs) for protection of groundwater from nitrogen discharges;

- Development of a BMP guidance document to assist Arizona farmers in managing irrigated cropland activities to protect groundwater resources from nitrogen discharges;
- Implementation of a draft Consent Decree model for addressing rural on-site waste-water issues on a statewide basis; and
- Implementation of rules for management of nitrogen discharges from irrigated agriculture and CAFOs.

The 1997 NPS State Water Quality Management Plan (SMP II) identified Arizona's goals and objectives for NPS program implementation for State Fiscal Years 1998-2003. SMP II reflects the maturation of the Arizona NPS management program with established goals built upon the successes of the SMP I. The SMP II reflects the national trend for NPS program implementation within a watershed framework, stressing partnering efforts, the nine key elements of an effective NPS program and measurements of success for nonpoint source pollution reduction.

SMP II was prepared to meet the following requirements:

- Section §319 of the federal Clean Water Act as amended in 1987;
- Sections §49-202, §49-203, §49-247 and §49-248 of the Arizona Environmental Quality Act (1986); and
- The USEPA Nonpoint Source Program and Grants Guidance for Fiscal Years 1997 and Future Years (May 1996).
- In addition, SMP II is consistent with the fundamental concepts for control and minimization of discharges of runoff through partnering and watershed implementation as outlined in the October 1997 Gore Initiative and the Federal Clean Water Action Plan.

Specific SMP II nonregulatory and regulatory NPS program goals are listed as follows:

- Assist the regulated community in complying with applicable water quality standards;
- Implement a statewide, community-based watershed program based on the NPS Zone Management program and the ADEQ's overall Watershed Framework (ADEQ, 1997);
- Develop and implement, where possible, partnering based inter-state/inter-regional watershed programs;
- Implement a Water Quality Improvement Grant program for selecting and contracting 319(h) projects aimed at improving Arizona's surface and groundwater resources;

- Address those water bodies on the 303(d) list whose impairments can be attributed to nonpoint source pollutants; and

- Finalize BMP guidance documents for livestock grazing, recreation, sand and gravel, urban runoff, and management of wildlife activities.

ADEQ prioritized the program elements of SMP II to provide flexibility in the event that reduced allocations of either federal or state funding required a scaled-down implementation effort. At the present time, ADEQ is preparing a major revision to SMP II for NPS Water Quality.

In the following sections, categories of nonpoint sources for water pollution applicable to the MAG planning area are described.

5.1.1 Urban Runoff

Nonpoint sources of urban pollution include discharges of storm runoff to surface water and groundwater. Potential contaminants in storm runoff include nitrate (from various sources), pesticides, bacteria, heavy metals, volatile organic compounds (VOCs), petroleum products, and sediment. Documentation of the impacts of these constituents in impairing surface water quality has increased in recent years. Phase I (1990) and Phase II (1999) of the NPDES Storm Water Permit Program have driven local and state agencies to implement new management and testing procedures related to storm water quality. In Maricopa County, most runoff from moderate storms is collected in infiltration basins and drywells, which can impact the groundwater. The storm sewer systems for urban areas in the county are incomplete. In some areas where storm water is not collected in a drainage system, runoff flows overland or in streets until it eventually drains into washes and river channels. Within existing drainage systems, some storm drains are regulated as part of the NPDES storm water permit program. The quality of water from storm drains varies depending on the duration of the storm event, the length of time between storm events, the amount of flow, and the source area of storm water runoff.

To reduce street flooding, city building codes require on-site retention of runoff from moderate storm events. Runoff that is retained on site is commonly disposed by allowing it to slowly infiltrate into the soil in a retention basin or by more rapid infiltration in a drywell. A drywell is a bored, drilled, or driven shaft or hole whose depth is greater than its width and is designed and constructed specifically for disposal of storm water. Drywells allow infiltrating water to bypass the shallow soil layers, short-circuiting a portion of the natural filtration processes. Some drywells are deep enough to extend below the water table, and thus are actually injection wells.

To provide answers to some of the questions surrounding the use of drywells for disposal of storm runoff, an urban runoff study was commissioned by MAG in 1983 and 1984 (Schmidt, 1985). The objective of the study was to evaluate the pollution potential of urban runoff that was disposed in drywells at the parking lot of a shopping center. The study reported that heavy metals and low concentrations of pesticides were present in runoff entering the drywells. However, shallow groundwater in the vicinity of the drywells was not noticeably adversely affected, due to the sorptive capacity of the drywell backfill and the aquifer material and due to mixing. Storm runoff from the shopping center was also diluted by recharge from other sources, including runoff from a nearby irrigation system.

Construction activities also contribute to pollution of urban runoff. Sediment is a primary concern, since sediments may adsorb several pollutants of concern known to be associated with storm runoff. In the 1988 Nonpoint Source Assessment, ADEQ expressed concern that runoff from construction sites previously subject to agricultural uses may be responsible for the partial contribution and transport of chlorinated pesticides to the Gila River and for concentrations of pesticides that have been detected in river sediments. One concern related to sediment pollution is a lack of data regarding naturally occurring background levels of pollutants. It is often difficult to define "natural" conditions to use as a basis for comparison.

5.1.2 Agriculture

Pollutants associated with agriculture include sediment, pesticides, bacteria, viruses, nitrates from both fertilizer and animal wastes, and salinity. Some of these pollutants can be discharged to surface waters in irrigation return flows and storm runoff, and to groundwater by percolation of irrigation water to the water table. Most agricultural water runoff originates in fields. It may also originate from equipment yards and from concentrated animal feeding operations (CAFOs).

A limited number of pesticides associated with agricultural activity have been identified in sediments associated with surface water and in groundwater. The Gila River is the most seriously affected surface waterbody. In tissue samples of fish collected from the Gila River in the planning area, toxaphene and degradation products of dichlorodiphenyl trichloroethene (DDT) have been detected in concentrations that constitute a hazard for human consumption (Arizona Department Environmental Quality, 1988). The U.S. Fish and Wildlife Service (USFWS) conducted a study on pesticides titled "Contaminants in Fish and Wildlife of the Middle Gila River, Arizona" (King & Baker, 1995). In groundwater, soluble fumigants dibromochloropropane (DBCP) and ethylene dibromide (EDB), that were used in the past to control nematodes in citrus crops, have been detected in several parts of the planning area.

Nitrate may be the most ubiquitous contaminant associated with agriculture. The most serious impact is on groundwater. Concentrations of nitrate exceed drinking water standards in shallow groundwater in large areas in Maricopa County. In some areas, the occurrence can be linked to over applications of nitrogen-bearing fertilizer. There are also some areas where high concentrations of nitrate occur naturally in the groundwater. Nitrate is highly soluble and can leach to groundwater through percolation of irrigation return flow.

In some other areas, high nitrate levels may be attributed to animal wastes from dairies or feedlots, although such impacts have not been documented in Maricopa County.

Increase in the salinity of groundwater is another widespread problem that is associated with irrigated agriculture. When water is applied to crops, evapotranspiration increases the concentration of dissolved solids in the deep percolation or return flow. When groundwater is recycled for irrigation, the dissolved solids may increase in concentration to the point where the water no longer is useable for crops. Such increases have occurred in areas along the Lower Salt and Gila Rivers and have restricted the use of groundwater for irrigation.

The presence of shallow groundwater is an important issue in many parts of the planning area. Shallow groundwater in the Salt River Valley was evaluated for MAG in the early 1980s as part of a drywell study (Schmidt, 1985), and again in support of this 208 Plan update (Schmidt, 2000). Agricultural activities have been directly related to depths and quality of shallow groundwater in some areas. The shallowest groundwater levels were found in the Buckeye area and along the Salt and Gila Rivers in the Southwest Valley. The Buckeye Irrigation Company (BIC) experiences shallow groundwater less than 20 feet deep, and operates 11 wells that pump the shallow groundwater to lower the water table and prevent water logging of farm land. As a result of urbanization and other factors, agricultural irrigation has ceased in large parts of the Valley in recent decades. This has had major impacts on groundwater discharge and recharge. There is much less pumpage of shallow groundwater and water levels are rising. Deep percolation will eventually decrease as water slowly drains out of the vadose zone.

5.1.3 Land Disposal

Nonpoint sources associated with land disposal activities in the planning area include landfills, wastewater ponds, and septic tanks. Some of the contaminants associated with some of these sources include salinity, bacteria, heavy metals, nitrates, ammonia, phosphates, pesticides, and volatile organic compounds (VOCs). Water quality impacts have been documented at landfills located in former sand and gravel pits adjacent to the Salt River and its tributaries in the planning area. Where pits have been excavated below the water table, landfilled solid waste can be in direct contact with groundwater. Erosion and washouts have occurred at some landfills along the Salt River during some large reservoir releases and floods.

When groundwater or surface water enters a landfill, it leaches contaminants present in the landfill. Water that has encountered refuse is called leachate. Contaminants present in leachate depend on the types of materials buried in the landfill. Active landfills have monitoring programs to detect pollution problems. However, some old, inactive landfills do not have a monitoring system to assess leachate quality (Middle Gila River Watershed Management Study, 1998).

Disposal of liquid wastes at landfills and in industrial wastewater lagoons is another documented source of nonpoint pollution in the planning area. Disposal of industrial wastes in unlined lagoons, pits, or drywells was a commonly used disposal alternative in parts of the planning area prior to the availability of sewers. Some landfills were also used to dispose of some liquid wastes. Some of these wastes, such as VOCs, are now considered hazardous, and the resulting groundwater contamination has created several CERCLA ("Superfund") and WQARF sites.

Septic tanks in combination with a leach bed or a drywell are used for onsite disposal of domestic liquid wastes in unsewered parts of the planning area. There have been few documented groundwater quality problems attributable to the use of these systems in the MAG planning area (Arizona Department of Environmental Quality, 1988). However, industrial use of septic tanks and leach beds is a suspected source of contamination in some areas. Potential contaminants include nitrate, bacteria, and viruses.

Table 5.1 in Section 5.3, summarizes a registry of WQARF sites in the planning area and their status.

5.1.4 Wastewater Treatment Plant Effluent

Use of effluent for irrigation, disposal of effluent to stream channels, or groundwater recharge using effluent has potential to impact surface water or groundwater quality in parts of the planning area. Contaminants of major concern include nitrate and pathogens (bacteria and viruses). Boron, elevated concentrations of dissolved solids, and fluoride have also been identified as potential pollutants in some sewage effluent.

Impacts of sewage effluent to groundwater in the planning area were studied for decades at the 91st Avenue and 23rd Avenue Projects. At these pilot projects, effluent from the 91st Avenue (Flushing Meadows) and 23rd Avenue treatment plants was spread in infiltration basins and then used to recharge groundwater. Passage of the effluent through soils in the floors of the infiltration basins reduced the concentrations of many contaminants, but others were not affected (Bouwer, 1981).

As presented in Section 4.1.3, the Best Available Demonstrated Control Technology (BADCT) component of the 1986 Environmental Quality Act stipulates that specific technologies be incorporated in the processes of wastewater treatment facilities required to obtain an APP. The principal processes impacted by BADCT requirements for most wastewater treatment plants are disinfection, turbidity removal, and nitrogen removal. Disinfection requirements are satisfied using ultraviolet light, ozone, or one of several chlorine derivatives. Most filtration to remove turbidity is accomplished using granular media or diatomaceous earth in one of various available types of equipment. Biological nutrient removal (BNR) processes are utilized in the treatment facilities to remove nitrogen-related compounds through nitrification and denitrification. Although phosphorus removal is not a high priority for discharge to dry river beds or indirect recharge, it is an issue in systems where effluent is discharged and stored in manmade lakes and reservoirs. BNR processes targeted at nitrogen removal have also shown some effectiveness with phosphorus removal.

In recent years, groundwater recharge has become a popular option for effluent disposal in the planning area. The two most common methods of indirect recharge are percolation through surface basins or in dry river beds, and injection through aquifer storage and recovery (ASR) wells. Recharge provides major advantages as compared to irrigation reuse. It is not constrained by seasonal demands, it requires minimal land use, it causes less concentration by evapotranspiration, and some system owners gain volume credits for future water supply with the groundwater recharge.

5.1.5 Hydrologic Modifications

The term hydrologic modifications refer to man-made alterations to or withdrawals from surface waters or aquifers. Nonpoint source pollution issues that can be related to hydrologic modifications in surface waters and groundwater may include:

- Eutrophication and bacterial contamination of surface waters.
- Sedimentation and accumulation of heavy metals and persistent pesticides in reservoirs.
- Impacts of water storage projects and floodplain development on instream water quality and riparian habitats.
- Lowering of the water table and changes in vertical and horizontal directions of flow due to large-scale pumping and diversions.
- Formation of "perched" groundwater and mounding of shallow groundwater due to irrigation return flows or other sources of recharge.
- Quality degradation in the shallow groundwater from artificial recharge and storm water percolation; and in the deeper aquifers from downward migration of shallow groundwater contaminants, driven by hydraulic pressure from shallow recharge and by increased pumping from the deeper aquifers.
- Installation of channel stabilization structures such as riprap, gabions, and levees.
- Constriction of channel widths due to bridge and road crossings.
- Shallow groundwater levels rising due to decrease in pumpage.

Water quality impacts due to hydrologic modifications in the planning area are significant, and many cannot be eliminated or even significantly reduced without profound changes in the patterns of water use. The water quality and quantity impacts of hydrologic modifications are difficult to anticipate and are difficult to manage. Historically, they have been relegated to a position of secondary importance due to overriding water quantity concerns.

5.1.6 Leaks and Spills

Unintentional leaks and spills of chemicals and petroleum products were not identified as a nonpoint source category in the original 1979 MAG 208 Plan. However, during the period after the 1979 edition of the Plan was completed, leaks and spills from underground storage tanks and hazardous waste containments emerged as a groundwater quality problem of major proportions in the planning area. The magnitude of the problem began to be identified in the mid-1980s, when state and federal regulations for upgrading underground storage tanks (USTs) were enacted. Since then, many UST owners in the planning area have closed USTs rather than attempt to comply with the requirements of the new regulations. The regulations also include requirements for closure and clean-up of contamination from closed tanks. Leaks, spills, or other releases have been identified at an estimated 60 to 80 percent of the USTs that have been closed.

Most USTs in the planning area are used to store petroleum products, and most UST releases involve gasoline, motor oil, or diesel fuel. Some releases have involved solvents such as trichloroethylene (TCE), trichloroethane (TCA), and perchloroethylene (PCE). Because the depths to the water table is greater than 50 feet in most of the planning area, some small releases may be adsorbed by the soil and not reach the water table. However, a thick vadose zone does not necessarily provide groundwater protection against all releases. Furthermore, in parts of the planning area, soil below a depth of about 10 to 20 feet consists of boulders, gravel, and sand. These have low adsorption and high porosity, giving them less ability to retard the downward migration of contaminants. A leak from a UST can go undetected for years, and large quantities of products or chemicals can be released from a very small leak. In some cases, overfilling of USTs, and pipe leaks can also cause contamination.

5.2 NONPOINT SOURCE ACTIVITIES IN THE PLANNING AREA

Baseline studies on groundwater quality were completed prior to specific nonpoint source investigations (Schmidt,1979). The studies focused on existing conditions and how natural factors were influencing the ambient groundwater conditions. Data on nitrate in groundwater was organized to evaluate and define trends of increases or decreases over time.

In preparation of the 1979 MAG Water Quality Management Plan, the authors evaluated potential pollution from several nonpoint sources, including agriculture, urban runoff, feed lots, dairies, sanitary landfills, and gravel operations. Although much data existed for work done in other areas of the country, it became apparent that nonpoint sources are very site specific and data from one part of the country (particularly in the humid eastern U.S.)

cannot be readily used in another (i.e., in an arid or semi-arid area). That proved especially true in the arid southwest, due in part to the fact that much of the previous work dealt with impacts on perennial flowing surface waters and little with impacts on groundwater. This information guided formulation of a new approach to nonpoint source pollution assessment in the MAG planning area. Historical changes in chemical constituents present in the groundwater were evaluated relative to surface activities or natural influences to identify nonpoint sources of groundwater pollution in the area.

As part of the 1979 Plan follow up and implementation, MAG commissioned studies to more accurately evaluate specific nonpoint source issues, including:

1. Irrigation return flow and shallow groundwater,
2. Urban storm runoff,
3. Altered patterns of groundwater flow in the vicinity of Chandler,
4. Landfills along the Salt River, and
5. Pesticides (namely EDB and DBCP) and volatile organic chemicals (VOCs) in groundwater in eastern Mesa and other parts of the planning area.

These studies were conducted by Ken Schmidt and results are provided in reports located in MAG files.

The following paragraphs summarize past and present activities associated with specific nonpoint sources.

5.2.1 Shallow Groundwater

Shallow groundwater in the Salt River Valley (Valley) was evaluated for the Maricopa Association of Governments in the early 1980s, as part of a drywell study (Schmidt, 1985), and again in 2000 to support this plan update (Schmidt, 2000). The most recent study summarized and compared depths to shallowest groundwater for the Valley in the early 1980s and the late 1990s. It also addressed sources of groundwater recharge and discharge, reasons for water level rises, implications of these rises, impacts on groundwater quality, and groundwater management proposals.

There are three major subsurface geologic units in the Valley. They are designated as the Upper, Middle, and Lower Alluvial Units (UAU, MAU, LAU). The UAU is generally comprised of coarse-grained deposits above an average depth of about 250 feet. Historically, there was a large amount of pumpage from agricultural irrigation wells tapping the UAU. However, because of inferior groundwater quality in much of the Valley, shallow groundwater in this unit is sealed off in many active public supply and some SRP wells (particularly public supply wells). The MAU is primarily fine-grained in the central parts of geologic basins (i.e., near the Gilbert and Luke AFB areas). This unit's most important characteristic is that the fine-grained deposits limit the vertical movement of groundwater.

The LAU is the major unit tapped by modern-day public supply wells and by newer Salt River Project wells in most of the Valley.

According to the 2000 Study, depths to the shallowest groundwater in the planning area range from less than 20 feet along the Salt River downstream of 51st Avenue, along the Gila River below the confluence with the Salt River, and in the Buckeye area; and more than 300 feet beneath the northwest part of the Valley, primarily in areas not served with surface water (i.e., outside of the Salt River Project). Maps prepared in the early 1980s and the late 1990s for depths to shallow groundwater in the Valley compare generally well, although the more recent map is much more detailed in some areas.

In the earlier MAG study (Schmidt, December 1983), samples of shallow groundwater were collected from existing irrigation wells and from monitor wells. At irrigation wells, shallow water sometimes cascades into the well through openings in the well casing above the water table. The cascading water can be sampled by lowering a container down the well. Monitor wells for sampling shallow groundwater are constructed by drilling into the shallowest saturated zone.

The results of the study showed that in some areas near irrigation canals, shallow groundwater was recharged by canal seepage, and the impact on groundwater quality was generally positive. Water that seeps from canals is generally of better quality than that of groundwater beneath most of the former and present irrigated areas of the planning area. However, in other areas of shallow groundwater, the shallow groundwater was recharged from deep percolation of irrigation water and had a high salinity and nitrate content.

In six monitor wells that were installed near Gilbert for the specific purpose of sampling shallow groundwater affected by deep percolation of irrigation water, the concentration of total dissolved solids exceeded that of the applied water by a factor of three to four. Because of the thousands of shallow monitor wells that were installed in the Valley after the early 1980s, much more information is now available on shallow groundwater. Unfortunately, no valley-wide database has been developed for the water level measurements for these wells. If this were available, more detailed water-level maps could be made for shallow groundwater in the Valley.

In recent years, shallow groundwater levels in most parts of the planning area either have remained relatively constant or have risen. Virtually the only areas where shallow water levels are declining over the long-term are where surface water is not available for supply, and areas located away from stream channels. Water levels are rising in the UAU in some areas, particularly in Tempe, Gilbert, and Chandler. These are primarily where pumping of the shallow groundwater has decreased during the past two decades due to urbanization and/or the poor quality of the shallow groundwater.

For deep wells in the planning area there are two predominate trends regarding water levels. First, for lands served with Salt and Verde River water supplies, water levels generally fell until sometime in the 1970s and have generally risen since then. Second, for lands not served with such water supplies (i.e., north of the Arizona Canal and east of the Roosevelt Canal), water levels in these wells have generally continued to decline.

Historically, shallow groundwater in the planning area has been incidentally recharged by seepage from canals, deep percolation from lands irrigated with surface water supplies, and periodic large flows in the Salt and Agua Fria Rivers. The largest of these, deep percolation from irrigated lands, has decreased in recent years with urbanization. However, intentional recharge, from sources including CAP, SRP and reclaimed water, are quickly gaining popularity. The two most important factors causing observed water level rises are decrease in pumpage (Groundwater Management Act of 1980), and the wetter years beginning in the late 1970s that resulted in more stream flow down the Salt River and less pumpage from SRP wells compared to previously.

Another important issue impacting groundwater quality in the MAG planning area is salinity. All waters used for irrigation, urban as well as agricultural, contain salts. Excess irrigation water is applied to irrigated plants to prevent accumulation of salts in the root zone, and surface water and effluent containing dissolved salts are recharged to the groundwater through percolation basins and wells. Much of this salt quantity is being imported to the MAG area in our water supplies from the Salt River and the Central Arizona Project (Colorado River). The potential effects and management of salt accumulation in south-central Arizona are addressed in two recent papers: “Accumulation and Management of Salt in South Central Arizona”, Bouwer, 1999; and “Where do the salts go?”, Cordy and Bouwer, USGS Fact Sheet, June 1999.

The primarily long-term impacts of the shallow groundwater on the quality aspects are:

1. Degradation of the quality of groundwater in the MAU and LAU that is now pumped by many City wells.
2. Increased salinity due to extremely shallow groundwater.

5.2.2 Urban Storm Runoff

In a study of urban storm runoff, MAG evaluated potential impacts by sampling at two storm sewer outfalls along the Salt River and at a drywell in the central Phoenix area. At the sewer outfalls, grab samples of runoff were collected during six winter storms and one summer storm in 1979 and 1980. In the drywell study, storm runoff was sampled near a drywell, monitor wells were installed, and samples of groundwater were collected.

Results of the drywell study indicated that storm runoff may not necessarily have a significant adverse impact on the quality of groundwater. Heavy metals were detected in runoff, but mostly in nondissolved forms, presumably bound to fine-grained sediments such as silt and clay. The results also suggested that drywell sediments might contain high concentrations of some metals.

The Flood Control District of Maricopa County (FCD) has taken an active role in assisting local municipalities with addressing the goals and requirements of the federal NPDES Storm Water Program. The Phase I Storm Water Program helped generate several intergovernmental agreements between the FCD and local municipalities. Under such agreements, the FCD is conducting storm water sampling for several local cities.

Phase II of the program became final in late 1999, with a deadline for compliance of March 2003. Under Phase II, unincorporated portions of the County (basically all urbanized areas) will require a NPDES Permit for storm water. The FCD will lead a "storm water task force" to assist smaller communities with Phase II requirements.

All new projects requesting permits from the FCD will be impacted by Phase II requirements. Projects requesting discharge to FCD systems will be required to handle "first flush" contaminants prior to discharge, a type of pretreatment program. The FCD is actively involved with several major projects that deal with storm water quality issues. One is the Southeast Valley Regional Drainage System (SEVRDS), a large ADOT project that is focused on handling drainage from new outer loop freeway systems, including the San Tan. The project includes a large collection basin and wetland treatment system, located south of Chandler Boulevard near Maricopa Road.

5.2.3 Altered Patterns of Groundwater Flow

In two parts of the planning area, increases in the concentration of total dissolved solids in groundwater have impacted municipal water supply wells. In both of these areas, Goodyear and Chandler, groundwater historically was an important component of the municipal supply. MAG initiated studies to identify the reasons for the increased levels of TDS.

In the Chandler area, the results of the study were interpreted to indicate that increases in salinity in one of two areas were due to the downward migration of highly saline shallow groundwater. In a second area, highly saline groundwater was migrating horizontally. In both cases, migration was due to hydraulic gradients that had been induced by large-scale pumping.

Results from the study conducted at Goodyear were similar to the results for Chandler. Increasing concentrations of dissolved solids in the wells were attributable to the lateral movement of high salinity groundwater in response to hydraulic gradients that had been induced by large-scale pumping farther to the north.

In a recent evaluation of shallow groundwater in the planning area (Schmidt, 2000), a combination of existing and potential hydrologic modifications in groundwater were addressed. Several important long-term implications of rising water levels are:

1. If water levels in the MAU and LAU in some areas continue to rise, they will eventually become as shallow as water levels in the UAU. Downward flow of

groundwater from the UAU will then decrease, eventually resulting in increased water level rises in the UAU.

2. If water levels in the UAU rise sufficiently, more widespread water logging will result in parts of the Valley. There have already been a number of lawsuits involving shallow groundwater in the central Phoenix area.

3. If water levels rise to within 10 feet or so of the land surface, increased evaporation can occur, resulting in loss of this water.

4. In some areas, shallow groundwater levels are rising and the deep underlying groundwater is being pumped for public supply. Downward head gradients can be increased significantly in such areas, resulting in enhanced downward movement of poor quality groundwater from the UAU to the LAU. This will result in a long-term deterioration of the quality of water pumped from City wells in these areas, unless management practices are implemented to combat this.

5. One of the most important undesirable aspects of rising water levels is that less and less storage space eventually becomes available for existing and future recharge and water banking projects.

6. If the present trend continues, there will be little demand for pumping of shallow poor quality groundwater. This water will then gradually accumulate and be a long-term problem.

5.2.4 Landfills

On several occasions in the past two decades, inflows to the reservoir systems on the Salt and Verde Rivers exceeded storage capacity and significant quantities of water were released into the normally dry channel of the Salt River through metropolitan Phoenix. These flows caused flooding, washouts and an elevated groundwater table affecting landfills along the entire reach of the Salt River. The Salt River Landfill Advisory Committee, created by the City of Phoenix City Council in December 1984, identified 42 possible private and public landfills along the Salt River within the City of Phoenix. However, many other landfills outside the Phoenix City limits were not part of the study.

In February 1979, the Arizona Department of Health Services (ADHS), entered into a consent agreement with the City of Phoenix to cease operations at the Del Rio (16th Street) and 19th Avenue Landfills. The City of Phoenix also agreed to initiate geologic and hydrogeologic studies at the Del Rio Landfill, 19th Avenue Landfill, and 27th Avenue Landfill. These reports were submitted to the Arizona Department of Environmental Quality (ADEQ). An initial set of monitor wells was installed by the City at these three landfills and a quarterly groundwater quality monitoring program was initiated. Since 1979, the City has increased the number of groundwater monitor wells at each of the landfill sites. All groundwater monitoring data is submitted quarterly to the ADEQ. Elevated organic constituents have been detected in both upgradient and downgradient monitor wells at these landfills.

The 19th Avenue Landfill is a federal Superfund site. This landfill was extensively studied by environmental consultants retained by the City of Phoenix. A Remedial Action Plan (RAP) was approved by both ADEQ and U.S. EPA. Remediation efforts were completed and monitoring of the landfill CAP, methane, groundwater and flood control are on-going.

Another landfill, the Tri-Cities Landfill, was also evaluated by MAG as part of the landfill study. At monitor wells drilled downgradient from the landfill, "perched" groundwater was encountered during drilling, but no evidence of landfill leachate was identified in the monitor wells. Subsequent sampling of wells in eastern Mesa, as part of the MAG study of pesticides and VOCs, showed that VOCs were present in water from downgradient wells.

Additional monitor wells have been installed and monitoring is continuing. Since closure of the landfill, VOC concentrations have decreased in water from the monitor well to below the MCLs. Figure 5.1 shows the operation status and general location of active municipal solid waste landfills in Arizona.

5.2.5 Pesticides and VOCs

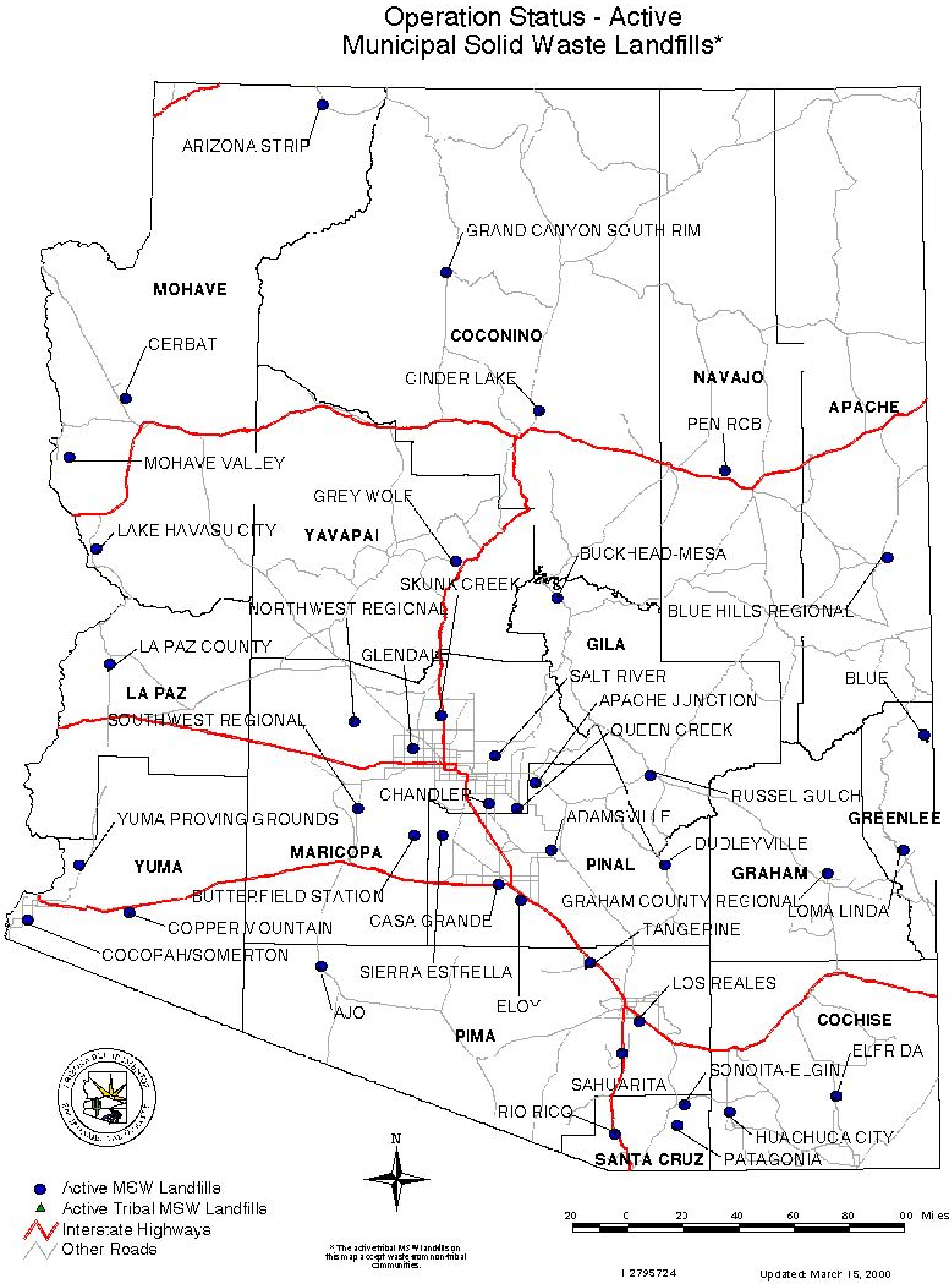
The occurrence of VOCs and pesticides in groundwater was investigated by MAG as a continuation of a study that was initiated by ADEQ. The objectives of the studies were to:

1. Identify problem areas that should be avoided during the siting of public water-supply wells; and
2. To formulate possible remedial action measures.

Initial water quality sampling for the pesticide dibromochloropropane (DBCP) was conducted by ADEQ in areas of citrus production. Contamination was identified in four areas: East Mesa, Chandler Heights, South Phoenix, and Glendale. MAG subsequently undertook additional sampling to more accurately assess the extent of DBCP and VOCs in groundwater in Mesa that might impact the municipal water supply. Contamination of groundwater by DBCP had necessitated the removal of some wells from the city water-supply system. Trichlorethylene (TCE) and other VOCs were also identified in some of the wells. These were irrigation wells, most of which were owned by SRP.

The results of the study indicated that VOCs were present in concentrations greater than regulatory standards in wells situated downgradient of the Tri-Cities Landfill, near the community of Lehi. TCE, perchloroethylene (PCE), Freon-113, and 1,1-DCE (dichloroethane) were detected most frequently and/or in highest concentrations. However, no drinking water wells had been affected by the VOCs, and therefore no municipal supply wells were threatened.

Figure 5.1


Operation Status - Active
Municipal Solid Waste Landfills*
ARIZONA STRIP
GRAND CANYON SOUTH RIM
MOHAVE
CERBAT
COCONINO
CINDER LAKE
NAVAJO
APACHE
PEN ROB
MOHAVE VALLEY
GREY WOLF
LAKE HAVASU CITY
YAVAPAI
BUCKHEAD-MESA
SKUNK CREEK
NORTHWEST REGIONAL
BLUE HILLS REGIONAL
LA PAZ COUNTY
GILA
GLENDALE
SALT RIVER
BLUE
LA PAZ
APACHE JUNCTION
SOUTHWEST REGIONAL
QUEEN CREEK
RUSSEL GULCH
CHANDLER
YUMA PROVING GROUNDS
ADAMSVILLE
GREENLEE
DUDLEYVILLE
MARICOPA
YUMA
PINAL
GRAHAM
BUTTERFIELD STATION
GRAHAM COUNTY REGIONAL
LOMA LINDA
COPPER MOUNTAIN
CASA GRANDE
TANGERINE
COCOPAH/SOMERTON
SIERRA ESTRELLA
LOS REALES
ELOY
AJO
COCHISE
PIMA
ELFRIDA
SONOITA-ELGIN
SAHUARITA
RIO RICO
HUACHUCA CITY
SANTA CRUZ
PATAGONIA
N
Active MSW Landfills
Active Tribal MSW Landfills
Interstate Highways
Other Roads
* The active tribal MSW landfills on this map accept waste from non-tribal communities.
20 0 20 40 60 80 100 Miles
1:2795724
Updated: March 15, 2000

DBCP was detected more frequently than were VOCs. It is estimated that 180,000 acre-feet of groundwater was contaminated, and three municipal water supply wells had been impacted and were removed from service. Depth-specific sampling showed that DBCP mainly occurred in groundwater that had characteristics of irrigation return flow. Therefore, the source of DBCP in the wells may have been precancellation applications of the chemical in the area's citrus orchards.

5.3 WATER QUALITY ASSURANCE REVOLVING FUND SITES

The Water Quality Assurance Revolving Fund (WQARF) was created by the Arizona Legislature in 1986 to provide a financial resource for the remediation of contaminated soil and water that poses an actual or potential risk to the public or environment. The WQARF program was modeled after the Federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Federal "Superfund" program. The 1986 Environmental Quality Act expanded WQARF to also address those sites where non-drinking water quality has been adversely impacted or threatened by the release of hazardous substances. WQARF supports a remedial action program administered by ADEQ, in the form of providing grants to other agencies for the coordination of cleanup efforts. WQARF is also a source of funds for emergency response activities.

In 1995, the ADEQ and ADWR established the Groundwater Cleanup Task Force to develop recommendations for the reform of the WQARF program. This effort resulted in the drafting and adoption of new WQARF legislation in 1997 (A.R.S. Title 49, Chapter 2, Article 5). The ADEQ is currently in the process of replacing the WQARF rules (A.A.C. R18-7-101 through R18-7-109) with new rules (Proposed A.A.C. R18-16-201 through R18-16-505).

The statutory changes, adopted in 1997, to the WQARF legislation established the WQARF Registry replacing the Priority List. In December 2000, ADEQ listed 18 sites within the MAG 208 Planning Area on the WQARF registry. Table 5.1 provides a description and current status of the WQARF registry sites.

Table 5.1 Status of WQARF Sites in MAG 208 Planning Area
MAG 208 Water Quality Management Plan Update

Site Location	Site Description	Date Placed on Registry	Status
16th Street and Camelback	Soil contaminated with total petroleum hydro-carbons, groundwater contaminated with tetrachloroethene (PCE), dichloroethane (1,2, DCA) and benzene	4/99	Groundwater in area not used for drinking water purposes. Community informed of on-site activities.

Table 5.1 Status of WQARF Sites in MAG 208 Planning Area MAG 208 Water Quality Management Plan Update			
Site Location	**Site Description**	**Date Placed on Registry**	**Status**
Central and Camelback	Groundwater contaminated with PCE	1/99	Early Response Action in progress.
24th Street and Grand Canal	Groundwater contaminated with PCE	5/00	ADEQ plans to conduct a Remedial Investigation.
32nd Street and Indian School Road	Groundwater contaminated with PCE	4/99	ADEQ plans to conduct a Remedial Investigation.
38th Street and Indian School Road	Groundwater contaminated with PCE	4/99	ADEQ plans to conduct a Remedial Investigation.
40th Street and Indian School	Groundwater contaminated with PCE	4/99	ADEQ plans to conduct a Remedial Investigation.
40th Street and Osborn Road	Groundwater contaminated with PCE	4/99	ADEQ plans to conduct a Remedial Investigation.
48th Street and Indian School Road	Groundwater contaminated with PCE	4/99	Site investigation completed, ADEQ negotiating agreement with SRP to develop source control remedy.
East Washington Fluff	Auto shedder fluff co-mingled with native soil, other known contaminants are lead and polychlorinated biphenyls (PCBs)	6/99	ADEQ plans to conduct a Remedial Investigation.
Estes Landfill	Soil contaminants are arsenic, lead and thallium; groundwater contaminants are vinyl chloride, DCE, cis-1,2-DCE, TCE, DCB, chlorobenzene, 1,1-DCE, 1,4-DCB, PCE, benzene, 1,2-DCA, chloroform, bis (2-ethylexyl) phthalate, arsenic, barium, chromium, cadmium, lead, manganese, and nitrate.	4/98	Final Remedial Investigation completed in July 1999. Feasibility Study scheduled for completion in early 2001. Schedule for Record of Decision is December 2001.

Table 5.1 Status of WQARF Sites in MAG 208 Planning Area MAG 208 Water Quality Management Plan Update			
Site Location	**Site Description**	**Date Placed on Registry**	**Status**
South Mesa	Groundwater contaminated with PCE	8/98	Early response action was wellhead treatment implemented by SRP from 1994 to 1996. Second early response action was soil vapor extraction system currently inactive. Existing data are under review to determine further remedial requirements.
East Grand Avenue	Groundwater contaminated with PCE, TCE, 1,1-DCE, 1,1-DCA, and vinyl chloride	4/98	Contaminated drinking water wells in area shut down. Remedial investigation ongoing. Eight monitor wells installed in 2000. Groundwater sampling results being evaluated to determine location of future monitor wells.
West Grand Avenue	Groundwater contaminated with PCE, TCE, 1,1-DCE, 1,1-DCA, and vinyl chloride	4/98	An interim remedy soil vapor extraction system was shut down in 1998. Plan to restart SVE system, if TCE levels are minimal - remedial efforts will be considered complete.
North Plume	Groundwater contaminated with PCE, TCE, 1,1-DCE, 1,1-DCA, and vinyl chloride	4/98	Remedial investigation is on-going. ADEQ installed 18 monitor wells in 2000. Groundwater sampling results being evaluated to determine location of future monitor wells. Soil remediation efforts on-going.
North Canal Plume	Groundwater contaminated with PCE, TCE, 1,1-DCE, 1,1-DCA, and vinyl chloride	6/98	Remedial investigation activities expected to be completed by September 2001.

Table 5.1 Status of WQARF Sites in MAG 208 Planning Area MAG 208 Water Quality Management Plan Update			
Site Location	**Site Description**	**Date Placed on Registry**	**Status**
West Osborn Complex	Groundwater contaminated with PCE, TCE, 1,1-DCE, 1,1-DCA, and vinyl chloride	1998	SVE system continuing operation. Lateral extent of groundwater contamination under investigation. Remedial investigation and feasibility study related to groundwater contamination expected to be finalized in 2001.
West Van Buren	Groundwater contaminated with PCE and TCE	4/98	Groundwater flow model being developed. Groundwater sampling collected semi-annually. Early response action being developed for groundwater. SVE and air sparging in operation for soil contamination. Groundwater monitoring expanded in 2000.
Western Avenue PCE	Groundwater contaminated with PCE	12/98	Pump and treat system in operation. Remedial investigation planned. Groundwater monitor wells installed.

5.3.1 Voluntary Remediation Program

The Voluntary Remediation Program (VRP) can be used to begin remedial actions at a site by a property owner, prospective property buyer, or other interested party. The purpose of the VRP is to promote the clean up of contaminated sites by providing timely reviews of the remedial plans and increasing cooperative efforts between the volunteer party and ADEQ. The VRP encourages remediation to acceptable levels by providing No Further Action determinations when this goal is met. The VRP participants submit an application that describes the site and remedial efforts, and a voluntary remediation agreement that grants ADEQ site access and provides ADEQ with the costs for the review of the remedial efforts.

Currently in the planning area, there are 18 active sites participating in the VRP. The majority of these sites have soil contamination. The project status report for the VRP listed three sites that had defined groundwater contamination.

ADEQ also seeks to facilitate the cleanup and redevelopment of "brownfield" properties through the VRP. A "brownfield" is defined as an abandoned or underutilized property with an active redevelopment potential that is complicated by either real or perceived environmental contamination. Once the source of jobs and economic benefits to the entire community, these property frequently lie abandoned for fear of the contamination and the liability it implies.

Tools that ADEQ offers for brownfields redevelopment include a Prospective Purchaser Agreement to limit potential liability for existing contamination, Phase I site assessments for qualifying brownfield properties, and eligibility certification for the federal Brownfields Tax Incentive. Funding and grants for brownfields investigation and cleanup are offered through two mechanisms: the Arizona Brownfields Cleanup Revolving Loan Fund and the Phase I Assessment Grant program. Additional tools and programs are offered through the EPA Brownfields Economic Redevelopment Initiative.

5.4 COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA) SITES – SUPERFUND

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as the Superfund, was established in 1980 to provide for the clean up of sites contaminated with hazardous substances that pose the greatest threat to human health and the environment throughout the United States. CERCLA was amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA) to provide additional provisions for encouraging the use of permanent remedies, coordination with State legislation, site ranking to ensure accurate assessment of risk to the public and environment, and increased funding. Sites that are known to have or threaten the release of hazardous substances are proposed for the National Priority List (NPL). The NPL includes two sections, one for sites that are generally evaluated and remediated, and the other for sites owned and operated by other Federal agencies. The EPA determines whether the proposed sites are placed on the general NPL, the Federal facility listing is typically addressed by other Federal agencies. Placement on the NPL is not a guarantee of funding for remediation efforts.

In the planning area, there are 5 locations listed as general Superfund sites and two facilities listed as Federal sites on the NPL. Table 5.2 provides a listing of the Superfund sites in the planning area and the dates of proposed and final placement on the NPL.

Table 5.2 Status of National Priority List (NPL) Sites in the MAG 208 Planning Area MAG 208 Water Quality Management Plan Update				
Description	**Location**	**Date Proposed**	**Date Listed**	**Status**
General Superfund Sites				
Hassayampa Landfill	Hassayampa	06/86	07/87	Some soil vapor remediation has occurred and groundwater remediation is ongoing.
Indian Bend Wash Area North Segment Indian Bend Wash Area South Segment	Scottsdale	12/82	09/83	On-going pump and treat groundwater remediation efforts. Feasibility study addendum, currently under review by EPA, evaluates effectiveness of existing remediation efforts and provides additional remedial options. For South Segment contact City of Tempe or EPA (Melissa Pennington 415/744-1141)
Litchfield Airport Area	Goodyear/ Avondale	12/82	09/83	On-going soil and groundwater remediation efforts.
Motorola, Inc. – 52nd Street Plant	Phoenix	10/84	10/89	On-going pump and treat groundwater remediation effort at Operable Unit 1 (OU1). Soil gas recovery and treatment at OU1. ADEQ currently conducted mandatory five-year review of the remedial efforts at OU1. OU2 – groundwater containment and treatment system being constructed. OU3 – EPA conducting remedial investigation, ADEQ investigating source areas. Focused Remedial Investigation being conducted at Honeywell facility within Superfund site boundaries.
Nineteenth Avenue Landfill	Phoenix	12/82	9/83	Remediation efforts completed. Monitoring of landfill cap, methane, groundwater and flood control on-going.

Table 5.2 Status of National Priority List (NPL) Sites in the MAG 208 Planning Area MAG 208 Water Quality Management Plan Update				
Description	**Location**	**Date Proposed**	**Date Listed**	**Status**
Federal Superfund Sites				
Luke Air Force Base	Glendale	07/89	08/90	Currently, LAFB is in the process of being delisted from the NPL.
Williams Air Force Base	Chandler	07/89	11/89	Six operable units identified. OU1 – Additional remedial efforts under review. OU2 – Remedial investigation completed. OU3 – Record of Decision amendment required to approve risk based standard assessment. OU4 – VEMUR. OU5 – Record of Decision closed. OU6 – Soil removal action planned.

5.5 LEAKING UNDERGROUND STORAGE TANK PROGRAM

The EPA issued regulations in the late 1980s requiring owners and operators of underground storage tanks to upgrade, replace, or close USTs that do not meet technical standards specified by the EPA to prevent spills, overfilling and corrosion. The owners and operators were given a deadline of December 1998 to meet the standards.

Owners and operators with substandard UST systems were given three options for meeting the EPA requirements before the December 1998 deadline. The UST system could be upgraded, existing UST could be upgraded to meet standards, or closed. The option of upgrading a system to meet standards was only viable where the tank meets corrosion protection requirements or EPA approved site specifics do not warrant the addition of cathodic protection.

ADEQ has prioritized UST inspections according to the potential risk to the public or environment. The ADEQ will also inspect facilities that are reportedly operating without having completed the EPA upgrade requirements.

In the planning area, there are 3,188 closed LUST cases involving 1,745 locations. Currently, there are 1,322 active LUST cases involving 715 different locations. A total of 482 of these cases involve groundwater.

5.6 EXISTING REGULATORY PROGRAMS

The Arizona Department of Environmental Quality (ADEQ) was established in 1986 and designated as the lead state agency with responsibility for regulating and abating nonpoint sources of water pollution. Specific programs that have been developed within ADEQ are described in the following sections. None of these programs existed in 1979, when the initial MAG 208 Plan was prepared, and some of the programs have been significantly modified since the 1993 Plan.

5.6.1 Aquifer Protection Permits

5.6.1.1 Individual Permits

ADEQ's Aquifer Protection Permit (APP) program is the principal management program for regulating discharges to groundwater and most other sources that are considered nonpoint under federal definition. Aquifer protection permits are also required for point source discharge to surface waters. A "discharge" (A.R.S. §49-201.10) means the addition of a pollutant from a facility either directly to an aquifer or to the land surface or the vadose zone in such a manner that there is reasonable probability that the pollutant will reach an aquifer. The following are considered to be "discharging" facilities that require permits:

- Surface impoundments, pits, ponds, and lagoons.
- Solid waste disposal facilities.
- Injection wells.
- Land treatment facilities.
- Facilities adding pollutants to a salt dome, salt beds, drywells, underground caves, or mines.
- Mine tailings piles and ponds.
- Mine leaching operations.
- Septic tank systems that have a capacity greater than 2000 gallons per day.
- Underground water storage facilities (if wastewater effluent is used).
- Sewage or wastewater treatment facilities.
- Point source discharges to navigable waters.

A facility in one of these categories is defined as a discharging facility and requires that the owner/operator acquire either a general or an individual APP, as required by statute.

In late 2000 the Governor's Regulatory Review Council approved three rule packages that are a part of the ADEQ Water Quality Division's unified water quality permit initiative. One of the three, the Unified Water Quality Permit Rule, consolidated the existing Sewerage System rules into the APP program, thereby eliminating duplicate permits and streamlining processes. The new rule established an entirely new general permit framework and greatly expanded general permit opportunities. The rule became effective January 1, 2001.

5.6.1.2 General Permits

ADEQ has the statutory authority to issue general APPs for categories of facilities or activities that are similar in nature, large in number, for those for which the cost of issuing an individual permit cannot be justified by any environmental or public health benefit to be gained in such issuance, or where the appropriate conditions for aquifer protection can be met without an individual permit.

<u>General Permit types with specific conditions listed in rule (A.A.C. R18-9-A301 through R18-9-E323)</u>

Table 5.3 summarizes the four types of general permits (Types 1, 2, 3, and 4) for which facilities may qualify. Forty two (42) general permits are listed from the department's Unified Water Quality Permit rules, adopted January 1, 2001.

Table 5.3 General Permits in the Unified Water Quality Rule
MAG 208 Water Quality Management Plan Update

General Permit Number and Description	Requirements to Qualify for General Permit
1.01 Discharge of wash water - Sand and gravel, placer mining and similar operations including construction	Limited to physical processes with no addition of hazardous substances.
1.02 Discharge of hydrostatic test water from drinking water systems - Water distribution systems and previously unused pipelines	Test water must meet aquifer water quality standards (AWQS). No discharge to waters of the US without a NPDES permit. Site must be restored to natural grade.
1.03 Discharge of hydrostatic test water from other pipelines - Pipelines previously used to transmit fluids (not drinking water)	Discharge is to lined impoundment. Design requires subgrade preparation or underliner and liner to minimize discharge. Test water must be removed within 60 days, liner removed and disposed appropriately, and site restored to natural grade.
1.04 Discharge of water, drilling fluids or drill cuttings from wells - Water quality sampling, hydrologic parameter testing, well development or redevelopment and potable water system repair and maintenance	Discharge of water, drilling fluids, drill cuttings from well must be to same aquifer in approximately the same location or under NPDES permit.

Table 5.3 General Permits in the Unified Water Quality Rule MAG 208 Water Quality Management Plan Update	
General Permit Number and Description	**Requirements to Qualify for General Permit**
1.05 Discharges of filter backwash less than 1,000 gpd - Filter backwash or returns from potable water treatment system, refrigeration unit condensate, evaporative cooler overflows, heat exchange system, or swimming pool	Discharge is minimized to less than 1,000 gpd to injection well, impoundment or leach line.
1.06 Burial of waste mine tires at mine sites - Provides APP for burial of waste mine tires regulated under R18-8-701 et. seq.	No discharge anticipated if cover requirements of R18-8-703 are met.
1.07 Operation of dockside facilities and watercraft - Docks that service watercraft, boats, houseboats, and other watercraft with marine toilets	Docks must provide restroom facilities and disposal of watercraft marine toilet wastewater, bilge water, or other wastewater to prevent discharge into waters of the state.
1.08 Earth pit privy if approved by a county health or environmental department - Examples where approval may given could include use during an emergency; or use at a pubic gathering or construction site	Design and installation must be approved by county health or environmental department under A.R.S. Title 36 or a delegation agreement.
1.09 Sewage Treatment Facilities less than 20,000 gpd operating under General Permit prior to 1/1/01 - Small sewage treatment facilities including package plants and expanded on-site wastewater treatment facilities	Design and installation approved under R18-9-801 et. seq. and according to Engineering Bulletin 12. Cannot: cause or contribute to violation of AWQS; increase flow; treat non-typical sewage; treat flows with hazardous substances or hazardous wastes; or create an environmental nuisance.
2.01 Drywells that drain areas where hazardous substances are used, stored, loaded or treated - Drywells are common for storm water disposal at facilities with potential for spills of pollutants into those drywells	BADCT limits drywell location and requires flow control or pretreatment device. Existing drywells require certification that past discharges have not impacted groundwater quality. Operation limited to storm water disposal. Requires control of detrimental practices; recordkeeping; reporting of spills; maintenance; inspections; employee training; and sampling.
2.02 Intermediate stockpiles at mining sites - Temporary storage of in-process materials at mine sites	BADCT consists of design, construction and operation to prevent impounding water; no hazardous substances may be added. Requires quarterly inspections; closure and notice of closure to the Department.

Table 5.3 General Permits in the Unified Water Quality Rule
MAG 208 Water Quality Management Plan Update

General Permit Number and Description	Requirements to Qualify for General Permit
2.03 Hydrologic tracer studies - Investigation performed to define properties of hydrologic system.	BADCT limits tracers - cannot use hazardous or radioactive materials; limits on well injection; must capture tracer within site boundaries. Monitoring, reporting and recordkeeping required.
3.01 Lined impoundments containing the following sources: 1. Evaporative cooler overflow 2. Short term process upsets 3. Storm water 4. Water from fire fighting 5. Cooling, heat exchange, and blowdown water 6. Wastewater from potable water treatment, food washing, and industrial laundries	In most instances these facilities contain wastewater that does not contain a strong concentration of pollutants and does not exceed AWQS. Process upsets will only be retained in the impoundment for less than 60 days. Design requires subgrade preparation and pond depth with liner configuration that minimizes discharge to less than 550 gpd per acre. ADEQ reviews and approves the design. Permittee must have a contingency plan for accidental releases and unauthorized inflows to the impoundment.
3.02 Process water discharges from water treatment plants - Impoundments or surface water discharges of filter backwash water from either a potable or industrial water treatment process	Monitoring for compliance with AWQS included as permit condition. Siting and setbacks provide a means for pathogen die-off that reduces levels below the AWQS. ADEQ reviews and approves the design and siting.
3.03 Vehicle and equipment washes - Facilities consist of a wash pad, a conveyance that is a pipe or lined ditch, and an impoundment for disposal. Commercial car and truck washes may use this general permit. Also, facilities used to wash mining vehicles, cement and gravel trucks, construction equipment and other industrial vehicles are covered by this general permit.	BADCT consists of restrictions on source water, use of liner technology or an unlined facility with pretreatment and discharge limitation, and operational inspection and maintenance. Also, water quality monitoring requirements are imposed if a liner is not used. ADEQ reviews and approves the design. Either the liner or the monitoring assures compliance with AWQS.
3.04 Non-storm water impoundments at mining sites can receive water from any of the following sources: 1. Seepage from tailings, process areas, or rock piles excluding those subject to leaching. 2. Process solutions from upsets only if they are for temporary containment. 3. Storm water. 4. Sand and gravel wash water.	BADCT consists of liner design and construction to minimize discharge to less than 550 gpd per acre. This process includes site preparation, slope stability, protection from flooding, liner inspection and maintenance. The permittee must have the design reviewed by an engineer and ADEQ also reviews and approves the design. Permittee must have a contingency plan for accidental releases and unauthorized inflows to the impoundment.

Table 5.3 General Permits in the Unified Water Quality Rule MAG 208 Water Quality Management Plan Update	
General Permit Number and Description	**Requirements to Qualify for General Permit**
3.05 Disposal wetlands - Virtually any surface discharge of class A+ reclaimed wastewater can qualify for this general permit. The general permit does not extend to the wastewater treatment facility that is the source of reclaimed water which still needs an individual APP	BADCT consists of ensuring that the source water to the wetland is maintained at a high quality and is accomplished by the APP for the wastewater treatment plant. This provision will also ensure that AWQS are met for all constituents except total coliform bacteria. For coliform bacteria the AWQS will be met by using a 100 foot setback criteria for any water supply well.
3.06 Constructed wetlands to treat acid rock drainage at mining sites - Constructed wetlands used to treat acid rock drainage from a closed facility	BADCT design requires subgrade preparation and pond depth with liner configuration that minimizes discharge to less than 550 gpd per acre. Liner material must be compatible with the drainage solution. Treatment cells must be sized to achieve treatment to standards specified for water released from the facility. ADEQ reviews and approves the design. Any water released from the wetlands must meet AWQS, fall within a specified pH range, and have a sulfate level below 1,000 mg/L. Monitoring is required to ensure that these water quality criteria are met.
3.07 Tertiary treatment wetlands - Constructed wetlands used to further treat secondary effluent to meet tertiary treatment levels	BADCT design requires subgrade preparation and pond depth with liner configuration that minimizes discharge to less than 550 gpd per acre. Treatment cell must be sized and planted to achieve tertiary treatment. Flood protection provisions are included. ADEQ reviews and approves the design. Any water released from the wetlands must meet an individual permit that will require meeting AWQS. Furthermore, the minimum separation from groundwater of 20 feet and a setback from supply wells of 100 feet ensures that any seepage from the liner system will meet AWQS.
4.01 Sewage collection systems - Pipelines, conduits, manholes, pumping stations, forcemains, and all other structures, devices, and appurtenances that collect, contain, and conduct sewage from its source to the entry of a sewage treatment facility or on-site wastewater treatment facility serving more than one residence	BADCT consists of design, installation, and operation and maintenance standards to ensure adequate flow capacity; proper flow velocities; adequate inspection, maintenance, testing, visibility, and accessibility; and structural integrity. Minimized exfiltration protects water quality.

Table 5.3 General Permits in the Unified Water Quality Rule MAG 208 Water Quality Management Plan Update	
General Permit Number and Description	**Requirements to Qualify for General Permit**
Conventional septic tank system or alternative system installed at a site to treat and dispose of wastewater, predominantly of human origin, generated at that site. On-site wastewater treatment facility with less than 3,000 gpd daily flow: 4.02 Septic tank with disposal by trench, bed, chamber technology, or seepage pit 4.03 Composting toilet 4.04 Pressure distribution system 4.05 Gravelless trench 4.06 Natural seal evapotranspiration bed 4.07 Lined evapotranspiration bed 4.08 Wisconsin mound 4.09 Engineered pad system 4.10 Intermittent sand filter 4.11 Peat filter 4.12 Textile filter 4.13 RUCK® system 4.14 Sewage vault 4.15 Aerobic system with subsurface disposal 4.16 Aerobic system with surface disposal 4.17 Cap system 4.18 Constructed wetlands 4.19 Sand lined trench 4.20 Disinfection devices 4.21 Sequencing batch reactor 4.22 Subsurface drip irrigation disposal	Design, installation, and operation and maintenance standards. Each general permit has performance standards for TSS, BOD_5, total nitrogen and total coliform to overcome site limitations and provide basis for system selection.

Table 5.3 General Permits in the Unified Water Quality Rule MAG 208 Water Quality Management Plan Update	
General Permit Number and Description	**Requirements to Qualify for General Permit**
4.23 On-site wastewater treatment facilities, 3,000 to less than 24,000 gpd design flow - Larger sized conventional septic tank system or alternative system - excludes aerobic systems, disinfection devices, sequencing batch reactors, and seepage pits	Technologies and designs consistent with other general permits. Requires performance assurance plan and reporting.
1 Compliance with Aquifer Water Quality Standards (AWQS) is measured at point of compliance as identified in R18-9-A302.	

5.6.1.3 BMP and BADCT

ADEQ has two regulatory tools to control pollutant discharges under the APP program: BADCT (best available demonstrated control technology) and BMPs (best management practices). An individual aquifer protection permit will require that a facility can demonstrate compliance with BADCT. To maintain eligibility for operation under a general permit, persons must comply with BMPs. Otherwise, ADEQ may require an individual permit.

ADEQ is in the process of preparing BMP and BADCT guidance documents. BADCT guidance documents have been prepared for the following categories of discharges.

- Landfills.
- Mining.
- Industrial wastes and waste streams.

Best Management Practices may be established for the following facilities or activities:

- On-site facilities for urban runoff.
- Storm sewers.
- Urban runoff.
- Silviculture activities.
- Septic tank systems that have a capacity not greater than 2,000 gallon per day.
- Agricultural application of nitrogen fertilizer.
- Concentrated animal feeding operations.
- Other facilities or activities that are established by rule.

BMP guidance documents have been prepared for those categories of facilities for which general permits have been issued:

- Sludge application.
- Recharge from water treatment plants of less than 1,000 gallons per day.
- Hydrostatic pipeline testing.
- Application of nitrogen fertilizer.
- Concentrated animal feeding operations.

5.6.1.4 Exempt Facilities

By statute, certain types of activities and facilities are exempt from the APP program. These activities or facilities may be regulated under other programs. They are perceived as not representing a threat to water quality.

A detailed list of exemptions and facilities to which the program does not apply can be found in A.R.S. §49-250, and A.A.C. R18-9-102 and 105.

5.6.2 UST Program

Leaking underground storage tanks are a nonpoint source that has had a significant impact on groundwater quality in the planning area. ADEQ has been given the statutory authority for regulating USTs and controlling and abating releases from leaking USTs.

The state statutes provide for UST registration, release detection systems, release detection record keeping, release reporting, and corrective action. The statutes also:

1. Specify that UST owners provide evidence of financial responsibility,
2. Establish liability for guarantors,
3. Specify general tank performance standards,
4. Establish a UST revolving fund for costs of corrective actions, and
5. Give ADEQ authority to establish rules for administering and carrying out the UST program.

The ADEQ Underground Storage Tank (UST) Program submitted the draft rule package to the UST Policy Commission in April 2000 for its review. The Commission unanimously accepted and recommended the rule package. However, due to the substantive changes relative to the October 1999 proposed rule, the process was extended. The rule is scheduled to be filed with the Secretary of State in the Spring of 2001. Major issues addressed in the draft rule include:

- Release notification and reporting;

- LUST site classification;
- LUST site investigations and remedial responses;
- Corrective action plans and standards; and
- Sampling and reporting requirements.

5.6.3 Drywell Program

The Environmental Quality Act gives ADEQ the authority to establish a drywell management program. The Act authorizes ADEQ to establish rules for:

1. The performance, operation, construction, design, closure, location, and inspection of drywells; and
2. Licensing of drywell drillers, and 3) registration of all existing and new drywells.

Drywells are regulated by the A.R.S. 49-331 through 336, and APP statutes and rules. Under ADEQ's new Unified Permit Program, permits for drywells are considered Type 2, General Aquifer Protection Permit (APP). The APP requires that a Notice of Intent to Discharge be filed with ADEQ prior to discharge. No verification is provided by ADEQ but the permittee must agree to comply with the terms of the specific general permit that applies to the discharge.

Drywells are designed and constructed specifically to dispose of storm water runoff. ADEQ has developed and adopted rules for the location, design, construction, operation and maintenance of drywells (A.A.C. R18-9-C301). ADEQ has developed guidance that should be followed for drywell construction, maintenance, siting, investigation, decommissioning, and closure.

5.6.4 Hazardous Waste Management Program

The federal and state programs are among the oldest and most highly developed of nonpoint source control programs in the planning area. The Resource Conservation and Recovery Act of 1976 (RCRA Subtitle C) has been amended several times since its enactment, most importantly in 1984 by the Hazard and Solid Waste Management Amendments. RCRA Subtitle C is a statute that designs a complex set of regulations regarding the management of hazardous wastes for generators and transporter. Arizona has generally adopted, with slight modifications, the federal RCRA regulations by reference. These are embodied in the Arizona Hazardous Waste Management Act (Arizona Revised Statute 49-901 et seq.). Regulations are contained in the Arizona Administrative Code Title 18.

Additionally, regulations and controls have spawned the development of a brand new industry to transport, dispose, treat and recycle hazardous wastes. However, the effectiveness of the Arizona program has been hampered in the past by staff shortages and insufficient resources. As a result, various inspections of hazardous waste facilities are not timely and compliance actions are delayed. At some facilities, noncompliance has resulted in known releases of hazardous wastes to the environment. When remediation has been postponed, potential impacts to water quality has increased in severity.

Currently, Arizona has approximately twenty active Treatment, Storage and Disposal (TSD) Hazardous Waste Facilities. Of these TSD facilities, only eleven are commercial hazardous waste facilities in business to treat and/or or store various hazardous waste streams.
Arizona does not have a TSD facility open for hazardous waste disposal. Generally, hazardous wastes that are not recycled or treated are only stored in Arizona for one year or less to be transported outside the state for disposal. The lack of a local disposal facility may contribute to noncompliance with existing regulations. Hazardous waste disposal is expensive, and the premium for out-of-state disposal is a financial burden. Therefore, an instate disposal facility for hazardous waste could improve the degree of compliance and reduce nonpoint pollution.

5.6.5 Pesticide Management

The 1986 Arizona Environmental Quality Act (EQA) mandated that ADEQ adopt a program of Pesticide Contamination Prevention (PCP) for agricultural use pesticides. The purpose of the program is to issue permits to the chemical industry, allowing them to register agricultural pesticides in Arizona if they meet particular requirements. Without the permit, specific agricultural pesticides can not be sold or used in the state.

The PCP program integrates six regulatory mechanisms as defined in statute in the Arizona EQA to accomplish the goal of protecting Arizona groundwater from NPS agricultural use pesticide contamination. These regulatory mechanisms consist of the following:

- Information submittal by pesticide registrants.
- Establishment of Specific Numeric Values (SNV) for mobility and persistence factors for pesticide active ingredients.
- Development of a Groundwater Protection List (GWPL).
- Reporting on the use and sales of pesticides on the GWPL by users and dealer.
- Monitoring and testing of groundwater and soil for pesticides on the GWPL associated with agricultural uses.
- Upon confirmed detection, review of circumstances surrounding contamination to determine whether use of the detected pesticide should be modified or discontinued.

By statute, the registrant of an agricultural use pesticide for use in Arizona must submit to the ADEQ specific criteria for each active ingredient for evaluation for groundwater pollution potential. These criteria are listed as follows:

- Water Solubility.
- Vapor Pressure.
- Henry's Law Constant.
- Octanol Water Partition Coefficient.
- Soil Adsorption Coefficient.
- Hydrolysis Half-life.
- Photolysis Half-life.
- Soil Aerobic Metabolic Half-life.
- Soil Anaerobic Metabolic Half-life.
- Field Dissipation Half-life.

The ADEQ has established Specific Numeric Values by rule for water solubility, soil adsorption coefficient, half-life values for hydrolysis, anaerobic and aerobic soil metabolism and field dissipation. By rule, an active ingredient of an agricultural use pesticide which has a water solubility greater than 30 ppm or a soil adsorption coefficient (k_d) of less than 5 and any dissipation half-life greater than 3 weeks is indicated as having a capacity of leaching to groundwater. An agricultural use pesticide is therefore categorized as a "suspect leacher" if its physico-chemical and environmental criteria indicated that it is both mobile (based on water solubility or soil adsorption value) and persistent (based on any of the dissipation half-life).

The ADEQ shall be establishing by rule a Groundwater Protection List (GWPL) consisting of active ingredients for agricultural use pesticides that have the potential to pollute groundwater. Agricultural use pesticides that are identified as both mobile and persistent are placed on the GWPL. Dealers/users shall be required to make quarterly reports to the Director of ADEQ of all pesticide sales.

Agricultural use pesticides that are placed on the GWPL shall be included in statewide groundwater monitoring and soil testing programs. ADEQ should monitor both soil and groundwater in those areas of the state where agricultural use pesticides have been used and where a reasonable probability exists that a specific active ingredient may leach to pollute groundwater.

A registrant of an agricultural use pesticide shall be notified when the confirmed detection of an active ingredient or degradation product of an agricultural use pesticide is detected in either groundwater or soil at or below the deepest of the following depths:

- 8 feet below the soil surface or below the root zone of a crop where the active ingredient was used.
- Below the soil microbial zone.
- In the groundwater of the state.

Upon notification that an active ingredient or a degradation where detection has been confirmed and poses a threat to public health, a registrant may be required to modify the label use instructions in such a manner that the active ingredient cannot pollute groundwater. If the label cannot be modified in a manner that will ensure that the active ingredient will not pollute groundwater in the state, the registration of the pesticide shall be canceled. If an agricultural use pesticide is found to be carcinogenic, mutagenic, teratogenic or toxic to humans, its registration shall be immediately canceled.

5.6.6 Water Quality Assessment and Management Program

ADEQ has the statutory authority to establish and conduct monitoring programs for surface and groundwater for the specific purposes listed below:

- Detect the presence of new and existing pollutants.
- Determine compliance with applicable water quality standards.
- Determine the effectiveness of BMPs and BADCTs.
- Evaluate the effects of pollutants on public health or the environment.
- Determine water quality trends.

The ADEQ Water Quality Assessment and Management program carries out mandates for water quality management and protection in Arizona. The mission of the program is to assess water quality conditions and pollution problems across the state, establish water quality standards and management plans, provide technical assistance, and develop an integrated planning strategy for all water programs. Planning and implementation activities are coordinated with a variety of federal, state, local, and regional agencies. In addition to providing data, technical support, public outreach, and training, the program is also responsible for the following tasks and activities:

- Assess the quality of Arizona's surface water and groundwater and prepare list of "water quality limited waters" pursuant to 303(d) federal Clean Water Act.
- Prepare reports to the Governor and others on monitoring results, water quality conditions and program effectiveness.
- Administer the Pesticide Contamination Prevention Program: submit pesticide chemistry and environmental fate information.

- Establish specific numeric values for pesticides and environmental fate parameters.
- Generate the Groundwater Protection List (GPL).
- Regulate the use of pesticides on GWPL; perform soil and groundwater monitoring for pesticides on the GWPL.
- Develop pesticide management plans.
- Support the NPDES and Section 404 permitting programs by conducting mixing zone or nutrient waiver analyses, antidegradation analyses, and use attainability analyses, as needed.
- Participate in: Colorado River Basin Salinity Control Advisory Council and Colorado River Basin Salinity Control Forum, Interagency Task Force on Water Quality Monitoring and Arizona Geographic Information Council.
- Establish water quality standards for surface waters to protect human health, aquatic life, wildlife, and agricultural livestock; aquifer water quality standards are developed and aquifer boundaries defined to protect groundwater as a drinking water source.
- Conduct water quality monitoring, including the collection of surface water and groundwater samples and biological samples, laboratory analysis, quality assurance/ quality control, data management, data analysis, and reporting information.
- Conduct the Triennial Review of surface water quality standards.

Every two years the ADEQ publishes a report on the status of surface and groundwater resources in Arizona in relation to state water quality standards. The report fulfills requirements of the federal Clean Water Act Section 305(b). All readily available and reliable water quality data is compared to Arizona's water quality standards to determine whether surface waters are meeting their designated uses and to determine areas of the state where groundwater is not suitable for drinking without water quality treatment. Currently, statewide water quality assessments are based on chemical data and other information generated by natural resource protection and land management agencies, along with a few volunteer monitoring programs. The latest 305(b) report for Arizona ("The Status of Water Quality in Arizona") was published in June 2000. Information about both surface and groundwater quality is included in this report; however, the main focus is on surface water quality. The following types of information are found in this report:

- Common pollutants or stressors in Arizona,
- Major sources of these stressors,
- Whether or not the designated uses of surface water are "impaired",
- A summary of data for each surface water monitoring site, and

- Contaminant occurrence in groundwater within a groundwater basin.

Assessments are used to allocate resources within ADEQ's water quality protection programs so that important water quality problems are resolved. For example, Best Management Practices (BMPs) have been developed to mitigate different nonpoint source types of pollutants. Waters that are assessed as "impaired" may also be included on the "Water Quality Limited Waters" list [303(d) list].

Section 303(d) of the federal Clean Water Act requires states/tribes to submit to the EPA a list of the surface water bodies for which the designated use (e.g., irrigation, fish consumption) of that waterbody is impaired or is "water quality limited". For each waterbody on the 303(d) list, a load analysis (total maximum daily load or TMDL) must be completed to determine the allowance amount of pollutants that can be assimilated by the waterbody without causing an exceedance of water quality standards.

TMDL calculations account for all sources of the pollutant in question including point sources (sewage treatment plant discharge), nonpoint sources (such as runoff from fields, streets, range, or forest land) and natural sources (such as runoff from undisturbed lands).

TMDLs may address individual pollutants or groups of pollutants, and they must identify the linkage between the following issues:

- What impairment is occurring in the waterbody?
- What is the cause of the impairment?
- What actions will be necessary to bring the waterbody into compliance with the standards?

TMDLs are to be completed for all listed water bodies within a reasonable period unless the waterbody is brought into compliance with water quality standards through other means (e.g., application of technology-based improvements, permit enforcement or changes in water quality standards). On the 1998 303(d) list for Arizona, 102 surface waters are listed as Water Quality Limited. The 1998 303(d) list is the current working list. As a result of new federally proposed rules, the next 303(d) list will not be required until April 2002. Water bodies are removed from the list when there is adequate information to drop all stressors or a TMDL has been completed.

5.6.7 Nonpoint Source Management Program

ADEQ is the lead agency designated to implement Section 319 of the 1987 Amendment to the federal Clean Water Act in Arizona. Section 319, "Nonpoint Source Management Programs," directs states to prepare a nonpoint source assessment report and a nonpoint source management program. The objectives of the assessment report are to:

- Identify navigable waters that, without nonpoint source pollution control, cannot be expected to meet water quality standards.
- Identify categories of nonpoint sources that add significant pollution to navigable waters.
- Describe the processes that will be used to develop BMPs that will control nonpoint sources.
- Identify state and local programs for controlling nonpoint sources.

The objectives of the management program are to:

- Identify BMPs and programs to implement BMPs for those nonpoint sources that are identified in the assessment report.
- Establish a schedule and identify sources of funding for implementing the management program.

The emphasis of the Section 319 program is on surface water; however, the degree to which a management program addresses groundwater quality protection from nonpoint sources is one criterion that is used to judge the eligibility of the program for federal funding.

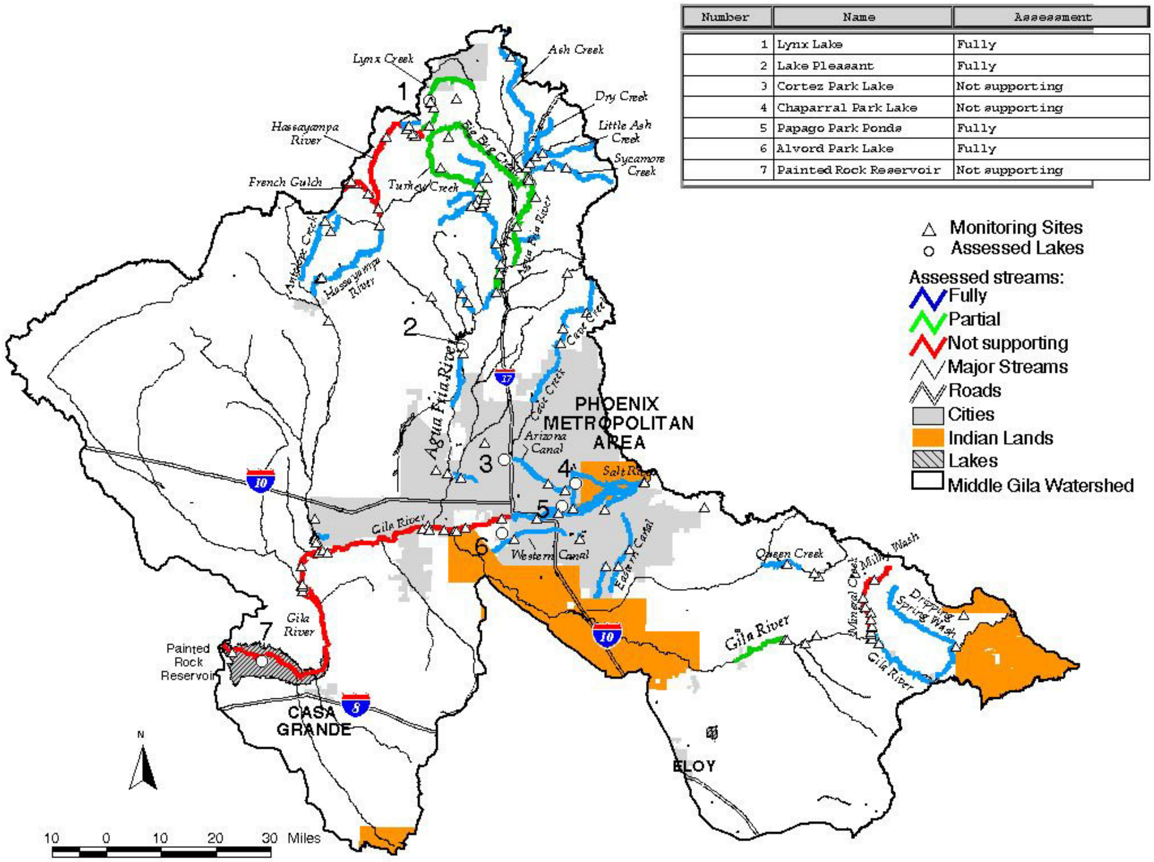
ADEQ completed its 1988 Nonpoint Source Assessment Report in 1990. A Nonpoint Source Water Quality Management Plan (SMPI) was approved by EPA and certified in January 1990. As a result, the ADEQ has received federal implementation funds. SMP II, completed in 1997, focuses on a watershed approach to NPS management.

A total of 504 miles of rivers and streams were reported as assessed in the 1988 NPS Assessment Report for Middle Gila Basin. Full attainment of water quality standards was not reported in any of the rivers and streams. Partial attainment was reported in 73 percent of the assessed miles, and 26 percent of the assessed miles were in the nonattainment category. Figure 5.2 shows a summary of surface water assessments on a map of the Middle Gila Watershed.

Surface water bodies are assessed, on a scale from good to bad, as in: full support, partial support, or non-support of designated uses. “Good quality waters” support their designated uses based on water quality standards. Generally, when there are more than 10 samples and the constituent exceeds a standard in less than 10 percent of the samples, the waterbody is considered in “full support” of its uses. If 10 to 25 percent of the samples exceed a standard, the waterbody is assessed as in “partial support,” and if more than 25 percent of the samples exceed a standard then the waterbody is assessed as in non-support of its uses. Assessment criteria vary by number of samples, designated use, and toxicity of pollutant.

Figure 5.2

Surface Water Assessments



Number	Name	Assessment
1	Lynx Lake	Fully
2	Lake Pleasant	Fully
3	Cortez Park Lake	Not supporting
4	Chaparral Park Lake	Not supporting
5	Papago Park Ponds	Fully
6	Alvord Park Lake	Fully
7	Painted Rock Reservoir	Not supporting

The nonpoint source management program identifies programs to control nonpoint sources. Relevant programs in the planning area are listed in Table 5.4. The APP program is the identified control program for many of the federal categories of nonpoint sources. For other categories, such as pesticides and wastewater reuse, specific permit programs have been developed.

The status of the programs varies. BMPs and BADCT have been developed for some programs, but not for others such as control of nonpoint sources associated with construction.

Table 5.4 Arizona Nonpoint Source Management Program MAG 208 Water Quality Management Plan Update

Agriculture		
Irrigated cropland	General APP	BMP
Feedlots	General APP	BMP
Pesticides	State Mgt. Program	Label modifications
Construction	Local ordinances	BMP
Urban runoff	NPDES, drywell rules, local ordinances, general APP	BMP
Resource extraction	Individual APP	BMP (surface water) BADCT (groundwater)
Land disposal		
Landfills	Individual APP	BADCT
On-site wastewater	Individual APP	BADCT
Sludge	Individual APP	BADCT
Reuse	NPS rules, reuse permit	BMP
Recharge	NPS rules, individual APP	BADCT
Hydrologic/Habitat Modification	404 Permit, 401C, State certification	BMP

Acronyms: APP = Aquifer Protection Permit
BMP = Best Management Practice
BADCT = Best Available Demonstrated Control Technology

5.6.8 NPDES Storm Water Program

The National Pollution Discharge Elimination System (NPDES) permit program is the basis for the NPDES Storm Water Permitting Program. The purpose of the program is to regulate pollutant discharges to Waters of the United States contributed by storm water runoff. The NPDES Storm Water Program is implemented in two phases. Phase 1 was promulgated in 1990. Phase 2 became final in December of 1999.

The first phase of the NPDES Storm Water Program regulates the following entities:

1. Operators of large municipal separate storm water systems (MS4s). This includes incorporated places or counties with populations of 250,000 or more.

2. Operators of medium MS4s. This includes incorporated counties with populations between 100,000 and 249,999.

3. Regulated MS4s. This includes incorporated counties with populations less than 100,000 that have been specifically brought into the Phase 1 program by the NPDES permitting authority. These entities are treated the same as medium and large entities.

4. Operators of any industrial activity falling into one of 29 sectors. The industrial activities are regulated for discharge of storm water into Waters of the United States or into an MS4.

5. Construction activity that disturbs five or more acres of land.

The medium and large MS4s in the planning area include the municipalities of Phoenix, Mesa, Tempe, Scottsdale, and Glendale. The Arizona Department of Transportation is also considered an MS4.

The term MS4 applies to municipal storm water systems, roads and associated drainage systems, gutters, and ditches. The scope applies to State departments of transportation, local sewer systems, hospitals, military bases, and prisons in addition to municipalities.

During Phase 1, three types of permits were developed to regulate the discharges of storm water from facilities classified as participating in defined industrial activities. These permits included the Construction General, Multi-Sector General, and Individual Permits.

The current Construction General Permit, issued in 1998, authorizes discharges from construction related activities that meet the conditions of the general permit. Owners or operators of new construction activities of 5 acres or more (or smaller areas that will become part of a larger development) are required to submit a Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under a NPDES General Permit. Before the NOI is submitted, a Storm Water Pollution Prevention Plan must be prepared and available for review if requested. When the construction activity is complete and the soils disturbed during construction have been stabilized, the permittee files a Notice of Termination (NOT) of Coverage Under a NPDES General Permit for Storm Water Discharges Associated with Industrial Activity.

The Multi-Sector General Permit (MSGP), issued in 2000, regulates storm water discharges from industrial activities that are not construction related. Of the 29 sectors of industrial activities defined by the EPA, the following affect the MAG 208 planning area including hazardous waste treatment, storage, or disposal facilities, land transportation, air transportation facilities, mineral mining (includes sand and gravel mining), and treatment works. If a facility has a variety of operations that are defined as industrial activities, those operations will be subjected to MSGP requirements specific to that type of operation. If a facility requires a NPDES Storm Water Permit, a NOI is filed in the same manner as for the

Construction General Permit coverage. Before the NOI is submitted, a Storm Water Pollution Prevention Plan must be prepared and available for review if requested. If the facility is closed or ownership changes, the permittee files a Notice of Termination (NOT) of Coverage Under a NPDES General Permit for Storm Water Discharges Associated with Industrial Activity.

An Individual Permit may be sought to provide a permit that is customized to the activities at the facility. The Individual Permit also addresses issues related to Limitations of Coverage of the MSGP for the various sectors. Medium and large MS4s are required to obtain individual permits. Regulated MS4s, although serving populations less than 100,000, are considered to be medium or large MS4s and are required to obtain an individual permit.

Table 5.5 provides a listing of the NPDES Storm Water Individual Permits in the planning area.

Table 5.5 NPDES Storm Water Individual Permits in the MAG 208 Planning Area MAG 208 Water Quality Management Plan Update

Permit Numbers	Facility Name	Expiration Date
AZS000018	ADOT MS4 Stormwater Permit	08/31/02
AZS000019	Glendale MS4 Stormwater Permit	08/31/02
AZS000020	Scottsdale MS4 Stormwater Permit	08/31/02
AZS000003	Phoenix, City of – MS4	03/19/02
AZS000005	Tempe, City of – MS4	03/19/02
AZS000004	Mesa, City of – MS4	03/19/02

The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 delayed the permitting requirements of the Phase 1 NPDES Storm Water Program for small MS4s to allow additional time for these entities to comply with NPDES requirements. Phase 2 of the NPDES Storm Water Program ends this exemption and provides a deadline of March 10, 2003 for application. Cities then have the permit cycle to implement new programs. Under Phase 2 requirements, small MS4s and small construction activity will be required to apply for general permit coverage and implement Best Management Practices (BMPs) for storm water discharges. All MS4 programs are required to meet Maximum Extent Practicable Standards through the use of Best Management Practices.

Phase 2 expands the NPDES Storm Water Program to include regulated MS4s with service area populations less than 100,000 and small construction activities that disturb between one and five acres of land. Phase 2 includes virtually everyone else in the urbanized area. Phase 2 will require more of a grassroots effort for water quality protection through various nonpoint source programs.

Regulated small MS4s are defined in one of three ways:

1. Automatic Nationwide Designation. Small MS4s located within "urbanized areas" as defined by the Bureau of Census. The rule for defining an urbanized area is generally an area that has a residential population of 50,000 and an overall population density of 1,000 persons per square mile.

2. Designation by NPDES Permitting Authority. If the NPDES Permitting Authority determines that discharges from a small MS4 cause or have the potential to cause an adverse impact on water quality, then the MS4 is defined as a regulated MS4. A Regulated MS4 is required to obtain a NPDES Permit.

3. Physically Interconnected Systems. A small MS4 that is connected to a second MS4 such that it discharges directly to the second system must obtain a NPDES Permit.

The small MS4s in the planning area within urbanized areas include Arizona State University, Luke AFB, military facilities, prisons and other publicly owned and operated storm sewer systems, Apache Junction, El Mirage, Maricopa County, Paradise Valley, Surprise, Chandler, Gilbert, Peoria, and Tolleson. The results of the most recent census will most probably increase the number of small MS4s in the planning area. Additionally, construction sites that disturb from one to five acres of land will be required to seek coverage under a Small Construction General Permit scheduled for issuance from the EPA in 2002.

In order for the medium and large MS4s to comply with the conditions of the NPDES Storm Water permits, urban storm water runoff must be sampled and analyzed for the term of the permits. The Flood Control District of Maricopa County (FCDMC) and the United States Geological Survey (USGS), in cooperation with the municipalities of Phoenix, Mesa, Scottsdale, and Glendale, are currently collecting samples from a total of 22 storm water monitoring stations throughout Maricopa County. The USGS, who collects samples for the City of Phoenix, has seven sampling locations that were selected to provide samples representative of storm water runoff from light industrial, heavy industrial, commercial, residential, and combined land uses. The City of Tempe currently conducts their own storm water sampling program. Samples are collected from representative winter and summer storm events based on the municipalities NPDES Storm Water Permit conditions. The storm water and receiving stream flow samples are analyzed for chemistry. The FCDMC provides the compiled data to the respective municipalities. The storm water results are evaluated to determine the effectiveness of control strategies to reduce pollutant loadings and to determine if the quality of the receiving streams are being degraded. The results and evaluations are presented to the EPA on an annual basis.

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MANAGEMENT PLAN

A key element of the 208 planning process is identifying a management system to implement the plan. Specifically, Section C (1) of Section 208 of the Clean Water Act states that "*The Governor of each state in consultation with the planning agency shall designate one or more waste treatment management agencies which may be an existing or newly created local, regional or state agency or political subdivision.*" According to Section 208, the management agency must have authority:

(A) to carry out appropriate portions of an areawide waste treatment management plan developed under subsection (b) of this section;

(B) to manage effectively waste treatment works and related facilities serving such area in conformance with any plan required by subsection (b) of this section;

(C) directly or by contract, to design and construct new works, and to operate and maintain new and existing works as required by any plan developed pursuant to subsection (b) of this section;

(D) to accept and utilize grants, or other funds from any source; for waste treatment management purposes;

(E) to raise revenues, including the assessment of waste treatment charges;

(F) to incur short and long-term indebtedness;

(G) to assure in implementation of an areawide waste treatment management plan that each participating community pays its proportionate share of treatment costs;

(H) to refuse to receive any wastes from any municipality or subdivision thereof, which does not comply with any provisions of an approved plan under this section applicable to such areas; and

(I) to accept for treatment industrial wastes.

The Section 208 management requirements can be met by a single governmental entity or by distributing the duties and responsibilities to a group of governments, thus creating a management system.

The Maricopa Association of Governments (MAG) 208 Water Quality Management Program calls for the MAG Regional Council, with the assistance of a Water Quality Advisory Committee and the MAG Management Committee to be responsible for ongoing areawide wastewater management planning and coordination with local jurisdictions in meeting the requirements of the Clean Water Act. Coordination, local planning, grants management and operation are the responsibilities of local municipalities, plus in two cases subregional operating groups (SROGs) composed of local governments. The existing SROGs are the Multi-Cities SROG, comprised of Glendale, Mesa, Phoenix, Scottsdale, and Tempe, and the Peoria-Tolleson SROG.

The concept of subregional operating groups was originally developed to take advantage of the experience gained through intergovernmental cooperation by the local governments of Phoenix, Youngtown, Scottsdale, Mesa, Tempe, and Glendale. These local governments (Youngtown withdrew in 1995) for over two decades have participated in a cooperative endeavor to provide wastewater management services. The concept has involved the designation of a Lead Agency and participation by various entities, jointly, to provide sewage collection and treatment facilities for much of the Phoenix metropolitan area.

The subregional operating group concept was designed to provide flexibility. Several governmental agencies of an area can participate jointly (multiple member SROG), and the concept is also applicable for other single entity areas (single member SROG). A local government may also be a member of more than one SROG.

The governing body of each city and town participating in a SROG has adopted a resolution establishing the SROG and agreeing to be a SROG member and requested, by letter, MAG designation of the SROG and its Lead Agency (Appendix C). MAG, in turn, adopted a resolution on January 17, 1979, designating each SROG and Lead Agency (Exhibit A). The cities of Avondale and Goodyear later adopted resolutions and were designated by MAG as the Avondale-Goodyear SROG; however, the Avondale-Goodyear SROG was subsequently dissolved. The future formation of additional multiple-member SROGs in the study area is possible but at present appears unlikely.

MAG is responsible for regional water quality management planning and for maintaining the MAG 208 Water Quality Management Program and process. The SROGs have each designated a Lead Agency to carry out the day-to-day operation of the system. Lead agency for the Multi-City SROG is the City of Phoenix. Lead agency for the Peoria-Tolleson SROG is the City of Tolleson.

Table 6.1 identifies the agencies responsible for the various water quality management tasks. More than one agency is responsible for some tasks. For example, the responsibility for administering the state revolving loan funds could involve five agencies if a multiple member SROG is involved. In accordance with state regulations (R18-9-B-201(H)), the Arizona Department of Environmental Quality (ADEQ) is responsible for determining consistency of proposed wastewater treatment systems with the MAG 208 Water Quality Management Plan. In accordance with state regulations (R18-9-B-201(H)), the Department shall not publish a notice of preliminary decision to issue an individual permit or amendment for a sewage treatment facility that is not in conformance with the certified areawide water quality management plan and the facility plan. Additional state regulations for water quality management planning are included in (R18-5-301), (R18-5-302), and (R18-5-303) (Appendix D). The jurisdiction in which the proposed facility would be located could request an amendment to the MAG 208 Plan, if the jurisdiction so desires. Once the amendment is approved by MAG, the State, and EPA, the proposed facility would become part of the 208 Plan.

Table 6.1 Water Quality Management System – Responsibilities MAG 208 Water Quality Management Plan Update

		Multiple Member SROG							
	MAG	SROG Board	Lead Agency	City, Town, Sanitary District, Private Sewer Agency	Munici-pality	ADEQ	WIFA	MCESD	EPA
Areawide Planning (208 Plan)	•								
Adopt Plan & Update	•				•	•			•
Assure Compliance with Adopted 208 Plan					•	•			
Assure Effective Management of Waste Treatment Works Under Conformance with 208 Plan		•	•	•	•	•			
Resolve Disagreements Among Local Governments	•	•							
Coordinate SROG Activities		•							
Facility Planning (201)		•	•	•	•	•			
Administer State Revolv-ing Fund Loans (WIFA)		•	•	•	•		•		
Refuse to Receive Wastes for Non-compliance		•	•	•	•				
Operate & Maintain Wastewater Treatment Plants			•	•	•			•	
Construct WTPs			•	•	•			•	
Operate & Maintain Collection System				•	•				
Construct Collection System			•	•	•				
Industrial Discharge Monitoring			•	•	•				
Plant Monitoring & Regulation			•	•	•	•		•	•
Administer Monthly Service Charges				•	•				
Collect Connection Fees				•	•				
Incur Bonded Indebtedness				•	•				

Water Infrastructure Financing Authority (WIFA) administers the revolving fund loan program for the State of Arizona. In the case of a SROG, the Lead Agency is responsible for applying for the loan and meeting the requirements attached to the loan. Each City and Town must approve the work done and application for the loan. The SROG has the responsibility of supervising the Lead Agency and assuring that all local, State, and Federal requirements are met.

A more detailed description of the agency responsibilities is given below.

6.1 MARICOPA ASSOCIATION OF GOVERNMENTS

The MAG Regional Council, Management Committee, and Water Quality Advisory Committee have major roles in managing the MAG 208 Water Quality Management Plan.

6.1.1 MAG Regional Council

The MAG Regional Council serves as the governing body of the Maricopa Association of Governments and is responsible for establishing and directing all MAG policies and activities. Membership is composed of elected officials appointed by each MAG member agency.

For water quality management planning, the MAG Regional Council maintains the MAG 208 Water Quality Management Program and the corresponding process. The Regional Council reviews pertinent water quality planning information; authorizes regional water quality studies as appropriate; adopts the MAG 208 Water Quality Management Plan; and approves plan updates and amendments, and small plant review and approvals.

6.1.2 MAG Management Committee

The MAG Management Committee serves as the primary advisory body to the MAG Regional Council. Membership is composed of the chief administrator from each member agency.

The Management Committee reviews water quality information and recommendations from the MAG Water Quality Advisory Committee. The MAG Management Committee then makes recommendations on pertinent water quality matters to the MAG Regional Council.

6.1.3 MAG Water Quality Advisory Committee

The MAG Water Quality Advisory Committee provides recommendations on water quality issues that affect the MAG region such as the update of the MAG 208 Water Quality Management Plan. MAG serves as the designated regional planning agency for water quality management planning in Maricopa County. Within this role, the MAG Water Quality Advisory Committee reviews pertinent regional water quality information and issues; participates in the development of the MAG 208 Water Quality Management Plan; conducts public hearing on the 208 Plan, plan amendments, and plan updates; reviews 208 plan amendments and small plant review and approvals; reviews State water quality management programs and requirements; and makes recommendations to the MAG Management Committee.

6.2 SUBREGIONAL OPERATING GROUPS (SROGs)

Two multiple-member SROGs are currently designated by MAG for Maricopa County:

SROG	Lead Agency
Multi-City (Phoenix, Mesa, Tempe, Scottsdale, Glendale)	Phoenix
Tolleson-Peoria	Tolleson

The Tolleson-Peoria SROG has not been active in the past several years. Tolleson and Peoria are invited to participate with the Multi-City SROG when regional issues are involved.

The governing body of each city and town in each multiple member SROG has adopted a resolution to establish the SROG and agree to be a SROG member and requested designation by MAG (Appendix C). The resolutions also outline the duties and responsibilities assigned to MAG for overall planning and coordination of areawide water quality management in Maricopa County.

Intergovernmental Agreements describe SROG and member agency duties and responsibilities. The Intergovernmental Agreements establish a SROG Board appointed by the governing body of each member agency. Each of the SROGs may establish technical and/or citizen advisory committees) to assist in performing its duties and responsibilities.

Within each multiple member SROG, the Lead Agency fulfills the staff duties and responsibilities. The SROG Board serves as the supervisor for the Lead Agency. The Lead Agency provides staff to carry out the SROG duties and responsibilities and in most cases is responsible for operation and maintenance of the jointly-owned wastewater collection and treatment facilities of the subregion. Staff of the Lead Agency are financially supported by members of the Subregional Operating Group from revenues derived from locally-enacted wastewater service charges. The Lead Agency responsibilities are considered as part of the operation and maintenance expenses of the treatment facilities.

The Lead Agency also serves as a key contact with the U.S., Environmental Protection Agency (EPA), ADEQ, and Maricopa County Department of Environmental Management for implementation of various federal and state water quality standards and the National Pollution Discharge Elimination System (NPDES) permits. The Lead Agency in most situations is the NPDES permit holder. Key responsibilities of multiple member SROGs are outlined below.

Planning responsibilities are:

- Members of a SROG submit information to the SROG Board regarding wastewater collection and treatment facility needs, population, projected growth, major developments, capacity of existing system and relationship of new proposals to the adopted MAG plan. Plans are then developed based on this information.

Finance responsibilities are:

- The SROG Board coordinates the establishment of proportional cost sharing among the members for the financial support of the Lead Agency and the operation and maintenance of the commonly owned wastewater treatment facilities.
- The SROG Board coordinates cost sharing among the SROG members for joint construction projects.
- The Lead Agency prepares an annual budget for Lead Agency activities and the operation and maintenance of jointly owned collection and treatment facilities.
- The Lead Agency is responsible for the application, receipt, and administration of federal or state funds on jointly owned projects. For projects contained wholly within a multiple member SROG city or town boundary, that entity may apply for, receive and administer state revolving loan funds.

Operation and maintenance responsibilities are:

- The SROG Board coordinates and monitors the operation and maintenance of jointly owned wastewater treatment plants and collection facilities.
- The SROG Board coordinates the preparation of industrial waste standards for the SROG area.
- The Lead Agency operates and maintains all jointly owned wastewater collection and treatment facilities in conformance with Federal and State water quality standards and applicable permit requirements.

Construction responsibilities are:

- The Lead Agency supervises the construction of new jointly owned facilities.
- The Lead Agency coordinates with EPA and ADEQ for permit approvals, audits, and expenses for federally or state funded projects on jointly owned facilities.

Enforcement and monitoring responsibilities are:

- The SROG Board coordinates EPA, ADEQ, and Maricopa County Environmental Services Department monitoring and enforcement of jointly owned wastewater treatment plants.

- The Lead Agency conducts a monitoring program for treatment facilities to assure compliance with Federal and State water quality standards and applicable permit requirements.
- The Lead Agency coordinates the monitoring of industrial discharges by member agencies.
- The Lead Agency coordinates with EPA, ADEQ, and Maricopa County Environmental Services Department monitoring and enforcement activities.
- The Lead Agency will notify the SROG Board of any violation of Federal or State water quality standards or applicable permit requirements.

6.3 MUNICIPALITIES

The governing body of many cities or towns have adopted a resolution requesting designation as wastewater management agency for their planning area. These resolutions and requests for designation are shown in Appendix C.

City or town staff will also perform necessary activities to meet EPA management agency requirements. Key responsibilities of individual State and municipalities are outlined below.

Planning responsibilities are:

- Plan for wastewater collection and treatment facility needs, population, projected growth, major developments, capacity of existing system, and relationship of new proposals to the adopted MAG 208 Plan.

Finance responsibilities are:

- Review, update and adopt appropriate revisions to the sewer user charge and industrial cost recovery program to meet State and EPA requirements.
- Obtain funds for wastewater facilities.

Operation and maintenance responsibilities are:

- Operate and maintain wastewater collection and treatment facilities within the entity.
- Prepare and adopt industrial waste standards.
- Operate treatment plants and pump stations in compliance with NPDES permit requirements and applicable water quality standards.
- Assure properly trained personnel at wastewater treatment plants.

Construction responsibilities are:

- Supervise the construction of new facilities.
- Coordinate with EPA, ADEQ, and Maricopa County for permit approvals, audits, and inspections of facilities.

Enforcement and monitoring responsibilities are:

- Conduct monitoring program to ensure compliance with NPDES or other applicable permits.
- Coordinate with EPA, ADEQ, and Maricopa County Environmental Services Department monitoring and enforcement activity.

6.4 STATE OF ARIZONA

The State of Arizona is an active participant in water quality management activities affecting local governments and private agencies. According to the Clean Water Act, the role of state government is to oversee the implementation of 208 Plans. ADEQ in conjunction with EPA establishes water quality standards for the streams and lakes of the State and adopts the statewide revolving loan fund priority list.

ADEQ has been designated by the legislature as the State's water pollution control agency, and ADEQ is empowered by Arizona statutes to regulate water pollution systems in Arizona. The ADEQ also contracts with EPA to administer several Federal programs including:

- State requirements of the Clean Water Act (PL 92-500) as amended by the Water Quality Act of 1987 (PL 100-4).
- Safe Drinking Water Act.
- NPDES permit drafting.

Congressional intent in the Federal legislation is to have the states take over as much of the functioning of the water and wastewater programs as possible.

ADEQ (or its delegated agency, Maricopa County Environmental Services Department (MCESD) in Maricopa County) performs reviews of applications for Aquifer Protection Permits (APP) for proposed wastewater treatment facilities. One of the criteria to be reviewed is conformance with the adopted MAG 208 Plan. In the MAG region, proposed facilities, either new treatment plants or expansions of existing plants, must be included in the adopted 208 Plan to be considered in conformance. If the proposed facilities are not in conformance with the adopted 208 Plan, ADEQ will not approve permits for the facilities. Jurisdictions wishing to construct facilities not listed in the adopted 208 Plan must obtain a 208 Plan amendment to incorporate the facilities into the 208 Plan before the project can be considered to be in conformance.

6.5 MARICOPA COUNTY

The Maricopa County Environmental Services Department (MCESD), under authority of the Maricopa County Environmental Health Code and per delegation agreement with ADEQ, performs plan reviews of designs for wastewater treatment facilities as part of its approval to construct process; and issues approval of construction following project completion.

6.6 INDIAN COMMUNITIES

There are three Indian Communities within the Maricopa County planning area:

- Gila River Indian Community
- Salt River Pima Maricopa Indian Community
- Ft. McDowell Yavapai Nation

The first two of these communities are MAG members, while the Ft. McDowell Yavapai Nation is not.

Each of the Indian Communities operates in accordance with their individual governing authorities and State and Federal agencies. Various agreements exist between Indian Communities and surrounding municipalities. At present, unique conditions exist for water quality management activities in each Indian Community, but changes are occurring as new agreements are developed in Water Rights Settlements, funding of projects through the WIFA source, and cooperative arrangements with municipal entities. A possible future goal may be more uniform regulation and control of water quality management of the entire planning area.

6.7 ENVIRONMENTAL PROTECTION AGENCY

Although EPA carries major responsibility for implementing the provisions of the Clean Water Act, the congressional intent was to encourage more state administration and local responsibility and initiative. EPA basically has two important inducements to require development of the compliance with the adopted plan. These inducements are:

- Federal revolving loans, and
- Issuance of NPDES permits to local governments and private agencies.

Federal funds and/or a NPDES permit can be withheld for noncompliance with the adopted water quality management plan.

6.8 MANAGEMENT SYSTEM ASSESSMENT

The point source management system, included in the adopted MAG 208 Water Quality Management Plan, is required by EPA regulations to possess acceptable legal, financial, and managerial capabilities to carry out assigned responsibilities. This section describes how the Clean Water Act, Section 208, assesses the adopted waste treatment management system in terms of meeting these requirements, and illustrates the managerial capabilities of the adopted point source management system.

6.8.1 Implementation of the Plan

Section 208 (c) (2) (A) requires that there be "*adequate authority to carry out appropriate portions of an areawide waste treatment management plan….*"

Section 208 (c) (2) (B) requires that there be "*adequate authority to manage effectively waste treatment works and related facilities serving such area in conformance with the plan….*"

Under these requirements, implementation of the water quality management plan developed by MAG must meet the criteria specified in Section 208 (b).

Municipalities and sanitary districts have adequate authority to perform these activities within their own jurisdiction. The Joint Exercise of Powers Act in Arizona permits counties, cities, towns, sanitary districts and other governmental agencies to enter into agreements for governmental services with the approval of their governing bodies. The governmental units may jointly "exercise any powers common to the contacting parties" and may enter into agreements for "joints or cooperative action."

Multiple-member SROGs can develop Intergovernmental Agreements (IGAs) that provide the specific authority necessary to meet the "adequate authority" requirements of Section 208 (c) (2) (A) and (3).

In the adopted MAG wastewater management system these required duties are shared by the Maricopa Association of Governments, subregional operating groups, lead agencies, and individual cities, towns and sanitary districts. Outside of the subregional operating groups, the individual cities, towns or sanitary districts are responsible for implementing the adopted MAG 208 plan for their jurisdiction and effectively managing the wastewater treatment facilities. Multiple-member SROGs will meet the requirements as individual cities, towns, and sanitary districts and by intergovernmental agreements and membership in the SROGs. The Lead Agency of a multiple-member SROG will in most instances operate and maintain treatment facilities and be responsible for implementation of jointly-owned facilities in accordance with the adopted MAG 208 Plan. Individual cities, towns, and sanitary districts will implement local aspects in accordance with the adopted plan and manage local wastewater treatment facilities.

The SROG Boards, MAG Management Committee and MAG Regional Council will monitor and oversee the compliance with these requirements.

6.8.2 Construction and Operation

Section 208 (c) (2) (C) provides that management agencies must have the authority "*directly or by contract to design and construct new works and to operate and maintain new and existing works as required by the plan….*"

Arizona's cities, towns and sanitary districts are authorized to construct, purchase, acquire, own and maintain within or without their corporate limits, wastewater treatment and collection systems. As noted previously, they can also contract for any service common to them for joint or cooperative action.

The adopted point source management system provides for single member subregional operating groups to individually carry out this responsibility for facilities to be jointly owned and operated. If a project is totally within the boundaries of a city, town, or sanitary district, that entity would be responsible for this requirement.

6.8.3 Finance

Section 208 (c) (2) (D) requires that management agencies have adequate authority "*to accept and utilize grants or other funds from any source for waste treatment management purposes*." Cities, towns, and sanitary districts in Arizona may accept and utilize grants from state, federal government, or other sources for or in aid of construction for wastewater treatment facilities. The Lead Agency of a multiple member SROG would apply for and receive grants for joint projects, but the individual entity would be the applicant in most cases if a project was for the sole benefit of that community.

Section 208 (c) (2) (E) requires that management agencies have adequate authority "*to raise revenues, including the assessment of waste treatment charges*." The Arizona Revised Statutes authorizes cities and towns that own or operate a wastewater treatment facility to collect user charges and to levy both property taxes and special assessments. This responsibility, in the adopted management system, will be conducted by individual cities, towns, and sanitary districts.

Section 208 (c) (2) (F) requires that there be adequate authority *"to incur short and long-term indebtedness."* Arizona cities, towns, and sanitary districts have authority to incur short- and long-term debt and this responsibility will continue to be met individually in each entity in the adopted wastewater management system.

Section 208 (c) (2) (G) requires that management agency(s) have adequate authority "*to assure in the implementation of an areawide waste treatment management plan that each participating community pay its proportional share of treatment costs*." Cities, towns, and sanitary districts have sufficient statutory authority to comply with this requirement. The adopted point source management system provides for each city, town, and sanitary district to individually meet this requirement.

6.8.4 Regulation

Section 208 (c) (2) (H) requires that the management agency(s) have the power "*to refuse to receive wastes from any municipality or subdivision thereof, which does not comply with any provision of the approved plan….*"

Section 208 (c) (2) (I) requires there be adequate authority "*to accept for treatment industrial wastes*."

Individual cities and towns that are designated management agencies have agreed by resolution adopted by their respective governing bodies to meet these 208 requirements. The members of multiple-member SROGs have also adopted resolutions agreeing to these requirements.

6.9 PLAN UPDATE

6.9.1 Annual Update Evaluation

In order to ensure that the MAG 208 Water Quality Management Plan remains an up-to-date document, MAG member agencies will be requested to advise MAG annually of changes to their wastewater treatment systems. The changes will then be presented to the MAG Water Quality Advisory Committee. If appropriate, the MAG Water Quality Advisory Committee may make a recommendation to the MAG Management Committee that the 208 Plan be amended to include the updated information.

6.9.2 Modifications to the MAG 208 Plan

The MAG 208 Plan is subject to change in accordance with these established procedures:

- Periodic Major Revision of the 208 Plan.
- 208 Plan Amendment Process.
- Small Plant Review and Approval Process.

Each of these procedures have been utilized multiple times since the original plan was developed.

6.9.3 Periodic Major Revision of the MAG 208 Plan

The MAG 208 Water Quality Management Plan is periodically updated in accordance with provisions of Section 208 of the Federal Clean Water Act. These updates to the original 208 Plan (July 1979) have been occurring on an approximate 10 year cycle (1982, 1993, and the current update to be completed in 2001/02).

6.9.4 Interim Revision of the MAG 208 Plan

Modifications to the MAG 208 Plan are incorporated in each update. Two procedures exist to modify the approved 208 Plan between revision cycles:

- 208 Amendment
- Small Plant Review and Approval Process

Each of these procedures for modifying the MAG 208 Plan is defined in detail in Chapter 4, Point Source Plan.

PUBLIC PARTICIPATION

One of the major requirements of the Clean Water Act is that the public play a decision-making role in all water pollution control activities at federal, state, and local levels. The term “public” in the MAG 208 program refers to any entity other than the MAG staff directly involved in the study. In this broad sense, the “public” can be thought of as coming from the governmental sector and interest groups, as well as the general public.

The objective of the public involvement program is to:

- Promote understanding of the manner and means by which water quality problems and needs are investigated and solutions are proposed.
- Provide an opportunity for a variety of interests to understand diverse viewpoints and resolve possible conflicts.
- Establish open communication among the public, the advisory groups, and the elected officials during the plan development.
- Solicit from the public their opinions and perceptions of problems, issues, concerns, and needs.
- Keep the public informed regarding the status and progress of studies and the results of planning activities.

To meet the objectives of the public participation program, various types of activities and public involvement techniques are used, namely:

- Establishment of an advisory group structure.
- Establishment of a 208 review process.
- Public meetings.

7.1 ADVISORY GROUP STRUCTURE

As an initial step in developing the MAG public participation program, an advisory group structure was established to assist the 208 staff in plan development. The advisory group reviewed and commented on program outputs in the areas of point sources, non-point sources and management, and made recommendations on elements of the plan.

7.1.1 Water Quality Advisory Committee

The MAG Water Quality Advisory Committee (WQAC) is comprised of representatives of various local government agencies, economic interests, environmental interests, and the private citizenry selected by MAG to provide technical expertise in the areas of concern. The WQAC provided insight into past, present, and future facility planning, and also reviewed and commented on the 208 Plan Revision Scope of Work, Point Source Plan, and Non-Point Source Plan.

7.1.2 Management Committee

The MAG Management Committee is composed of the chief administrator from each MAG member agency, representing each city, town and Indian Community in the planning area as well as the county. The Management Committee reviews water quality information and recommendations from the MAG Water Quality Advisory Committee and then makes recommendations on water quality matters to the MAG Regional Council.

7.2 208 REVIEW PROCESS

In the MAG 208 Program, review occurs at local, state, and federal levels. At the local level, the review process consists of three interrelated components: advisory group review, public review, and jurisdictional review.

The Water Quality Advisory Group is charged with the responsibility of reviewing, at critical points in the 208 program, the work of consultants and staff and making recommendations. Their recommendations, together with those of the Management Committee are then forwarded to the Regional Council, the policy-making body of MAG. The MAG Regional Council, whose membership consists of elected officials of the MAG member agencies, receive and review the recommendations and adopt the final elements of the plan. Formal public review of the 208 Plan includes a public meeting held to review the Draft 208 Plan Revision.

Regarding jurisdictional review, each of the cities and towns, the county, Gila River Indian Community, Salt River Pima-Maricopa Indian Community and Fort McDowell Yavapai Nation, Luke Air Force Base, and the Fountain Hills Sanitary District have participated actively in reviewing the plan, particularly those elements applicable to their area. Each jurisdiction had an opportunity to directly participate in plan development and to review and indicate their preferences regarding plan elements before decisions are made by the MAG Regional Council. Following local review and adoption, the 208 Plan will also be reviewed for approval by the ADEQ and EPA.

Key issues and critical decision points in the development of final 208 Plan elements were:

- Approval of the scope of work.
- Population projections and distribution.
- Selection of Point Source Plan elements.
- Non-Point Source Plan.

7.2.1 Work Plans

In addition to meeting technical requirements, the final plan must be acceptable to the local communities, implementable, and serve as a basis for future planning.

7.2.2 Population Projections

On August 3, 1977, the Governor designated the Department of Economic Security (DES) as the official populations projecting and estimating agency for the State of Arizona. For each county, a control total is developed by DES. In Maricopa County, the Maricopa Association of Governments develops projections of future population totals in the various planning areas in the county. These projections are periodically reviewed and approved by the MAG Regional Council. Frequent updates are made to respond to trends and changes in development and growth patterns. The most recent set of adopted population figures has been used in this 208 Plan Revision.

7.3 CONTINUED PUBLIC INVOLVEMENT

A public participation program must be regularly adjusted or improved to meet the specific needs of each phase of planning activities. The identification of specific publics, the selection of a particular medium of communication, the feedback mechanism that is established, and the desired impact of the participant's responses must be closely coordinated to enhance long- and short-range program goals.

A high degree of involvement in the 208 program by elected and appointed public officials, technical specialists, and the general public will be continued in the MAG public participation efforts. Opportunities for the public to make decisions on water quality issues affecting them will be provided. The effectiveness of public meetings, field trips, workshops, advisory group meetings, and other mechanisms used to solicit public response will be evaluated and revised as necessary.

The membership and structure of the advisory groups will also be evaluated and changed as needed to make operation smoother and more responsive to the goals of the programs.

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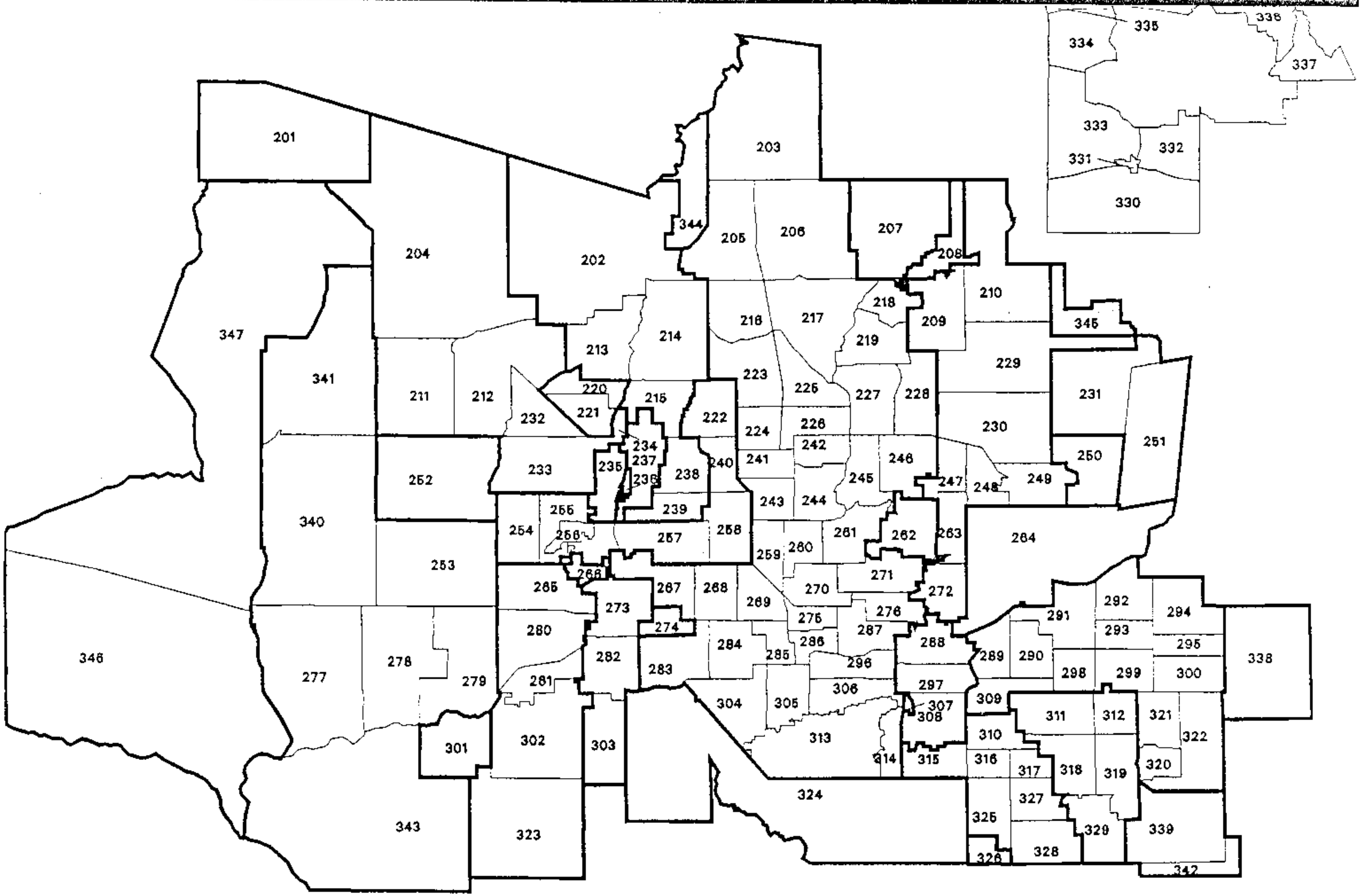
Appendix A
MAG REGIONAL ANALYSIS ZONES

MARICOPA ASSOCIATION of GOVERNMENTS

MUNICIPAL PLANNING AREAS



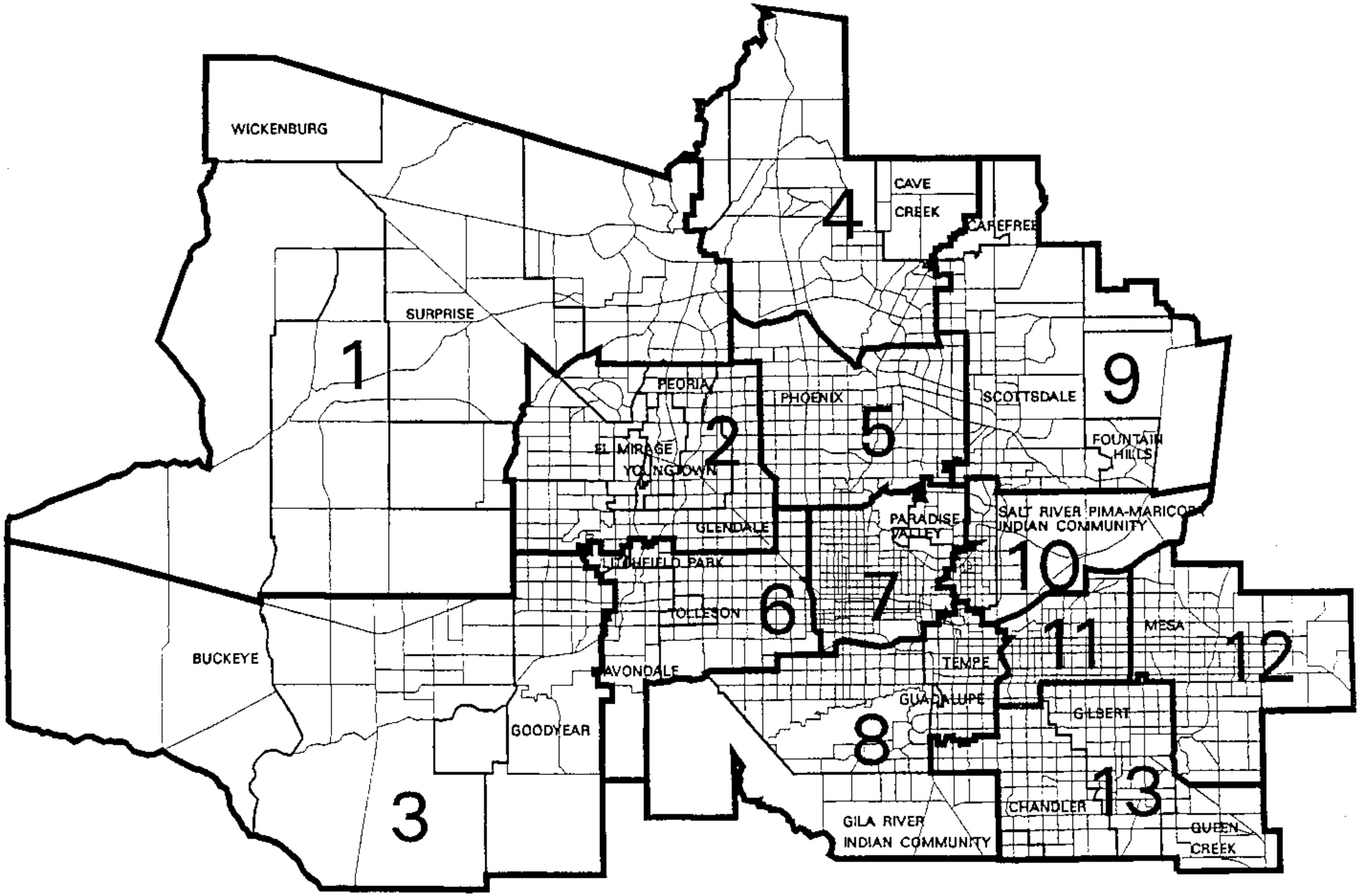
MARICOPA ASSOCIATION of GOVERNMENTS

December, 1996

REGIONAL ANALYSIS ZONES

Municipal Planning Area Boundary

RAZ Boundary



MAG Regional Analysis/Traffic Analysis Zones

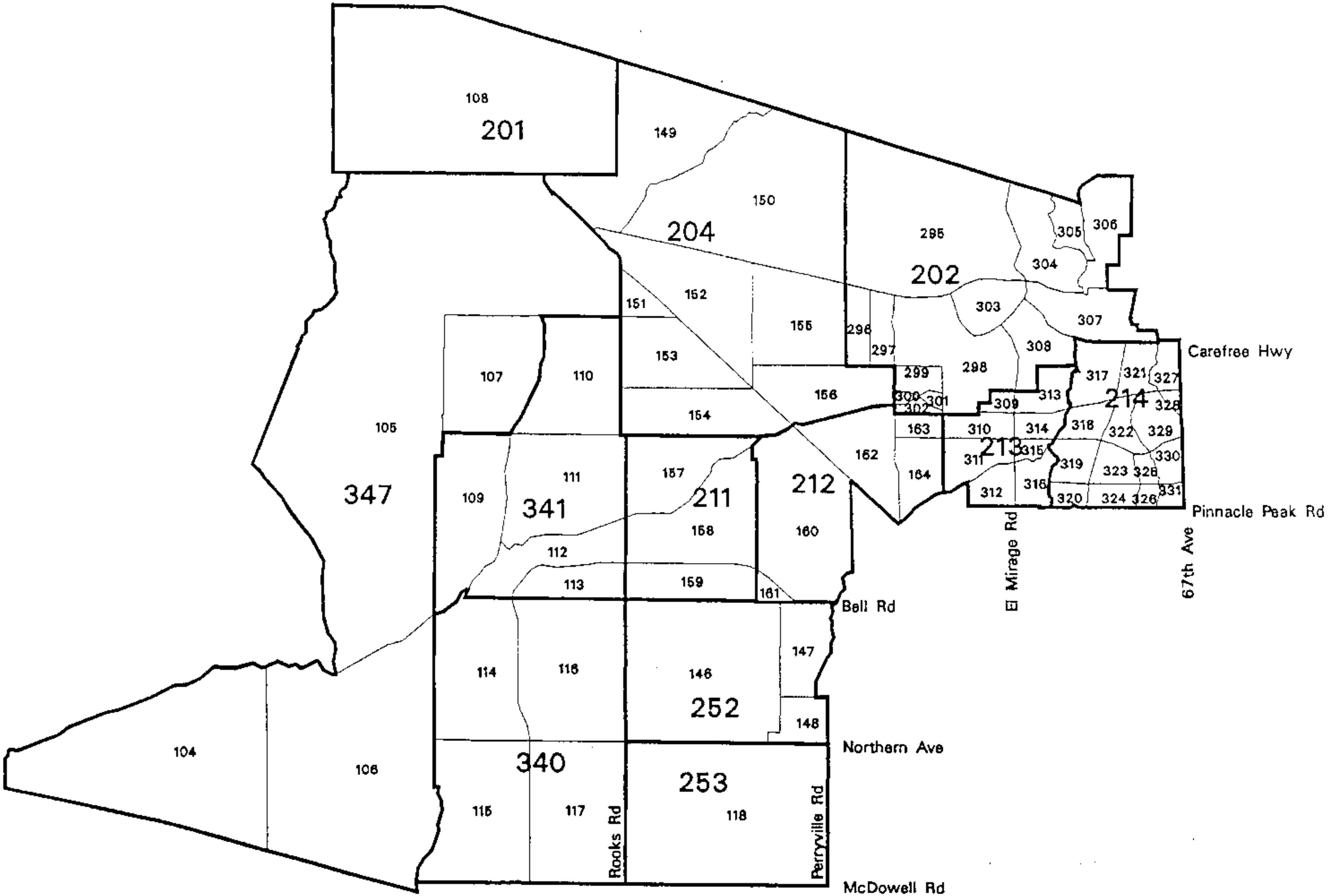
SECTION KEY MAP

Municipal Planning Area Boundary

TAZ Boundary

MARICOPA ASSOCIATION of GOVERNMENTS

December, 1996



MAG Regional Analysis/Traffic Analysis Zones

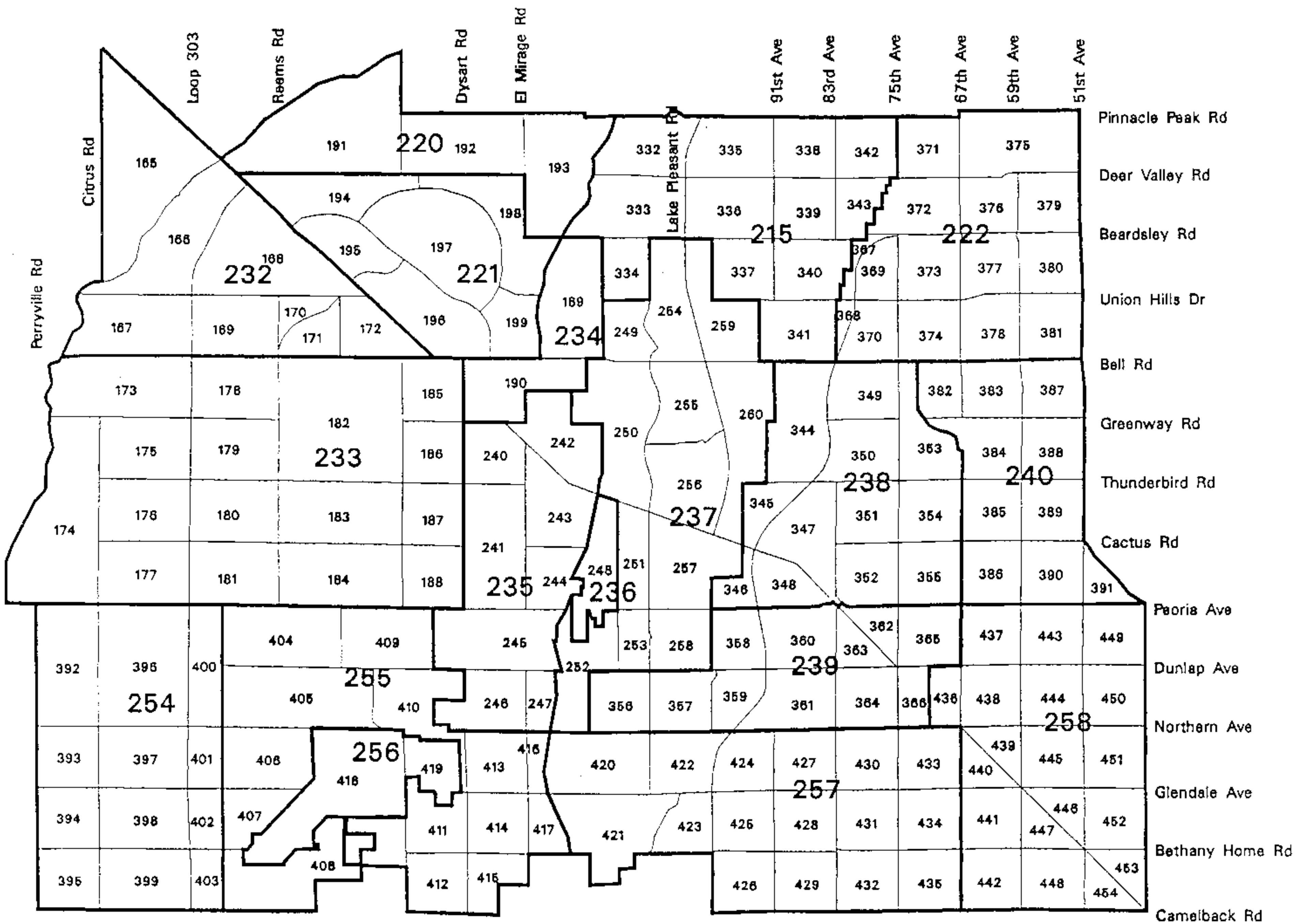
SECTION 1

RAZ Boundary (Large Numbers)

TAZ Boundary (Small Numbers)

MARICOPA ASSOCIATION of GOVERNMENTS

October, 1996



MAG Regional Analysis/Traffic Analysis Zones

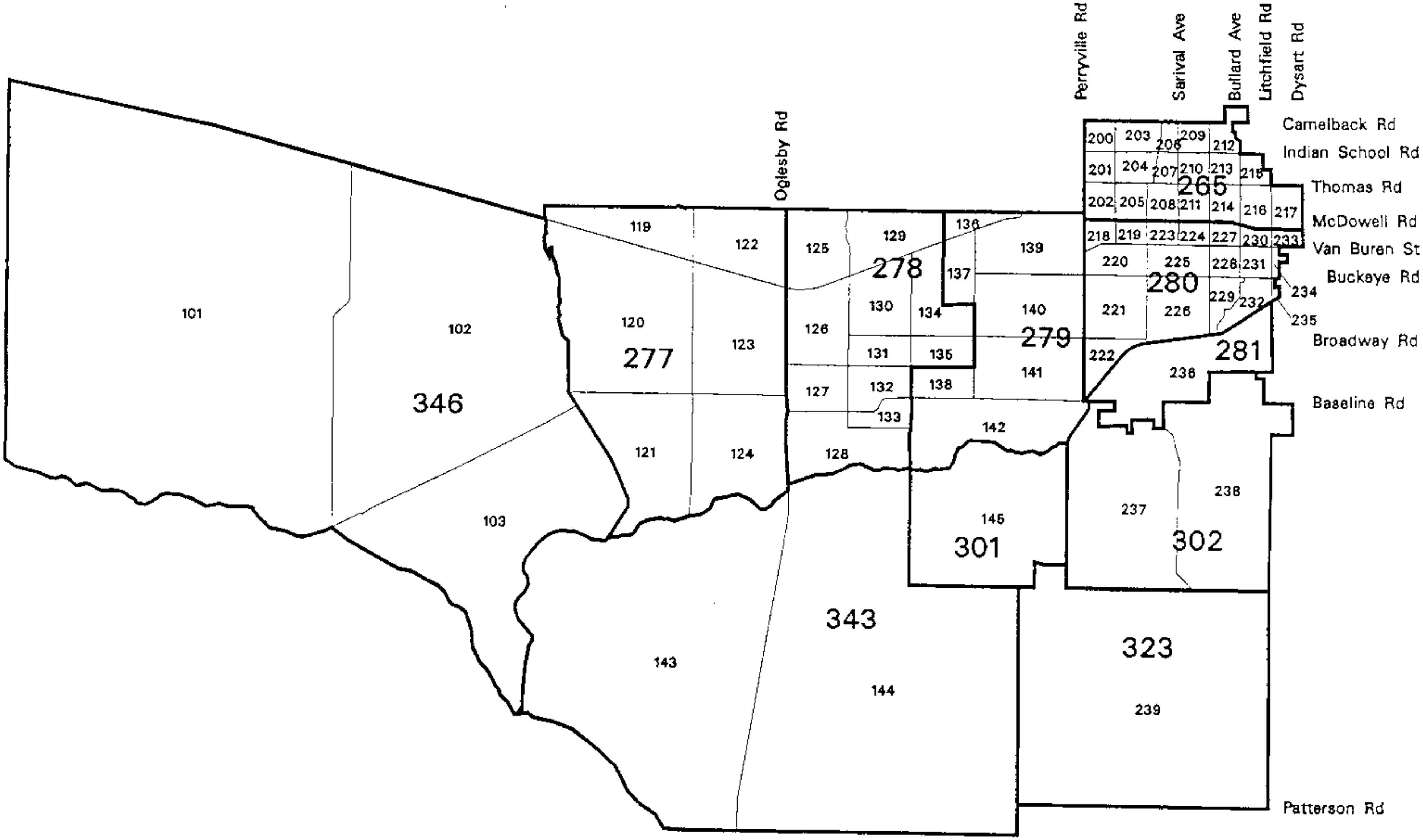
SECTION 2

RAZ Boundary (Large Numbers)

TAZ Boundary (Small Numbers)

MARICOPA ASSOCIATION of GOVERNMENTS

October, 1996



MAG Regional Analysis/Traffic Analysis Zones

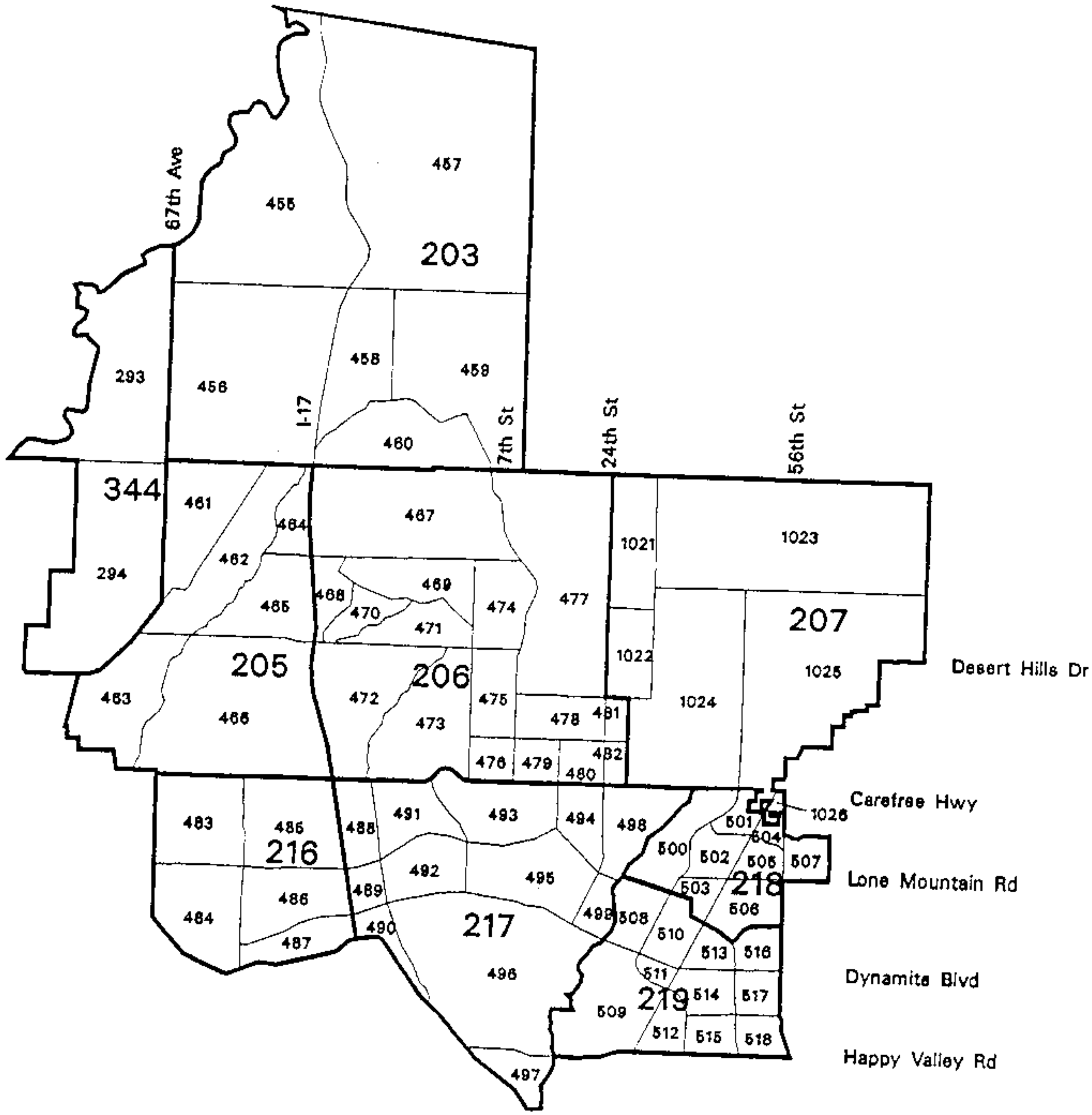
SECTION 3

RAZ Boundary (Large Numbers)

TAZ Boundary (Small Numbers)

MARICOPA ASSOCIATION of GOVERNMENTS

October, 1996



MARICOPA ASSOCIATION of GOVERNMENTS

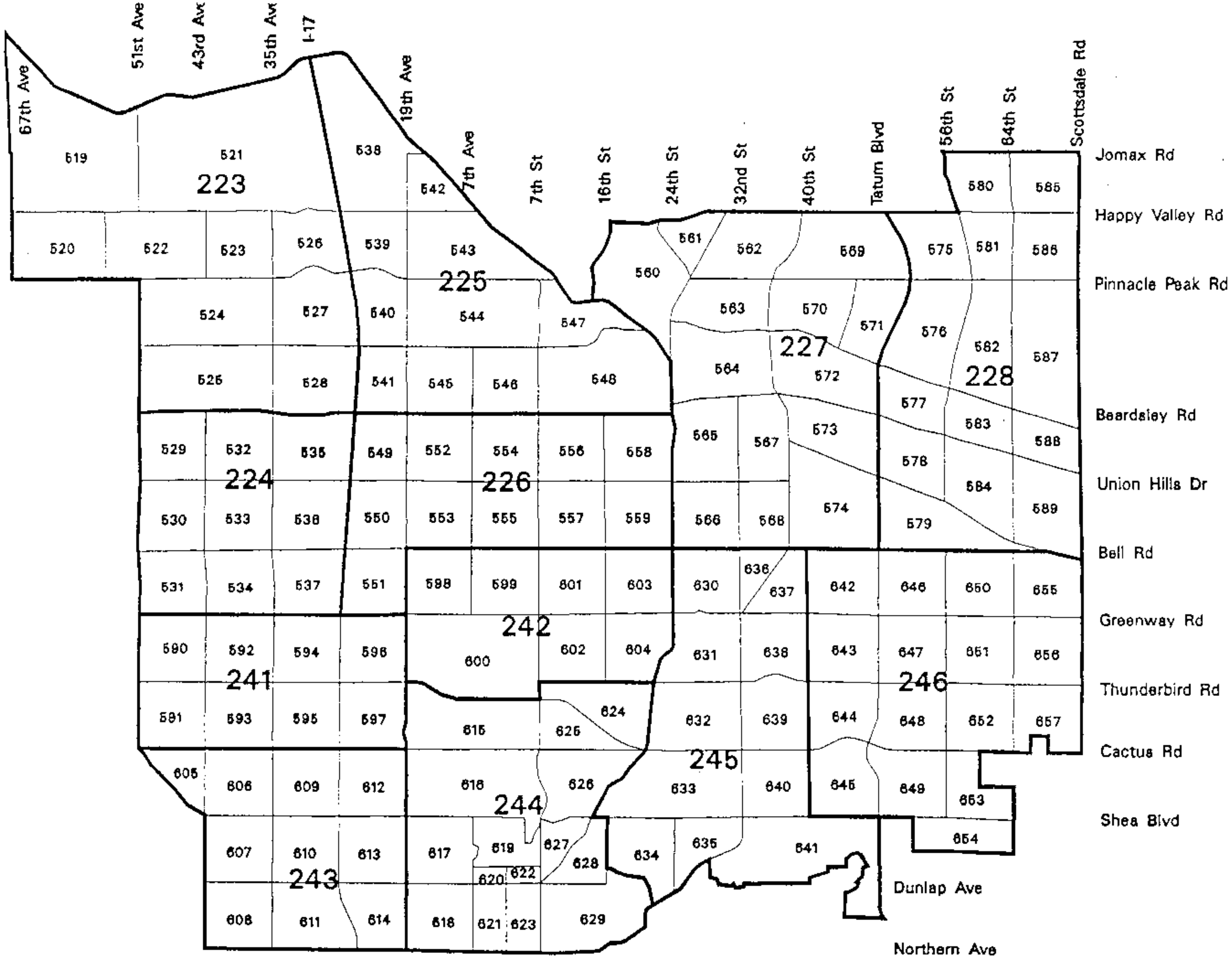
October, 1996

MAG Regional Analysis/Traffic Analysis Zones

SECTION 4

RAZ Boundary (Large Numbers)

TAZ Boundary



MAG Regional Analysis/Traffic Analysis Zones

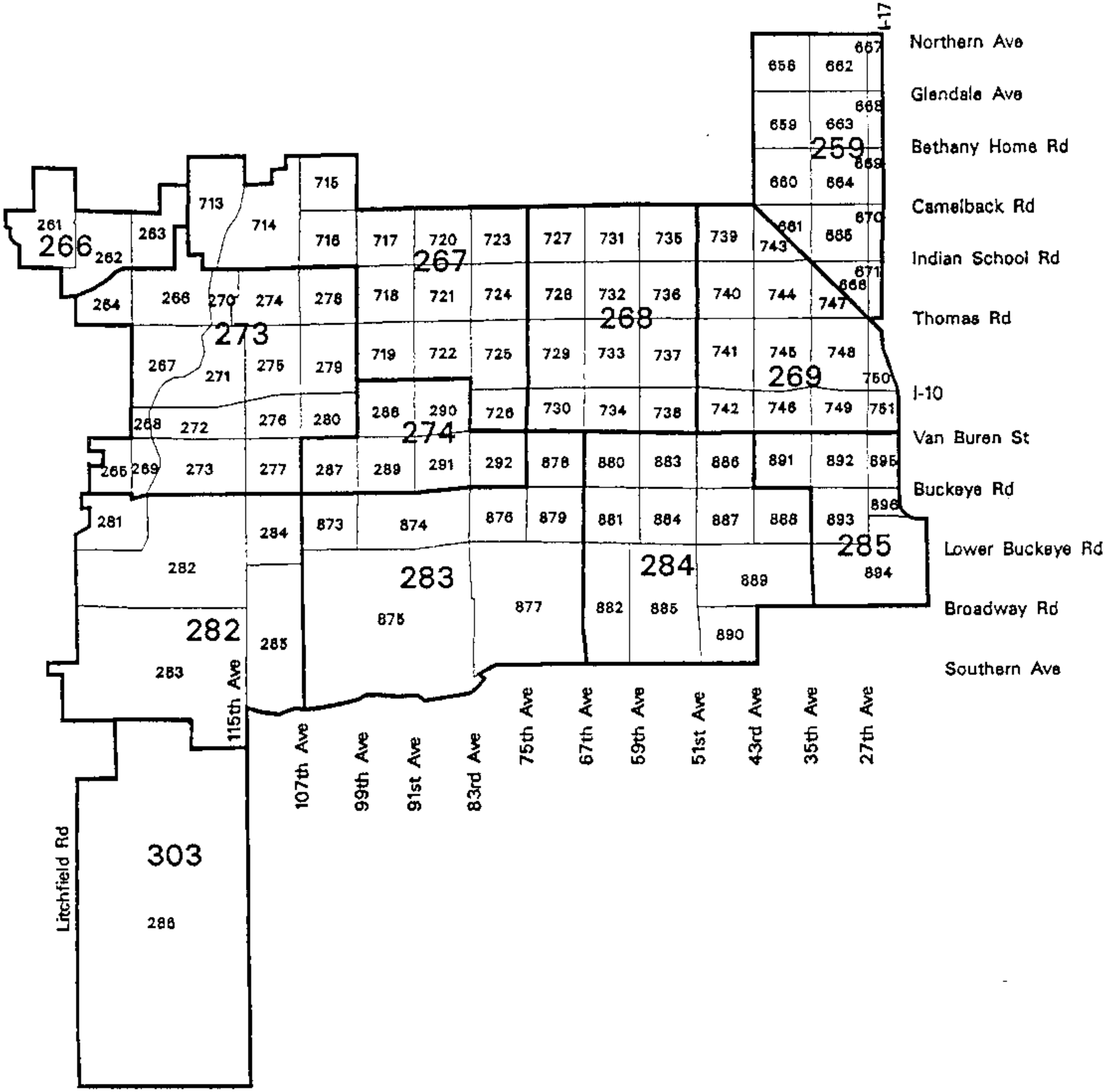
SECTION 5

RAZ Boundary (Large Numbers)

TAZ Boundary (Small Numbers)

MARICOPA ASSOCIATION of GOVERNMENTS

October, 1996



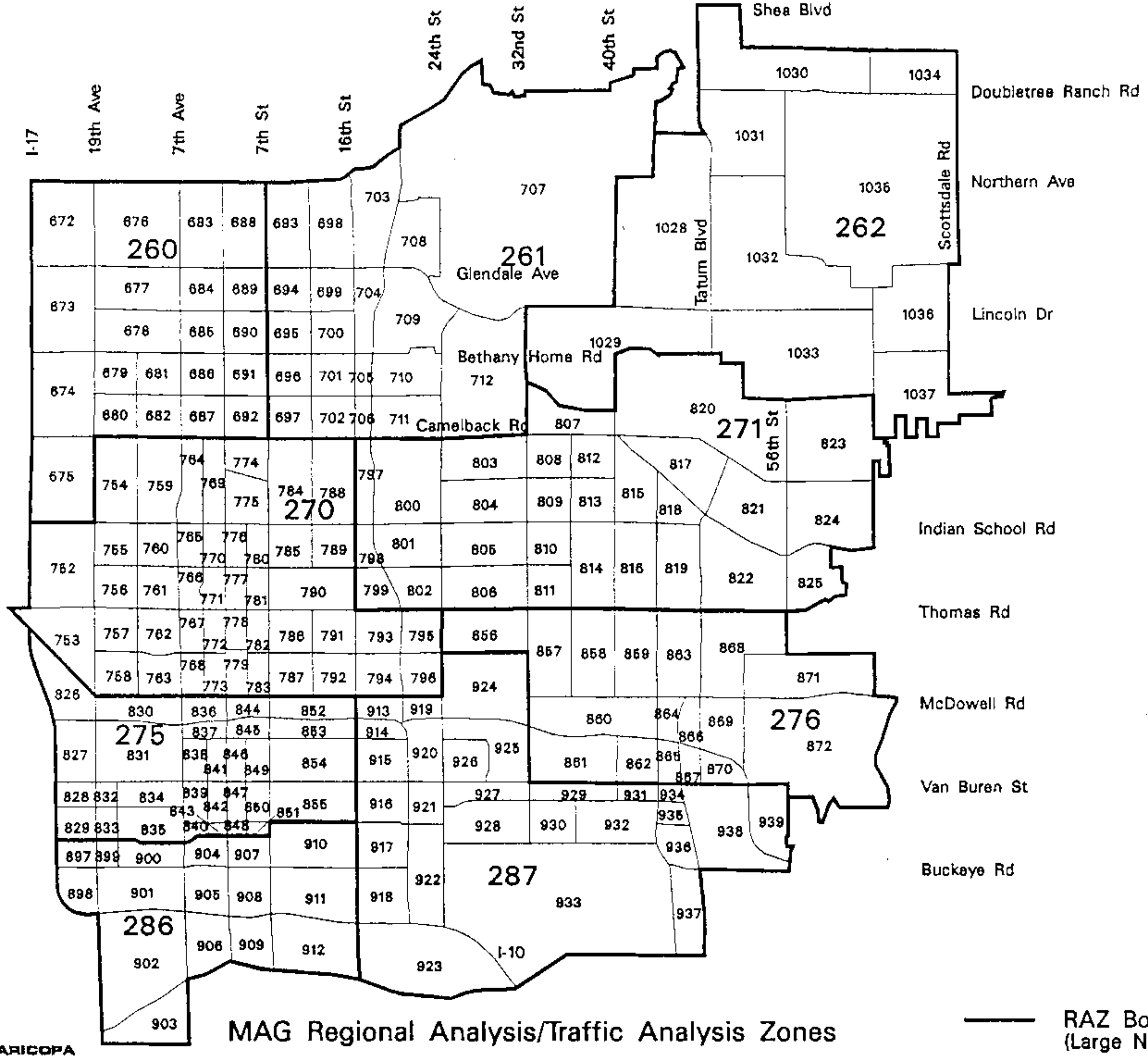
MAG Regional Analysis/Traffic Analysis Zones

SECTION 6

MARICOPA ASSOCIATION of GOVERNMENTS

RAZ Boundary (Large Numbers)

TAZ Boundary (Small Numbers)



MAG Regional Analysis/Traffic Analysis Zones

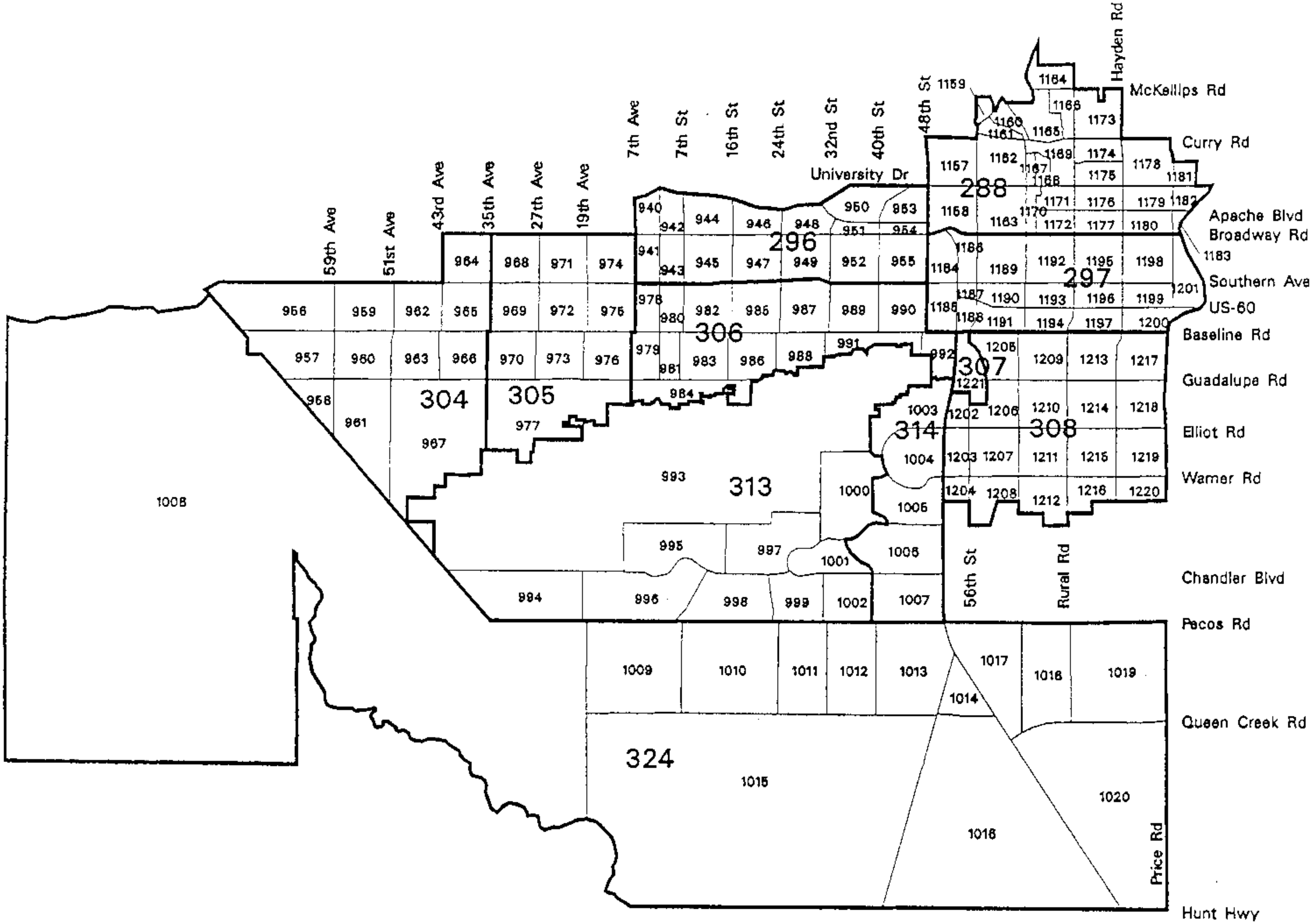
SECTION 7

RAZ Boundary (Large Numbers)

TAZ Boundary (Small Numbers)

MARICOPA ASSOCIATION of GOVERNMENTS

October, 1996



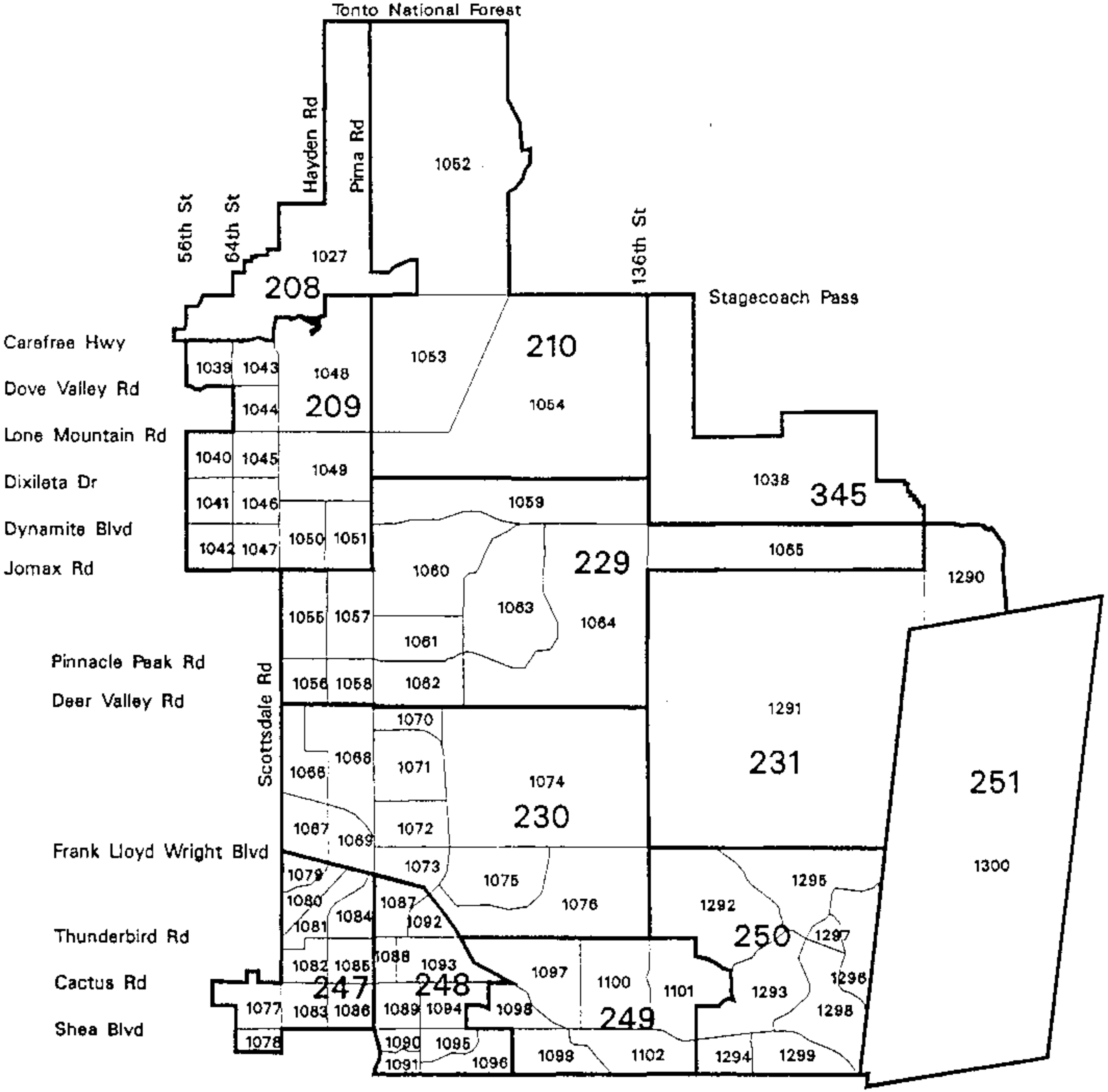
MAG Regional Analysis/Traffic Analysis Zones

SECTION 8

RAZ Boundary (Large Numbers)

TAZ Boundary

MARICOPA ASSOCIATION of GOVERNMENTS



MAG Regional Analysis/Traffic Analysis Zones

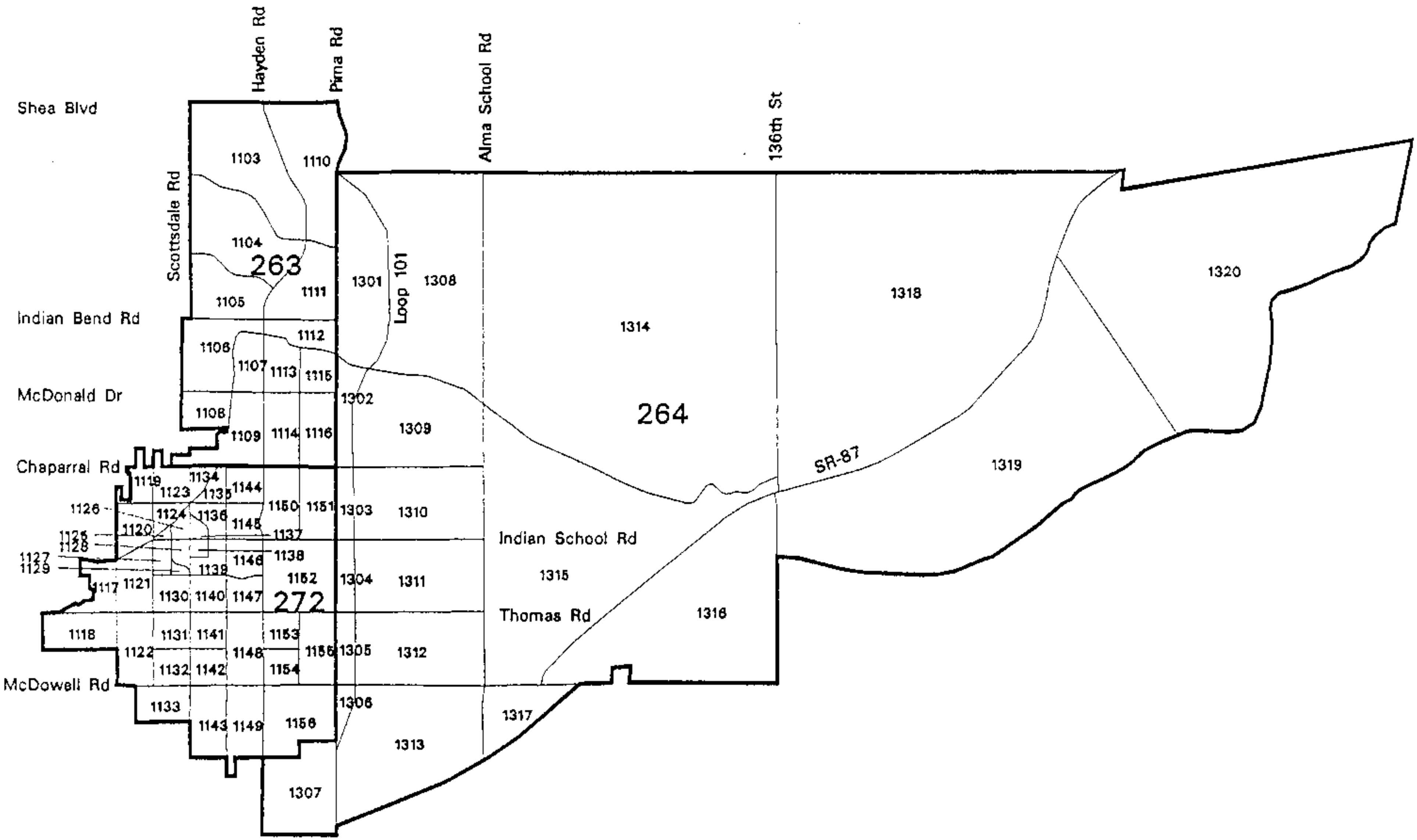
SECTION 9

RAZ Boundary (Large Numbers)

TAZ Boundary (Small Numbers)

MARICOPA ASSOCIATION of GOVERNMENTS

October, 1996



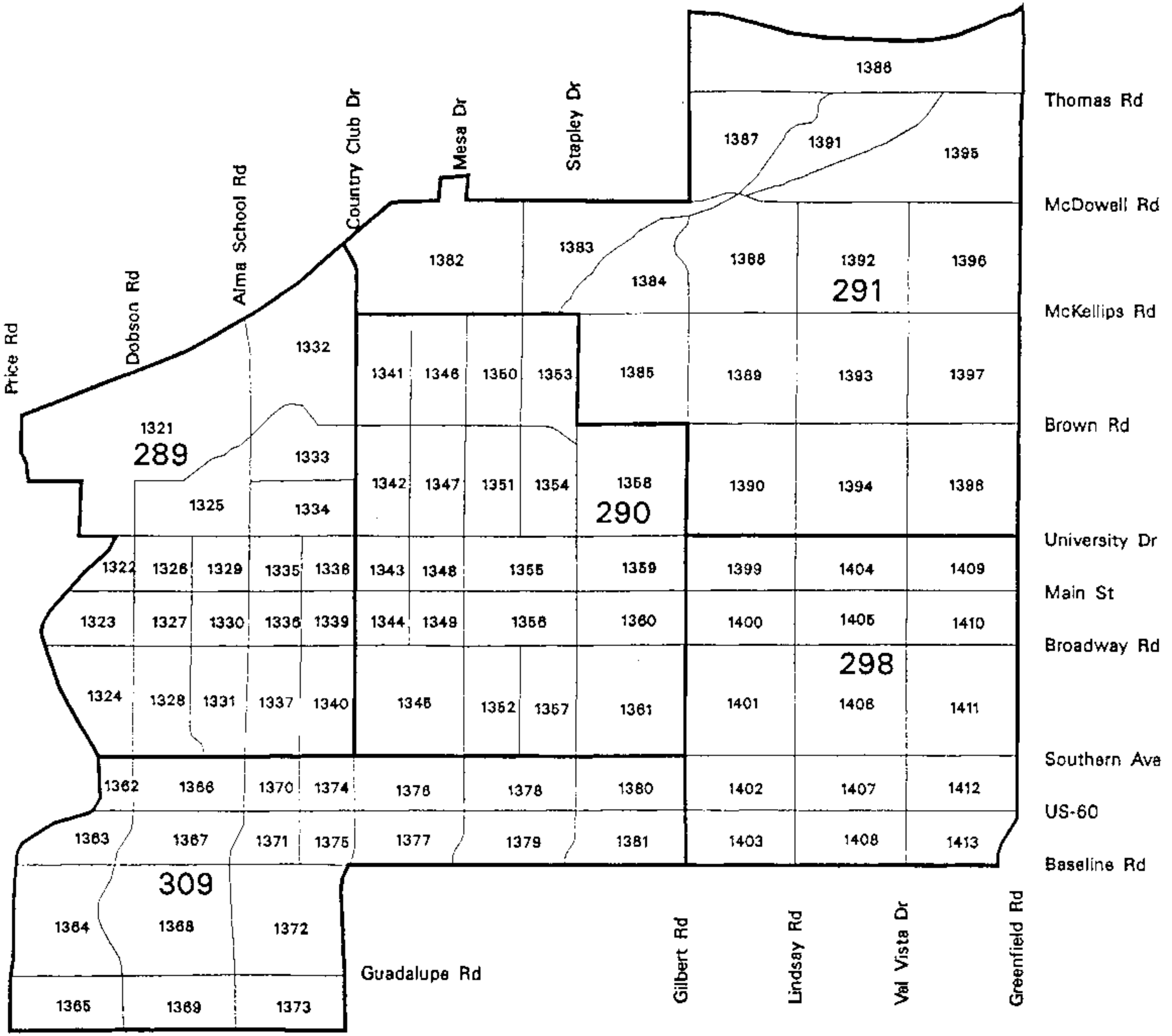
MARICOPA ASSOCIATION of GOVERNMENTS

MAG Regional Analysis/Traffic Analysis Zones

SECTION 10

RAZ Boundary (Large Numbers)

TAZ Boundary



MAG Regional Analysis/Traffic Analysis Zones

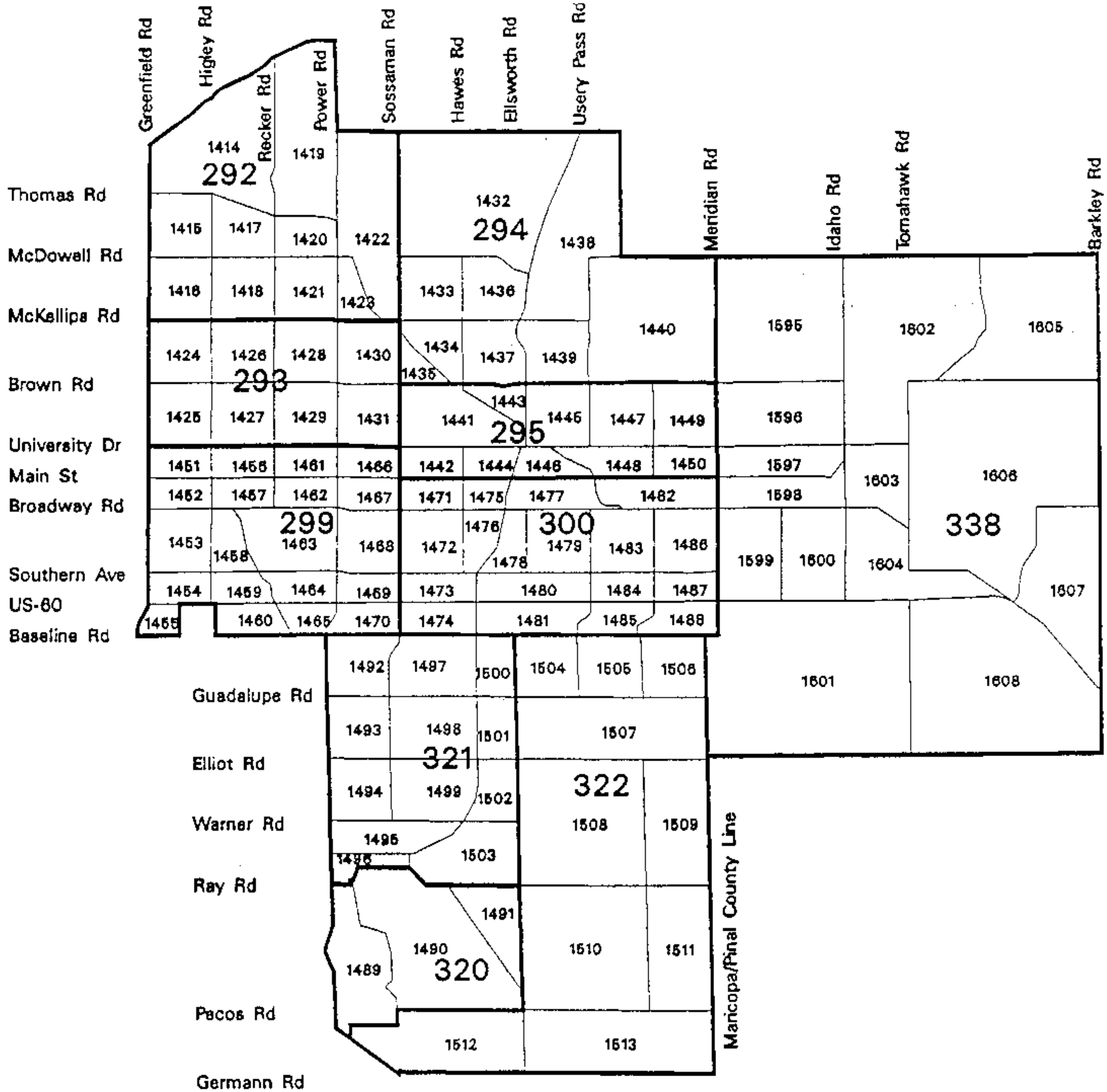
SECTION 11

RAZ Boundary (Large Numbers)

TAZ Boundary (Small Numbers)

MARICOPA ASSOCIATION of GOVERNMENTS

October, 1996



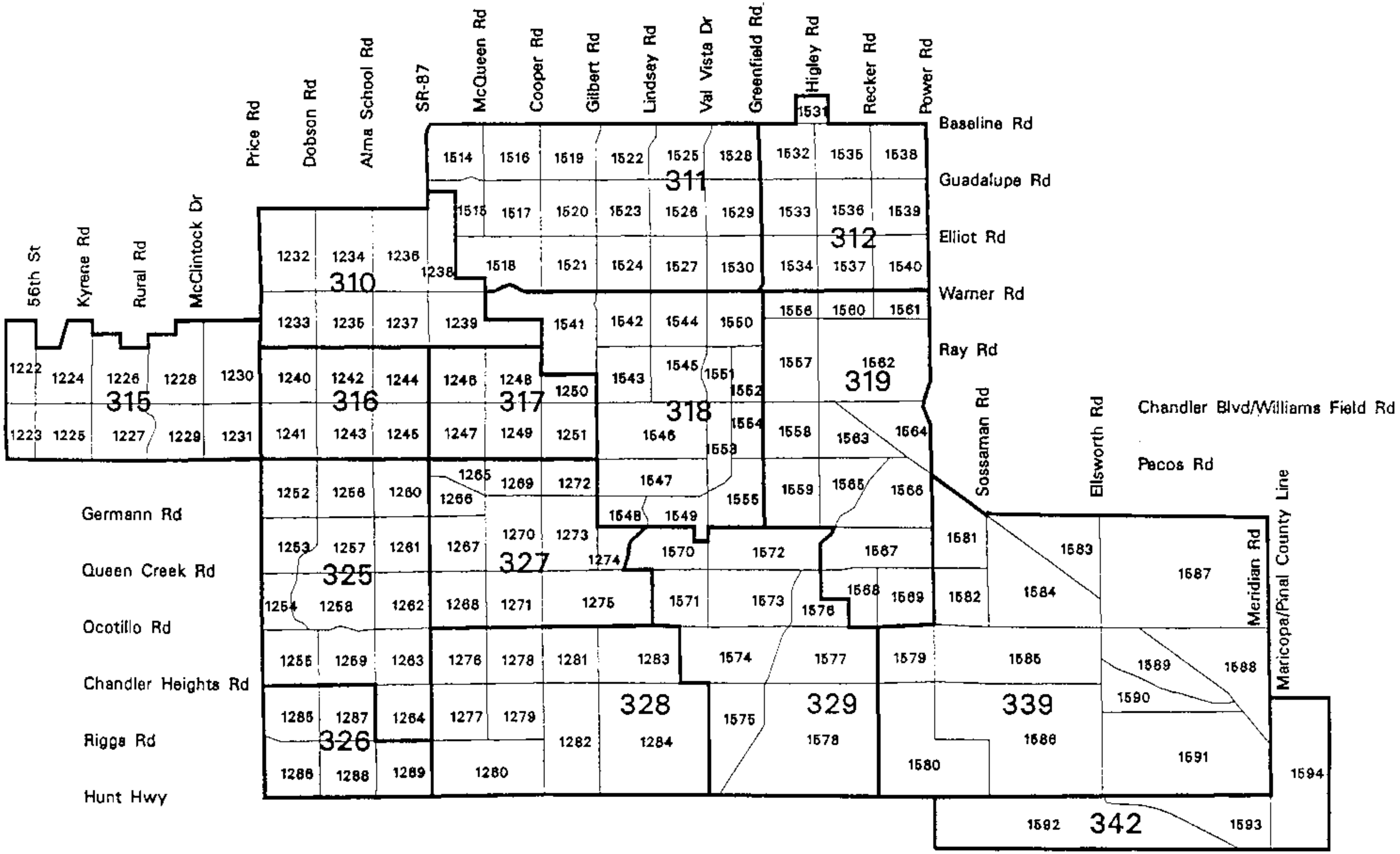
MAG Regional Analysis/Traffic Analysis Zones

SECTION 12

RAZ Boundary (Large Numbers)

TAZ Boundary (Small Numbers)

MARICOPA ASSOCIATION of GOVERNMENTS



MARICOPA ASSOCIATION of GOVERNMENTS

December, 1996

MAG Regional Analysis/Traffic Analysis Zones

SECTION 13

Appendix B

MAG POPULATION PROJECTIONS

POPULATION PROJECTIONS SUMMARY – MAG 208 WQMP REVISION

	Year	2000	2005	2010	2015	2020
MAG Planning Area Population Summary						
	Total Resident	2,954,150	3,329,550	3,709,575	4,101,775	4,516,100
	Total Non-resident	89,174	95,441	103,395	114,067	125,026
	Transient	36,118	38,737	41,242	43,164	45,125
	Seasonal	53,056	56,704	62,153	70,903	79,901
Total		3,132,498	3,520,432	3,916,365	4,329,909	4,766,152
Resident and Seasonal Population by 208 Planning Region and Municipal Planning Area						
Northeast Region						
	Cave Creek	4,231	6,463	9,188	11,398	13,288
	Carefree	3,041	3,578	4,760	5,196	5,564
	Scottsdale	206,429	244,556	273,343	297,940	311,047
	Fountain Hills	18,745	26,113	34,939	52,860	54,999
	Paradise Valley	13,353	13,388	13,587	13,734	13,760
	SRPMIC	6,851	6,975	7,024	7,162	7,467
	County -Rio Verde	1,152	1,179	1,216	1,253	1,286
	County-Spur Cross	58	58	58	58	58
	Fort McDowell	750	838	944	1,097	1,174
	Subtotal	254,610	303,148	345,059	390,698	408,643
Northwest Region						
	Peoria	96,974	130,910	145,797	172,138	188,834
	Surprise	27,739	38,486	43,105	49,205	64,143
	El Mirage	6,605	6,678	6,702	6,869	8,148
	Youngtown	2,978	3,040	3,119	3,206	3,286
	Glendale	215,477	235,863	259,808	287,873	305,529
	Luke AFB	3,794	3,796	3,815	3,815	3,821
	County	71,994	73,551	75,536	79,332	86,462
	Subtotal	425,561	492,324	537,882	602,438	660,223
Southeast Area						
	Mesa	444,643	500,151	561,764	591,196	619,228
	Tempe	166,207	172,458	176,878	183,392	185,862
	Guadalupe	5,506	5,665	5,724	5,731	5,736
	Chandler	171,099	199,967	223,398	242,995	261,587
	Gilbert	108,688	132,978	174,856	201,616	245,440
	Queen Creek	7,452	10,735	14,042	17,283	20,584
	County - Sun Lakes	13,241	15,900	18,539	22,169	26,839
	Subtotal	916,836	1,037,854	1,175,201	1,264,382	1,365,276
Southwest Area						
	Buckeye	18,084	22,385	28,176	51,446	82,416
	Goodyear	19,939	28,504	38,425	58,712	93,396
	Litchfield Park	4,942	6,583	8,519	12,629	14,778
	Avondale	29,450	32,922	37,909	52,307	85,294
	Tolleson	4,525	4,783	6,955	7,603	8,267
	Unincorporated Areas	1,471	2,509	3,472	5,166	7,816
	Subtotal	78,411	97,686	123,456	187,863	291,967

POPULATION PROJECTIONS SUMMARY – MAG 208 WQMP REVISION

Year		2000	2005	2010	2015	2020
Central Area						
	Phoenix	1,309,799	1,427,315	1,557,858	1,687,240	1,812,784
Outlying Areas						
	Wickenburg	8,495	8,967	9,516	10,070	10,582
	Gila Bend	2,124	2,249	2,393	2,548	2,742
	GRIC	2,708	2,764	2,832	2,919	3,101
	County SW	5,568	8,530	10,614	14,854	25,006
	County SE	-	-	-	-	-
	County NE	1,784	3,475	3,947	4,067	4,119
	County NW	1,310	1,942	2,970	5,599	11,558
	Subtotal	21,989	27,927	32,272	40,057	57,108
SROG						
	Phoenix	1,309,799	1,427,315	1,557,858	1,687,240	1,812,784
	Youngtown	2,978	3,040	3,119	3,206	3,286
	Glendale	219,271	239,659	263,623	291,688	309,350
	Tempe	166,207	172,458	176,878	183,392	185,862
	Mesa	444,643	500,151	561,764	591,196	619,228
	Scottsdale	206,429	244,556	273,343	297,940	311,047
	Subtotal	2,349,327	2,587,179	2,836,585	3,054,662	3,241,557

Notes:

1. The resident population, housing unit and employment projections are consistent with the October 27, 1995 Special Census.
2. The resident population and employment projections were prepared to be consistent with the county population control totals developed by the Department of Economic Security (DES) and approved by the director of DES in January 1997 as required by Executive Order 95-2.
3. These projections were based on planned and proposed development and adopted land use plans.
4. These projections should be used with caution. They are subject to fluctuation as a result of changes in economic and development conditions.

Prepared by Carollo Engineers for the purpose of 208 Water Quality Management Planning, based on “MAG Socioeconomic Projections Interim Report, June 1997”.

Appendix C

DESIGNATED MANAGEMENT AGENCY RESOLUTIONS

CITY OF PHOENIX • OFFICE OF THE MAYOR

MARGARET T. HANCE
MAYOR

January 9, 1979

Mayor Charles Salem, President
MAG Regional Council
Mayor of Goodyear
1820 West Washington
Phoenix, AZ 85007

Dear ~~Mayor Salem:~~ Charlie:

On January 9, 1979, the Mayor and Council of the City of Phoenix adopted the Areawide Wastewater Treatment Management System in Resolution #15113.

In order to implement the adopted management system, the MAG Regional Council is hereby requested to designate the City of Phoenix as a member of the Multi-City Sub-Regional Operating Group. It is further requested that the City of Phoenix be designated as the Lead Agency of the Multi-City Sub-Regional Operating Group.

Cordially,

Margie

Margaret T. Hance
MAYOR

RESOLUTION NO. 15113

A RESOLUTION INDICATING THE WILLINGNESS OF THE CITY OF PHOENIX TO CARRY OUT THE RESPONSIBILITIES DESIGNATED IN THE MAG WATER QUALITY MANAGEMENT PLAN; AND DECLARING AN EMERGENCY.

WHEREAS, the City of Phoenix, Arizona, is aware that Provisions of the Clean Water Act (Public Laws 92-500 and 95-217), Section 208, require development of an Areawide Water Quality Management Plan and, further, require the Governor of Arizona and the U. S. Environmental Protection Agency, Region IX Administrator, to designate official management agency(s) to carry out appropriate sections of the plan, and

WHEREAS, the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona, and the U. S. Environmental Protection Agency, Region IX Administrator, to prepare the Areawide Water Quality Management Plan for the Maricopa County area in accordance with the provisions of Section 208, and

WHEREAS, the Regional Council of the Maricopa Association of Governments (MAG) has approved a Water Quality Management Plan and a Wastewater Treatment Management System for the Maricopa County area,

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF PHOENIX as follows:

SECTION 1. That the Mayor and Council of the City of Phoenix hereby indicate the willingness of the City of Phoenix to proceed to carry out the appropriate responsibilities for which it has been designated in the Wastewater Treatment

Management System Report approved by the MAG Regional Council on March 15, 1978.

SECTION 2. WHEREAS, the immediate operation of the provisions of this resolution is necessary for the preservation of the public peace, health and safety, an EMERGENCY is hereby declared to exist, and this resolution shall be in full force and effect from and after its passage by the Council as required by the City Charter and is hereby exempted from the referendum clause of said Charter.

PASSED by the Council of the City of Phoenix this 9 day of January, 1979.

Margaret T. Hance
MAYOR

ATTEST:

_______________ City Clerk

APPROVED AS TO FORM:

_______________ ACTING City Attorney

REVIEWED BY:

_______________ City Manager

STATE OF ARIZONA } SS
COUNTY OF MARICOPA }

I, BEULAH BRADLEY, DEPUTY City Clerk of the City of Phoenix, County of Maricopa, State of Arizona, do hereby certify and attest the foregoing to be a full, true and correct copy of Resolution No. 15113 of the City of Phoenix, Arizona, as adopted by the City Council of the City of Phoenix at a Regular Meeting held on the 9 day of January, 1979, all as appears of record in my office.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the official seal of the City of Phoenix to be affixed hereunto this 10TH day of January, 1979.

Beulah Bradley
DEPUTY City Clerk

Office of
The Mayor

WAYNE C. POMEROY

January 16, 1979

MAG REGIONAL COUNCIL
Maricopa Association of
Governments
1820 West Washington
Phoenix, Arizona 85007

Dear Council Members:

On January 8, 1979, the Mayor and Council of the City of Mesa adopted the Areawide Wastewater Treatment Management System in Resolution #4335.

In order to implement the adopted management system, the MAG Regional Council is hereby requested to designate the City of Mesa as a member of the Multi-City Sub-Regional Operating Group. It is further requested the the City of Phoenix be designated as the Lead Agency of the Multi-City Sub-Regional Operating Group.

Sincerely,

Wayne C. Pomeroy

WAYNE C. POMEROY
Mayor

WCP:mw

JAN 1

Certificate of CITY CLERK

I, DORTHE M. DANA, THE DULY APPOINTED AND QUALIFIED CITY CLERK OF THE CITY OF MESA, MARICOPA COUNTY, ARIZONA, DO HEREBY CERTIFY THAT THE ATTACHED COPY OF RESOLUTION NO. 4335, ENTITLED:

RESOLUTION NO. 4335

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MESA, MARICOPA COUNTY, ARIZONA, AGREEING TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM

IS A TRUE, CORRECT AND COMPARED COPY OF THE ORIGINAL OF RECORD, AND ON FILE IN THE OFFICE OF THE CITY CLERK OF THE CITY OF MESA, ARIZONA.

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND AND SEAL OF THE CITY OF MESA, MARICOPA COUNTY, STATE OF ARIZONA, THIS 9th DAY OF January, 1979.

Dorthe Dana

DORTHE M. DANA, CITY CLERK

JLS:jhw

RESOLUTION NO. 4335

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MESA, MARICOPA COUNTY, ARIZONA, AGREEING TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM.

WHEREAS, the City of Mesa is aware that Provisions of the Clean Water Act (Public Laws 92-500 and 95-217) Section 208 require development of an Areawide Water Quality Management Plan, and, further, require the Governor of Arizona and the U.S. Environmental Protection Agency, Region IX Administrator to designate official management agency(s) to carry out appropriate sections of the plan; and

WHEREAS, the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona, and the U.S. Environmental Protection Agency, Region IX Administrator to prepare the Areawide Water Quality Management Plan for the Maricopa County area in accordance with the provisions of Section 208; and

WHEREAS, the Regional Council of the Maricopa Association of Governments (MAG) has approved a Water Quality Management Plan and a Wastewater Treatment Management System for the Maricopa County area.

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF MESA, MARICOPA COUNTY, ARIZONA, that the City of Mesa agrees to carry out the appropriate duties and responsibilities identified in the Waste Treatment Management System Report approved by the MAG Regional Council on March 15, 1978.

PASSED AND ADOPTED by the Mayor and City Council of the City of Mesa, Maricopa County, Arizona, this 8th day of January, 1979.

APPROVED:

Wayne Pomeroy

Mayor

ATTEST:

Dorothe Ross

City Clerk

CITY OF TEMPE

Home of Arizona State University

P.O. Box 5002 Tempe, Arizona 85281 (602) 967-2001

January 12, 1979

Office of the
Mayor and City Manager

MAG Regional Council
1820 W. Washington Street
Phoenix, Arizona 85007

Gentlemen:

On January 11, 1979, the Mayor and City Council of the City of Tempe, Arizona adopted the Areawide Wastewater Treatment Management System in Resolution #1521.

In order to implement the adopted management system, the MAG Regional Council is hereby requested to designate the City of Tempe, Arizona as a member of the Multi-City Sub-Regional Operating Group. It is further requested that the City of Phoenix be designated as the Lead Agency of the Multi-City Sub-Regional Operating Group.

Sincerely,

Harry E. Mitchell
Mayor

RESOLUTION NO. 1521

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF TEMPE, ARIZONA, AGREEING TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM.

* *

WHEREAS, the City of Tempe is aware that Provisions of the Clean Water Act (Public Laws 92-500 and 95-217) Section 208 require development of an Areawide Water Quality Management Plan, and, further, require the Governor of Arizona and the U. S. Environmental Protection Agency, Region IX Administrator to designate official management agency(s) to carry out appropriate sections of the plan, and;

WHEREAS, the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona, and the U. S. Environmental Protection Agency, Region IX Administrator to prepare the Areawide Water Quality Management Plan for the Maricopa County area in accordance with the provisions of Section 208, and;

WHEREAS, the Regional Council of the Maricopa Association of Governments (MAG) has approved a Water Quality Management Plan and a Wastewater Treatment Management System for the Maricopa County area.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TEMPE, ARIZONA, as follows:

That the City of Tempe agrees to carry out the appropriate duties and responsibilities identified in the Waste Treatment Management System Report approved by the MAG Regional Council on March 15, 1978.

PASSED AND ADOPTED BY THE CITY COUNCIL OF THE CITY OF TEMPE, ARIZONA, this 11th day of January, 1979.

Harry E. Mitchell
MAYOR

ATTEST:

Pauline S. Templeton
City Clerk

APPROVED AS TO FORM:

David R. Merkel
City Attorney

Office of the Mayor and City Council

January 3, 1979

MAG Regional Council
Maricopa Association of Governments
1820 West Washington
Phoenix, Arizona 85007

Dear Council Members:

On January 2, 1979, the Mayor and Council of the City of Scottsdale adopted the Areawide Wastewater Treatment Management System in Resolution #1900.

In order to implement the adopted management system, the MAG Regional Council is hereby requested to designate the City of Scottsdale as a member of the Multi-City Sub-Regional Operating Group. It is further requested that the City of Phoenix be designated as the Lead Agency of the Multi-City Sub-Regional Operating Group.

Sincerely,

William C. Jenkins

William C. Jenkins
Mayor

WCJ:mb

Enclosure - Resolution #1900

RESOLUTION NO. 1900

A RESOLUTION OF THE COUNCIL OF THE CITY OF SCOTTSDALE, MARICOPA COUNTY, ARIZONA, DECLARING ITS INTENTION TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM.

WHEREAS, the City of Scottsdale is aware that Provisions of the Clean Water Act (Public Laws 92-500 and 95-217) Section 208 require development of an Areawide Water Quality Management Plan, and, further, require the Governor of Arizona and the U. S. Environmental Protection Agency, Region IX Administrator to designate official management agency(s) to carry out appropriate sections of the plan, and;

WHEREAS, the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona, and the U. S. Environmental Protection Agency, Region IX Administrator to prepare the Areawide Water Quality Management Plan for the Maricopa County area in accordance with the provisions of Section 208, and;

WHEREAS, the Regional Council of the Maricopa Association of Governments (MAG) has approved a Water Quality Management Plan and a Wastewater Treatment Management System for the Maricopa County area,

NOW, THEREFORE BE IT RESOLVED that the Mayor and City Council of Scottsdale agree to carry out the appropriate duties and responsibilities identified in the Waste Treatment Management System Report approved by the MAG Regional Council on March 15, 1978.

PASSED AND ADOPTED by the Council of the City of Scottsdale, this 2nd day of January, 1979.

William C. Jenkins

William C. Jenkins, Mayor

ATTEST:

Jean Anderson

City of Glendale

7022 NORTH 58TH DRIVE • P. O. BOX 1556 • GLENDALE, ARIZONA 85311 • (602) ~~XXXXXX~~
931-5400

January 23, 1979

Maricopa Association of Governments
Regional Council
1820 West Washington
Phoenix, AZ 85007

Attention: Ken Driggs

On January 9, 1979, the Mayor and Council of the City of Glendale adopted the Areawide Wastewater Treatment Management System in Resolution No. 1862 New Series.

In order to implement the adopted management system, the MAG Regional Council is hereby requested to designate the City of Glendale as member of the Multi-Cities Sub-Regional Operating Group. It is further requested that City of Phoenix be designated as the Lead Agency of the Multi-Cities Sub-Regional Operating Group.

Sincerely,

F. Van de Putte

S. F. Van de Putte
City Manager

cc: Marvin Andrews

attachments

RESOLUTION NO. 1862 NEW SERIES

A RESOLUTION OF THE COUNCIL OF THE CITY OF GLENDALE, MARICOPA COUNTY, ARIZONA, AGREEING TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM

WHEREAS, the City of Glendale is aware that provisions of the Clean Water Act (Public Laws 92-500 and 95-217) Section 208 require development of an Areawide Water Quality Management Plan, and, further, require the Governor of Arizona and the U. S. Environmental Protection Agency, Region IX Administrator to designate official management agency(s) to carry out appropriate sections of the plan; and

WHEREAS, the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona, and the U. S. Environmental Protection Agency, Region IX Administrator to prepare the Areawide Water Quality Management Plan for the Maricopa County area in accordance with the provisions of Section 208; and

WHEREAS, the Regional Council of the Maricopa Association of Governments (MAG) has approved a Water Quality Management Plan and a Wastewater Treatment Management System for the Maricopa County area,

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF GLENDALE as follows:

SECTION 1. That the City of Glendale agrees to carry out the appropriate duties and responsibilities identified in the Waste Treatment Management System Report approved by the Maricopa Association of Governments (MAG) Regional Council on the 15th day of March, 1978.

PASSED, ADOPTED AND APPROVED by the Mayor and Council of the City of Glendale, Maricopa County, Arizona, this 9th day of January, 1979.

J. STERLING RIDGE
MAYOR

ATTEST:

IRENE WITTER
City Clerk

(SEAL)

APPROVED AS TO FORM:

THOMAS A. McCARTHY, JR.
Assistant City Attorney

REVIEWED BY:

S. F. VAN de PUTTE

CITY OF GLENDALE, ARIZONA

COUNCIL COMMUNICATION

CC NO.: 1978/79 - 179

DATE 1/5/79

TO: Honorable Mayor and Council

FROM: City Manager

SUBJECT: 208 AREAWIDE WASTEWATER TREATMENT MANAGEMENT SYSTEM

SUMMARY

I have attached for your review a document entitled, "Maricopa Association of Governments Water Quality Management Program." The contents of this report have been discussed with you as each segment has been prepared. This management system has been developed under the provisions of the Clean Water Act of Public Laws 92-500 and 95-217, and in compliance with these laws, all of the cities participating in the Areawide Wastewater Treatment Management System must pass a resolution agreeing to participate in said management program. We have prepared a resolution authorizing this participation.

The second part of the 208 program is a letter requesting designation of a Sub-regional Operating Group and a lead agency to implement the system. This Sub-regional Operating Group (SROG) will include Mesa, Tempe, Scottsdale, Youngtown, Gilbert, Glendale and Phoenix, with the latter being designated as the lead agency. A copy of the form letter to be utilized is attached.

RECOMMENDED ACTION

Passage of the resolution agreeing to participate in the Maricopa County Area Wastewater Treatment Management System, motion authorizing our membership in the Sub-regional Operating Group, and designating Phoenix as the lead agency.

S. F. VAN DE PUTTE
CITY MANAGER

E X C E R P T

FROM THE MINUTES OF A REGULAR MEETING OF THE COUNCIL OF THE CITY OF GLENDALE, MARICOPA COUNTY, ARIZONA, HELD AT 7:30 P.M., TUESDAY, THE 9th DAY OF January, 1979.

VOLUME 1978/79 PAGE 125

208 Areawide Wastewater Treatment Management System

The City Manager had submitted to Council a document for review entitled Maricopa Association of Governments Water Quality Management Program. The Manager stated this management system has been developed under the provisions of the Clean Water Act of Public Laws 92-500 and 95-217, and in compliance with these laws each participating city in the Areawide Wastewater Treatment Management System is required to pass a resolution authorizing such participation.

The City Manager stated a motion authorizing the City's membership in the Sub-regional Operating Group and designating a Lead Agency for the Multi-Cities (SROG) Group is also required in letter form.

Resolution No. 1862 New Series was read by number and title only, it being A RESOLUTION OF THE COUNCIL OF THE CITY OF GLENDALE, MARICOPA COUNTY, ARIZONA, AGREEING TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM.

Motion by Heatwole, seconded by Asdell, to pass, adopt and approve Resolution No. 1862 New Series and authorize and direct the Mayor to sign the same. Motion carried unanimously.

TOWN OF YOUNGTOWN

12028 CLUBHOUSE SQUARE
YOUNGTOWN, ARIZONA 85363

[redacted] 933-8286

January 18, 1979

On January 18, 1979, the Mayor and Common Council of the Town of Youngtown, Arizona adopted the Areawide Wastwater Treatment Management System in Resolution No. 2047.

In order to implement the adopted management system, the MAG Regional Council if hereby requested to designate the Town of Youngtown as member of the Multi-Member Sub-Regional Operating Group. It is further requested that the City of Phoenix be designated as the Lead Agency of the Multi Member Sub-Regional Operating Group.

Cordially,

Norman B. Shrenk

Norman B. Shrenk, Mayor

JAN

RESOLUTION NO. [illegible]

A RESOLUTION OF THE MAYOR AND COMMON COUNCIL OF THE TOWN OF YOUNGTOWN, ARIZONA, AGREEING TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM.

WHEREAS, the Town of Youngtown is aware that Provisions of the Clean Water Act (Public Laws 92-500 and 95-217) Section 208 require development of an Areawide Water Quality Management Plan, and further, require the Governor of Arizona and the U.S. Environmental Protection Agency, Region IX, Administrator to designate official management agency(s) to carry out appropriate sections of the plan, and;

WHEREAS, the Maricopa Association of Governments has been designated by the Governor of Arizona and the U.S. Environmental Protection Agency, Region IX Administrator to prepare the Area Wide Water Quality Management Plan for the Maricopa County Area in accordance with the provisions of Section 208, and;

WHEREAS, the Regional Council of the Maricopa Association of Governments has approved a Water Quality Management Plan and a Wastewater Treatment Management System for the Maricopa County Area.

NOW THEREFORE, BE IT RESOLVED THAT THE Mayor and Common Council of the Town of Youngtown, Arizona agrees to carry out the appropriate duties and responsibilities identified in the Waste Treatment Management System Report approved by the Maricopa Association of Governments Regional Council on March 15, 19[illegible].

WHEREAS, it is necessary for the preservation of the public peace, health and safety of the Town of Youngtown, Arizona, an emergency is hereby declared to exist and this resolution shall be effective immediately upon its passage and adoption and approval of the Mayor and Common Council of the Town of Youngtown, Arizona.

PASSED AND ADOPTED, by the Mayor and Common Council of the Town of Youngtown, on this 18th day of January 1979.

APPROVED THIS 18th day of January 1979 by the affirmative vote of three-fourths of the members of the Common Council of the Town of Youngtown, Arizona.

Norman E. Shiek, Mayor

ATTEST: [illegible]

[illegible], Town Clerk

TOWN — of — GILBERT

P.O. BOX 837 • GILBERT, ARIZONA 85234

January 17, 1979

MAG Regional Council
1820 West Washington Street
Phoenix, Arizona 85007

On January 16, 1979, the Mayor and Council of the Town of Gilbert adopted the Areawide Wastewater Treatment Management System, in Resolution No. 328.

In order to implement the adopted management system, the MAG Regional Council is hereby requested to designate the Town of Gilbert as a single member Sub-Regional Operating Group and Lead Agency.

In addition, the MAG Regional Council is hereby requested to designate the Town of Gilbert as a member of the Multi-Cities Sub-Regional Operating Group. It is further requested that the City of Phoenix be designated as the Lead Agency of the Multi-City Sub-Regional Operating Group.

Cordially,

TOWN OF GILBERT

Edward Lane

Edward Lane
Mayor

lo

RESOLUTION NO. 328

AGREEMENT TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM

WHEREAS, the Town of Gilbert is aware that provisions of the Clean Water Act (Public Laws 92-500 and 95-217) Section 208 require development of an Areawide Water Quality Management Plan; and, further, require the Governor of Arizona and the U. S. Environmental Protection Agency, Region IX Administrator to designate official management agency(ies) to carry out appropriate sections of the plan; and,

WHEREAS, the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona, and the U. S. Environmental Protection Agency, Region IX Administrator to prepare the Areawide Water Quality Management Plan for the Maricopa County area in accordance with the provisions of Section 208; and,

WHEREAS, the Regional Council of the Maricopa Association of Governments (MAG) has approved a Water Quality Management Plan and a Wastewater Treatment Management System for the Maricopa County area.

NOW, THEREFORE, BE IT RESOLVED THAT THE MAYOR AND TOWN COUNCIL of Gilbert, Arizona, agrees to carry out the appropriate duties and responsibilities identified in the Waste Treatment Management System Report approved by the MAG Regional Council on March 15, 1978.

APPROVED this 16 day of January, 1979.

TOWN OF GILBERT

By Edward W. Fane
Mayor

ATTEST:

Ly Oldenburg
Town Clerk

CITY OF PEORIA

8355 W. PEORIA AVENUE
POST OFFICE BOX 38
PEORIA, ARIZONA 85345

CITY OF PEORIA 1954

MARICOPA COUNTY, ARIZONA

DEPARTMENT: Mayor

MAG Regional Council
1820 W. Washington
Phoenix, Arizona

Gentlemen:

On December 26, 1978, the Mayor and Council of the City of Peoria, Arizona, adopted the Areawide Wastewater Treatment Management System in Resolution No. 78-40.

In order to implement the adopted management system, the MAG Regional Council [illegible] requested to designate the City of Peoria, Arizona [illegible]ber of the Peo[illegible] Tolleson Sub-Regional Operating Group. It is further requ[illegible]ty of Tolleson, Arizona, be designated as the Lea[illegible]eoria-Tolleson Sub-Regional Operating Group.

Very truly yours,

CITY OF PEORIA

Robert K. Hensley

RKH:cmw

RESOLUTION NO. 78-40

A RESOLUTION OF THE COUNCIL OF THE CITY OF PEORIA, ARIZONA, AGREEING TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTE-WATER TREATMENT MANAGEMENT SYSTEM, AND DECLARING AN EMERGENCY.

BE IT RESOLVED BY THE MAYOR AND COUNCIL OF THE CITY OF PEORIA, ARIZONA:

WHEREAS, the City of Peoria, Arizona, is aware that Provisions of the Clean Water Act (Public Laws 92-500 and 95-217) Section 208 require development of an Areawide Water Quality Management Plan, and, further, require the Governor of Arizona and the U. S. Environmental Protection Agency, Region IX Administrator to designate official management agency(s) to carry out appropriate sections of the plan; and

WHEREAS, the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona, and the U. S. Environmental Protection Agency, Region IX Administrator, to prepare the Areawide Water Quality Management Plan for the Maricopa County area in accordance with the provisions of Section 208; and

WHEREAS, the Regional Council of the Maricopa Association of Governments (MAG) has approved a Water Quality Management Plan and a Wastewater Treatment Management System for the Maricopa County area.

NOW, THEREFORE, BE IT RESOLVED THAT THE MAYOR AND CITY COUNCIL OF PEORIA, ARIZONA, agree to carry out the appropriate duties and responsibilities identified in the Waste Treatment Management System Report approved by the MAG Regional Council on March 15, 1978.

WHEREAS, the immediate operation of the provisions of this Resolution is necessary for the preservation of the public peace, health and safety, an EMERGENCY is hereby declared to exist, and this Resolution shall be in full force and effect from and after its passage by the Council.

PASSED AND ADOPTED by the Mayor and Council of the City of Peoria, Arizona, this 26th day of December, 1978.

Mayor

ATTEST:

City Clerk

City of TOLLESON

9555 WEST VAN BUREN — TOLLESON, ARIZONA 85353
TELEPHONE: 936-1161 - 936-1871

TOLLESON

OFFICE OF CITY MANAGER

January 12, 1979

Charles Salem, Chairman
MAG Regional Council
1820 W. Washintgon Street
Phoenix, Arizona 85007

Dear Mr. Salem:

You will please find enclosed two documents relating to the MAG 208 Water Quality Program which were approved at the Tolleson City COuncil Meeting on January 9, 1979.

First, the resolution (No. 330) agreeing to participate in the Maricopa County Area Wastewater Treatment Management System has been signed by the Mayor.

Second, is the letter designating the City of Tolleson as a member of the Tolleson Sub-Regional Operating Group.

If you have any questions, please do not hesitate to contact me.

Sincerely,

David M. Mansfield

David M. Mansfield
City Manager

DMM/lml

Enclosure

The CITY of TOLLESON

OFFICE OF THE MAYOR

January 12, 1979

MAG Regional Council
1820 W. Washington Street
Phoenix, Arizona 85007

Dear Councilmembers:

On January 9, 1979, the Mayor and Council of the City of Tolleson adopted the Areawide Wastewater Treatment Management System in Resolution No. 330.

In order to implement the adopted management system, the MAG Regional Council is hereby requested to designate the City of Tolleson as member of the Tolleson Sub-Regional Operating Group. It is further requested that City of Tolleson be designated as the Lead Agency of the Tolleson Sub-Regional Operating Group.

Cordially,

Mario J. Herrera

Mario J. Herrera, Mayor
City of Tolleson

MJH/lml

RESOLUTION 330

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF TOLLESON, MARICOPA COUNTY, ARIZONA, AGREEING TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM.

WHEREAS, the City of Tolleson is aware that Provisions of the Clean Water Act (Public Laws 92-500 and 95-217) Section 208 require development of an Areawide Water Quality Management Plan, and, further, require the Governor of Arizona and the U.S. Environmental Protection Agency, Region IX Administrator to designate official management agency(s) to carry out appropriate sections of the plan, and;

WHEREAS, the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona and the U.S. Environmental Protection Agency, Region IX Administrator to prepare the Areawide Water Quality Managemet Plan for the Maricopa County area.

WHEREAS, the Regional Council of the Maricopa Association of Governments (MAG) has approved a Water Quality Management Plan and a Wastewater Treatment Management System for the Maricopa County area.

NOW, THEREFORE, BE IT RESOLVED THAT THE MAYOR AND CITY COUNCIL, of Tolleson agrees to carry out the appropriate duties and responsibilities identified in the Waste Treatment Management System Report approved by the MAG Regional Council on March 13, 1978.

PASSED AND ADOPTED by the Mayor and Council of the City of Tolleson, Arizona, this 9th day of January, 1979.

APPROVED this 9th day of January, 1979.

Mario C. Herrera, Mayor

ATTEST:

Esther Angulo, City Clerk

APPROVED AS TO FORM:

Donald J. Kenney, City Attorney

TOWN OF GOODYEAR ARIZONA INCORPORATED 1946 • 119 North Litchfield Road

MAYOR
Charles H. Salem
VICE-MAYOR
John E. Winter
COUNCIL MEMBERS
Chauncey B. Coor
Barbara W. LaPrade
John N. Maxwell
Kenneth J. Thomas
Ilo Gregory
TOWN MANAGER
E.W. Kleinschmidt
TOWN ATTORNEY
F. Britton Burns
932-3910
932-3911
932-1220

March 12, 1979

MAG REGIONAL COUNCIL
1820 W. Washington
Phoenix, AZ 85007

Dear Councilmembers:

On March 12, 1979, the Mayor and Council of the Town of Goodyear, adopted the Areawide Wastewater Treatment Management System in Resolution No. 155.

In order to implement the adopted management system, the MAG Regional Council is hereby requested to designate the Town of Goodyear as a member of the Avondale/Goodyear Sub-Regional Operating Group. It is further requested that the Town of Goodyear be designated as the Lead Agency of the Avondale/Goodyear Sub-Regional Operating Group.

Cordially,

Charles H. Salem

CHARLES H. SALEM,
Mayor

1979

RESOLUTION NO. 135

RESOLUTION AGREEING TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM.

WHEREAS the Town of Goodyear is aware that Provisions of Clean Water Act (Public Laws 92-500 and 95-217) Section 208 require development of an Areawide Water Quality Management Plan, and, further, require the Governor of Arizona and the U. S. Environmental Protection Agency, Region IX Administrator to designate official management agency (s) to carry out appropriate sections of the plan, and;

WHEREAS the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona, and the U. S. Environmental Protection Agency, Region IX Administrator to prepare the Areawide Water Quality Management Plan for the Maricopa County area in accordance with the provisions of Section 208, and;

WHEREAS the Regional Council of the Maricopa Association of Governments (MAG) has approved a Water Quality Management Plan and a Wastewater Treatment Management System for the Maricopa County area.

NOW, THEREFORE BE IT RESOLVED THAT THE MAYOR AND TOWN COUNCIL, OF THE TOWN OF GOODYEAR agree to carry out the appropriate duties and responsibilities identified in the Waste Treatment Management System Report approved by the MAG Regional Council on March 15, 1978.

APPROVED THIS 8th day of January 1979

CHARLES [illegible]

ATTEST:

Jean Bailey

JEAN BAILEY, TOWN CLERK

After recording, return to:
Douglas A. Jorden, Town Attorney
6401 E. Lincoln Dr.
Paradise Valley, AZ 85253

RESOLUTION 289

A RESOLUTION OF THE MAYOR AND COMMON COUNCIL OF THE TOWN OF PARADISE VALLEY, ARIZONA, AGREEING TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM

WHEREAS, the Town of Paradise Valley is aware that Provisions of the Clean Water Act (Public Laws 92-500 and 95-217) Section 208 require development of an Areawide Water Quality Management Plan, and, further, require the Governor of Arizona and the U.S. Environmental Protection Agency, Region IX Administrator to designate official management agency(s) to carry out appropriate sections of the plan, and;

WHEREAS, the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona, and the U. S. Environmental Protection Agency, Region IX Administrator to prepare the Areawide Water Quality Management Plan for the Maricopa County area in accordance with the provisions of Section 208, and;

WHEREAS, the Regional Council of the Maricopa Association of Governments (MAG) has approved a Water Quality Management Plan and Wastewater Treatment Management System for the Maricopa County area.

NOW, THEREFORE, BE IT RESOLVED by the Mayor and Common Council of the Town of Paradise Valley, Arizona that the Town of Paradise Valley agrees to carry out the appropriate duties and responsibilities identified in the Wastewater Treatment Management System Report approved by the MAG Regional Council on March 15, 1978.

PASSED AND ADOPTED by the Mayor and Common Council of the Town of Paradise Valley, Arizona, this 25th day of January, 1979.

Barbara vonAmmon
Barbara VonAmmon, Mayor

ATTEST:

Mary Ann Brines
Mary Ann Brines, Town Clerk

APPROVED AS TO FORM:

Douglas A. Jorden
Douglas A. Jorden, Town Attorney

CITY OF AVONDALE

PHONE 932-2400

CITY HALL 525 NORTH CENTRAL AVENUE · AVONDALE, ARIZONA 85323

LETTER TO MAG REGIONAL COUNCIL

On April 3, 1979, the Mayor and Council of the City of Avondale adopted the Areawide Wastewater Treatment Management System in Resolution No. 317.

In order to implement the adopted management system, the MAG Regional Council is hereby requested to designate the City of Avondale as member of the Avondale/Goodyear Sub-Regional Operating Group. It is further requested that the Town of Goodyear be designated as the Lead Agency for the Avondale/Goodyear Sub-Regional Operating Group.

Cordially,

Vice-Mayor Riefkohl

RESOLUTION No. 317

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF AVONDALE, ARIZONA, AGREEING TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM AND DECLARING AN EMERGENCY.

WHEREAS, the City of Avondale is aware that Provisions of the Clean Water Act (Public Laws 92-500 and 95-217) Section 208 require development of an Areawide Water Quality Management Plan, and further, require the Governor of Arizona and the U.S. Environmental Protection Agency, Region IX Administrator to designate official management agency (s) to carry out appropriate sections of the plan, and;

WHEREAS, the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona, and the U.S. Environmental Protection Agency, Region IX Administrator to prepare the Areawide Water Quality Management Plan for the Maricopa County area in accordance with the provisions of Section 208, and;

WHEREAS, the Regional Council of the Maricopa Association of Governments (MAG) has approved a Water Quality Management Plan and a Wastewater Treatment Management System for the Maricopa County area.

NOW, THEREFORE, BE IT RESOLVED THAT the City Council of the City of Avondale agrees to carry out the appropriate duties and responsibilities identified in the Waste Treatment Management System Report approved by MAG Regional Council on March 15, 1978.

This Resolution is adopted in reliance on the fact that the information contained in the letters dated March 6, 1979 and March 16, 1979, from Mark Frank 208 Water Quality Management Program Coordinator, to Mr. Carlos V. Palma, City Manager, City of Avondale, does, correctly state the position of MAG Regional Council with respect to the El Mirage interceptor and the possible staging of the construction of the various components of the system. Copies of said letters are attached to and made a part of this Resolution.

Whereas, the immediate operation of this Resolution is necessary for the health, peace and safety of the City of Avondale, an emergency is hereby declared to exist which is created by the necessity of providing continued Wastewater Treatment for the City, and this Resolution shall be in full force and effect from and after this date.

PASSED AND ADOPTED by the City Council of the City of Avondale this 3rd day of April, 1979.

APPROVED by the Vice-Mayor this 3rd day of April, 1979.

VICE-MAYOR

ATTEST:

CITY CLERK

RESOLUTION NO. 99

A RESOLUTION OF THE TOWN OF SURPRISE AGREEING TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM.

WHEREAS the Town of Surprise is aware that Provisions of the Clean Water Act (Public Laws 92-500 and 95-217) Section 208 require development of an Areawide Water Quality Management Plan, and further, require the Governor of Arizona and the U.S. Environmental Protection Agency, Region IX Administrator to designate official management agency(s) to carry out appropriate sections of the plan, and;

WHEREAS the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona, and the U.S. Environmental Protection Agency, Region IX Administrator to prepare the Areawide Water Quality Management Plan for the Maricopa County area in accordance with the provisions of Section 208, and;

WHEREAS the Regional Council of the Maricopa Association of Governments (MAG) has approved a Water Quality Managment Plan and a Wastewater Treatment Management System for the Maricopa County area,

NOW, THEREFORE BE IT RESOLVED THAT THE Mayor and Common Council of the Town of Surprise agree to carry out the appropriate duties and responsibilities identified in the Waste Treatment Management System Report approved by the MAG Regional Council on March 15, 1978.

Approved this 11th day of January, 1979.

MAYOR

ATTEST:

Lorena Luttrell
TOWN CLERK

APPROVED AS TO FORM:

TOWN ATTORNEY

SAMPLE RESOLUTION

#173

RESOLUTION: AGREEING TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM

WHEREAS the (City), (Town), of El Mirage is aware that Provisions of the Clean Water Act (Public Laws 92-500 and 95-217) Section 208 require development of an Areawide Water Quality Management Plan, and, further, require the Governor of Arizona and the U.S. Environmental Protection Agency, Region IX Administrator to designate official management agency(s) to carry out appropriate sections of the plan, and;

WHEREAS the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona, and the U.S. Environmental Protection Agency, Region IX Administrator to prepare the Areawide Water Quality Management Plan for the Maricopa County area in accordance with the provisions of Section 208, and;

WHEREAS the Regional Council of the Maricopa Association of Governments (MAG) has approved a Water Qualtiy Management Plan and a Wastewater Treatment Management System for the Maricopa County area.

NOW, THEREFORE BE IT RESOLVED THAT THE (MAYOR AND TOWN COUNCIL), (MAYOR AND CITY COUNCIL), of [illegible] agrees to carry out the appropriate duties and responsibilities identified in the Waste Treatment Management System Report approved by the MAG Regional Council on March 15, 1978.

Approved this [illegible] day of [illegible] 19 [illegible]

[illegible] [illegible]

MARICOPA ASSOCIATION 12/13/78
OF GOVERNMENTS

RESOLUTION NO. 101

A RESOLUTION OF THE MAYOR AND COMMON COUNCIL OF THE TOWN OF GUADALUPE, MARICOPA COUNTY, ARIZONA AGREEING TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM.

WHEREAS the Town of Guadalupe, Arizona is aware that Provisions of the Clean Water Act (Public Laws 92-500 and 95-217) Section 208 require development of an Areawide Water Quality Management Plan, and, further, require the Governor of Arizona and the U.S. Environmental Protection Agency, Region IX Administrator to designate official management agency(s) to carry out appropriate sections of the plan, and;

WHEREAS the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona, and the U.S. Environmental Protection Agency, Region IX Administrator to prepare the Areawide Water Quality Management Plan for the Maricopa County area in accordance with the provisions of Section 208, and;

WHEREAS the Regional Council of the Maricopa Association of Governments (MAG) has approved a Water Quality Management Plan and a Wastewater Treatment Management System for the Maricopa County area.

NOW, THEREFORE BE IT RESOLVED THAT THE MAYOR AND TOWN COUNCIL, of the Town of Guadalupe, Arizona agree to carry out the appropriate duties and responsibilities identified in the Waste Treatment Management system Report approved by the MAG Regional Council on March 15, 1978.

PASSED AND ADOPTED BY the Counicl of the Town of Guadalupe, Arizona this 11th day of January, 1979.

Frank T. Cota Sr.
Mayor

ATTEST:

Francisco M. Ureña
Town Clerk

APPROVED AS TO FORM:

Jerry Levine
Town Attorney

RESOLUTION NO. 155

RESOLUTION AGREEING TO PARTICIPATE IN
THE MARICOPA COUNTY AREA WASTEWATER
TREATMENT MANAGEMENT SYSTEM.

WHEREAS the Town of Goodyear is aware that Provisions of Clean Water Act (Public Laws 92-500 and 95-217) Section 208 require development of an Areawide Water Quality Management Plan, and, further, require the Governor of Arizona and the U. S. Environmental Protection Agency, Region IX Administrator to designate official management agency (s) to carry out appropriate sections of the plan, and;

WHEREAS the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona, and the U. S. Environmental Protection Agency, Region IX Administrator to prepare the Areawide Water Quality Management Plan for the Maricopa County area in accordance with the provisions of Section 208, and;

WHEREAS the Regional Council of the Maricopa Association of Governments (MAG) has approved a Water Quality Management Plan and a Wastewater Treatment Management System for the Maricopa County area.

NOW, THEREFORE BE IT RESOLVED THAT THE MAYOR AND TOWN COUNCIL, OF THE TOWN OF GOODYEAR agree to carry out the appropriate duties and responsibilities identified in the Waste Treatment Management System Report approved by the MAG Regional Council on March 15, 1978.

APPROVED THIS 8th day of January 1979

Charles W. Salem

CHARLES H. SALEM, MAYOR

ATTEST:

Jean Bailey

JEAN BAILEY, TOWN CLERK

TOWN OF WICKENBURG

P.O. BOX 1269 – WICKENBURG, ARIZONA 85358
TELEPHONE: (602) 684-5451

January 19, 1979

Maricopa Association of Governments
1820 W. Washington
Phoenix, Arizona

Dear Bill:

On December 28, 1978, the Mayor and Common Council of the Town of Wickenburg, Arizona adopted the Areawide Wastewater Treatment Management System in Resolution 643.

In order to implement the adopted management system, the MAG Regional Council is hereby requested to designate the Town of Wickenburg, Arizona as a single member Sub-Regional Operating Group and Lead Agency.

Cordially,

Richard C. Stone
Mayor

RESOLUTION NUMBER 693

A RESOLUTION OF THE TOWN OF WICKENBURG AGREEING TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM.

WHEREAS: The Town of Wickenburg is aware that Provisions of the Clean Water Act (Public Laws 92-500 and 95-217) Section 208 require development of an Areawide Water Quality Management Plan, and, further, require the Governor of Arizona and the U.S. Environmental Protection Agency, Region IX Administrator to designate official management agencys to carry out appropriate sections of the plan, and;

WHEREAS: The Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona, and the U.S. Environmental Protection Agency, Region IX Administrator to prepare the Areawide Water Quality Management Plan for the Maricopa County area in accordance with the provisions of Section 208, and;

WHEREAS: The Regional Council of the Maricopa Association of Governments (MAG) has approved a Water Quality Management Plan and a Wastewater Treatment Management System for the Maricopa County area.

NOW, THEREFORE BE IT RESOLVED THAT THE MAYOR AND COMMON COUNCIL OF THE TOWN OF WICKENBURG, ARIZONA, agrees to carry out the appropriate duties and responsibilities identified in the Waste Treatment Management System Report approved by the MAG Regional Council on March 15, 1978.

PASSED AND ADOPTED BY THE MAYOR AND COMMON COUNCIL OF THE TOWN OF WICKENBURG, ARIZONA, this 28th day of December, 1978.

TOWN OF WICKENBURG

Richard C. Stone

RICHARD C. STONE, MAYOR

ATTEST:

MARVIN E. MILLSAP, TOWN CLERK

APPROVED AS TO FORM:

DIDDY & WRIGHT, TOWN ATTORNEYS

Municipal Building

City of Chandler

OFFICE OF THE MAYOR

200 E. Commonwealth Avenue
Chandler, Arizona 85224

January 12, 1979

Charles H. Salem, Mayor, Goodyear
Chairman, Maricopa Assn. of Governments
Regional Council
1820 West Washington
Phoenix, AZ 85007

Dear Mayor Salem:

On January 11, 1979, the Mayor and Council of the City of Chandler adopted the Areawide Wastewater Treatment Management System in Resolution #809.

In order to implement the adopted management system, the MAG Regional Council is hereby requested to designate the City of Chandler as a single member Sub-Regional Operating Group and Lead Agency.

Cordially,

Kenneth Thomas
Mayor

RESOLUTION NO. 809

CITY OF CHANDLER PARTICIPATION

COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM

WHEREAS the City of Chandler is aware that Provisions of the Clean Water Act (Public Laws 92-500 and 92-217) Section 208 require development of an Areawide Water Quality Management Plan, and, further, require the Governor of Arizona and the U.S. Environmental Protection Agency, Region IX Administrator to designate official management agency(s) to carry out appropriate sections of the plan, and;

WHEREAS the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona, and the U.S. Environmental Protection Agency, Region IX Administrator to prepare the Areawide Water Quality Management Plan for the Maricopa County area in accordance with the provisions of Section 208, and;

WHEREAS the Regional Council of the Maricopa Association of Governments (MAG) has approved a Water Quality Management Plan and a Wastewater Treatment Management System for the Maricopa County area.

NOW, THEREFORE BE IT RESOLVED that the City Council of the City of Chandler agrees to carry out the appropriate duties and responsibilities identified in the Waste Treatment Management System Report approved by the MAG Regional Council on March 15, 1978.

PASSED AND APPROVED by the City Council of the City of Chandler, this 11th day of January, 1979.

MAYOR

ATTEST:

Helen McCain

CITY CLERK

C E R T I F I C A T I O N

I HEREBY CERTIFY that the above and foregoing Resolution No. 809 was duly passed and adopted by the City Council of the City of Chandler, Arizona, at a regular meeting held on the 11th day of January, 1979, and that a quorum was present thereat.

Helen McCain

CITY CLERK

TOWN OF GILA BEND

P. O. DRAWER I   GILA BEND, ARIZONA 85337   TELEPHONE 602 683-2435

January 10, 1979

Regional Council
Maricopa Association of Governments
1820 West Washington Street
Phoenix, AZ 85007

Gentlemen:

On 9 January 1979, the Mayor and Council of the Town of Gila Bend adopted the Areawide Wastewater Treatment Management System in Resolution No. 185, copy enclosed.

In order to implement the adopted management system, the MAG Regional Council is hereby requested to designate the Town of Gila Bend as a single member Sub-Regional Operating Group and Lead Agency.

Cordially,

Jerry C. Roberson

Jerry C. Roberson
Mayor

JCR:DCH:dh
Enclosure

RESOLUTION NO. 185

RESOLUTION: AGREEING TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTEWATER TREATMENT MANAGEMENT SYSTEM

WHEREAS the Town of Gila Bend, Maricopa County, Arizona, is aware that Provisions of the Clean Water Act (Public Laws 92-500 and 95-217) Section 208 require development of an Areawide Water Quality Management Plan, and, further, require the Governor of Arizona and the U.S. Environmental Protection Agency, Region IX Administrator to designate official management agency(s) to carry out appropriate sections of the plan, and;

WHEREAS the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona, and the U.S. Environmental Protection Agency, Region IX Administrator to prepare the Areawide Water Quality Management Plan for the Maricopa County area in accordance with the provisions of Section 208, and;

WHEREAS the Regional Council of the Maricopa County Association of Governments (MAG) has approved a Water Quality Management Plan and a Wastewater Treatment Management System for the Maricopa County area.

NOW, THEREFORE BE IT RESOLVED THAT THE MAYOR AND TOWN COUNCIL, of the Town of Gila Bend agrees to carry out the appropriate duties and responsibilities identified in the Waste Treatment Management System Report approved by the MAG Regional Council on March 15, 1978.

Approved this 9th day of January 1979.

Jerry C. Roberson

Jerry C. Roberson, Mayor

ATTEST

David C. Haynes

David C. Haynes, Town Clerk

Town Of Buckeye

P. O. Box 157
Buckeye, Arizona 85326

Telephone (602) 386-4691
Phoenix Line 935-4532

JAN 3 1979

January 2, 1979

MAG Regional Council
1820 West Washington
Phoenix, Arizona 85007

Gentlemen:

On December 19, 1978, the Mayor and Council of the Town of Buckeye adopted the Areawide Wastewater Treatment Management System in Resolution No. 10-78.

In order to implement the adopted management system, the MAG Regional Council is hereby requested to designate the Town of Buckeye as a single member Sub-Regional Operating Group and Lead Agency.

Sincerely,

John B. Hawley
Mayor

RESOLUTION NO. 10-78

RESOLUTION AGREEING TO PARTICIPATE IN THE MARICOPA COUNTY AREA WASTE TREATMENT MANAGEMENT SYSTEM.

WHEREAS, the Town of Buckeye is aware that provisions of the Federal Water Pollution Control Act of 1972, (Public Law 92-500) Section 208 require development of an Areawide Waste Treatment Management Plan and, further, require the State of Arizona Water Quality Control Council, the Governor of Arizona and the U.S. Environmental Protection Agency, Region IX administrator to designate official management agency(s) to carry out appropriate sections of the law, and;

WHEREAS, the Maricopa Association of Governments (MAG) has been designated by the Governor of Arizona and the U.S. Environmental Protection Agency Region IX Administrator as the agency responsible for preparing the Areawide Waste Treatment Management Plan in accordance with provisions of Section 208 of Public Law 92-500, and:

WHEREAS, the Regional Council of the Maricopa Association of Governments (MAG) has approved a Waste Treatment Management System Plan for the Maricopa County Area, and;

WHEREAS THE Maricopa Association of Governments (MAG) was formed by local governments of the Maricopa County Area to study area-wide problems and facilitate the development of solutions to joint and interrelated problems.

NOW, THEREFORE BE IT RESOLVED THAT THE MAYOR AND TOWN COUNCIL OF THE TOWN OF BUCKEYE hereby:

1. Request the Maricopa Association of Governments to undertake the following duties and responsibilities for the Maricopa County Area:

   a. Adopt and assure implementation of the Areawide Waste Treatment Management Plan.

b. Assure the effective management of waste treatment works and related facilities in conformance with the plan.

c. Assure in implementation of an Areawide Waste Treatment Management Plan that each participating community pay its proportionate share of treatment costs.

d. Adopt construction priorities for Waste Treatment facilities for the region and make recommendations to the State of Arizona.

e. Adopt an annual update of the Waste Treatment Management Plan.

f. Arbitrate disagreements among local governments or private agencies for non-compliance with the adopted Waste Treatment Management Plan.

g. Make recommendations to the State of Arizona and U.S. EPA on water quality and reuse standards and regulations.

h. Authorize Subregional Operating Groups, designate members of each group and approve selection of "Lead Agency."

i. Approve industrial waste standards for the Region.

j. Coordinate public information programs on waste treatment management.

k. Coordinate communication between local governments and private agencies with U.S. EPA and State of Arizona agencies regarding Waste Treatment Management.

2. Request the MAG Regional Council to designate the Town of Buckeye as the single member of the Sub-Regional Operating Group.

3. Agree to carry out the following duties and responsibilities as the Sub-Regional Operating Group.

Resolution No. 10-78

k. Assure that each participating community pay its proportionate share of treatment costs.

Approved this 19th day of December 1978.

John B. Hawley
Mayor

ATTEST:

Steven L. Thompson
Town Manager / Clerk

a. Identify projects for inclusion in the Areawide Waste Treatment Management Plan.

b. Operate the treatment plants and pump stations to insure compliance with NPDES (National Pollution Discharge Eliminations System) permits and water quality criteria.

c. Maintain plants and pump stations in operable condition and good appearance.

d. Insure adequately trained and certified staff for plant operation.

e. Conduct monitoring program for treatment facilities for compliance with permits and reuse needs.

f. Conduct monitoring program for community and industrial discharges to the system.

g. Review monitoring data to insure compliance with applicable EPA and State of Arizona standards.

h. Coordinate with U.S. Environmental Protection Agency and State Department of Health Services and Maricopa County Health Department on monitoring and enforcement provisions.

i. Work with Maricopa Association of Governments members and staff to insure uniformity in integration of the various wastewater management functions.

j. Refuse to receive wastes from agencies, or subdivisions not in compliance with the adopted Areawide Waste Treatment Management Plan.

ARIZONA ADMINISTRATIVE CODE TITLE 18
ARTICLE 9 AQUIFER PROTECTION PERMIT RULES
PART B BADCT FOR SEWAGE TREATMENT FACILITIES
ARTICLE 3 WATER QUALITY MANAGEMENT PLANNING

1. Notify the Department by certified mail within 15 days after the change of ownership of the transfer and include a written agreement between the existing and new permittee indicating a specific date for transfer of all permit responsibility, coverage, and liability;
2. Submit the applicable fee established in 18 A.A.C. 14;
3. Demonstrate the technical and financial capability necessary to fully carry out the terms of the permit according to R18-9-A202 and R18-9-A203;
4. Submit a signed statement by the new permittee that the permittee has reviewed the permit and agrees to be bound by its terms; and
5. Provide the Department with a copy of the Certificate of Disclosure required by A.R.S. § 49-109.

C. A permittee shall comply with the permit conditions specified under A.R.S. §§ 49-241 through 49-252, and Articles 1 and 2 of this Chapter, regardless of whether the permittee has sold or disposed of the facility, until the Director transfers the permit.

R18-9-A213. Permit Suspension, Revocation, or Denial

A. The Director may suspend or revoke an individual permit or a continuance under R18-9-105(A)(1), (A)(2), or (A)(3) for any of the following:
1. A permittee failed to comply with any applicable provision of A.R.S. Title 49, Chapter 2, Article 3; Articles 1 and 2 of this Chapter; or any permit condition.
2. A permittee's misrepresentation or omission of any fact, information, or data related to an Aquifer Protection Permit application or permit conditions.
3. The Director determines that a permitted activity is causing or will cause a violation of any Aquifer Water Quality Standard at a point of compliance.
4. A permitted discharge is causing or will cause imminent and substantial endangerment to public health or the environment.

B. The Director may deny an individual permit if the Director determines upon completion of the application process that the applicant has:
1. Failed or refused to correct a deficiency in the permit application;
2. Failed to demonstrate that the facility and the operation will comply with the requirements of A.R.S. §§ 49-241 through 49-252 and Articles 1 and 2 of this Chapter. This determination shall be based on:
   a. The information submitted in the Aquifer Protection Permit application,
   b. Any information submitted to the Department following a public hearing, or
   c. Any relevant information that is developed or acquired by the Department.
3. Provided false or misleading information.

PART B. BADCT FOR SEWAGE TREATMENT FACILITIES

R18-9-B201. General Considerations and Prohibitions

A. Applicability. The requirements in this Article, including BADCT requirements, apply to all sewage treatment facilities, including expansions of existing sewage treatment facilities, that treat wastewater containing sewage, unless the discharge is covered by a general permit under Article 3 of this Chapter.

B. The Director may specify alert levels, discharge limitations, design specifications, and operation and maintenance requirements in the permit that are based upon information provided by the applicant and that meet the requirements under A.R.S. § 49-243(B)(1).

C. The Director may specify adherence to an operation and maintenance plan as an Aquifer Protection Permit condition, based on consideration of the factors in A.R.S. § 49-243(B)(1).

D. A person shall not install or maintain a connection between any part of a sewage treatment facility and a potable water supply so that sewage or wastewater contaminates a potable or public water supply.

E. A person shall not bypass untreated sewage from a sewage treatment facility.

F. Reclaimed water dispensed to a direct reuse site from a sewage treatment facility is regulated under Reclaimed Water Quality Standards established under A.R.S. § 49-221(E) and reclaimed water permit requirements under A.R.S.§ 49-203(A)(6).

G. The preparation, transport, or land application of any biosolid generated by a sewage treatment facility is regulated under 18 A.A.C. 13, Article 15.

H. The Department shall not publish a Notice of Preliminary Decision to issue an individual permit or amendment under R18-9-A211(B)(2)(b) or an amendment under R18-9-A211(B)(6) for a sewage treatment facility that is not in conformance with the Certified Areawide Water Quality Management Plan and the Facility Plan.

I. The owner or operator of a sewage treatment facility that is a new facility or undergoing a major modification shall provide setbacks from the nearest adjacent property line using the following information:

TITLE 18. ENVIRONMENTAL QUALITY
CHAPTER 5. DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL REVIEWS AND CERTIFICATION

ARTICLE 3. WATER QUALITY MANAGEMENT PLANNING

ARTICLE 3.WATER QUALITY MANAGEMENT PLANNING

R18-5-301. Definitions

In addition to the definitions established in R18-9-101, the following terms apply to this Article:

1. "Certified Areawide Water Quality Management Plan" means a plan prepared by a designated Water Quality Management Planning Agency under Section 208 of the Federal Water Pollution Control Act (P.L. 92-500) as amended by the Water Quality Act of 1987 (P.L. 100-4), certified by the Governor or the Governor's designee, and approved by the United States Environmental Protection Agency.

2. "Designated management agency" means those entities designated in a Certified Areawide Water Quality Management Plan to manage sewage treatment facilities and sewage collection systems in their respective area.

3. "Designated water quality planning agency" means the single representative organization designated by the Governor under Section 208 of the Federal Water Pollution Control Act (P.L. 92-500) as amended by the Water Quality Act of 1987 (P.L. 100-4) as capable of developing effective areawide sewage treatment management plans for the respective area. The state acts as the planning agency for those non-tribal portions of the state for which there is no designated water quality planning agency

4. "Facility Plan" means the plans, specifications, and estimates for a proposed sewage treatment facility, prepared under Section 201 and 203 of the Federal Water Pollution Control Act (P.L. 92-500) as amended by the Water Quality Act of 1987 (P.L. 100-4), and submitted to the Department by and for a designated management agency.

5. "General Plan" means a municipal statement of land-development policies that may include maps, charts, graphs, and text that list objectives, principles, and standards for local growth and development enacted under state law.

6. "Service area" means the geographic region specified for a designated management agency by the applicable Certified Areawide Water Quality Management Plan, Facility Plan, or General Plan.

7. "State water quality management plan" means the following elements:

   a. Certified Areawide Water Quality Management Plans and amendments;

   b. Water quality rules and laws;

   c. Final total maximum daily loads approved by the United States Environmental Protection Agency for impaired waters;

   d. Water quality priorities established by the Department;

   e. Intergovernmental agreements between the Department and a designated water quality planning agency or a designated management agency; and

   f. Active management area plans adopted by the Department of Water Resources.

R18-5-302. Certified Areawide Water Quality Management Plan Approval

A designated water quality planning agency shall submit a proposed Certified Areawide Water Quality Management Plan or plan amendment to the Director for review and approval. Upon approval, the Governor or the Governor's designee shall:

1. Certify that the plan or plan amendment is incorporated into and is consistent with the state water quality management plan, and

2. Submit the plan or plan amendment to the United States Environmental Protection Agency for approval.

R18-5-303. Determination of Conformance

All sewage treatment facilities, including an expansion of a facility, shall, before construction, conform with the Certified Areawide Water Quality Management Plan, Facility Plan, and General Plans as specified in subsections (1) and (2).

1. The Department shall make the determination of conformance if the sewage treatment facility or expansion of the facility conforms with the Certified Areawide Water Quality Management Plan and Facility Plan that prescribe a configuration for sewage treatment and sewage collection system management by a designated management agency within the service area.

2. If the condition specified in subsection (1) is not met, the Department shall make the determination of conformance as follows:

   a. If no Facility Plan is applicable and a Certified Areawide Water Quality Management Plan as described in subsection (1) is available, the Department shall rely on the Certified Areawide Water Quality Management Plan for the determination of conformance.

   b. If no Certified Areawide Water Quality Management Plan as described in subsection (1) is available, the Department shall make the determination of conformance based on conformance with applicable General Plans and after conferring with the designated water quality planning agency for the area and any responsible and affected governmental unit.

Appendix E

MAG SOLID WASTE MANAGEMENT FACILITIES SUMMARY
MAY 2001 UPDATE

MAG SOLID WASTE MANAGEMENT FACILITIES SUMMARY

MAY 2001 UPDATE

OPERATING SOLID WASTE LANDFILLS						
	REMAINING CAPACITY (10^6 CY)	REMAINING YEARS	ANTICIPATED YEAR OF CLOSURE	OWNER	LOCATION	OTHER COMPONENTS
Butterfield Station	33	50	2049	Waste Management, Inc.	One mile north of 238 on 99th Ave	
Cave Creek	5			Maricopa County	3 miles west of Cave Creek Road on south side of Carefree Highway	Life Cycle
Chandler	766,000	6	2006	City of Chandler	Northwest corner of Ocotillo Road and McQueen Road	Life Cycle. Current last cell is Subtitle D.
Glendale	42	43	2043	City of Glendale	115th Ave & Glendale Ave (1/2 mile E. of Agua Fria River)	Landscape waste mulching
Northwest Regional	85	47	2046	USA Waste	Deer Valley Rd. and 195th Ave	Waste tire collection center
Queen Creek		6 months to 1 year	2002	Maricopa County	1/2 mile south of Chandler Heights Road on Hawes Road	Local concerns: availability of new Southeast regional facility. Planned site for composting of NHLW. Potential consideration of expansion.
Salt River Landfill	10	9	2008	SRPMIC	SR 87 and Gilbert Road	Life Cycle
Skunk Creek	10 as of 5-01-00	5	2006	City of Phoenix	1/4 mile west of I-17 on Happy Valley Road	Extended land patent agreement.
Southwest Regional	26	48	2051	Buckeye owner/Allied operates	8 miles south of Buckeye, east of State Highway 85	

SOLID WASTE MANAGEMENT FACILITIES SUMMARY (continued)

PLANNED SOLID WASTE LANDFILLS

	PLANNED CAPACITY (YEARS)	PLANNED SIZE (ACRES)	EXPECTED YEAR OF OPENING	OWNER	LOCATION	ADDITIONAL COMPONENTS (Conceptual)
Phoenix currently siting one or two landfills to service City of Phoenix	Combined life of 50	1,280	2006	City of Phoenix	Undetermined. Siting study underway.	
Sierra Estrella	N/A	260 acres with additional contingency	1995	BFI	Pinal County. Bounded on N by Gila Indian Community, on S by SR 238, on E by N Ralston Road and on W by N White Road	N/A
Tri-City (New Cell)	N/A	N/A	1993	SRPMIC	Adjacent to existing landfill on State Highway 87	

CLOSED SOLID WASTE LANDFILLS

	YEAR OF CLOSURE	OWNER	LOCATION	REMARKS ON CLOSURE
New River	1997	Maricopa County	3 ½ miles west of I-17 on New River Road	3.5 MGY NHLW evaporation pond (existing); planned expansion to 8.5 MGY (1993). Closed
Gila Bend	1997	Maricopa County	3 miles north of Gila Bend on Old, US 80	RCRA regulations. Closed
Gila River Indian Community District 6	1995	GRIC	Between 51st Avenue and the Gila River	Life Cycle. Closed
Hassayampa	1997	Maricopa County	Salome Highway and Ward Road/ Baseline Road	RCRA regulations. Closed
Sacaton	N/A	GRIC	South of the City limits of Chandler and East of I-10 in Pinal County	Life Cycle. Closed, transfer station constructed.
Tri-City	N/A	SRPMIC	South side of State Highway 87	Closed, potential gas to energy.
27th Avenue	1995	City of Phoenix	27th Avenue and Lower Buckeye Road	Closed
Wickenburg	1997	Town of Wickenburg	NE quarter, Section 7, township 7N, range 5W	Closed 10/1/97

SOLID WASTE MANAGEMENT FACILITIES SUMMARY (continued)

EXISTING TRANSFER FACILITIES				
TRANSFER FACILITY NAME	OWNER/OPERATOR	LANDFILL FOR DISPOSAL	TYPES OF WASTE ACCEPTED	TRANSFER STATION LOCATION
Aguila	Maricopa County	Northwest Regional	Residential	3 miles west of Aguila on State Highway 60
Avondale	City of Avondale	Southwest Regional	Residential	South of Lower Buckeye Road, adjacent to old treatment plan site
Lone Butte	Sanifill of AZ, Inc.	Butterfield	N/A	6520 W Allison Road (on Gila River Indian Community)
Morristown	Maricopa County	Northwest Regional	Residential	North of 60-89-93 by Morristown overpass
New River	Maricopa County			3 ½ miles west of I-17 on New River Road
Rainbow Valley	Maricopa County	Southwest Regional	Residential	3 miles south of Ray Road on Rainbow Valley Road
Sacaton	GRIC	Butterfield	Residential	South of Chandler city limits and east of I-10 in Pinal County
Scottsdale	City of Scottsdale	SRPMIC	Residential, Commercial & Recyclables	Pima & Union Hills
Skunk Creek	City of Phoenix	Transferred to MRF	City of Phoenix residential commingled recyclables	1/4 mile west of I-17 on Happy Valley Road
Wickenburg	Maricopa County	Northwest Regional	Residential	NE quarter, section 7, township 7N, range 5W
Cave Creek	Maricopa County		Residential	8.3 miles east of I-17 on S Side State Highway 74
PLANNED TRANSFER FACILITIES				
TRANSFER FACILITY NAME	OWNER/OPERATOR	LANDFILL FOR DISPOSAL	TYPES OF WASTE ACCEPTED	TRANSFER STATION LOCATION
Chandler	City of Chandler	Chandler/Butterfield	Residential	SW corner of Queen Creek and McQueen Roads
Gila River Indian Community District 6	GRIC	Butterfield	Residential	Between 51st Avenue and the Gila River
Tolleson	City of Tolleson	Regional Landfills, Glendale Landfill, Phoenix 27th Avenue	Residential/ Commercial	1/4 mile south of Buckeye Road and 1/4 mile west of 91st Avenue

SOLID WASTE MANAGEMENT FACILITIES SUMMARY (continued)

CLOSED TRANSFER FACILITIES				
TRANSFER FACILITY NAME	OWNER-OPERATOR	LANDFILL FOR DISPOSAL	TYPES OF WASTE ACCEPTED	TRANSFER STATION LOCATION
Glendale	Glendale	Glendale	Residential	6210 W Myrtle.

RECYCLING/MATERIALS RECOVERY FACILITIES (MRFs)						
FACILITY NAME	STATUS	OWNER-OPERATOR	AREAS SERVED	MATERIAL RECOVERY CAPACITY	LANDFILL FOR REJECTS	MRF LOCATION
Glendale	Operating	City of Glendale	Glendale	87,600 Tons per Year (240 Tons per Day)	Glendale	6210 W Myrtle
Hudson Baler	Operating	New England CRInc	Phoenix (S of Cactus Road)	90,000 Tons per Year	Skunk Creek	1919 E University Drive
Valley Recycling	Operating	Valley Recycling	Mesa, Chandler, Gilbert		Salt River Landfill	Ray and Chandler Blvd.
PLANNED MATERIAL RECOVERY FACILITIES (MRFS)						
FACILITY NAME	STATUS	OWNER/OPERATOR	AREAS SERVED	CAPACITY	LANDFILL FOR REJECTS	LOCATION
North CRInc MRF	Planned	New England CRInc	Phoenix (N of Cactus Road)	90,000 Tons per Year	Southwest Regional Skunk Creek	To be Determined
Salt River Landfill	Planned 1999	Western Organics	Scottsdale, Mesa, Chandler	36,000 Ton per Year	Salt River Landfill	SR 87 & Gilbert
Tri-City	(Conceptual)	SRPMIC	Mesa, Chandler, Scottsdale	N/A	Tri-City	SR 87 near the Tri-City landfill site

SOLID WASTE MANAGEMENT FACILITIES SUMMARY (continued)

COMBINED MATERIALS RECOVERY FACILITIES/TRANSFER FACILITIES							
FACILITY NAME	STATUS	OWNER/OPERATOR	AREAS SERVED	CAPACITIES TRANSFER	(TONS/DAY) RECOVERY	LANDFILL FOR DISPOSAL	FACILITY LOCATION
27TH Avenue Solid Waste Management	Operating	City of Phoenix	Phoenix (partial)	3,800	300 Residential 400 Commercial	Skunk Creek	27th Avenue and Lower Buckeye Road
Sky Harbor Transfer/Recycling Facility	Operating	Waste Management, Inc.	Tempe, Commercial accounts; future NHLW	N/A	N/A	Butterfield Station	40th Street, north of University Drive
PLANNED COMBINED MATERIALS RECOVERY FACILITIES/TRANSFER FACILITIES							
FACILITY NAME	STATUS	OWNER/OPERATOR	AREAS SERVED	CAPACITIES TRANSFER	(TONS/DAY) RECOVERY	LANDFILL FOR DISPOSAL	FACILITY LOCATION
Chandler	Planned	City of Chandler	Chandler	1,000-1,500 tons/day	5-10 tons/day, average	Chandler/Butterfield	SW corner of Queen Creek Road, west of McQueen Road
North Transfer/Recycling Station	Planned 2006	City of Phoenix	North portion of Phoenix	Undetermined	Undetermined	New Phoenix Landfill currently being sited	To be determined
Peoria	(Conceptual)	Peoria, or Private	Peoria	40,000		Northwest Regional	To be determined
Southeast Transfer/Recycling Station	Planned	City of Phoenix	Phoenix (S of Cactus)	2,000	400	Southwest or Southeast Regional	To be determined

SOLID WASTE MANAGEMENT FACILITIES SUMMARY (continued)

RUBBISH/CONSTRUCTION & DEMOLITION DEBRIS LANDFILLS				
LANDFILL/OWNER NAME	SIZE (ACRES)	REMAINING CAPACITY	REMAINING YEARS	LOCATION
Allied	25	N/A	1-2	South side of Indian School Road and West of Agua Fria
Deer Valley Landfill (f/k/a Knuoeckel Brothers)	N/A	N/A	N/A	24802 N 14th Street, at 14th Street and Alemeda
Weinberger	N/A	N/A	N/A	3410 S 39th Avenue (39th Avenue and Lower Buckeye Road)
40th Street (Bradley)	40	10 acres	3-4	North Side of Magnolia Street, 1/4 mile east of 40th Street
Lone Cactus (f/k/a Arizona Crushers)				Northwest corner of 7th Street and Beardsley Road, 21402 N 7th Street

COMPOSTING FACILITIES			
FACILITY NAME	OWNER/OPERATOR	MATERIALS ACCEPTED	LOCATION
Western Organics	Private	Green wastes, biosolids, agricultural wastes, solid wastes	2807 S 27th Avenue, Phoenix
Urban Forest Products	Private	Green wastes, wood wastes, agricultural wastes	3330 W Broadway Road, Phoenix
Chandler	City of Chandler	Green wastes, wood wastes, biosolids, agricultural wastes	South of Queen Creek Road, west of McQueen Road
PLANNED MUNICIPAL SOLID WASTE COMPOSTING FACILITIES			
FACILITY NAME	OWNER/OPERATOR	MATERIALS ACCEPTED	LOCATION
Salt River Landfill	Western Organics	Green wastes, biosolids, agricultural & solid waste	SR 87 & Gilbert Road

Appendix F

RESPONSES TO PUBLIC COMMENT

AFFIDAVIT OF PUBLICATION

2138

THE ARIZONA REPUBLIC

STATE OF ARIZONA } SS.
COUNTY OF MARICOPA }

TOM BIANCO, being first duly sworn, upon oath deposes and says: That he is the legal advertising manager of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

The Arizona Republic

03/08/2002

Sworn to before me this
8 th day of
March A.D. 2002

GLORIA SALDIVAR
NOTARY PUBLIC ARIZONA
MARICOPA COUNTY
My Comm. Expires Oct 1, 2003

Notary Public

PUBLIC HEARING ON THE DRAFT REVISION TO THE MAG 208 WATER QUALITY MANAGEMENT PLAN

Tuesday, April 23, 2002 at 4:00 p.m.

MAG Office, Suite 200 - Saguaro Room 302 North 1st Avenue Phoenix, Arizona 85003

The Maricopa Association of Governments (MAG) will conduct a public hearing on Tuesday, April 23, 2002 on the Draft Revision to the MAG 208 Water Quality Management Plan. The purpose of the hearing is to receive public comments on the draft Plan. The Plan has been prepared in accordance with Section 208 of the Clean Water Act.

The two major sections of the draft Plan are the Point Source and Nonpoint Source elements. The Point Source Element describes the desired wastewater treatment configuration for the MAG area as identified by the MAG member agencies for the 20 year planning horizon. The Nonpoint Source Element describes Federal and State program activities designed to control nonpoint source pollution.

Following consideration of comments at the hearing, it is anticipated that the MAG Water Quality Advisory Committee will make a recommendation to the MAG Management Committee. On May 8, 2002, the MAG Management Committee is anticipated to make a recommendation to the MAG Regional Council. It is anticipated that the MAG Regional Council will take action on the draft Revision to the MAG 208 Plan on May 22, 2002.

Written and verbal comments are welcome at the hearing. A copy of the draft document will be available for public review at the MAG Office from 8:30 a.m. to 5:30 p.m. Monday through Friday, beginning Thursday, March 7, 2002. Copies will also be available for review at the Glendale Public Library, 5959 West Brown Street; Mesa Public Library, 64 East First Street,, and Phoenix Central Public Library, 1221 North Central Avenue. For further information or to submit written comments on the draft prior to the hearing, contact Brenda Gelson, MAG, at (602) 254-6300.

02138 - March 8, 2002

MARICOPA ASSOCIATION of GOVERNMENTS

302 North 1st Avenue, Suite 300 ▲ Phoenix, Arizona 85003
Phone (602) 254-6300 ▲ FAX (602) 254-6490
Email: mag@mag.maricopa.gov ▲ Website: www.mag.maricopa.gov

March 7, 2002

TO: Interested Parties for Water Quality

FROM: Brenda Geisen, Environmental Planner

SUBJECT: NOTIFICATION OF A PUBLIC HEARING ON THE DRAFT REVISION TO THE MAG 208 WATER QUALITY MANAGEMENT PLAN

Public Hearing
Tuesday, April 23, 2002 at 4:00 p.m.
MAG Office, Suite 200 - Saguaro Room
302 North 1st Avenue
Phoenix, Arizona 85003

The Maricopa Association of Governments (MAG) would like to invite you to attend a public hearing on the Draft Revision to the MAG 208 Water Quality Management Plan. The purpose of the hearing is to receive public comments on the draft Plan. The Plan has been prepared in accordance with Section 208 of the Clean Water Act.

The two major sections of the draft Plan are the Point Source and Nonpoint Source elements. The Point Source Element describes the desired wastewater treatment configuration for the MAG area as identified by the MAG member agencies for the 20 year planning horizon. The Nonpoint Source Element describes Federal and State program activities designed to control nonpoint source pollution from land disposal, agriculture, urban stormwater runoff, pesticides and volatile organic compounds.

Following consideration of comments at the hearing, it is anticipated that the MAG Water Quality Advisory Committee will make a recommendation to the MAG Management Committee. On May 8, 2002, the MAG Management Committee is anticipated to make a recommendation to the MAG Regional Council. It is anticipated that the MAG Regional Council will take action on the draft Revision to the MAG 208 Plan on May 22,
2002.

Written and verbal comments are welcome at the hearing. A copy of the draft document will be available for public review at the MAG Office from 8:30 a.m. to 5:30 p.m. Monday through Friday beginning Thursday, March 7, 2002. Copies will also be available for review at the Glendale Public Library, 5959 West Brown Street; Mesa Public Library, 64 East First Street; and Phoenix Central Public Library, 1221 North Central Avenue. For further information or to submit written comments on the draft prior to the hearing, contact Brenda Geisen, MAG, at (602) 254-6300.

RESPONSES TO PUBLIC COMMENT
DRAFT MAG 208 WATER QUALITY MANAGEMENT PLAN

April 23, 2002 Public Hearing

The Maricopa Association of Governments (MAG) appreciates the comments made during the public comment period for the Draft MAG 208 Water Quality Management Plan. An advertised public hearing on the subject was conducted by MAG on April 23, 2002. No comments were received from public during the public hearing.

Comments were received prior to the public hearing and subsequent to the hearing (prior to authorization for a second public hearing on June 11, 2002).

Comments prior to public hearing were:

1. The City of Phoenix, on April 2, 2002, provided clarification on capacity of the 91st Avenue WWTP as a total of 179.25 mgd with Phoenix portion of 101.17. Total capacity of the 23rd Avenue WWTP is being increased to an annual average capacity of 63 mgd. Revisions and corrections to Table 4.43 on Pg. 4-127 were proposed to:

   Delete 3rd column, "Current[1]" and re-label 4th column, "Current."

   In fifth column "Projected" (after UP01 expansion), for Scottsdale, BOD, revise "55,600 lbs/day" to "53,600 lbs/day.

   In column "Projected 2020," change note from "3" to "1." Delete Note 1, Delete Note 2, Re-label Note "3" as Note "1."

   In last paragraph, delete words "The current Plant 3B expansion and" so sentence begins, "The proposed UP01 expansion. . ."

Response: The Errata sheet item to revise page 4-32 and Table 4.42 on page 4-125 addresses these corrections.

2. The City of Mesa provided notification on April 5, 2002 that Mesa's ultimate capacity in the Mesa-Gilbert South WRP would increase from 24 to 30 mgd. This change was previously noted in Errata sheet issued prior to public hearing.

   The City of Mesa also suggested that the references to the Mesa-Gilbert South Water Reclamation Plant (MGSWRP) be consistently presented in both the Mesa and Gilbert sections (4.2.5.3 Gilbert and 4.2.5.4 Mesa). These modifications and others provided by Mesa include:

   On Pg. 4-113, in second paragraph, first sentence, add "SAI' after ". . . Southern Avenue Interceptor . . ."

   In fourth paragraph, change ". . . (MGSL) . . ." to ". . . (MGSLS) . . ." (two places). Under Northwest Water Reclamation Plant) add new bullet , "Existing NPDES, APP and (2) USF Permits."

   On Pg. 4-114 under Southeast Water Reclamation Plant, first paragraph, add (3) bullets:

   "• Chlorine disinfection.
   • Dechlorination.
   • Existing APP and Reuse Permits (future permits if needed: NPDES and USF)."

In Table 4.37, revise heading of column 5 from "SWRP" to "MGSWRP."

On Pg. 4-115, in first paragraph, first sentence, change to read "The Mesa-Gilbert South WRP (MGSWRP) will have an initial capacity for Mesa of 3 mgd, and an ultimate capacity of 30 mgd (initial total including Town of Gilbert 12 mgd, 49 mgd ultimate)." Second sentence, change "chlorination" to "disinfection"; add sentence at end of paragraph, "This facility will obtain permits for NPDES, APP and USF."

In sixth paragraph, first sentence, change to read ". . . on SRPMIC Land, the GRUSP and the Salt River."

On Pg. 4-116, delete third paragraph that reads "Effluent from all . . . property for irrigation purposes. Revise Summary of Proposed Wastewater System Improvements."

"Item		Estimated Costs[1]
MGSWRP Phase II		$ 30,000,000
Wastewater System Expansion		102,000,000
Expansion at 91st Avenue		28,000,000
	Total	$160,000,000

[1] June 2000 Costs (ENR Construction cost Index = 6238)."

Response: Errata sheet items include all above clarifications and corrections.

3. On April 5, the City of Scottsdale advised that Figure 4-17 should be corrected as follows: The sewage lift station at Lone Mountain and Hayden Road should be deleted, and reuse/recharge sites should be added at several locations.

   On Pg. 4-94, fourth paragraph, first sentence, change to read "with current capacities of 12 mgd and 10 mgd, respectively."

Response: The Errata sheet item to revise Figure 4-17 incorporates requested correction. Errata sheet items include requested correction.

4. The City of Chandler requested that Table 4.34 be clarified to indicate flow is in mgd, and that a footnote be added to indicate the Airport WRF site is sized to allow expansion to 30 mgd.

Response: Errata sheet items incorporate these items.

5. The City of Tempe requested corrections as follows:

   On Pg. 4-120, in first paragraph **Existing Wastewater Treatment**, change last sentence "Tempe owns 22.53 mgd of treatment capacity at the 91st Avenue WWTP."

Response: The Errata sheet incorporates this correction.

6. In their April 10, 2002 letter, Algonquin Water Resources of America, Inc. provided updated information regarding the acquisition of Boulders Carefree Sewer Corporation in March 2001. The information is consistent with that previously provided and used in development of the subsection 4.2.4.1 Carefree. The key change is name of WWTP.

   On page 4-79, change name of WWTP from "Boulders Carefree Sewer Corporation (BCSC)" to the "Black Mountain Sewer Corporation (BMSC)" in three locations.

On page 4-80 in the first and second paragraphs, change “Carefree system”; “Boulders treatment plant”; “Boulders plant;” “Boulders wastewater treatment plant” to “BMSC system”; “BMSC treatment plant”; “BMSC plant” and “BMSC wastewater treatment plant,” respectively. In third paragraph, change “Boulders Carefree Sewer Corporation” to “Black Mountain Sewer Corporation.”

The Figure 4-13 should be revised to reflect name change.

Response: These items have been added to Errata sheet.

7. The City of Goodyear provided notification in their April 12, 2002 letter that a new WWTP is being planned to treat 4.0 mgd of wastewater originally planned for expansions of their 157th Avenue WWTP. The new plant, Gila River Basin - Cotton Lane WRF was included as a proposed new plant in the Errata sheet issued prior to public hearing. Information describing plant features and design parameters was not provided.

Response: This item has been added to Errata Sheet. Figures 4.4 and ES-1 will be revised.

8. The City of Surprise, in a letter of April 15, 2002, requested MAG make corrections to information as follows:

   a. Comment on page 4-09, Table 4.3, Current Aquifer Protection Permits in Maricopa County:

      The City of Surprise currently holds two Aquifer Protection Permits. The Litchfield Road WRP is correctly listed in the draft. However, we also hold File No. 102478 (Permit No. 14431-Facility I.D. 1916-11/10/97) for the South Surprise WRP.

Response: This item is included in Errata sheet.

   b. On page 4-73, the second paragraph from the top incorrectly describes the service area western boundary as being “the Loop 303” when in fact it is actually the “Beardsley Canal.”

Response: This item is included in Errata sheet.

   c. Comments on page 4-74, Figure 4.11 incorrectly detail the City’s General Plan 2020. The northern boundary currently planned for the year 2020 stops at State Road 74. I have attached a copy of the 2020 plan boundaries for your use.

Response: Boundary of Figure 4.11 is based on planning areas as set by each municipal member of MAG and may differ from the boundaries of the General Plan 2020.

   d. Comment: On page 4-75, the last sentence of the fourth paragraph from the top of the page states “Sludge is treated through aerobic digestion to produce Class A sludge …” which should state that the “Sludge is treated through Autothermal Thermophilic Aerobic Digestion (ATAD) to produce Class A sludge …”

Response: This item is included in Errata sheet.

   e. Comment: The South Plant III expansion to 7.2 mgd is scheduled to begin construction during 2002.

Response: This item is included in Errata sheet.

9. In their April 19, 2002 letter and April 17, 2002 fax, Arizona American Water Company provided comments on Chapter 3, Description of Water Resources and Chapter 4, Point Source Plan.

   a. Comment: Table 3.6, taken from the 1998 MAG 208 Plan, is obsolete and should be updated with current information. The Arizona Department of Water Resources prepares an updated table of CAP allocations each year. Regardless of whether the table is completely updated, please change the references to Citizens' allocations to Arizona-American Water Company, as marked on the enclosed pages.

Response: Pages 3-14 and 3-15, Table 3.6, Central Arizona Project Allocations, have been updated based on CAP Subcontracting Status Report - May 22, 2000 from CAWCD and as noted with change from Citizens' allocations to Arizona American Water Company. See Errata sheet for revised Table.

Table 3.6 Central Arizona Project Allocations, Phoenix Active Management Area, 2000 MAG 208 Water Quality Management Plan Update

Subcontracts	Allocation (acre-feet/yr)
Municipal and Industrial Subcontracts	
Arizona-American Water Company (Paradise Valley)	3,231
Arizona Water Company – White Tanks	968
City of Avondale	4,746
Berneil Water Company	200
Town of Buckeye	25
Carefree Water Company	400
Cave Creek Water Company	1,600
Circle City Water Company	3,932
City of Chandler	3,668
Chandler Heights Citrus Irrigation District	315
Chaparral City Water Company	6,978
Arizona American Water Co. (Agua Fria)	11,093
Arizona American Water Co. (Sun City)	4,189
Town of Gilbert	7,235
City of Glendale	14,183
City of Goodyear	3,381
Litchfield Park Service Company	5,580
Maricopa County Parks and Recreation Department	665
City of Mesa	36,388
New River Utility Company	1,885
City of Peoria	18,709
City of Phoenix	113,914

Table 3.6 Central Arizona Project Allocations, Phoenix Active Management Area, 2000 MAG 208 Water Quality Management Plan Update	
Subcontracts	**Allocation (acre-feet/yr)**
Phoenix Memorial Park	84
Queen Creek Water Company	348
Rio Verde Utilities, Incorporation	812
San Tan Irrigation District	236
City of Scottsdale	48,529
Arizona American Water Co. (Sun City)	2,372
Sunrise Water Company	944
City of Surprise	7,373
City of Tempe	4,315
Water Utilities Community Facilities District	2,919
Water Utility of Greater Buckeye	43
Water Utility of Greater Tonopah	64
West End Water Company	157
SUBTOTAL	**311,481**
Indian Subcontracts	
Ak-Chin Indian Community	58,300
Fort McDowell Indian Community	4,300
Gila River Indian Community[1]	173,100
Salt River Pima – Maricopa Indian Community	13,300
SUBTOTAL	**249,000**

Source: CAP Subcontracting Status Report, May 22, 2000 and ADWR, Third Management Plan, 1999

1. The Gila River Indian Community is partially located in Maricopa County.

b. Comment: Please insert a statement, as marked, concerning Arizona-American's operation of the Anthem CAP water treatment plant.

Response: On page 3-13, under 3.2.2, Allocations and Flows, change the first sentence to read "The Cities of Glendale, …, Peoria, the Town of Gilbert and Fountain Hills (served by the Chaparral City Water Co.) and Anthem master planned community (served by Arizona-American Water Co.) have municipal …"

c. On Pgs. 4-63, 64, 146, and 148, change "Citizens Water Co." to "Arizona-American Water Co."

Response: These items have been added to Errata sheet.

Comments received subsequent to April 23, 2002 public hearing were as follows:

1. Comments by Ray Hedrick, of Salt River Project, provided immediately following public hearing included several edits and corrections to text of Chapter 3, Description of Water Resources in Subsection 3.1.2 Salt and Verde Rivers.

Response: These edits and corrections having to do with terminology of Granite Reef Diversion Dam, its operation, and periodic water quality issues in the Verde River, are tabulated in Errata sheet.

2. On April 24, 2002, MAG Regional Council approved the Small Plant Review and Approval Report for Desert Gardens II Apartment Complex, March 2002. This plant is added to 208 WQMP Update as follows:

Page ES-13, Table ES-1, Northwest Area, Glendale. Add new seventh line:

NAME	CURRENT MGD	FUTURE ADD MGD	ULTIMATE MGD	OTHER IMPROVEMENTS	ESTIMATED COSTS
Desert Gardens II WWTP	-	0.06	0.06	-	$442,000

Page ES-15, Table ES-1, revise totals line.

FUTURE ADD MGD	ULTIMATE MGD	OTHER IMPROVEMENTS	ESTIMATED COSTS
245.53	873.07	-	$1,977,528,700

Response: The Errata sheet has been updated to incorporate above.

Page 4-64, under **Future Wastewater System Development**, add a new paragraph as follows:

"A new wastewater treatment plant is planned for the Desert Gardens II Apartment Complex on Glendale Avenue west of 135th Avenue. The 60,000 gpd WWTP will consist of a sewage lift station, primary settling, extended aeration, denitrification, clarification, tertiary filtration and disinfection. Sludge disposal will be to State-approved landfill and effluent disposal will be through deep sewage pits. An Aquifer Protection Permit will be required."

Response: The Errata Sheet has been updated to include this change.

3. Comments received from the City of Avondale dated May 8, 2002 provided updated population projections and associated wastewater flows, and requested the location of proposed future water reclamation plant in northern portion of city be shifted to east side of Agua Fria River.

Response: Comments incorporated into current Errata.

4. Comments dated May 10, 2002 received from a developer in the City of Buckeye requested that "Whitestone Water Reclamation Facility" be changed to reflect revised name of development "Verrado". Also, a notation on initial unit processes should be added to indicate "grit removal".

Response: MAG verified with the Town of Buckeye that they were in support of these requested changes, and comments were incorporated into current Errata.

5. Comments dated May 21, 2002 received from the City of Peoria requested that description of Quintero project be revised to indicate effluent from WRP will be reused for golf course irrigation and will not be discharged from site.

Response: Comments incorporated into current Errata.

PUBLIC HEARING ON THE DRAFT REVISION TO THE MAG 208 WATER QUALITY MANAGEMENT PLAN

Wednesday, July 31, 2002 at 4:00 p.m. MAG Office, Suite 200–Cholla Room 302 North 1st Avenue Phoenix, Arizona 85003

The Maricopa Association of Governments (MAG) will conduct a second public hearing on Wednesday, July 31, 2002 on the Draft Revision to the MAG 208 Water Quality Management Plan. The purpose of the hearing is to recieve public comments on the draft Plan, which includes an Errata Sheet. The Plan has been prepared in accordance with Section 208 of the Clean Water Act. The two major sections of the draft Plan are the Point Source and Nonpoint Source elements. The Point Source Element describes the desired wastewater treatment configuration for the MAG area as identified by the MAG member agencies for the 20 year planning horizon. The Nonpoint Source Element describes Federal and State program activities designed to control nonpoint source pollution.

Following consideration of comments at the hearing, it is anticipated that the MAG Water Quality Advisory Committee will make a recommendation to the MAG Management Committee. On September 11, 2002, the MAG Management Committee is anticipated to make a recommendation to the MAG Regional Council. It is anticipated that the MAG Regional Council will take action on the draft Revision to the MAG 208 Plan on September 25, 2002.

Written and verbal comments are welcome at the hearing. A copy of the draft document will be available for public review at the MAG Office from 8:30 a.m. to 5:30 p.m. Monday through Friday beginning Monday, July 1, 2002. Copies will also be available for review at the Glendale Public Library, 5959 West Brown Street; Mesa Public Library, 64 East First Street; and Phoenix Central Public Library, 1221 North Central Avenue. For further information or to submit written comments on the draft prior to the hearing, contact Brenda Geisen, MAG, at (602) 254-6300.

02347– June 15, 2002.

AFFIDAVIT OF PUBLICATION

2347

THE ARIZONA REPUBLIC

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

TOM BIANCO, being first duly sworn, upon oath deposes and says: That he is the legal advertising manager of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

The Arizona Republic

06/15/2002

[signature]

Sworn to before me this
17TH day of
June A.D. 2002

OFFICIAL SEAL
GLORIA SALDIVAR
NOTARY PUBLIC-ARIZONA
MARICOPA COUNTY
My Comm. Expires Dec. 1, 2003

Gloria Saldivar
Notary Public

MARICOPA ASSOCIATION of GOVERNMENTS

302 North 1st Avenue, Suite 300 ▲ Phoenix, Arizona 85003
Phone (602) 254-6300 ▲ FAX (602) 254-6490
Email: mag@mag.maricopa.gov ▲ Website: www.mag.maricopa.gov

June 25, 2002

TO: Interested Parties for Water Quality

FROM: Brenda Geisen, Environmental Planner

SUBJECT: NOTIFICATION OF A PUBLIC HEARING ON THE DRAFT REVISION TO THE MAG 208 WATER QUALITY MANAGEMENT PLAN

Public Hearing
Wednesday, July 31, 2002 at 4:00 p.m.
MAG Office, Suite 200 - Cholla Room
302 North 1st Avenue
Phoenix, Arizona 85003

The Maricopa Association of Governments (MAG) would like to invite you to attend a second public hearing on the Draft Revision to the MAG 208 Water Quality Management Plan. The purpose of the hearing is to receive public comments on the Draft 208 Plan, which includes an Errata Sheet. The Plan has been prepared in accordance with Section 208 of the Clean Water Act.

MAG announced during the April 23, 2002 public hearing on the Draft Plan that, due to requested changes, a second hearing would be conducted. A new complete Errata Sheet has been developed which addresses requested changes such as, addition of the City of Goodyear planned Gila River Cotton Basin Water Reclamation Plant. This Errata Sheet will be inserted into the February 2002 Draft Final Revision to the MAG 208 Plan and the complete draft document will be made available for public review.

The two major sections of the draft Plan are the Point Source and Nonpoint Source elements. The Point Source Element describes the desired wastewater treatment configuration for the MAG area as identified by the MAG member agencies for the 20 year planning horizon. The Nonpoint Source Element describes Federal and State program activities designed to control nonpoint source pollution from land disposal, agriculture, urban stormwater runoff, pesticides and volatile organic compounds.

Following consideration of comments at the hearing, it is anticipated that the MAG Water Quality Advisory Committee will make a recommendation to the MAG Management Committee. On September 11, 2002, the MAG Management Committee is anticipated to make a recommendation to the MAG Regional Council. It is anticipated that the MAG Regional Council will take action on the draft Revision to the MAG 208 Plan on September 25, 2002.

Written and verbal comments are welcome at the hearing. A copy of the draft document which includes the Errata Sheet will be available for public review at the MAG Office from 8:30 a.m. to 5:30 p.m. Monday through Friday beginning Monday, July 1, 2002. Copies will also be available for review at the Glendale Public Library, 5959 West Brown Street; Mesa Public Library, 64 East First Street; and Phoenix Central Public Library, 1221 North Central Avenue. For further information or to submit written comments on the draft prior to the hearing, contact Brenda Geisen, MAG, at (602) 254-6300.

RESPONSES TO PUBLIC COMMENT
DRAFT MAG 208 WATER QUALITY MANAGEMENT PLAN

July 31, 2002 Public Hearing

The Maricopa Association of Governments (MAG) appreciates the comments made during the second public comment period for the Draft MAG 208 Water Quality Management Plan. An advertised second public hearing on the subject was conducted by MAG on July 31, 2002. No comments were received from public during the public hearing.

Comments received prior to the public hearing are as follows:

1. During Water Quality Advisory Committee meeting of June 6, 2002, it was requested that clarification of capacities of two WWTPs listed on the Salt River Maricopa Indian Community (SRPMIC) be provided. In Errata, Table ES-1, page ES-15, the Pavilions WWTP and Scottsdale Community College WWTP did not list a capacity.

Response: The Engineer researched the two facilities noted on SRPMIC and determined that: 1) Current capacity of Pavilions WWTP is 0.12 mgd, and 2) there is not a WWTP at Scottsdale Community College, as wastewater is discharged into the City of Scottsdale sewer system.

Table ES-1, Point Source Plan Summary - Errata for page ES-15 for Salt River Pima-Maricopa Indian Community, delete row for “Scottsdale Community College WWTP”, in column “Current MGD” add “0.12” for Pavilions WWTP. Revise Totals under “Current MGD” column to “400.12” (Totals also reflect Item 2 response).

Chapter 4, Point Source Plan - on page 4-140, Future Wastewater System Development, change first sentence to read “The Pavilions development currently utilizes a small package wastewater treatment plant (capacity 120,000 gpd).

2. The City of Chandler, in a letter dated June 25, 2002, stated the current capacity of the Airport WRF is 6.5 mgd (corrected from 5.0 mgd), the Ocotillo WRF is now owned by the city and operated by Severn Trent Environmental, and the city has nine (9) sewage lift stations.

Response: The following changes will be incorporated into the final draft MAG 208 Water Quality Management Plan:

Executive Summary

Table ES.1, Point Source Plan Summary - In Errata, on page ES-14 for Chandler, in column “Current MGD” change “5.0” to “6.5”. Revise totals of this column on page ES-15 (see Item 1 Response).

Chapter 4, Point Source Plan, 4.2.5.2 Chandler

Figure 4.19 - Add lift stations Kyrene/Pecos LS, Pumpback LS, and McQueen LS; change Riggs Road LS to existing.

In section Existing Collection System on page 4-100 - revise last paragraph first sentence “. . . the Chandler collection system has nine lift stations.” At end of paragraph, add sentence “Other lift stations include the Kyrene/Pecos Lift Station, McQueen Lift Station and Pumpback Lift Station.

In section Existing Treatment System, page 4-101 - in third paragraph revise second sentence to read “The Ocotillo WRF is now owned by the city and operated by Severn Trent Environmental.” In sixth paragraph revise first sentence “The Airport WRF . . ., and has a treatment capacity of 6.5 mgd, and is master planned to be expanded to 20 mgd.”

Table 4.34, Flow Allocation (mgd) to WRF/WWTP on page 4-103 - the line for year 2000, under “Airport WRF”, change “5.0” to “6.5” and under “Total Available”, change “23.8” to “25.3”.