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MAG 208 WATER QUALITY MANAGEMENT PLAN
POINT SOURCE UPDATE

MAY 2014

MARICOPA ASSOCIATION of GOVERNMENTS

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208 WATER QUALITY MANAGEMENT PLAN POINT SOURCE 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 Point Source Update requires the participation and assistance of many agencies and individuals. The following individuals and agencies 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 update. 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 Water Quality Management Planning Agency for the Maricopa County area.

Other Agency Participation

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

- Arizona Department of Environmental Quality.
- Maricopa County Environmental Services Department.
- Arizona Municipal Water Users Association.
- U.S. Environmental Protection Agency.

Funding was provided to the program through a grant from the Environmental Protection Agency, by the Arizona Department of Environmental Quality, and by the Maricopa Association of Governments.

EXECUTIVE SUMMARY

This document serves as a revision to the Maricopa Association of Governments (MAG) 208 Water Quality Management Plan to update the Point Source Plan. The last major revision of the 208 Plan occurred in 2002. At that time, the Nonpoint Source Plan, Management Plan, and descriptions of water resources, permits and protected uses were also updated. However, the goal of this revision is to update the Point Source Plan due to significant changes that have occurred since 2002, including:

- Numerous 208 Plan Amendments and Small Plant Review and Approvals.
- Major population growth in the metropolitan Phoenix area.
- Revised Municipal Planning Area boundaries.
- Increased emphasis on using reclaimed water.
- Increased concern on the potential impacts of emerging contaminants.
- Greening wastewater infrastructure by conserving water, reusing reclaimed water, and reducing energy demand at wastewater treatment facilities.

This Point Source Update to the MAG 208 Water Quality Management Plan was prepared in response to the changes that have taken place over the past decade. Collectively, there have been 22 Amendments to the MAG 208 Plan and six Small Plant Review and Approvals approved by the MAG Regional Council since 2002. In addition, communities have revised their wastewater treatment configurations to more accurately reflect the needs over the twenty year planning period, including changing anticipated capacities and in some instances adding and/or removing facilities.

The Maricopa Association of Governments is the designated Regional Water Quality Management Planning Agency for the Maricopa County area. This designation was made in accordance with Section 208 of the Clean Water Act. During development of the original 208 Plan, in July 1979, a planning process was established which has been in effect for over 30 years and is well-established. The original 208 Plan has been amended several times since 1979.

The 208 program includes two major elements: the Point Source Plan and the Nonpoint Source Plan. As indicated, the purpose of this 208 revision is to update 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 2040. 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 2002 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.

Several agencies have responsibilities in the MAG 208 planning process. The U.S. Environmental Protection Agency (EPA) and the Arizona Department of Environmental Quality (ADEQ) 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.

STUDY AREA DESCRIPTION

Maricopa County is the most populous of Arizona's fifteen counties, home to approximately 60 percent of the State's population. The MAG region is geographically situated in the south-central interior region of the State of Arizona and encompasses an area of approximately 9,223 square miles. The region is located in the Sonoran Desert with elevations generally ranging from 500 to 2,500 feet above sea level. There are six main rivers that run through the region. These rivers are: the Salt River, Agua Fria River, Gila River, New River, Verde River, and Hassayampa River.

For several decades, the MAG region had been one of the fastest-growing metropolitan areas in the United States. While the region has experienced a recession in recent years, the population of the County has continued to grow. From 1990 to 2010, the County experienced a population growth of nearly 80 percent. The population estimates for 2013, approved by the MAG Regional Council on December 4, 2013, indicate that the Maricopa County population is approximately 3.9 million. Between 2000 and 2013, migration accounted for approximately 44 percent of the growth in the County. Many of the people migrating to the region were from California or other parts of Arizona. Although the recent recession has had a significant impact on the region, growth is expected to continue over the next twenty year planning period and beyond. A population of over 6 million is projected in the region by 2040.

For the purposes of the 208 Plan Point Source Update, 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.

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. This revision is an update of Point Source Plan presented in the 2002 MAG 208 Water Quality Management Plan. The Point Source Plan reflects the major advances which have been made by the communities in the region in wastewater management planning. Detailed wastewater master plans have been developed by individual municipalities and agencies, but they reflect a thorough awareness of the water quality management issues facing the region.

Due to the importance of highly-treated effluent or reclaimed water as a source of supply, many communities in the study area are utilizing this resource. Because of the cost of distributing water to users, a local approach to reclamation and reuse may be 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 in Table ES.1 is a summary of the selected wastewater treatment plants in each community. A composite map of the Point Source Plan is reflected in Figure ES-1. There are currently 31 treatment plants over 2 million gallons per day (mgd) in capacity and 55 small plants (86 total). The count is expected to increase to 68 larger plants and 52 smaller plants (120 total). Thirty-five new facilities were added to the MAG 208 Plan through 208 Plan Amendments and Small Plant Review and Approvals since the last major revision. In addition, two future facilities have been added and nearly 20 plants deleted as part of this update.

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

AREA	MEMBER AGENCY	TREATMENT PLANTS		
		NAME	CURRENT MGD	ULTIMATE MGD
Central	**Phoenix**	23rd Ave. WWTP	63.0	63.0
		91st Ave. WWTP (SROG)	204.5	230.0
		Cave Creek WRP	8.0	TBD[1]
		Misc. WWTP Facilities (14 small)	0.247	0.247
Southwest	**Avondale**	Avondale WRF	9.0	15.0
	Buckeye	Central Buckeye WWTP	4.0	45.8
		Sundance WWTP	2.4	13.9
		ADOC Lewis Prison WWTP	0.75	-
		Verrado WRF	0.45	3.6
		Tartesso West WRF	1.2	24.2
		Festival Ranch WRF	1.0	17.3
		Anthem at Sun Valley South WRF	-	4.5
		Douglas Ranch WRF	-	31.9
		Palo Verde Road WRF	-	11.7
		Tartesso East WRF	-	10.7
		Town of Buckeye WRF at Cipriani	-	12.0
		Trillium West WWTF	-	3.2
		Gila 85 WRF	-	9.1
		Gila Hassayampa WRF	-	7.8
		Gila Rainbow WRF	-	13.2
		Gila Southwest WRF	-	7.5
		Hassayampa North WRF	-	9.4
		Sun Valley WRF	-	13.2
		Waterman Wash WRF	-	2.2
	Goodyear	Palm Valley WRF	4.1	8.2
		Sarival WRF	-	8.2
		Goodyear 157th Ave. WWTP	4.0	22.0
		Lockheed Martin WWTP	0.065	0.065
		Corgett Wash WRF	0.8	2.0
		Waterman Basin WRF	-	10.0
		Rainbow Valley WRF	0.75	6.0
		Pecos WRF	-	8.0
		Estrella WRF (State Land WRF)	-	4.75
		Southern Region WRF	-	24.0
		Section 23 WRF	-	0.6
		Section 28 WRF	-	0.6
	Litchfield Park	-	-	-
	Tolleson	Tolleson WWTP	17.5	24.9
Northwest	**El Mirage**	El Mirage WWTP	2.5	4.5

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

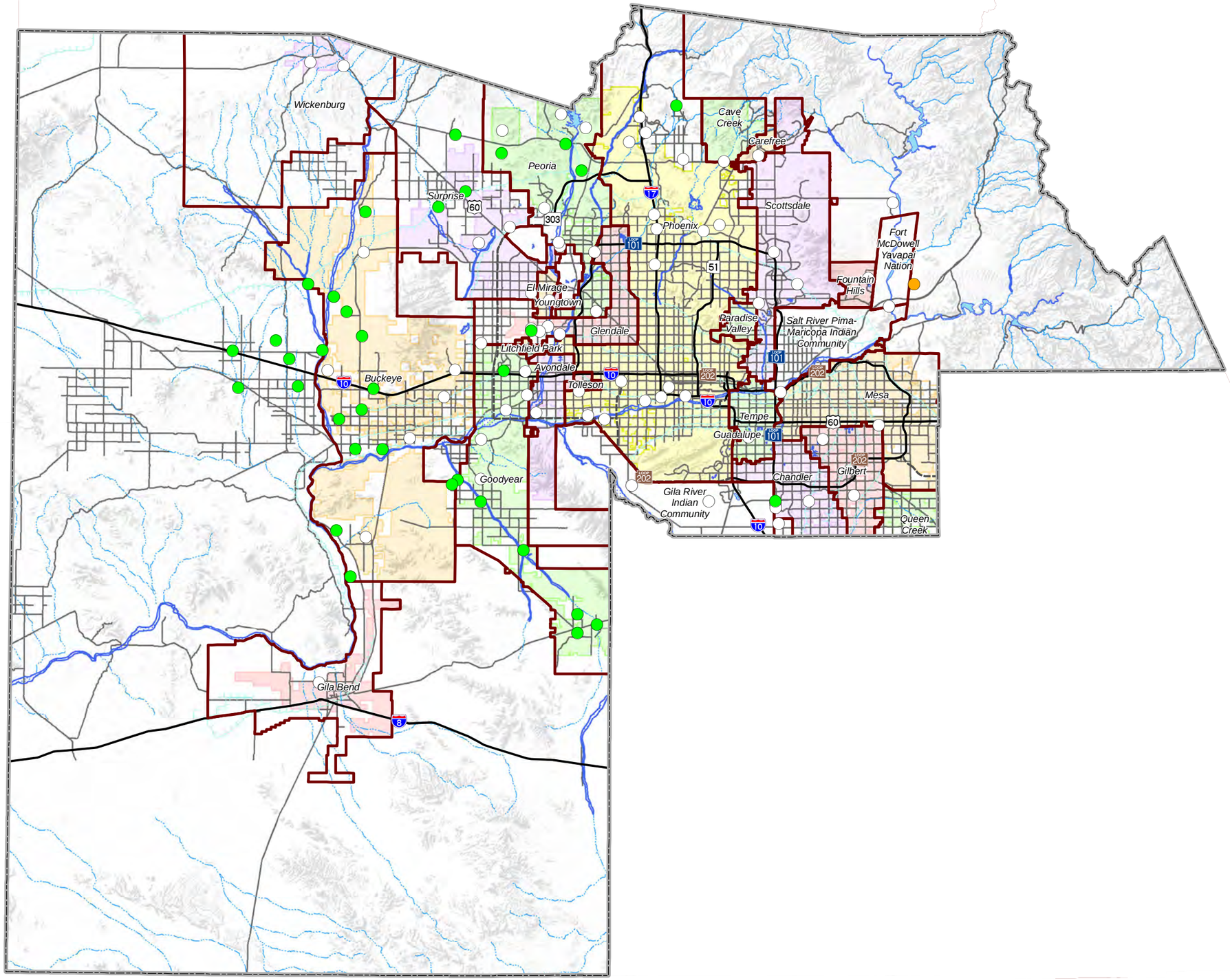
AREA	MEMBER AGENCY	TREATMENT PLANTS		
		NAME	CURRENT MGD	ULTIMATE MGD
	Glendale	Arrowhead Ranch WRF	4.5	4.5
		West Area WRF	11.5	31.0
		Desert Gardens I WWTP	0.05	0.05
		Casitas Bonitas WWTP	0.05	0.05
		Russell Ranch WWTP	0.06	0.4
		Desert Gardens II WWTP	-	0.06
	Luke AFB	Luke AFB WWTP	1.0	1.0
	Peoria	Butler WRF (South Peoria WRP)	10.0	13.4
		Beardsley WRF	4.0	12.0
		Jomax WRF	2.25	10.0
		Quintero WRF	0.125	0.125
		Pleasant Harbor WRP	0.063	0.189
		Scorpion Bay WWTP	0.0195	0.035
		Agua Fria WRF (Saddleback)	-	15.0
		Padelford WRF (Paddelford WRP)	-	7.0
		Estates at Lakeside WWTP	-	0.12
	Surprise	SPA 1 (South Surprise WWTP)	16.3	24.0
		SPA 2 WRF	2.0	10.1
		SPA 3 WRF	1.8	19.4
		SPA 4 WRF	-	13.8
		SPA 5 WRF	-	15.7
		SPA 6 WRF	-	5.4
	Youngtown	-	-	-
Northeast	**Carefree**	BMSC WWTP	0.12	0.16
	Cave Creek	Town of Cave Creek WRF	0.75	2.25
	Fountain Hills	Fountain Hills WWTP	2.9	3.3
	Paradise Valley	-	-	-
	Scottsdale	Gainey Ranch WRP	1.7	1.7
		Water Campus WRP	20.0	25.0
		Water Campus AWTP	20.0	20.0
		Taliesen West WWTP	0.015	0.015
Southeast	**Guadalupe**	-	-	-
	Chandler	Lone Butte WRF (GRIC)	10.0	10.0
		Ocotillo WRF	10.0	20.0
		Airport WRF	15.0	30.0
		Industrial WWTP	2.8	5.6
		Chandler WRF	-	40.0

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

AREA	MEMBER AGENCY	TREATMENT PLANTS		
		NAME	CURRENT MGD	ULTIMATE MGD
	Gilbert	Neely WRF Greenfield WRP	11.0 16.0	11.0 50.0
	Mesa	Northwest WRP Southeast WRP	18.0 8.0	18.0 8.0
	Queen Creek	-	-	-
	Tempe	Kyrene WRP	9.0	9.0
Outlying	**Gila Bend**	Gila Bend WWTP	0.35	2.0
	Wickenburg	Wickenburg WWTP Wickenburg School District Wetland	0.8 0.0166	1.2 0.0166
	Gila River Indian Community	Vee Quiva WWTF	0.1	0.1
	Salt River Pima-Maricopa Indian Community	-	-	-
	Fort McDowell Yavapai Nation	Fort McDowell WWTP	0.24	0.24
	Maricopa County	Anthem Rio Verde Utilities Sun City West Sun Lakes Wigwam Creek HUC Northeast Campus 1 HUC Northeast Campus 2 HUC Northeast Campus 3 HUC Northeast Campus 4 HUC Southwest Campus 1 Balterra Ruth Fisher School Preserve at Goldfield Ranch[2] Misc. Small WWTP (14 WWTPs)	3.0 0.7 5.0 2.4 - - - - - - - 0.015 - 0.2	4.5 0.9 6.44 2.4 2.4 9.0 10.0 12.0 14.0 32.0 15.0 0.042 0.4 0.2
Totals			536.09	1,223.45

[1] Phoenix anticipates that the Cave Creek WRP will be off line until at least 2015 at which time the decision to remain off line will be reevaluated. The decision to return the facility to operation is dependent on development and loading from the area.
[2] To date the Arizona Department of Environmental Quality has not taken action on the Small Plant Review and Approval for the Preserve at Goldfield Ranch WRF.

Figure ES-1 Existing and Planned WWTP Locations



Legend

- Existing Treatment Plant
- Future Treatment Plant
- Proposed Plant
- Canal
- Perennial Stream
- Wash
- Water
- Intermitent Water
- Maricopa County
- Freeway
- Planned Freeway
- Major Roads
- MPAs 2012

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While every effort has been made to ensure the accuracy of this information, the Maricopa Association of Governments makes no warranty, expressed or implied, as to its accuracy and expressly disclaims liability for the accuracy thereof.

Date: February 2014

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Environmental Assessment of Point Source Plan

The MAG 208 Water Quality Management Plan Revision completed in 2002 included a description of existing environmental conditions as well as the environmental consequences of the Point Source Plan. For wastewater treatment facilities added to the MAG 208 Plan following the 2002 Revision, the environmental impacts were evaluated through the MAG 208 Plan Amendment and Small Plant Review and Approval Processes.

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.

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, 2002, and the current Point Source Plan Update to be completed in 2014).

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 National Pollutant Discharge Elimination System (NPDES) permit or Arizona Pollutant Discharge Elimination System (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 to the Arizona Department of Environmental Quality. ADEQ certifies that the 208 Plan amendment is incorporated into and is consistent with the Arizona Water Quality Management Plan and submits the revision to the U.S. Environmental Protection Agency for approval. 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 Review and Approval Process

Part of the Multi-City Sub-Regional Operating Group (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 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.

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CHAPTER 1
INTRODUCTION

The Maricopa Association of Governments (MAG) serves as the designated Regional Water Quality Management Planning Agency for the Maricopa County area. This designation was made by Governor Jack Williams in 1974 in accordance with Section 208 of the federal Clean Water Act. In this capacity, MAG develops the MAG 208 Water Quality Management Plan which describes the preferred wastewater treatment system to serve the wastewater treatment needs of the area over a twenty year time period. In this analysis, wastewater flows, wastewater discharges, wastewater reuse, and sludge management are examined. The initial MAG 208 Water Quality Management Plan was prepared in 1979 with revisions in 1982, 1993, and 2002.

The 208 program includes two major elements: the Point Source Plan and the Nonpoint Source Plan. The Point Source section describes the desired wastewater treatment configuration for Maricopa County. The Nonpoint Source section primarily includes a description of regional groundwater quality and the federal and state program activities designed to control nonpoint source pollution. This revision to the 208 Plan is an update to the Point Source Plan. Information regarding the Nonpoint Source Plan, Management Plan, water resources, and permits and protected uses can be found in the last comprehensive revision of the 208 Plan, completed in 2002.

Following the approval of the MAG 208 Plan in 2002, significant changes have occurred in the region resulting in 22 MAG 208 Plan Amendments and six Small Plant Review and Approvals. The purpose of this update is to include these modifications as well as other changes that impact the Point Source Plan over the twenty year planning period.

1.1 MAJOR CHANGES SINCE THE 2002 MAG 208 PLAN

Numerous changes have occurred since the 2002 MAG 208 Water Quality Management Plan was approved. Maricopa County has experienced a period of high growth as well as a recession. In addition, the importance of reclaimed water and its use has continued to grow as the demand for water increases in the region. Wastewater treatment and effluent disposal methods have also evolved due to new technologies and sustainable initiatives.

1.1.1 Population Projections and Municipal Planning Areas

Over the past several decades, the MAG region has been marked by significant growth. From 1990 to 2010, the County experienced a population growth of nearly 80 percent. In the past 10 years, the population density of Maricopa County has increased from approximately 334 persons per square mile to approximately 415 persons per square mile. While the recent recession has had an impact on population in Maricopa County, the region is still expected to grow over the next twenty years and beyond.

The latest population projections and Municipal Planning Areas for the region were approved by the MAG Regional Council on June 19, 2013. The *Socioeconomic Projections of Population, Housing and Employment by Municipal Planning Area and*

Regional Analysis Zone, June 2013, used the April 1, 2010 Census as the base and projected for July 1st of 2010, 2020, 2030, and 2040. According to the projections, the population in Maricopa County will be approximately 5.36 million in 2030 and 6.18 million by 2040. The approved projections and Municipal Planning Areas are provided in Appendix A.

1.1.2 Reclaimed Water

As the region grows, a greater demand will be placed on the limited water resources. Therefore, reclaimed water will play an increasingly important role in water supply. Reclaimed water is currently used in Maricopa County to supply water for irrigation, industrial uses, recreational purposes including lakes and ponds, artificial recharge, and wetlands. In general, there has been a shift from constructing more regional wastewater treatment facilities to the construction of facilities in better proximity to reclaimed water users creating better opportunities for reuse. Significant progress has been made in the region with regard to the reuse of reclaimed water and communities continue to explore additional uses in an effort to become a more sustainable region.

In order to improve statewide water sustainability through increased recycling and conservation, Governor Jan Brewer announced the formation of the Blue Ribbon Panel on Water Sustainability on August 28, 2009. The Panel, co-chaired by the Arizona Department of Environmental Quality (ADEQ), Arizona Department of Water Resources (ADWR), and Arizona Corporation Commission (ACC), included 40 representatives with diverse water interests in Arizona. Five working groups were then formed that discussed a variety of issues and developed recommendations for the Panel. On November 30, 2010, the Governor's Blue Ribbon Panel on Water Sustainability issued a Final Report that included specific recommendations in order to advance water sustainability goals.

According to the Final Report, the goal of the Panel was to provide recommendations on statute, rule, and policy changes that, by the year 2020 in Arizona would significantly:

- Increase the volume of reclaimed water reused for beneficial purposes in place of raw or potable water,
- Advance water conservation, increase the efficiency of water use by existing users, and increase the use of recycled water for beneficial purpose in place of raw or potable water,
- Reduce the amount of energy needed to produce, deliver, treat, and reclaim and recycle water by the municipal, industrial, and agricultural sectors,
- Reduce the amount of water required to produce and provide energy by Arizona power generators, and
- Increase public awareness and acceptance of reclaimed and recycled water uses and the need to work toward water sustainability (ADEQ, ADWR, ACC, 2010).

The Blue Ribbon Panel on Water Sustainability Final Report indicates that 78 percent of the permitted wastewater treatment plants in Maricopa County are authorized to reuse. Although many plants are distributing reclaimed water for reuse, the portion of the plant

capacity being reused may vary. The Final Report indicates that there are additional opportunities for uses of reclaimed water as well as the need to match the appropriate recycled water with an end user. In order to better match water quality with intended uses, the Panel recommended initiating a stakeholder process to review and make any necessary changes to regulations to improve, enhance, or encourage use, storage, and exchange of lower quality water supplies. Additional recommendations include: evaluating the potential for incentives that encourage use of lower quality water supplies; investing in treatment technology research aimed at improving efficiency, cost reduction, and quality improvement; and encouraging research in water reuse (ADEQ, ADWR, ACC, 2010).

The recommendations from the Final Report were forwarded for consideration to the Governor, the Legislature, the Arizona Department of Environmental Quality, Arizona Department of Water Resources, and Arizona Corporation Commission. The Final Report provides a path for increasing the reuse of reclaimed water and many other ways to advance water sustainability. Of the reclaimed water recommendations from the Panel, there has been some activity regarding indirect potable reuse. WateReuse Arizona has formed a Steering Committee on Arizona Potable Reuse (SCAPR) to develop guidance on technology and permitting requirements for potential implementation of projects. A report is anticipated in 2014.

With reuse of reclaimed water being a viable method for extending water resources in the region, an increasing focus on potential reuse opportunities is expected in the twenty year planning period.

1.1.3 Emerging Contaminants

Since the last 208 Plan Update, there has been growing concern about the potential impact of emerging contaminants in the Nation's waterways and the impact on human health and the environment. In 2011, the MAG Water Quality Advisory Committee discussed emerging contaminants as a new issue since the last 208 Plan update in 2002. The Committee mentioned the importance of monitoring emerging contaminants and any potential future regulations as they relate to water reclamation facilities. This issue continues to evolve.

According to the Environmental Protection Agency (EPA), "an emerging contaminant is a chemical or material characterized by a perceived, potential, or real threat to human health or the environment or by a lack of published health standards. A contaminant also may be emerging because of the discovery of a new source or a new pathway to humans" (EPA, 2014).

Emerging contaminants such as pharmaceuticals may enter the environment when unused or expired medication is flushed. In addition, medications that are discarded in the trash enter the landfill and could pose a threat to the groundwater. Medications may also be incompletely metabolized by the body and enter the sewer system. Animal waste containing veterinary medications could run off into surface water or enter the groundwater. In addition, personal care products applied to the skin may wash down the drain. While some pharmaceuticals and person care products (PPCPs) break down easily, others do

not and therefore pose more of a challenge and potential impact on the environment (Pennsylvania Department of Environmental Protection, 2014; EPA, 2014c).

There is still a great deal unknown about the presence of PPCPs and other emerging contaminants in the environment. While emerging contaminants are not new, their existence in the Nation's waterbodies have become more evident due to improvements in technologies that are able to detect these chemicals at lower limits (parts per billion and parts per trillion). According to EPA, research has discovered that certain pharmaceutical drugs may cause ecological harm; however, more research is needed to determine to what extent and if there are any potential human health effects (EPA, 2014d). The Environmental Protection Agency has been working to address the issue of emerging contaminants, specifically PPCPs with a four-pronged strategy: 1) improve the science to better understand the behavior of PPCPs in water; 2) improve public understanding; 3) identify partnership and stewardship opportunities; and 4) take regulatory action when appropriate (EPA, 2014e). It is important to note that according to EPA, scientists have found no evidence to date of adverse human health effects from PPCPs being present in the environment (EPA, 2014b).

The Governor's Blue Ribbon Panel on Water Sustainability also addressed emerging contaminants in its Final Report. One of the priority issues identified in the report was the need for the public, community leaders, water treatment professionals, business, and industry to understand and be aware of water quality issues and how actions, such as the disposal of pharmaceuticals and personal care products, can influence water quality. A challenge of using reclaimed water is addressing the public perception of water quality and the presence of emerging contaminants. The Final Report by the Blue Ribbon Panel on Water Sustainability recommended the development of an education and outreach campaign that included the expansion of pharmaceutical take-back programs to address this issue. The program would also include an element on working with the media to ensure consistent messaging (ADEQ, ADWR, ACC, 2010).

To address recommendations by the Blue Ribbon Panel regarding emerging contaminants, ADEQ convened the Advisory Panel on Emerging Contaminants (APEC) in December 2012. The purpose of the APEC is to: 1) provide guidance on identifying and managing unregulated chemical and microbial contaminants in Arizona's water so as to minimize risk to human health and the environment; 2) identify research opportunities and funding mechanisms to improve our understanding of emerging contaminant issues; 3) provide guidance on effectively communicating issues of unregulated chemical and microbial contaminants to the citizens of Arizona; and 4) seek to become an influential voice for addressing unregulated chemical and microbial contaminants on a statewide basis and contributing to the national discussion. A Panel report is anticipated in 2014 (ADEQ, 2014).

It is important to note that while emerging contaminants in water have been a growing concern, the production and use of reclaimed water is regulated by the Arizona Department of Environmental Quality. Wastewater treatment plants that produce reclaimed water for reuse need an individual Aquifer Protection Permit (APP), obtained from ADEQ, providing certification for a class of reclaimed water (A+, A, B+, B, or C). The APP requires

monitoring and reporting to ensure that effluent limitations and reclaimed water quality classes are met. While a significant number of wastewater treatment plants reuse reclaimed water, many treat the water to a high quality (Class A+ or A). Cities and towns have conducted major upgrades to their treatment facilities in order to produce the high quality reclaimed water. Treatment technology is constantly improving which is resulting in more plants treating reclaimed water to the high quality level.

1.1.4 Greening Wastewater Infrastructure

Since the last MAG 208 Water Quality Management Plan was approved in 2002, great strides have been made to create a more sustainable future. In terms of water and wastewater, many jurisdictions in Maricopa County have implemented innovative programs designed to conserve water, reuse reclaimed water, and reduce the energy required to treat water and wastewater. In this arid environment, “greening” wastewater infrastructure is an important component to becoming a more sustainable region.

In the past decade, an even greater emphasis has been placed on reusing and recharging reclaimed water versus discharging via an Arizona Pollutant Discharge Elimination System (AZPDES) Permit. With reclaimed water being treated to high levels in the region, the end use options for this valuable resource increase. Conservation programs have also reduced the gallons of wastewater flowing to the plant per capita. As a result, jurisdictions have adjusted their wastewater treatment configuration to account for these changes. Low flow water fixtures and xeriscape landscaping have also contributed to the increase in water use efficiency in Maricopa County.

Once the flows reach the plant, the process used to treat the wastewater can vary significantly. With changing technologies, jurisdictions continually evaluate opportunities for treating wastewater in a way that assists in achieving long-term sustainability goals. One option for operating more environmentally friendly wastewater treatment plants is by reducing energy use. According to EPA, water and wastewater utilities typically are the largest consumers of energy for municipalities, often accounting for 30 to 40 percent of total energy consumed (EPA 2014a).

On January 12, 2010, MAG, in cooperation with ADEQ and EPA, conducted a workshop on greening infrastructure for water and wastewater treatment plants focusing on Arizona issues. The workshop highlighted strategies for integrating green technologies into water and wastewater infrastructure. With water and wastewater treatment being some of the largest energy users for a jurisdiction, many of the workshop presentations included information on the water/energy nexus and methods for eliminating energy waste. Several opportunities for capturing energy were discussed including solar, methane, biofuel, hydroturbines as well as other technologies. There was significant discussion on energy audits, which often identify energy savings and lower facility costs options. Presenters also illustrated that benchmarking can be an important component to gaging effectiveness of implementing sustainability measures.

Due to the recent recession, jurisdictions have faced decreased revenues and having to push capital improvement projects further into the future. With this in mind, the Greening

Water and Wastewater Infrastructure Workshop focused on changes that could be incorporated into the existing infrastructure to make it more environmentally friendly in the short-term and also save critical financial resources. In addition to an immediate impact, the green alternatives could be a factor in long-term planning.

Following the workshop, a Roadmap for Greening Water and Wastewater Infrastructure was prepared. The roadmap was designed to assist utilities in evaluating options for reducing energy consumption and chemical use, conserve water, and save financial resources. In addition, potential next steps for greening water and wastewater infrastructure in the region were included. The Roadmap for Greening Water and Wastewater Infrastructure is included in Appendix B.

The Governor's Blue Ribbon Panel on Water Sustainability recognized the water/energy nexus as a potential opportunity to advance water sustainability in Arizona. A priority issue identified by the Panel was the need for Arizona-specific information on the amount of water embedded in energy and the amount of energy embedded in water. Recommendations to address the issue included: conducting an Arizona-specific study identifying the amount of water in energy and amount of energy in water; create a state-hosted information clearinghouse to store data; and develop a data management process/mechanism to facilitate data entry and retrieval (ADEQ, ADWR, ACC, 2010).

Another priority issue identified by the Panel was developing ways to facilitate collaboration between water and energy planners to ensure the most efficient use of water and energy. One recommendation to address the issue was conducting a workshop to promote discussion among the stakeholders. Another recommendation addressed the Arizona Power Plant and Transmission Line Siting Statue (A.R.S. § 40-360-06) and potentially amending it to specify that water resource impacts should be considered in issuing a Certificate of Environmental Compatibility. At this time, water resource impacts are addressed during the siting process under the general provisions of this statute (ADEQ, ADWR, ACC, 2010).

Currently, these priority issues and recommendations from the Blue Ribbon Panel have not come to fruition; however, the region continues to seek more sustainable approaches to water and wastewater treatment. Recently, the AZ Water Association formed the Energy Management and Sustainability Committee to discuss the energy and water nexus.

While jurisdictions will continue to take steps to incorporate green infrastructure for wastewater treatment plants into short-term improvements and long-term planning, it is important to recognize that several sustainable programs are already in place in the region. This is evident by some of the changes made in the Point Source Update. Infrastructure has been upgraded to lower operating costs, reduce energy, and treat wastewater to high quality levels for reuse purposes. In addition, the changes to the treatment plant configuration for the region shows that while growth will continue, there is the desire to place the plants near reclaimed water end uses. Adjustments to plant capacities are also indicative of the success of water conservation programs in the region.

1.2 STUDY AREA DESCRIPTION

Maricopa County covers 9,223 square miles and is geographically situated in the south-central interior region of the State of Arizona. The region is located in the Sonoran Desert with elevations generally ranging from 500 to 2,500 feet above sea level. The six main rivers in the County include: the Salt River, Agua Fria River, Gila River, New River, Verde River, and Hassayampa River.

1.2.1 Planning Area Boundaries

For the purposes of the Point Source Update, 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. The Municipal Planning Areas 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. For the purposes of the 208 Plan, the jurisdiction boundaries are the same as the MAG Municipal Planning Area boundaries.

1.2.2 Population Growth

Maricopa County is the seat of government for the State of Arizona and is an economic and financial hub for the southwestern United States. Approximately 60 percent of Arizona's population resides in Maricopa County, the area encompassed by this report. Since 1980, Maricopa County has increased from a population of 1.5 million to over 3.9 million in 2013. While the recent recession has had an impact on population in Maricopa County, growth is still expected within Maricopa County over the next twenty years and beyond. A population of over 6 million is projected in the region by 2040.

According to the 2010 Decennial Census, Maricopa County had a resident population of approximately 3.8 million. The 2013 population estimates approved by the MAG Regional Council on December 4, 2013 show that the population of Maricopa County is now 3.9 million. Between 2000 and 2013, migration accounted for approximately 44 percent of the population growth that occurred. Many of these people arrived from other areas in the west/southwest. According to the U.S. Census Bureau's American Community Survey five-year estimates, for the period 2007 to 2011, approximately 18 percent of people that relocated to Maricopa County were from other parts of Arizona and 14 percent migrated from California.

1.3 MAG 208 PLANNING PROCESS

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.

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.

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.

The 208 program includes two major elements: the Point Source Plan and the Nonpoint 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 30 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 2040. 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 2002 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.

1.4 AGENCY RESPONSIBILITIES

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 responsibilities. Others, such as the local municipalities and wastewater utilities, deal with the specific wastewater management concerns of individual communities. All provide input to the regional planning effort. The efforts of the agencies involved are

coordinated and presented in this MAG 208 Water Quality Management Plan for Maricopa County.

1.4.1 U.S. Environmental Protection Agency

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.

1.4.2 State of Arizona

The Arizona Department of Environmental Quality 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.

1.4.3 Maricopa Association of Governments

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.

1.4.4 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.

1.4.5 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. MCESD performs plan review for wastewater facilities in incorporated and unincorporated portions of Maricopa County. Their work includes approvals to construct certification, approvals to operate, and inspections of operations for wastewater facilities throughout Maricopa County under the authority of the Maricopa County Environmental Health Code.

1.5 REFERENCES

ADEQ, 2014. http://www.azdeq.gov/environ/water/apec/ (accessed February 2014).

ADEQ, 2014a. Personal communication with Chuck Graf, ADEQ. (February 12, 2014).

ADEQ, ADWR, ACC, 2010. *Blue Ribbon Panel on Water Sustainability Final Report*. November 30, 2010.

Arizona Department of Health Services, 2014. http://www.azdhs.gov/ (accessed February 2014).

Arizona Office of Employment and Population Statistics, 2014. http://www.workforce.az.gov/ (accessed February 2014).

Carollo Engineers, 2002. *MAG 208 Water Quality Management Plan*. October 2002.

EPA, 2014. http://www.epa.gov/fedfac/documents/emerging_contaminants.htm (accessed February 2014).

EPA, 2014a. http://water.epa.gov/infrastructure/sustain/waterefficiency.cfm (accessed February 2014.

EPA, 2014b. http://www.epa.gov/ppcp/ (accessed February 2014).

EPA, 2014c. http://www.epa.gov/ppcp/basic2.html (accessed February 2014).

EPA, 2014d. http://www.epa.gov/ppcp/faq.html (accessed February 2014).

EPA, 2014e. http://water.epa.gov/scitech/swguidance/ppcp/index.cfm (accessed February 2014).

MAG, 2005. *Regional Solid Waste Management Plan*. February 2005.

MAG, 2013. *July 1, 2013 Maricopa County and Municipality Resident Population Updates*. December 2013.

MAG, 2013. *Socioeconomic Projections of Population, Housing and Employment by Municipal Planning Area and Regional Analysis Zone*. June 2013.

Pennsylvania Department of Environmental Protection, 2014. http://www.portal.state.pa.us/portal/server.pt/community/public_drinking_water/21162/emerging_contaminants/1258859 (accessed February 2014).

U.S. Census Bureau, 2002. *2000 Census of Population and Housing, Summary Population and Housing Characteristics, PHC-1-4, Arizona.* Issued September 2002.

U.S. Census Bureau, American Community Survey Five-Year Estimates 2007-2011, 2014. www.census.gov/hhes/migration/data/acs/county_to_county_mig_2007_to_2011.html (accessed February 2014).

U.S. Census Bureau, 2014. http://quickfacts.census.gov/qfd/states/04/04013.html (accessed January 2014).

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CHAPTER 2
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. The Point Source Plan has been updated to reflect the major advances that have been made by the communities in wastewater management planning. 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.

Due to the importance of highly-treated effluent or reclaimed water as a source of supply, communities in the study area are utilizing this resource. 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 Update is based on information included in the 2002 MAG 208 Water Quality Management Plan; 208 Plan Amendments and Small Plant Review and Approvals that have been approved since the Plan was last updated; and data received from the MAG member agencies as part of an information collection effort for the update. The Point Source Update 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 document. 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 as shown in Figure 2.1.

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.

Since 2002, there have been significant changes to the wastewater treatment configuration for the region. In order to facilitate this update, MAG member agencies were requested to review the wastewater treatment description for their jurisdiction and provide the appropriate and necessary revisions. The changes received reflect the wastewater treatment configuration planned for the 2010 through 2040 planning period and in some instances ultimate build-out.

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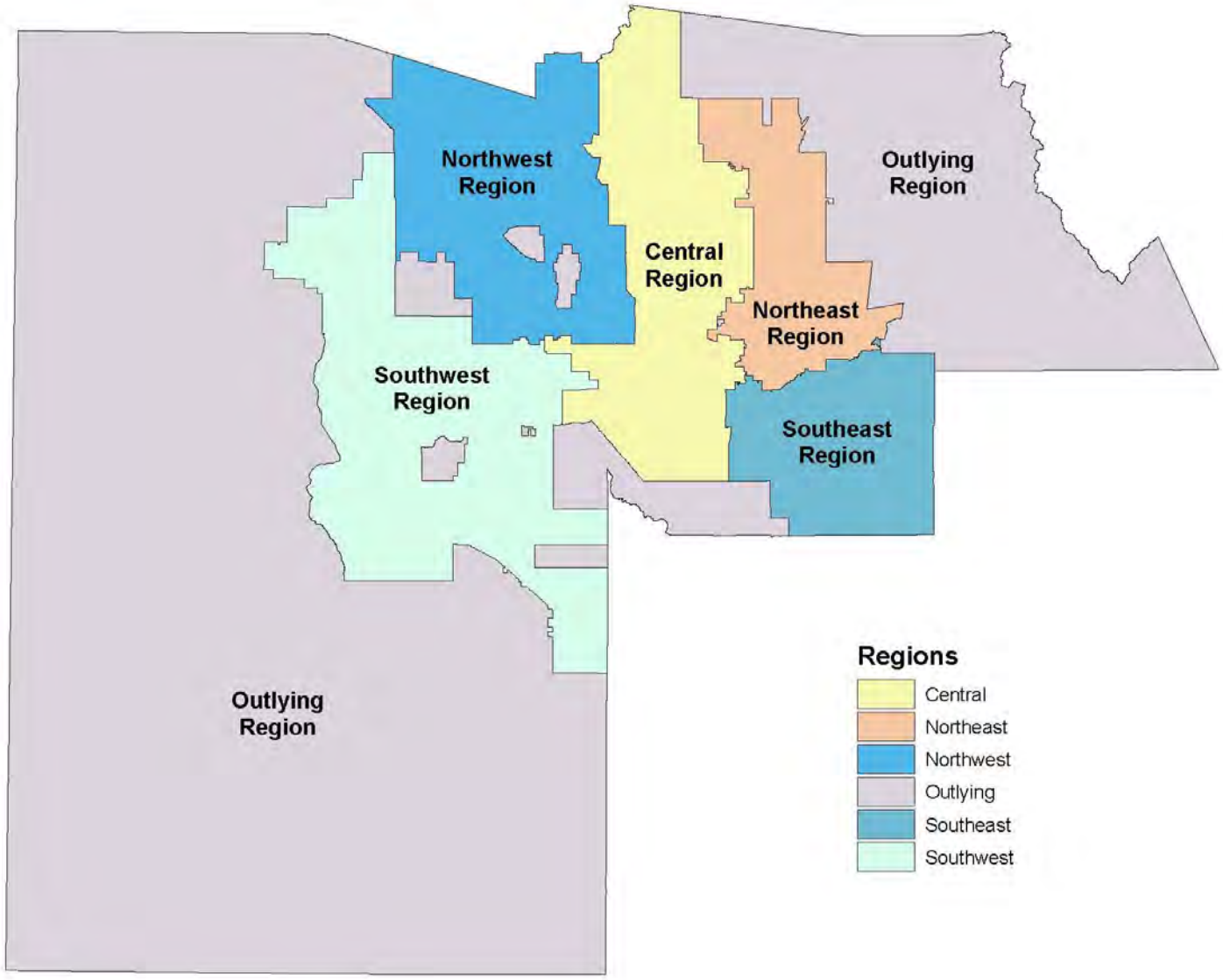

Figure 2.1 MAG Planning Area Regions

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The Point Source Plan contains two types of population estimates and projections. The two types are:

1. Socioeconomic Projections of Population, Housing and Employment by Municipal Planning Area and Regional Analysis Zone, Maricopa County, Arizona, approved by the MAG Regional Council in June 2013 – To cover the planning period of year 2010 to year 2040. The resident population projections were approved subject to the notes and caveats included in Appendix A.

2. Seasonal and Transient Population Projections – The seasonal and transient population data is based on the MAG population projections approved by the MAG Regional Council in June 2013. Seasonal population includes people who are in the local area for up to six months. Transient population includes people who are in the local area for two weeks or less. Since wastewater treatment capacity is needed to serve the seasonal and transient population, these population figures have been included in the update. These projections are included with the resident estimates in Appendix A.

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2.1 CENTRAL AREA

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 2.2. 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 the area in Laveen Village between Carver Mountain and South Mountain and some of the far northern areas, are served by septic tanks.

Population and Flow Projections. Table 2.1 presents the population and flow projections for the Phoenix Municipal Planning Area based on the 2013 MAG population projections and 62 gallons per capita per day (gpcd) unit flow.

Table 2.1 Phoenix Population and Flow Projections MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)
2010	1,600,831	99.0
2020	1,842,691	114.0
2030	2,111,147	131.0
2040	2,378,641	147.0

Existing Collection System. All wastewater generated in Phoenix is currently 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. 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 operates the plant.

Existing Wastewater Treatment. The 91st Avenue and 23rd Avenue Plants currently provide the wastewater treatment for the whole study area. The Cave Creek Water Reclamation Plant (WRP) that was constructed to service areas north of the Central Arizona Project (CAP) Aqueduct or Jomax Road has entered a temporary cessation of operations due to lower than anticipated loadings.

The 91st Avenue Wastewater Treatment Plant Unified Plant Expansion Phase 1 (UP01) was completed in 2008 and commissioned in 2009. The total treatment plant capacity was expanded to 205 million gallons per day (mgd), and the Phoenix purchased capacity was

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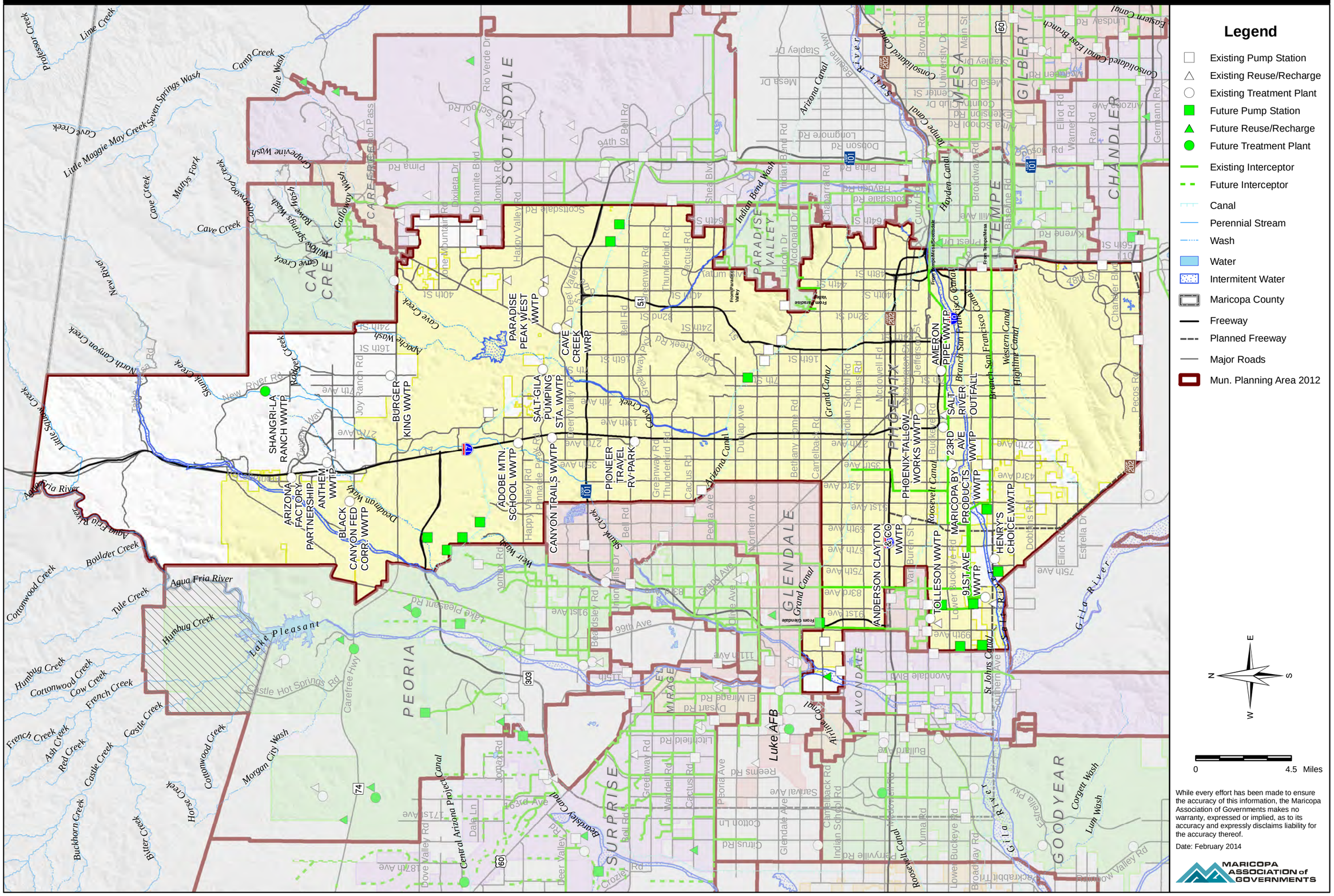
Figure 2.2 Phoenix Municipal Planning Area



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expanded to 112.9 mgd. The Unified Plant Expansion Phase 2 (UP05) was started in 2009 and completed in 2010. Completion of the Unified Plant Expansion Phase 2 (UP05) improvement elements expanded the total treatment plant capacity to 230 mgd, and the Phoenix purchased capacity was expanded to 134.8 mgd.

The 91st Avenue WWTP includes the following unit processes: screening, grit removal, primary sedimentation, fine-bubble aeration, secondary clarification, effluent chlorination/dechlorination, and solids treatment with anaerobic sludge digesters. The sludge 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 2050. The SROG is obligated to make up to 80,000 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. The Tres Rios Flow Regulation Wetlands have been constructed and in operation. Discharge to the Tres Rios Flow Regulating Wetlands began in August 2010. Discharge from the Tres Rios Flow Regulating Wetlands is either to the Salt River or the newly constructed Tres Rios Overbank Wetlands.

The 23rd Avenue WWTP treatment capacity has been expanded and upgraded to 63 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.

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 water reclamation plant that has entered a temporary cessation of operations since November 2009 due to lower than anticipated loadings from the service areas north of the CAP Aqueduct. 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. The facility is being maintained with the intent of returning to operational status at a future date dependent on loadings. During the cessation, wastewater is being diverted to the 91st Avenue Wastewater Treatment Plant.

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

Additional small wastewater treatment plants, not operated by the City of Phoenix but within the Phoenix Planning Area, are summarized in Table 2.2.

Table 2.2 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
Shangri-La Ranch	20,000	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 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 either the Cave Creek WRP or the 91st Avenue Wastewater Treatment Plant. The Cave Creek WRP will be expanded as the Desert View area develops.

Wastewater flow projections (annual average flow in mgd) for each potential treatment plant service area are presented in Table 2.3.

Table 2.3 Phoenix Wastewater Flow Allocation Projections MAG 208 Water Quality Management Plan Update				
Year	**Cave Creek WRP[1,2]**	**23rd Ave. WWTP[1]**	**91st Ave. WWTP[3]**	**Total Treated Flow**
2010	0.00	32.0	82.0	114.0
2020	TBD	32.0	82.0	114.0
2030	TBD	34.0	97.0	131.0
2040	TBD	35.0	112.0	147.0

[1] Local WRP flow less residual (effluent total).
[2] Phoenix anticipates that the Cave Creek WRP will be off line until at least 2015 at which time the decision to remain off line will be reevaluated. The decision to return the facility to operation is dependent on development and loading from the area.
[3] 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. The City of Phoenix is currently in the process of updating its master plan.

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2.2 SOUTHWEST AREA

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 facility and expansion of the collection system. The existing Avondale service area is comprised of Regional Analysis Zones 273, 282, and 303 as depicted on Figure 2.3. 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.

Population and Flow Projections. The growth experienced in the City of Avondale is expected to continue through the current planning period. It is expected that all development within the boundaries of the service area will receive wastewater collection and treatment services provided by the City. Table 2.4 presents the population and flow projections based on 2013 MAG population projections and 100 gpcd unit flow.

Table 2.4 Avondale Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)
2010	80,473	8.05
2020	100,302	10.03
2030	126,836	12.68
2040	162,959	16.30

Existing Collection System. The existing collection system serves the developed area of Avondale. As recommended by the Facility Plan, Avondale's old treatment facility, located near Lower Buckeye Road on the west bank of the Agua Fria River, was abandoned. The new treatment facility is sited east of the Agua Fria, near the intersection of Broadway and Dysart Roads. Conveyance of wastewater to the new treatment facility included construction of an interceptor sewer from the old facility to the new facility 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 facility. The existing collection system includes 11 lift stations. When the area south of the new treatment facility develops, additional lift station(s) will be required to transmit flow to the plant site.

In 2005, the City constructed an interceptor in Avondale Boulevard that runs from McDowell Road south to Roeser Road, then west to the facility. This line was constructed to serve a portion of the City north of I-10, unserved properties east of Avondale Boulevard

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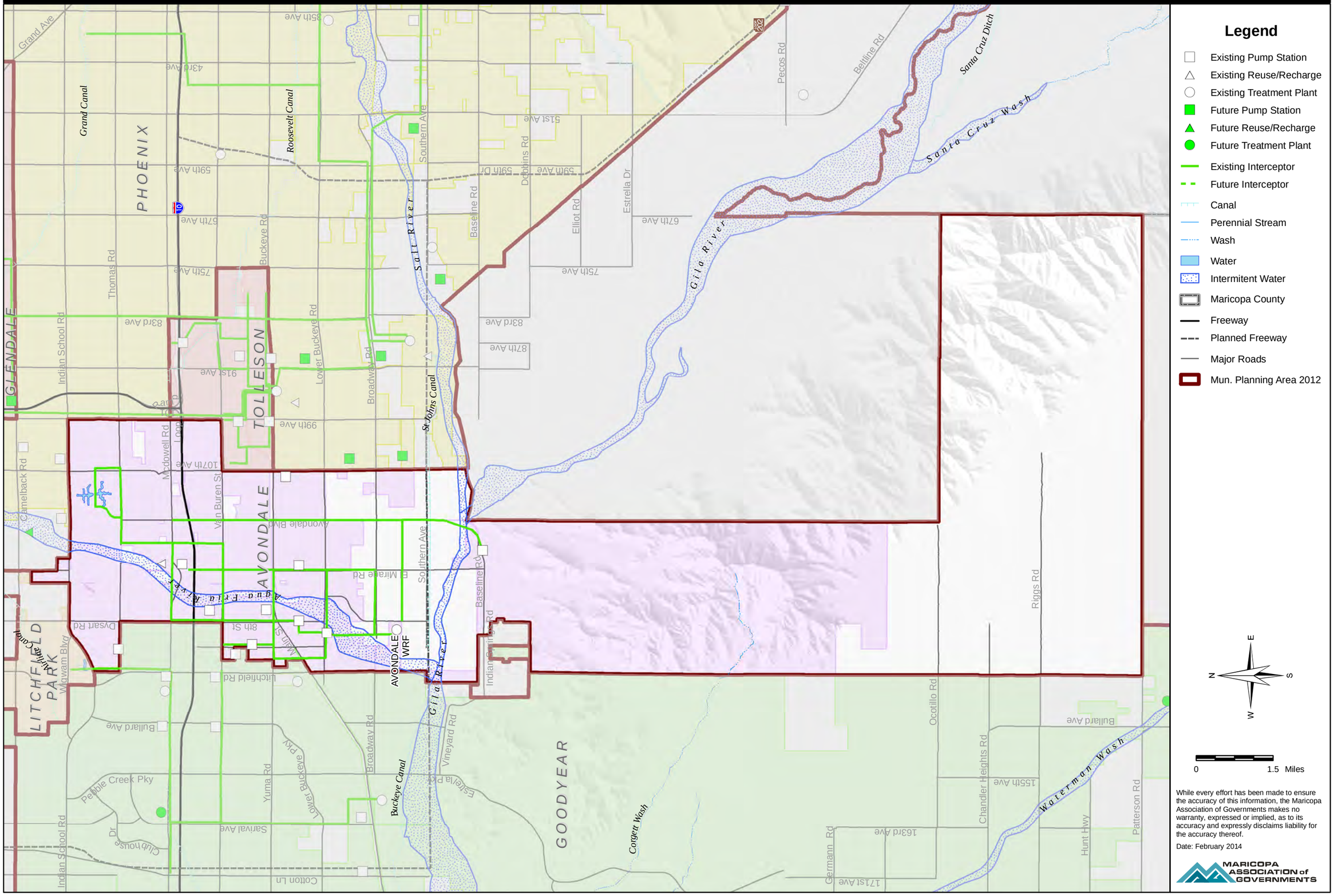
Figure 2.3 Avondale Municipal Planning Area



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to the south, and the areas north of the trunk line to the west. The APS waterline serving the nuclear plant acts as a barrier for gravity lines from the south of Roeser Road.

In 2013, the City constructed a sewer force main and lift station that conveys flows from the Phoenix International Raceway (PIR) north along Avondale Boulevard to the Roeser line.

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

Plans developed for this new facility to replace the existing facility were processed by MAG and the Arizona Department of Environmental Quality (ADEQ) and approved by Environmental Protection Agency (EPA) in June 1988. An amendment to the 208 Plan was made by MAG to enable the new facility to proceed. After the new treatment facility was constructed, the old facility was closed.

The initial treatment facility process was designed to treat 3.5 mgd and consisted of mechanical screening, grit removal, secondary clarification, chlorination, dechlorination, and discharge to the Agua Fria River. The aeration process also performs nitrification/denitrification.

The facility was expanded to treat 6.4 mgd in 2001. This expansion added a solids handling facility. In 2009, the facility was expanded again to treat 9.0 mgd and to include water reclamation. The facility is now referred to as a water reclamation facility. This expansion included a new headworks and pump station, an equalization basin, a primary clarifier, anaerobic digesters, a new chlorine contact basin, and an effluent pump station. Coincident with the 9.0 mgd expansion, an effluent discharge line was constructed from the facility to the City's underground storage (recharge) facility north of McDowell Road to enable recharge of reclaimed water. The City is currently sending the majority of its reclaimed water to this recharge facility. Avondale disposes of its solids via landfill. All required permits were obtained from ADEQ and Arizona Department of Water Resources (ADWR) prior to project completion.

Future Wastewater System Development. According to the City's most recent Water Resources Master Plan Update (May 2010), the existing treatment plant capacity of 9.0 mgd will meet projected requirements through approximately year 2020. Additional phases of the current expansion concept are planned at the existing site to increase hydraulic treatment capacity to 15 mgd.

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. Currently, the City has a project on Central Avenue to replace a sewer line and eliminate a lift station. Installation of future lift stations may be required to serve three areas, including south of the reclamation facility, west of the Agua Fria River and south of Roeser Road, and the PIR area south of the Gila River.

Summary of Proposed Improvements.

Item	Estimated Cost
Water Reclamation Facility Expansions (future)	$43,000,000
Southern Avenue Trunk Sewer	5,000,000
Southern Avenue Lift Station	3,200,000
Total	$51,200,000

2.2.2 Buckeye

The City of Buckeye Municipal Planning Area corresponds to Regional Analysis Zones (RAZ) 253, 277, 278, 279, 340, 341, and 343. The Town is the designated wastewater management agency for this area. Encompassing approximately 590 square miles of planning area, Buckeye has concentrated their planning efforts in a core planning area bounded by Interstate 10, Beloat Road, Jackrabbit Trail, and Turner Road, within RAZs 278 and 279. The City 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. Due to this expected growth, wastewater treatment plans for the entire Municipal Planning Area boundary have been developed. The Buckeye Municipal Planning Area is depicted in Figure 2.4.

Population and Flow Projections. Table 2.5 presents population projections, based on the 2013 MAG population projections for the City. Based on the populations and a 100 gpcd unit flow rate, wastewater flow projections are also presented in Table 2.5.

Table 2.5 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)
2010	44,128	4.41	22,983	2.30	67,111	6.71
2020	65,184	6.52	45,926	4.59	111,110	11.11
2030	100,794	10.08	93,846	9.38	194,640	19.46
2040	156,481	15.65	178,845	17.88	335,326	33.53

On January 30, 2008, the MAG Regional Council approved the MAG 208 Water Quality Management Plan Comprehensive Amendment for Buckeye (CMX, 2007). The amendment identified the wastewater treatment needs for the City over the 20 year planning period and ultimately build-out. As part of that analysis, Buckeye evaluated the MAG population projections, projected growth given more recent development activity, and build-out conditions for the City of Buckeye. According to the amendment, the Buckeye planning area will have a build-out population of 2,031,000. The ultimate capacities provided for the wastewater treatment facilities are based on build-out of the Buckeye Municipal Planning Area, which extends far beyond the 20 year planning period. The ultimate wastewater flow from the Buckeye Municipal Planning Area is anticipated to be 241.2 mgd (CMX, 2007).

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

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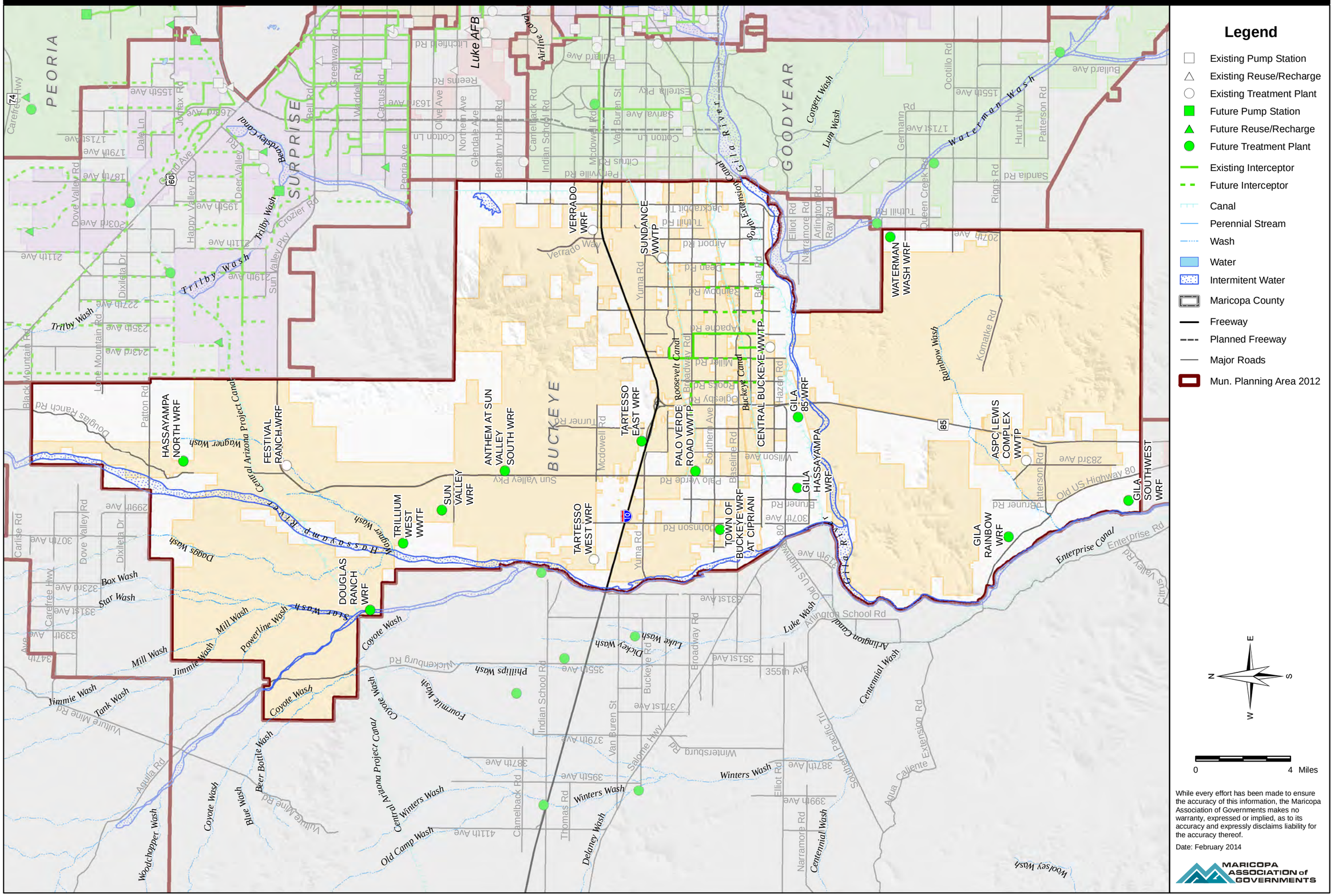
Figure 2.4 Buckeye Municipal Planning Area


Legend
Existing Pump Station
Existing Reuse/Recharge
Existing Treatment Plant
Future Pump Station
Future Reuse/Recharge
Future Treatment Plant
Existing Interceptor
Future Interceptor
Canal
Perennial Stream
Wash
Water
Intermitent Water
Maricopa County
Freeway
Planned Freeway
Major Roads
Mun. Planning Area 2012
0
4 Miles
While every effort has been made to ensure the accuracy of this information, the Maricopa Association of Governments makes no warranty, expressed or implied, as to its accuracy and expressly disclaims liability for the accuracy thereof.
Date: February 2014
MARICOPA ASSOCIATION of GOVERNMENTS
PEORIA
SURPRISE
GOODYEAR
BUCKEYE
Luke AFB
VERRADO WRF
SUNDANCE WWTP
WATERMAN WASH WRF
HASSAYAMPA NORTH WRF
FESTIVAL RANCH WRF
ANTHEM AT SUN VALLEY SOUTH WRF
TARTESSO EAST WRF
PALO VERDE ROAD WWTP
CENTRAL BUCKEYE WWTP
GILA 85 WRF
GILA HASSAYAMPA WRF
ASPC LEWIS COMPLEX WWTP
GILA SOUTHWEST WRF
SUN VALLEY WRF
TRILLIUM WEST WWTF
TARTESSO WEST WRF
TOWN OF BUCKEYE WRF AT CIPRIANI
GILA RAINBOW WRF
DOUGLAS RANCH WRF
Trilby Wash
Tuthill Wash
Waterman Wash
Gila River
Corgett Wash
Lum Wash
Beardsley Canal
Roosevelt Canal
Buckeye Canal
Central Arizona Project Canal
Wagner Wash
Daggs Wash
Box Wash
Star Wash
Mill Wash
Powerline Wash
Jimmie Wash
Tank Wash
Coyote Wash
Phillips Wash
Dickey Wash
Luke Wash
Fourmile Wash
Winters Wash
Old Camp Wash
Delaney Wash
Woodchapper Wash
Blue Wash
Beer Bottle Wash
Centennial Wash
Woolsey Wash
Rainbow Wash
Komatke Rd
Enterprise Canal
Arlington Canal
Arlington School Rd
Old US Highway 80
Old US Highway 80
Sun Valley Pkwy
Sun Valley Pky
Indian School Rd
Camelback Rd
Thomas Rd
Van Buren St
Salome Hwy
Winterburg Rd
Wickenburg Rd
Vulture Mine Rd
Aguila Rd
Douglas Ranch Rd
Carefree Hwy
Carefree Hwy
Lone Mountain Rd
Black Mountain Rd
Dove Valley Rd
Dixileta Dr
Happy Valley Rd
Deer Valley Rd
Jomax Rd
Dale Ln
Patton Rd
Carlisle Rd
Crozier Rd
Bell Rd
Greenway Rd
Waddell Rd
Cactus Rd
Olive Ave
Northern Ave
Glendale Ave
Peoria Ave
Bethany Home Rd
Camelback Rd
Indian School Rd
Mcdowell Rd
Van Buren St
Cotton Ln
Citrus Rd
Perryville Rd
Bullard Ave
Estrella Pky
Sarival Ave
Litchfield Rd
Reems Rd
Cotton Ln
Tuthill Rd
Jackrabbit Tl
Airport Rd
Deer Rd
Rainbow Rd
Lapaque Rd
Miller Rd
Rogers Rd
Ogleesby Rd
Turner Rd
Palo Verde Rd
Johnson Rd
Wilson Ave
Southern Ave
Baseline Rd
Broadway Rd
Buckeye Rd
Yuma Rd
Elliot Rd
Narramore Rd
Arlington Rd
Ray Rd
Germann Rd
Queen Creek Rd
Ocotillo Rd
Hunt Hwy
Patterson Rd
Riggs Rd
Sandia Rd
Hazen Rd
Verrado Way
Bruner Rd
Southern Pacific Tl
Agua Caliente Extension Rd
Citrus
Valley Rd
Enterprise Rd
Patterson Rd
Bruner Rd
Old US Highway 80
Gila River
Gila River
Gila River

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the existing collection system. The collection system requires no pumping for transport of wastewater to the treatment plant.

Existing Treatment System. The MAG 208 Water Quality Management Plan Comprehensive Amendment for Buckeye described the six existing wastewater treatment facilities within the Buckeye Municipal Planning Area, including the Arizona State Prison Complex-Lewis Wastewater Treatment Plant located on Patterson Road at State Route 85. With a capacity of 0.75 mgd, the Arizona State Prison Complex-Lewis facility is intended to only serve the Prison Complex. The treatment process includes an extended aeration, activated sludge process, with clarification, tertiary filtration, and ultraviolet disinfection. Effluent is reused on softball fields, gardens, recreational fields, and a turf farm located on the prison property. Any excess effluent is land applied on a turf farm. Sludge is aerobically digested and dried (CMX, 2007).

The Central Buckeye Wastewater Treatment Plant is located south of Beloat Road, between Miller and Apache Road. It began receiving flow as a 0.6 mgd facility. Improvements to the process and expansion of the facility increased the capacity to 1.5 mgd and a second expansion to 4.0 mgd occurred in 2007. Actual average flows were approximately 0.912 mgd as of July 2007. An additional 3.0 mgd facility expansion has been designed to reach a treatment capacity of 7.0 mgd (CMX, 2007).

Previously, the Central Buckeye facility consisted of screening facilities, an oxidation ditch equipped with a “boat” clarifier for solids removal, effluent chlorination, and belt filer press. The 2007 expansion of the facility included the following updates to the treatment process: influent pumping, mechanically and manually cleaned bar screens, grit removal, secondary treatment (Bardenpho process for nitrification/denitrification), secondary clarification, tertiary filtration and chlorination/dechlorination. The sludge is processed through a belt filter press prior to landfill disposal (CMX, 2007).

The Central Buckeye WWTP currently discharges effluent into the Buckeye Water Conservation Drainage Ditch (BID) under an Arizona Pollutant Discharge Elimination System (AZPDES) permit. The effluent is used downstream for irrigation of nonedible agricultural crops. The facility does not currently recharge. Direct reuse is to the Earl Edgar Park, with other possible sites dependant upon the construction of the facility reuse infrastructure to serve potential customers. Recharge would likely need to be performed off-site due to waterlogged conditions at the facility site.

Located along Wagner Wash near Sun Valley Parkway is the Festival Ranch Water Reclamation Facility. This facility has a capacity of 1.0 mgd with average flows of 0.026 mgd as of July 2007. The facility consists of fine screens at the headworks followed by a sequencing batch reactor (SBR) for secondary treatment. Also included in the treatment process are tertiary filtration and ultraviolet disinfection (CMX, 2007). Effluent is currently reused for irrigation on three golf courses, public access parks, turf facilities at schools and irrigation of rights-of-way landscaping. Reclaimed water infrastructure is being constructed which will include recharge facilities, a pump station at the facility, a pipe network throughout the Festival Ranch development, and storage lakes at the golf courses.

Effluent in excess of the reuse demand will be recharged. There is also an AZPDES permit for emergency discharges to the Wagner Wash (CMX, 2007).

Residents in the Sundance, Blue Horizons, and other central Buckeye developments are served by the Sundance Wastewater Treatment Plant. The Blue Horizons Villages WWTP was included in the 2002 MAG 208 Plan to serve the Blue Horizons development; however, the plant was never built. In 2005, the MAG Regional Council approved a 208 Amendment to expand the Sundance WWTP to include flows from additional developments, including Blue Horizons. The Sundance facility is located east of Dean Road and north of Roosevelt Canal (CMX, 2007).

The first phase of the Sundance WWTP had a capacity of 1.2 mgd. The average flows were at 0.692 mgd as of July 2007. The facility consists of a biological treatment process that removes biological oxygen demand (BOD), provides nitrification and denitrification, aerobic sludge digestion, sludge dewatering, odor scrubbing equipment and basin covers. The facility has been upgraded to increase capacity to 2.4 mgd. Effluent is currently reused as irrigation for a golf course (CMX, 2007). An effluent line also conveys flows to the Buckeye Canal. Effluent in excess of reuse demand is discharged to the Buckeye and/or Roosevelt Canals under AZPDES permits. Recharge may not be feasible onsite due to constrained site conditions. Potentially, recharge facilities could be constructed; however, further investigation may be needed into the groundwater conditions in the area (CMX, 2007).

The Tartesso West Water Reclamation Facility is located at approximately McDowell Road and the 315th Avenue alignment and has a capacity of 1.2 mgd. As of July 2007, the facility was receiving flows of 0.112 mgd. The facility utilizes an activated sludge process within hybrid SBRs. The facility is equipped with screening, grit removal, biological oxidation, nitrification/denitrification, clarification, filtration, and ultraviolet disinfection with back-up chlorination. Effluent from the Tartesso West Water Reclamation Facility (WRF) will be recharged at a facility adjacent to the plant site. Potential reuse may include irrigation for a golf course and public park. During wet weather or emergency cases, effluent may be discharged to a local wash, tributary to the Hassayampa River, under an AZPDES permit (CMX, 2007).

The Verrado Water Reclamation Facility in Buckeye is privately owned and operated by EPCOR Water (formerly Arizona American Water Company). It serves the Verrado development, located on the east side of the White Tank Mountains, and the Fireside at Sienna Hills development. Located at Tuthill Road and McDowell Road, the facility had an average flow of 0.141 mgd, as of July 2007. The current capacity is 0.45 mgd. The SBR treatment facility includes screening, secondary treatment with biological nitrogen removal, and chlorination. Effluent from Phase 1 is reused for golf course irrigation and recharged. Once the development grows and future expansions of the facility are needed, there may be additional opportunities for reuse. Effluent in excess of that reused and recharged may be discharged to the White Tanks Flood Retarding Structure (FRS) No. 4 and/or the Roosevelt Canal under an AZPDES permit (CMX, 2007).

Future Wastewater System Development. Except for the Arizona State Prison Complex Wastewater Treatment Plant, all of the existing facilities are anticipated to increase in capacity as growth occurs within the Buckeye Municipal Planning Area. Since the Arizona State Prison Complex WWTP serves only the Prison Complex and therefore a relatively fixed population, there are no plans for plant expansion beyond 0.75 mgd. Given the limited service area and the elevation in relation to the developable land in the area, this facility will ultimately be decommissioned and flows sent to the future Gila Rainbow Water Reclamation Facility (CMX, 2007).

The Central Buckeye Wastewater Treatment Plant will expand the Bardenpho treatment process in 3.0 mgd increments based on population increases or as decided by Buckeye. Future expansions will result in an ultimate capacity of 45.8 mgd (CMX, 2007).

The Festival Ranch WRF is expected to expand in phases to an ultimate capacity of 17.3 mgd at build-out. For the Sundance WWTP, future planned upgrades include increasing capacity to 3.6 mgd. The ultimate capacity for the facility at build-out will be 13.9 mgd. The Tartesso West WRF is expected to reach an ultimate capacity of 24.2 mgd. At build-out, the Verrado WRF is planned to reach a capacity of 3.6 mgd. Expansions of these facilities will occur as dictated by development in the Buckeye planning area (CMX, 2007).

Planned Facilities. In addition to addressing the existing treatment facilities within the Buckeye Municipal Planning Area, the MAG 208 Water Quality Management Plan Comprehensive Amendment for Buckeye identifies planned and future facilities. The six planned facilities are anticipated to be constructed in the near future (CMX, 2007).

The Anthem at Sun Valley South Water Reclamation Facility is planned on the east side of Sun Valley Parkway, south of the Bethany Home Road alignment. The first phase of the facility would have a capacity of 1.125 mgd. Future expansion would occur in 1.125 mgd increments with an ultimate capacity of 4.5 mgd. The multi-phase SBR facility would consist of influent wet well and lift station including flow metering, fine screening, grit removal, secondary treatment with biological nitrogen removal, secondary equalization/clarification, tertiary filtration, ultraviolet disinfection, nitrification and denitrification, effluent pump station including flow metering, standby generator, laboratory and control building, effluent reuse and sludge treatment (CMX, 2007).

Effluent from the Anthem at Sun Valley South WRF will primarily be reused for irrigation of landscape areas and open space, community parks, golf courses, and other turf managed facilities. Recharge may also occur for flows that exceed the reuse demand. Effluent in excess of what is recharged and reused will be discharged to a local unnamed wash that is tributary to the White Tanks Wash. Flows from the wash are retained behind FRS No. 1, north of I-10. The FRS is operated and maintained by the Flood Control District of Maricopa County. Any flow exceeding the 100-year storm would discharge to the Hassayampa River. This AZPDES permit discharge would only occur during wet or emergency conditions (CMX, 2007).

The Douglas Ranch Water Reclamation Facility is planned at approximately 339th Avenue and Waddell Road alignments in the northwestern part of the Buckeye Municipal Planning Area. The facility would primarily serve the Douglas Ranch development and include a multi-phased activated sludge treatment process. Although, it may operate as an extended aeration plant without primary treatment initially. Phase 1 of the facility will have a capacity of 1.0 mgd and consist of influent pumping, fine screening, extended aeration activated sludge, flow equalization, secondary clarification, filtration, ultraviolet disinfection, belt press dewatering, reclaimed water storage, and effluent distribution pumping. Ultimate capacity for the facility will be 31.9 mgd (CMX, 2007).

A majority of the effluent from the Douglas Ranch WRF will be reused for irrigation on golf courses, lakes, open space green belt areas, schools, and public access parks. Effluent in excess of the reuse demand will be recharged. An AZPDES permit will also be obtained for discharge into the local Jackrabbit Wash during wet weather or emergencies (CMX, 2007).

The planned Palo Verde Road Wastewater Treatment Plant will be located on Palo Verde Road approximately one-half mile north of Broadway Road. Phase 1A of the facility would have a capacity of 0.5 mgd and include a multi-phased SBR system. The full first phase will have a capacity of 1.0 mgd with a facility build-out capacity of 11.7 mgd. The plant will consist of screening, secondary biological treatment using the activated sludge process, secondary clarification, tertiary filtration, ultraviolet disinfection, nitrification/denitrification, either aerobic or anaerobic sludge digestion, sludge dewatering, a sludge disposal strategy and flow equalization (CMX, 2007).

Effluent from the Palo Verde Road WWTP will primarily be reused for irrigation of public and/or private open spaces. Any effluent in excess of what could be reused will be recharged. Beyond reuse and recharge demand, effluent will be discharged to the Buckeye or Roosevelt canals. The water is then used downstream for agricultural irrigation. The facility may also obtain an AZPDES permit discharge to the Hassayampa River for flows that exceed direct reuse, recharge, and indirect reuse demand. This will only occur during wet weather or emergency situations (CMX, 2007).

The Tartesso East Water Reclamation Facility is planned at the intersection of I-10 and Turner Road with an ultimate capacity of 10.7 mgd. The first phase will have a capacity of 1.2 mgd and operate using an SBR activated sludge treatment system with advanced tertiary treatment. Buckeye will have the option of converting the facility to the Bardenpho process once the capacity is approximately 3.0 to 5.0 mgd. The treatment train will ultimately consist of screening, grit removal, biological nutrient removal through anoxic and aerobic zones, clarification, nitrification/denitrification, filtration and ultraviolet disinfection. Sludge storage, treatment and processing capabilities will also be incorporated. Odor and noise control and other aesthetic measures will be included (CMX, 2007).

Effluent from the Tartesso East WRF will be recharged and potentially reused for irrigation, golf courses, and lakes, if developed. In addition, an AZPDES permit will be obtained for emergencies and wet weather conditions. The receiving stream will be a local unnamed

wash that is retained behind FRS No. 1, north of I-10. Flows beyond the 100-year storm event would discharge from FRS No. 1 into the Hassayampa River (CMX, 2007).

Located in the western portion of the Central Buckeye Region will be the Town of Buckeye Water Reclamation Facility at Cipriani, planned for the southwest corner of Johnson and Southern Avenues. The first phase of the facility will be a 1.2 mgd multi-phase SBR with the capability for future expansions. The facility will consist of influent wet well and lift station, fine screening, grit removal, secondary treatment with biological nitrogen removal, secondary equalization/clarification, tertiary filtration, ultraviolet disinfection, nitrification/denitrification, effluent pump station including flow metering, standby generator, laboratory and control building, effluent reuse and sludge treatment. Future phasing will be modular and flexible depending on population growth. The ultimate capacity for the facility will be 12.0 mgd (CMX, 2007).

The flows from the Town of Buckeye WRF at Cipriani will be reused and recharged. Effluent will be reused for irrigation of parks and turf managed facilities. Recharge will occur at the constructed underground storage facility (USF) within the Stone House Wash. A recharge facility may also be constructed by the Desert Creek development. Effluent in excess of flows that are reused and recharged may be discharged to the Stone House Wash, a tributary to the Hassayampa River, in cases of emergencies or wet weather. This discharge would be permitted under the AZPDES program (CMX, 2007).

The Trillium West Wastewater Treatment Facility is planned along Peoria Avenue adjacent to the Hassayampa River. It will be a multi-phase SBR facility with an initial capacity of 0.32 mgd. The first phase will include an influent pump station consisting of one duty and one standby submersible pump and a wet well. There will be a lift station equipped with an odor control system and headworks consisting of flow metering and fine screens. Biological treatment will consist of a SBR system. The system will be programmed to include anoxic sequences within the treatment cycles to reduce the nitrogen levels in the mixed liquor. An aerobic digester will be used to further reduce the volatile solids. Thickened sludge will be processed in the sludge handling facility to produce sludge cake that could be safely disposed of in a landfill. The treatment process will also include filtration and ultraviolet radiation to disinfect the tertiary effluent. A chlorination system will be provided for backup disinfection. Full noise and odor control will be provided at the facility (CMX, 2007).

Effluent from the Trillium West WWTF will initially be recharged via onsite percolation basins. As growth occurs, effluent will also be reused for irrigation of gateway entrances, parks, open space landscaping, schools, and other amenities. An AZPDES permit may also be obtained for discharge into the Hassayampa River or Wagner Wash during wet weather or emergency conditions. The Trillium West WWTF will transition from the initial 0.32 mgd SBR system to a full process with an ultimate capacity of 3.2 mgd (CMX, 2007).

Future Facilities. Buckeye has also identified seven future facilities to serve the remaining portions of its planning area, which were included in the MAG 208 Water Quality Management Plan Comprehensive Amendment for Buckeye. These facilities are conceptual and the areas to be served had not identified a sewer solution. According to

the amendment, flows from these areas are unable to go to another facility due to topographic constraints. Buckeye is identifying the future facilities to achieve the goal of planning for the wastewater treatment necessary to meet the growth of the City over the next 20 years and ultimately at build-out. The locations of the future facilities are approximate given that they are planned far into the future. Adjustments will be made at the discretion of Buckeye (CMX, 2007).

The future facilities include the Gila 85 Water Reclamation Facility. This facility is planned at a location along the Gila River (Section 14 of Township 1 South, Range 4 West). Locating the facility on land owned by the Flood Control District of Maricopa County is being explored; however, private land in the area may be pursued. The WRF will be a multi-phase SBR. The treatment train will include preliminary screening, biological treatment using the activated sludge process, clarification, nitrification/denitrification, filtration and ultraviolet disinfection. Sludge storage, treatment, and processing capabilities may also be incorporated. In addition, the facility will include odor and noise control and other aesthetic measures (CMX, 2007).

The Gila 85 WRF will have a Phase 1 capacity of 1.2 mgd. Once the flow level reaches approximately 5.0 mgd, the facility will be planned to upgrade to one of four Bardenpho alternative technologies. The facility will have an ultimate capacity of 9.1 mgd. Effluent may be reused for irrigation and recharged. Recharge is not recommended at the facility site due to high groundwater levels; however, Buckeye is evaluating other alternatives and locations. An AZPDES permit may also be obtained for discharge into the Arlington Canal, Hassayampa River, or Gila River under planned and emergency conditions (CMX, 2007).

The Gila Hassayampa Water Reclamation Facility is planned near the intersection of Narramore and Bruner Roads outside the floodways of the Gila and Hassayampa Rivers. The WRF will be a multi-phase SBR and the treatment train will include preliminary screening, biological treatment using the activated sludge process, clarification, nitrification/denitrification, filtration and ultraviolet disinfection. Sludge storage, treatment, and processing capabilities may also be incorporated. The facility will also include odor and noise control and other aesthetic measures. Once flows reach a level of approximately 5.0 mgd, the facility will be planned to upgrade to one of four Bardenpho alternative technologies (CMX, 2007).

Effluent from the Gila Hassayampa WRF may be reused for irrigation and recharged. Due to the high groundwater level at the plant site, Buckeye is evaluating other alternatives and locations for recharge. Planned or emergency discharges may occur into the Arlington Canal, Hassayampa River, or Gila River. The Gila Hassayampa WRF will have a Phase 1 capacity of 1.2 mgd with an ultimate capacity of 7.8 mgd (CMX, 2007).

The Gila Rainbow Water Reclamation Facility will be built along the Gila Bend Canal (Section 36 of Township 2 South, Range 5 West). Located near the Arizona State Prison Complex-Lewis, this facility will ultimately provide municipal wastewater service to the prison. The ASPC-Lewis WWTP would then be decommissioned. The Gila Rainbow WRF will have a Phase 1 capacity of 1.2 mgd and an ultimate capacity of 13.2 mgd (CMX, 2007).

The facility will be a multi-phase SBR and the treatment train will include preliminary screening, biological treatment using the activated sludge process, clarification, nitrification/denitrification, filtration and ultraviolet disinfection. Sludge storage, treatment, and processing capabilities may also be incorporated. In addition, odor and noise control and other aesthetic measures will be included. Once flows reach a level of approximately 5.0 mgd, the facility will be planned to upgrade to one of four Bardenpho alternative technologies. Effluent may be reused and/or recharged. An AZPDES permit may also be obtained for planned and emergency discharges to the Gila River, Gila Bend Canal, or Rainbow Wash (CMX, 2007).

The Gila Southwest Water Reclamation Facility will be located in the southwest corner of the Buckeye Municipal Planning Area (Section 29 of Township 3 South, Range 4 West) and have an ultimate capacity of 7.5 mgd. Phase 1 will have a capacity of 1.2 mgd. The facility will be a multi-phase SBR with a treatment train that consists of preliminary screening, biological treatment using the activated sludge process, clarification, nitrification/denitrification, filtration and ultraviolet disinfection. Consistent with all the future facilities, sludge storage, treatment, and processing capabilities may also be incorporated. In addition, the facility will include odor and noise control and other aesthetic measures. The facility will be planned to upgrade to one of four Bardenpho alternative technologies as flows reach a level of approximately 5.0 mgd. Effluent will be reused and/or recharged. In addition, an AZPDES permit may be obtained for discharges into the Gila River or Gila Bend Canal that is in excess of the effluent that could be reused and recharged (CMX, 2007).

The Hassayampa North Water Reclamation Facility will serve an area in the northernmost portion of the Buckeye Municipal Planning Area. The facility would be located near the Hassayampa River (Section 4 of Township 4 North, Range 4 West) and be a multi-phase SBR. The treatment train will include preliminary screening, biological treatment using the activated sludge process, clarification, nitrification/denitrification, filtration and ultraviolet disinfection. Sludge storage, treatment, and processing capabilities may also be incorporated and the facility will include odor and noise control and other aesthetic measures. The Phase 1 capacity will be 1.2 mgd. When flows are at approximately 5.0 mgd, the facility will be planned to upgrade to one of four Bardenpho alternative technologies (CMX, 2007).

Effluent from the Hassayampa North WRF will be reused and recharged. Flows that exceed the amount that would be reused and recharged may be discharged into the Hassayampa River or an unnamed wash that is directly tributary to the Hassayampa River. This AZPDES permit discharge would only occur during wet weather and emergency conditions. The facility will have an ultimate capacity of 9.4 mgd at build-out (CMX, 2007).

The future Sun Valley Water Reclamation Facility is planned near the intersection of Johnson Road and Northern Avenue. The facility will be a multi-phase SBR and have an ultimate capacity of 13.2 mgd. Phase 1 will be 1.2 mgd. The treatment train will consist of preliminary screening, biological treatment using the activated sludge process, clarification, nitrification/denitrification, filtration and ultraviolet disinfection. Sludge storage, treatment, and processing capabilities may also be incorporated. The facility will include

odor and noise control and other aesthetic measures. Once the facility has flows that reach approximately 5.0 mgd, it will be planned to upgrade to one of four Bardenpho alternative technologies. Effluent will be reused and recharged. An AZPDES permit may also be obtained for discharge into the Hassayampa River or White Tanks Wash. The AZPDES permit discharge would only occur during wet weather or emergency conditions (CMX, 2007).

The Waterman Wash WRF will be located within approximately Section 6 of Township 2 South, Range 2 West. It would serve a relatively limited piece of private land along the southeastern boundary of the Buckeye Municipal Planning Area. It is anticipated that the Phase 1 capacity will be 1.2 mgd with an ultimate capacity of 2.2 mgd at build-out. The Waterman Wash WRF will be a multi-phase SBR and the treatment train will include preliminary screening, biological treatment using the activated sludge process, clarification, nitrification/denitrification, filtration and ultraviolet disinfection. Sludge storage, treatment, and processing capabilities may also be incorporated along with odor and noise control and other aesthetic measures. Effluent from the facility will be reused and recharged. Excess effluent which cannot be reused or recharged may be discharged to the Waterman Wash. This AZPDES permit discharge would only occur during wet weather or emergency conditions (CMX, 2007).

Table 2.6 presents the anticipated wastewater flow projections for each treatment facility at build-out, based on the information provided in the MAG 208 Water Quality Management Plan Comprehensive Amendment for Buckeye (CMX, 2007).

Table 2.6 Buckeye Treatment Facilities and Wastewater Flows at Build-Out MAG 208 Water Quality Management Plan Update	
Wastewater Treatment Facility	**Ultimate Capacity at Build-Out (mgd)**
Existing Facilities	
Arizona State Prison Complex WWTP	0.0[1]
Central Buckeye WWTP	45.8
Festival Ranch WRF	17.3
Sundance WWTP	13.9
Tartesso West WRF	24.2
Verrado WRF	3.6
Planned Facilities	
Anthem at Sun Valley South WRF	4.5
Douglas Ranch WRF	31.9
Palo Verde Road WWTP	11.7
Tartesso East WRF	10.7
Town of Buckeye WRF at Cipriani	12.0
Trillium West WWTF	3.2
Future Facilities	
Gila 85 WRF	9.1
Gila Hassayampa WRF	7.8
Gila Rainbow WRF	13.2
Gila Southwest WRF	7.5
Hassayampa North WRF	9.4
Sun Valley WRF	13.2
Waterman Wash WRF	2.2
Total Wastewater Flows at Build-Out	**241.2**

[1] The Arizona State Prison Complex WWTP will ultimately be phased out of service. The existing service area for the facility is assumed to be served by the Gila Rainbow WRF in the future.

While the majority of Buckeye residents will receive wastewater service through the facilities identified above, the Buckeye has agreed to have two properties within its Municipal Planning Area be served by facilities within the Goodyear Municipal Planning Area. The Litchfield Park Service Company doing business as Liberty Utilities owns and operates the Palm Valley Water Reclamation Facility and future Sarival Water Reclamation Facility (currently a lift station) in Goodyear. These facilities were identified in the 2002 MAG 208 Plan. On May 24, 2006, the MAG Regional Council approved a MAG 208 Water

Quality Management Plan Amendment for the Service Area Expansion of the Litchfield Park Service Company Palm Valley and Sarival Water Reclamation Facilities (Wood, Patel & Associates, 2006). This amendment expanded the LPSCo dba Liberty Utilities service area to include portions of the Buckeye and Glendale Municipal Planning Areas and unincorporated areas of Maricopa County.

The Palm Valley and Sarival WRFs are each identified in the 2002 MAG 208 Plan with an ultimate capacity of 8.2 mgd. The total ultimate capacity of 16.4 mgd for the two facilities include a 38 percent reserve capacity of 6.3 mgd. The expanded service area would utilize 3 mgd of the reserve capacity. The Palm Valley WRF was constructed and placed into service in February 2001. The Sarival Lift Station was constructed to provide interim pumping capacity to the Palm Valley facility until such time that the flows increase to a level that would support startup and continuous operation of the Sarival WRF. The expanded service area includes two properties in Buckeye which are bound by Jackrabbit Trail and the Beardsley Canal on the west, Camelback Road on the south, Perryville Road on the east and Peoria Avenue on the north (Wood, Patel & Associates, 2006).

Summary of Proposed Improvements. Construction of the planned and future water reclamation facilities and expansion of the existing plants is dependant on many factors. The rate in which development occurs and the actual wastewater flows generated from these developments will determine construction schedules (CMX, 2007).

Currently in the City Buckeye, developers pay for the design and construction of the facilities. The developer finances the portion of the cost of the plant that serves their area. This financing model is also expected to be used for future expansions. Community facilities districts may be formed with the City as a financing mechanism. As the phases are completed, tested, and accepted by Buckeye, facility ownership will be transferred to Buckeye. Ultimately, the City will be responsible for operating and maintaining the facilities within its Municipal Planning Area except for the Verrado WRF (CMX, 2007).

2.2.3 Goodyear

The City of Goodyear comprises approximately 191 square miles of incorporated land. The total planning area for wastewater services consists of Regional Analysis Zones (RAZ) 265, 280, 281, 302, 323, and 373. Previously, the City boundaries were generally described as west of Dysart, south of Camelback, east of Perryville, and north of Patterson Roads. However, in 2007, the City of Goodyear annexed a significant portion of land that extended its planning area south of Patterson Road to the Papago Road alignment, approximately four miles south of State Route 238. The newly annexed area is bound by the Maricopa/Pinal County line on the east and the Sonoran Desert National Monument on the west. This area is referred to as the Sonoran Valley Planning Area.

The City has established four (northern, central, southern, and Sonoran Valley Planning Area) wastewater service areas. Each area is or will be served by separate wastewater treatment facilities in the City as described herein. The Sonoran Valley Planning Area is located south of Patterson Road. The southern area is that portion south of the Gila River and north of Patterson Road while the central area is everything north of the Gila River and south of McDowell. The northern area includes the land north of McDowell Road, which is provided wastewater service from Litchfield Park Service Company dba Liberty Utilities. Figure 2.5 depicts the total Goodyear Municipal 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 2.7 below describes the population and the resulting wastewater flow rates for the period 2010 through 2040. An estimated 26.20 mgd of total treatment facility capacity will be needed to serve more than 260,000 people by 2040. This is based on the 2013 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 2.7 Goodyear Population and Flow Projections MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)
2010	73,176	7.32
2020	121,633	12.16
2030	180,141	18.01
2040	261,993	26.20

The 2002 MAG 208 Plan referenced the 1997 population projections which showed that the City of Goodyear was experiencing significant growth. Specifically, the southern planning area was growing much more rapidly than previously expected. This is principally due to the development of Estrella Mountain Ranch, a large master-planned community

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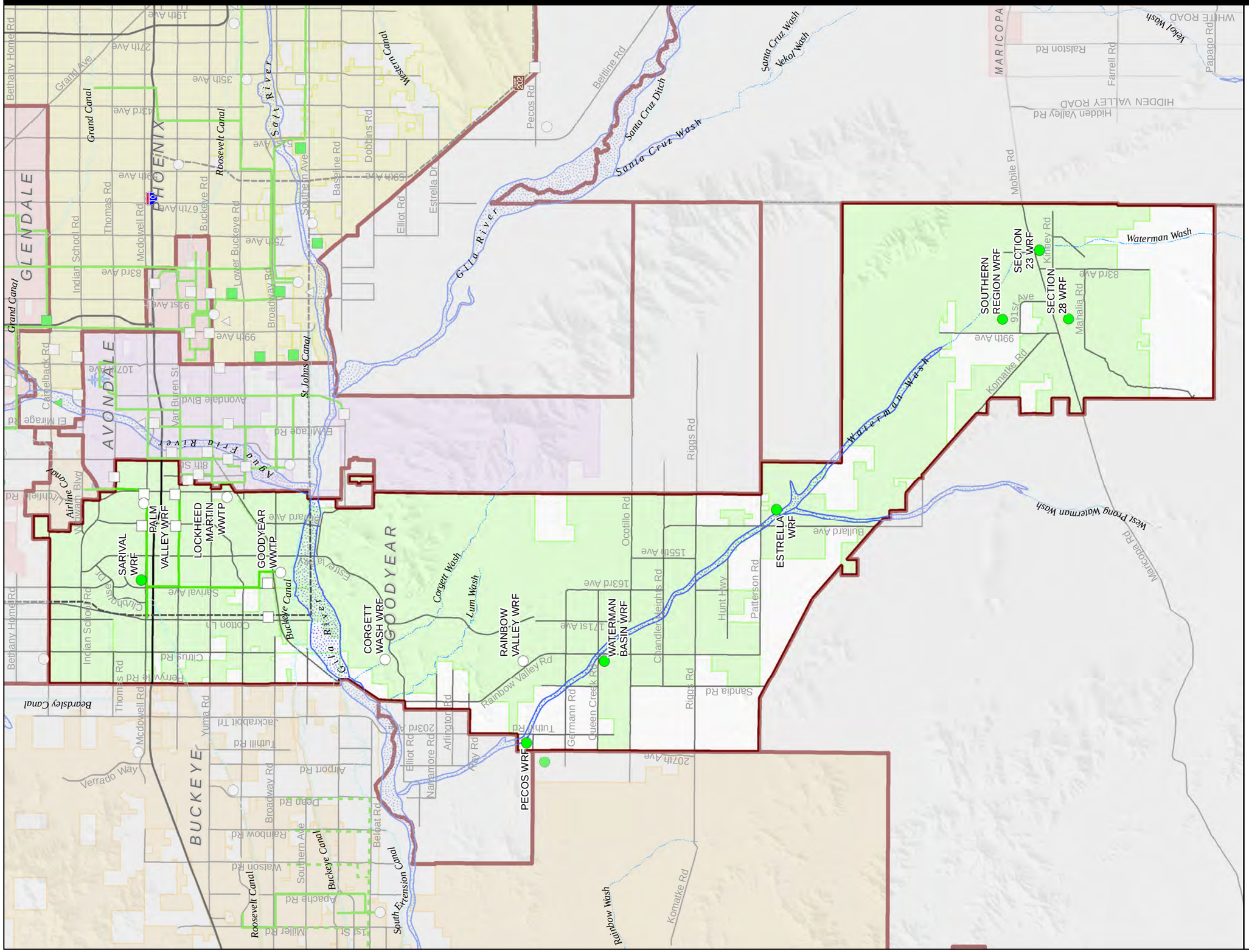
Figure 2.5 Goodyear Municipal Planning Area



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that occupies much of the southern area. The 2013 population projections indicate that the City of Goodyear will continue to experience rapid growth.

Following the annexation of the Sonoran Valley Planning Area by the City of Goodyear, the MAG Regional Council approved on March 26, 2008 a MAG 208 Water Quality Management Plan Amendment for the City of Goodyear Sonoran Valley Planning Area (Wilson Engineers, 2007). According to the amendment, build-out of this area is expected to be 243,000 residents.

Wastewater planning and development has also changed significantly in the northern area. The Litchfield Park Service Company dba Liberty Utilities no longer uses any treatment capacity at the City of Goodyear 157th Avenue Plant. Litchfield Park Service Company dba Liberty Utilities sold its capacity back to the City after the Palm Valley Facility came on line. 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. The Palm Valley WRF was placed into service in February 2001. The Sarival WRF will be built once flows reach a level to support startup and operation of a second facility.

While the northern area is served by the LPSCo dba Liberty Utilities facilities, the remaining areas of Goodyear are served by Goodyear facilities. According to the 2007 City of Goodyear Integrated Water Master Plan, the following flows will be reached at ultimate build-out:

Goodyear 157th WRF	16.2 mgd
Southern (Corgett, Rainbow, Pecos, Waterman)	23.4 mgd
Sonoran (Estrella)	2.7 mgd

Northern Planning and Service Area. The 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 Litchfield Park Service Company dba Liberty Utilities. Plant expansion at the Palm Valley Water Reclamation Facility will coincide with construction of the Regional Mall located on Palm Valley Parkway north of Interstate 10. A 208 Plan Amendment for two water reclamation facilities to serve the northern area received MAG Regional Council approval in January 2001.

The Palm Valley WRF is located on McDowell Road between Bullard Avenue and Litchfield Road and will have an ultimate capacity of 8.2 mgd. It was placed into service in February 2001 and has a capacity of 4.1 mgd. It serves to reclaim wastewater flows from the current LPSCo dba Liberty Utilities service area and portions of RAZ 265 and 266. The facility serves an area generally bounded south to north by the Interstate 10 freeway and Camelback Road, and west to east by Bullard Avenue and Dysart Road. The 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 Interstate 10 freeway north to Camelback Road, west from Bullard Avenue to Cotton Lane, and sections between Cotton Lane and Perryville Road. The Sarival Lift Station was constructed to provide interim pumping capacity to the Palm Valley Facility until flows increase to a level that would support startup and continuous operation of the Sarival WRF (Wood, Patel & Associates, 2006).

Both facilities will include an ADEQ Effluent Reuse Permit for irrigation on 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, an AZPDES permit will be in place to allow a secondary point of discharge. LPSCo dba Liberty Utilities will own and operate both of the reclamation facilities.

On May 24, 2006, the MAG Regional Council approved a MAG 208 Water Quality Management Plan Amendment for the Service Area Expansion of the Litchfield Park Service Company Palm Valley and Sarival Water Reclamation Facilities (Wood, Patel & Associates, 2006). This amendment expanded the service area to include portions of the Buckeye and Glendale Municipal Planning Areas and unincorporated areas of Maricopa County. The Palm Valley and Sarival WRFs combined have an ultimate capacity of 16.4 mgd, which includes a 38 percent reserve capacity of 6.3 mgd. The expanded service area will utilize 3 mgd of the reserve capacity. These facilities provide wastewater collection and treatment service for all of the City of Litchfield Park and portions of Avondale, Glendale, Goodyear, and unincorporated Maricopa County (Wood, Patel & Associates, 2006).

On January 30, 2013, the MAG Regional Council approved a MAG 208 Water Quality Management Plan Amendment for the Service Area Expansion of the Litchfield Park Service Company doing business as Liberty Utilities Palm Valley and Sarival Water Reclamation Facilities (Water Works Engineers, 2012). This amendment further expanded the service area for the facilities to include additional portions of the Glendale Municipal Planning Area. The facilities contained reserve capacity to accommodate the sewer service needs of the expanded area (Water Works Engineers, 2012).

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 MAG 208 Plan. The current boundaries of the central area are generally defined as McDowell Road on the north, the Gila River on the south, Dysart 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 4 mgd. Plans for additional plant capacity have been approved. Ultimate capacity for the 157th WRF will be 22 mgd. The facility consists of raw sewage pumps, 3 aeration basins, 2 oxidation ditches, 5 clarifiers, chlorination, 2 centrifuges and sludge tanks. Effluent disposal includes irrigation reuse on landscaping, open spaces, and ballpark turf, and groundwater recharge. There are additional deliveries to the Palo Verde Nuclear Generating Station via an interconnect to the pipline from the 91st Avenue Facility.

There is an AZPDES permit to discharge to the Gila River. A pipeline to the Gila River was completed in April 2011.

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 220 miles of sewers. The interceptor conveying wastewater to the treatment facility has been in service for approximately 15 years and is currently not operating at 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 facility has a design capacity of 0.065 mgd. Currently, the plant is operating at much less than this rated capacity. The owner holds an AZPDES permit for the treatment facility.

A small plant owned by the Arizona Equestrian Center, located on Citrus Road north of Van Buren Street is no longer operational. Flows are now directed to the Goodyear 157th WRF.

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. This area has experienced rapid growth, which has been 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 Wash WRF and the Rainbow Valley 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. The following plants will serve the southern planning area:

Water Reclamation Facility	Build-Out Capacities
Corgett Wash WRF	2.0 mgd
Rainbow Valley WRF (Lum Basin)	6.0 mgd
Waterman Basin WRF	10.0 mgd
Pecos WRF	8.0 mgd

The Corgett Wash WRF exists and has a capacity of 0.8 mgd. The Rainbow Valley WRF was completed in 2005 and became fully operational in 2006. The permitted capacity is 0.75 mgd. The Waterman Basin WRF and Pecos WRF will be constructed in the future to serve the expected growing population within the City's Municipal Planning Area. Effluent from the facilities in the southern planning area will be disposed of through reuse and/or recharge. The City may also obtain AZPDES permits for the southern planning area facilities.

Sonoran Valley Planning Area. In 2007, the City of Goodyear annexed a large portion of land that extended its incorporated limits and Municipal Planning Area south and east of the previous boundary. The newly annexed area is called the Sonoran Valley Planning Area. To address wastewater collection and treatment, the City of Goodyear requested that the 2002 MAG 208 Plan be amended to include four water reclamation facilities to serve the area. On March 26, 2008, the MAG Regional Council approved a MAG 208 Water Quality Management Plan Amendment for the City of Goodyear Sonoran Valley Planning Area (Wilson Engineers, 2007).

According to the amendment, the Sonoran Valley Planning Area is separated into two distinct developable areas with an open space wildlife movement corridor separating the two areas. The northern developable area is referred to as the State Land Area and will be served by the State Land WRF. The facility will be located within Section 9 of Township 3 South, Range 1 West and have an ultimate capacity of 4.75 mgd (Wilson Engineers, 2007). The 2007 City of Goodyear Integrated Water Master Plan refers to this facility as the Estrella WRF.

The southern developable area is referred to as the Southern Region Area and will be served by the Southern Region WRF, Section 23 WRF, and Section 28 WRF. The Southern Region WRF would be sized to serve the entire Southern Region Area with an ultimate capacity of 24 mgd. The Section 23 WRF and Section 28 WRF will be satellite facilities that will serve as the initial plants while flows in the area are low. As flows increase and the Southern Region WRF is constructed, the Section 23 WRF and Section 28 WRF may transition into scalping plants and just treat the required flows to satisfy adjacent reclaimed water needs. The Section 23 WRF and Section 28 WRF will each have an ultimate capacity of 0.6 mgd (Wilson Engineers, 2007).

All four facilities will consist of influent pumping, screening, and metering; activated sludge secondary treatment with biological nutrient removal; clarification; filtration; disinfection; effluent pumping; sludge handling; and noise and odor control facilities. Effluent will be disposed of through reuse, recharge, and AZPDES permit discharge points to the Waterman Wash. Waste activated sludge from the State Land WRF (Estrella WRF) and

Southern Region WRF will be stored in sludge holding tanks. It will be mechanically dewatered and hauled to an approved landfill for disposal. Waste activated sludge for the satellite facilities will be stored on-site. Provisions will be made for it to be pumped out by a licensed sludge hauler and transported to an approved wastewater treatment plant for disposal, for the sludge to be dewatered on-site, and for the sludge to be returned to the sewer for treatment and dewatering at the Southern Region WRF. The City of Goodyear will own all of the wastewater system infrastructure in the Sonoran Valley Planning Area. Other options could also be considered in the future as to the design, operation, financing, and operations of wastewater treatment facilities for this area (Wilson Engineers, 2007).

Summary of Proposed Improvements.

Northern Area (LPSCo dba Liberty Utilities)	Estimated Cost
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 4.0 mgd	$32,500,000
Phase V Expansion to 6.0 mgd	20,000,000
Phase VI Expansion to 11.0 mgd	50,000,000
Phase VII Expansion to 16.0 mgd	50,000,000
Phase VIII Expansion to 22.0 mgd Ultimate Capacity	60,000,000
Area Subtotal	$212,500,000
Southern Area (Estrella Ranch)	
Rainbow Valley WRF – Initial Capacity of 0.75 mgd	$6,500,000
Rainbow Valley WRF Expansion to 1.5 mgd	7,500,000
Rainbow Valley WRF Expansion to 3.0 mgd	15,000,000
Rainbow Valley WRF Expansion to 6.0 mgd Ultimate Capacity	30,000,000
Corgett Wash WRF Expansion to 1.0 mgd	2,000,000
Corgett Wash WRF Expansion to 1.4 mgd	4,000,000
Corgett Wash WRF Expansion to 2.0 mgd Ultimate Capacity	6,000,000
Waterman Basin WRF Constructed 1.25 mgd	12,500,000
Waterman Basin WRF Expansion to 2.5 mgd	12,500,000
Waterman Basin WRF Expansion to 3.0 mgd	5,000,000
Waterman Basin WRF Expansion to 10.0 mgd Ultimate Capacity	70,000,000
Pecos WRF Constructed 1.25 mgd	12,500,000
Pecos WRF Expansion to 2.5 mgd	12,500,000
Pecos WRF Expansion to 3.0 mgd	5,000,000
Pecos WRF Expansion to 6.0 mgd	30,000,000
Pecos WRF Expansion to 8.0 mgd Ultimate Capacity	20,000,000
Area Subtotal	$251,000,000
Grand Total:	$501,848,000

Note: The wastewater treatment facility phasing for the southern area is based on the 2007 City of Goodyear Integrated Water Master Plan.

2.2.4 Litchfield Park

The planning area for Litchfield Park, depicted on Figure 2.6, consists of 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 dba Liberty Utilities a privately owned utility. The City of Litchfield Park does not operate any wastewater facilities. Because the City 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 City of Litchfield Park is projected to increase, although its small size is a limiting factor. Assuming a per capita wastewater flow rate of 100 gpcd, population and flow projections for the City of Litchfield Park are presented in Table 2.8.

Table 2.8 Litchfield Park Population and Flow Projections MAG 208 Water Quality Management Plan Update

Year	Population	Flow, mgd
2010	11,844	1.18
2020	13,382	1.34
2030	15,778	1.58
2040	15,937	1.59

Existing Collection System. The existing collection system operated by Litchfield Park Service Company dba Liberty Utilities serves all of Litchfield Park, as well as adjoining areas that also are in its certificated service area. Flows entering the collection system are conveyed with wastewater from outside Litchfield Park to an existing treatment plant owned and operated by Litchfield Park Service Company dba Liberty Utilities.

Existing Treatment Facilities. Litchfield Park's wastewater, as well as wastewater from some adjoining areas, is treated at the Palm Valley Water Reclamation Facility located in the Goodyear Municipal Planning Area.

Future Wastewater System Development. Current and future wastewater flows from the City of Litchfield Park will be treated at the Litchfield Park Service Company dba Liberty Utilities facilities in Goodyear. Litchfield Park Service Company dba Liberty Utilities, through the City of Goodyear, received approval of a MAG 208 Amendment for the Palm Valley and Sarival Water Reclamation Facilities. The Palm Valley WRF was constructed and placed into operation in February 2001. The Sarival Lift Station was placed into service in June 2005. It will become a facility once flows reach a level to support startup and operation of a second facility (Wood, Patel & Associates, 2006). The Palm Valley and Sarival facilities will each have an ultimate capacity of 8.2 mgd. The Palm Valley WRF is located on McDowell Road between Bullard Avenue and Litchfield Road. The Sarival WRF will be located near the intersection of Sarival Avenue and McDowell Road.

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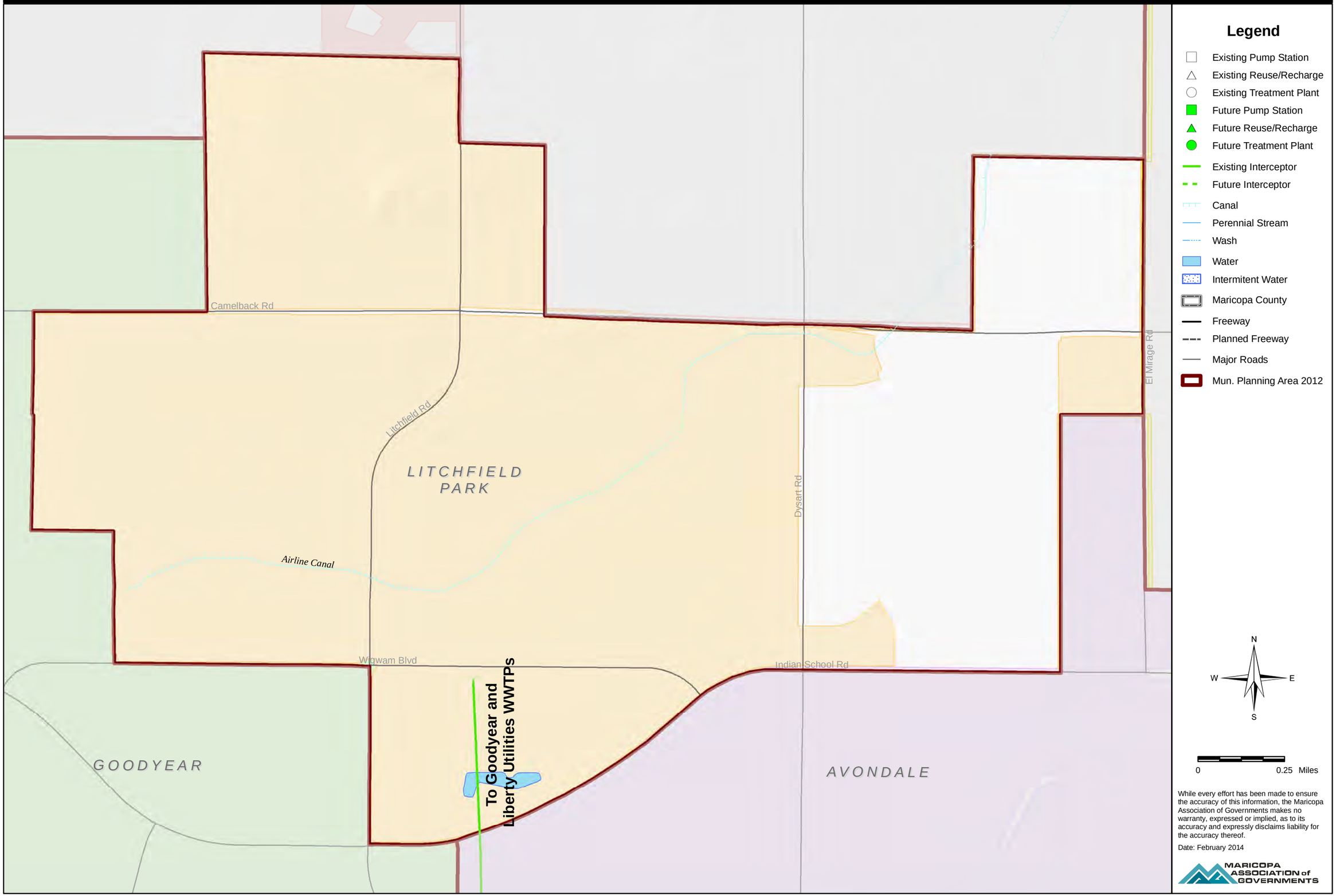
Figure 2.6 Litchfield Park Municipal Planning Area



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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 six square miles, and is depicted on Figure 2.7.

Wastewater collected in Tolleson is treated at a wastewater treatment plant owned and operated by the City. This treatment plant also treats wastewater from Sun City.

Population and Flow Projections. According to City records, Tolleson's annual average daily wastewater flow to the treatment plant was approximately 1.5 mgd during 2011. Based upon the 2013 MAG population projections, the 2010 population for Tolleson was 7,478. Based on these figures, wastewater flow in Tolleson was approximately 201 gpcd. This is considerably higher than the 100 gpcd used for planning purposes by many other communities in the 208 Plan. Much of the flow received by the Tolleson wastewater system is discharged by large industrial customers. 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 2.9 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 2.9 Tolleson Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Projected Flow at 100 gpcd (mgd)	Flow from Industrial Discharger[1] (mgd)	Tolleson Total Flow (mgd)
2010	7,478	0.75	1.96	2.71
2020	8,166	0.82	3.22	4.04
2030	9,638	0.96	4.48	5.44
2040	10,596	1.06	5.74	6.80

[1] Tolleson reported an industrial discharge of 0.7 mgd in 2000 and a projected discharge of 3.22 mgd in 2020. 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.

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 has available 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 City of Phoenix 91st Avenue Treatment Plant. Flow is diverted to the Tolleson WWTP from the 99th Avenue interceptor by a splitter structure located at the intersection

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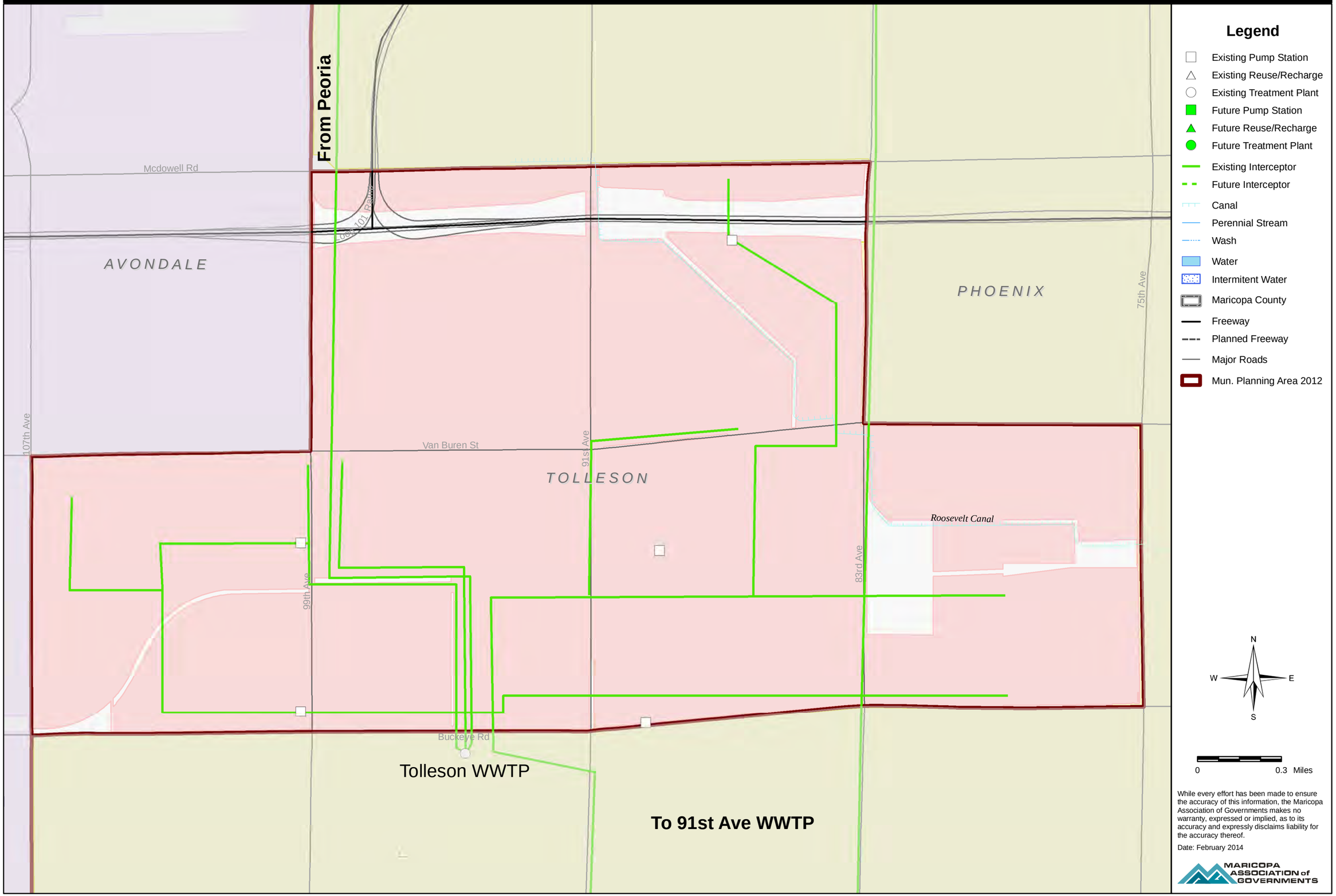
Figure 2.7 Tolleson Municipal Planning Area



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of 99th Avenue and Van Buren Street. Tolleson then takes off its contracted amount of flow for Sun City and Tolleson 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 four 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 11.5 mgd. Table 2.10 summarizes the allocation of treatment capacity at the Tolleson WWTP among all current participants.

Table 2.10 Tolleson WWTP Capacity Allocation
MAG 208 Water Quality Management Plan Update

Community	Current Flow (2/12) (mgd)	Additional Capacity Available (mgd)	Total Capacity Available (mgd)
Tolleson	1.5	10.0	11.5
JBS/Packerland (Tolleson)	0.8	0.0	0.8
Sun City	3.9	1.3	5.2
Total	6.2	11.3	17.5

The treatment process includes the following:

- Headworks: bar screens and aerated grit removal basins.
- Primary clarifiers with odor control.
- Rotary Drum Thickener.
- 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. 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 AZPDES 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 in the future due to

increased populations within the existing service area. According to Table 2.9, flow projected for year 2040 is 6.80 mgd. Tolleson's treatment capacity at the WWTP is 11.5 mgd; therefore, no 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 2011 – 2020.

Item	Estimated Cost
Ammonia Removal Improvement	$2,875,000
WWTP Improvements and Upgrades	$25,000,000
Total	$27,875,000

2.3 NORTHWEST AREA

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 2.8 depicts the planning area. El Mirage is the designated wastewater management agency for this area.

Population and Flow Projections. The El Mirage Planning Area experienced a significant increase in population since the 208 Plan was last updated in 2002. Although not as significant, growth is also expected through 2040. Table 2.11 includes population and the resulting wastewater flow for the period 2010 through 2040 based on the 2013 MAG population projections for the City of El Mirage. For wastewater flow, the City used a rate of 54.2 gallons per capita per day, which is based on its Water and Wastewater Master Plan Update completed in 2008.

Table 2.11 El Mirage Population and Flow Projections MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)
2010	33,806	1.83
2020	36,972	2.00
2030	43,070	2.33
2040	51,298	2.78

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. The City of El Mirage currently owns and operates the City Water Reclamation Facility that was constructed to treat up to 2.5 mgd of wastewater. This facility, which utilizes a sequential batch reactor treatment technology, is presently rated for a treatment capacity of 2.5 mgd with a planned ultimate capacity of 4.5 mgd by 2020 (Water and Wastewater Master Plan Update, April 2008).

The current capacities, design loading rates, and peaking factors are as follows:

Design Flow and Loading:

- Rated Flow: 2.5 mgd
- Annual Average Flow: 2.1 mgd

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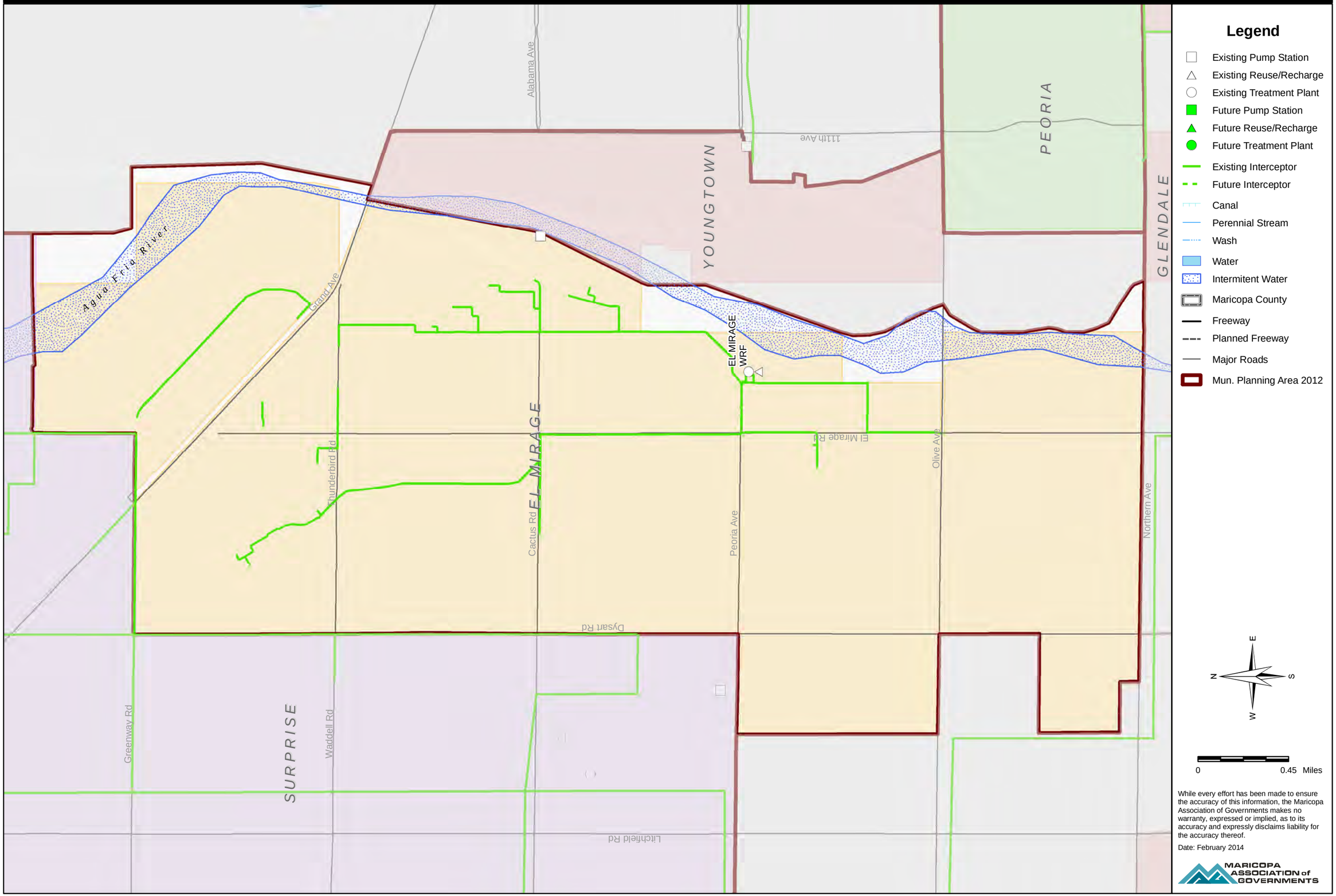
Figure 2.8 El Mirage Municipal Planning Area



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- BOD/TSS: 300/250 mg/l
- Total Nitrogen: 45 mg/l

Flow Peaking Factors:

- Maximum Month (rated capacity): 1.2 x Annual Average
- Maximum Day: 2.1 x Annual Average (1.75 x Maximum Month)
- Peak Hour: 2.9 x Annual Average (2.42 x Maximum Month)

The El Mirage WRF is a wastewater treatment plant that utilizes a SBR technology. It is designed to produce Arizona Revised Statutes (ARS) Title 18 "Class A+" quality effluent for various reuse applications. However, the facility is currently only required to produce Class B+ effluent that is recharged in infiltration basins adjacent to the plant. The present treatment train consists of the following liquid-stream processes and equipment:

Influent Station:

- Parshall Flume - metering channel and bypass/overflow channel
- Coarse Screening - one 5.0 mgd mechanical bar screen channel and two manual bar screen channels
- Influent Wet Well - with three VFD-controlled 4,500 gpm submersible pumps

Headworks Facility:

- Fine Screening - two 5.5 mgd auger screens
- Grit Removal - one 11 mgd vortex Grit Removal Unit with grit screw classifier

The facility also contains the following:

- Flow Equalization Basin - a 455,000 gallon tank with air-liquid jet mixing, three 45 HP submersible transfer pumps, and one 45 HP submersible jet-motive pump; designed with approximately 295,000 gallons of equalization capacity.
- Sequential Batch Reactors - consisting of four 650,000 gallon reactor tanks with air-liquid jet mixing, fixed-level decanters, and two submersible jet-motive pumps each.
- Process Air System - utilizing six 2,000 cubic feet per minute (cfm) blowers; four are new high-efficiency adjustable speed turbine blowers and two are the original constant-speed rotary lobe blowers.
- Post-Equalization - through a serpentine-baffled surge tank with approximately 177,000 gallons of equalization capacity and three vertical turbine filter feed pumps with a capacity of 3.6-mgd each, one is variable frequency drive (VFD)-equipped.
- Tertiary Filters - utilizing three 1.5 mgd cloth-media disk filters.

- Post-Filtration Storage - clear well tank with approximately 67,200 gallons of equalization capacity and three vertical turbine effluent discharge pumps, two are VFD-equipped.
- Chlorination System - sodium hypochlorite storage and feed system for final disinfection (in lieu of UV disinfection) and pre-treatment of the disk filter influent.
- UV Disinfection (currently not being used) - consisting of six in-line medium pressure UV reactors with a capacity of 1.44 mgd each.
- Reuse Water Pump Station - pressure break at plant water system wet well; 5,700 gallon wet well with two 100 gallon per minute (gpm) pumps and hydro-pneumatic system for plant reuse/reclaimed water supply; gravity overflow to effluent recharge basins.
- Effluent Metering - utilizing an electronic flow meter on the 16-inch UV influent line and on the 14-inch portion of the gravity effluent line.

The solids handling system for the facility consists of the following:

- WAS Pumping - four 400 gpm self-priming centrifugal pumps
- Sludge Digestion - multi-stage stabilization utilizing:
  - Two 68,000 gallon anaerobic basins (not currently utilized) with mixers and floating decanters
  - One 139,000 gallon anoxic basin with minimal jet aeration, and two 288,000 gallon aerobic basins with full jet aeration and floating decanters
- Digester Blowers - two 1,000 cfm constant-speed rotary lobe blowers
- Sludge Dewatering - consisting of one decanting centrifuge with a capacity of about 100 gpm with associated sludge feed pumps, and one supplemental 1.5-meter belt filter press with two portable 150 gpm feed pumps

The odor control system for the facility includes the following:

- One 1,900 cfm dry-adsorption carbon scrubber for the Influent Pump Station structure
- Two 6,000 cfm multi-stage chemical scrubbers for the headworks and solids handling buildings

Future Wastewater System Development. According to the City, the primary goal in the short term is to increase the reliability and flexibility of the plant to ensure consistent operation; and the long term goal is to develop a plan for the eventual build-out of the facility to 4.5 mgd and expand the collection system to the southern City borders.

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 ½ 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 222, 240, 254, 255, 256, 257, and 258, is depicted on Figure 2.9. The City of Glendale is the designated wastewater management agency for this area.

Population and Flow Projections. The MAG Municipal Planning Area 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 67 gpcd (rather than the 100 gpcd often used for planning purposes of flow projections). Table 2.12 includes the population and resulting wastewater flow for the period 2010 through 2040 based upon the 2013 MAG population projections for the City of Glendale, exclusive of Luke AFB.

Table 2.12 Glendale Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)
2010	258,728	17.33
2020	299,561	20.07
2030	353,381	23.68
2040	368,919	24.72

Existing Collection System. The current Master Plan was completed in 2008 with improvement projects identified through 2020. Timing and need for those projects will be evaluated as the City plans to update the Wastewater Master Plan by 2018.

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.

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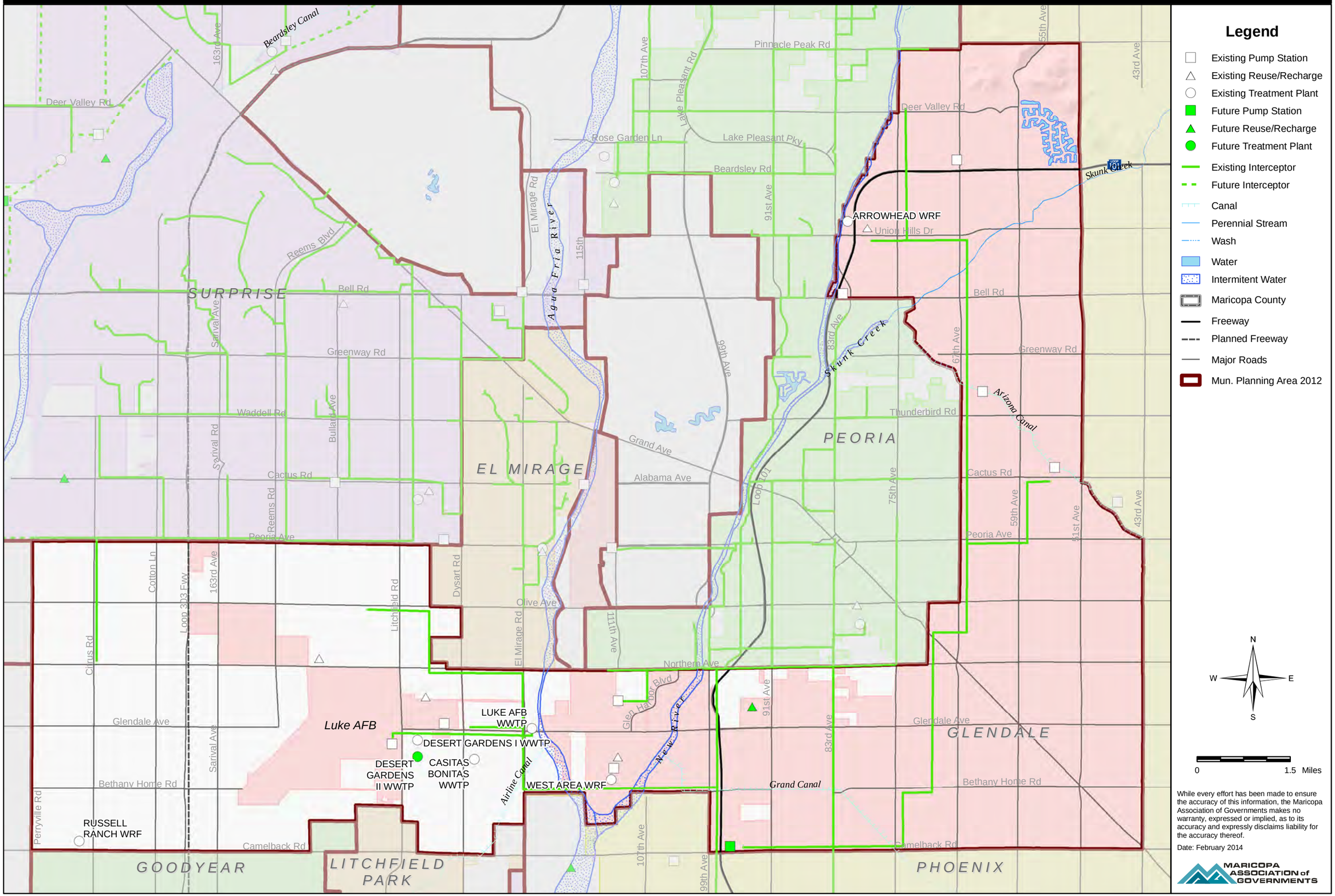
Figure 2.9 Glendale Municipal Planning Area



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Date: February 2014

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Flows collected in the North Area are conveyed primarily by a gravity main to the Arrowhead Ranch Water Reclamation Facility. 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 four lift stations in the South Area.

On February 23, 2005, the MAG Regional Council approved a MAG 208 Water Quality Management Plan Amendment for the City of Glendale Temporary Sewer Service Agreement and Future Water Reclamation Plan Correction (Carollo Engineers, 2004). The amendment included the definition of an area within the Glendale Municipal Planning Area where temporary sewer service would be provided by the City of Surprise. The City of Glendale executed an Intergovernmental Agreement with the City of Surprise that allows two developments within the Glendale Municipal Planning Area to receive sewer service from Surprise. The purpose of the agreement is to clarify the intent of the two cities allowing conveyance of sewage from the specified area to the South Surprise Wastewater Treatment Plant temporarily while Glendale evaluates permanent solutions to wastewater treatment within its planning area. The properties are approximately 640 acres in size and located between Peoria Avenue, Perryville Road, Northern Avenue, and Citrus Road in the West Area (Carollo Engineers, 2004).

The MAG Regional Council also approved a MAG 208 Water Quality Management Plan Amendment for the Service Area Expansion of the Litchfield Park Service Company Palm Valley and Sarival Water Reclamation Facilities (Wood, Patel & Associates, 2006) on May 24, 2006. The Palm Valley and Sarival Water Reclamation Facilities, located in the City of Goodyear Municipal Planning Area, provide wastewater collection and treatment service for all of the City of Litchfield Park and portions of Avondale, Glendale, Goodyear, and unincorporated Maricopa County. These facilities are owned and operated by LPSCo dba Liberty Utilities. This amendment expanded the service area for the facilities to include portions of the Buckeye and Glendale Municipal Planning Areas and unincorporated areas of Maricopa County. The expanded service area includes three properties in Glendale's West Area that are located between Perryville Road, Camelback Road, Citrus Road, and Bethany Home Road (Wood, Patel & Associates, 2006).

On January 30, 2013, the MAG Regional Council approved a MAG 208 Water Quality Management Plan Amendment for the Service Area Expansion of the Litchfield Park Service Company doing business as Liberty Utilities Palm Valley and Sarival Water Reclamation Facilities (Water Works Engineers, 2012). This amendment further expanded the service area for the facilities to include additional portions of the Glendale Municipal Planning Area. The facilities contain reserve capacity to accommodate the sewer service needs of the expanded area (Water Works Engineers, 2012).

Existing Treatment Facilities. Glendale is a member of the Multi-City Subregional Operating Group 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. The Raw Sewage Pump Station pumps flow from the Camelback sewer at 99th Avenue and Camelback Road and

discharges at the WAWRF. In 2003, construction began to expand the WAWRF to a treatment capacity of 10.0 mgd. This expansion project was completed in 2004 but received a final rerating to 11.5 mgd upon completion. 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. 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 is 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 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 11.5 mgd WAWRF includes screening, grit removal, extended air activated sludge and secondary sedimentation, filtration and ultraviolet disinfection. The effluent is pumped to two aquifer recharge areas, the City of Glendale's Aquifer Recharge Facility (ARF) and the jointly owned New River Agua Fria Underground Storage Project (NAUSP). In addition, effluent is currently being reused at the Coyotes Arena Lake, Cabelas Outdoor Outfitters, the Zanjero Development, and the Camelback Ranch Development area which includes the City's Baseball Training Facilities and Stadium. Future reuses may include irrigation of parks, golf courses, street rights-of-way, and other direct reuses within the West Area of the City.

The Russell Ranch Water Reclamation Facility serves the Russell Ranch development located near Camelback Road and Citrus Road. The treatment facility consists of influent pumping and headworks, conventional extended aeration activated sludge with nitrogen removal, tertiary filtration, and UV disinfection. Capacity of the facility is 0.06 mgd with an ultimate capacity of 0.40 mgd. Effluent is recharged or reused for landscape irrigation. The facility is owned and operated by EPCOR Water (formerly Arizona American Water Company).

Desert Gardens Apartments (formerly named Desert Eagle Apartments) located in the Western Area, has a treatment facility with a design capacity of 52,500 gallons per day. American Public Service operates a 50,000 gallons per day WWTP at Casitas Bonitas. 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 91st Avenue WWTP for treatment in order to meet flow commitments to the Arizona Nuclear Power Project, Buckeye Irrigation Company, and the Tres Rios Wetlands Project. The Glendale West Area Water Reclamation Facility Master Plan includes two future expansions. It is estimated that an ultimate capacity of 31 mgd will be achieved by 2040. Final capacity and project timing will be evaluated as the City plans to update the Wastewater Master Plan by 2018. New sewer

line extensions are to be constructed in multiple areas as development is expected to focus on infill areas in the next several years.

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 2.13.

Table 2.13 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
2010	8.1	2.8	5.8	16.7
2015	8.1	3.0	7.1	18.2
2020	8.1	3.3	7.6	19.0
2025	8.1	3.5	7.8	19.4
2030	8.1	3.6	7.9	19.6

[1] Annual average daily flows. Includes residuals from WRP.
[2] Annual average effluent flow (local WRF 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.

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 2020 are summarized below.

Item	Estimated Cost[1]
Glendale West Area WRP Expansion	$50,000,000
SROG Treatment Plant Upgrade - Glendale Contribution	$4,060,000
Sewer Line Installation and Rehabilitation	$15,500,000
Total	$69,560,000

[1] Costs are at June 2010 dollars, ENR = 8834.

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2.3.3 Luke Air Force Base

Wastewater collection and treatment is provided by the Luke Air Force Base system, which serves the entire Base. The Luke AFB Planning Area is depicted on Figure 2.10. 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 population projections for Luke AFB and associated wastewater flow projections, assuming 100 gpcd, are shown in Table 2.14.

Table 2.14 Luke Air Force Base Population and Flow Projections MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)
2010	3,580	0.36
2020	4,539	0.45
2030	4,891	0.49
2040	4,985	0.50

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 Litchfield Road overpass. That lift station discharges into the Base's primary trunkline sewer. The trunkline exits the main Base south of the Litchfield Road overpass, 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.

Existing Treatment System. 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.

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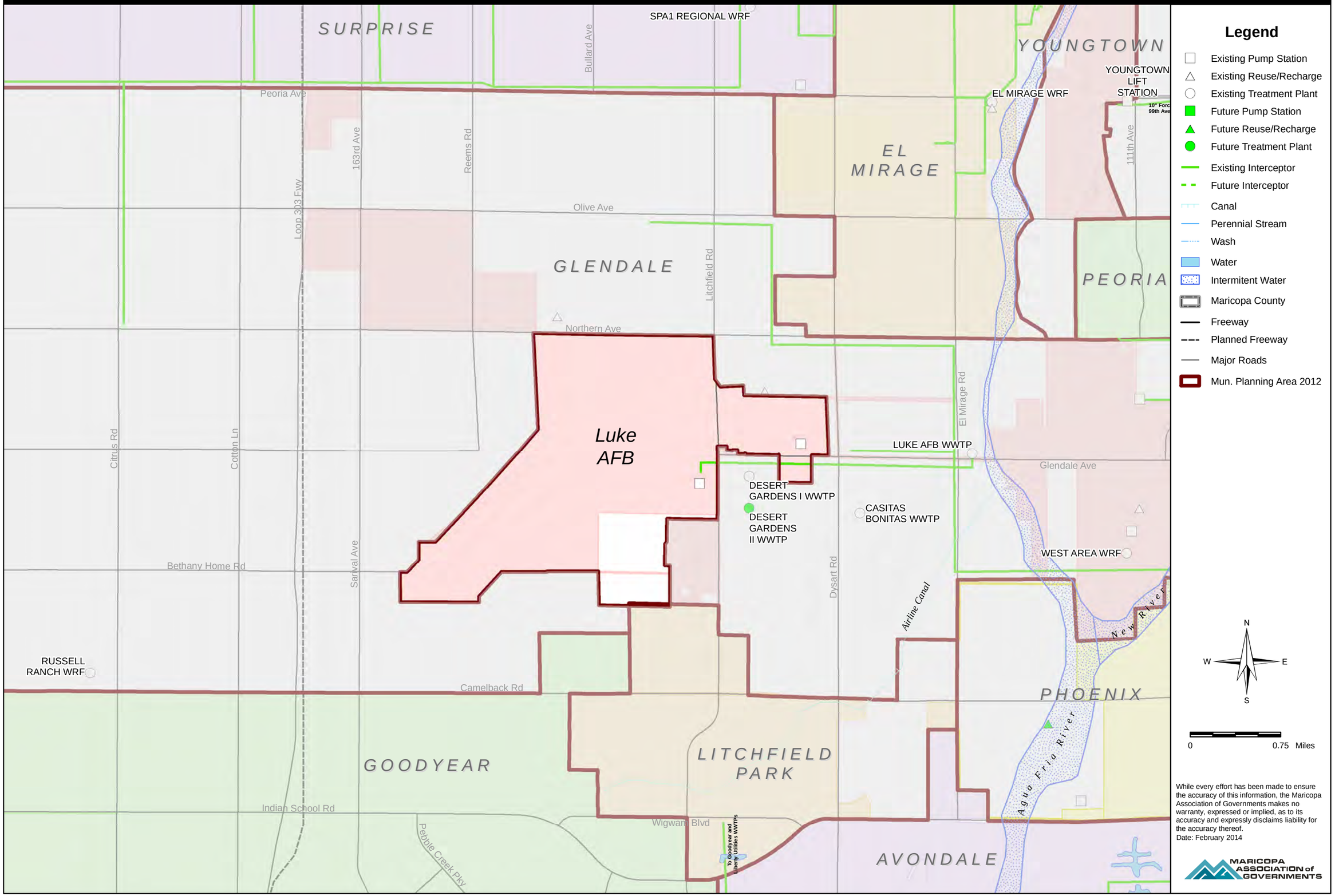
Figure 2.10 Luke Air Force Base



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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 AZPDES 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.

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

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

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2.3.4 Peoria

The City of Peoria's Municipal Planning Area spans approximately 233 square miles and consists of four adjoining geographic areas or wastewater basins:

- Southern Area - generally bounded by Beardsley Road on the north, 67th Avenue on the east, Northern Avenue to the south, and 115th Avenue to the west. This area is generally referred to within the City as its Butler Wastewater Basin.
- North Central Area - generally bounded by Beardsley Road on the south, Agua Fria River to the west, State Route 74 to the north, and 67th Avenue to the east. This area is generally referred to within the City as its Beardsley Wastewater Basin.
- Northwest Area - generally bounded by State Route 74 on the north, Citrus Road to the west, Pinnacle Peak Road on the south, and Agua Fria River to the east. This area is generally referred to within the City as its Jomax Wastewater Basin.
- Northern Area - the portion of the City located north of State Route 74. This area is generally referred to within the City as its Quintero Wastewater Basin.

The Peoria Municipal Planning Area is located within Maricopa and Yavapai Counties. The portion in Maricopa County is within the MAG 208 planning boundary and consists of Regional Analysis Zones (RAZ) 202, 213, 214, 215, 238, 239, and 344, as depicted on Figure 2.11. The portion within Yavapai County is within the Northern Arizona Council of Governments (NACOG) 208 planning area.

The City of Peoria is the designated wastewater management agency and provides wastewater collection and treatment for almost all of its Municipal Planning Area. There are a few areas within Peoria's Municipal Planning Area where wastewater service is, or will be, provided by EPCOR Water, a privately-owned utility. There are also a few low-density areas within the City that are currently unsewered and rely on privately-owned septic systems.

Population and Flow Projections. In the past ten years, Peoria has experienced significant growth. While growth has slowed in recent years, it is expected that Peoria will continue to experience marked growth due to the completion of the new Loop 303 freeway in the north area of the City.

Projected population and wastewater flows for Peoria are presented in Table 2.15. The 2010 through 2040 population values are based upon the 2013 MAG population projections. The wastewater flows for 2010 are based on actual measured values. The 2020 through 2040 values are based on projections using Peoria's adopted per capita wastewater flow projections of 100 gpcd for areas that contain a mix of residential and commercial flows. Along the Loop 303 corridor, in areas planned to have high commercial density and few residential units, Peoria has adopted a wastewater flow projection value of 725 gallons per acre day (gpad).

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Figure 2.11 Peoria Municipal Planning Area

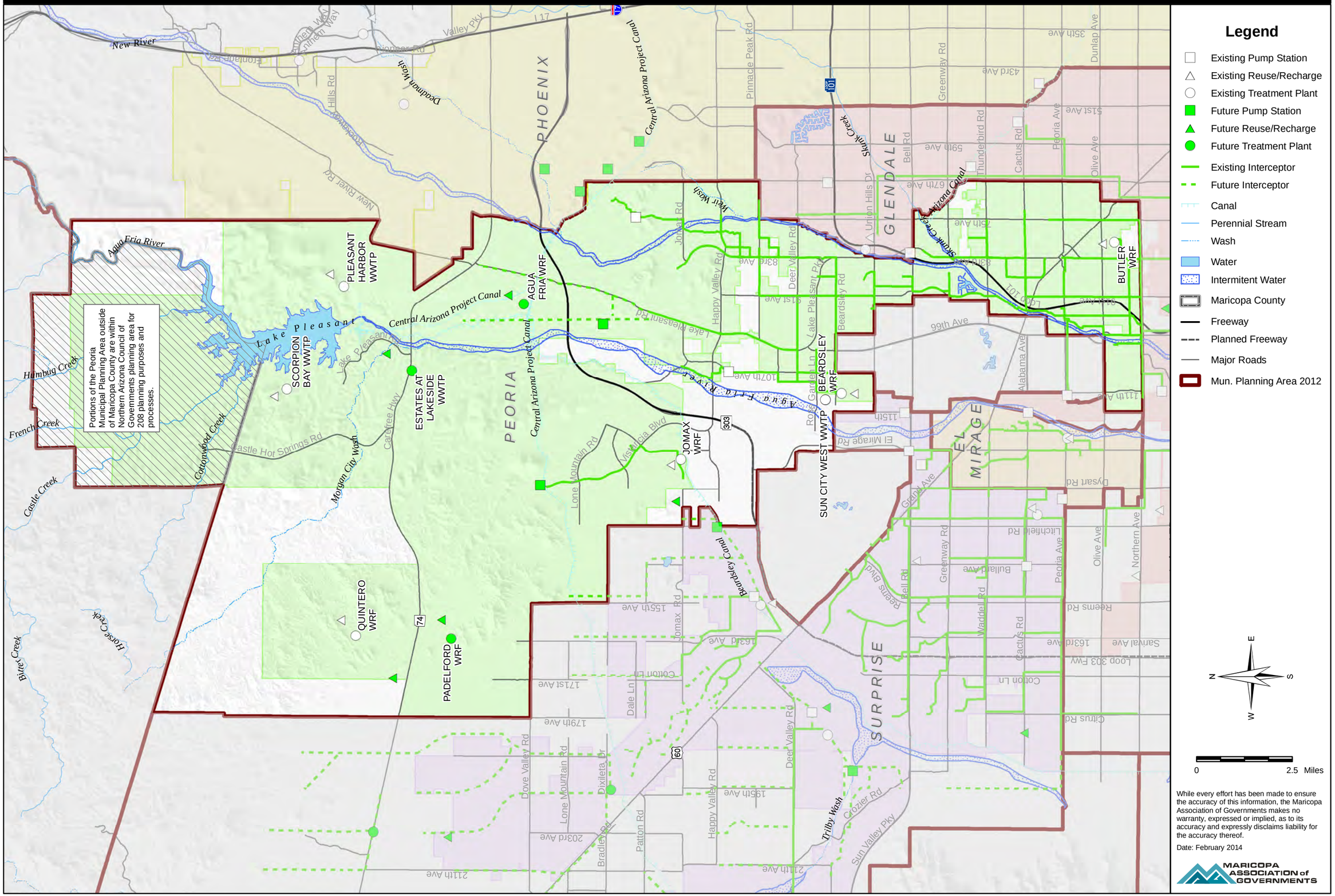

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Table 2.15 Peoria Population and Flow Projections MAG 208 Water Quality Management Plan Update		
Year	**Population[1]**	**Flow (mgd)[2,3]**
2010	171,466	9.77
2020	225,685	22.57
2030	292,507	29.25
2040	363,737	36.37

[1] Population projections only include the Maricopa County portion of Peoria.
[2] The 2010 flows are based on actual measured values.
[3] The 2020 through 2040 flows are based on 100 gpcd and 725 gpad for Loop 303 Commercial.

Existing Collection System. The existing wastewater collection system for Peoria consists of local sewers, interceptor sewers and various pump or lift stations. Existing interceptors are located in the Southern, North Central, and Northwest Areas, as shown on Figure 2.11.

Southern Area. There are a number of existing interceptor sewers in the Southern Area of Peoria, ranging from 12 to 42 inches in diameter. Peoria also collects wastewater from a small area within Glendale city limits bounded by Northern Avenue on the north, 107th Avenue on the east, 111th Avenue on the west and Orangewood Avenue on the south (the area falls within RAZ 257). In addition to the existing 111th Avenue and Orangewood Avenue pump station, there are also a total of four existing pump stations that collect wastewater flows from local neighborhoods in the Southern Area.

All of the wastewater generated in the Southern Area is collected and conveyed to the Butler Influent Pump Station (IPS) located at 99th and Northern Avenues. The Butler IPS in turn pumps the wastewater to the Butler Water Reclamation Facility for treatment.

North Central Area. There are a number of existing interceptor sewers in the North Central Area of Peoria, ranging from 15 to 36 inches in diameter. There are seven existing pump stations in the area. Three of these pump stations collect flows from local neighborhoods and two collect wastewater from larger regional areas. The two remaining pump stations are smaller, special-duty pump stations. One is used to pump waste activated sludge from the Beardsley WRF treatment process to the Butler WRF, and one serves the Beardsley WRF buildings.

All of the flows from the North Central Area are collected and conveyed to the Beardsley WRF for treatment. There is an existing gravity sewer interconnect at the intersection of 91st Avenue and Beardsley Road. This interconnection serves as a diversion structure and allows a portion of the sewer flows in the North Central Area to be sent to the Southern Area for treatment at the Butler WRF.

Northwest Area. Currently there is only one existing interceptor sewer in the Northwest Area of Peoria, varying from 15 to 36 inches in diameter. The interceptor collects and

conveys wastewater generated in the Northwest Area to the Jomax WRF for treatment. Several pump stations are planned for this area as development progresses.

Northern Area. In the Northern Area of Peoria, the City currently owns and operates the collection system with the Quintero development. The collection systems consists of local 8-inch sewer lines and three neighborhood lift stations that collect and convey wastewater to the Quintero WRF for treatment.

There are existing collection systems associated with the Pleasant Harbor WRP and Scorpion Bay WWTP, which are located adjacent to Lake Pleasant. Peoria does not own or operate either of these collection systems.

Existing Treatment Facilities. The Butler Water Reclamation Facility was built in 2008 to treat wastewater generated by the Southern Area of Peoria and is located on 79th Avenue south of Olive Avenue. The facility has a current permitted capacity of 10 mgd and produces Class A+ effluent using a membrane bio-reactor process. Major components include: mechanical bar screens, vortex grit removal, mechanical fine screens, aeration basin for biological nutrient removal, membrane bioreactors, and ultraviolet disinfection. Solids from the process are dewatered through centrifuges before being disposed of at an authorized disposal site. Effluent is disposed of through off-site recharge basins or is used as a source for a reclaimed water system that serves landscape irrigation in the southern portion of the City. The Butler WRF also has an AZPDES permit that allows for the discharge of effluent into the New River, which is only done if the flow exceeds the capacity of the recharge basins or irrigation demands.

The Beardsley Water Reclamation Facility was originally constructed in 1986 to treat wastewater generated by the North Central Area of Peoria and is located on 111th Avenue, south of Beardsley Road. The plant has undergone two major upgrades and has a current permitted capacity of 4 mgd. The facility produces Class A+ effluent using an activated sludge process. Major components include: mechanical bar screens, vortex grit removal, aeration basins for nitrification/denitrification, secondary clarification, tertiary filtration, and UV disinfection. Solids from the process are conveyed through the existing collection system to the Butler WRF for treatment. Effluent is recharged via on-site recharge basins.

The Jomax Water Reclamation Facility was originally constructed in 2005 to treat wastewater generated by the Northwest Area of Peoria and is located on Jomax Road, east of El Mirage Road. The plant has undergone one major upgrade and has a current permitted capacity of 2.25 mgd. The facility produces Class A+ effluent using an activated sludge process. Major components include: influent grinders (commutators), mechanical bar screens, vortex grit removal, aeration basins for nitrification/denitrification, secondary clarification, tertiary filtration, and UV disinfection. Solids from the plant are stored in an on-site aerated holding tank. Periodically, solids are pumped out and dewatered through a centrifuge before being disposed of at an authorized disposal site. Effluent is used for nearby landscape irrigation, or is recharged through vadose zone wells. The Jomax WRF also has an AZPDES permit that allows for the discharge of effluent into the McMicken Wash, which would be done only if effluent production exceeded irrigation demands and recharge well capacity.

The Quintero Water Reclamation Facility was built in 2006 to treat wastewater generated by the 827 acre Quintero master-planned golf and country club development. The facility is located eight miles west of the New Waddell Dam and just over one mile north of State Route 74. The development is planned for 283 dwelling units and a population of 700. Initially, wastewater will be collected on-site and hauled to another WRF for treatment. When sufficient dwelling units are constructed and connected to the collection system, the Quintero WRF will be placed in service. The Quintero WRF is a 125,000 gallons per day activated sludge treatment facility. Major components include: bar screens, aeration basins for nitrification/denitrification, secondary clarification, tertiary sand filtration, and chlorine contact basin for disinfection. Solids from the plant are dewatered via centrifuge before being disposed of at an authorized disposal site. Effluent is used for local golf course irrigation.

The Pleasant Harbor Water Reclamation Plant 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 is located on the eastern shore of Lake Pleasant just north of the New Waddell Dam. The facility has a current capacity of 63,000 gallons per day. Major components include: aeration basins with nitrification/denitrification, secondary sedimentation, filtration, and UV disinfection. Solids are stored in a holding tank and periodically pumped out and disposed of at an authorized disposal site. Effluent is reused for on-site irrigation of landscaping. The Pleasant Harbor WRP is not owned, maintained, or operated by the City of Peoria.

The Scorpion Bay Wastewater Treatment Plant was constructed in 2010 to treat wastewater generated by the new marina, located on the west shore of Lake Pleasant, following approval by the MAG Regional Council on March 29, 2006. The facility has a current capacity of 19,500 gallons per day and wastewater consists of flows from a public marine pump-out facility, a restaurant, restrooms, and businesses located in the marina. Major treatment system components include: aeration basins with nitrification/denitrification, clarifier, chemical coagulation system, external filters, and a chlorine tablet chlorination system and dechlorination. Solids from the plant are stored in an on-site aerated holding tank. Solids are pumped out and disposed of at an authorized disposal site. Effluent is reused for on-site irrigation. The facility is owned by Lake Pleasant Marina Partners, LLC and is not maintained or operated by the City of Peoria.

Future Wastewater System Development.

Southern Area. The wastewater collection system for the Southern Area of the City is largely completed with the exception of local sewers to service undeveloped parcels. The Butler WRF will be upgraded from the current permitted capacity of 10 mgd to 13.4 mgd. Effluent will continue to be used for groundwater recharge or landscape irrigation. The City will also look at constructing new deep injection wells to recharge a portion of the effluent.

North Central Area. The wastewater collection system in the North Central Area will be expanded north of the Dynamite Boulevard alignment by construction of a new interceptor sewer in Lake Pleasant Parkway to State Route 74. Another interceptor sewer is planned in the 96th Avenue alignment that will collect wastewater generated by the area west of

Lake Pleasant Parkway and east of the Agua Fria River. The new 96th Avenue interceptor will include the construction of two new regional lift stations that will pump flows into the gravity collection system for treatment at the Beardsley WRF. The first lift station is planned to be located near Dixileta Drive and 96th Avenue and the second at Dove Valley Road and 96th Avenue, just north of the CAP Canal.

Through 2030, the Beardsley WRF will undergo a series of expansions to increase the permitted capacity from 4 mgd to 12 mgd to handle projected demands. Future expansion phases will be initiated as necessary to treat additional flows. As flows at the Beardsley WRF continue to increase, the City will construct new on-site solids handling systems and cease pumping solids to the Butler WRF for treatment. The existing on-site recharge basins will be expanded as necessary. The City will also evaluate the construction of a reclaimed water distribution system to serve irrigation needs and possibly ornamental lakes/water features in the area. Another option that the City will evaluate will be an AZPDES discharge permit to allow effluent to be discharged into the Agua Fria River if required.

After 2030, growth in the North Central Area is expected to cause wastewater flows to exceed the ultimate 12 mgd permitted capacity of the Beardsley WRF. Expanding the facility beyond 12 mgd would require significant investment in new primary treatment components and more advanced solids handling systems. Accordingly, after 2030 the City is planning to divide the collection basin for the Beardsley WRF and construct a new Agua Fria WRF located at 96th Avenue, just north of the CAP Canal. The Agua Fria WRF is planned to treat wastewater from the area generally bounded by the CAP Canal on the south, 67th Avenue on the east, El Mirage Road on the west, and Lake Pleasant on the north. This new collection basin also includes a portion of the existing Northwest Area. At build-out, the Agua Fria WRF is expected to have a permitted capacity of 15 mgd. Effluent will be used for groundwater recharge or landscape irrigation. Another option that the City will evaluate will be an AZPDES discharge permit to allow discharge of effluent into the Agua Fria River.

Northwest Area. The wastewater collection system in the Northwest Area will be extended through construction of new local sewers, interceptor sewers, and local lift stations. A regional lift station is planned to be constructed at Vistancia Boulevard, just north of the CAP Canal. This lift station will convey wastewater flows for a majority of the Vistancia development located north of the CAP Canal as well as other properties in this area of the City.

The Jomax WRF will undergo a series of expansions to increase the permitted capacity from 2.25 mgd to 10 mgd to handle the projected growth in the area. Future expansion phases will be driven by growth within the basin. Effluent will continue to be used for landscape irrigation or recharged through vadose zone wells.

The future Padelford WRF will initially be constructed to treat at least a portion of the wastewater generated by the 5,400 acre Saddleback Heights development. The facility will be located near the Sarival Avenue and Cloud Road alignments. Due to the topography of the area and the distance from the Jomax WRF, the Padelford WRF is

logically placed to provide regional wastewater services and allow the northwest portion of Peoria to be divided into two service areas. Additionally, subdividing this area will ensure that the Jomax WRF does not require expansion beyond its ultimate master planned capacity of 10 mgd. The Padelford WRF will have an ultimate permitted treatment capacity of 7 mgd. Effluent generated by the facility will be used primarily for landscape irrigation or groundwater recharge. Another option that the City will evaluate is an AZPDES discharge permit to allow effluent to be discharged into the Padelford Wash when necessary.

Northern Area. On March 29, 2006, the MAG Regional Council approved the Estates at Lakeside Wastewater Treatment Plant as part of the MAG 208 Plan (ESCA Environmental, 2006). The facility is planned to be located south of State Route 74, one-half mile west of the Agua Fria River. Wastewater flows will come from the Estates at Lakeside development and will be conveyed to the treatment facility through a series of lift stations. The Estates at Lakeside WWTP will ultimately be a 120,000 gallons per day treatment facility that will use an activated sludge treatment process. Major components are planned to include: mechanical bar screen, influent grinders (commutators), aeration basins for nitrification/denitrification, secondary clarification, filtration, and chlorine contact basin for disinfection. Effluent will be disposed of through deep well injection into the aquifer. The facility will be constructed by Lake Pleasant Sewer Company and ownership will be transferred to the City of Peoria prior to start-up. When Peoria's wastewater collection system is eventually extended into the Northern Area, the Estates at Lakeside WWTP may be retired from service and flows pumped to another facility for treatment.

The Quintero WRF has a current capacity of 125,000 gallons per day, which is adequate to treat the ultimate wastewater flows expended from the development. When Peoria's wastewater collection system is eventually extended into the Northern Area, the Quintero WRF may be retired from service and flows pumped to another facility for treatment.

The Pleasant Harbor WRP has a current capacity of 63,000 gallons per day with an ultimate planned capacity of 189,000 gallons per day. The Scorpion Bay WWTP has a current capacity of 19,500 gallons per day with an ultimate planned capacity of 35,000 gallons per day. Neither of these two facilities are owned, maintained, or operated by the City of Peoria.

Summary of Proposed Improvements (2014-2023).

Item	Estimated Cost
Southern Region	
Collection System	$4,471,620
Butler WRF Upgrades/Expansion	5,140,000
Reuse/Recharge of Effluent	7,413,546
North Central Region	
Collection System	9,200,376
Beardsley WRF Upgrades/Expansion	21,040,678
Northwest Region	
Jomax WRF Upgrades/Expansion	636,624
Total	$47,902,844

2.3.5 Surprise

The Municipal Planning Area for the City of Surprise is comprised of Regional Analysis Zones 204, 211, 212, 232, 233, and 234 and is depicted on Figure 2.12. The Surprise Municipal Planning Area, approved by the MAG Regional Council as part of the 2013 resident population projections, covers approximately 285 square miles. The City is the designated wastewater management agency for this area.

The City of Surprise divided its planning area into six smaller Special Planning Areas (SPAs), based on the planning area identified in the Surprise General Plan. Generally, the SPA1-SPA6 planning areas also double as wastewater service areas with minor exceptions. In 2009, the City approved an update to its Integrated Water Master Plan (IWMP) related to the projected collection and wastewater treatment needs for the City of Surprise General Plan 2020 across the six SPAs. The City of Surprise intends to control and plan development in each of the different planning areas as development activity moves forward.

Special Planning Area 1 (SPA1) is comprised of approximately 43 square miles and includes the majority of the currently developed portion of the City plus an additional two square mile wastewater collection service area that was obtained through an Intergovernmental Agreement with the City of Glendale. The temporary agreement to have the City of Surprise provide sewer service to this two mile service area, which is outside of the Surprise City limits and within the Glendale Municipal Planning Area, was approved by the MAG Regional Council on February 23, 2005 through a 208 amendment. The approximate geographic boundaries of the SPA1 wastewater service area are: the Beardsley Canal on the north, 115th Avenue on the east, Peoria Avenue on the south and 195th Avenue on the west. In addition, the two square mile section served outside of the City limits are bounded by Peoria Avenue on the north, 179th Avenue on the east, Northern Avenue on the south and 187th Avenue on the west.

Special Planning Area 2 (SPA2) is north of SPA1 and is comprised of approximately 23 square miles and is located on the east side of Grand Avenue. It has experienced early development and installation of initial infrastructure as a result of the high rate of growth over the past decade. The approximate SPA2 wastewater service area geographic boundaries are: the CAP Canal on the north, 135th Avenue on the east, the Beardsley Canal on the south and Grand Avenue on the west.

Special Planning Area 3 (SPA3) is west of Grand Avenue and SPA2 and includes approximately 58 square miles. There is future development planned but to date none has moved forward. The approximate SPA2 wastewater service area geographic boundaries are: the CAP Canal on the north, Grand Avenue on the east, Bell Road on the south and 259th Avenue on the west.

Special Planning Area 4 (SPA4) is northwest of SPA2, east of Grand Avenue and is comprised of approximately 48 square miles. There is future development planned but to date none has moved forward. The approximate SPA4 wastewater service area

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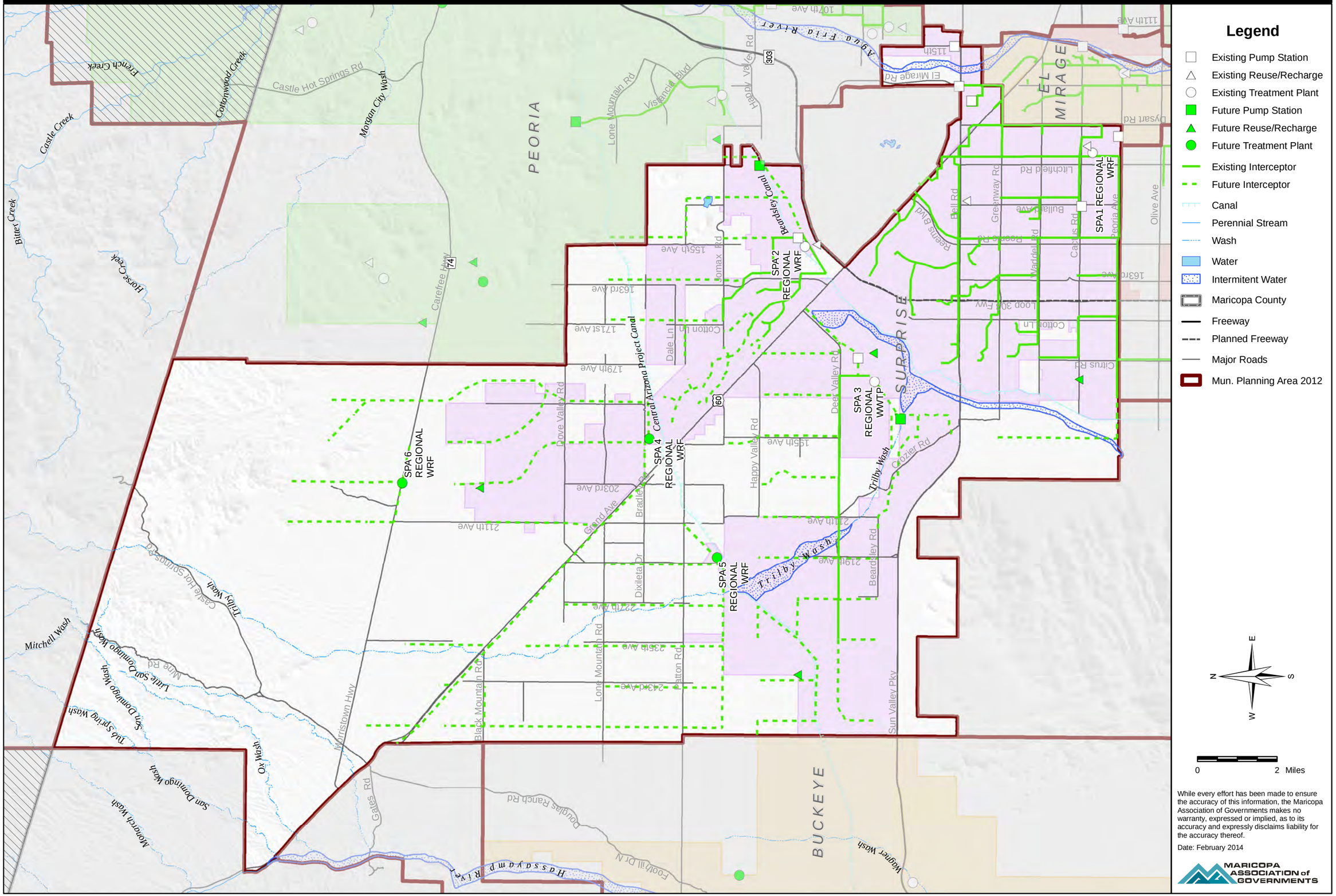
Figure 2.12 Surprise Municipal Planning Area



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geographic boundaries are: State Route 74 on the north, 155th Avenue on the east, the CAP Canal on the south and Grand Avenue on the west.

Special Planning Area 5 (SPA5) includes approximately 57 square miles and is northwest of SPA3 and west of Grand Avenue. There is future development planned but to date none has moved forward. The approximate SPA5 wastewater service area geographic boundaries are: State Route 74 on the north, Grand Avenue on the east, the CAP Canal on the south and 275th Avenue on the west.

Special Planning Area 6 (SPA6) is comprised of approximately 81 square miles and is north of SPA4 and SPA5. The approximate SPA6 wastewater service area geographic boundaries are: Yavapai County on the north, 179th Avenue on the east, State Route 74 on the south and 259th Avenue on the west.

Population and Flow Projections. Surprise is expected to experience significant growth over the planning period. The 2010 through 2040 population and wastewater flow projections for the City are presented in Table 2.16. The projected populations are based on the 2013 MAG population projections. Wastewater flows are projected based on a 70 gpcd demand factor from the Surprise Integrated Water Master Plan.

Table 2.16 Surprise Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)
2010	141,146	9.88
2020	175,853	12.31
2030	258,683	18.11
2040	364,357	25.50

Existing Wastewater System. The existing City of Surprise collection systems are currently located within SPA1, SPA2, and the two square miles of unincorporated Maricopa County within the Glendale Municipal Planning Area, which is where most of the existing development resides. The main interceptors are generally separated by Special Planning Areas and are typically located on the north/south and east/west mile roadway alignments with smaller contributory lines within each geographic square mile. The SPA1 collection system (including the two square miles within the Glendale Municipal Planning Area) is substantially built out; the SPA2 collection system is in the early development stages; and the SPA3 collection system has several miles of interceptor installed on Deer Valley Road but not yet activated due to a lack of development activity. There are currently no interceptors within SPA4, SPA5, and SPA6.

Existing Wastewater Treatment. With the previous closure of the SPA1 Litchfield Road WWTP in 2008 and SPA2 Temporary Desert Oasis WWTP, due to its replacement by the SPA2 Regional WRF, the City of Surprise currently has two operating water reclamation facilities, the SPA1 WRF and the SPA2 WRF.

The SPA1 WRF has a current constructed operating capacity of 16.3 mgd and includes rotary and step screens, grit removal, oxidation ditches with nitrification/denitrification, secondary clarifiers, tertiary filters, and chlorine disinfection. A portion of the effluent is sent off-site through a reuse system for irrigation of landscape and the majority is recharged through a combination of groundwater recharge basins and vadose zone wells located on-site. Additionally, a small portion of the effluent is used for irrigation on the treatment facility site. The majority of biosolids treatment is available through aerobic digestion and a lesser amount through auto thermal thermophyllic aerobic digestion (ATAD) which produces Class A biosolids with the potential for land application.

The SPA2 Regional WRF - Phase 1 has a current constructed operating capacity of 2.0 mgd and includes rotary screens, grit removal, oxidation with nitrification/denitrification, Membrane Bioreactors (MBR), centrifuge dewatering, and UV disinfection. The effluent is recharged through groundwater recharge basins and vadose zone wells located on-site.

Future Wastewater System Development. Since the MAG 208 Plan was last updated in 2002, the following Water Quality Management Plan Amendments have been approved by the MAG Regional Council for SPAs 2, 3, 4, and 5:

- MAG 208 Water Quality Management Plan Amendment for the City of Surprise Special Planning Area 3 Regional Water Reclamation Facility, approved February 23, 2005 (CSA Engineering, 2004).
- MAG 208 Water Quality Management Plan Amendment for the City of Surprise Special Planning Area 2 Regional Water Reclamation Facility, approved July 27, 2005 (PERC and PACE, 2005).
- MAG 208 Water Quality Management Plan Amendment for the City of Surprise Special Planning Area 4 Regional Water Reclamation Facility, approved July 26, 2006 (PERC and PACE, 2006).
- MAG 208 Water Quality Management Plan Amendment for the City of Surprise Special Planning Area 5 Regional Water Reclamation Facility, approved July 26, 2006 (PERC and PACE, 2006a).

The MAG Regional Council also approved the Desert Oasis Wastewater Treatment Facility through the Small Plant Review and Approval Process on May 23, 2003 (GTA Engineering, 2003). As mentioned previously, this temporary facility was closed and replaced by the SPA2 Regional WRF.

Special Planning Area 1. The SPA1 Regional WRF master planned capacity is projected to be 24 mgd at build-out, which is anticipated to be accomplished by construction of additional 4 mgd modular phases as development activity increases within the service area. The expansion technology will be determined in conjunction with the most recent Surprise Technology Assessment documents.

The SPA1 wastewater system infrastructure will expand in conjunction with ongoing development. In order to expand opportunities for effluent reuse, the City owns and operates: 1) A reclaimed transmission line and pressure booster station that extends from

the SPA1 WRF north in Litchfield Road to Statler Boulevard and then westerly along Statler and Young Street to the Bell Road Lake area, and 2) A second reclaimed transmission line that extends west on Cactus Road, from Litchfield Road, to Citrus Road (179th Avenue). These lines deliver reclaimed effluent for irrigation to multiple open space areas and in the future will deliver reclaimed effluent to the City multi-use complex at the Surprise Civic Center.

Special Planning Area 2. The SPA2 Regional WRF master planned capacity is projected to be 10.1 mgd at build-out. Additional modular phases of the Regional WRF will be constructed as development activity increases within the service area. Future expansion technology will be determined in conjunction with the most recent Surprise Technology Assessment documents.

Additionally, a separate 1.2 mgd SPA2 "Developer Phase" WRF has been substantially constructed and will be completed and dedicated to the City, for consolidation into the master planned Regional SPA2 WRF, as development activity increases flows within the service area. The SBR facility incorporates activated sludge type biological nutrient removal treatment system with advanced tertiary treatment. It will be equipped with screening, grit removal, biological BOD reduction, nitrification/denitrification, clarification, filtration, and ultraviolet disinfection. Sludge storage, treatment, and processing capability will also be incorporated. Odor and noise control and aesthetic measures will be incorporated in accordance with State regulations. Effluent will be reclaimed for landscape and open space irrigation. Any excess effluent will be used for groundwater recharge through vadose wells and percolation basins. In the event that not all the effluent water is reused/recharged, an AZPDES permit may be sought to allow an additional point of discharge to the McMicken Dam outlet or the Agua Fria River (PERC and PACE, 2005).

Special Planning Area 3. The SPA3 Regional WRF master planned capacity is projected to be 19.4 mgd at build-out. The City currently owns one hundred and five acres of land which will become the future SPA3 Regional WRF site.

Currently, a 1.8 mgd "Developer Phase" WRF has been constructed and will be dedicated to the City, along with thirty-five acres of land, once development activity begins in the area. The Developer Phase SBR facility incorporates activated sludge type biological nutrient removal treatment system with advanced tertiary treatment. It will be equipped with screening, grit removal, biological BOD reduction, nitrification/denitrification, clarification, filtration, and ultraviolet disinfection. Sludge storage, treatment, and processing capability will also be incorporated. Odor and noise control and aesthetic measures will be incorporated in accordance with State regulations. Effluent will be reclaimed for landscape and open space irrigation. Any excess effluent will be used for groundwater recharge through percolation basins or vadose wells.

Additional modular phases of the Regional WRF will be constructed as development activity increases within the service area. Future expansion technology will be determined in conjunction with the most recent Surprise Technology Assessment documents.

Special Planning Area 4. The SPA4 WRF master planned capacity is projected to be 13.8 mgd at build-out. The City does not currently own or control any land or infrastructure within SPA4. It will be necessary for the City to partner with future development entities in order to facilitate the necessary infrastructure to develop this service area.

Effluent will be reclaimed for landscape and open space irrigation. Any excess effluent will be used for groundwater recharge through vadose wells and percolation basins. In the event that not all the effluent water is reused/recharged, an AZPDES permit may be sought to allow an additional point of discharge to the Agua Fria River or unnamed washes south of the WRF and west of the Agua Fria River (northwest quarter of Section 28, Township 5 North, Range 2 West of the Gila and Salt River Basin Meridian) (PERC and PACE, 2006).

Special Planning Area 5. The SPA5 Regional WRF master planned capacity is projected to be 15.7 mgd at build-out. The City currently owns fifty acres of land which will become the future SPA5 Regional WRF site.

Additionally, a 1.2 mgd "Developer Phase" WRF has been substantially designed and, when constructed in response to future development, will be dedicated to the City. The Developer Phase SBR facility incorporates activated sludge type biological nutrient removal treatment system with advanced tertiary treatment. It will be equipped with screening, grit removal, biological BOD reduction, nitrification/denitrification, clarification, filtration, and ultraviolet disinfection. Sludge storage, treatment, and processing capability will also be incorporated. Odor and noise control and aesthetic measures will be incorporated in accordance with State regulations. Effluent will be reclaimed for landscape and open space irrigation. Any excess effluent will be used for groundwater recharge through percolation basins or vadose wells. In the event that not all effluent water is reused/recharged, an AZPDES permit may be sought to allow for additional discharge points to the Hassayampa River, to the Trilby Wash, or an unnamed wash east of the WRF (in the southwest corner of Section 36, Township 5 North, Range 3 West of the Gila and Salt River Base Meridian) (PERC and PACE, 2006a).

Additional modular phases of the Regional WRF will be constructed as development activity increases within the service area. Future expansion technology will be determined in conjunction with the most recent Surprise Technology Assessment documents.

Special Planning Area 6. The SPA6 WRF master planned capacity is projected to be 5.4 mgd at build-out. The City does not currently own or control any land or infrastructure within SPA6. It will be necessary for the City to partner with future development entities in order to facilitate the necessary infrastructure to develop this future service area.

Summary of Proposed Improvements.

Item	Estimated Cost
SPA1 WRF Vadose Zone Well Design/Construction (2011-2012)	$3,552,600

2.3.6 Youngtown

The Planning Area for Youngtown consists of Regional Analysis Zone (RAZ) 236, and is depicted on Figure 2.13. The approximate boundaries of Youngtown are Grand Avenue on the north, the Agua Fria River to the west, Olive Avenue on the south and 111th Avenue on the east. 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 for the Town of Youngtown is expected to increase minimally over the planning period. Based on information provided by the Town, a per capita wastewater flow rate of 90 gpcd is used for projecting future wastewater flow. Table 2.17 presents the projected wastewater flows for Youngtown using the 2013 MAG population projections.

Table 2.17 Youngtown Population and Flow Projections MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)
2010	6,582	0.59
2020	7,174	0.65
2030	8,178	0.74
2040	8,389	0.76

Existing Collection System. The existing collection system serving the incorporated area of Youngtown is operated by EPCOR Water (formerly Arizona American Water Company). Wastewater from this collection system is conveyed from the Youngtown Lift Station to the EPCOR Water 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, sold its wastewater system to Arizona American Water Company (now EPCOR Water) in 1995. EPCOR Water 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 planning period. Therefore, no major system developments are expected. EPCOR Water has adequate capacity for Youngtown flows to be treated in the Tolleson WWTP over the planning period.

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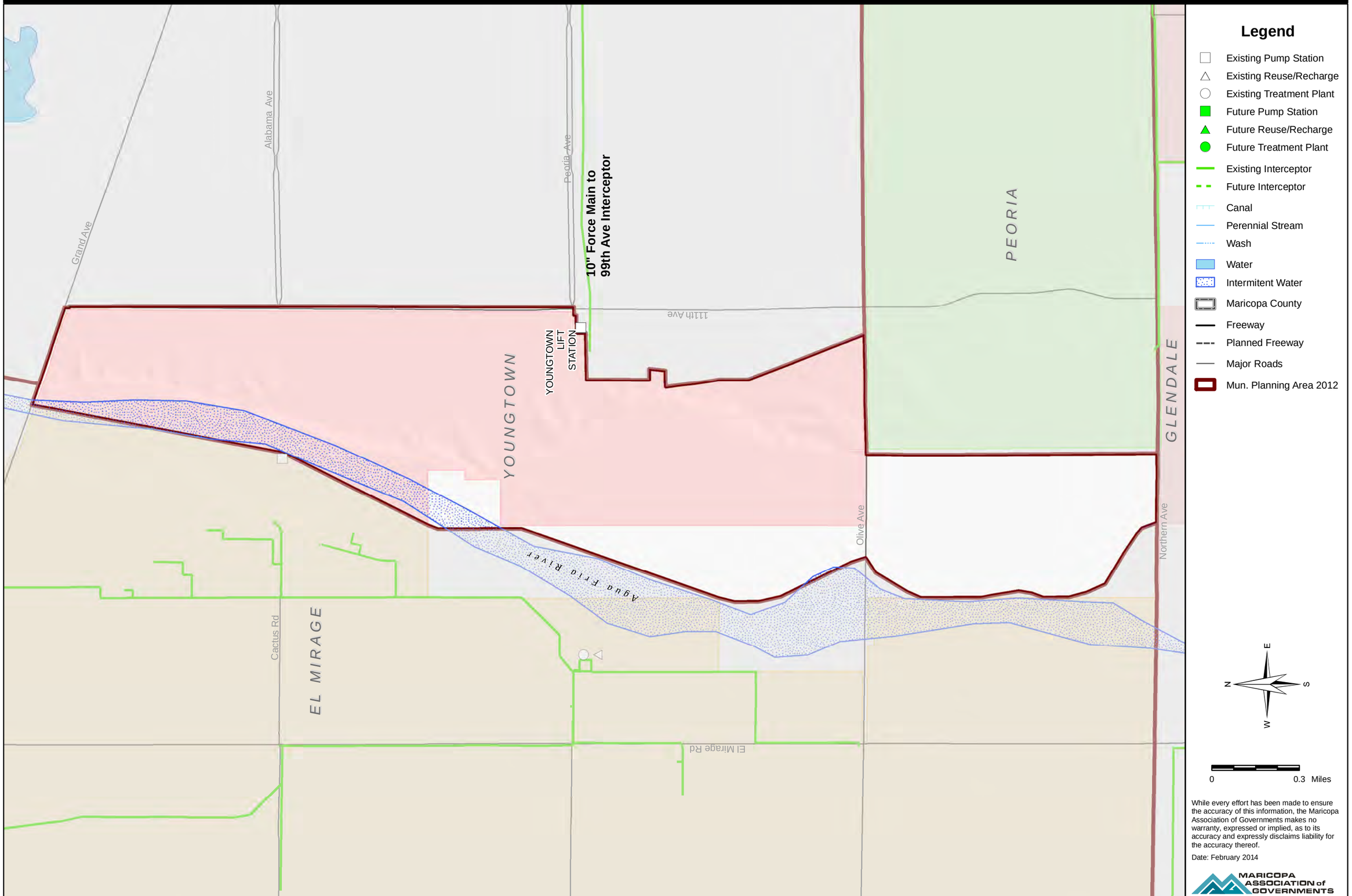
Figure 2.13 Youngtown Municipal Planning Area



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2.4 NORTHEAST AREA

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 five 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 2.14 depicts the Carefree Municipal 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. Previous 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 2.18, are used by the utility to size its facilities. Projected populations and wastewater flows are based on the 2013 MAG population projections.

Table 2.18 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
2010	5,141	3,856	0.46	0.69
2020	5,742	4,307	0.52	0.78
2030	6,593	4,945	0.59	0.89
2040	7,100	5,325	0.64	0.96

[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.

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.

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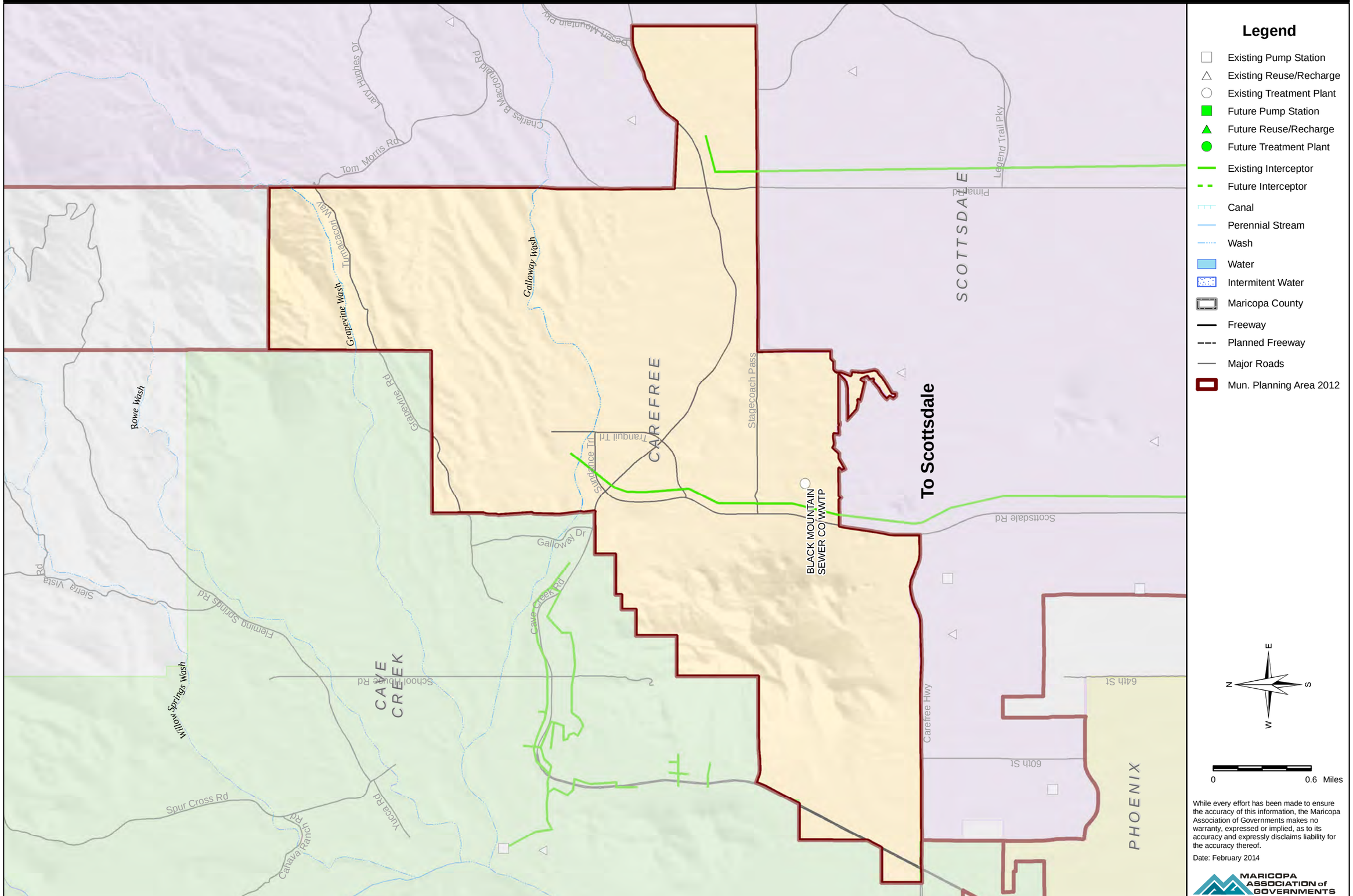
Figure 2.14 Carefree Municipal Planning Area



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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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2.4.2 Cave Creek

The Town of Cave Creek, corresponding to Regional Analysis Zone (RAZ) 207, constructed and began operating its new Water Ranch in 2010. The Rancho Mañana Wastewater Treatment Plant was decommissioned once the new facility became operational. Much of the sewered area was acquired by the Town from the Cave Creek Sewer Company private utility in the mid-1990s. The rest of the Town is served by septic tanks.

The planning area depicted on Figure 2.15 consists of the incorporated Town plus county land to the northeast. 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.

In making flow projections, it is assumed that not all areas within the Town will be sewered due to topography and low densities. Table 2.19 includes the Town's population, based on the 2013 MAG population projections, and the projected sewered population and associated wastewater flows based on the 2013 Cave Creek Wastewater Master Plan. Wastewater flows were calculated using a 200 gpcd unit flow rate.

Table 2.19 Cave Creek Population and Flow Projections MAG 208 Water Quality Management Plan Update

Year	Population	Sewered Population	Flow (mgd)
2010	5,571	1,045	0.21
2020	6,566	1,934	0.39
2030	8,473	2,819	0.56
2040	9,959	2,819	0.56

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.

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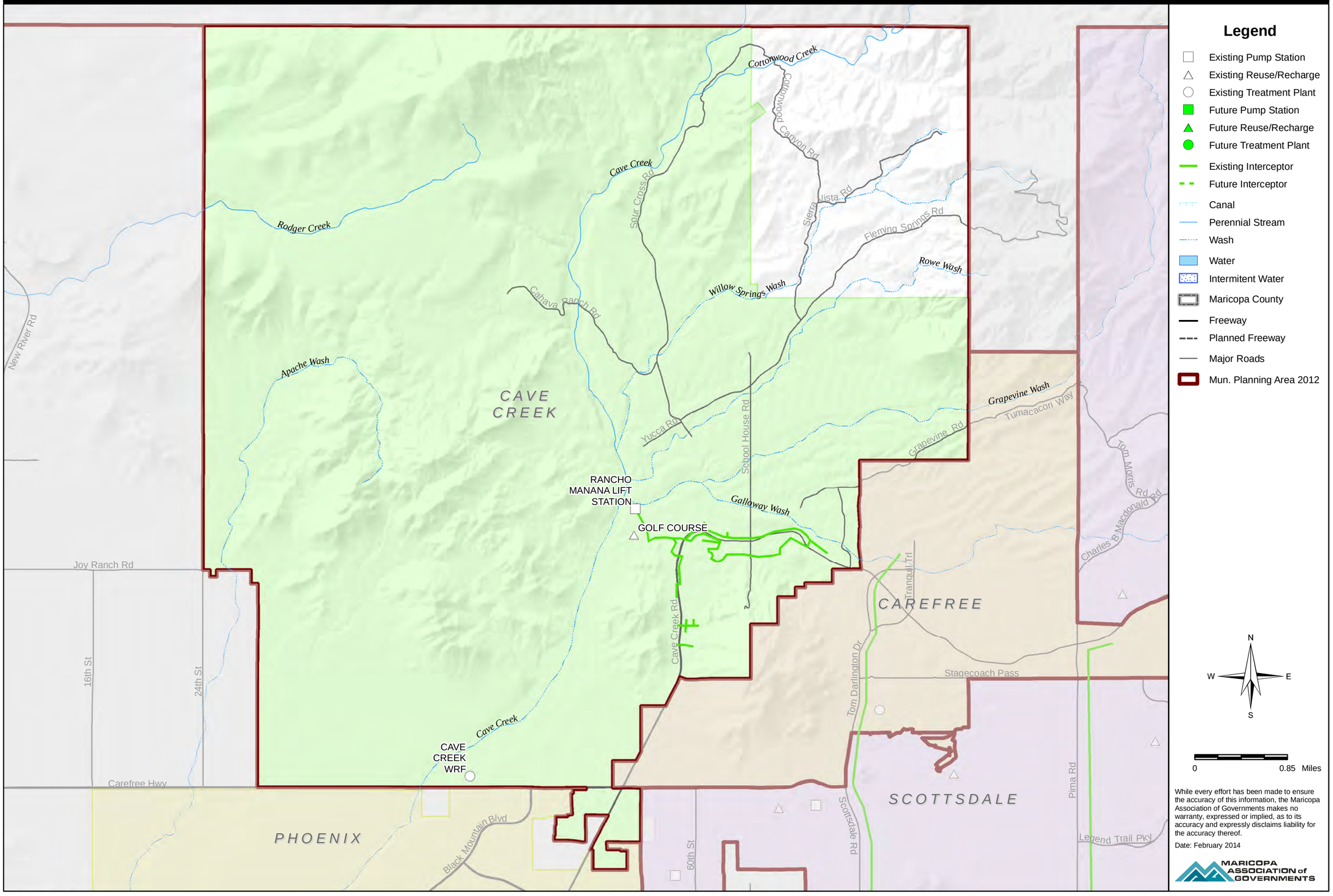
Figure 2.15 Cave Creek Municipal Planning Area



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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 Mañana Road to the eastern Town limits.

Existing Wastewater System Development. On July 23, 2008, the MAG Regional Council approved a MAG 208 Amendment for the Town of Cave Creek Water Reclamation Facility (Burns & McDonnell, 2008). The new facility was constructed and became operational in November 2010. It is located near the corner of 44th Street and Carefree Highway. Flows are accepted from the Cave Creek Municipal Planning Area; however, some areas within the Municipal Planning Area will not be sewered due to the undulating, hilly terrain and large lots with homes some distance apart. Any future developments will be connected to the sewer system when possible (Burns & McDonnell, 2008). The Rancho Mañana Wastewater Treatment Plant was decommissioned in 2010 once the new facility became operational.

The current capacity of the water reclamation facility is 0.75 mgd with an ultimate capacity of 2.25 mgd. The facility consists of screening, grit removal, secondary treatment with biological nutrient removal, tertiary filtration, and chlorination/dechlorination. The biosolids are aerobically digested and mechanically dewatered. Odor control equipment is also utilized. Initially, effluent from the facility is reused for irrigation on the Rancho Mañana Golf Course and discharged to the Galloway Wash (tributary to Cave Creek Wash) under an AZPDES permit. Future disposal options include additional reuse in landscaped areas and an AZPDES permit discharge to Cave Creek Wash (Burns & McDonnell, 2008). The facility is owned and operated by the Town of Cave Creek.

Future Wastewater System Development. Zoning is generally one unit per five acres that would allow continued use of septic tanks. Future development would be to expand the Water Ranch (WRF) as needed.

The Town is interested in discussing regional wastewater treatment and disposal options with Maricopa County and the neighboring communities of Carefree or Phoenix.

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

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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 (FHSD). With the exception of the former State Trust Land in the northeast corner of the community (annexed by the Town in 2006), FHSD serves the incorporated Town and a portion of the 405 acres know as Eagle Ridge, which was previously annexed by the City of Scottsdale. The owners of the former State Trust Land are currently in discussions with the Fountain Hills Sanitary District to annex the property into the District for the provision of sewer service. All platted areas of the community are sewered. The Fountain Hills Sanitary District is a local government agency (special district) whose Board of Directors is elected by the public. The Town of Fountain Hills itself does not operate any wastewater facilities. The Sanitary District service area is depicted on Figure 2.16.

Population and Flow Projections. Table 2.20 presents the 2010 through 2040 population for the Town of Fountain Hills, based on the 2013 MAG population projections. Wastewater flows for 2010 are based on actual flow. Projected flows for 2020 and 2030 were provided by the Town of Fountain Hills. The flows for 2040 are projected based on a unit flow rate of 100 gpcd.

Table 2.20 Fountain Hills Population and Flow Projections MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)[1]
2010	27,255	1.99
2020	31,251	3.00
2030	33,983	3.30
2040	35,012	3.50

[1] The 2010 value is based on actual flow.

Existing Collection System. All wastewater generated in Fountain Hills is collected and conveyed to the FHSD 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 18 lift stations with force mains.

Existing Treatment Facility. The Fountain Hills Sanitary District operates a wastewater treatment plant, currently rated at 2.9 mgd (annualized average daily flow). 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).

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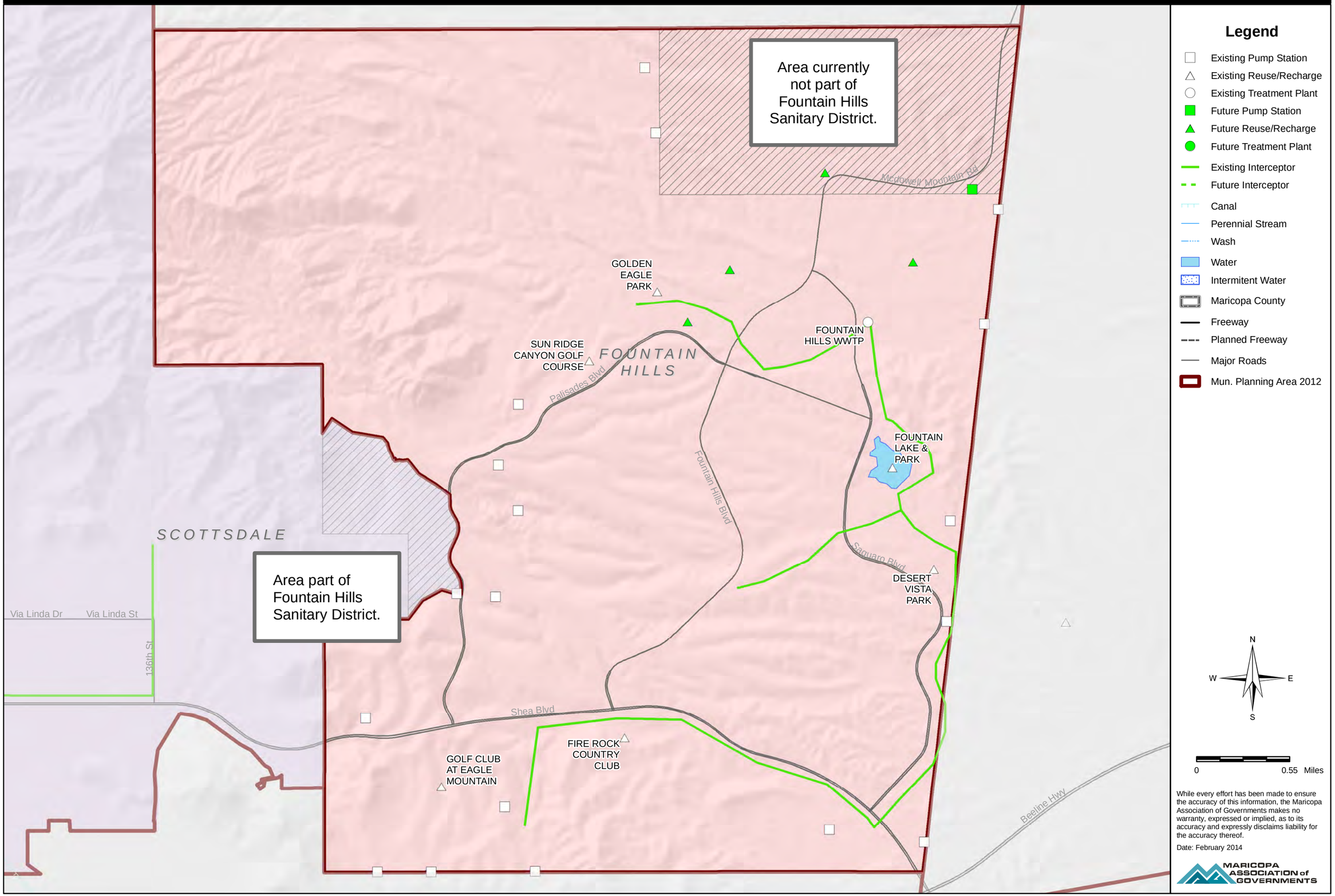
Figure 2.16 Fountain Hills Municipal Planning Area



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- Grit removal chambers.
- Aeration basins with diffused aeration and biological nitrogen removal.
- Secondary clarifiers.
- Cloth disk filters.
- Chlorine disinfection and UV 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 3 mgd, takes effluent that is not reused for irrigation. The aerobically-digested sludge is thickened, dewatered, and then hauled to the Apache Junction or Tri-City Landfill.

Future Wastewater System Development. The Fountain Hills Sanitary District will continue to replace or provide relief for existing collection system components as the need arises in the future. Also, the reclaimed water system will be expanded or upgraded. Additional wells will be required for recharge and recovery.

The Fountain Hills Sanitary District treatment plant will be expanded at its current location in the future to an ultimate capacity of 3.3 mgd annualized average daily flow (3.8 mgd average day in maximum month). Many of the unit processes are already rated at 3.3 mgd; therefore only certain unit processes, i.e. influent pumping and aerobic digestion facilities, will need expansion. State requirements for redundancy may impact the expansion of additional unit operations at the plant.

The FHSD will pursue an AZPDES 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 2015.

Item	Estimated Cost[1]
Reclaimed Water System Improvements	$5,900,000
Collection System Improvements	1,000,000
Total	$6,900,000

[1] All costs are in March 2011 dollars.

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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 2.17.

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) 1030 west of Indian Bend Wash. Most of TAZ 1030 east of Indian Bend Wash is served by the City of Scottsdale with discharge to the Scottsdale Road Interceptor (SRI). 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 projecting wastewater flows, the Town of Paradise Valley uses 480 gallons per day per lot, with 2.1 people per lot. This is approximately 230 gpcd, which is considerably higher than the 100 gpcd 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 gpcd. In making flow projections, it is assumed that existing unsewered developments as well as any future developments will not receive sewer service over the duration of the planning period. Table 2.21 presents the population and flow projections for the Town of Paradise Valley based upon the 2013 MAG population projections and a unit flow rate of 230 gpcd.

Table 2.21 Paradise Valley Population and Flow Projections MAG 208 Water Quality Management Plan Update

Year	Total Population	Unsewered Population	Sewered Population	Sewered Wastewater Flow (mgd)
2010	17,275	8,638	8,637	1.99
2020	18,545	9,908	8,637	1.99
2030	20,260	11,623	8,637	1.99
2040	21,181	12,544	8,637	1.99

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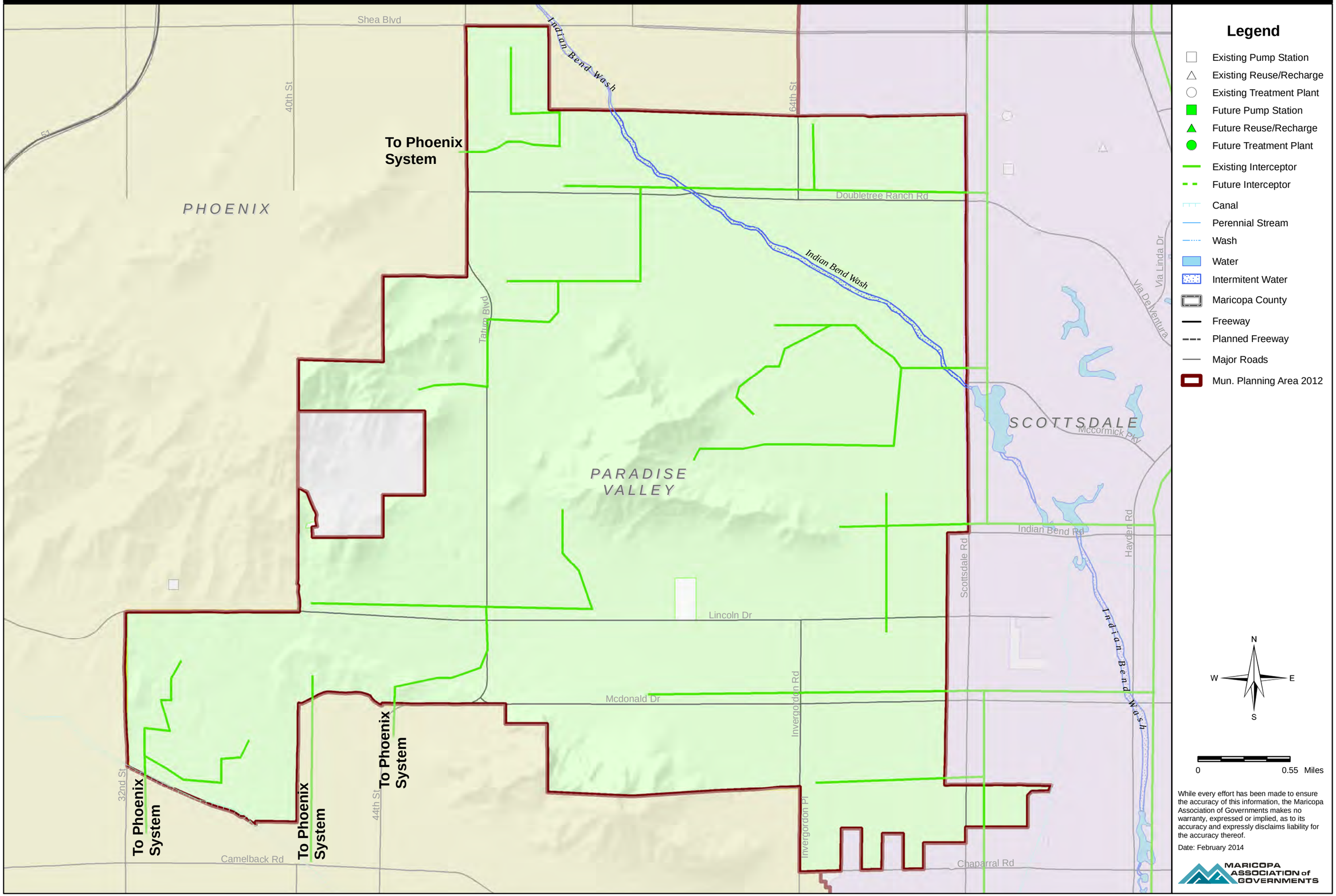
Figure 2.17 Paradise Valley Municipal Planning Area



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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 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-Paradise Valley Interceptor along Doubletree Ranch Road.

The Paradise Valley system has several points of connection to the Scottsdale Road Interceptor. Portions are collected at Doubletree Ranch Road and discharged to the Scottsdale-Paradise Valley Interceptor at Doubletree Ranch Road. All flows collected by the Scottsdale Road Interceptor are conveyed 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 1.03 mgd, flows to Scottsdale per an Intergovernmental Agreement, signed in 1998 and additional capacity was purchased in 2006. Scottsdale is currently only treating about 0.3 mgd. Table 2.22 shows the wastewater capacity at each of the plants for the Town of Paradise Valley.

Table 2.22 Paradise Valley Wastewater Flow Distribution MAG 208 Water Quality Management Plan Update

City of Scottsdale (mgd)	City of Phoenix (mgd)	SROG (mgd)	Total (mgd)
1.03	0.42	0.50	1.95

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.

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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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 2.18.

The Scottsdale Planning Area covers approximately 190 square miles. The Planning Area is generally divided into two parts: north of the 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. It is expected that all development within the boundaries of the Scottsdale Municipal Planning Area will receive sewerage service provided by the City. Scottsdale has Intergovernmental Agreements with Black Mountain Sewer Corporation, and Paradise Valley to treat up to 1 mgd and 1.03 mgd, respectively. Scottsdale also conveys about 5.4 mgd of Phoenix flows through the Scottsdale-Paradise Valley Interceptor to the Salt River Outfall (SRO).

Table 2.23 presents the population and flow projections for the City of Scottsdale. Population projections are based upon the 2013 MAG population projections. The projected wastewater flows for 2010 through 2030 were provided by the City of Scottsdale. Wastewater flows for 2040 were projected based on a unit flow rate of 100 gpcd.

Table 2.23 Scottsdale Population and Flow Projections MAG 208 Water Quality Management Plan Update

Year	Scottsdale Population	Scottsdale Flow (mgd)	External Flow (mgd)[1]	Total Flow (mgd)
2010	255,584	19.20	2.03	21.23
2020	297,596	23.60	2.03	25.63
2030	332,394	28.70	2.03	30.73
2040	347,168	34.72	2.03	36.75

[1] External flow consists of BMSC flow of 1 mgd and Paradise Valley flow of 1.03 mgd.

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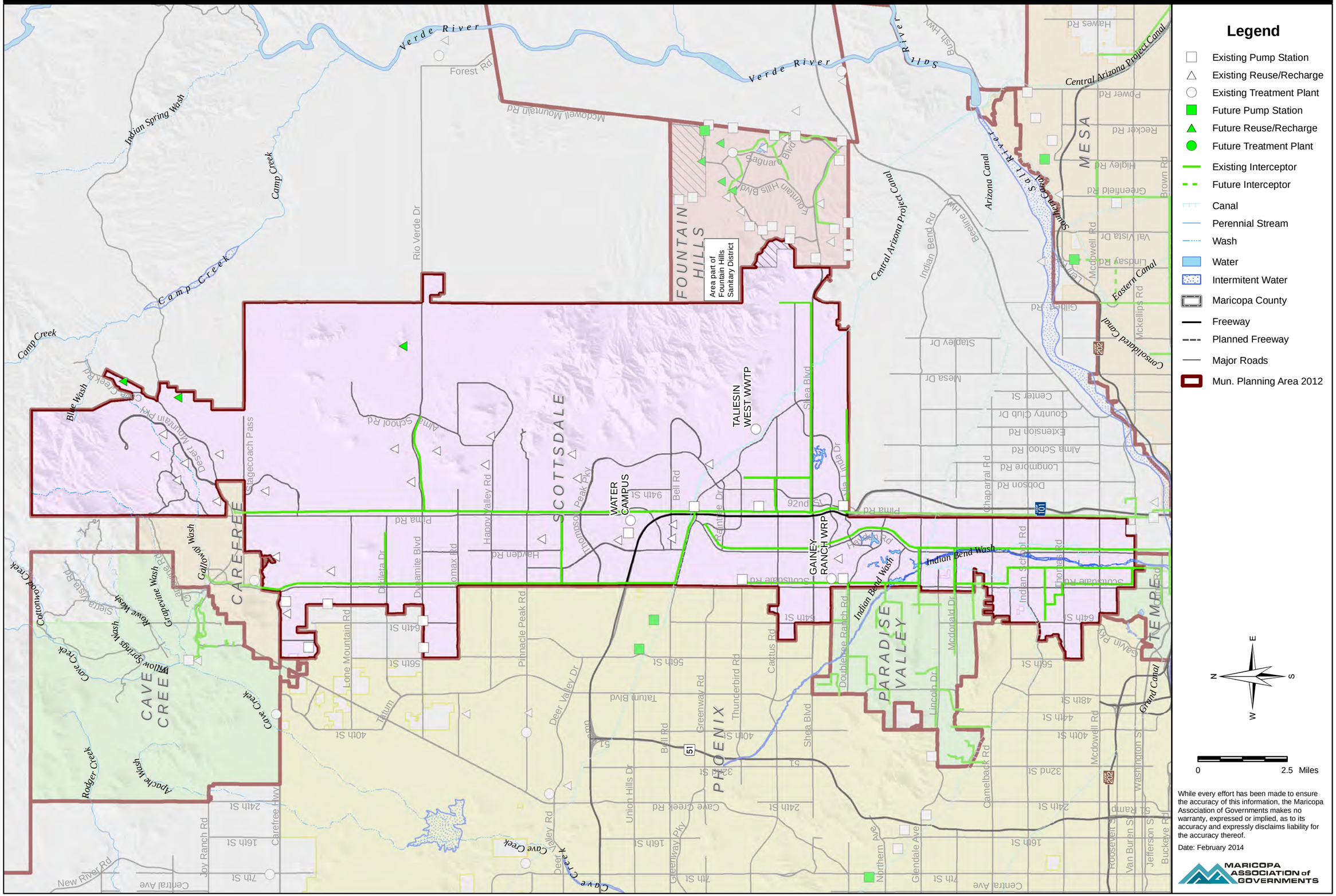
Figure 2.18 Scottsdale Municipal Planning Area



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Date: February 2014

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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 Salt River Outfall in the Scottsdale Road Interceptor.

BMSC-Carefree discharges residential wastewater to Scottsdale sewers at approximately 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 to Scottsdale.

Paradise Valley discharges residential wastewater to Scottsdale at several locations along Scottsdale Road that border the Town of Paradise Valley. This is primarily in the southern portion of Scottsdale south of Shea Boulevard. The most recent IGA started in 1998, allowing Paradise Valley to discharge up to 1.03 mgd into Scottsdale's collection system.

Wastewater within the City primarily flows in a north to south direction within its boundaries. This wastewater flow is ultimately conveyed through the Miller Road and Hayden Road trunk sewers to the Multi-City Salt River Outfall interceptor sewer which is located in the far southern portion of the City. This interceptor 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 conveyed for treatment and reclaimed purposes to the Water Campus Facility. The primary conveyance systems are sewer trunk lines along Scottsdale Road on the west and Pima Road on the east. These lines collect sewage in the northern region of the City and deliver it south to the Water Campus.

The City also has a major pump back system used to capture sewage from as far south as Doubletree Ranch Road on the west and Via Linda on the east. These flows are captured and conveyed via the five large pump stations associated with the pump back system and delivered to the Water Campus Facility for treatment and reclamation. The pumpback stations are identified below:

- Southwest Pumpback — 7301 E. Doubletree Ranch Road, Scottsdale
- Northwest Pumpback — 7535 E. Redfield Road, Scottsdale
- Southeast Pumpback — 8815 E. Via Linda Road, Scottsdale
- Northeast Pumpback — 13001 N. 80th Street, Scottsdale
- North Pumpback — 16638 N. Pima Road, Scottsdale

Existing Treatment System. As a member of the Multi-City SROG, Scottsdale currently owns 20.25 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; and 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 the appropriate regulatory permits 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 20 mgd at both facilities. The Campus is located north of the CAP Aqueduct near Pima Road. An ultimate capacity of 25 mgd is planned for the Wastewater Reclamation Plant and 20 mgd for the Advanced Water Treatment Plant. Effluent from the Water Reclamation Plant is used for open access irrigation (primarily golf courses) and effluent from the Advanced Water Treatment Plant is used for aquifer storage and recovery. Residual solids are conveyed through the existing collection system to the 91st Avenue WWTP for processing. The facility operates under all appropriate regulatory permitting necessary for reuse and recharge of effluent. Major 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.

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 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 and 2007 master plans including expansion of the Scottsdale Water Campus Water Reclamation and Advanced Water Treatment Plants.

Future treatment capacity (through planning year 2030) will be provided at the SROG facility, Scottsdale Water Campus, and the satellite water reclamation plants, as shown on Table 2.24. The Gainey Ranch WRP will be maintained as a permanent facility.

Scottsdale has constructed a water treatment plant to treat Salt River Project water supply. Residuals from that WTP are planned to be either discharged to the sanitary sewer system for treatment at the SROG facility at 91st Avenue or treated on-site.

Table 2.24 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)
2010	10.64	7.34	1.15	1.42	20.55
2020	12.91	12.20	1.15	2.60	28.86
2030	16.56	16.43	1.15	3.79	37.93

[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
Sewer Pumpback Modifications (FY 2020/2021)	$27,000,000
SROG Sewage Transmission Line Improvements (FY 2013/2014)	16,000,000
SROG 91st Avenue	21,500,000
Water Reclamation Plant On-Site Chlorine Generation (FY 2011/2012)	5,000,000
Water Reclamation Plant Expansion from 20 mgd to 25 mgd (FY 2018/2019)	22,000,000
Advanced Water Treatment Expansion (FY 2010/2011)	59,300,000
Total	$150,800,000

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2.5 SOUTHEAST AREA

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 2.19 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 2.25 depicts the 2013 MAG population projections for the Town of Guadalupe and wastewater flows projections based on a rate of 120 gpcd.

Table 2.25 Guadalupe Population and Flow Projections MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)
2010	6,415	0.77
2020	7,148	0.86
2030	7,918	0.95
2040	8,555	1.03

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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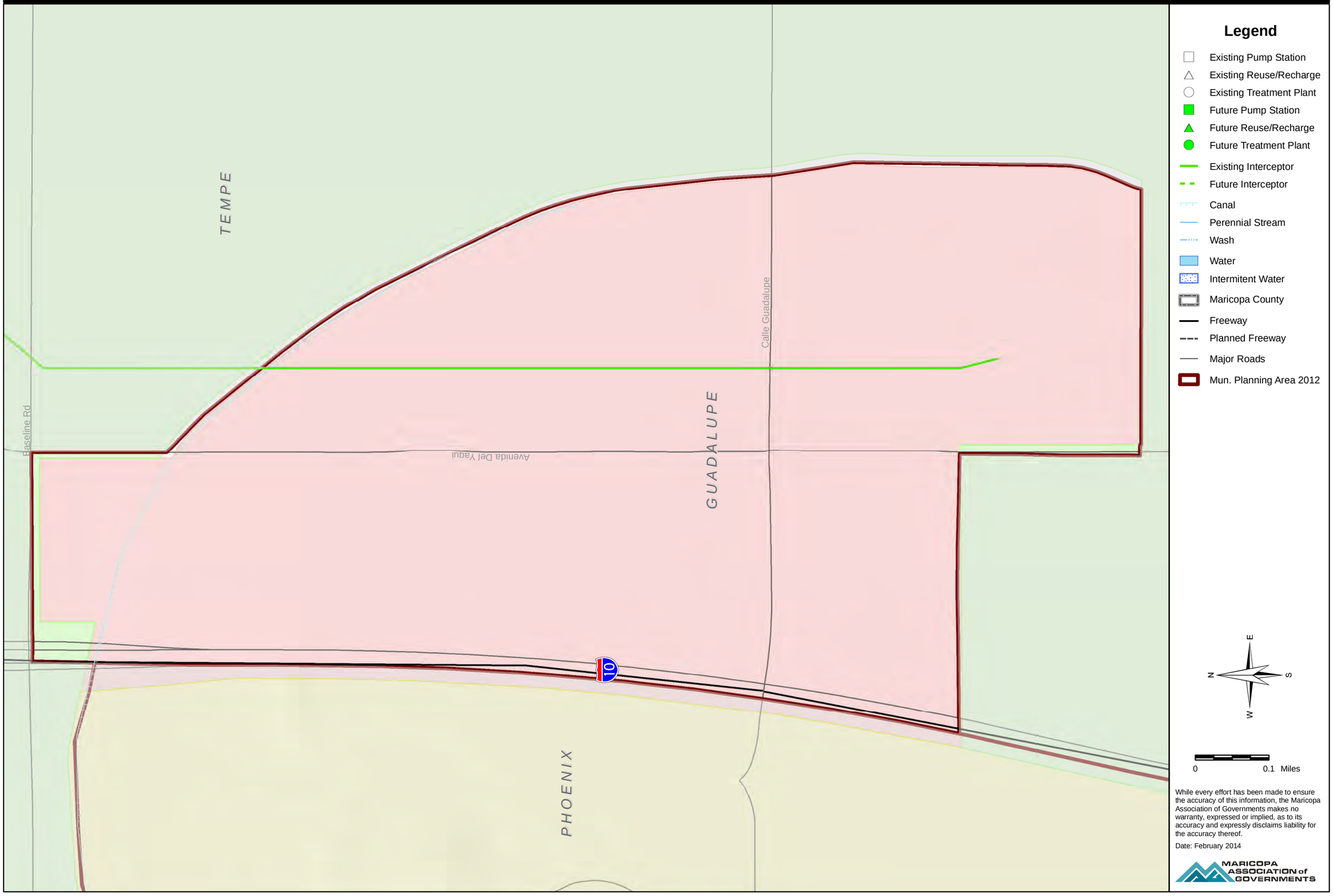
Figure 2.19 Guadalupe Municipal Planning Area



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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 area is bounded by Pecos Road from Interstate 10 to Price Road, by Chandler Heights from Price Road to Alma School Road and by Hunt Highway from Alma School Road 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 Alma School Road from Hunt Highway to Chandler Heights Road, Price Road from Chandler Heights to Pecos Road, and Interstate 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 2.20 depicts the Chandler Municipal Planning Area. The City of Chandler is the designated wastewater management agency for this area.

Population and Flow Projections. Table 2.26 depicts population and wastewater flow projections for Chandler over the planning period. Population data are based on the 2013 MAG population projections. The 2010 wastewater flow is based on actual flow and the 2020 and 2030 projections are from the 2008 Chandler Water, Wastewater, Reclaimed Water Master Plan. For 2040, projected wastewater flows are based on a 100 gpcd unit flow rate.

Table 2.26 Chandler Population and Flow Projections MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)[1]
2010	257,889	23.8
2020	298,380	32.0
2030	326,420	35.5
2040	340,297	34.0

[1] The 2010 value is based on the actual flow. The 2020 and 2030 values are based on the 2008 Chandler Water, Wastewater, Reclaimed Water Master Plan. The 2040 value is based on 100 gpcd.

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 (OWRF).

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

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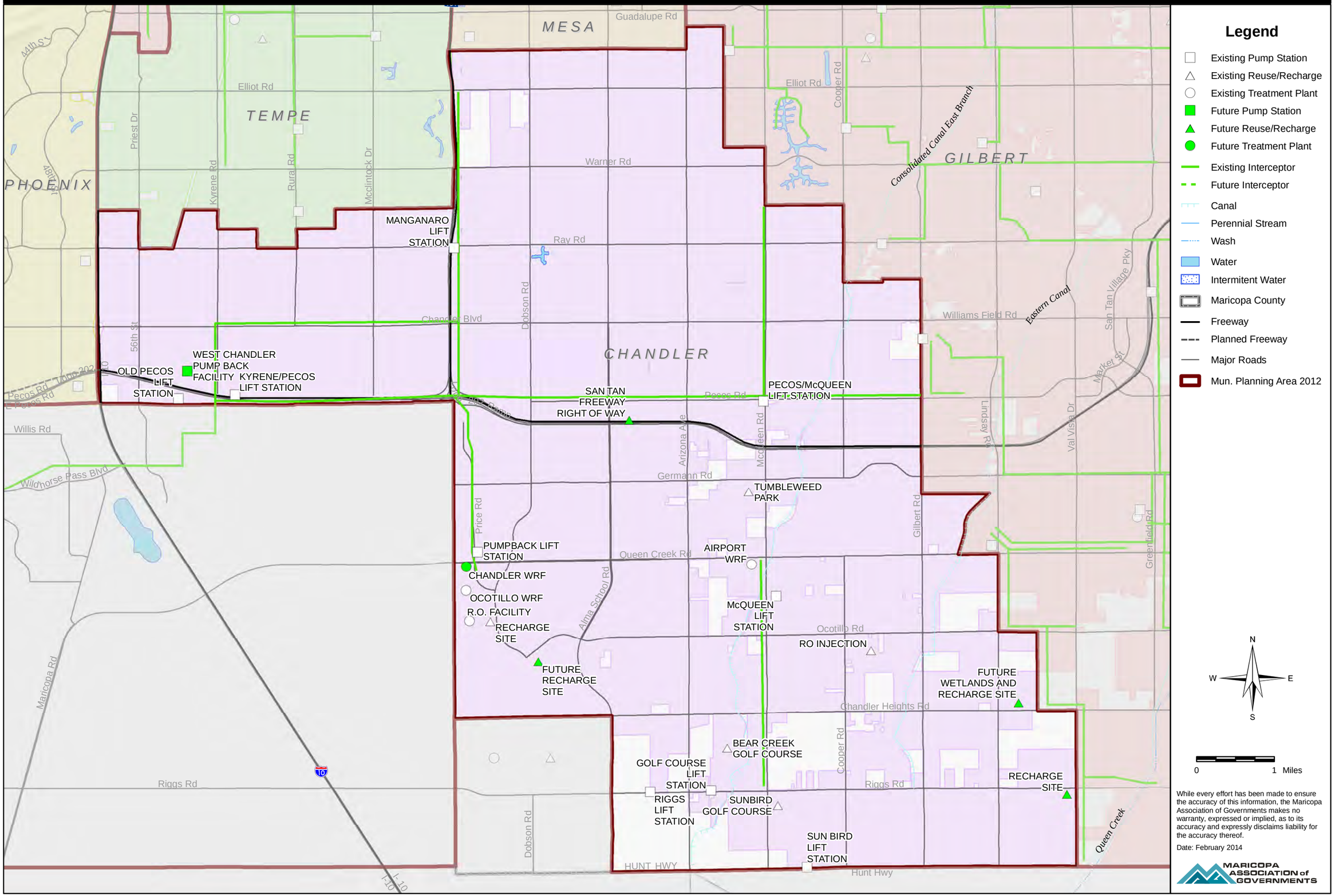
Figure 2.20 Chandler Municipal Planning Area



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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 McQueen Road Interceptor South is 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 control and distribute flow among 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 Old Pecos 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 approximately Chandler Boulevard in the north and to Pecos Road in the south. This lift station has a capacity for 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 Manganaro 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 Price Road Interceptor North, and has a capacity of 10 mgd.

The Sun Bird Lift Station, located midway between 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 Riggs Lift Station, on Riggs Road between Alma School 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, Golf Course Lift Station, Pecos/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 three 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 up to 15 mgd and is located on the southwest corner of Queen Creek Road and McQueen Road.

The Lone Butte WRF unit processes include fine 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. The City recently renegotiated its lease agreement with the GRIC to extend their capacity at Lone Butte through 2027. 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, and for golf course irrigation.

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. The facility is owned by the City and operated by Severn Trent Environmental Services (STES). Sludge produced at the Ocotillo WRF is landfilled at the Butterfield Landfill.

The effluent produced at the Ocotillo WRF is discharged through pump stations to the lake system in the Ocotillo Development, to Intel, to GRIC, and/or to aquifer storage and recovery (ASR) wells. 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 up to 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's Ocotillo Campus 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 recharge facility was developed south of the OWRF. This facility discharges additional effluent from the OWRF into the upper aquifer.

The Airport WRF is the City's newest reclamation facility. The facility is owned and operated by the City of Chandler, has a current treatment capacity of 15 mgd, and is master planned to be expanded to 30 mgd. Note that an expansion is underway to expand the capacity to 22 mgd to accommodate additional flows from Intel's new Fab 42.1 Facility. The major unit processes consist of fine screening, biological nutrient removal, clarification, flocculation, filtration, and sodium hypochlorite disinfection. The effluent produced at this facility is pumped to the upper aquifer unit through ASR wells at the City's Tumbleweed Park recharge facility (capacity of 10 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,

GRIC, or surface recharge at Veteran's Oasis Park. The sludge is dewatered with belt presses and disposed in Butterfield Landfill.

In addition to the three main treatment plants, the City of Chandler owns and operates an industrial wastewater treatment facility (the Ocotillo Brine Reduction Facility) with a capacity of 2.8 mgd, which treats industrial wastewater from Intel's Ocotillo Campus, located near Old Price Road and Queen Creek Road. The facility, which was recently upgraded in conjunction with Intel's construction of Fab 42.1 Facility, includes a variety of unit processes including a softening system, weak acid cation exchange, high efficiency reverse osmosis (RO) membranes, thermal brine concentration, and a mechanical dewatering facility. The product water produced at this facility is either sent directly to Intel for reuse in various onsite applications, or pumped to a recharge site located approximately six miles to the east at Gilbert Road and Ocotillo Road where the water is recharged to the aquifer through middle alluvial unit injection wells. The concentrated brine product produced by the facility is discharged to four brine ponds located at the site. Overflow volumes are discharged to offsite 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.

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 and build a new WRF adjacent to the existing Ocotillo WRF. The City has also taken steps to further address treatment capacity needs and add operational flexibility by constructing a new pumpback/lift station near the Pecos Road alignment and Kyrene Road. The lift station and associated force main will provide the flexibility to pump raw sewage from west Chandler back to the treatment facilities located in the southeastern portion of the City in the event the Lone Butte lease is not maintained or, in the event that development dictates its need.

- Lone Butte WRF - The Lone Butte WRF is not planned for expansion beyond the current capacity. While the City will maintain capacity allocation at the facility through at least 2027, the Lone Butte WRF is not part of the long-term wastewater solution for the City.

- Airport WRF - There is sufficient land at the existing site to expand the Airport WRF to 30 mgd, if necessary. The Airport WRF is currently treating 15 mgd, but is master planned for 30 mgd of average daily flows. The City is currently in the process of expanding the treatment capacity of the facility to 22 mgd to accommodate increased flows associated with Intel's new Fab 42.1 Facility. The City estimates that future

recharge and various future irrigation sites will account for the reclaimed water produced by the Airport WRF.

- Ocotillo WRF - The Ocotillo WRF has a current capacity of 10 mgd. There is sufficient space on the existing site to expand the site to 20 mgd in the future, if necessary. The City is currently evaluating a series of upgrades to the WRF to improve performance and increase the flexibility and robustness of the process.

- Chandler WRF - The City is moving forward with design and construction of a new WRF on land directly north of the existing Ocotillo WRF. The new Chandler WRF will be part of the larger campus, which includes the Ocotillo WRF and the Ocotillo Brine Reduction Facility. The facility will have an initial capacity of between 5 and 10 mgd with an ultimate planned capacity of 40 mgd to accommodate flows from the West Chandler area.

- Ocotillo Brine Reduction Facility - The Ocotillo BRF will continue to be dedicated specifically to treating waste flows from Intel's ultrapure water (UPW) systems at the Ocotillo Campus. The recent upgrades to the facility resulted in a 2.8 mgd capacity, but established the footprint and facility hydraulics to accommodate up to 5.6 mgd of treatment capacity should Intel further expand their Fabs in the future.

Table 2.27 summarizes the available capacity in each plant through year 2040:

Table 2.27 Flow Allocation (mgd) to WRF
MAG 208 Water Quality Management Plan Update

Year	Lone Butte WRF	Airport WRF[1]	Ocotillo WRF[2]	New Chandler WRF[3]	Total Available
2010	8.8	15.0	10.0	0.0[4]	33.8
2015	8.8	22.0	10.0	0.0	40.8
2020	8.8	22.0	10.0	10.0	50.8
2030	0.0	30.0	10.0	15.0	55.0
2040	0.0	30.0	10.0	20.0	60.0

[1]Site could allow expansion to 30 mgd.
[2]Site could allow expansion to 20 mgd.
[3]Site could allow expansion to 40 mgd.
[4]Expansion could occur at Airport WRF, Ocotillo WRF, or New Chandler WRF.

Summary of Wastewater System Improvements.

Item[1]	Estimated Cost
2010-2015	
Collection System Improvements	$10,000,000
WRF Expansion	$180,000,000
Reclaimed Water Transmission	$2,200,000
Recharge Facilities	$11,000,000
2015-2020	
Collection System Improvements	$10,000,000
WRF Expansion	$100,000,000
Reclaimed Water Transmission	$1,000,000
Total	$314,200,000

[1] Data from Chandler Municipal Utilities Department 2011-2016 Capital Improvement Plan.

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2.5.3 Gilbert

The Town of Gilbert Planning Area, depicted in Figure 2.21, consists of Regional Analysis Zones (RAZ) 311, 312, 318, 319, and 329. The Planning Area is approximately bounded by Baseline Road to the north, the Mesa and Queen Creek Planning Areas to the east, Hunt Highway to the south and the Chandler Planning Area to the west.

Population and Flow Projections. The Town of Gilbert has experienced record growth with a 2010 population surpassing 200,000. Given future development and infrastructure improvement, the Town can expect continued growth 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 have grown 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 update applies population projections based on the 2013 MAG projections, 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 specific master planning. Table 2.28 depicts population and wastewater flow projections through the planning period.

Table 2.28 Gilbert Population and Flow Projections MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)
2010	219,491	17.56
2020	267,833	21.43
2030	305,715	24.46
2040	335,753	26.86

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 Power 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

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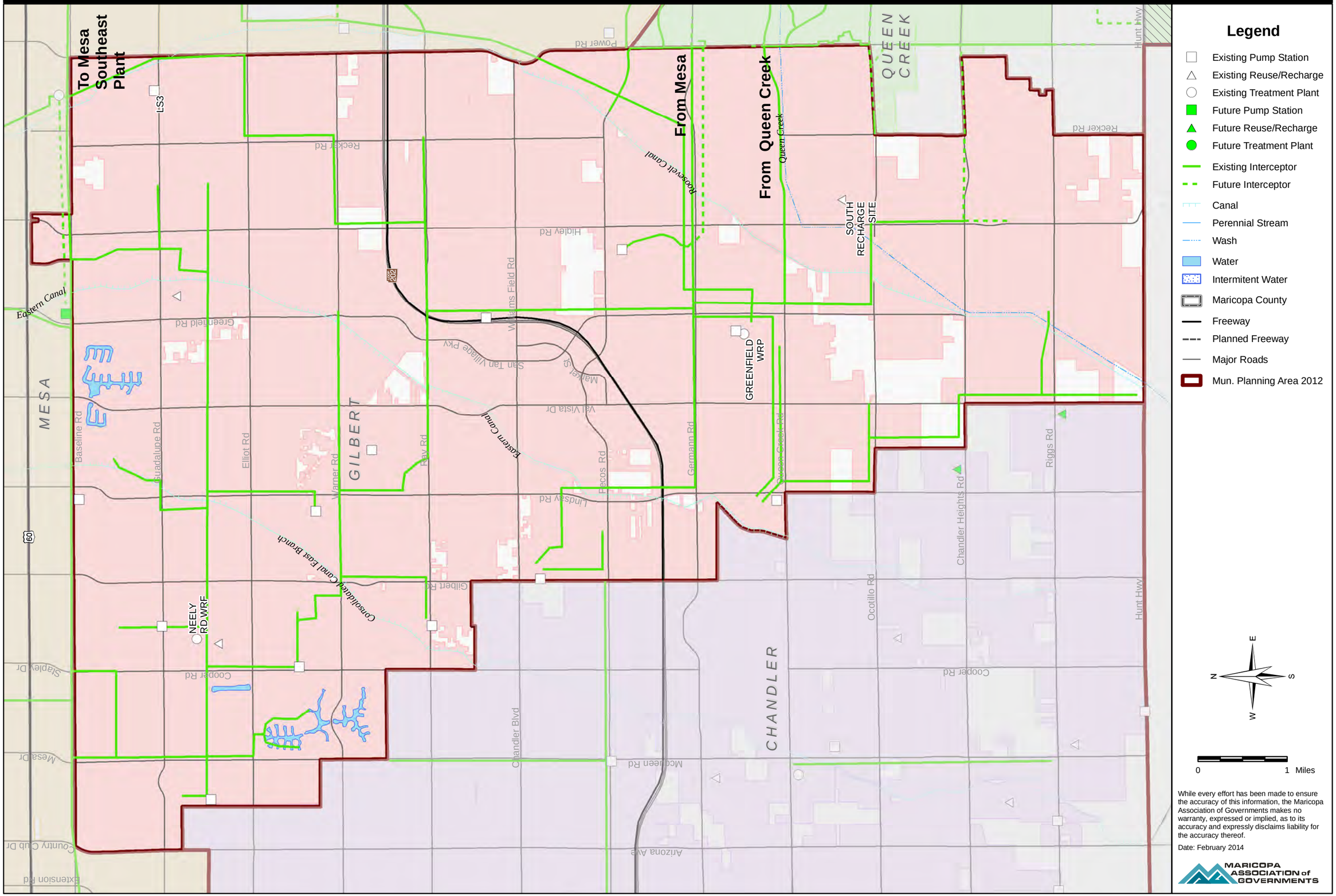
Figure 2.21 Gilbert Municipal Planning Area



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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 developments to either the Greenfield Water Reclamation Plant (GWRP) or the Neely WRF via 18-inch and 12-inch force mains. The Crossroads Lift Station, located on Greenfield Road, north of Williams Field Road, pumps flows from the area generally bounded by Pecos Road, Power Road, Elliot Road, and Greenfield Road. This lift station sends flows to the Greenfield WRF via 18-inch and 24-inch force mains. The San Tan Lift Station, located on Higley and Pecos Roads, pumps flows from the San Tan Ranch Development to the GWRP.

Several other small lift stations, including the Spring Meadows, Baseline, and Commerce Lift Stations, deliver flows from several smaller developments in the northern half of the Planning Area to the Neely WRF.

In addition, two major lines were 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 GWRP 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 GWRP site.

The Town of Queen Creek delivers flows from a portion of its Planning Area to the GWRP site via a 24-inch line on Queen Creek Road. The City of Mesa also has the ability to deliver flows to the GWRP 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 11.0 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 2011, average influent flow to the WRF was approximately 8 mgd.

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 also operates two recharge wells on its Municipal Center site south of Warner Road and east of Gilbert Road. 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 operates three reclaimed water reservoir/pump stations: 1) 1.25 million gallon located on Elliot Road, east of Greenfield Road; 2) 2.0 million gallon located adjacent to the Neely WRF; and, 3) 5.0 million gallon located adjacent to the Greenfield WRP.

Waste sludge from the Neely WRF is currently pumped to the Baseline Road Interceptor (BRI) for treatment at the 91st Avenue WWTP.

Gilbert, Mesa, and Queen Creek partnered to construct the Greenfield Water Reclamation Plant located just west of Greenfield Road, approximately one-half mile north of Queen Creek Road. Mesa is the operating partner of the plant. Unit processes include primary clarification, biological nutrient removal through the use of aeration basins, secondary clarification, filtration, and UV disinfection (with chlorine backup). Solids generated by the plant are handled on-site through the use of thickeners, digesters, and mechanical dewatering. The plant is currently sized at 16 mgd and Gilbert owns 8 mgd of the capacity. At the beginning of calendar year 2011, average influent from Gilbert to the GWRP was approximately 4.5 mgd. Reclaimed water from the GWRP is used in the southern part of Gilbert and recharged at the South Recharge site located at the northeast corner of Higley and Ocotillo Roads. A 5.0 million gallon reservoir/booster station, located adjacent to the GWRP, allows reclaimed water to be distributed to end users throughout the planning area.

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.

Future Treatment System. The next phase of development primarily involves expanding the Greenfield WRP. The next phase of plant expansion is currently scheduled to be complete in 2018. Ultimately, the plant will be expanded to treat approximately 50 mgd (Gilbert - 16 mgd, Mesa - 26 mgd, Queen Creek - 8 mgd). The Neely WRF has reached its ultimate capacity of 11.0 mgd.

Future development will also include expansion of the Town's reclaimed water distribution and recharge system. The South Recharge site (northeast corner of Higley and Ocotillo Roads) will be expanded in 2017, in coordination with the GWRP expansion, and injection wells may be added to increase recharge capacity.

Summary of Proposed Improvements.

Item	Estimated Cost[1]
Sewer Rehabilitation	$1,349,000
Reclaimed Water System Improvements	15,650,000
Lift Station & Force Main Installation	9,940,000
Well Construction	825,000
Greenfield Water Reclamation Plant	
Expansion to 16 mgd Capacity	74,793,000
Total	$102,557,000

[1] All costs are in January 2010 dollars (ENR Construction Cost Index = 6000).

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2.5.4 Mesa

Wastewater collection and treatment service is provided by the City of Mesa. In 2012, Mesa completed a Sewer Master Plan Update. The document updated Mesa's needs for wastewater collection and treatment. The Mesa Municipal Planning Area, depicted in Figure 2.22, is generally bounded by the Salt River Pima-Maricopa Indian Community (SRPMIC) 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 of the incorporated City of Mesa (including Williams Gateway Airport) and some unincorporated areas within Maricopa County, 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, and the Town of Queen Creek. The City of Mesa, Town of Gilbert, and Town of Queen Creek have an agreement for regional wastewater treatment at the Greenfield Water Reclamation Plant, located in Gilbert.

Population and Flow Projections. Continued growth is projected in the Mesa Planning Area. Table 2.29 presents the 2010 through 2040 population for the City of Mesa based on the 2013 MAG population projections and extensive land utilization based flow projections. The equivalent per capita flow varies depending on the ratio of commercial/industrial versus residential developments within the City.

Table 2.29 Mesa Population and Flow Projections MAG 208 Water Quality Management Plan Update

Year	Population	Flow (mgd)
2010	535,928	33.5
2020	608,359	45.3
2030	685,071	58.2
2040	717,071	68.5

Existing Collection System. The wastewater collection serving the City of Mesa Planning Area consists of more than 1,600 miles of collection and interceptor sewers, 15 lift stations, and 21 Odor Control Stations.

The major interceptors serving Mesa include:

- Baseline Road Interceptor (BRI #1).
- Baseline Road Relief Interceptor (BRI #2).
- 8th Street Interceptor.

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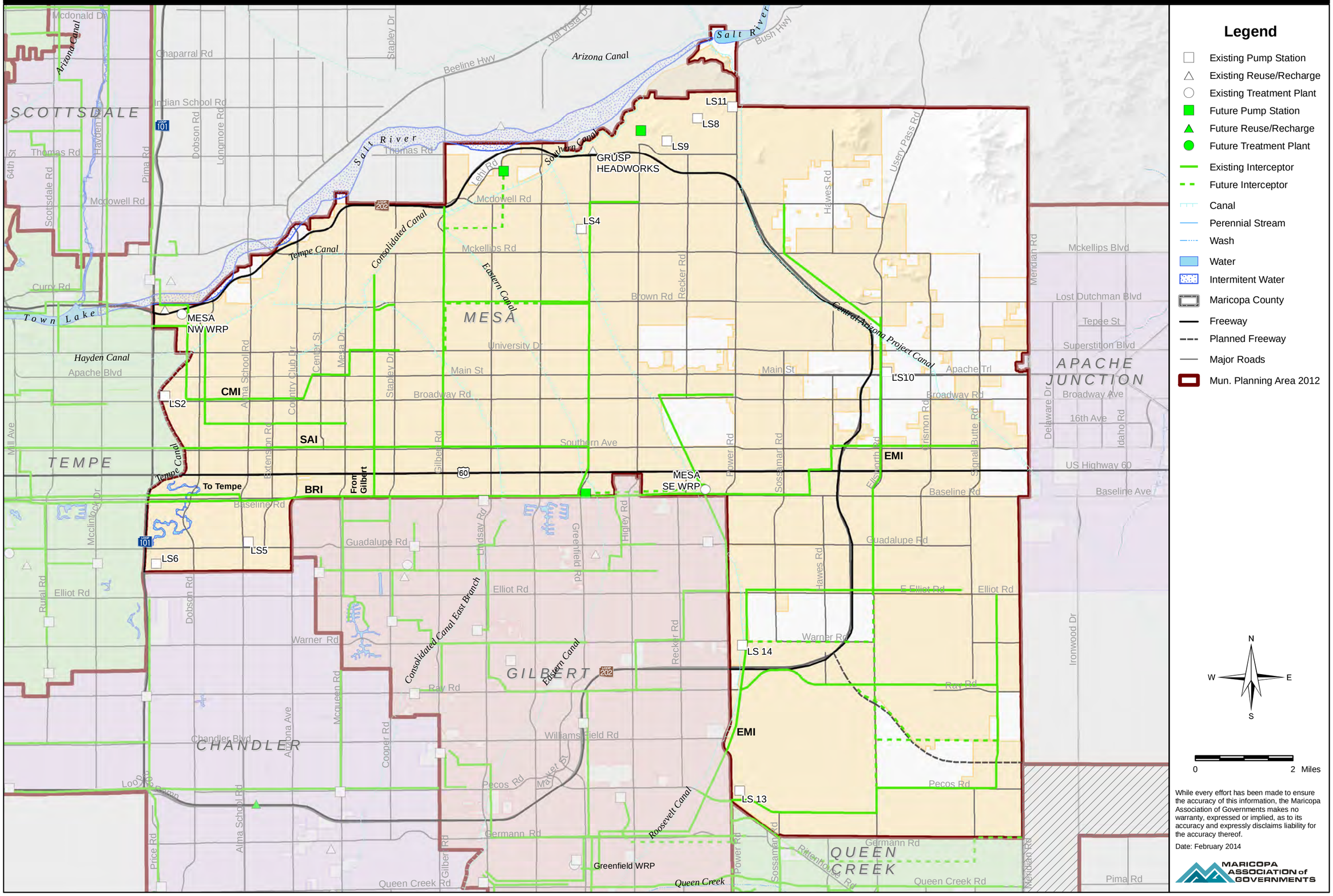
Figure 2.22 Mesa Municipal Planning Area



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- Southern Avenue Interceptor (SAI).
- Central Mesa Interceptor (CMI).
- East Mesa Interceptor (EMI).

The Baseline Road, Southern Avenue, and 8th Street Interceptors convey wastewater from Mesa (through Tempe) to the Salt River Outfall (SRO) and the Southern Avenue Interceptor (SAI) to the SROG 91st Avenue Wastewater Treatment Plant WWTP. The City of Mesa currently owns capacities ranging from 19.6 to 36.6 mgd in the SRO and 12 to 22 mgd in the SAI.

The CMI conveys wastewater from the northwest portion of the Planning Area to the Northwest Water Reclamation Plant (NWWRP). Flow from the CMI can also be diverted to the SRO via the 8th Street Interceptor and/or the SAI for treatment at the 91st Avenue WWTP.

The EMI conveys flow from the eastern portion of the Planning Area to the Greenfield Water Reclamation Plant (GWRP). A portion of this flow north of Elliot Road can also be diverted to the Southeast Water Reclamation Plant (SEWRP) and/or the BRI for treatment at the 91st Avenue WWTP.

Flows from Queen Creek and a portion of Gilbert are sent to the GWRP for treatment. Flow from the SRPMIC is pumped to the NWWRP. This flow can also be diverted to the 8th Street Interceptor for treatment at the 91st Avenue WWTP.

Existing Treatment Facilities. The City of Mesa owns and operates the Northwest Water Reclamation Plant and the Southeast Water Reclamation Plant. Mesa is also a joint owner and lead agent for the Greenfield Water Reclamation Plant along with the Town of Gilbert and Town of Queen Creek. Mesa's current ownership capacity at this facility is 4.0 mgd, with a projected build-out capacity of 26.0 mgd, which includes a 6.0 mgd pump back from SROG. Mesa also owns 29.2 mgd of capacity at the SROG 91st Avenue WWTP.

Biosolids from the NWWRP and GWRP are treated on-site. Biosolids from the SEWRP are typically sent to the GWRP for treatment. However, they can also be sent to the BRI for treatment at the 91st Avenue WWTP.

Capacities and facilities at each reclamation plant are summarized below:

Northwest Water Reclamation Plant

- Capacity: 18 mgd (no expansion planned).
- Bar Screens.
- Primary Sedimentation.
- Activated Sludge with Nitrification and Denitrification.
- Secondary Sedimentation.
- Dual Media Filtration.

- UV Disinfection.
- Chlorine Disinfection.
- Dechlorination.
- Biosolids Treatment.
- Existing AZPDES, NPDES, and APP Permits.

Biosolids treatment consists of single stage anaerobic digesters with primary and secondary sludge thickening and sludge dewatering. The plant produces Class A+ effluent and Class B sludge.

Southeast Water Reclamation Plant

- Capacity: 8 mgd (no expansion planned).
- Bar Screens.
- Primary Sedimentation.
- Activated Sludge with Nitrification and Denitrification.
- Secondary Sedimentation.
- Dual Media Filtration.
- Chlorine Disinfection.
- Dechlorination.
- Existing AZPDES and APP Permits.

The plant produces Class A+ effluent. The plant does not have a solids treatment, and primary/secondary sludge is pumped to GWRP for solids treatment.

Greenfield Water Reclamation Plant

- Capacity: 16 mgd total, 4 mgd Mesa (Build-out: 50 mgd total, 26 mgd Mesa, which includes a 6 mgd pumpback).
- Bar Screens.
- Grit Removal.
- Primary Sedimentation.
- Activated Sludge with Nitrification and Denitrification.
- Secondary Sedimentation.
- Media Disc Filtration.
- UV Disinfection.
- Chlorine Disinfection.
- Biosolids Treatment.
- Existing AZPDES and APP Permits.

Biosolids treatment consists of single stage anaerobic digesters with primary and secondary sludge thickening and sludge dewatering. The plant produces Class A+ effluent and Class B sludge.

Future Wastewater System Development. The City of Mesa is implementing system improvements recommended in the 2012 Wastewater Master Plan Update. Future system improvements will include providing service to undeveloped areas and upgrades in areas that are currently served. These improvements will extend service, primarily in the southeast portion of the Planning Area, and increase capacity within the system.

Improvements are also planned that will enable the City to reduce the amount of flow sent to the SROG system for treatment and increase the flows treated at the NWWRP and GWRP. The Brown Road Relief Sewer Project (Phase 1 is complete), will enable the City to divert approximately 3 mgd of flow to the NWWRP that is now sent to the 91st Avenue WWTP. The Greenfield Road Pumpback Station, currently programmed for 2027, will allow Mesa to send approximately 6 mgd of flow to the GWRP for treatment that is currently being sent to the 91st Avenue plant.

Based on the 2012 Wastewater Master Plan Update and current population projections, future wastewater treatment capacity will be provided by the NWWRP, SEWRP, GWRP, and the SROG 91st Avenue WWTP. An estimate of the projected flows to each plant through the planning period is summarized in Table 2.30.

Table 2.30 Mesa Wastewater Flow Allocation Projections MAG 208 Water Quality Management Plan Update

Year	SROG Facilities[1] (mgd)	NWWRP (mgd)	SEWRP (mgd)	GWRP[2] (mgd)	Gilbert Residuals[3] (mgd)	Total Treated Flow (mgd)
2010	17.8	8.4	4.0	3.3	0.56	33.5
2015	18.5	9.1	7.1	3.4[4]	0.62	38.7
2020	19.5	10.5	5.1[5]	9.6	0.62	45.3
2025	20.4	11.9	6.1	12.7	0.62	51.7
2030	21.3	13.3	7.1	15.9	0.62	58.2

[1] Annual average daily flows. Includes residuals from Gilbert Neely WRF.
[2] Mesa flow only.
[3] Gilbert currently sends residuals from their Neely WRF for treatment at the 91st Avenue WWTP.
[4] Some flow from GWRP diverted to SEWRP.
[5] Flow diversion from SEWRP to GWRP ceases.

Reclaimed Water Use. Effluent from the NWWRP is delivered to the Granite Reef Underground Storage Project (GRUSP), when available, for recharge. Mesa's current ownership capacity in GRUSP is approximately 24.86 percent of the current permitted

volume of 200,000 acre-feet per year (AF/year) or 49,720 AF/year. However, it is anticipated that this will be reduced to approximately 25,000 AF/year when the renewal USF permit for GRUSP is finalized at 96,720 AF/year. However, the City of Phoenix has announced its desire to release its capacity of 26.88 percent ownership in GRUSP. The reclaimed water from the NWWRP is discharged to the Salt River when GRUSP is not available. The recharge basins near the plant site are not used on a regular basis, due to high ground water levels.

The majority of the effluent from the SEWRP is pumped to the GWRP where it is mixed with reclaimed water from the GWRP and delivered to the Gila River Indian Community for agricultural irrigation in exchange for CAP water. The SEWRP can also discharge to the East Maricopa Floodway (EMF) under an Aquifer Protection Permit and agreement with the Maricopa County Flood Control District.

As mentioned above, Mesa's portion of the reclaimed water from the GWRP is sent to the GRIC where it is used for agricultural irrigation. An Intergovernmental Agreement between the City of Mesa and the Gila River Indian Community stipulate an initial delivery of 7,000 AF/year with an annual increase of 1,000 AF/year to a maximum of 29,400 AF/year. Based on current flow projections, Mesa will deliver most or all of the effluent from both the SEWRP and GWRP as part of the exchange agreement. Effluent from the GWRP can also be discharged to the EMF 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 2019 are summarized below:

Item	Estimated Cost[1]
Collection System Expansion and Improvements	$35,400,000
GWRP Expansion[2]	99,500,000
Water Reclamation Plant Improvements	30,500,000
Sewer Line Rehabilitation	29,300,000
Total	$194,700,000

[1]January 2014 costs ENR Construction Cost Index 9664
[2]Mesa cost only

Contract Customer Service. In addition to wastewater collection and treatment for the Mesa Planning Area, the City may also provide service to contract customers outside of the designated Planning Area. Mesa currently has an agreement with the Town of Gilbert to convey residual solids from Gilbert's Neely WRF through the BRI and SAI for treatment at the SROG 91st Avenue WWTP. Mesa also provides treatment for an area of Gilbert (Towne Meadows) bounded by Baseline Road, Power Road, Recker Road, and Guadalupe Road at their SEWRP for wastewater. It also serves a portion of Gilbert bounded by Baseline Road, Country Club Drive, W. San Angelo Street, and Center Street Alignment (Fiesta Tech). Flow from this area discharges to the BRI for treatment at the 91st Avenue WWTP. Other contract customers include the Town of Queen Creek and the SRPMIC. Service to contract customers is provided through Intergovernmental Agreements between Mesa and the individual customers.

2.5.5 Queen Creek

The Planning Area for Queen Creek includes the incorporated limits of the Town, as depicted on Figure 2.23. The MAG 208 planning boundary is the Maricopa County boundary. Portions of Queen Creek outside of Maricopa County are within Central Arizona Governments planning area for 208 planning purposes and processes. The portion of the Queen Creek Municipal Planning Area within Maricopa County corresponds to Regional Analysis Zone (RAZ) 339.

Population and Flow Projections. The Town of Queen Creek is expected to more than double its population in the next 20 years. The Town's estimated population projections, as well as wastewater flow projections, are presented in Table 2.31. Population data are based on the 2013 MAG population projections. Flow projections are based on a rate of 75 gpcd.

Table 2.31 Queen Creek Population and Flow Projections MAG 208 Water Quality Management Plan Update

Year	Population[1]	Flow (mgd)[2]
2010	33,120	1.30
2020	51,488	3.86
2030	70,342	5.28
2040	76,292	5.72

[1] Population projections include the Maricopa County portion of Queen Creek only.
[2] The 2010 values is based on actual average daily flow.

Existing Wastewater System. At present, there are no treatment facilities in Queen Creek. All flow from the Town of Queen Creek is collected at one of three outfalls, Rittenhouse, Queen Creek, and Ocotillo Road, and then conveyed to the Greenfield Water Reclamation Plant. The GWRP is jointly owned by the City of Mesa, the Town of Gilbert, and the Town of Queen Creek and is operated by the City of Mesa with an Intergovernmental Agreement to service incoming flow from the Town of Queen Creek. The Town of Queen Creek currently owns 4 mgd of treatment capacity, with the current IGA allowing for an ultimate treatment capacity of 8 mgd, average daily flow.

The collection system has been divided in four separate zones, each with a network of sewers leading to an outfall, or multiple outfalls, 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. All four zones have been developed to some extent, while only Zone 1 has all major infrastructure installed.

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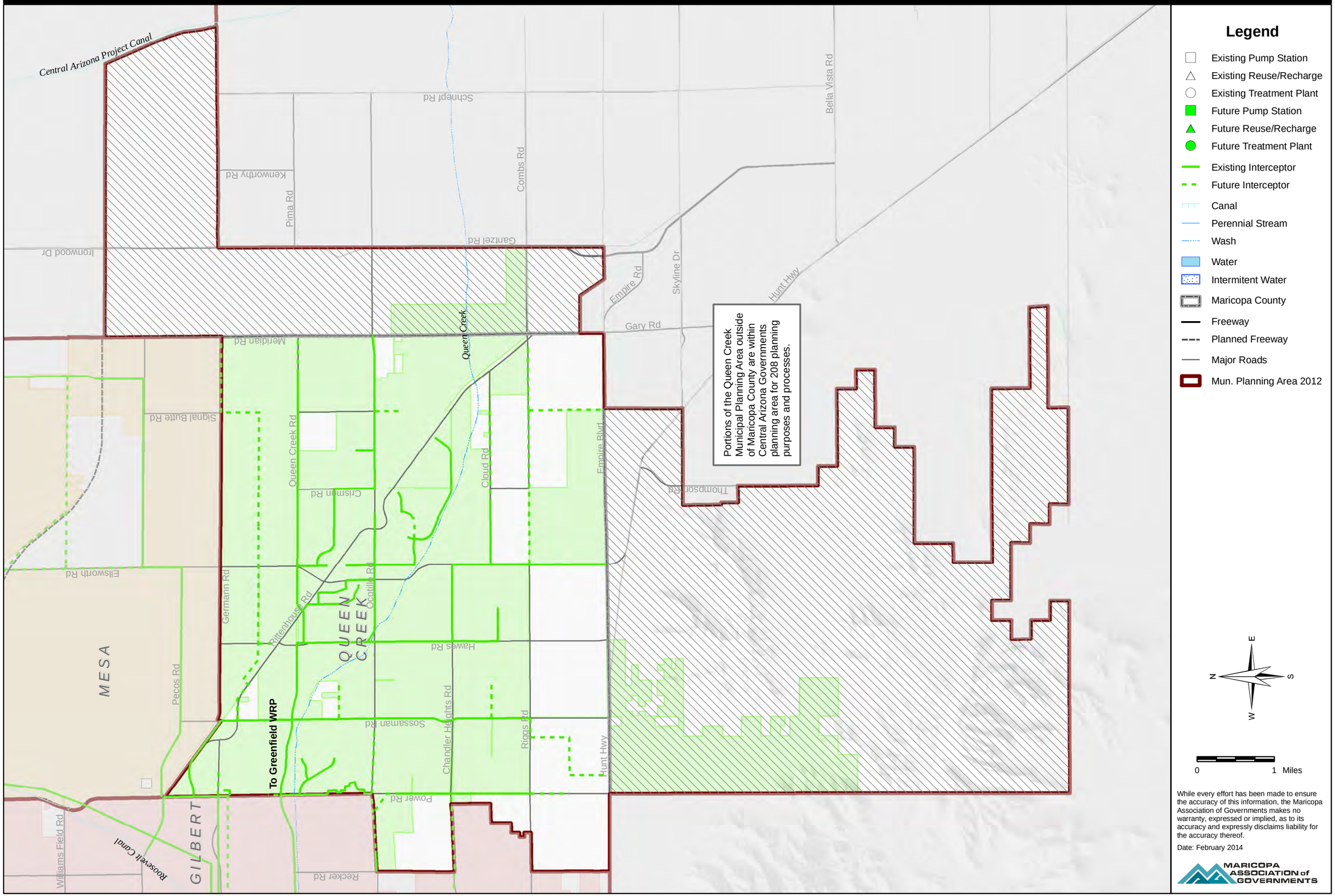
Figure 2.23 Queen Creek Municipal Planning Area



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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 sewers from this zone combine at the Rittenhouse Outfall and are then conveyed to the GWRP.

Zone 2 is located in the northeast section of Queen Creek, east of Ellsworth Road and northeast of the Southern Pacific Railroad. The major infrastructure for this zone is partially in place. The sewage generated by Zone 2 is collected at the Rittenhouse Outfall and conveyed to the GWRP.

Zone 3 consists of the area south of Queen Creek Wash, in the southwestern section of Queen Creek. The major infrastructure for this zone is partly in place. The sewage generated from this zone is partly collected at all three Outfalls (Rittenhouse, Queen Creek, and Ocotillo Road) depending on the area or origin. All three outfalls convey the sewage to the GWRP.

Zone 4 consists of one-half 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. Currently only the area north of Germann Road, south of the railroad, between Sossaman Road and Power Road has the major infrastructure in place. The sewage generated from this area is collected at the Rittenhouse Outfall and conveyed to the GWRP.

Future Wastewater System Development. As urban development of Queen Creek occurs, additional infrastructure in Zones 2 through 4 of the wastewater collection system will be installed. The configuration of the collection system will be determined by the Interceptor Sewer Modeling & Wastewater Town Master Plan-2011 (Town Sewer Master Plan) and by the size and location of the developments.

As development occurs in Zones 2 through 4, new infrastructure will be added to the existing infrastructure according to the Town Sewer Master Plan. In Zone 4, infrastructure will be added to the areas of the one-half mile wide industrial zoned corridor along the south side of Germann Road from the County Line to Ellsworth Road and the area from Hawes Road to Sossaman Road north of the Southern Pacific Railroad and south of Germann Road. All sewage from Zones 2 and 4 will be collected at the Rittenhouse Outfall and conveyed to the GWRP. Sewage from Zone 3 will be collected at all three outfalls, depending on the area of origin, and then conveyed to the GWRP.

The Town of Queen Creek will implement recommendations that are in the Town Sewer Master Plan.

Summary of Wastewater System Improvements. 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. Additional treatment capacity and agreements may be necessary depending on actual development versus projected development.

Item	Estimated Cost[1]
Zone 2 Collection System	$1,659,000
Zone 3 Collection System	9,916,000
Zone 4 Collection System	5,761,000
Wastewater Master Plan Recommendations	1,525,000
Total	$18,861,000

[1] Town Sewer Master Plan - Engineers Probable Costs.

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 2.24 depicts the Tempe Planning Area.

Population and Flow Projections. Table 2.32 presents the projected population and wastewater flows based on the 2013 MAG population projections. For planning purposes, Tempe assumes a peak daily flow rate of 120 gpcd due to a higher proportion of industrial water and sewer use.

Table 2.32 Tempe Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Tempe Population	Guadalupe Population	Flow Projections (mgd)	
			Average Daily Flows	Peak Daily Flows
2010	175,593	6,415	19.2	21.8
2020	200,513	7,148	20.8	24.9
2030	232,211	7,918	24.0	28.8
2040	240,354	8,555	24.9	29.9

Existing Collection System. Tempe, Guadalupe, and Arizona State University 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. There are four pumping stations in the Tempe system, all of which have adequate capacity for ultimate flows.

Existing Wastewater Treatment. Tempe is a member of the Multi-City Subregional Operating Group and currently obtains a substantial portion of its wastewater treatment at the SROG's 91st Avenue WWTP. Tempe owns 29.03 mgd of treatment capacity at the 91st Avenue WWTP, enough to meet its anticipated build-out demand.

Tempe's Kyrene Water Reclamation Plant is located near the intersection of Kyrene and Guadalupe Roads. The Kyrene WRP has the capacity to treat 9 mgd of wastewater generated in southern Tempe. Kyrene performs the following unit processes: screening and grit removal, activated sludge, nitrification/denitrification, membrane filtration, and ultraviolet disinfection. The Kyrene WRP has obtained an Aquifer Protection Permit and does not discharge to Waters of the U.S., so AZPDES permit coverage was terminated in 2011. Reclaimed water produced by the plant may be used for turf irrigation pursuant to

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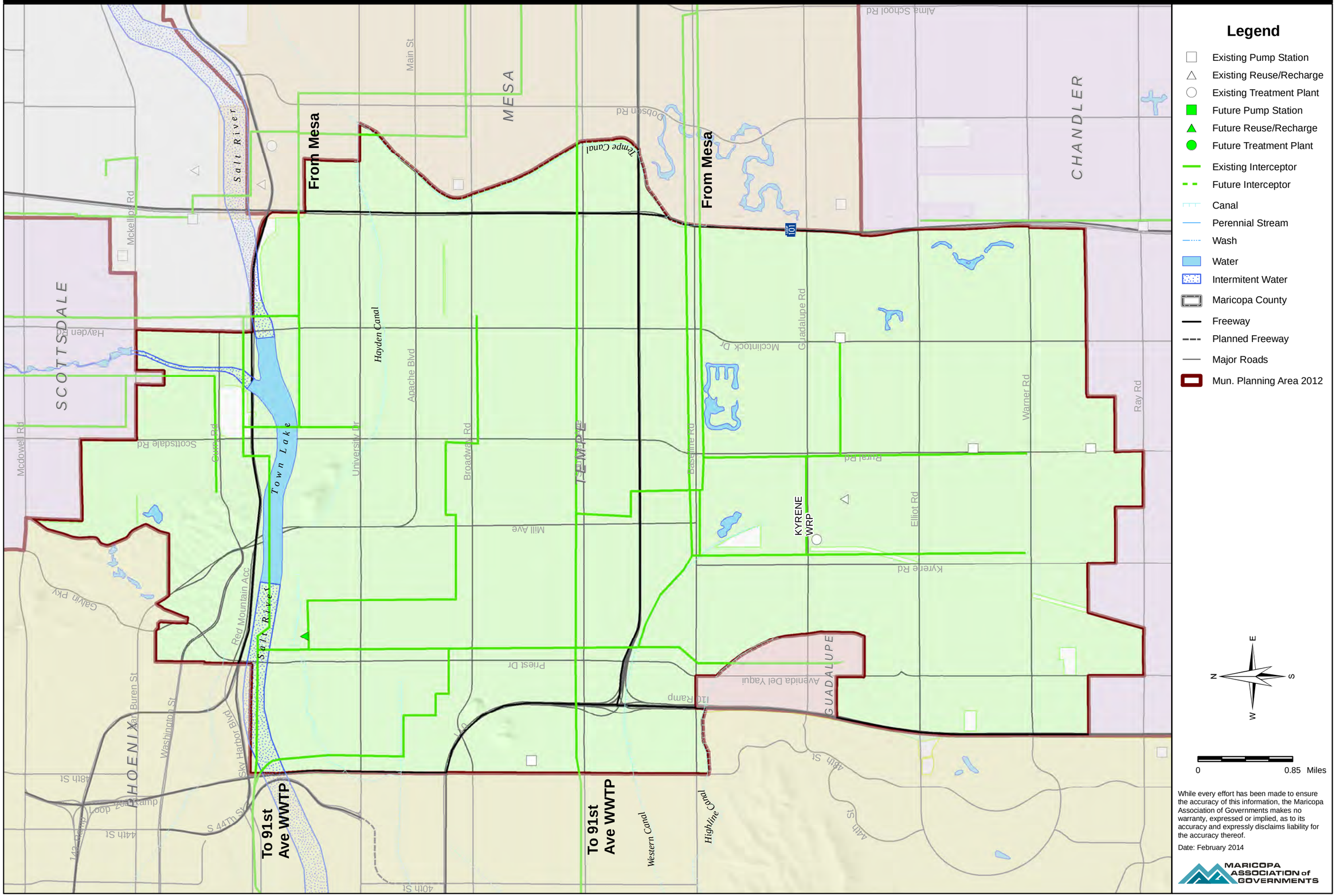
Figure 2.24 Tempe Municipal Planning Area



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a Type 2 Reclaimed Water General Permit and for aquifer storage and recovery, and may be used by the Salt River Project as cooling water for the expanded Kyrene generating stations. When operational, residual solids and sludge are discharged into the SROG system and conveyed to the 91st Avenue WWTP. Operation of the Kyrene WRP is not necessary to treat build-out wastewater flows, but is maintained in the event that reclaimed water is needed to meet water demands and maintain Tempe's assured water supply designation.

Projections of flows to be treated at the various treatment plants are presented in Table 2.33. Future flow allocations for the Kyrene WRP are omitted because under Tempe's projected flow allocation strategy, Tempe anticipates treating all wastewater flows at SROG facilities. This could change in the future due to operational, financial, and environmental considerations, and Tempe maintains the option to distribute wastewater flows between Kyrene WRP and SROG facilities.

Table 2.33 Tempe Wastewater Flow Allocation Projections MAG 208 Water Quality Management Plan Update

Year	SROG Facilities (mgd)[1]	Kyrene WRP (mgd)	Total Treated Flow
2010	18.8	0.5	19.2
2015	20.0	0.0	20.0
2020	20.8	0.0	20.8
2025	22.4	0.0	22.4
2030	24.0	0.0	24.0
2040	24.9	0.0	24.9

[1] Annual average daily flows.

Future improvements of the collection system will consist of extending branch lines to newly developing areas within the City limits.

Summary of Proposed Wastewater System Improvements.

Capital improvements planned through year 2030 are summarized below:

Item	Estimated Cost[1]
General system improvements	$37,000,000
SROG Interceptor Reallocation	12,000,000
Total	$49,000,000

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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 EPCOR Water (formerly Arizona American Water Company). The SROG provides wastewater treatment for its member communities at the 91st Avenue Wastewater Treatment Plant. 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 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 which can 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. Based on information provided by the SROG cities, Table 2.34 depicts expected annual average flows to 91st Avenue, adjusted for planned local WRPs.

Table 2.34 Projected SROG Service Areas Annual Average Flow, mgd MAG 208 Water Quality Management Plan Update

Community	2010	2020	2030	2040
Phoenix				
Total Flow, mgd	114.0	114.0	131.0	147.0
Local WRP/WWTP Treated	32.0	32.0	34.0	35.0
91st Ave. WWTP Flow, mgd	82.0	82.0	97.0	112.0
Mesa				
Total Flow, mgd	33.5	45.3	58.2	
Local WRP/WWTP Treated	15.7	25.8	36.9	
91st Ave. WWTP Flow, mgd	17.8	19.5	21.3	

Table 2.34 Projected SROG Service Areas Annual Average Flow, mgd MAG 208 Water Quality Management Plan Update				
Community	**2010**	**2020**	**2030**	**2040**
Tempe				
Total Flow, mgd	19.2	20.8	24.0	24.9
Local WRP/WWTP Treated	0.5	0.0	0.0	0.0
91st Ave. WWTP Flow, mgd	18.8	20.8	24.0	24.9
Glendale				
Total Flow, mgd	16.7	19.0	19.6	
Local WRP/WWTP Treated	8.6	10.9	11.5	
91st Ave. WWTP Flow, mgd	8.1	8.1	8.1	
Scottsdale				
Total Flow, mgd	20.55	28.86	37.93	
Local WRP/WWTP Treated	9.91	15.95	21.37	
91st Ave. WWTP Flow, mgd	10.64	12.91	16.56	
Total				
91st Avenue WWTP Flow	137.34	143.31	166.96	

Existing Treatment Facilities. The anticipated capacity allocation among SROG members through 2040 is shown in Table 2.35.

Table 2.35 Sub-Regional Operating Group (SROG) Treatment Capacity Allocations MAG 208 Water Quality Management Plan Update				
	Treatment Capacity Allocations, mgd			
Community	**2010**	**2020**	**2030**	**2040**
Phoenix	112.80	112.80	112.80	112.80
Mesa	29.22	29.22	29.22	29.22
Tempe	29.03	29.03	29.03	29.03
Glendale	13.20	13.20	13.20	13.20
Scottsdale	20.25	20.25	20.25	20.25

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.

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 80,000 acre-feet per year of effluent under an agreement that ends in 2050. 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 expired in the year 2011, the new agreement became effective, 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. Effluent not sent to PVNGS is sent to the Tres Rios Flow Regulating Wetlands. Discharge from the Tres Rios Flow Regulating Wetlands is either to the Salt River or the Tres Rios Overbank Wetlands and then to the Salt River.

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 (Chemical Oxygen Demand [COD] and Total Suspended Solids [TSS]). The current and projected (Year 2040) ownership is shown for each of these parameters in Table 2.36.

Table 2.36 Ownership Parameters MAG 208 Water Quality Management Plan Update			
Community	**Parameter**	**Current**	**Projected 2040**
Phoenix	Hydraulics COD TSS	112.80 mgd 601,000 lbs/day 288,000 lbs/day	112.80 mgd 601,000 lbs/day 288,000 lbs/day
Mesa	Hydraulics COD TSS	29.22 mgd 160,000 lbs/day 88,000 lbs/day	29.22 mgd 160,000 lbs/day 88,000 lbs/day
Tempe	Hydraulics COD TSS	29.03 mgd 207,000 lbs/day 86,000 lbs/day	29.03 mgd 207,000 lbs/day 86,000 lbs/day
Glendale	Hydraulics COD TSS	13.20 mgd 103,000 lbs/day 61,600 lbs/day	13.20 mgd 103,000 lbs/day 61,600 lbs/day
Scottsdale	Hydraulics COD TSS	20.25 mgd 115,000 lbs/day 88,000 lbs/day	20.25 mgd 115,000 lbs/day 88,000 lbs/day
Total	Hydraulics COD TSS	204.50 mgd 1,186,000 lbs/day 611,600 lbs/day	204.50 mgd 1,186,000 lbs/day 611,600 lbs/day

2.7 OUTLYING AREAS

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 corresponds to Regional Analysis Zone (RAZ) 331. It 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 0.35 mgd capacity wastewater treatment plant 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 gallons per day and convert on pond to a wetland. The Town is awaiting funding for construction.

Population and Flow Projections. Since the 208 Plan was last updated in 2002, the Gila Bend Municipal Planning Area has expanded significantly to include areas previously part of the Maricopa County Planning Area. The Gila Bend Municipal Planning Area is depicted in Figure 2.25. Population within this Planning Area is expected to continue to grow over the planning period. Table 2.37 presents the population and flow projections through 2040. Population is based on the 2013 MAG population projections. The wastewater flow rate for 2010 was provided by the Town and 2020 through 2040 flow projections were estimated using 100 gpcd. The table assumes that 90 percent of the total community is sewered.

Table 2.37 Gila Bend Population and Flow Projections
MAG 208 Water Quality Management Plan Update

Year	Population	Sewered Population	Flow (mgd)[1]
2010	3,293	2,964	0.27
2020	3,745	3,371	0.34
2030	7,800	7,020	0.70
2040	20,010	18,009	1.80

[1] Wastewater flow for 2010 provided by the Town of Gila Bend.

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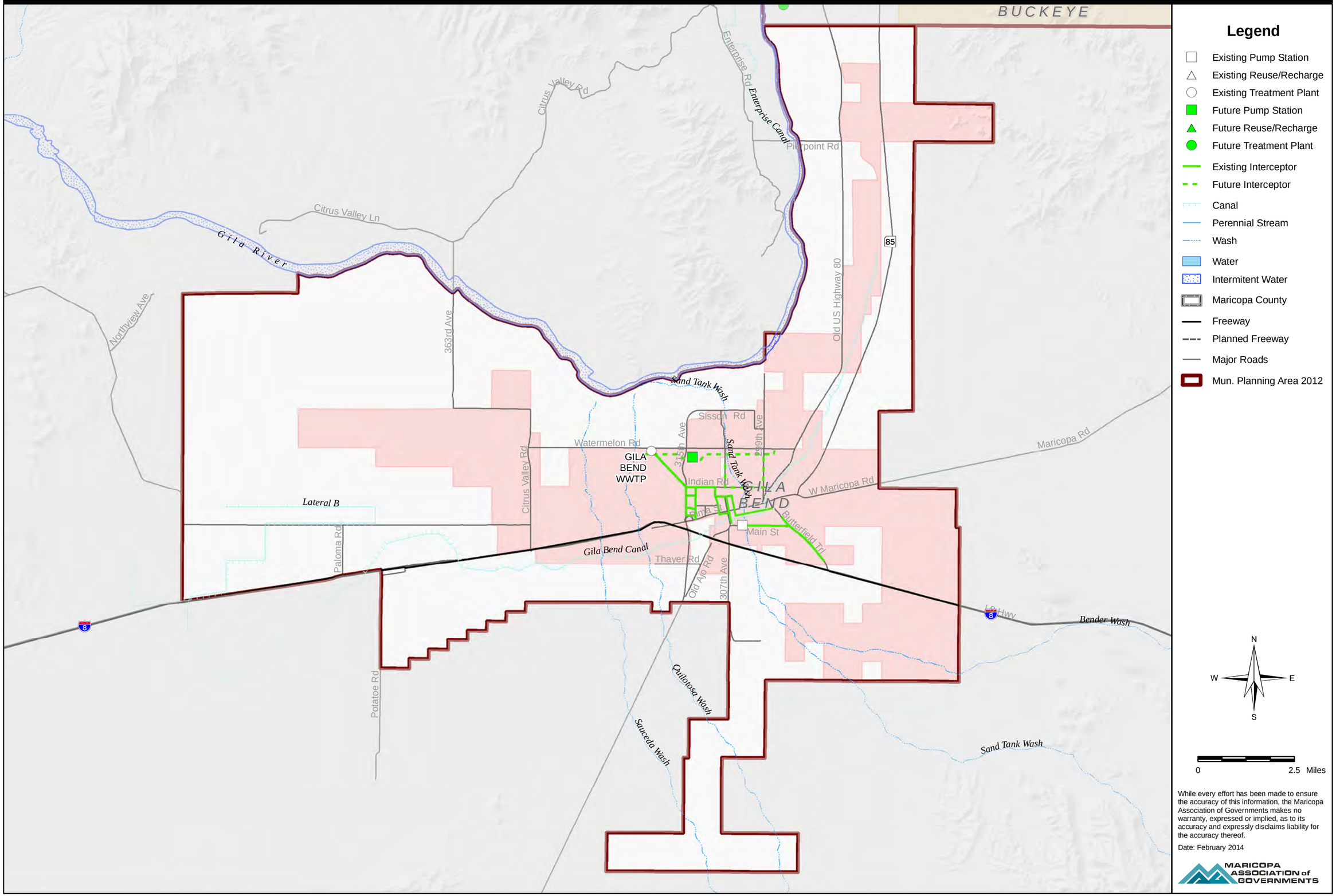
Figure 2.25 Gila Bend Municipal Planning Area



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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.

The adequacy of the collection system was reviewed in the 1977 Facility Plan. It was found that approximately three 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 reevaluated.

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 0.35 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. Two half horse SolarBees were placed in the main two ponds increasing productivity and lowering energy costs. 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.

Future Wastewater System. Plans and Specifications were approved by the County for the modifications to the wastewater treatment plant in approximately 2002/2003. Construction costs still need to be negotiated. Improvements to the existing facility will consist of additional aerators to provide improved BOD5 and suspended solid concentrations in the lagoon effluent and increase capacity to 700,000 gallons per day (current capacity is 350,000 gallons per day). Through 2040, the Town's service area population is expected to increase to 20,010. Assuming flows of 125 gallons per day/person, which would include a reserve for commercial and industrial growth, the WWTP would need to handle a design flow of 700,000 gallons per day with a peaking factor of double the design flow, equal to 1.4 mgd. The ultimate capacity of the plant will be 2 mgd. 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 AZPDES 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.

Summary of Proposed Wastewater System Improvements.

Item	Estimated Cost
WWTP Upgrades	$5,000,000
Activated Sludge Mechanical Plant - 2 mgd	
New Sewer Lines Under Rail Road Tracks	
Relief Sewer	
Move Inflow Meter Closer to WWTP for Future Connectivity	

2.7.2 Wickenburg

Wastewater collection and treatment service is provided by the Town of Wickenburg to portions of the incorporated Town. The Wickenburg Municipal Planning Area within Maricopa County corresponds to Regional Analysis Zones (RAZ) 201, 335, and 347. Wickenburg is the designated wastewater management agency for this area. The MAG 208 planning boundary is the Maricopa County boundary. Portions of Wickenburg outside of Maricopa County are within Northern Arizona Council of Governments planning area for 208 planning purposes and processes.

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 on-site 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 2.26 depicts the Wickenburg Municipal Planning Area.

Population and Flow Projections. Wickenburg is projected to continue to grow over the planning period. As noted above, it is likely that a 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 2.38 presents the population for Wickenburg based on the 2013 MAG population projections. The table also includes projected wastewater flows from the estimated population served. The projections are based on the assumption that approximately 95 percent of future population growth will be served by the wastewater system. Wastewater flows for 2010 are based on actual flow and 2020 through 2040 are estimated at a rate of 75 gpcd.

Table 2.38 Wickenburg Population and Flow Projections MAG 208 Water Quality Management Plan Update

Year	Planning Area Population[1]	Estimated Population Served	Flow (mgd)[2]
2010	9,611	6,000	0.48
2020	12,595	8,835	0.66
2030	19,029	14,947	1.12
2040	31,169	26,480	1.99

[1]Population projections include the Maricopa County portion of Wickenburg only.
[2]The 2010 value is based on actual flow.

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 2.38. If the entire Town were served, projected flow would reach 2.46 mgd by year 2040.

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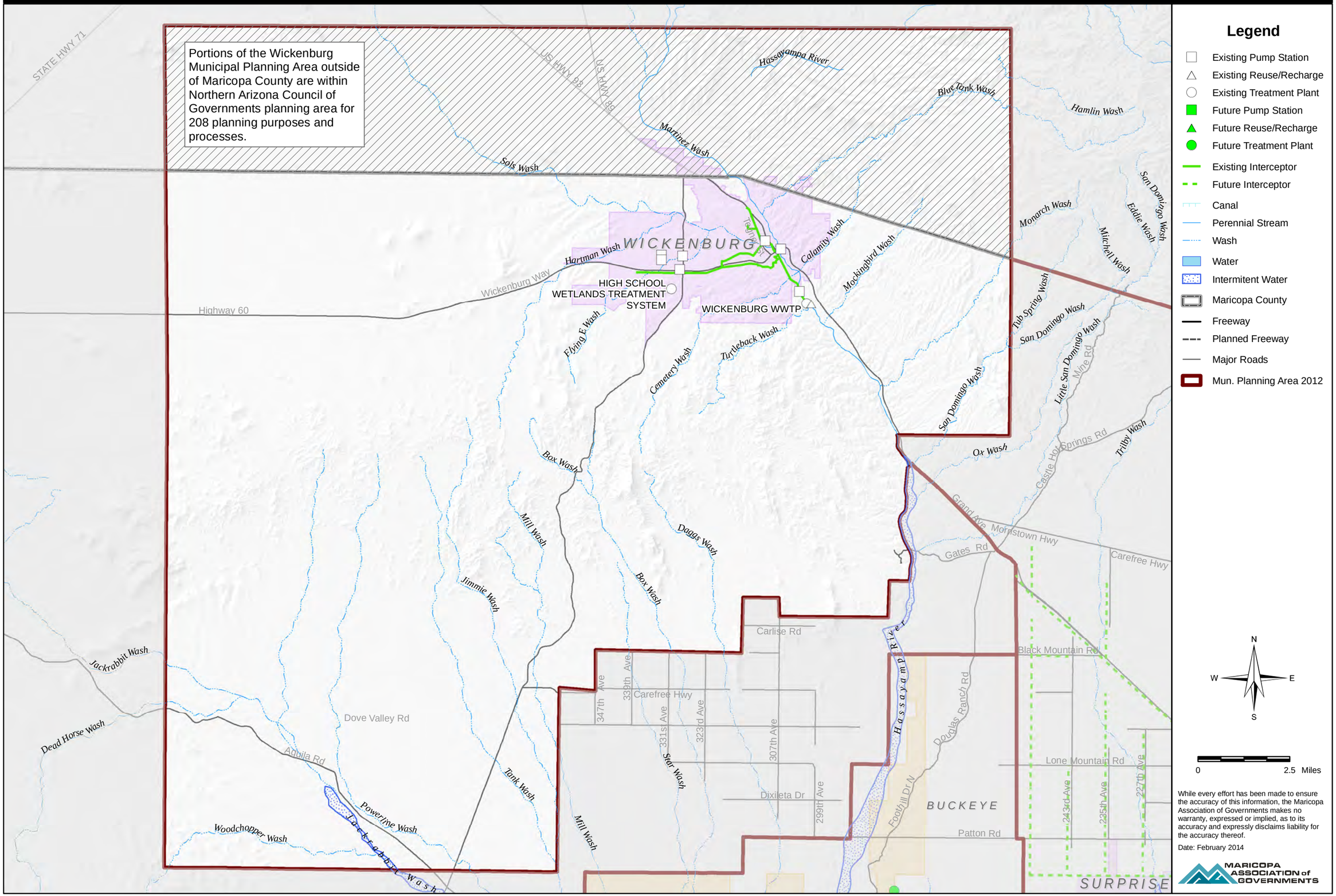
Figure 2.26 Wickenburg Municipal Planning Area



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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 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. The collection system includes seven lift stations.

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 influent flow to the plant is approximately 0.46 mgd. The plant includes: a mechanical bar screen, aerated grit chamber, two grinder-auger units, parshall flume, anoxic reactor for denitrification, two aeration basins, three clarifiers, disinfection by UV radiation, two effluent pumps, four infiltration basins, and two aerobic digesters. The sludge is processed through a belt filter press prior to disposal in the Northwest Regional Landfill.

The Town holds an AZPDES 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. An Aquifer Protection Permit has been issued for the facility.

In addition to the Town WWTP, there is a wetlands system located at the high school. The Wickenburg School District Wetland was approved as part of the MAG 208 Plan by the MAG Regional Council on February 24, 1999 with a capacity of 16,600 gallons per day.

Future Wastewater System Development. Although the existing treatment facility is rated at 0.80 mgd for permitting, actual process design rating is 1.2 mgd. Therefore, an upgrade will not be necessary until the flow reaches 70 percent of that figure. Based on flow projections alone, the existing Wickenburg treatment plant's capacity is adequate to meet the needs of the Town through year 2025.

Future plans for development of the collection system include a Flying “E” Wash sewer and an airport collector sewer.

Summary of Proposed Wastewater System Improvements.

Item	Estimated Cost[1]
Flying “E” Wash Sewer	$573,600
Airport Industrial Park-Collector Sewer	$93,800
Total	$667,400

[1]Costs obtained from the “Town of Wickenburg Wastewater Master Plan”, October 2000.

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2.7.3 Gila River Indian Community

The Gila River Indian Community 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 2.39, based on 2013 MAG population projections.

Table 2.39 Gila River Indian Community Population Projections MAG 208 Water Quality Management Plan Update

Year	Population[1]
2010	3,950
2020	4,359
2030	4,715
2040	4,900

[1]Population projections include the Maricopa County portion of the Gila River Indian Community only.

Wastewater System Development. Wastewater treatment at the Gila River Indian Community falls under the jurisdiction of the GRIC 208 Plan.

Two WWTFs are located within the Maricopa County portion of the Gila River Indian Community. The first is the Lone Butte WWTF, which is operated by the City of Chandler under an agreement (through 2027). Influent from two casinos, a Community industrial park, and the City of Chandler are treated at this facility. Effluent from this facility is used for agricultural reuse on GRIC lands. The second WWTF is the Vee Quiva WWTF. This facility treats influent from the Vee Quiva hotel and casino complex plus the surrounding residential areas. The capacity, treatment system, and method of effluent disposal for the WWTFs are provided below.

Location	Capacity	Treatment System	Effluent Disposal
Vee Quiva (St. Johns)	100,000 gpd	Aerated Lagoon	Evaporation
Lone Butte WWTF	10 mgd	Aerated Lagoon	Reuse

Figure 2.27 shows the current wastewater treatment facilities.

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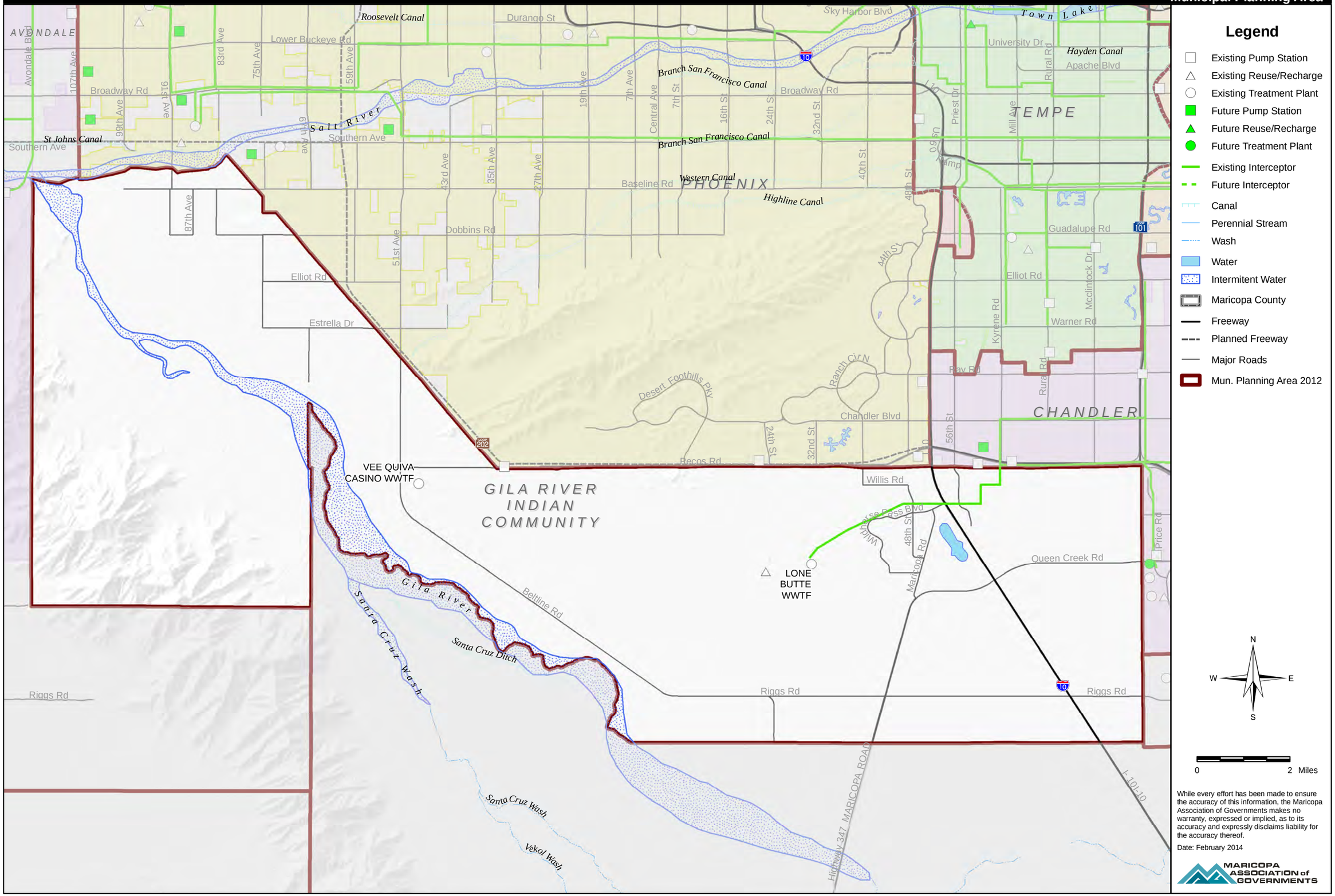
Figure 2.27 Gila River Indian Community Municipal Planning Area



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2.7.4 Salt River Pima-Maricopa Indian Community

The Salt River Pima-Maricopa Indian Community 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 2.28. It is generally bounded on the south by the Salt River, on the west by Pima Road, and on the north by DoubleTree Ranch Road alignment and the Fort McDowell Yavapai Nation.

Population and Flow Projections. The projected future population of the SRPMIC corresponds to MAG Regional Analysis Zone (RAZ) 264. Table 2.40 shows population forecast through the year 2040, based on the 2013 MAG population projections. Wastewater generation as estimated in the 2007 Master Plan is 8.47 mgd at build-out (estimated year 2040), with 6.82 mgd from commercial/industrial development.

Table 2.40 Salt River Pima-Maricopa Indian Community Population Projections MAG 208 Water Quality Management Plan Update

Year	Population
2010	8,334
2020	8,820
2030	9,786
2040	10,610

Existing Wastewater Collection and Treatment. SRPMIC has a major interceptor sewer (full pipe capacity approximately 18 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.

The SRPMIC has an agreement with the City of Mesa for treatment of up to 4 mgd of wastewater in the Mesa Northwest WRP.

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. No significant wastewater projects are planned within the next five years.

Summary of Proposed Improvements. None planned.

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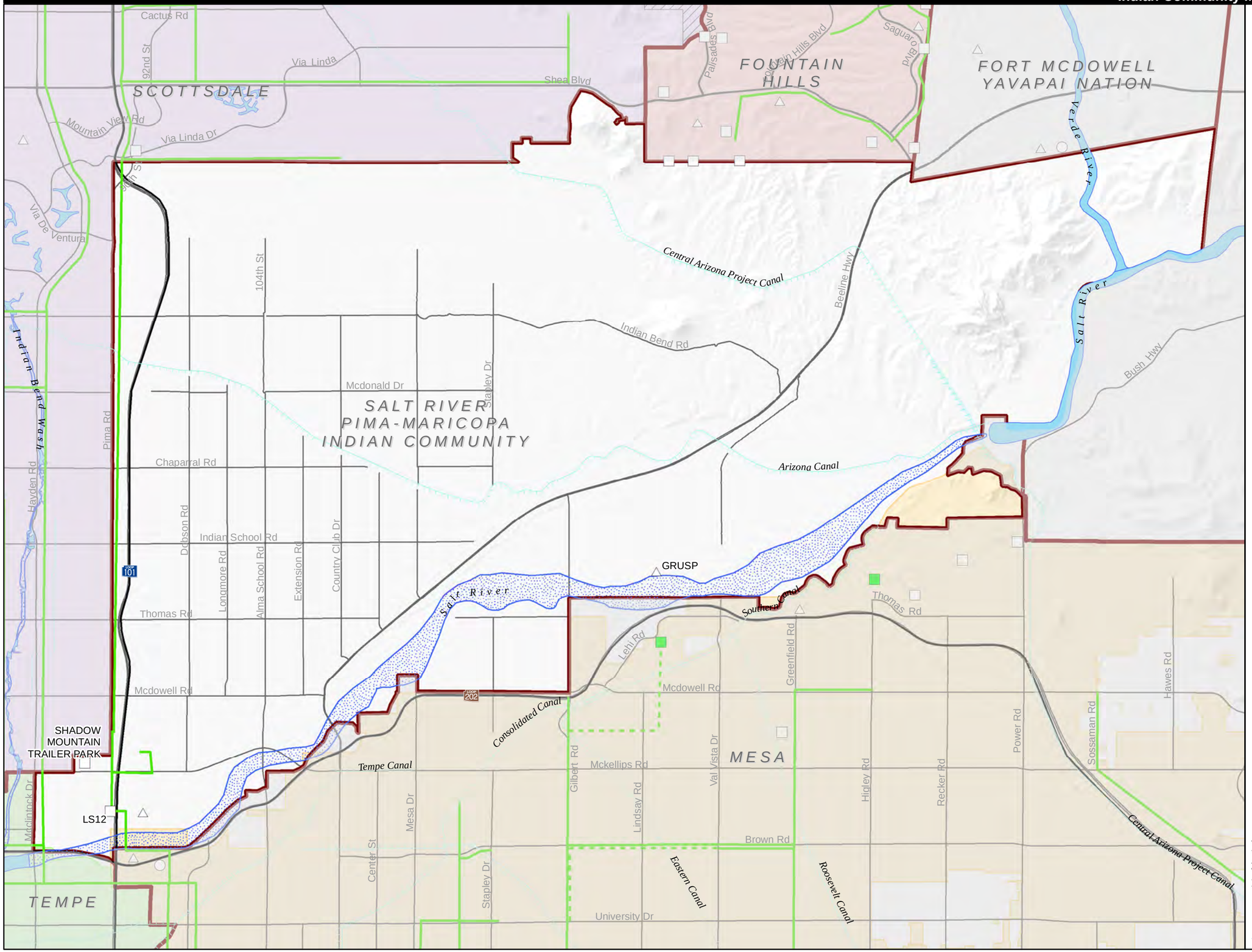
Figure 2.28 Salt River Pima-Maricopa Indian Community Municipal Planning Area



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2.7.5 Fort McDowell Yavapai Nation

The Fort McDowell Yavapai Nation is a member of the Maricopa Association of Governments. The Nation 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 2.29. 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 2.41 shows population forecast through the year 2040. Wastewater generation as estimated in the Facility Plan of August 1997 is 1.9 mgd at build-out.

Table 2.41 Fort McDowell Yavapai Nation Population Projections MAG 208 Water Quality Management Plan Update

Year	Population
2010	1,436
2020	1,636
2030	1,824
2040	2,010

Existing Wastewater Collection and Treatment. The Fort McDowell Yavapai Nation currently operates a 238,000 gallons per day wastewater treatment plant on a site south of the Beeline Highway and west of Fort McDowell Road. A gravity sewer system has been constructed to serve commercial, governmental, and residential users. The WWTP (completed in 2003) is a sequential batch reactor with effluent filters and UV disinfection. Effluent is reused on a limited basis to irrigate two 18-hole golf courses with the remainder evaporated and recharged. Solids are aerobically digested, dewatered, and sent to a landfill for disposal.

Future Wastewater System Development. The WWTP has been constructed for modular expansion as flows increase. The collection system will be completed as funding becomes available.

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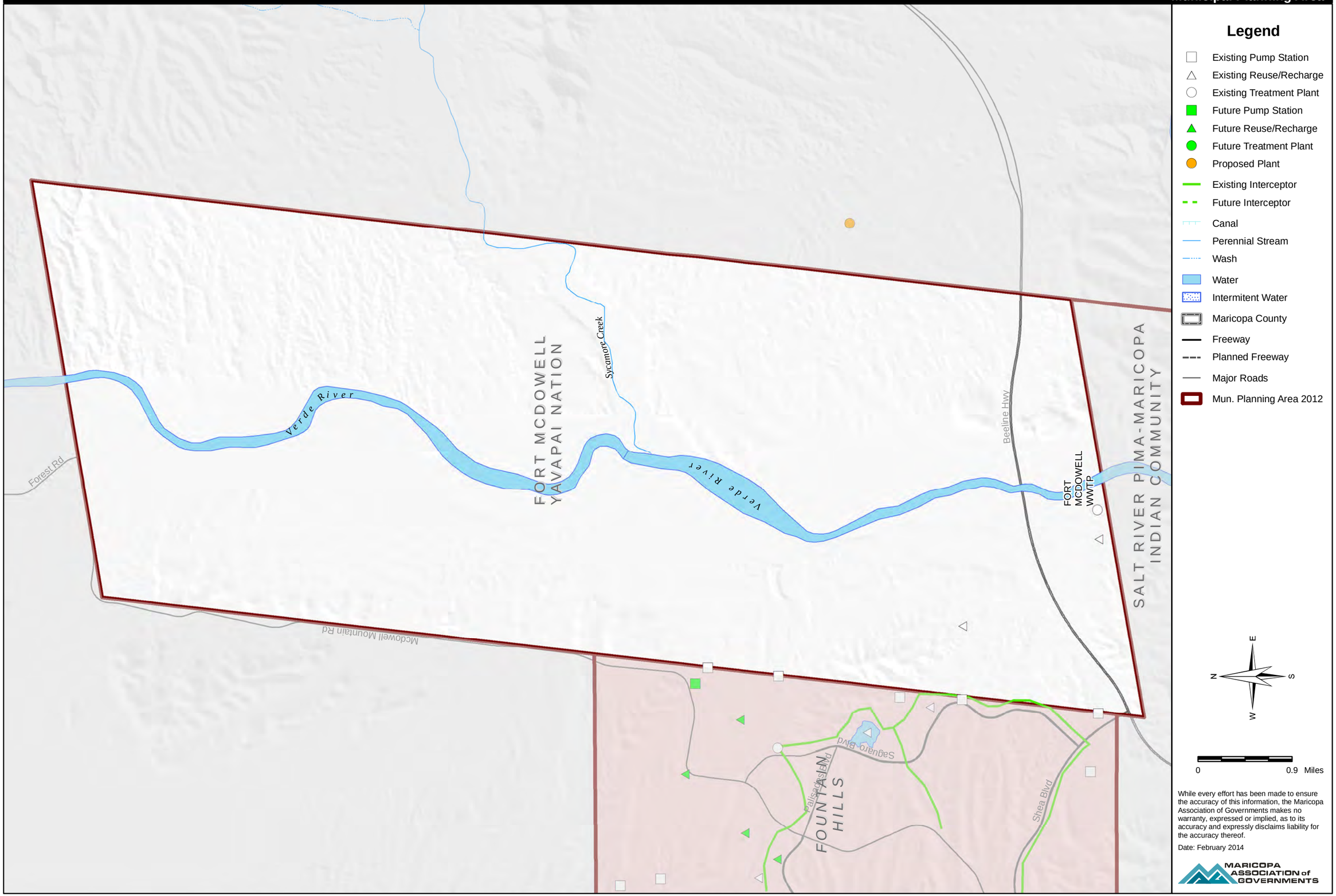
Figure 2.29 Fort McDowell Yavapai Nation Municipal Planning Area



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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
- Rio Verde, Vista Verde, and Tonto Verde
- Sun City and Sun City West
- Sun Lakes
- Wigwam Creek
- Belmont
- Copper Leaf
- Desert Whisper
- Hassayampa
- I-10, 339th Avenue Project
- Silver Spring Ranch
- Silver Water Ranch

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 2.30 shows the entire Maricopa County and Figure 2.31 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 2040 and corresponding wastewater flow for some of the approved master planned communities are summarized in Table 2.42. Population data are based on the 2013 MAG population projections. A unit wastewater flow of 100 gpcd is used to estimate 2040 flow projections.

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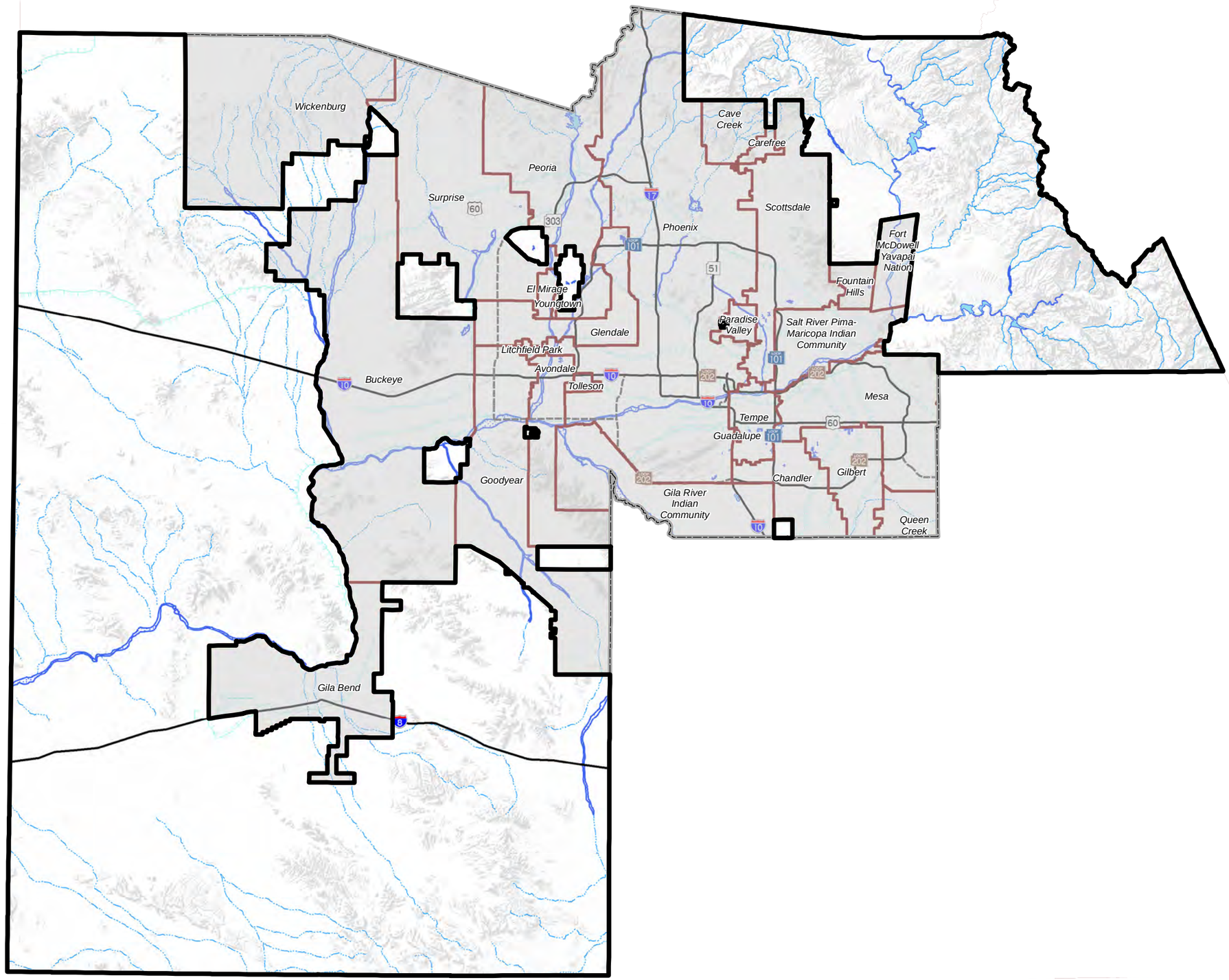
Figure 2.30 Maricopa County Municipal Planning Area



Legend

- Water
- Intermitent Water
- Maricopa County
- Freeway
- Planned Freeway
- County Planning Area 2012
- Mun. Planning Area 2012

N
W E
S

0 10 Miles

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Figure 2.31 Unincorporated Communities Planning Area

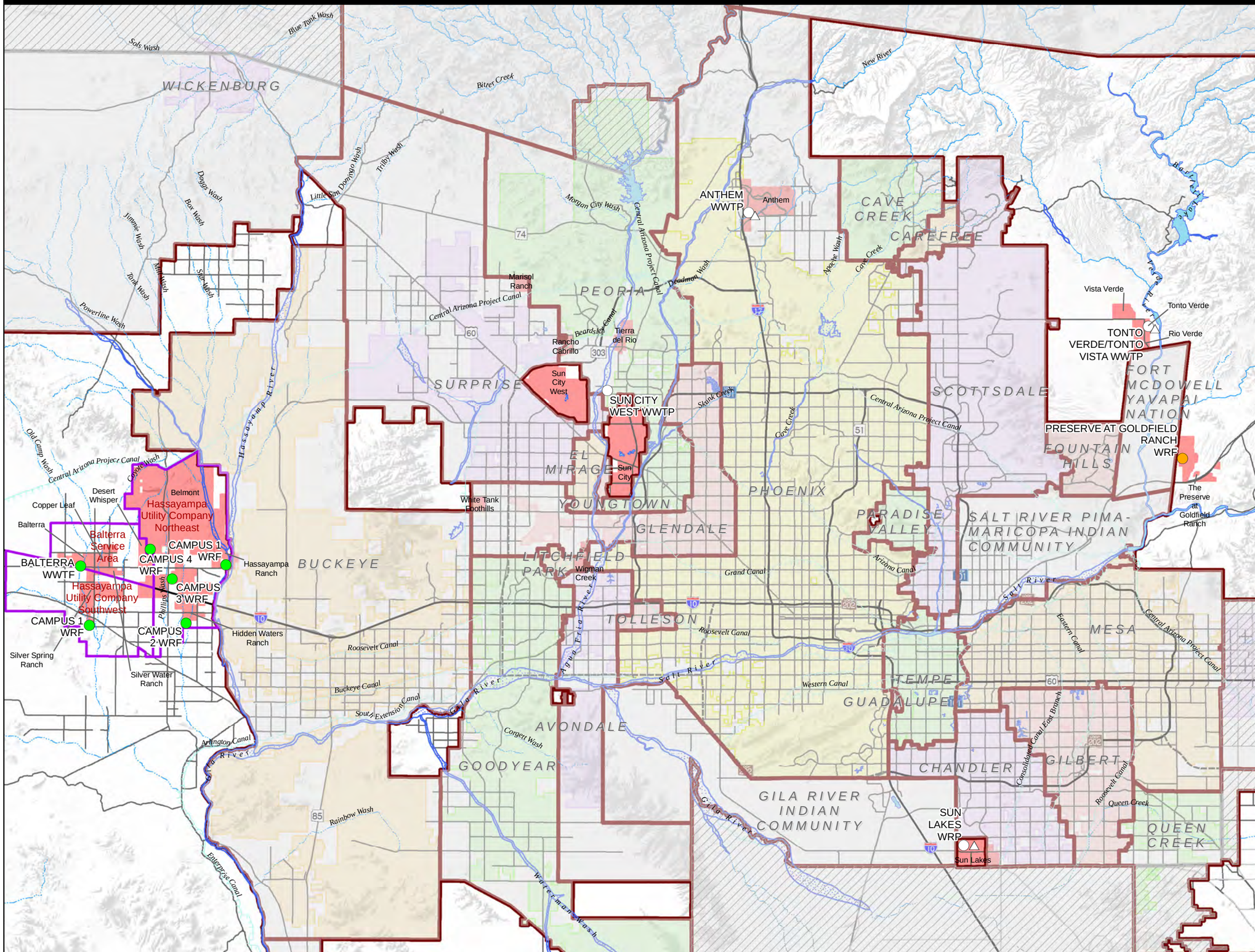

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Table 2.42 Maricopa County Master-Planned Developments Population and Flow Projections MAG 208 Water Quality Management Plan Update		
Community	Projected Year 2040 Population	Projected Year 2040 Flow (mgd)
Anthem	27,536	2.75
Rio Verde	3,197	0.32
Sun City West	31,714	3.17
Sun Lakes	12,657	1.27
Wigwam Creek	7,496	0.75
Belmont	2,406	0.24
Total	85,006	8.5

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.

A single wastewater treatment facility was constructed with an initial capacity of 0.5 mgd along with a collection and interceptor sewer system. Treatment capacity was expanded to 3.0 mgd in September 2010. The 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 Class A+ effluent is reused for landscape irrigation and for maintaining water in lakes. Excess effluent is used for groundwater recharge. If flows exceed reuse and recharge capacity, effluent is discharged to an unnamed wash that is tributary to Deadman Wash, which is tributary to New River. An AZPDES permit has been obtained (#AZ0025429) for this discharge. Solids are dewatered and hauled to an approved landfill.

EPCOR Water (formerly Arizona American Water Company) is the owner/operator of the wastewater system and holds an APP, AZPDES, ADWR Underground Water Storage, ADWR Underground Water Storage Facility, and Reclaimed Water Permit.

Rio Verde Utilities. Rio Verde Utilities provides wastewater collection and treatment services for Rio Verde, Vista Verde, 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 700,000 gallons per day. Secondary treatment is accomplished by an oxidation ditch, followed by tertiary treatment by sand filtration. Class B effluent is reused for golf course irrigation. Sludge is dewatered and hauled to a landfill. 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 EPCOR Water (formerly Arizona American Water Company) at the Northwest Valley

Regional Water Reclamation Facility (aka Sun City West WRF). The treatment facility was expanded to 5.0 mgd capacity in September 2006. The site is sized for an ultimate treatment plant capacity up to 6.44 mgd. The existing WWTP consists of a headworks, a pre-aeration basin, bioreactors, secondary clarifiers, filters, and chlorine disinfection. Sludge is digested, dewatered, and hauled to a landfill. Class B+ effluent is disposed of in recharge basins. If future expansions exceed the recharge basin capacity, discharge will be to an adjacent ephemeral reach of the Agua Fria River. An AZPDES 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. Class A+ effluent is filtered and UV disinfected 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, ADWR Underground Water Storage, ADWR Underground Water Storage Facility, 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 one-half mile of the west boundary.

Sewer service is to be provided by the Litchfield Park Service Company dba Liberty Utilities. Capacity of 2.4 mgd at build-out is anticipated.

Belmont/Hassayampa Utility Company Northeast Service Area. Belmont is a master-planned community of 20,805 acres 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. The 2002 MAG 208 Plan identified a WWTP to serve the Belmont development. However, on October 24, 2007, the MAG Regional Council approved a MAG 208 Water Quality Management Plan Amendment for the Hassayampa Utility Company (HUC) Northeast Service Area (Damon S. Williams Associates, LLC., 2007) which included Belmont and other developments such as Hassayampa Ranch and the 339th Avenue Project. The owners of Belmont signed an agreement with Global Water Resources for the Hassayampa Utility Company to provide wastewater and reclaimed water service to the Belmont development. Therefore, the projected wastewater flows from Belmont have been incorporated into the ultimate capacity for the HUC Northeast Service Area (Damon S. Williams Associates, LLC., 2007).

The amendment identified four water reclamation facilities to serve approximately 63.6 square miles. The Campuses 1 through 4 WRFs and service areas are located in unincorporated Maricopa County and make up the HUC Northeast Service Area. The area is generally bound by the CAP Canal on the north, 363rd Avenue to Wintersburg Road on

the west, Buckeye Road to Broadway Road on the south, and the Buckeye Municipal Planning Area on the east. The expected wastewater flows throughout the Northeast Service Area are projected to be 45 mgd (Damon S. Williams Associates, LLC., 2007).

The Campus 1 WRF will be located in Section 22 of Township 2 North, Range 5 West and have an ultimate capacity of 9 mgd. Class A+ effluent will be disposed of through reuse, recharge, and an AZPDES permit discharge to the Hassayampa River. The Campus 2 WRF will be located within Section 8 of Township 1 North, Range 5 West and have an ultimate capacity of 10 mgd. Class A+ effluent from this facility will be disposed of through reuse, recharge, and AZPDES permit discharge point to the Dickey Wash and/or Hassayampa River. The Campus 3 WRF will have an ultimate capacity of 12 mgd and be located in Section 30 of Township 2 North, Range 5 West. Class A+ effluent will be reused, recharged, and discharged through an AZPDES permit to the Dickey Wash and/or Phillips Wash. The Campus 4 WRF will be located within Section 14 of Township 2 North, Range 6 West and have an ultimate capacity of 14 mgd. Class A+ effluent will be disposed of through reuse, recharge, and an AZPDES permit discharge to the Phillips Wash. The Dickey Wash and Phillips Wash are tributaries to the Luke Wash (Damon S. Williams Associates, LLC., 2007).

The Campuses 1 through 4 WRFs will consist of screening and grit removal preliminary treatment by Sequencing Batch Reactors, post equalization, tertiary filtration, and ultraviolet disinfection. Aerobic digesters will be designed to produce Class B sludge suitable for land application. Sludge will be dewatered using a belt press or centrifuge and disposed of at a landfill or on permitted farmland. The facilities will have noise, odor and aesthetic control and include a standby diesel generator (Damon S. Williams Associates, LLC., 2007).

The facilities will be designed and constructed by HUC, a wholly owned subsidiary of Global Water Resources. The Hassayampa Utility Company will also be responsible for the operation and maintenance of the facilities.

Within the area to be served by the HUC Campuses 1 through 4 WRFs there is the Truckstops of America WWTP. This facility was identified in the 2002 MAG 208 Plan as the Rip Griffin Truck Stop facility. The small existing facility is located on the southwest corner of Interstate 10 and 339th Avenue. It is an activated sludge facility. The APP allows treatment of up to 80,000 gallons per day. However, due to effluent disposal constraints, the approved capacity is only 54,000 gallons per day. Flows from the truck stop may be incorporated into the HUC system if wastewater service is requested.

Hassayampa Utility Company Southwest Service Area. The Hassayampa Utility Company also expressed interest in providing wastewater service near Tonopah. On September 26, 2007, the MAG Regional Council approved a MAG 208 Water Quality Management Plan for the Hassayampa Utility Company Southwest Service Area (Damon S. Williams Associates, LLC., 2007a). The Campus 1 Water Reclamation Facility for the HUC Southwest Service Area will have an ultimate capacity of 32 mgd and be located in unincorporated Maricopa County within Section 7 of Township 1 North, Range 6 West. The Southwest Service Area comprises approximately 45.5 square miles and is generally

bound by Interstate 10 on the north, 443rd Avenue on the west, Van Buren Street and Broadway Road on the south, and 363rd Avenue on the east (Damon S. Williams Associates, LLC., 2007a).

The Campus 1 WRF will consist of screening and grit removal preliminary treatment followed by Sequencing Batch Reactors, post equalization, tertiary filtration, and ultraviolet disinfection. Aerobic digesters will be designed to produce Class B sludge suitable for land application. Sludge will be dewatered using a belt press or centrifuge and disposed of at a landfill or on permitted farmland. The facility will have noise, odor, and aesthetic control and include a standby diesel generator. Class A+ effluent will be disposed of through reuse, recharge, and an AZPDES Permit discharge points to the Delaney Wash, Four Mile Wash, Old Camp Wash, and/or an unnamed wash northeast of the facility 12,000 feet. The Delaney Wash, Old Camp Wash, and unnamed wash are tributaries to the Four Mile Wash. The HUC will be responsible for the design and construction of the Campus 1 WRF as well as the operation and maintenance (Damon S. Williams Associates, LLC., 2007a).

There is one existing wastewater treatment facility located within the area to be served by the Campus 1 WRF. The Saddle Mountain RV Park (formerly Palo Verde Mobile Home Park) facility was identified in the 2002 MAG 208 Plan as an activated sludge plant with a capacity of 200,000 gallons per day. Since then, the plant has been rebuilt and the capacity is only 20,000 gallons per day. Flows treated by the facility may be incorporated into the HUC system if wastewater service is requested by the Saddle Mountain RV Park.

Ruth Fisher School/Balterra. The Ruth Fisher School Wastewater Treatment Plant was identified in the 2002 MAG 208 Plan with a capacity of 15,000 gallons per day. On January 26, 2005, the MAG Regional Council approved the expansion of the Ruth Fisher School WWTP as part of the MAG 208 Water Quality Management Plan (Fluid Solutions, 2004). The expansion increases the facility capacity to 42,000 gallons per day to provide service for the expansion of the Ruth Fisher Elementary School and a new high school. The expanded facility also includes process upgrades to enable recharge in addition to existing irrigation activities. The facility is located at the southwest corner of Indian School Road and Wintersburg Road, north of Interstate 10 in Tonopah.

The aging plant will be replaced with a new facility consisting of mechanical bar screen solids removal and flow equalization, activated sludge nitrification denitrification, tertiary filtration, and chlorine disinfection. Sludge will be aerobically digested and hauled to a landfill for disposal.

Following the approval for the expansion of the Ruth Fisher School WWTP, the Saddle Mountain Unified School District #90 engaged in discussions with the Balterra Sewer Corp., who expressed interest in constructing, owning, and operating a wastewater treatment facility to serve 24 square miles in the area. A 208 Plan Amendment was prepared for the Balterra WWTF. At the request of the Saddle Mountain Unified School District #90, the facility included enough capacity to accept the flows from the school district. Therefore, the Ruth Fisher School WWTP will be closed upon completion of the Balterra WWTF.

On July 26, 2006, MAG Regional Council approved a MAG 208 Water Quality Management Plan Amendment for the Balterra Wastewater Treatment Facility (CSA Engineering, 2007). The facility will accept flow from the North Tonopah's Southeast Planning Area which is generally located north of Interstate 10, east of 419th Avenue, south of Glendale Avenue, and west of 363rd Avenue. The Balterra WWTF was approved with an initial flow of 0.55 mgd and an ultimate capacity of 15 mgd (CSA Engineering, 2007). In 2008, it was proposed that the facility would have a design flow of 0.40 mgd with an ultimate capacity of 22.5 mgd; however, the facility has not been built. It will be located in unincorporated Maricopa County in the northeast quadrant of 403rd Avenue and Indian School Road.

The Balterra WWTF will consist of a membrane bioreactor activated sludge process. Peripheral facility components include headworks, tertiary treatment units, UV disinfection, solids handling facilities, odor control facilities, administration facilities, and maintenance facilities. Class A+ effluent will be disposed of through reuse, recharge, and an AZPDES Permit discharge to the adjacent wash (T2N-R6W-30W as identified in the Palo Verde Watershed Zone A Flood Delineation Study). The AZPDES Permit discharge point would be located along the northeast edge of the facility site, near the confluence of the adjacent wash and Winters Wash. It would only be used as an emergency back-up. Sludge will be digested, thickened, dewatered, and hauled to the Southwest Regional Landfill (CSA Engineering, 2007).

Following the approval of the MAG 208 Water Quality Management Plan Amendments for the HUC Northeast Service Area, HUC Southwest Service Area, and Balterra WWTF, Global Water Resources acquired Balterra Sewer Corp. with the final approval being granted by the Arizona Corporation Commission on April 24, 2008. This acquisition provides Global Water the opportunity to maximize the benefits of regionalization and construct the most cost-effective infrastructure.

Preserve at Goldfield Ranch. On May 28, 2008, the MAG Regional Council approved as part of the MAG 208 Water Quality Management Plan, the Preserve at Goldfield Ranch Water Reclamation Facility as revised on May 23, 2008 (CMX, 2008), with additional modifications and assurances made in the letter from the applicant's counsel to Dennis Smith dated May 27, 2008 and to acknowledge that Maricopa County formed a County Improvement District on August 8, 2007, for the purposes of acquiring, owning, operating, and maintaining the treatment plant once constructed, and to forward to the Arizona Department of Environmental Quality issues that are appropriate to be resolved in the Aquifer Protection Permit process for the facility including: (1) Injection of reclaimed water into the same aquifer that will be used for a drinking water source; (2) A specific sludge management plan for the facility.

The Small Plant Review and Approval for the Preserve at Goldfield Ranch Water Reclamation Facility was submitted to the Arizona Department of Environmental Quality on June 2, 2008. To date ADEQ has not taken action on the plant. The proposed facility would have an ultimate capacity of 400,000 gallons per day and be located within Section 15 of Township 3 North, Range 7 East. It is anticipated that the facility would be a complete mix system, although alternative treatment technologies may be reevaluated

as further planning and design proceeds. Preliminary treatment would include screening to remove the coarse solids and processes to macerate, wash, compact, and dewater the captured solids. Dewatered screenings would be properly disposed at an approved landfill. Class A+ effluent would be treated with ultraviolet radiation to disinfect the water and disposed of through reuse and recharge (CMX, 2008).

Other Facilities.

Table 2.43 summarizes additional small wastewater treatment facilities in unincorporated areas of Maricopa County.

Table 2.43 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	60,000 150,000,000	Activated sludge Physical-chemical	-- Cooling
ADOT-Sentinel Rest Area Eastbound	--		--
ADOT-Sentinel Rest Area Westbound	--		--
Canyon Lake Marina	15,000	Activated sludge	Subsurface Irrigation/Dust Control for Parking Lot
Gila Compressor Station, Arlington	--		--
Salt-Gila Pumping Station	3,800	Activated sludge	Percolation
Saddle Mountain RV Park (formerly Palo Verde Mobile Home Park)	20,000	Activated sludge	Percolation
Pioneer RV Park – Pioneer Road	35,000	Activated sludge	Evaporation Ponds
Truckstops of America WWTP	54,000		
St. John's Mission – Laveen	--	--	--
Tortilla Flat Campground – U.S. Forest Service	10,000	Aerated Ponds	Evaporation Pond
Tortilla Flat Resort – Tortilla Flat	5,000	Activated sludge	Mound System

In addition to adding new facilities to serve developments in unincorporated areas, Maricopa County requested that a small unincorporated area be provided wastewater service from the Palm Valley and Sarival Water Reclamation Facilities located in the City of Goodyear Municipal Planning Area. These facilities currently provide wastewater collection and treatment service to all of the City of Litchfield Park and portions of Avondale, Glendale, Goodyear, and unincorporated Maricopa County. The facilities are owned and operated by Litchfield Park Service Company dba Liberty Utilities and identified in the 2002 MAG 208 Plan.

On May 24, 2006, the MAG Regional Council approved a MAG 208 Water Quality Management Plan Amendment for the Service Area Expansion of the Litchfield Park Service Company Palm Valley and Sarival Water Reclamation Facilities (Wood, Patel & Associates, 2006). This amendment expanded the service area to include portions of the Buckeye and Glendale Municipal Planning Areas and unincorporated areas of Maricopa County. The expanded service area includes the Zanjero Trails development that extends from the Buckeye Planning Area into unincorporated Maricopa County located west of Perryville Road between Northern and Peoria Avenues (Wood, Patel & Associates, 2006).

Wastewater System Costs. Table 2.44 summarizes the estimated costs associated with wastewater system development in Maricopa County. The costs presented are based upon costs of $6 per gallons per day for capacities less than 3 mgd and $5 per gallons per day for capacities greater than or equal to 3 mgd.

Table 2.44 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	3.50	17.50
Rio Verde Utilities	0.79	4.70
Sun City West	1.16	7.00
Sun Lakes	0.00	0.00
Wigwam Creek	2.40	14.40
Belmont	3.70	18.50
Total	11.55	$62.10

[1]August 2000 Dollars, Millions (ENR Construction Cost Index = 6000).

2.8 ENVIRONMENTAL ASSESSMENT OF POINT SOURCE PLAN

The MAG 208 Water Quality Management Plan Revision completed in 2002 included a description of existing environmental conditions as well as the environmental consequences of the Point Source Plan. A copy of this section is included in Appendix C. For wastewater treatment facilities added to the MAG 208 Plan following the 2002 Revision, the environmental impacts were evaluated through the MAG 208 Plan Amendment and Small Plant Review and Approval Processes.

2.9 REFERENCES

Black & Veatch, 2008. *2007 City of Goodyear Integrated Water Master Plan*. June 2008.

Burnes & McDonnell, 2008. *MAG 208 Amendment for the Town of Cave Creek Water Reclamation Facility*. April 2008.

Carollo Engineers, 2002. *MAG 208 Water Quality Management Plan*. October 2002.

Carollo Engineers, 2004. *City of Glendale 208 Water Quality Management Plan Amendment*. November 2004.

CMX, 2007. *MAG 208 Water Quality Management Plan Comprehensive Amendment for the Town of Buckeye*. October 2007.

CMX, 2008. *MAG 208 Water Quality Management Plan Small Plant Review and Approval for the Preserve at Goldfield Ranch Water Reclamation Facility*. May 2008.

CSA Engineering, 2004. *Clean Water Act 208 Amendment Special Planning Area 3 Regional Wastewater Facility and Service Area, Draft*. November 30, 2004.

CSA Engineering, 2007. *Clean Water Act 208 Amendment Maricopa County Balterra Wastewater Treatment Facility*. June 2007.

CSA Engineering, 2007a. *MAG Water Quality Management Plan Small Plant Review and Approval City of Peoria Scorpion Bay Wastewater Treatment Plant*. Draft-August 2007.

Damon S. Williams Associates, LLC., 2007. *Maricopa Association of Governments 208 Water Quality Management Plan Amendment Application HUC Northeast Service Area*. May 2007.

Damon S. Williams Associates, LLC., 2007a. *Maricopa Association of Governments 208 Water Quality Management Plan Amendment Application HUC Southwest Service Area*. May 2007.

ESCA Environmental, Inc., 2006. *MAG 208 Water Quality Management Plan Small Plant Review and Approval Report for Estates at Lakeside Peoria, Arizona*. January 2006 (Revised).

Fluid Solutions, 2004. *Saddle Mountain Unified School District No. 90 Ruth Fisher School 208 Water Quality Management Plan Small Plant Review and Approval*. October 2004.

GTA Engineering, Inc., 2003. *MAG 208 Water Quality Management Plan Application for Small Plant Approval for Desert Oasis Wastewater Management System*. Revised January 2003.

MAG, 2013. *Socioeconomic Projections of Population, Housing and Employment by Municipal Planning Area and Regional Analysis Zone*. June 2013.

Malcolm Pirnie, Inc., 2005. *City of Glendale West Area Water Reclamation Facility Arizona Pollutant Discharge Elimination System Permit Discharge Project No. 012012 Clean Water Act MAG 208 Amendment*. July 2005.

Pacific Environmental Resource Corp. (PERC) and Pacific Advanced Civil Engineering (PACE), 2005. *MAG 208 Amendment for the City of Surprise Special Planning Area No. 2 Water Reclamation Facility*. May 2005 (Revised).

Pacific Environmental Resource Corp. (PERC) and Pacific Advanced Civil Engineering (PACE), 2006. *MAG 208 Amendment for the City of Surprise Special Planning Area No. 4 Regional Water Reclamation Facility*. Revised April 2006.

Pacific Environmental Resource Corp. (PERC) and Pacific Advanced Civil Engineering (PACE), 2006a. *MAG 208 Amendment for the City of Surprise Special Planning Area No. 5 Regional Water Reclamation Facility*. Revised April 2006.

Steven M. Verfurth P.E. Consulting Engineering Service, 2002. *MAG 208 Water Quality Management Plan Small Plant Review and Approval Report for Kraus Investments LC d.b.a. Shangri-La Ranch Wastewater Treatment Facilities*. May 2002.

Sunrise Engineering, 2011. *Town of Queen Creek Interceptor Sewer Modeling & Wastewater Master Plan*. July 2011.

Water Works Engineers, 2012. *MAG 208 Plan Amendment for the Service Area Expansion of the LPSCo dba Liberty Utilities Palm Valley and Sarival Water Reclamation Facilities*. Revised October 2012.

Water Works Engineers, 2013. *Town of Cave Creek Arizona Wastewater Master Plan*. November 2013.

Wilson Engineers, 2007. *MAG 208 Water Quality Management Plan Amendment for the City of Goodyear Sonoran Valley Planning Area*. November 2007.

Wood, Patel & Associates, Inc., 2006. *Service Area Expansion for the Litchfield Park Service Company Palm Valley and Sarival Water Reclamation Facilities Draft 208 Amendment*. Revised February 2006.

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CHAPTER 3
MODIFICATIONS TO THE MAG 208 PLAN

Changes may be made to the MAG 208 Plan through a Periodic Major Revision of the 208 Plan, the 208 Plan Amendment Process, and the Small Plant Review and Approval Process. Each of these procedures have been utilized multiple times since the original plan was developed. A description of each procedure is provided in this section.

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. Updates to the original 208 Plan (July 1979) have been occurring on an approximate ten year cycle (1982, 1993, and 2002).

In preparation of a major revision to the MAG 208 Plan, the MAG member agencies provide their plans for future wastewater treatment facilities, which are considered for the revision. For each community, the 208 Plan describes the planning area, population and wastewater flow projections, existing wastewater collection and treatment systems, wastewater disposal and/or reuse, sludge management, planned improvements, and improvement costs.

The MAG Water Quality Advisory Committee reviews the draft revision 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 MAG.

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 revision to the MAG 208 Plan.

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

3.2 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 to the Arizona Department of Environmental Quality. ADEQ certifies that the 208 Plan amendment is incorporated into and is consistent with the Arizona Water Quality Management Plan and submits the revision to the U.S. Environmental Protection Agency for approval. 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.

3.3 SMALL PLANT REVIEW AND APPROVAL PROCESS

3.3.1 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.

3.3.1.1 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.

3.3.1.2 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. The 27 Municipal Planning Areas 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.

3.3.1.3 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 3.1 schematically illustrates the relationship between the three areas of responsibility.

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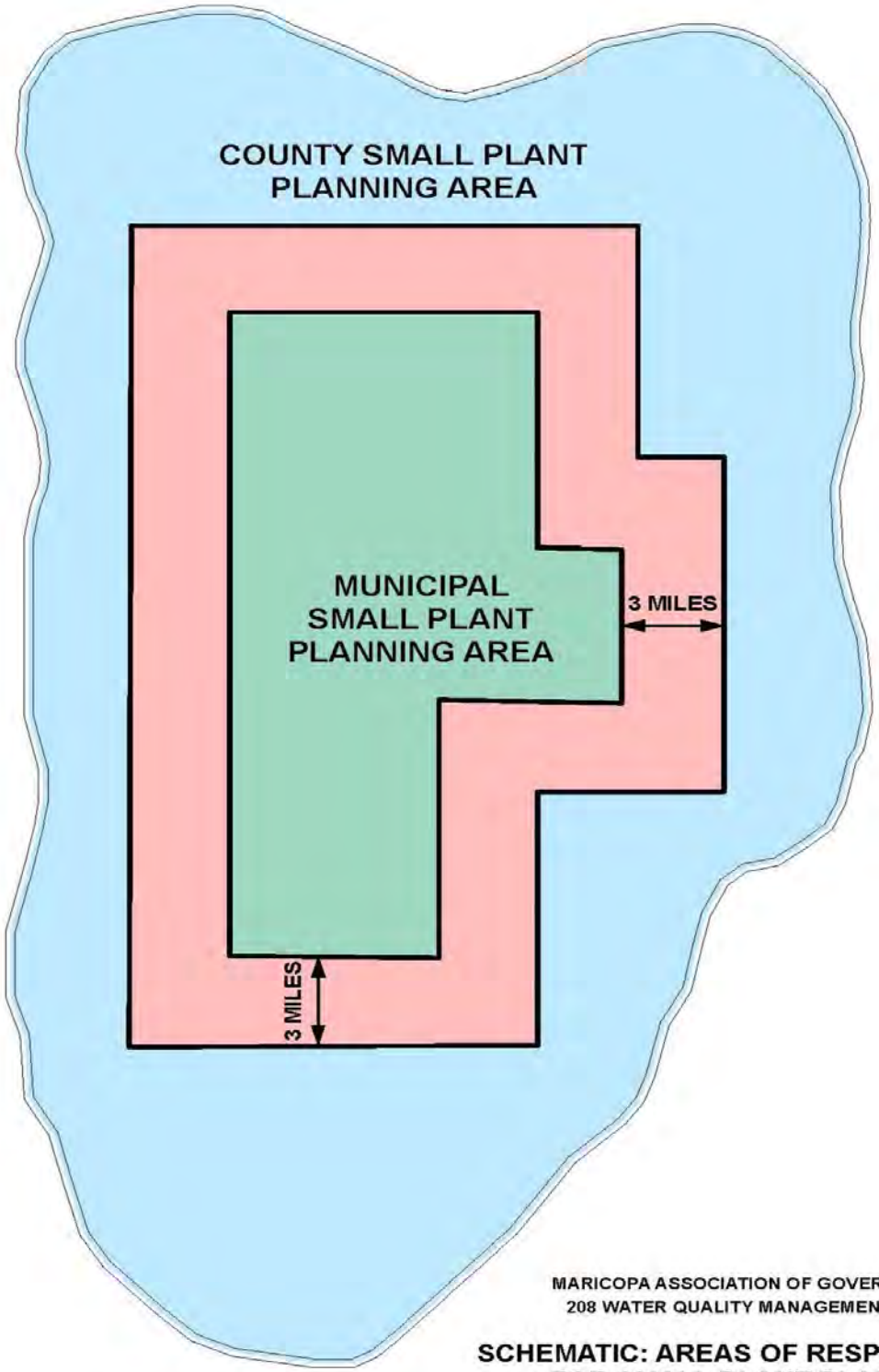

MARICOPA ASSOCIATION OF GOVERNMENTS
208 WATER QUALITY MANAGEMENT PLAN

SCHEMATIC: AREAS OF RESPONSIBILITY FOR SMALL PLANT PLANNING

Figure 3.1

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3.3.1.4 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 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.

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-A201(B)(6)(a), the applicant for an Individual Aquifer Protection Permit shall provide the Arizona Department of Environmental Quality with documentation that the sewage treatment facility or expansion conforms with the Certified Areawide Water Quality Management Plan and the Facility Plan (see Appendix D). 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.

3.3.2 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 3.1) 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 3.1 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?

Table 3.1 Guidelines for Small Plants Within Municipal Small Plant Planning Area MAG 208 Water Quality Management Plan Update
• 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)
• 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.

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 3.2.

Table 3.2 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
• 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?

Table 3.2 Criteria for Feasibility Report for Small Plants Outside of Municipal Small Plant Planning Area MAG 208 Water Quality Management Plan Update
• 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?
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.

APPENDIX A

MAG POPULATION PROJECTIONS AND MUNICIPAL PLANNING AREAS

Maricopa Association of Governments
Resident Population by Municipal Planning Area, Maricopa County
July 1, 2010 and Projections July 1, 2020 to July 1, 2040

Municipal Planning Area	2010	2020	2030	2040
Apache Junction	294	294	344	344
Avondale	77,911	96,591	121,500	155,258
Buckeye	62,807	103,550	183,795	313,544
Carefree	3,353	3,770	4,248	4,402
Cave Creek	4,939	5,850	7,410	8,869
Chandler	244,636	283,052	307,539	316,489
County Areas	94,620	104,094	119,895	145,198
El Mirage	31,894	34,596	40,955	48,425
Fort McDowell	976	1,026	1,097	1,135
Fountain Hills	22,444	25,929	31,043	31,182
Gila Bend	2,492	2,789	6,196	16,955
Gila River	3,005	3,084	3,324	3,386
Gilbert	212,431	259,113	293,139	322,300
Glendale	252,773	291,461	343,456	357,490
Goodyear	68,031	115,307	167,650	241,407
Guadalupe	5,540	6,036	6,516	6,791
Litchfield Park	10,524	11,985	13,816	13,816
Mesa	482,503	543,353	620,265	656,933
Paradise Valley	12,764	12,951	14,056	14,476
Peoria	162,482	214,412	276,207	342,565
Phoenix	1,501,259	1,711,641	1,953,806	2,197,958
Queen Creek	32,208	50,130	67,808	73,410
Salt River	6,300	6,428	6,994	7,635
Scottsdale	217,443	252,275	282,977	296,298
Surprise	127,623	159,171	241,901	336,911
Tempe	162,116	183,864	211,740	217,582
Tolleson	6,575	6,963	8,175	8,909
Wickenburg	7,983	10,651	16,215	27,685
Youngtown	6,130	6,583	7,430	7,587
Maricopa County Total	**3,824,056**	**4,506,949**	**5,359,497**	**6,174,940**

Note: These projections include only the Maricopa County portions for Apache Junction, Peoria, Queen Creek, Wickenburg and the Gila River Indian Community.

Source: MAG Socioeconomic Projections of Population, Housing and Employment by Municipal Planning Area and Regional Analysis Zone, June 2013.

NOTES AND CAVEATS FOR 2013 PROJECTIONS

1. The projections by Municipal Planning Area (MPA) and Regional Analysis Zone (RAZ) were prepared to be consistent with the April 1, 2010 Census and have been prepared for July 1st of the base year 2010 and projected for July 1st of 2020, 2030, and 2040.

2. The 2010 housing and population base was developed by aggregating Census 2010 data to Traffic Analysis Zone. Census place mismatches were corrected in this process and are reflected in the Base 2010 MPA and RAZ numbers.

3. The population projections are for resident population only and do not include nonresident seasonal or transient population.

4. The projections are required to use the latest Census as the base. The 2010 Census data were released in July 2011. Subsequent to the release, the Arizona Department of Administration, Office of Employment and Population Statistics, prepared a new set of Maricopa County projections consistent with the 2010 Decennial Census. These County projections were recommended for approval by the MAG Population Technical Advisory Committee (POPTAC) in October 2012 and the Management Committee in November 2012. The projections were approved by the Regional Council in December 2012.

5. The MAG socioeconomic projections by MPA and RAZ were recommended for approval by the MAG POPTAC on May 28, 2013 and by the MAG Management Committee on June 12, 2013. The projections were approved by MAG Regional Council on June 19, 2013.

6. The projections include only the Maricopa County portion of Apache Junction, Peoria, Queen Creek, Wickenburg, and the Gila River Indian Community.

7. The projections were based upon the latest version of each member agency's land use plan. These plans are subject to change.

8. The databases and assumptions upon which the projections are based have been reviewed by MAG member agencies, revised by MAG staff based on input received and approved by members of the MAG POPTAC.

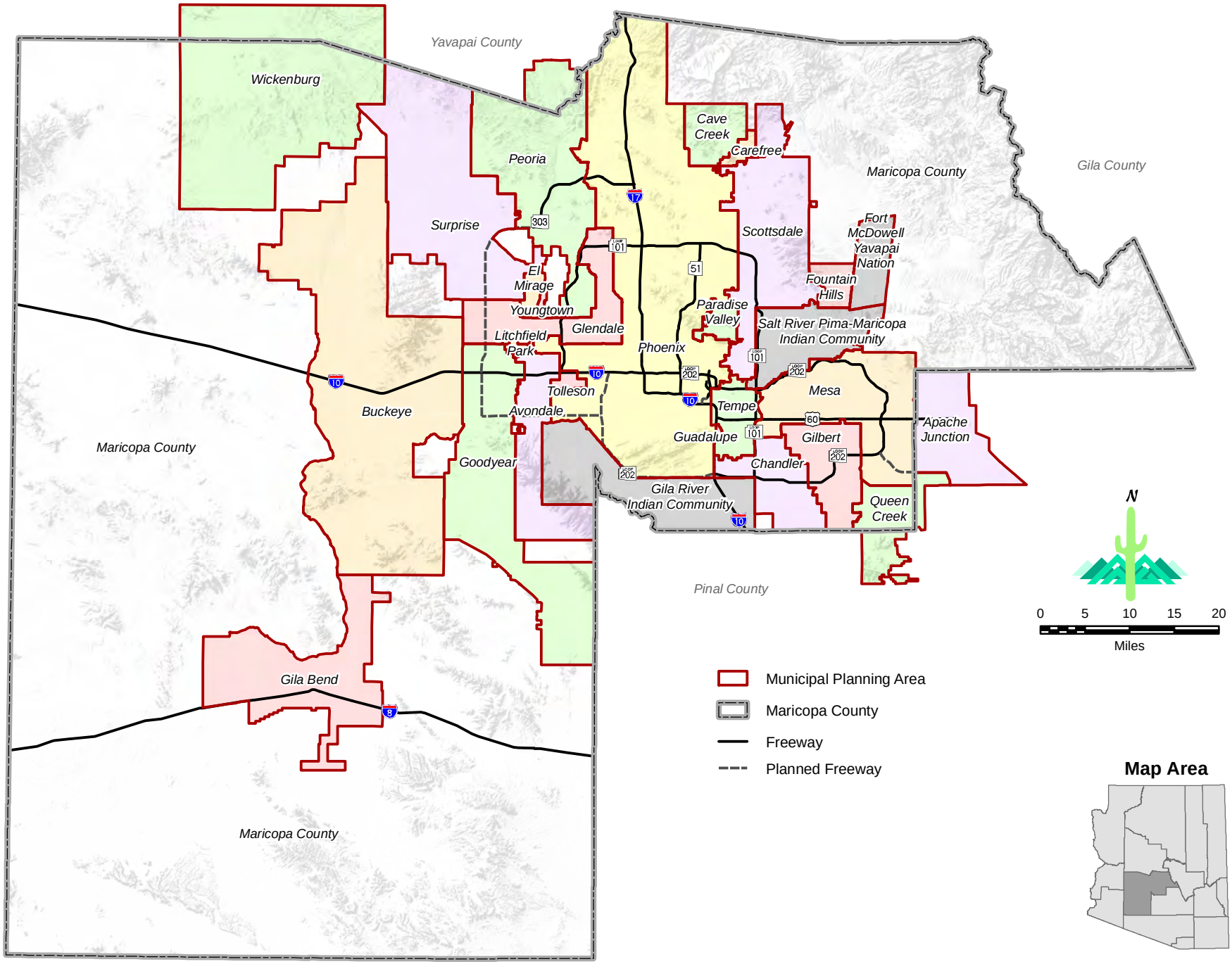
9. The projections are based upon previous review and local insight by members of the MAG POPTAC.

10. The "other" employment category includes work-at-home, construction employment, and non-site based employment. Because construction and non-site based employment follows development, employment projections may show declines in future years.

11. The projections should be used with caution. They are subject to change as a result of fluctuation in economic and development conditions, local development policies and updated data.

2012 Municipal Planning Areas, Maricopa County, Arizona

MARICOPA ASSOCIATION of GOVERNMENTS



Source: MAG and the MAG member agencies
Date: May 2013

POPULATION PROJECTIONS SUMMARY - MAG 208 PLAN UPDATE

	2010	2020	2030	2040
Maricopa County Population Summary				
Total Resident	3,824,056	4,506,949	5,359,497	6,174,940
Total Non-Resident	308,398	387,285	454,248	519,918
Total	4,132,454	4,894,234	5,813,745	6,694,858
Population by 208 Planning Region and Municipal Planning Area Including Non-Resident (Seasonal and Transient)				
Northeast Region				
Cave Creek	5,571	6,566	8,473	9,959
Carefree	5,141	5,742	6,593	7,100
Scottsdale	255,584	297,596	332,394	347,168
Fountain Hills	27,255	31,251	33,983	35,012
Paradise Valley	17,275	18,545	20,260	21,181
SRPMIC	8,334	8,820	9,786	10,610
County - Rio Verde	2,709	3,369	3,622	3,197
Fort McDowell	1,436	1,636	1,824	2,010
County	415	441	470	450
Subtotal	323,720	373,966	417,405	436,687
Northwest Region				
Peoria	171,466	225,685	292,507	363,737
Surprise	141,146	175,853	258,683	364,357
El Mirage	33,806	36,972	43,070	51,298
Youngtown	6,582	7,174	8,178	8,389
Glendale	258,728	299,561	353,381	368,919
Luke AFB	3,580	4,539	4,891	4,985
County	75,359	78,315	81,976	80,836
Subtotal	690,667	828,099	1,042,686	1,242,521
Southeast Region				
Mesa	535,928	608,359	685,071	717,071
Tempe	175,593	200,513	232,211	240,354
Guadalupe	6,415	7,148	7,918	8,555
Chandler	257,889	298,380	326,420	340,297
Gilbert	219,491	267,833	305,715	335,753
Queen Creek	33,120	51,488	70,342	76,292
Apache Junction	378	398	391	416
County - Sun Lakes	12,441	12,887	13,351	12,657
Subtotal	1,241,255	1,447,006	1,641,419	1,731,395

POPULATION PROJECTIONS SUMMARY - MAG 208 PLAN UPDATE

	2010	2020	2030	2040
Southwest Region				
Buckeye	67,111	111,110	194,640	335,326
Goodyear	73,176	121,633	180,141	261,993
Litchfield Park	11,844	13,382	15,778	15,937
Avondale	80,473	100,302	126,836	162,959
Tolleson	7,478	8,166	9,638	10,596
Unincorporated Areas	3,815	4,041	4,484	4,996
Subtotal	243,897	358,634	531,517	791,807
Central Region				
Phoenix	1,600,831	1,842,691	2,111,147	2,378,641
Outlying Areas				
Wickenburg	9,611	12,595	19,029	31,169
Gila Bend	3,293	3,745	7,800	20,010
GRIC	3,950	4,359	4,715	4,900
County SW	10,320	15,234	25,486	44,520
County NE	4,575	7,514	12,041	12,628
County NW	335	391	500	580
Subtotal	32,084	43,838	69,571	113,807
SROG				
Phoenix	1,600,831	1,842,691	2,111,147	2,378,641
Glendale	258,728	299,561	353,381	368,919
Tempe	175,593	200,513	232,211	240,354
Mesa	535,928	608,359	685,071	717,071
Scottsdale	255,584	297,596	332,394	347,168
Subtotal	2,826,664	3,248,720	3,714,204	4,052,153

Notes:

- The resident population by Municipal Planning Area were approved by the MAG Regional Council on June 19, 2013.
- The projections by Municipal Planning Area and Regional Analysis Zone (RAZ) were prepared to be consistent with the April 1, 2010 Census and have been prepared for July 1st of the base 2010 and projected for July 1st of 2020, 2030, and 2040.
- The projections include only the Maricopa County portion of Apache Junction, Peoria, Queen Creek, Wickenburg, and the Gila River Indian Community.
- The projections were based upon the latest version of each member agency's land use plan. These plans are subject to change.
- The projections should be used with caution. They are subject to change as a result of fluctuation in economic and development conditions, local development policies and updated data.

APPENDIX B

ROADMAP FOR GREENING WATER AND WASTEWATER INFRASTRUCTURE

DEVELOPING A ROADMAP FOR GREENING WATER INFRASTRUCTURE

On July 22, 2009, the MAG Regional Council accepted stimulus funding from the American Recovery and Reinvestment Act of 2009 from the Arizona Department of Environmental Quality (ADEQ) for water quality management planning. The ADEQ received the stimulus funds from the Environmental Protection Agency (EPA) Region IX. The scope for the project included conducting a workshop on greening infrastructure for water and wastewater treatment plants focusing on Arizona issues and preparing a roadmap for greening water infrastructure.

MAG Greening Water and Wastewater Infrastructure Workshop

On January 12, 2010, MAG conducted the Greening Water and Wastewater Infrastructure Workshop. The workshop highlighted strategies for integrating green technologies into water and wastewater treatment and funding opportunities that are available. With approximately 80 percent of municipal water and wastewater processing and distribution costs being for electricity, many of the presentations focused on the water/energy nexus and methods for eliminating energy waste (Source: www.epa.gov/waterinfrastructure/basicinfo.htm). In addition, there was discussion on opportunities for capturing energy from water and wastewater infrastructure using solar, methane, biofuel, hydrotubines, and other technologies. Approximately 150 people attended the workshop, representing public and private utilities, consulting firms, academia, state and federal agencies, and others.

The workshop provided water and wastewater professionals with valuable resources and contacts. In addition, agencies such as EPA and the U.S. Department of Energy were provided the opportunity to become more acquainted with some of the challenges and also progress in Arizona. Workshop participants found the event to be very informative and beneficial for incorporating green infrastructure for water and wastewater treatment plants into short-term and long-term planning. Many attendees stated that the information learned will be shared with others and that they will be evaluating opportunities for making water and wastewater treatment plants more environmentally friendly. This workshop served as an important step to a more sustainable future. To encourage continued dialogue, the workshop participants were provided with the names and email addresses of those in attendance and a link to the workshop presentations that are posted to the MAG website at http://www.mag.maricopa.gov/detail.cms?item=11400.

Roadmap for Greening Water and Wastewater Infrastructure

A roadmap for greening water and wastewater infrastructure may assist utilities with assessing options for reducing energy consumption and chemical use, conserving water, and saving critical financial resources. Jurisdictions are currently facing decreased revenues due to the economy and need to push capital improvement projects further into the future. A roadmap could provide utilities with opportunities to reduce energy waste and lower costs. In addition, utilities would be doing something good for the environment by reducing their carbon footprint and exploring the use of alternative energy sources.

Following the workshop, a menu of ideas was developed for making water and wastewater treatment plants more sustainable. To assist utilities with implementing the ideas, links to resources and contacts were also provided. In addition, potential next steps for greening water and wastewater infrastructure in the region have been included. As we continue to move forward, it is important that we recognize and utilize sustainable approaches available in water and wastewater treatment.

MAG Greening Water and Wastewater Infrastructure Workshop

First Steps Today, Standard Operating Procedure Tomorrow

January 12, 2010 AGENDA

8:00 a.m. - 8:30 a.m.	**Registration**
8:30 a.m. - 8:35 a.m.	**Welcome:** Councilwoman Peggy Neely, *City of Phoenix,* Chair, *Maricopa Association of Governments*
8:35 a.m. - 9:00 a.m.	**Sustainability and the Water/Energy Nexus:** Benjamin H. Grumbles, Director, *Arizona Department of Environmental Quality*
9:00 a.m. - 10:15 a.m.	**Session 1: Doing the Audit** Moderator: Lindy Bauer, *Maricopa Association of Governments* 1. The How and What of Audits for Sustainable Infrastructure: Donald King, P.E., *Tetra Tech* 2. Benchmarking: Metrics for Success: Cheryl McGovern, *U.S. Environmental Protection Agency, Region IX* 3. Lessons from the Small Fry: Robert Casavant, Ph.D., *Arizona State Parks*
10:15 a.m. - 10:30 a.m.	**Morning Break**
10:30 a.m. - 12:10 p.m.	**Session 2: How to Fund the Fixes** Moderator: David McNeil, *City of Tempe* 1. Energy Audits and Financial Assistance: Melanie Ford, *Arizona Water Infrastructure Finance Authority* 2. Grants and Other Funding Opportunities: Cheryl McGovern, *U.S. Environmental Protection Agency, Region IX* 3. Power Purchase Agreements and Other Innovative Approaches: Guy Carpenter, P.E., *HDR* 4. U.S. Department of Energy Assistance Opportunities: Patti Case, P.E., *U.S. DOE, Intermountain Clean Energy Center*
12:10 p.m. - 1:10 p.m.	**Lunch and Keynote Speaker** Cashing In on Energy Management Initiatives for Sustainable Infrastructure: Shonnie Cline, *Water Research Foundation*
1:10 p.m. - 2:30 p.m.	**Session 3: Stepping Toward Sustainability** Moderator: Greg Ramon, *City of Phoenix* 1. Cogeneration, Demand Management Program, and Chemical Reduction: Ronny Lopez, *City of Mesa* 2. Innovations in Nitrate Treatment and Water Reclamation: Rick Scott and Larry Brotman, *City of Glendale* 3. Conserving Water with a Rebate Threshold Rate Structure: Graham Symmonds, P.E., *Global Water* 4. Water Smart Grids: Demand and Leak Control Using Intelligent Monitoring Systems: Eric Williams, Ph.D., *Arizona State University*
2:30 p.m. - 2:45 p.m.	**Afternoon Break**
2:45 p.m. - 4:20 p.m.	**Session 4: Opportunities for New Energy: Ready-to-Use Technologies** Moderator: Cathy Arthur, *Maricopa Association of Governments* 1. Hydroturbines: It's All Downhill from Here: Maureen Hymel, *City of Phoenix* 2. Not Hazy: Energy from FOG: Karri Ving, *San Francisco Public Utilities Commission* 3. Pima County Opportunities and Initiatives: Ed Curley and Eric Wiedulwilt, P.E., *Pima County Regional Wastewater Reclamation Department* 4. Improved Therapy for Wastewater Treatment Plant Digester Gas: David Mahaffay, P.E., *Black & Veatch*
4:20 p.m. - 4:40 p.m.	**Closing: Greening Water and Wastewater Infrastructure - The Path Forward:** Cheryl McGovern, *U.S. Environmental Protection Agency, Region IX*

Operation Certification Professional Development Hours (PDHs) are available for this workshop. You will earn 7.5 hours if you attend the full day. Please retain this agenda as your documentation.

Contact Julie Hoffman at (602) 254-6300 for more information.

MARICOPA ASSOCIATION of GOVERNMENTS

RECOVERY.GOV

ADEQ Arizona Department of Environmental Quality

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

A special thanks to the League of Arizona Cities and Towns for promoting the workshop.

IDEAS FOR GREENING WATER AND WASTEWATER INFRASTRUCTURE

INTRODUCTION

On July 22, 2009, the MAG Regional Council accepted stimulus funding from the American Recovery and Reinvestment Act of 2009 from the Arizona Department of Environmental Quality (ADEQ) for water quality management planning. The ADEQ received the stimulus funds from the Environmental Protection Agency Region IX. The scope for the project included conducting a workshop on greening infrastructure for water and wastewater treatment plants focusing on Arizona issues and preparing a roadmap for greening water infrastructure. On January 12, 2010, MAG conducted the Greening Water and Wastewater Infrastructure Workshop. The MAG Greening Water and Wastewater Infrastructure Planning Group assisted MAG in identifying topics and speakers that would provide the most benefit to water and wastewater utilities in the region. Approximately 150 people attended the workshop, representing public and private utilities, consulting firms, academia, state and federal agencies, and others. The workshop highlighted strategies for integrating green technologies into water and wastewater treatment and funding opportunities that are available. Presentations from the event have been posted to the MAG website at www.mag.maricopa.gov/detail.cms?item=11400.

IDEAS FOR GREENING WATER AND WASTEWATER INFRASTRUCTURE

Now that the workshop has been completed, the next step involves developing a roadmap for greening water and wastewater infrastructure. A roadmap may assist utilities in evaluating opportunities to reduce energy consumption and chemical use, conserve water, and save critical financial resources. On February 18, 2010, the MAG Greening Water and Wastewater Infrastructure Planning Group met to discuss a wide variety of ideas for making water and wastewater infrastructure more environmentally friendly, recognizing the importance of working toward a more sustainable future.

In general, the ideas from the Planning Group are designed to provide utilities with opportunities for reducing energy consumption and plant costs. Due to the economic downturn, jurisdictions are facing decreased revenues and having to push capital improvement projects further into the future. These ideas generated by the Planning Group could result in cost savings by identifying energy waste at current facilities. It is important to note that greening water and wastewater infrastructure today may pave the way for significant cost savings in the future. Not only will these ideas save financial resources, they will also improve our environment as we work toward a more sustainable State. The ideas from the Planning Group are discussed below.

Energy Audits

Energy audits for water and wastewater treatment plants assist utilities in determining energy consumption as well as discovering opportunities for improving efficiency and reducing operating costs. Funding alternatives for improvements may also be identified through the audit process. In addition, audits bring awareness to the issues a utility may be facing. At the end of the audit process, plant staff will have a better understanding of the energy used by the various processes in the facility and associated costs. The utility will be able to recognize successes and develop goals for the future. Furthermore, audits are a tool for

benchmarking against other facilities, as discussed in the next section. For all these reasons, audits are a useful exercise regardless of location and size of a plant.

Audits may be conducted at various levels of detail. Once the audit level has been determined, an audit team is assembled. The audit team works to collect as much information as possible prior to the site visit. Open discussion among the audit team, plant managers and staff is critical for a successful audit. The team then visits the site and assesses the energy usage. Audits typically break down energy usage by unit processes. The audit team is then able to review each process, determine opportunities for energy conservation, and estimate energy savings. A list of operation and maintenance and capital improvement recommendations is prepared. The utility reviews the list and selects the viable alternatives based on its needs, budget, and future growth. The audit team may also determine available funding opportunities. The plant then begins implementation and monitoring.

Utilities could also benefit by comparing their audit results with the results from other facilities. A comparative analysis may reveal additional possibilities for energy conservation, cost savings and partnerships. Several utilities working together could result in easier access to funding. In addition, rural communities may not be able to afford consultants to conduct the audits; therefore, audits performed at another facility by a contractor could guide treatment plant staff in conducting an in-house audit. The audit process serves as a valuable training and learning experience for plant staff. Staff will gain a greater understanding of how the plant runs and its impact on energy and resource use.

A first step in conducting audits of rural treatment facilities was completed in 2009. Faculty and students from the Northern Arizona University and University of Arizona assisted rural Arizona communities with assessing their water and wastewater treatment plants. The report prepared on the study, "A Water/Energy Best Practices Guide for Rural Arizona's Water and Wastewater Systems," could be used to assist utilities with beginning an audit. Funding may also be available for energy audits from the Water Infrastructure Finance Authority of Arizona (WIFA) and Arizona Department of Environmental Quality.

An alternative to a comprehensive energy audit that includes field visitation would be a desk audit. Desk audits are not as detailed; however, they still provide valuable information for a utility. They may also be a first step in efficiently performing a more comprehensive field audit. An idea mentioned by the Planning Group included conducting desk audits for many or all of the wastewater treatment plants in Arizona. The information could be inputted into the U.S. Environmental Protection Agency (EPA) ENERGY STAR Program and each facility would be provided a rating. These ratings could be publicized and propel utilities to continually evaluate potential green projects in order to better their rating. Agencies that could assist in promoting the effort include EPA, WIFA, Arizona Public Service (APS), and Salt River Project (SRP). In addition to assisting utilities with energy audits, APS and SRP also offer rebate programs.

Another suggestion by the Planning Group was to have the Arizona Department of Environmental Quality encourage and spearhead audits for smaller wastewater treatment plants in the State. The ADEQ could select a plant to audit which would serve as an example for small facilities (reality audit). The various steps of the process would be posted and provided to other interested utilities for guidance. This idea could prompt many other plants to initiate audits to become more sustainable, thus leveraging the power of the facility audit performed by ADEQ. Information sharing would also be encouraged so that utilities could gain from the experiences of others.

Resources:

- Water Infrastructure Finance Authority of Arizona Planning and Design Grant Program (targets smaller systems that lack technical staff to complete design and planning phases of projects)
  http://www.azwifa.gov/?pageid=pdgrant

  - Melanie Ford, WIFA
    mford@azwifa.gov
    (602) 364-1321

  - Sara Konrad, WIFA (Green Projects)
    skonrad@azwifa.gov
    (602) 364-1319

- ADEQ Capacity Development Program (free technical assistance for small drinking water systems serving 10,000 people or less)
  http://www.azdeq.gov/environ/water/dw/capdev.html

  - Kathy Stevens, ADEQ
    stevens.kathryn@azdeq.gov
    (602) 771-4653

- A Water/Energy Best Practices Guide for Rural Arizona's Water and Wastewater Systems
  http://www.waterenergy.nau.edu/

- EPA ENERGY STAR Program
  http://www.energystar.gov

  - Cheryl McGovern, EPA Region IX
    mcgovern.cheryl@epa.gov
    (415) 972-3415

- Salt River Project
  http://www.srpnet.com

- Arizona Public Service
  http://www.aps.com

Benchmarking

Benchmarking facilities relative to performance metrics provides the opportunity for utilities to track and evaluate their energy and water consumption. The EPA ENERGY STAR Portfolio Manager is a readily-available assessment tool to measure a facility's current energy efficiency and track progress over time. The Portfolio Manager provides benchmark metrics that allow comparison of operational efficiencies of wastewater treatment facilities with similar facilities across the country. The program may

be used to facilitate the dissemination of information since it creates reports and offers utilities the ability to share data. The Portfolio Manager also estimates a facility's greenhouse gas emissions using the international standard. There are 70 different values that could be tracked in the program. For wastewater treatment plants, EPA claims a 90 percent confidence level; however, beta testing is still being conducted.

Enrolling in the ENERGY STAR Portfolio Manager is easy, consisting of a one-hour phone call with an EPA specialist to establish the facility's account, baseline, and benchmark. The utility will then be able to determine its baseline energy use, target energy use, energy cost savings, and target reduction required. The Portfolio Manager rates the energy performance of the facility on a scale of 1 to 100 with 100 being the most efficient. A score of 75 or greater is considered energy efficient. If the facility has a score below 69, the Portfolio Manager could be used to set a percentage energy reduction target.

The ENERGY STAR Portfolio Manager is an interactive online energy management tool that is free, available 24 hours per day, and requires no special computers or software. It assists utilities in identifying ways to eliminate energy waste and lower operating costs of water and wastewater systems. Both drinking water systems and wastewater treatment plants are able to track energy use, energy costs, and associated carbon emissions using Portfolio Manager. However, only wastewater treatment plants may be compared with similar plants in a national database using the EPA energy performance rating system. The Planning Group members indicated that it would be beneficial to utilities if the comparison component of the Portfolio Manager would also become available for drinking water systems in the future.

The EPA recommends that in addition to using the Portfolio Manager, utilities should also perform energy audits. The Portfolio Manager provides only the energy consumption per year; however, an energy audit provides more detailed information. The Environmental Protection Agency has also published its 2008 Guidebook, "Ensuring a Sustainable Future: An Energy Management Guidebook for Wastewater and Water Utilities" to assist utilities. The guidebook is based on a Plan-Do-Check-Act management system approach to reduce energy consumption and costs.

In addition to the efforts by EPA, the Water Research Foundation conducted a research project to benchmark water and wastewater utilities. The document was published in 2007 and is available to Water Research Foundation subscribers as "Energy Index Development for Benchmarking Water and Wastewater Utilities." The project established metrics for utilities to evaluate the effectiveness of new energy efficiency practices. The metrics also enable utilities to measure their performance relative to their peers, establish targets and budgets, and assess progress over time. The Water Research Foundation has a mission of advancing the science of water to improve the quality of life. As part of this mission, the Foundation coordinates an extensive research program.

Resources:

- EPA ENERGY STAR Portfolio Manager
  www.energystar.gov/benchmark

- EPA's 2008 Guidebook "Ensuring a Sustainable Future: An Energy Management Guidebook for Wastewater and Water Utilities"
  www.epa.gov/waterinfrastructure/bettermanagement.html

- Cheryl McGovern, EPA Region IX
  mcgovern.cheryl@epa.gov
  (415) 972-3415

- Water Research Foundation, Energy Index Development for Benchmarking Water and Wastewater Utilities
  http://www.waterresearchfoundation.org/research/TopicsAndProjects/projectSnapshot.aspx?pn=3009

Energy Performance Contracts and Loans

The Arizona Department of Commerce Energy Office offers technical and program assistance to support energy efficiency programs including Energy Savings Performance Contracting. As part of this assistance, the State Procurement Office issued a request for qualifications from companies that provide energy savings performance contract services. A pre-qualified list of companies was created so that a governmental entity would not be required to conduct this step, therefore reducing the time necessary for securing a contract. The pre-qualified list of companies may be used by all governmental entities. State agencies are required to use the list; however, other entities are not required. They may use the established state contract or establish contracts on their own. Using the list does require an entity to follow all of the procedures in the State Procurement Office's initial solicitation. These services may greatly assist local governments with reducing energy consumption and saving money. While the pre-qualified companies may be able to provide some assistance in the area of water and wastewater treatment, they may not have the specific expertise some jurisdictions need. Since water and wastewater treatment are often some of the biggest energy users for municipalities, cities and towns would benefit from ensuring that their contract specifies access to water and wastewater experts.

Energy performance contracts are effective ways to green water and wastewater infrastructure. To finance projects, it was suggested that potentially the Water Infrastructure Finance Authority of Arizona could provide energy performance loans that would be paid back using the energy savings. Currently, WIFA is required to direct at least 20 percent of its drinking water and clean water federal funding toward green projects. Green projects are divided into two categories: energy efficiency and water efficiency. The project criteria set by WIFA is based on EPA's Clean Water and Drinking Water State Revolving Fund Green Project Reserve criteria. The projects may include planning, design, and/or construction activities. The whole project or just a component of the project may be identified as green. If WIFA were to offer energy performance loans to municipalities, this may increase the ability to make water and wastewater treatment processes more sustainable.

Resources

- Arizona Department of Commerce
  http://www.azcommerce.com/Energy/ESPC.htm

- Water Infrastructure Finance Authority of Arizona
  http://www.azwifa.gov

Technology Specifications

Additional efforts to green water and wastewater infrastructure may include incorporating energy-efficient specifications for areas such as lighting, motor pumps, and HVAC (heating, ventilating, and air conditioning) into standard practices. The specifications would likely vary by jurisdiction due to different plant sizes, processes and goals. The rebate programs at SRP and APS may provide assistance with incorporating energy-saving technologies. The Sustainable Cities Network, which was formed by the Arizona State University Global Institute of Sustainability, could also assist municipalities by sharing information on specifications that have already been developed.

Efficiency from Solar

Solar, especially photovoltaic solar, is one way for water and wastewater utilities to capture energy. The large footprint of many treatment facilities may allow for the installation of arrays of solar panels. While solar has been a great success in some areas, additional research and studies could be conducted to provide additional guidance on return on investment and pay back periods, particularly in light of changing rebate structures and regulations. Guidance would also be helpful for municipalities interested in reducing their carbon footprint at their treatment facilities by using solar.

The cities of Peoria and Glendale have implemented solar projects at their wastewater treatment facilities. Recently, the City of Peoria completed a solar project at the Beardsley Water Reclamation Facility that provides a portion of the power that is necessary for the facility's operations building. The City of Glendale uses solar energy at the West Area Water Reclamation Facility to provide all the hot water needs for the plant. In addition, the facility utilizes solar energy for the administration building. These solar projects have resulted in an approximately 40 percent cut in facility costs for the City of Glendale.

Hydroturbines

Hydroturbines harness the power of water to produce electricity. They are not traditionally used in water distribution systems; however, they are a clean and renewable source of energy. Hydroturbines are potentially usable in water distribution systems having significant elevation changes or multiple pressure zones. Hydroturbine technology has been in existence for a long time and continues to evolve. Additional guidance on generating electricity from hydroturbines would assist utilities in incorporating hydrogeneration into their processes. The City of Phoenix discussed hydroturbines at the MAG Greening Water and Wastewater Infrastructure Workshop. The link to the presentation is provided below.

Resource

- Hydroturbines: It's All Downhill From Here
  http://www.mag.maricopa.gov/detail.cms?item=11400

Arizona Corporation Commission

The Arizona Corporation Commission could work with utilities on sustainability initiatives. Areas of specific interest include the permitting process and third-party providers.

319H Nonpoint Source Grant Funds for Urban Sustainability Projects

The Arizona Department of Environmental Quality Nonpoint Source Program promotes and facilitates statewide efforts to manage the impact that nonpoint source pollution has on surface and groundwater. The majority of the work performed by the Program is funded by Clean Water Act Section 319(h) grant funding that is awarded to ADEQ by the U.S. Environmental Protection Agency. The Program focuses on land use activities that potentially have negative impacts on surface and groundwater quality including: agriculture, forestry, urban runoff, hydromodification, onsite/septic waste treatment systems, mining, and recreation.

The EPA estimates that approximately 30 percent of the known pollution to the nation's waters is due to stormwater runoff (Source: www.azdeq.gov/environ/water/permits/stormwater.html). One suggestion for the Planning Group was for ADEQ to potentially allocate a portion of the Section 319(h) grant funding for urban sustainability projects related to stormwater. The Environmental Protection Agency considers stormwater a point source once it reaches a municipal storm drain; therefore qualifying projects would need to address stormwater at sites prior to reaching the storm drain.

- Arizona Department of Environmental Quality Nonpoint Source Pollution Program
  http://www.azdeq.gov/environ/water/watershed/nonpoint.html

  - Krista Osterberg, ADEQ
    ko1@azdeq.gov
    (602) 771-4635

WIFA Reclaimed Water Rate Study

The Water Infrastructure Finance Authority provides three types of technical assistance for drinking water and wastewater facilities: project, operational, and policy. Project technical assistance involves assisting individual systems to conceive, plan, design, and develop infrastructure. For operational technical assistance, WIFA provides funding through the ADEQ Capacity Development Program to assist individual systems with improving day-to-day operations. The policy technical assistance includes developing and distributing guidance and performing related activities to benefit a wide range of drinking water and wastewater systems. Policy technical assistance provided by WIFA in the past has included guidance on arsenic treatment, how to hire an engineer, and funding of a water and wastewater residential rate study. This study was conducted by WIFA to provide unit rates and total monthly charges assessed by utilities for water consumed and wastewater generated. Since reclaimed water continues to be a valuable resource, WIFA could consider funding a reclaimed water rate study. Utilities would then have a base for comparison of rates and methodologies for establishing rates.

Sustainability in General Plans/Master Plans

In 1998, Arizona adopted the Growing Smarter Act which establishes roles of local and state government in the planning and management of new development. The Growing Smarter Plus Act of 2000 is an extension to the 1998 Growing Smarter Act. Together, these acts initiated requirements for extensive growth planning by municipal agencies. One of the components of the legislation requires municipalities

and counties to adopt general and comprehensive plans to serve as guides to future development. As municipalities prepare updates to their general plans, as required by the legislation, the Planning Group suggested that sustainability components could be incorporated into the discussions about water and wastewater treatment. There may also be the opportunity to include sustainability as the overriding goal of a general plan. Possibilities for including sustainability components into general plans may vary by jurisdiction.

Sustainability and 208 Water Quality Management Plans

The 208 Water Quality Management Plans are prepared by the designated Regional Water Quality Management Planning Agencies in accordance with Section 208 of the Clean Water Act. These plans include the desired wastewater treatment configuration for their regions. Currently, the SouthEastern Arizona Governments Organization (SEAGO) and Central Arizona Association of Governments (CAAG) are updating their 208 Plans. As part of the updates, the Arizona Department of Environmental Quality has indicated that sustainability/infrastructure greening issues must be addressed. As the Regional Water Quality Management Planning Agencies update their 208 Plans in the future, it may be beneficial for them to review the sustainability components included in the SEAGO and CAAG plans. While 208 Plans are prepared in accordance with Section 208 of the Clean Water Act, they are specific to each region. Therefore, differences among the plans are common. For example, processes and goals for rural areas may be different in comparison to urban regions.

Information Exchange

A forum for Arizona utilities to meet and discuss sustainable aspects of water and wastewater infrastructure could provide local governments the opportunity to share ideas and best practices. There have been efforts to initiate forums to discuss these ideas. For example, the Arizona State University Global Institute of Sustainability formed the Sustainable Cities Network as a place where professionals may discuss sustainability ideas, challenges, and best practices. In March 2010, the Network held the inaugural meeting of the new Water and Wastewater Workgroup. This group, which will include municipal and tribal representatives, will work to identify, discuss, and take action on sustainability challenges and move toward a more sustainable region. Potentially, the Sustainable Cities Network could also host a clearinghouse for green projects related to water and wastewater treatment systems.

There are many possible collaborative opportunities for making water and wastewater plants more environmentally friendly. Sustainability/energy partnerships could be formed with Arizona State University, for example. Local governments such as the City of Phoenix have already formed data exchange programs with the ASU School of Sustainability.

Resource

- Sustainable Cities Network
  http://sustainablecities.asu.edu

  - Anne Reichman, Sustainable Cities Network
    anne.reichman@asu.edu
    (480) 965-2168

Specialized Workshops

The MAG Greening Water and Wastewater Infrastructure Workshop included sessions that covered a variety of topics for making water and wastewater systems more sustainable. Additional workshops could be conducted to expand on the ideas discussed at the MAG workshop. Additional workshops could involve collaborations with the U.S. Department of Energy Intermountain Clean Energy Center and ASU Global Institute of Sustainability. In addition to workshops, it was suggested that a community college, such as Gateway Community College which already has similar programs, could offer a class for owners/operators of drinking water and wastewater treatment plants dedicated to sustainability opportunities.

Resources

- U.S. Department of Energy Clean Energy Center, Intermountain Region
  http://www.intermountainchp.org

- ASU Global Institute of Sustainability
  http://sustainability.asu.edu

Financial Resource Guide

A compendium resource that lists the funding opportunities for green projects such as audits and retrofits would aid utilities in improving the environment and lowering their costs. This resource could include descriptions of eligibility, grant ceilings or minimums, applicability, and cost shares. Utilities are very interested in making water and wastewater infrastructure more sustainable; however, the current economic climate has made funding these projects challenging.

At the January 12, 2010 MAG Greening Water and Wastewater Infrastructure Workshop, several speakers discussed funding opportunities for green projects. The presentations have been posted to the MAG website.

Resource

- MAG Greening Water and Wastewater Infrastructure Workshop Presentations
  http://www.mag.maricopa.gov/detail.cms?item=11400

Funding Agency Contacts

One of the challenges of working with large agencies is finding the appropriate contact within the agency. A list of contacts at agencies such as WIFA, ADEQ, EPA, and the U.S. Department of Energy (DOE) would be helpful for those with questions on available funding. There is also potential for local governments to partner with these agencies. Representatives from several funding agencies were in attendance and presented at the MAG Greening Water and Wastewater Infrastructure Workshop. Contact information is provided below.

Resources

- Water Infrastructure Finance Authority of Arizona
    - Melanie Ford
      mford@azwifa.gov
      (602) 364-1321
- ADEQ Capacity Development Program (free technical assistance for small drinking water systems serving 10,000 people or less)
    - Kathy Stevens
      stevens.kathryn@azdeq.gov
      (602) 771-4653
- U.S. Environmental Protection Agency Region IX
    - Cheryl McGovern
      mcgovern.cheryl@epa.gov
      (415) 972-3415
- U.S. Department of Energy Clean Energy Center, Intermountain Region
    - Patti Case
      plcase@etcgrp.com
      (801) 278-1927

THE NEXT STEPS TO GREENING WATER AND WASTEWATER INFRASTRUCTURE

Introduction

On January 12, 2010, the Maricopa Association of Governments conducted the Greening Water and Wastewater Infrastructure Workshop in Phoenix, Arizona. The workshop was highly successful with approximately 150 people in attendance, representing public and private utilities, consulting firms, academia, state and federal agencies, and others. To assist with the planning of the workshop, MAG had formed the Greening Water and Wastewater Infrastructure Planning Group. The Planning Group, comprised primarily of utility representatives from MAG member agencies, discussed topic ideas for the workshop and guided development of the workshop agenda. The agenda is posted on the MAG website at http://www.mag.maricopa.gov/pdf/cms.agendas/WQAC_2009-12-10_Greening-Water-Infrastructure_AGD-2_12777.pdf.

Following the workshop, the Planning Group met again to discuss ideas for next steps, including the development of a roadmap for incorporating green technologies into water and wastewater treatment plants. The Planning Group drew on both the information presented at the workshop as well as current and contemplated sustainability initiatives withing their jurisdictions. These ideas include water conservation, energy conservation and capture, and chemical use reduction measures. These measures focus on saving financial resources in both the short-term and long-term. This document summarizes the next steps suggested by the Planning Group. For further information, resources, and contacts, please refer to the companion MAG document, "Ideas for Greening Water and Wastewater Infrastructure."

Energy Audits

Energy audits (in conjunction with water use audits as applicable) were considered by the Planning Group as a first step in understanding the current "green" status of water and wastewater infrastructure and developing appropriate responses to enhance sustainability.

- Faculty and students from the Northern Arizona University and University of Arizona assisted several rural Arizona communities with assessing the status of their water and wastewater treatment plants. The report prepared on the study, "A Water/Energy Best Practices Guide for Rural Arizona's Water and Wastewater Systems," could be used as a first step by a utility in preparing to conduct an in-house audit or procuring outside audit services.

- Desk audits could be conducted for wastewater treatment plants throughout Arizona. The information could be inputted into the U.S. Environmental Protection Agency (EPA) ENERGY STAR Program and each facility would be provided a rating from 1 to 100, based on the ENERGY STAR formula. These ratings could be publicized and propel utilities to continually evaluate potential green projects in order to better their rating.

- The Arizona Department of Environmental Quality (ADEQ) could encourage and spearhead audits for smaller wastewater treatment plants in the State. The ADEQ could select a plant to audit which would serve as a model for conducting audits for other small facilities (a "reality" audit).

Benchmarking

The Planning Group considered benchmarking and associated metrics critical for gaging the effectiveness of implementing sustainability measures and for comparison with similar facilities in the State.

- The Water Research Foundation conducted a research project to benchmark water and wastewater utilities. The document was published in 2007 and is available to Water Research Foundation subscribers as "Energy Index Development for Benchmarking Water and Wastewater Utilities."

- The EPA ENERGY STAR Portfolio Manager is an assessment tool for facilities to measure current energy efficiency and track progress. There is also a component that compares operational efficiencies of wastewater treatment plants with similar facilities across the country. This is a free, online tool to assist utilities in eliminating energy waste and lowering operating costs for water and wastewater systems.

- The EPA published a 2008 Guidebook, "Ensuring a Sustainable Future: An Energy Management Guidebook for Wastewater and Water Utilities" to assist utilities. The guidebook is based on a Plan-Do-Check-Act management system approach to reduce energy consumption and costs.

- At the January 12, 2010 MAG Greening Water and Wastewater Infrastructure Workshop, EPA offered assistance to utilities interested in benchmarking their facilities and/or applying the Plan-Do-Check-Act management system discussed in the EPA guidebook.

Energy Performance Contracts and Loans

- The Arizona Department of Commerce Energy Office offers technical and program assistance to support energy efficiency programs including Energy Savings Performance Contracting. As part of this assistance, the Energy Office created a pre-qualified list of companies to assist governmental entities. With water and wastewater treatment often being some of the biggest energy users for municipalities, cities and towns would benefit from ensuring that their energy performance contract specifies access to water and wastewater experts.

- Potentially, the Water Infrastructure Finance Authority of Arizona (WIFA) could provide energy performance loans that would be paid back using the energy saved by implementing sustainability measures at water and wastewater treatment plants. This type of program could promote faster adoption of energy saving or enhancement technologies by utilities. Currently, WIFA is required to direct at least 20 percent of its drinking water and clean water federal funding toward green projects.

Technology Specifications

- Energy-efficient specifications for areas such as lighting, motor pumps, and HVAC (heating, ventilating, and air conditioning) could be incorporated into standard practices for water and wastewater infrastructure procurement. The rebate programs at Salt River Project (SRP) and Arizona Public Service (APS) may provide assistance with incorporating energy-saving technologies.

- The Sustainable Cities Network, which was formed by the Arizona State University Global Institute of Sustainability, could also assist municipalities by compiling and sharing information on specifications that have already been developed.

Efficiency from Solar

- Cities are beginning to implement solar projects at their wastewater treatment facilities; however, additional research could be conducted to provide guidance on return on investment and pay back periods, particularly in light of changing rebate structures and regulations.

Hydroturbines

- Since hydroturbines are not traditionally used in water distribution systems, additional guidance on generating electricity from hydroturbines would assist utilities in incorporating hydrogeneration into their processes to capture energy that is currently wasted. Hydroturbines are a clean and renewable source of energy and have been implemented in the City of Phoenix water system.

Arizona Corporation Commission

- The Arizona Corporation Commission could play a role in assisting utilities in sustainability efforts. Areas of specific interest include the permitting process and third-party providers.

319H Nonpoint Source Grant Funds for Urban Sustainability Projects

- The Arizona Department of Environmental Quality could potentially allocate a portion of its Section 319(h) nonpoint source grant funding for urban sustainability projects related to stormwater.

WIFA Reclaimed Water Study

- Since reclaimed water continues to be a valuable resource, the Water Infrastructure Finance Authority of Arizona could consider funding a reclaimed water rate study. In the past, WIFA has funded water and wastewater residential rate studies to provide unit rates and the total monthly charges assessed by utilities for water consumed and wastewater generated. There is a need for a similar study for reclaimed water to compile both rates as well as methodologies for establishing rates.

Sustainability in General Plans/Master Plans

- As municipalities prepare updates to their general plans, sustainability components could potentially be incorporated into the discussions involving water and wastewater infrastructure. There may also be opportunities for including sustainability as the overriding goal of a general plan.

Sustainability and 208 Water Quality Management Plans

- As the Regional Water Quality Management Planning Agencies update their 208 Water Quality Management Plans, it may be beneficial for them to review the sustainability components being

included in the updates to the SouthEastern Arizona Governments Organization (SEAGO) and Central Arizona Association of Governments (CAAG) plans. The Arizona Department of Environmental Quality has indicated that sustainability/infrastructure greening issues must be addressed as part of these updates.

Information Exchange

The Planning Group considered information exchange to be a critical element in advancing sustainability in water and wastewater infrastructure.

- The Arizona State University Global Institute of Sustainability formed the Sustainable Cities Network as a forum where professionals may discuss sustainability ideas, challenges, and best practices. In March 2010, the Network held the inaugural meeting of the new Water and Wastewater Workgroup. Potentially, the Sustainable Cities Network could also host a clearinghouse for green projects related to water and wastewater infrastructure.

- There are many possible collaborative opportunities for making water and wastewater plants more environmentally friendly. Sustainability/energy partnerships could be formed with Arizona State University, for example. Local governments such as the City of Phoenix have already formed data exchange programs with the ASU School of Sustainability.

Specialized Workshops

- The success of the Greening Water and Wastewater Infrastructure Workshop conducted by MAG on January 12, 2010, in cooperation with ADEQ and EPA, spawned ideas for further workshops. These could involve collaborations with the U.S. Department of Energy Intermountain Clean Energy Center, EPA, the ASU Global Institute of Sustainability, and others.

- In addition to workshops, a community college such as Gateway Community College, which already has similar/related classes, could offer a class for owners/operators of drinking water and wastewater treatment plants dedicated to sustainability opportunities.

Financial Resource Guide

- A compendium resource that lists the funding opportunities for green projects such as audits and retrofits would aid utilities in improving the environment and lowering their costs. This resource could include descriptions of eligibility, grant ceilings or minimums, applicability, and cost shares.

Funding Agency Contacts

- A list of contacts at agencies such as WIFA, ADEQ, EPA, and the U.S. Department of Energy would be helpful for those with questions on available funding. Representatives from several funding agencies were in attendance and presented at the MAG Greening Water and Wastewater Infrastructure Workshop. Contact information is provided in the MAG document "Ideas for Greening Water and Wastewater Infrastructure."

APPENDIX C

MAG 208 WATER QUALITY MANAGEMENT PLAN, OCTOBER 2002
SECTION 4.6 ENVIRONMENTAL ASSESSMENT OF POINT SOURCE PLAN

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 Impacts of Proposed Facilities

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 Impacts of Proposed Effluent Reuse

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 Impacts of Plan Implementation

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.

APPENDIX D

ARIZONA ADMINISTRATIVE CODE TITLE 18 CHAPTER 9 ARTICLE 2 AQUIFER PROTECTION PERMITS - INDIVIDUAL PERMITS PART A APPLICATION AND GENERAL PROVISIONS AND CHAPTER 5 ARTICLE 3 WATER QUALITY MANAGEMENT PLANNING

R18-9-127. Repealed

Historical Note
Adopted effective September 27, 1989 (Supp. 89-3). Section repealed by final rulemaking at 7 A.A.R. 235, effective January 1, 2001 (Supp. 00-4).

R18-9-128. Repealed

Historical Note
Adopted effective September 27, 1989 (Supp. 89-3). Repealed effective November 12, 1996 (Supp. 96-4).

R18-9-129. Repealed

Historical Note
Adopted effective September 27, 1989 (Supp. 89-3). Section repealed by final rulemaking at 7 A.A.R. 235, effective January 1, 2001 (Supp. 00-4).

R18-9-130. Repealed

Historical Note
Adopted effective September 27, 1989 (Supp. 89-3). Section repealed by final rulemaking at 7 A.A.R. 235, effective January 1, 2001 (Supp. 00-4).

Appendix I. Repealed

Historical Note
Appendix I repealed by final rulemaking at 7 A.A.R. 235, effective January 1, 2001 (Supp. 00-4).

ARTICLE 2. AQUIFER PROTECTION PERMITS - INDIVIDUAL PERMITS

PART A. APPLICATION AND GENERAL PROVISIONS

R18-9-A201. Individual Permit Application

A. An individual permit application covers one or more of the following categories:
1. Drywell,
2. Industrial,
3. Mining,
4. Wastewater,
5. Solid waste disposal, or
6. Land treatment facility.

B. An applicant for an individual permit shall provide the Department with:
1. The following information on an application form:
   a. The name and mailing address of the applicant;
   b. The name and mailing address of the owner of the facility;
   c. The name and mailing address of the operator of the facility;
   d. The legal description, including latitude and longitude, of the location of the facility;
   e. The expected operational life of the facility; and
   f. The permit number for any other federal or state environmental permit issued to the applicant for that facility or site.
2. A copy of the certificate of disclosure required by A.R.S. § 49-109;
3. Evidence that the facility complies with applicable municipal or county zoning ordinances, codes, and regulations;
4. Two copies of the technical information required in R18-9-A202(A);
5. Cost estimates for facility construction, operation, maintenance, closure, and post-closure as follows.
   a. The applicant shall ensure that the cost estimates are derived by an engineer, controller, or accountant using competitive bids, construction plan take-off's, specifications, operating history for similar facilities, or other appropriate sources, as applicable.
   b. The following cost estimates that are representative of regional fair market costs:
      i. The cost of closure estimate under R18-9-A209(B)(2), consistent with the closure plan or strategy submitted under R18-9-A202(A)(10);
      ii. The estimated cost of post-closure monitoring and maintenance under R18-9-A209(C), consistent with the post-closure plan or strategy submitted under R18-9-A202(A)(10); and
      iii. For a sewage treatment facility or utility subject to Title 40 of the Arizona Revised Statutes, the operation and maintenance costs of those elements of the facility used to make the demonstration under A.R.S. § 49-243(B);
6. For a sewage treatment facility:
   a. Documentation that the sewage treatment facility or expansion conforms with the Certified Areawide Water Quality Management Plan and the Facility Plan, and
   b. The additional information required in R18-9-B202 and R18-9-B203;
7. Certification in writing that the information submitted in the application is true and accurate to the best of the applicant's knowledge; and
8. The applicable fee established in 18 A.A.C. 14.

C. Special provision for an underground storage facility as defined in A.R.S. § 45-802.01(21). A person applying for an individual permit for an underground storage facility shall submit the information described in R18-9-A201 through R18-9-A203, except for the BADCT information specified in R18-9-A202(A)(5).
1. Upon receipt of the application, the Department shall process the application in coordination with the underground storage facility permit process administered by the Department of Water Resources.
2. The Department shall advise the Department of Water Resources of each permit application received.

D. Pre-application conference. Upon request of the applicant, the Department shall schedule and hold a pre-application conference with the applicant to discuss any requirements in Articles 1 and 2 of this Chapter.

E. Draft permit. The Department shall provide the applicant with a draft of the individual permit before publication of the Notice of Preliminary Decision specified in R18-9-109.

F. Permit duration. Except for a temporary permit, an individual permit is valid for the operational life of the facility and any period during which the facility is subject to a post-closure plan under R18-9-A209(C).

G. Permit issuance or denial.
1. The Director shall issue an individual permit, based upon the information obtained by or made available to the Department, if the Director determines that the applicant will comply with A.R.S. §§ 49-241 through 49-252 and Articles 1 and 2 of this Chapter.
2. The Director shall provide the applicant with written notification of the final decision to issue or deny the permit within the overall licensing time-frame requirements under 18 A.A.C. 1, Article 5, Table 10 and the following:
   a. The applicant's right to appeal the final permit determination, including the number of days the applicant has to file a protest and the name and telephone

number of the Department contact person who can answer questions regarding the appeals process;

b. If the permit is denied under R18-9-A213(B), the reason for the denial with reference to the statute or rule on which the denial is based; and

c. The applicant's right to request an informal settlement conference under A.R.S. §§ 41-1092.03(A) and 41-1092.06.

Historical Note

New Section adopted by final rulemaking at 7 A.A.R. 235, effective January 1, 2001 (Supp. 00-4). Amended by final rulemaking at 11 A.A.R. 4544, effective November 12, 2005 (05-3).

R18-9-A202. Technical Requirements

A. Except as specified in R18-9-A201(C)(1), an applicant shall, as required under R18-9-A201(B)(4), submit the following technical information as attachments to the individual permit application:

1. A topographic map, or other appropriate map approved by the Department, of the facility location and contiguous land area showing the known use of adjacent properties, all known water well locations found within one-half mile of the facility, and a description of well construction details and well uses, if available;
2. A facility site plan showing all known property lines, structures, water wells, injection wells, drywells and their uses, topography, and the location of points of discharge. The facility site plan shall include all known borings. If the Department determines that borings are numerous, the applicant shall satisfy this requirement with a narrative description of the number and location of the borings;
3. The facility design documents indicating proposed or as-built design details and proposed or as-built configuration of basins, ponds, waste storage areas, drainage diversion features, or other engineered elements of the facility affecting discharge. When formal as-built plan submittals are not available, the applicant shall provide documentation sufficient to allow evaluation of those elements of the facility affecting discharge, following the demonstration requirements of A.R.S. § 49-243(B). An applicant seeking an Aquifer Protection Permit for a sewage treatment facility satisfies the requirements of this subsection by submitting the documents required in R18-9-B202 and R18-9-B203;
4. A summary of the known past facility discharge activities and the proposed facility discharge activities indicating all of the following:
   a. The chemical, biological, and physical characteristics of the discharge;
   b. The rate, volume, and frequency of the discharge for each facility; and
   c. The location of the discharge and a map outlining the pollutant management area described in A.R.S. § 49-244(1);
5. A description of the BADCT employed in the facility, including:
   a. A statement of the technology, processes, operating methods, or other alternatives proposed to meet the requirements of A.R.S. § 49-243(B), (G), or (P), as applicable. The statement shall describe:
      i. The alternative discharge control measures considered,
      ii. The technical and economic advantages and disadvantages of each alternative, and
      iii. The justification for selection or rejection of each alternative;
   b. An evaluation of each alternative discharge control technology relative to the amount of discharge reduction achievable, site-specific hydrologic and geologic characteristics, other environmental impacts, and water conservation or augmentation;
   c. For a new facility, an industry-wide evaluation of the economic impact of implementation of each alternative discharge control technology;
   d. For an existing facility, a statement reflecting the consideration of factors listed in A.R.S. § 49-243(B)(1)(a) through (h);
   e. A sewage treatment facility meeting the BADCT requirements under Article 2, Part B of this Chapter satisfies the requirements under subsections (A)(5)(a) through (d).
6. Proposed points of compliance for the facility based on A.R.S. § 49-244. An applicant shall demonstrate that:
   a. The facility will not cause or contribute to a violation of an Aquifer Water Quality Standard at the proposed point of compliance; or
   b. If an Aquifer Water Quality Standard for a pollutant is exceeded in an aquifer at the time of permit issuance, no additional degradation of the aquifer relative to that pollutant and determined at the proposed point of compliance will occur as a result of the discharge from the proposed facility. In this case, the applicant shall submit an Ambient Groundwater Monitoring Report that includes:
      i. Data from eight or more rounds of ambient groundwater samples collected to represent groundwater quality at the proposed points of compliance, and
      ii. An AQL proposal for each pollutant that exceeds an Aquifer Water Quality Standard;
7. A contingency plan that meets the requirements of R18-9-A204;
8. A hydrogeologic study that defines the discharge impact area for the expected duration of the facility. The Department may allow the applicant to submit an abbreviated hydrogeologic study or, if warranted, no hydrogeologic study, based upon the quantity and characteristics of the pollutants discharged, the methods of disposal, and the site conditions. The applicant may include information from a previous study of the affected area to meet a requirement of the hydrogeologic study, if the previous study accurately represents current hydrogeologic conditions.
   a. The hydrogeologic study shall demonstrate:
      i. That the facility will not cause or contribute to a violation of an Aquifer Water Quality Standard at the applicable point of compliance; or
      ii. If an Aquifer Water Quality Standard for a pollutant is exceeded in an aquifer at the time of permit issuance, that no additional degradation of the aquifer relative to that pollutant and determined at the applicable point of compliance will occur as a result of the discharge from the proposed facility;
   b. Based on the quantity and characteristics of pollutants discharged, methods of disposal, and site conditions, the Department may require the applicant to provide:
      i. A description of the surface and subsurface geology, including a description of all borings;

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.

Historical Note

New Section adopted by final rulemaking at 7 A.A.R. 559, effective January 2, 2001 (Supp. 01-1).

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.

Historical Note

New Section adopted by final rulemaking at 7 A.A.R. 559, effective January 2, 2001 (Supp. 01-1).

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.

Historical Note

New Section adopted by final rulemaking at 7 A.A.R. 559, effective January 2, 2001 (Supp. 01-1).

ARTICLE 4. SUBDIVISIONS

R18-5-401. Definitions

In this Article unless the context otherwise requires:

1. "Approved" or "approval" means approved in writing by the Department.
2. "Condominium" means a subdivision established as a horizontal property regime pursuant to A.R.S. § 33-551 et seq.
3. "Department" means the Department of Environmental Quality or its designated representative.
4. "Garbage" means putrescible animal and vegetable wastes resulting from the handling, preparation, cooking and consumption of food.
5. "Refuse" means all putrescible and nonputrescible solid wastes (except body wastes), including garbage, rubbish, ashes, street cleanings, dead animals, abandoned automobiles, and solid market and industrial wastes.
6. "Subdivision" has the meaning defined in A.R.S. § 32-2101.