

**REVISED DRAFT**  
**TOWN OF MARANA**  
**PIMA ASSOCIATION OF GOVERNMENTS**  
**208 PLAN AMENDMENT**

*Prepared for:*

**TOWN OF MARANA**

AND

**PIMA ASSOCIATION OF GOVERNMENTS**  
177 North Church Avenue, Suite 405  
Tucson, Arizona 85701

*Prepared by:*



**WestLand Resources, Inc.**  
Engineering and Environmental Consultants  
4001 East Paradise Falls Drive  
Tucson, Arizona 85712  
(520) 206-9585

**APRIL**~~JUNE~~ **2009**  
Project No. 527.11 A 7650

## TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	1
BACKGROUND.....	<del>45</del>
Marana <del>Public Services</del> Utilities Department <del>—</del> Water/Wastewater.....	<del>45</del>
Town of Marana Water Utility.....	<del>56</del>
<u>Area Designated Water Providers</u> .....	<u>7</u>
INTRODUCTION.....	<del>78</del>
Purpose.....	<del>78</del>
Study Area.....	8
Rationale for Amending Plan.....	<del>811</del>
NATURAL SETTING.....	11
Geology.....	<del>11</del> <u>12</u>
<del>Groundwater Hydrology</del> .....	<del>12</del>
Groundwater <del>Quality</del> .....	<del>13</del>
<del>Surface Water</del> Hydrology.....	<del>13</del> <u>12</u>
<u>Groundwater Quality</u> .....	<u>13</u>
Surface Water <del>Quality</del> Hydrology.....	14
<u>Surface Water Quality</u> .....	<u>17</u>
Habitat.....	<del>14</del> <u>18</u>
PROJECT DESCRIPTION.....	<del>16</del> <u>19</u>
Overview.....	<del>16</del> <u>19</u>
Plan Area.....	<del>17</del> <u>20</u>
Current and Future Conditions.....	<del>17</del> <u>20</u>
Population.....	<del>17</del> <u>20</u>
Sewer Basins.....	<del>18</del> <u>21</u>
<u>Septic Systems</u> .....	<u>22</u>
Wastewater Flow Projections.....	<del>21</del> <u>25</u>
5-Year, 10-Year, 20-Year, and <del>Ultimate</del> <u>Buildout</u> Projections.....	<del>23</del> <u>27</u>
EXISTING CONDITIONS.....	<del>26</del> <u>30</u>
Existing Public Sanitary Sewage Conveyance Facilities.....	<del>26</del> <u>30</u>
<u>Topography and Potential Impacts on Sewerage System Planning</u> .....	<u>34</u>
Existing Wastewater Treatment Facilities.....	<del>28</del> <u>34</u>
Existing Sewer Basins.....	<del>31</del> <u>36</u>
<del>WASTEWATER</del> <u>WATER</u> RECLAMATION FACILITY ALTERNATIVES.....	<del>33</del> <u>37</u>
Treatment System Description.....	<del>33</del> <u>37</u>
Alternative 3 <del>34</del> <u>(Preferred Alternative)</u> .....	<u>38</u>
<u>Alternative 3 Capital Improvement Projects and Costs</u> .....	<u>42</u>
Alternative 1.....	<del>37</del> <u>45</u>
Alternative 2.....	<del>37</del> <u>47</u>
<u>Wastewater Service Agreements</u> .....	<u>49</u>
WATER RECLAMATION FACILITY PROCESS ALTERNATIVES.....	<del>40</del> <u>49</u>
Sequencing Batch Reactor.....	<del>40</del> <u>50</u>

Membrane Bioreactor.....	<a href="#">4050</a>
<a href="#">Oxidation Ditch</a> .....	<a href="#">50</a>
Enhanced Treatment.....	<a href="#">4151</a>
RECLAIMED WATER.....	<a href="#">4152</a>
IMPACTS OF PROPOSED FACILITIES.....	<a href="#">4152</a>
FINANCING.....	<a href="#">4253</a>
CONSTRUCTION.....	<a href="#">4255</a>
INDUSTRIAL PRETREATMENT PROGRAM.....	<a href="#">4355</a>
ENVIRONMENTAL IMPACT OF PROPOSED CONSTRUCTION.....	<a href="#">4355</a>
SETBACK REQUIREMENTS.....	<a href="#">4356</a>
PERMITS.....	<a href="#">4456</a>
CONSTRUCTION SCHEDULE.....	<a href="#">4658</a>
NON-POINT SOURCE ISSUES AND MITIGATION PROCEDURES.....	<a href="#">4759</a>
IMPLEMENTABILITY.....	<a href="#">4759</a>
OPERATION AND MAINTENANCE OF PROPOSED WASTEWATER TREATMENT FACILITY.....	<a href="#">4760</a>
ENFORCEMENT ACTIONS AND REMEDIES.....	<a href="#">4760</a>
DESIGNATED MANAGEMENT AGENCY BOUNDARY EXPANSION.....	<a href="#">4760</a>
REFERENCES.....	<a href="#">4860</a>

## LIST OF FIGURES

Figure 1. Location Map.....	<a href="#">910</a>
Figure 2. Area Wastewater Treatment Facilities.....	<a href="#">10</a>
Figure 3. <a href="#">Floodplain zone information</a> .....	<a href="#">16</a>
<a href="#">Figure 4. Sewer Basin Delineation &amp; Existing Sewer Infrastructure</a> .....	<a href="#">2023</a>
Figure <del>4.</del> <a href="#">Town of 5.</a> Marana General Plan and Specific Plans.....	<a href="#">2226</a>
Figure <del>5.</del> <a href="#">6.</a> Public Wastewater Pumping Systems.....	<a href="#">2731</a>
Figure <del>6.</del> <a href="#">7.</a> Sewer Basins Currently Served by the Three Existing <del>WWTPWREs</del> and Impact of Significant Infrastructure Features on Positioning of Basin Boundaries.....	<a href="#">2933</a>
Figure <del>7.</del> <a href="#">8.</a> Preferred Alternative 3 – 20-Year Proposed Water Reclamation Facilities.....	<a href="#">3540</a>
Figure <del>8.</del> <a href="#">9.</a> Preferred Alternative 3 Water Reclamation Facilities at Buildout.....	<a href="#">3641</a>
Figure <del>9.</del> <a href="#">10.</a> Alternative 1 – 20-Year Proposed Water Reclamation Facilities.....	<a href="#">3846</a>
Figure <del>10.</del> <a href="#">11.</a> Alternative 2 – 20-Year Proposed Water Reclamation Facilities.....	<a href="#">3948</a>
 <a href="#">Figure 12. Design, Permitting and Construction Timeline Template</a> .....	 <a href="#">59</a>

## LIST OF TABLES

Table 1. Planning Density and General Plan Area by Land Use Category.....	<a href="#">2125</a>
Table 2. Projected Population and <del>Equivalent Dwelling Units</del> <a href="#">EDUs</a> by Sewer Basin for 20-Year and Buildout.....	<a href="#">2428</a>
Table 3. Estimated Wastewater Flow for 5-Year, 10-Year, 20-Year, and Buildout.....	<del>25</del> <a href="#">29</a>

Table 4. <a href="#">Tabulation of Currently Sewered Basins and the Involved Public WRF</a>	32
<a href="#">Table 5. Estimate of Existing Wastewater Connections and Flows by Sewer Basin</a>	3237
<del>Table 5. <a href="#">Alternative 3 – Wastewater Reclamation Facilities and Flow Projection</a></del>	<del>34</del>
Table 6. <del>Alternative 3</del> – Wastewater Reclamation Facilities and Flow Projection	3742
Table 7. <a href="#">Town of Marana Sewer Basin Study CIP – 5-Year Alternative 3</a>	43
<a href="#">Table 8. Town of Marana Sewer Basin Study CIP – 10-year Alternative 3<sup>(1)</sup></a>	44
<a href="#">Table 9. Alternative 1 – Wastewater Reclamation Facilities and Flow Projection</a>	45
<a href="#">Table 10. Alternative 2 – Wastewater Reclamation <del>Facilities</del>Facility and Flow Projection</a>	3747
Table <del>8-11</del> . <a href="#">Setback Requirements</a>	4356
Table <del>9-12</del> . <a href="#">Preferred Alternative WRF – Accumulative Phased Construction Schedule</a>	4658

## LIST OF APPENDICES

Appendix A:	208 Amendment Checklist
Appendix B.	<del>Summary Judgment</del> Appendix C.....Town of Marana Self Certification Letter
<del>Appendix D-</del> <a href="#">Appendix C.</a>	Record of Public Participation (to be provided by PAG in their addendum)
<del>Appendix E-</del> <a href="#">Appendix D.</a>	Communications

## LIST OF ACRONYMS

<del>AAC</del> <a href="#">A.A.C.</a>	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
af	acre feet
af/yr	acre-feet/year
AMA	Active Management Area
APP	Aquifer Protection Permit
AWS	Assured Water Supply
AZPDES	Arizona Pollutant Discharge Elimination System
BADCT	Best <del>Available Demonstrated Control Technologies</del> <a href="#">available</a>
bls	below land surface
CAAG	Central Arizona Association of Governments
CAGR	Central Arizona Groundwater Replenishment District
CAP	Central Arizona Project
CAWCD	Central Arizona Water Conservation District
<a href="#">CCR</a>	<a href="#">Consumer confidence report</a>
CDO	Cañada del Oro
CFR	Code of Federal Regulations
<a href="#">CIP</a>	<a href="#">Capital Improvement Plan</a>
CMID	Cortaro-Marana Irrigation District
<del>COG</del>	<del>Council of Governments</del>
CRRPS	Continental Ranch Regional Pumping Station

<u>CRRWWPS</u>	<u>Continental Ranch Regional Wastewater Pumping</u>
CWA	Clean Water Act
<u>DCR</u>	<u>Design concept report</u>
DES	Department of Economic Security
DIP	Ductile <del>Iron</del> <u>iron Pipe</u> <u>pipe</u>
DMA	Designated Management Agency
DWS	Drinking Water Standards
EDCs	Endocrine disrupting chemicals
EDUs	Equivalent <del>Dwelling</del> <u>dwelling Units</u> <u>units</u>
EPA	Environmental Protection Agency
GIS	Geographic <del>Information</del> <u>information Systems</u> <u>systems</u>
gpcd	gallon per capita per day
<u>gpd</u>	<u>gallons per day</u>
GSF	Groundwater Saving Facility
I-10	Interstate <del>Highway</del> <u>10</u>
IGA	Intergovernmental <del>Agreement</del> <u>agreement</u>
<u>lf</u>	<u>linear feet</u>
LSCRIP	Lower Santa Cruz Recharge Project
MBR	membrane bioreactor
mg/L	milligrams per liter
mgd	million gallons per day
MLSS	mixed liquor suspended solids
<u>mm</u>	<u>Milliliter</u>
MTC	Management and Training Corporation
NOI	Notice of <del>Intent</del> <u>intent</u>
<u>NOT</u>	<u>Notice of termination</u>
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and <del>Maintenance</del> <u>maintenance</u>
PAG	Pima Association of Governments
PCRWRD	Pima County Regional Wastewater Reclamation
POPTAC	Population Technical Advisory Committee
PCCPs	Pharmaceutical and <del>Personal Care Products</del> <u>personal care</u>
PVC	Polyvinyl <del>Chloride</del> <u>chloride</u>
ROMP	Regional Optimization Master Plan
RRU	Red Rock Utilities, <u>L.L.C.</u>
SBR	Sequencing <del>Batch</del> <u>batch Reactor</u> <u>reactor</u>
<del>SSO</del> <u>SDWA</u>	<del>Sanitary Sewer Overflow</del> <u>Safe Drinking Water Act</u>
<u>SROG</u>	<u>Sub-Regional Operating Group</u>
<u>SRTs</u>	<u>Solids retention times</u>
SWPPP	Storm Water Pollution Prevention Plan
TAZ	Transportation <del>Analysis</del> <u>analysis Zone</u> <u>zone</u>
TDS	Total <del>Dissolved</del> <u>dissolved Solids</u> <u>solids</u>
TMUD	Town of Marana Utilities Department

USF	Underground <del>Storage</del> <u>storage</u> <del>Facility</del> <u>facility</u>
<u>UV</u>	<u>Ultraviolet</u>
VCP	Vitrified <del>Clay</del> <u>clay</u> <del>Pipe</del> <u>pipe</u>
<del>WPCF</del>	<del>Water Pollution Control Facility</del>
WRF	Water <del>Reclamation Facility</del> <u>reclamation facility</u> (acronym used for any type of wastewater treatment facility)
<del>WWPS</del> <u>WR</u>	<del>Wastewater Pumping Systems</del> <u>Water reclamation facility</u>
<del>WWT</del>	<del>Wastewater Treatment</del>
<del>WWTF</del>	<del>Wastewater Treatment Facility</del>
<del>WWTP</del> <u>WW</u>	Wastewater <del>Treatment</del> <u>pumping Plant</u> <u>system</u>

## ~~EXECUTIVE SUMMARY~~ executive summary

The Town of Marana (Town) is committed to providing the necessary planning and management of its available water resources to ensure that existing and future development within the Town's planning area meets ~~the goals outlined in the Clean Water Act (CWA), local, state, and federal regulations.~~ To meet this commitment, the Town intends to become the Designated Management Agency (DMA) for its planning area ~~that is,~~ located within Pima and Pinal Counties. As a DMA, the Town ~~would obtain effluent ownership that would be added to its water resource portfolio and put~~ will put the effluent from its new Water Reclamation Facilities (WRFs) to its highest beneficial use— as part of the Town's water resources portfolio. The Town will then be in a position to better manage and control water resources within its planning area.

~~As a result of a termination of agreement (1979 Intergovernmental Agreement) between the Town and Pima County related to sewer service to customers within Marana, and a subsequent court ruling and summary judgment, the Town decided to move forward with the 208 Plan Amendment process to obtain DMA status and provided wastewater treatment to customers~~

The Town's decision to manage and control water resources is supported by a 1986 Marana water and wastewater service voter referendum, the 2007 Marana General Plan, and the 2009 Marana Strategic Plan. Becoming the DMA for the Town's planning area will allow the Town to implement this decision.

The Town is establishing a wastewater utility to provide sanitary sewage collection and treatment services within its planning area. A detailed sewer basin study and rate analysis performed by the Town demonstrated the technical and financial feasibility needed to support the Town's creation and operation of a wastewater utility. As a result, the Town initiated this 208 Plan Amendment process to obtain DMA status.

The Town ~~has~~ prepared two 208 Plan Amendments to be processed separately by the Pima Association of Governments (PAG) and the Central Arizona Association of Governments (CAAG) for the Pima County and Pinal County portions of its planning area, respectively. ~~It is however, the intent of the~~ The Town intends to coordinate these planning efforts on parallel tracks with PAG and CAAG.

~~The Town boundaries include areas~~ purpose of this 208 Plan Amendment is to conform to the PAG Areawide Water Quality Management Plan, to become the DMA, and provide sanitary sewage collection and wastewater treatment services for residential and commercial uses within the

Town's planning area. This 208 Plan Amendment describes the sanitary sewage collection system, proposed WRFs, treatment alternatives, reclaimed water use, and acquisition and transition planning for the Town's planning area within Pima County.

The Town's planning area is located in eastern Pima County and southern Pinal County. The Pima County portion of the Town's planning area encompasses approximately ~~217~~178 square miles ~~acres~~ within the Upper Santa Cruz Valley and Avra Valley Sub-basins of the Tucson Active Management Area (AMA). The Pinal County portion of the Town's ~~proposed expansion~~planning area includes an additional ~~area about~~ 39 square miles ~~in size and includes that~~ extends to the Eloy Sub-basin of the Pinal AMA. Elevation in ~~this existing and proposed~~the planning area ranges from 3,300 feet (in the Tortolita Mountains) to 1,730 feet (near the northwest corner of the Town planning area). ~~In general, the topography in the majority of projected development areas is flat. A significant portion of the planning area has minimal slope conditions.~~ The Santa Cruz River flows in a north-northwesterly direction and is the ~~dominant~~major waterway in the planning area. ~~Effluent dominated sections of the~~ The Santa Cruz River ~~flow is~~ effluent dominated throughout the planning area and flows year round ~~in the planning area~~ due to upstream discharges from the Roger Road and Ina Road wastewater facilities.

~~Surface flows in the area are ephemeral, occurring in the Santa Cruz River and its tributaries. The Santa Cruz River enters the Tucson AMA from the Santa Cruz AMA to the south and outflows north into the Pinal AMA. The Santa Cruz River is the major stream channel within the Tucson AMA and in the southern portions of the Pinal AMA (the Gila River is the main stream in terms of flow and water resources in the Pinal AMA). The major tributaries to the Santa Cruz River in the Town's planning area are the Canada del Oro, Rillito Creek, and Brawley Wash.~~

~~Groundwater is the primary potable water source for the Town. Historically, groundwater level declines were a result of agricultural water use. Recent trends have indicated groundwater level rise primarily due to the in-lieu use of Central Arizona Project (CAP) water for agriculture, reduced agricultural acreage, storm water events, and recharge activities.~~

~~Projected~~The Town projected population and wastewater flow ~~estimates were made~~ based on an ~~extensive~~a Geographic Information ~~Systems~~System (GIS) ~~data base~~database developed for the Town's Sewer Basin Study. ~~Estimated wastewater~~ Wastewater flows ~~for the Town were developed~~ based on planned land uses (~~Town of the 2007~~ Marana General Plan, ~~2007 and was used unless~~ specific plans for developments ~~where were~~ available) and corresponding unit flows per land use category. The estimated ~~land use based~~ 20-year and buildout population projection for the Town's ~~proposed DMA~~planning area for PAG are 106,700 and 187,500, respectively. ~~The land use projections are more comprehensive than relying on population estimates especially since sewer flow projections can be made for commercial uses as well as residential. Therefore, the land use based~~

**WestLand Resources, Inc.**

Engineering and Environmental Consultants

~~projections were used in lieu of the estimates from the Land use-based population projections developed by the Town were used in lieu of the PAG-generated estimates. After a formal review process, the PAG Population Technical Advisory Committee (POPTAC). The methodology used to estimate population and sewer flow was approved by POPTAC and adopted by PAG for use in this 208 Plan Amendment~~ accepted the Town’s methodology and resulting population estimates.

Based on the 2008 Town of Marana Sewer Basin Study, the planning area has been separated into 24 sewer basins. The majority of the basins are located within Pima County, except for Basins 1 and 2 and a small portion of Basins 3 and 6, which are located in Pinal County.

Flow projections for the planning area are provided for infrastructure planning purposes. Sewer flows are projected within each basin for current, 5-year (2013), 10-year (2018), 20-year (2028), and buildout conditions. Phasing for the 5-, 10-, and 20-year projections are provided in this 208 Plan Amendment for comparison, in addition to the estimated buildout projections.

There are ~~several operating~~six wastewater treatment facilities ~~that serve the existing needs~~ within the Town—’s planning area. These include the Ina Road ~~Water Pollution Control Facility (WPCF) and the Marana Wastewater Treatment Facility (WWTF).~~ Both of these facilities, Rillito Vista and Marana WRFs that are currently owned and operated by Pima County.—~~Several smaller wastewater treatment plants are located within Pima County portion of the planning boundaries. These Three small private WRFs~~ include the Adonis Sanitary Sewerage Facility, ~~the public Rillito Vista Wastewater Treatment Plant (WWTP), the Marana High School WWTP,~~ and the Management and Training Corporation (MTC) ~~WWTF.~~ The Town expects to coordinate with these facility owners and develop agreements regarding the best approach to provide wastewater service for customers within these sewer service areas. As new public WRFs are constructed, the Town will coordinate with the owners and operators of these smaller public and private systems to evaluate treatment alternatives for connection to the public system.

~~To meet the projected wastewater treatment needs within the Town’s 208 Planning Areas, the Town has evaluated six alternative locations for new water reclamation facilities (WRFs). Two of these WRFs are projected for the Pinal County portion of the Town’s planning area and will be processed through a CAAG 208 Plan Amendment. However, the final location of the County Line WRF will be determined during a final site selection process and this plant may be located in either Pinal County or Pima County. The location of the WRFs are based on a 2008 Town of Marana Sewer Basin Study prepared for the Town by WestLand Resources, Inc. (WestLand), and are described in detail in the PAG and CAAG 208 Plan Amendment documents.~~

~~Multiple wastewater treatment site scenarios were evaluated in preparation of the Town’s Sewer Basin Study. Three WRF alternatives based on projected sewer basin flow rates were selected and evaluated in~~

~~detail. The Town has indicated a preference for the treatment plant locations as presented in Alternative 3 of the 2008 Sewer Basin Study and described in this document. Based on the preferred alternative, the Sandario WRF and Cottonwood WRF would be the first facilities to be operational. Each alternative as well as a description of the preferred alternative is presented in this 208 Plan Amendment.~~

Six proposed WRF alternative sites were identified and evaluated during the planning process. Four sites were selected—two within PAG’s jurisdiction and two within CAAG’s jurisdiction. The WRF site locations were determined based on projected wastewater flows, existing and likely future collection system alignments, land ownership and acquisition, site and environmental constraints, and reclaimed water use opportunities.

The 2008 Town of Marana Sewer Basin Study developed three alternative configurations for the WRFs and described the advantages and disadvantages of each alternative. The three alternatives were evaluated in detail to select a preferred alternative for the planning area located in Pima County. While all three alternatives are presented in this 208 Plan Amendment, the Town chose Alternative 3 as its preferred alternative. Alternative 3 includes the Sandario and Cottonwood WRFs in the PAG planning area.

The Town recognizes that special consideration must be given to boundary areas where service by either Pima County or Marana facilities would be feasible. When new sewer service is requested in these boundary areas, the project should be jointly evaluated by Pima County and the Town to determine which entity will serve the area. [Outcome of litigation will be inserted here.]

~~Each~~Alternative wastewater treatment technologies will continue to be evaluated by the Town. Each new WRF will be designed to meet the Arizona Department of Environmental Quality (ADEQ) ADEQ A+ Reclaimed Water Quality standards. A detailed Design Concept Report (DCR) for the new WRFs that meet ADEQ Best Available Demonstrated Control Technology (BADCT) under an Individual Aquifer Protection Permit (APP). Alternative WRF treatment processes being considered by the Town are described in general detail in this 208 Plan Amendment. During the Individual APP application review and approval process conducted by ADEQ, design details for each WRF will be developed. will be prepared by the Town following the approval of this 208 Plan Amendment or obtaining DMA status.

~~Treated effluent from each proposed WRF will meet ADEQ Class A+ Reclaimed Water Quality standards and put to its highest beneficial use. Reclaimed water uses include, but are not limited to, the irrigation of parks, road medians, school yards, agriculture, and turf facilities. Excess reclaimed water that is available may be recharged under an Arizona Department of Water Resources (ADWR) Underground Storage Facility (USF) permit and/or Groundwater Savings Facility (GSF) permit.~~

~~This 208 Plan Amendment to the PAG Areawide Water Quality Management Plan is necessary to meet the existing and future wastewater treatment needs based on the development plans and population projections for the Pima County portion of the Town's planning area.~~

Reclaimed water generated by the new WRFs within the Town's planning area will be put to its highest beneficial use to offset groundwater pumping. The proposed locations of the WRFs provide opportunities to distribute reclaimed water effectively and efficiently to end users while minimizing delivery infrastructure requirements. Reclaimed water will be used to irrigate parks, school yards, road medians, and golf courses; for environmental, agricultural, construction and industrial purposes; and for underground storage at recharge facilities. The direct use of reclaimed water will be maximized based on area demand and will be further evaluated during the APP application process. To accommodate excess reclaimed water due to seasonal demand, each WRF will be designed to convey its entire volume of reclaimed water to constructed recharge basins for storage and recovery.

The Town has adequate financial capability to meet the responsibilities of a wastewater utility and at this time no financial constraints have been identified. The Town meets the financial requirements of A.A.C. R18-9-A203(B)(2). The Town has the financial capability to administer, design, permit, construct, operate, close, and ensure proper post-closure activities of the utility. Methods of financing and financial resources available to the Town are provided in this 208 Plan Amendment. The Town developed an economic model to evaluate the potential costs and wastewater fees, including impact fees, required to support the Town's planned comprehensive wastewater services.

The Town will construct WRFs according to specified engineering plans and permitting requirements for the facility. The WRF design report and construction drawings will be submitted to ADEQ as part of the APP application review and approval process. Each WRF will be constructed in phases to meet the wastewater treatment needs as areas develop. Consistency of each new WRF with the PAG Areawide Water Quality Management Plan will be determined either through a 208 Plan Consistency Report or 208 Plan Amendment. The two facilities that will be constructed are based on the Town's preferred alternative and include the Cottonwood and Sandario WRFs. Upon completion of this 208 Plan Amendment process or establishment of the Town as a DMA, the design, permitting, and construction of the WRFs first phase will be initiated. With the authorities of a DMA, the Town will provide the operations and maintenance required for sewer collection and wastewater treatment services for customers within its planning area.

## BACKGROUND

~~MARANA PUBLIC SERVICES UTILITIES DEPARTMENT~~  
~~WATER/WASTEWATER~~

The Town ~~under its Public Services~~ of Marana Utilities Department ~~owns and operates the Marana Water Utility Department and (TMUD)~~ provides potable and non-potable water service to its customers. ~~The Town has also been pursuing the necessary activities to establish and operate a Wastewater Utility within its Public Services Department. The Town's primary objective is to provide wastewater treatment services to obtain ownership and control of 100 percent of the effluent generated within its service area and to be put the reclaimed water to its highest beneficial use. Beneficial uses include, but are not limited to, the direct use of effluent for landscape irrigation and for recharge/recovery. ADWR requires water providers to develop long term plans to mitigate groundwater mining. To that end, the Town has evaluated water portfolio options that meet the legal requirements and provide long term water resources for potable and non-potable uses. Most Arizona water service providers have three water sources in their portfolio—groundwater, surface water, and reclaimed water. Reclaimed water is the only resource that increases with population growth.~~

For over a decade, the Town has been expanding its water utility service and planning for ~~the development of an expanded reclaimed~~ and developing a non-potable water delivery system, ~~of which, some has been constructed.~~ Previous ~~discussions~~ negotiations to obtain reclaimed water ~~from effluent owners~~ were limited ~~due to~~ by high costs and the inability to acquire long ~~term~~ supplies, Control and ~~high costs.~~ ~~By owning and operating sewage collection and treatment systems as a DMA, the Town would have the legal ownership to 100 percent of the effluent, thus providing a substantial contribution to the Town's ownership of effluent as a renewable water resource portfolio. Having complete control and ownership of effluent as a renewable water resource would assist the Town in meeting the 100 year Assured Water Supply (AWS) regulations established by ADWR. The Town's decision to establish a wastewater utility resulted from a legislative decision. Under the current arrangement of Pima County being the DMA for the Town's service area, the Town is prevented from obtaining full ownership and control of the involved effluent.~~ helps the Town meet its 100-year AWS obligation. Designating Pima County as the DMA for the Town's planning area prevents the Town from controlling its own destiny and owning and controlling this valuable resource.

~~In recognition by the Town to manage its water supply from all available sources, a decision was made to form a water utility. A legislative decision was made by the voters and by the Town's elected body. The Town held a special election on March 29, 1988 concerning its authority to own and operate a wastewater and sewer collection system. The question presented to the voters to "construct, purchase, acquire, lease, own, and operate a municipal wastewater and sewer system" was passed by nearly 80 percent.~~

**WestLand Resources, Inc.**

Engineering and Environmental Consultants

~~Pima County has provided sanitary sewer service to customers within the Town based on a 1979 Intergovernmental Agreement (IGA) with Marana. As a condition of the IGA, on July 11, 2007, the Town provided its six month notice to Pima County that it was terminating the 1979 IGA. The IGA states that upon termination of the agreement, ownership of all property relating to flow through sewer facilities shall remain vested in the County (Clerk of the Court, 2008). The referenced ruling further states the conditions of the IGA termination (Appendix B). Based on this ruling, “it is ordered granting summary judgment in part, finding that Marana owns the non flow through portion of the sewer system within the town, finding that Marana has the right to operate a sewer system that serves its residents, and finding that Pima County has no authority to provide sewer services in Marana without Marana’s permission” (Clerk of the Court, 2008). The court ruling did not determine if the Town would be given ownership of the Marana wastewater treatment facility.~~

The Town’s decision to provide all water services has been publicly supported by the 1986 voter referendum to provide water and wastewater service, the 2007 Town General Plan, and the 2009 Town of Marana Strategic Plan. Designating the Town as the DMA for its own planning area will allow the Town to implement this policy.

[AFTER THE SEWER LITIGATION ENDS, A DESCRIPTION OF THE LITIGATION’S OUTCOME WILL BE INSERTED HERE.]

~~In preparation to provide sanitary sewage collection and treatment services for its customers, the Town began taking the necessary steps to establish~~The Town is establishing a wastewater utility ~~and the construction of the infrastructure to provide sewer~~to provide collection and treatment services. ~~The~~To this end, the Town developed a ~~detailed~~ sewer basin study and rate analysis ~~for this purpose.~~ ~~In addition, the Town in cooperation with PAG commenced the,~~ and began this 208 Plan Amendment process to obtain DMA status. ~~With 208 Plan Amendment~~Upon approval ~~that provides DMA status~~of this 208 Plan Amendment or establishment as the DMA, the Town will ~~pursue the design and construction of a WRF under ADEQ permitting requirements. Having DMA status would provide the Town the legal ownership of effluent generated within its service area for the direct and beneficial use of a~~design, permit, and construct WRFs. Town ownership of WRFs will give the Town control and legal ownership of the effluent from the Town’s WRFs, which will allow the Town to assure that this valuable renewable water resource. ~~is put to its highest beneficial use, consistent with Town-adopted policies. The Council has indicated its support of a proposed policy to assure that water providers who serve Town wastewater utility customers will be offered the same opportunity to own effluent generated from those customers as they currently enjoy under the standard City of Tucson intergovernmental agreement relating to effluent.~~

**TOWN OF MARANA WATER UTILITY**

The Town operates a municipal water utility, ~~servicing~~ that serves approximately 4,900 residential and commercial connections (~~Town of Marana Utilities Department (TMUD)~~ (TMUD 2008)). ~~The Town's water service area is currently contained within the corporate limits of the Town. The Town has been~~ TMUD 2008. ~~ADWR has~~ issued ~~the Town~~ a designation of ~~Assured Water Supply (AWS) in the amount of 7,580 acre-feet per year (af/yr) by ADWR (ADWR 2007 a). Based on this designation of AWS, the~~ The Town is able to meet the water demands for current and anticipated population growth for the next ~~10~~ ten years within the service area based upon its existing ~~agreement~~ Central Arizona Groundwater Replenishment District (CAGRDR)<sup>1</sup> Member Service Agreement with the Central Arizona Water Conservation District (CAWCD ~~1995~~). ~~As population grows within the Town's water service area, a modification to the AWS designation will be made in accordance with ADWR guidelines. To meet the groundwater replenishment obligations of the AWS program, the Town will continue to~~ (CAWCD 1995). The Town will modify its AWS designation as required in response to population or service area growth. The Town will rely on stored recharge credits, effluent utilization, CAGRDR membership, and/or ~~participate with the Central Arizona Groundwater Replenishment District (CAGRDR) to offset groundwater pumping Central Arizona Project (CAP) water direct delivery to meet the future groundwater replenishment obligations of the AWS program.~~

The Town's water ~~service area~~ utility was established in 1997 ~~through~~ with the acquisition of ~~several water systems within the Town boundary. The water systems acquired included the Honea Water Company, the Cortaro-Marana Irrigation District (CMID)/Cortaro Water Users Association~~ potable system, portions of the I.M. Water Company, and portions of the potable system owned by Marana-Picture Rocks Water Service. ~~Many smaller~~ The Town later purchased other privately owned water companies ~~were purchased by the Town and consolidated~~ under them ~~into~~ the Town's ~~Water Utility.~~ water utility. The Town ~~primarily~~ currently serves residential single-family homes ~~with some~~ and mixed commercial ~~and~~ / government office uses.

The Town ~~currently~~ relies primarily on groundwater for its potable water source. The existing well fields lie mainly within the Upper Santa Cruz Valley sub-basin ~~within~~ of the Tucson ~~Active Management Area~~ AMA. The TMUD service area is made up of ~~several public water systems that service the developed portions of Marana. The service area is comprised of the following~~ ten separate public water systems: Airline/Lambert, Airport, Amole, Continental Reserve, Cortaro Ranch, Falstaff Flats, Hartman Vistas, ~~La Puerta~~, North Marana, ~~and~~ Palo Verde, and Pioneer.

<sup>1</sup> Membership in CAGRDR does not waive the requirement under AWS Rules to demonstrate the physical and legal availability of groundwater.

In ~~2007,2008~~, TMUD delivered approximately 1,888,2000 acre feet (af) of water to its customers. ~~The Cortaro Marana Irrigation District (CMID) provided the majority of this water to the Town and was its principal~~ The Town purchased wholesale water ~~provider. CMID delivered 229~~from CMID for a portion of these deliveries. CMID supplied approximately 197 af of surface water and ~~747,757~~ 747,757 af of groundwater to the Town in ~~2007.2008~~. The Town supplemented this with approximately ~~886,856~~ 886,856 af of groundwater pumped from its well system, and ~~26~~reported 11.3 af of groundwater ~~received from~~delivered to Tucson Water (ADWR ~~2008~~2009). In 2008, Tucson Water delivered 2,897 af of potable water (groundwater and CAP), and 2,875 af of reclaimed water within the Town limits (Tucson Water, 2009).

~~The existing well fields used by the Town and its wholesale water provider lie primarily within the Upper Santa Cruz Valley sub-basin of the (AMA). As noted, the Town has an AWS designation from ADWR and is a member of CAGRD.<sup>1</sup> ADWR's May 14, 2007 Decision and Order, dated May 14, 2007, states recognizes~~ that 7,580 acre-feet/year (af/yr) are physically, legally, and continuously available to the Town to support its AWS designation. ~~The ADWR Rules require the~~ Town mustto meet ~~the~~ depth to groundwater criteria ~~established in the AWS Rules and~~to have the legal right to withdraw groundwater from the identified point(s)~~points~~ of withdrawal.

In accordance with the Town's CAGRD Member Service ~~Area Agreement with CAWCD, 910/30<sup>th</sup>~~ (~~499~529~~ af) of the groundwater delivered by the Town within the service area is~~was~~ considered excess groundwater use in ~~2007~~2008<sup>2</sup> (CAWCD 1995). This excess groundwater use was offset by accumulated recharge credits and the recharge of excess CAP water in the Lower Santa Cruz Recharge Project (LSCR).<sup>3</sup>

#### AREA DESIGNATED WATER PROVIDERS

Other ADWR-designated water providers located within or near the Town include the City of Tucson, Town of Oro Valley, Metropolitan Domestic Water Improvement District, Metropolitan Domestic Water Improvement District—West, and the Flowing Wells Irrigation District.

<sup>1</sup> ~~Membership in CAGRD does not waive the requirement under AWS Rules to demonstrate the physical and legal availability of groundwater.~~

<sup>2</sup> ~~This~~ The percentage of ~~the pumped~~ groundwater ~~pumped~~ that is considered excess groundwater is calculated on a sliding scale, beginning as 1/30<sup>th</sup> of the groundwater pumped in 1999 to 16/30<sup>th</sup> of the groundwater pumped in 2014.

<sup>3</sup> As a member of CAGRD, TMUD could have purchased replenishment credits directly from CAGRD to ~~comply with~~satisfy its AWS requirements.

## INTRODUCTION

This 208 Plan Amendment ~~for the Town provides a description of~~ describes the wastewater collection, ~~system, WRF alternatives, the~~ proposed ~~water reclamation facilities~~ WRFs, treatment alternatives, ~~disposal, and~~ reclaimed water ~~reuse associated with the existing sewer flows and future projected development~~ use, and acquisition and transition planning within the Town’s planning area. Appendix A contains the checklist for the 208 Plan Amendment.

~~As a result of a termination of agreement (1979 Intergovernmental Agreement) between the Town and Pima County related to sewer service to customers within Marana, and a subsequent court ruling and summary judgment, the Town decided to move forward with the 208 Plan Amendment process to obtain DMA status and provided sanitary sewerage services to customers within its planning area. The Town was given certain rights with respect to sewer service within the Town were addressed in a Court Ruling dated June 9, 2008 (Appendix B).~~

### PURPOSE

The purpose of ~~the~~ this 208 Plan Amendment is to ~~conform to the Pima Association of Government’s (PAG)~~ amend the PAG Areawide Water Quality Management Plan ~~and to obtain 208 Plan Amendment Approval to meet the current and future wastewater collection, conveyance, and treatment needs for the Town. It is the Town’s intent to be the DMA for areas within their existing Town boundaries and projected planning area. As the DMA, the Town can~~ to designate the Town as the DMA authorized to provide sewage collection and wastewater treatment services for residences and commercial uses within ~~its town boundaries. Having~~ the Town’s projected planning area as depicted in Figure 1, DMA status ~~would~~ will provide the Town with the ownership and control of ~~the effluent produced within the Town, thus maximizing the beneficial use of a renewable water resource.~~ available effluent supplies produced from Town WRFs. This will allow the Town to assure that effluent is put to its highest beneficial use, consistent with Town-adopted policies, including a proposed policy to assure that water providers who serve Town wastewater utility customers will be offered the same opportunity to own effluent generated from those customers as they currently enjoy under the standard City of Tucson intergovernmental agreement relating to effluent.

The Town plans to ~~augment~~ conserve groundwater resources ~~through the direct use of reclaimed water. Reclaimed water uses are projected to include the irrigation of~~ by directly utilizing or recharging reclaimed water. The Town expects to use reclaimed water to irrigate parks, school yards, road medians, and golf courses. ~~Excess; and for environmental, agricultural, construction~~

and industrial purposes. Seasonally-available excess reclaimed water ~~that will likely be seasonally available is projected to~~will be recharged and incorporated into a recovery plan for direct beneficial use.

~~The Town is proposing to provide sewage collection and wastewater treatment for its current and proposed areas within its planning area.~~ This PAG 208 Plan Amendment has been developed specifically for the Town's planning areas located within Pima County ~~through the PAG.~~ Another 208 Plan Amendment ~~has been~~ developed for the Pinal County portion of the Marana planning area ~~and~~ is being processed through CAAG. The concurrent CAAG 208 Plan Amendment will establish the Town as a DMA in the Pinal County portion of its planning area. As part of this effort, the Town coordinated with the City of Eloy ~~(Eloy)~~ and Red Rock Utilities, LLC (RRU) to refine the Town's planning area and define the boundaries of the future DMA ~~area~~authorities for the City of Eloy and RRU service area expansion.

#### **STUDY AREA**

The Town is located approximately 15 miles northwest of Tucson in the northeastern part of Pima County and the southern portion of Pinal County. ~~This region~~ The Marana planning area encompasses ~~an area of~~ approximately 217 square miles, of which 178 square miles are ~~associated in Pima County and addressed~~ directly ~~with~~by this 208 Plan Amendment. The Town is generally bounded by ~~a portion of~~ Pinal County to the north, Trico Road to the west, Ina Road and Twin Peaks Road to the south, and Camino de Oeste and Thornydale Road to the east. The study area is ~~based primarily on~~essentially the Pima County portion of the 2007 ~~Draft~~ Town of Marana General Plan.

A vicinity map for the Town, the 208 planning area, and surrounding existing wastewater ~~facilities~~facilities are shown on Figures 1 and 2.

[Figure 1. Location Map](#)

[Figure 2. Area Wastewater Treatment Facilities](#)

The Town is surrounded by Pinal County to the north, State Land and agricultural property to the west, Oro Valley to the east, and the City of Tucson to the south. Dominant features include the Tortolita Mountains, the Tucson Mountains, the Santa Cruz River, Interstate ~~Highway~~ 10 (I-10), the Union Pacific Railroad, the proposed Bartlett Channel, and the CAP aqueduct. Elevations range from 3,300 feet (in the Tortolita Mountains) to 1,730 feet (near the northwest corner of the town boundary), but the topography in certain areas; has a shallow surface gradient. The planning area for the PAG 208 Plan Amendment is ~~contained~~ within the Tucson AMA.

#### **RATIONALE FOR AMENDING PLAN**

The Town’s Mayor and Council, ~~with the concurrence of its electorate, have made a formal legislative decision to pursue this 208 Plan Amendment and its intended goals. Town staff has been authorized by its Mayor and Council~~ authorized Town staff to pursue the right, ownership, administration and operation of the sanitary sewerage facilities serving Marana’s current and future ~~citizens-~~ customers. The Town ~~is resolved that it must~~ develop and control ~~and utilize any and~~ all available water resources ~~available in order~~ to more fully control and determine its growth and development ~~strategy~~. In furtherance of those goals, this 208 Plan Amendment is submitted to designate the Town as the DMA for the Town’s ~~General Plan~~ planning area and to ~~recognize the~~ identify proposed locations for future WRFs to serve the ~~sewage~~ drainage basins ~~positioned in that~~ the planning area. The Town acknowledges, recognizes, and accepts responsibility for having to follow through diligently with the bureaucratic, fiscal, and regulatory steps needed for the Town’s wastewater ~~system~~ utility to develop and ~~thrive~~ prosper.

~~As noted, the Town’s rationale for amending the PAG Areawide Water Quality Management Plan is to obtain DMA status of its planning area and 100 percent ownership of the effluent generated from within its service area. With effluent ownership and control, the Town would be able to implement the direct beneficial use of reclaimed water for landscape irrigation and recharge, while achieving the ADWR water management goals for the Tucson AMA. Additionally, the Town would be able to better evaluate and manage requests for capacity assurances for new development and planned growth within its planning area.~~

~~Figure 1. Location Map~~

~~Figure 2. Area Wastewater Treatment Facilities~~

## NATURAL SETTING

The Town's PAG 208 Plan Amendment Area (~~Area~~) is located ~~in the northern portion of the Tucson AMA and lies~~ within portions of the Upper Santa Cruz and Avra Valley sub-basins, in northern area of the Tucson AMA. The ~~Area~~area is ~~bounded on the west~~surrounded by the Silver Bell ~~and~~, Tucson ~~Mountains and on the east by the~~, Tortolita , and Santa Catalina ~~Mountains~~ mountain ranges. The main water drainage within the Tucson AMA is the Santa Cruz River, which runs from south to north in the Upper Santa Cruz sub-basin, and then northwest into the Avra Valley sub-basin. Major Santa Cruz River tributaries ~~to the Santa Cruz River~~ upstream of the Town include the Cañada del Oro Wash, Rillito Creek, and their tributaries, the Pantano Wash and the Tanque Verde Wash. These drainages are ephemeral and flow only in response to rainfall events. However, ~~there is an~~ approximately a 9nine-mile reach of the Santa Cruz River ~~which is~~ perennial as a result of treated effluent discharged into the channel at the Roger Road and Ina ~~Roads~~Road WRFs (ADWR 1999). ~~Storm water~~ Stormwater runoff from the ~~adjacent~~ Tucson and Tortolita ~~Mountain ranges~~Mountains, coupled with ~~storm water~~stormwater infiltration along the Lower Santa Cruz River and its tributaries, contribute to the aquifer which supplies the Town.

Historical records indicate that impacts from agricultural irrigation, municipal use, and industrial water supplies have considerably altered groundwater levels in the Tucson AMA since the 1940s. Fissuring and land subsidence have been attributed to aquifer dewatering in northern Avra Valley. ~~Compaction tests demonstrate~~ Field data demonstrates a change in surface elevation from 0.02-foot to 0.18-foot at seven locations in the Upper Santa Cruz sub-basin and from 0.01-foot to 0.11-foot at seven locations in ~~the~~ Avra Valley (ADWR 1999). There has been some recovery of groundwater levels along the Santa Cruz River and northern Avra Valley due to decreased agricultural and mine pumping and increased flood flows (ADWR 1999). The use of CAP water for agriculture in lieu of groundwater has also contributed to rising groundwater levels. The stability of the water supply relies on the management of renewable water supplies as demand continues to increase.

### GEOLOGY

The Tucson AMA lies within the Basin and Range physiographic province. The geologic framework of the alluvial basins in the study area is similar to most of the other basins in the southwestern Arizona Basin and Range physiographic province ~~in southwestern Arizona~~. The basins are filled with alluvium sediments that accumulated in structural basins ~~that were~~ formed

in response to regional movements during the Basin and Range structural disturbance 15 to 10 million years ago (Eberley and Stanley, 1978).

The mountains that border the basins were ~~up-lifted~~uplifted in relation to the intervening structural troughs during the Basin and Range disturbance. These mountains are composed of sedimentary, volcanic, and granitic rocks. The rocks exposed in the mountains and underlying the basin fills are considered to be the boundaries of the groundwater aquifers. These older sedimentary rocks and the volcanic and granitic rocks are considered bedrock and the surface extent of this “hard rock” is considered to be the boundary of the alluvial basin.

### **GROUNDWATER HYDROLOGY**

The main water-bearing units in the Tucson AMA are the alluvial deposits of the basin-fill sediments. These sediments are composed of consolidated and unconsolidated materials of Tertiary to Quaternary age. The basin fill has been divided into upper and lower units based on regional hydrogeologic characteristics (Mason and Bota, 2006). The upper basin fill is the main water-bearing unit and consists of clayey silt, sand, and gravel. The upper basin-fill ranges from a few hundred feet to as much as 1,000 feet thick in both sub-basins. The lower basin fill consists of mudstones, clayey silt, sand, and gravel and conglomerates. The lower basin-fill is as much as several thousand feet thick (Mason and Bota, 2006).

Groundwater in the sub-basins generally flows from southeast to northwest, except in the northeastern portion of the Upper Santa Cruz sub-basin. ~~There the~~ The southwestward -trending groundwater flow in that area shows the effect of recharge in the ~~Canada~~Cañada del Oro drainage.

Inflow ~~into~~to the regional aquifers occurs from groundwater underflow from adjacent basins and recharge within the basin, including mountain-front recharge, natural recharge from ~~streamflow~~stream flow, incidental recharge from water use (irrigation), direct CAP water recharge, and recharge of effluent ~~released into stream channels~~. Groundwater discharge from the regional aquifer occurs as pumpage for municipal, industrial, and agricultural uses, evapotranspiration from limited areas adjacent to stream channels, and groundwater underflow from the Avra Valley sub-basin to the Pinal AMA Eloy sub-basin.

Depths to groundwater range from over 500 feet below land surface (bls) to less than 100 feet bls. Depths to groundwater reflect both the slope of the groundwater surface and the land surface and tend to be ~~larger~~deeper near the mountain fronts and shallower along the stream channels.

Groundwater has been the most extensively developed water resource in the Tucson AMA. Groundwater pumpage in the Tucson AMA has been in excess of natural recharge since the mid-1940s and widespread water level declines have occurred in the Tucson AMA as a result of this overdraft. Water level declines have decreased in recent years in the Tucson AMA as a result of the agricultural use of in-lieu CAP water, reduced agricultural acreage, ~~storm-water~~stormwater events, and ~~recharge~~-activities related to the recharge of CAP water and effluent. Most of the ~~Area~~area has had a rebound in groundwater levels since the 1990's as indicated by measured increases in aquifer water levels.

Although historic declines in groundwater levels have occurred within the Pima County portion of the Town's planning area, recent trends have indicated groundwater level increases in the Avra Valley Sub-basin. Based on information contained in ADWR's Arizona Water Atlas (Volume 8, July 2008), the water level ~~change between 1995 and 2005~~ has increased up to 60 feet along I-10 and Santa Cruz River corridor.— between 1995 and 2005. Groundwater level rise is primarily due to a combination of CAP water use for agriculture, effluent discharges to the Santa Cruz River, and constructed recharge facilities.

#### **GROUNDWATER QUALITY**

Groundwater quality in the Tucson AMA is generally acceptable for most uses, as evidenced by the extensive use of the resource. However, in some areas of the Tucson AMA, natural and anthropogenic causes have impacted groundwater quality. The ADWR discusses these impacts on a regional basis in more detail in the Third Management Plan for the Tucson AMA (ADWR, 1999).

~~Contaminants of concern~~Potable water supply wells in the Town's service area meet the current Safe Drinking Water Act (SDWA) regulations. Constituents of concern in the Tucson AMA can be divided into groups that are indicative of natural sources and anthropogenic contamination sources. Nitrates are the most common groundwater ~~contaminants~~contaminants detected in Arizona and are attributed to natural sources as well as anthropogenic sources, such as industrial facilities, wastewater treatment plants, residential septic systems, agricultural fertilizers, and animal production facilities.

Sulfates occur from natural sources and ~~industrial~~mine wastes. Elevated total dissolved solids (TDS) concentrations are often due to natural sources, but include ~~industrial~~mine wastes, as well as municipal and industrial wastewater discharges. The introduction of CAP water into the aquifer through recharge can also increase ~~the~~-TDS concentrations in groundwater. Many of the

CAP recharge projects south of the planning area also incorporate recovery from wells that would minimize the migration of these constituents.

~~Groundwater quality data from the~~ ADWR analyzed late 1990s ~~for the Tucson AMA was analyzed by~~ ADWR groundwater quality data to characterize usability of the resource (ADWR, 1999). A review of this analysis shows ~~where~~ no exceedances of groundwater quality standards within the planning area, except for nitrates. Regulated drinking water quality parameters are routinely monitored for compliance with ~~state drinking water standards.~~ State Drinking Water Standards (DWS).

~~Based~~ More recent data based on the ADWR Arizona Water Atlas (Chapter 8 Draft, Section 8.5, July 2008), ~~Drinking Water Standards (DWS) indicates that DWS~~ were equaled or exceeded in some wells not used for potable supply. Water quality ~~exceedences~~ exceedances in the area along the Santa Cruz River and ~~I-10~~ corridor north of Marana to the Pinal County boundary included primarily Nitrate/Nitrite (NO<sub>3</sub>). Other constituents identified included Arsenic (As), ~~Berillium~~ Beryllium (Be), ~~Mangenes~~ Manganese (Mg), Cadmium (Cd), Lead (Pb), and Organics. ~~It should be noted that exceedances in~~ DWS have not ~~detected~~ been exceeded in Town wells used for potable ~~use.~~ deliveries.

The Town complies with the regulatory requirements established by ADEQ, including scheduled monitoring and reporting of water delivered to customers. As a part of this requirement under the SDWA, the Town produces and distributes an annual Consumer Confidence Report (CCR) describing the water source, levels, and possible sources of contaminants found, corrective action taken, health effects, and delivered water quality information.

## **SURFACE WATER HYDROLOGY**

Surface flows in the area are ephemeral, occurring in the Santa Cruz River and its tributaries. The Santa Cruz River enters the Tucson AMA from the Santa Cruz AMA in the south ~~from the Santa Cruz AMA.~~ The Santa Cruz River is the primary surface water drainage within the Tucson AMA with outflows into Pinal County. As noted, the major tributaries to the Santa Cruz River in the ~~Area~~ area are the Cañada del Oro Wash and the Rillito River.

The Santa Cruz River receives discharges of treated effluent at the outflow of the Roger Road and Ina Road ~~wastewater treatment plants.~~ WREs. Effluent ~~dominated~~ surface flows in the Santa Cruz River are regularly visible beyond the Pima/Pinal County line. Riparian habitat has been established in areas downstream of the Roger Road and Ina Road ~~wastewater treatment plants~~ WREs as a result of effluent discharges to the Santa Cruz River.

ADEQ requires all facilities either to be located outside of or protected from the 100-year flood plain during the APP application process and development of design parameters for a new WRF. As part of the WRF site selection process and design, the Town will coordinate with ADEQ to meet these requirements. Figure 3 provides floodplain zone information for the Town’s planning area.

**Figure 3. Floodplain zone information**

**SURFACE WATER QUALITY**

The following information was provided by Pima County:

Surface water quality in the effluent dominated ~~portions reach~~ of the Santa Cruz River ~~listed below are a result~~ from Prince Road to Pima/Pinal County boundary is composed primarily of effluent discharges from both the Ina Road and Roger Road and Marana wastewater treatment plants reclamation facilities except during periods when stormwater flow. Aquifer Protection Permits (APP) and Arizona Pollutant Discharge Elimination System (AZPDES) permits issued by ADEQ govern discharges of effluent from these reclamation facilities. AZPDES and APP permits establish effluent quality limitations and monitoring requirements to establish and ensure that discharges will meet applicable water quality standards. Water quality resulting from these discharges meets or exceeds all applicable surface water and aquifer quality limits, as well as all regulatory requirements for reuse and recharge.

~~(WATER QUALITY INFORMATION REQUESTED FROM PIMA COUNTY).~~

~~Pima County is in the process to make improvements to its Roger Road and Ina Road wastewater facilities for water discharged into the Santa Cruz River as a result of its Regional Optimization Master Plan (ROMP). Once completed, the improvements to these facilities will provide the wastewater treatment quality necessary to remain in compliance with ADEQ regulations. Although these improvements are being made to existing plants, it should be noted that the WRFs proposed for the Town will meet all new regulatory requirements. In addition, the effluent generated from the Town's new WRFs will be designed to meet Class A+ Reclaimed Water quality standards and 100 percent reuse or recharge.~~ The Roger Road WRF began operation in 1955 and continues to provide treatment for up to 41 million gallons per day (MGD). Since 2000, the Roger Road WRF has received two Gold Awards and four Silver Awards from the National Association of Clean Water Agencies. Gold Awards honor treatment works that have achieved 100 percent compliance with their NPDES/AZPDES permit for an entire calendar year while Silver Awards recognize facilities that have received no more than five NPDES/AZPDES permit exceedences per calendar year. The Roger Road WRF currently performs over 3,000 analyses per year with five or fewer exceedences per year. In addition, the Roger Road WRF received Arizona Water Pollution Control Association Peak Performance Awards in 2002 and 2007 for wastewater facilities serving large populations.

The Ina Road WRF began operation in 1977 and provides treatment for up to 37.5 million gallons per day. Since 2000, the Ina Road WRF has performed approximately

3,000 analyses per year and received five Silver Awards for receiving no more than five NPDES/AZPDES permit exceedences per calendar year.

At the time of construction of the pre-1993 Pima County WRFs, secondary treatment and disinfection were required wastewater treatment technologies. Recent changes to water quality standards require all new treatment facilities to meet BADCT for which nitrification and denitrification are necessary. Any WRFs proposed for the Town will be required to meet BADCT standards. All Pima County RWRD facilities constructed since 1993 meet current BADCT standards including the 12.5 MGD expansion at the Ina Road WRF and the 0.5 MGD expansion at the Marana WRF which began operation in 2006.

In 2008, the Marana WRF underwent further improvements and added filtration and UV disinfection. The effluent generated from the Marana WRF meets Class A+ Reclaimed Water quality standards and has over 250,000 gallons of excess capacity available for future growth and a 1.5 MGD expansion designed and ready for implementation when necessary. This facility has ample ability to accommodate both future flows and A+ water quality standards.

Both the Ina Road WRF and Roger WRF AZPDES permits contain variances for ammonia toxicity to *Pimephales promelas* and *Ceriodaphnia dubia* and for copper in the current permit terms since the effluent does not consistently meet the toxicity and the copper standards. However, the AZPDES permits require actions to upgrade these facilities to current BADCT standards. These facilities are currently on schedule to address compliance with ammonia toxicity by January 2014 and copper standards by December 2010.

The Town does not intend to discharge to the Santa Cruz River or its tributaries except in an emergency. If discharge occurs, the Town will meet all applicable discharge standards established in rule by ADEQ under an Arizona Pollution Discharge Elimination Systems (AZPDES) permit. Recharge basins will be designed to accept all of the effluent generated from the WRFs, and emergency discharges are unlikely to occur. Given the improbable event of a discharge to the Santa Cruz River and effluent meeting A+ Reclaimed Water Quality standards, negative impacts to downstream land owners are not considered an issue.

## **HABITAT**

There are four general habitat types within and adjacent to the Town's planning area, ~~including~~ upland, xeroriparian, riparian, and wetland communities. Denser xeroriparian vegetation along ephemeral drainages provides the best wildlife habitat because of higher plant density or

vegetation volume. Xeroriparian wash habitats provide correspondingly higher habitat values for some wildlife, particularly birds and small to medium-sized mammals. Vegetation associated with washes provides foraging resources and cover for wildlife species that use both uplands and washes, such as coyotes, some reptiles, and most birds. Most of these species use both uplands and washes for movement and are not strictly dependent on washes as movement corridors. However, due to low cover in desertscrub areas, larger wildlife tends to move along washes.

Mesoriparian and hydroriparian habitats, including wetlands, occur in association with portions of the Santa Cruz River that receive effluent from adjacent wastewater treatment plants. Hydroriparian habitats on banks adjacent to and on islands within the Santa Cruz River are associated with perennial water flow and are characterized by plant communities dominated by obligate or preferential wetland species. Important Riparian Areas are identified along portions of the Santa Cruz River. Named drainages that cross the Town's service areas include Cañada Agua 1, Santa Cruz River, Cottonwood Wash, Picture Rocks Wash, and Yuma Mine Wash. Numerous unnamed drainages tributary to the Santa Cruz River traverse the area ~~as well~~.

Special status species likely to occur within the ~~service~~planning area include the southwestern willow flycatcher, yellow-billed cuckoo, and the lesser long-nosed bat. Sightings of California brown pelicans are rare and the birds' presence in the area is considered accidental. Riparian habitat for the southwestern willow flycatcher and yellow-billed cuckoo is present along effluent-supported portions of the Santa Cruz River within the Town. Undisturbed areas of Sonoran desertscrub where saguaros and agave are present provide potential forage for the lesser long-nosed bat.

## PROJECT DESCRIPTION

### OVERVIEW

The Town ~~has identified the need to~~will manage ~~the~~ water resources within its planning area to ensure ~~water is both physically and legally available~~physical and legal availability of water to meet the demands of existing and proposed development. Through the ownership and operation of WRFs within ~~their~~its planning area, the Town ~~would~~will have the ability to acquire and use effluent resources and reduce ~~dependency on~~ groundwater ~~supplies.~~mining. The Town intends to construct and operate ~~up to three~~ new WRFs within its PAG 208 planning area to treat wastewater to ADEQ Class A+ Reclaimed ~~water quality~~Water Quality standards. ~~The County Line WRF may be located in either Pinal or Pima County depending on the final site selection process. It is also the Town's intent to use 100 percent~~ The Town will also consider the use of the~~available~~ reclaimed water supplies for ~~landscape~~ irrigation of parks, schools, ~~and road medians, and recharge. Although the option to discharge effluent to a stream will be a consideration, the Town intends to beneficially use all of the generated effluent.~~road medians, and golf courses; environmental, agricultural, industrial, and construction uses; and recharge. The Town intends to use all of the available effluent to its highest and most beneficial use, and will discharge to a stream under emergency conditions only.

To meet the intent of the CWA and the general goals of the Environmental Protection Agency (EPA), the Town has addressed the following five goals:

1. Clean Air and Global Climate Change: The Town will use its allocation of Parker-Davis hydropower and any Cortaro-Marana Irrigation District Hoover hydropower allocation that is available to power wastewater reclamation and conveyance facilities. Hydropower is a renewable resource.
2. Clean and Safe Water: The Town will build wastewater reclamation facilities that produce A+ ~~Reclaimed Water Quality~~quality reclaimed water.
3. Land Preservation and Restoration: The Town has actively worked toward the development of the Tres Rios ~~Del~~del Norte Project and anticipates that reclaimed water produced by the Town's WRFs may be used for this restoration project.
4. Healthy Communities and Ecosystems: Marana has committed to building healthy communities and ecosystems and developing a sustainable community since its inception.

5. Compliance and Environmental Stewardship: Marana has a history of complying with all applicable environmental laws and regulations in its stewardship of the environment.

Through the implementation of its established goals, having access to increasing effluent supplies, and being in control of ~~h~~its own destiny, the Town can provide for responsible community growth.

#### **PLAN AREA**

The Town's planning area is primarily located in Eastern Pima County extending into areas in the southern portion of Pinal County as indicated on Figure 1. ~~The Town's planning area within Pima County is located in portions of Township 11 South, Range 10 East, Township 11 South, Range 11 East, Township 11 South, Range 12 East, Township 11 South, Range 13 East, Township 12 South, Range 10 East, Township 12 South, Range 11 East, Township 12 South, Range 12 East, Township 12 South, Range 13 East, Township 13 South, Range 12 East, and Township 13 South, Range 13 East.~~

#### **CURRENT AND FUTURE CONDITIONS**

The current population of the Town is ~~currently about~~approximately 32,300 (~~draft 2007 population estimates~~). estimate). The Town's population does not significantly change seasonally. The land use is mixed residential, commercial, industrial, and agricultural. Agricultural crop production consists primarily of cotton, alfalfa, wheat, and sorghum. During the previous decade, there has been a trend of decreasing agricultural acreage and an increase in residential and commercial growth. Sand and gravel operations are located predominately along the Santa Cruz River corridor. Existing local and regional wastewater ~~treatment~~ facilities and proposed new WRFs are described in greater detail in ~~the following~~later sections of this report.

#### **POPULATION**

The Arizona Department of Economic Security (DES) has published its official population projections for the State and all counties: 2006 – 2055. The projected population for the Town based on DES data in year 2028 and 2055 is 86,757 and 121,292, respectively. These forecasts conform to Pima County Control Totals adopted by DES in 2006.

~~In order to~~To provide better estimates for sewer basin flow rates, ~~a GIS data base was~~the Town developed a GIS database to evaluate sewer flow based on land use projections. As described in the following sections, the estimated wastewater flows for the Town ~~were developed~~are based on planned land uses (~~Town of 2007~~ Marana General Plan, ~~2007~~ and specific plans where available) and corresponding unit flows per land use category. The ~~land use based~~ 20-year and buildout population projection for the Town's proposed PAG-DMAplanning area are 106,650 and 196,900, respectively. The land use projections are ~~thought to be~~ more comprehensive and relevant to

wastewater planning, since sewer flow projections can be made for commercial ~~uses~~ as well as residential uses. Therefore, the land use-based projections prepared for this 208 Plan Amendment were used in lieu of the DES, Transportation Analysis Zone (TAZ), and POPTAC estimates.

The Town's methodology to ~~estimate project~~ population growth was presented to ~~PAG-POPTAC for review and approval. POPTAC~~. The Town coordinated with PAG staff to provide the information and assumptions used to establish planned land uses, and the resulting population and wastewater flow estimates are described in this 208 Plan Amendment.

The Town attended two POPTAC meetings to present and discuss the methodology used for population projections, and to obtain support for the projections presented in the Town's 208 Plan Amendment. The methodology presented by the Town was well received by POPTAC members. A comparison of population projections used by the Town and those developed by PAG were considered to differ negligibly. The POPTAC recommended approval and adoption of the Town's estimates for the 208 Plan Amendment ~~and future~~, and recommended that the Town's estimates be used as a reference for future PAG planning activities.

#### **SEWER BASINS**

Based on the 2008 Town of Marana Sewer Basin Study, the planning area has been separated into 24 sewer basins: Basins 1 through ~~24. These sewer basins are~~ 24 as shown on Figure ~~3. 4.~~ All the sewer basins except Basin 22 are within the ~~Town of 2007~~ Marana General Plan planning area. Basin 22 is located outside the planning area, but ~~it~~ wastewater currently flows into Basin 21. Basin 24 is located in the Town's planning area and flows by gravity to the Ina Road ~~WPCFWRE~~. The majority of the basins are located within Pima County, except for Basins 1 and ~~2, 2~~ and a small portion of Basins 3 and 6, which are located within ~~the boundary of~~ Pinal County.

The sewer basin delineation is ~~first~~ primarily based on ~~the distinction of~~ distinct natural and man-made features within the planning area:

- Interstate Highway 10 and the Union Pacific Railroad
- The Santa Cruz River
- The Central Arizona Project Canal
- The future Barnett Channel

The five major basins were further subdivided into a total of 24 sewer basins to account for topography, existing sewers, major roadways, and possible locations of treatment plants and lift stations.

Generally, onsite gravity sewers will collect wastewater generated within each basin and convey ~~that flow~~it to an existing or proposed WRF. Due to the ~~extremely~~-flat ~~nature~~slope of the existing site topography, ~~in some cases it will be necessary to construct~~ lift stations and force mains will be constructed in some cases to convey the sewage to a WRF or ~~to~~ a gravity sewer main.

~~Sewers in Basin 24 flow to the Ina Road WPCF, and it is assumed that the flow will continue to flow to Ina Road WPCF in the future.~~

#### **SEPTIC SYSTEMS**

This 208 Plan Amendment recognizes that there may be parcels and subdivisions that do not ~~now~~currently have access to public sewage collection and treatment services. ~~Providing that these areas meet the~~ If public sewage collection is not available and the utilization of an onsite system can meet established regulatory requirements, private septic systems ~~would~~may be ~~allowed~~permitted. The Town may need flexibility regarding what can ~~be served~~ and cannot be served by the proposed WRFs. ~~Restrictive~~ due to restrictive conditions ~~may include~~including but not ~~be~~ limited to, distance from existing or planned public sewer mains, topography, and ~~or~~ cost.

**Figure 4. Sewer Basin Delineation & Existing Sewer Infrastructure**

Septic systems currently exist on many larger properties (e.g. greater than ~~one~~ acre) within the planning area, primarily due to the lack of available public wastewater collection and treatment facility infrastructure. ~~The Town plans to adopt a code comparable to the one currently established by~~ Existing areas with septic systems are indicated on Figure 7, on page 33. The Town will evaluate opportunities to allow and encourage the conversion from septic to sanitary sewer service where appropriate.

The Town anticipates adopting a code comparable to Pima County's (Title 7, Environmental Quality, Chapter 7.21 Liquid Waste). In general, an application for an onsite disposal system will be denied if available sewer capacity is within 200 feet of the parcel property line. ~~Other conditions exist for individual parcels as noted in the code.~~ Subdivisions ~~further~~ more than 200 feet from a public sewer using onsite disposal systems will be required to record permanent rights-of-way for future public sewer construction and covenants requiring connection within five years of public sewer availability. Waivers could be granted upon review provided that it meets certain conditions.

In addition to meeting the code requirements established by Pima County, the Town will implement the guidelines established in the Arizona Administrative Code (A.A.C.) R18-9-A309 (A)(5) that ~~states~~ state:

A person constructing a new onsite wastewater treatment facility or replacing the treatment works or disposal works of an existing onsite wastewater treatment facility shall connect to a sewage collection system if:

- a. One of the following applies:
  - i. A provision of a Nitrogen Management Area designation under R18-9-A317(C) requires connection;
  - ii. A county, municipal, or sanitary district ordinance requires connection; or
  - iii. The onsite wastewater treatment facility is located within an area identified for connection to a sewage collection system by a Certified Areawide Water Quality Management Plan adopted under 18 A.A.C. 5 or a master plan adopted by a majority of the elected officials of a board or council for a county, municipality, or sanitary district; or
- b. A sewer service line extension is available at the property boundary and both of the following apply:

~~i.~~ i. The service connection fee is not more than ~~\$6000~~6,000 for a dwelling or \$10 times the daily design flow in gallons for a source other than a dwelling, and

~~ii.~~ ii. The cost of constructing the building sewer from the wastewater source to the service connection is not more than ~~\$3000~~3,000 for a dwelling or \$5 times the daily design flow in gallons for a source other than a dwelling.

---

-  
~~Figure 3. Sewer Basin Delineation & Existing Sewer Infrastructure~~

**WASTEWATER FLOW PROJECTIONS**

Wastewater flows ~~are have been~~ projected within each sewer basin ~~based on~~according to the land use categories in ~~Town of the 2007~~ Marana General Plan, ~~2007~~, development plans, and specific plans where available. Figure 45 shows future land use based on the Town’s General Plan and specific plans. Specific plans within the Town’s limit include 34,393 single-family residential units and 2,505 acres of industrial/commercial area. Table 1 shows the planning density in equivalent dwelling units (~~EDU~~EDUs) that was assumed for each land use category and the total land area for each category within the ~~General Plan area. Specific Plans within the Town’s limit include an additional 34,393 residential units and 2,505 acres of industrial/commercial area.~~planning area. The use of EDUs for flow rate calculations allows all types of land uses to be represented in terms of the equivalent wastewater flow produced by an average single-family residence. For example, as shown in Table 1, it is assumed that one acre of commercial land use will produce the same amount of wastewater as four single-family residences (that is, four EDUs).

**Table 1. Planning Density and General Plan Area by Land Use Category**

Land Use Category	Equivalent Dwelling Units per Acre	Land Area* (Acres)
Airport	0.25	6,703
Commercial	4.0	6,070
Industrial	4.0	16,290
Industrial (Low Density)	0.4	1,713
Low-density Residential	1.5	17,576
Medium-density Residential	4.0	9,414
Mixed Rural	0.5	241
Rural-density Residential	0.1	70,188
Special Planning Area	4.0	868

\* Area includes portions in both Pima and Pinal Counties.

~~An EDU represents either a single family residence or some other wastewater source that produces the same amount of wastewater as a single family residence. For example, as shown in Table 1, it is assumed that, on average, one acre of commercial land use will produce the same amount of wastewater as four single family residences (or 4 EDUs).~~

Two other assumptions were made when calculating flow projections:

- 2.7 persons per dwelling unit based on the 2000 census for Marana.
- ~~Only 25 percent~~% of the homes in the ~~Rural~~rural-density ~~Residential~~residential land use areas will be connected to the sewer system; the remainder will use onsite septic systems.

Figure ~~45. Town of~~ Marana General Plan and Specific Plans

**5-YEAR, 10-YEAR, 20-YEAR, AND ULTIMATE BUILDOUT PROJECTIONS**

The 2008 Town of Marana Sewer Basin Study projects the sewer flow within each basin for existing, ~~5-years-year~~ (2013), ~~10-years-year~~ (2018), ~~20-years-year~~ (2028), and buildout conditions. Phasing for the ~~5-, 10-, 5-, 10-,~~ and 20-year ~~projects~~projections are provided for comparison, in addition to the estimated buildout projections. The pattern of ~~growth~~development for the first ~~10~~ten years is based on the assumption that growth during this time will occur in the specific plan areas and in the area surrounding the Marana Airport. The Town’s Planning Department provided estimates of the percentage of growth of each specific plan for each phase.

Growth of the area surrounding the Marana Airport was also divided by phase, with 125 ~~EDU~~EDUs of total growth during the period ~~from 2009-2013 to 2013,~~ and 650 ~~EDU~~EDUs of total growth during the period ~~from 2014- to 2018.~~ The Marana Airport currently has approximately 50 EDUs, which produce flows that are treated and disposed of onsite using conventional septic systems. These flows will ultimately be included in a ~~regional~~-wastewater collection and treatment system.

Table 2 shows the projected EDUs for each sewer basin for 20-year (2028) and ultimate buildout. The projected wastewater flows for ~~5-year,~~ ~~10-year,~~ ~~20-year,~~ and buildout ~~conditions~~ are presented in Table 3. The wastewater flows were calculated assuming 62 ~~gallon~~gallons per capita per day (gpcd) and 85 gpcd. The lower ~~end of the range (62 gpcd)~~number represents the currently ~~observed flow~~ ~~rates~~rate within the Town’s planning area; the higher ~~end of the range (85 gpcd)~~number represents the ~~value~~flow rate accepted by Pima County Regional Wastewater Reclamation Department (PCRWRD) and is typically used for sewer collection ~~systems-~~system planning. Flows for Basin 22 are based on the number of parcels currently in the basin. Sewer flows generated from Basin 24 ~~located in the Town’s planning area~~ are projected to be served by the Ina Road ~~WPCF~~WRE.

Table 2. Projected Population and Equivalent Dwelling Units (EDUs) by Sewer Basin for 20-Year and Buildout

Sewer Basin	20 –Year Projection				Buildout Projection			
	Population	Residential Units	Non-Residential Acres**	Equivalent Dwelling Units	Population	Residential Units	Non-Residential Acres**	Equivalent Dwelling Units
1*	270	100	722	2,987	4,728	1,751	8,835	22,935
2*	--	--	--	--	4,630	1,715	2,864	13,172
3	--	--	--	--	1,036	384	1,246	5,368
4	--	--	--	--	1,587	588	2,934	9,463
5	3,692	1,368	444	3,145	24,825	9,194	1,640	15,755
6	19,116	7,080	57	7,309	31,372	11,619	101	12,025
7	--	--	--	--	418	155	--	155
8	--	--	125	500	470	174	235	1,116
9	11,671	4,322	181	5,046	16,789	6,218	397	7,807
10	14,726	5,454	44	5,630	17,690	6,552	796	9,735
11	1,555	576	51	782	6,636	2,458	104	2,875
12	5,371	1,989	347	3,378	5,371	1,989	347	3,378
13	--	--	856	3,425	--	--	2,611	5,051
14	162	60	319	1,335	162	60	577	2,339
15	--	--	125	500	1,300	482	1,001	4,484
16	12,066	4,469	150	5,069	20,859	7,726	437	9,473
17	--	--	--	--	1,498	555	--	555
18	--	--	--	--	4,769	1,766	3,103	11,538
19	7,730	2,863	236	3,807	20,545	7,609	2,162	12,434
20	18,936	7,013	1,014	11,070	18,936	7,013	1,014	11,071
21	5,337	1,977	59	2,214	6,882	2,549	108	2,982
22	6,256	2,317	3	2,329	6,256	2,317	3	2,329
23	--	--	--	--	41	15	311	140
24	30	11	430	1,731	84	31	1,318	3,998
<b>TOTAL</b>	<b>106,917</b>	<b>39,599</b>	<b>5,164</b>	<b>60,256</b>	<b>196,885</b>	<b>72,920</b>	<b>32,147</b>	<b>170,177</b>

\* Basins located in CAAG 208 planning area

\*\* Non-residential refers to non-residential sources of wastewater, including commercial, industrial, airport, and public/institutional.

Table 3. Estimated Wastewater Flow for 5-Year, 10-Year, 20-Year, and Buildout

Sewer Basin	Wastewater Flow (mgd)					Wastewater Flow (mgd)				
	Assuming 62 gpcd					Assuming 85 gpcd				
	Existing	2013	2018	2028	Buildout	Existing	2013	2018	2028	Buildout
1	--	0.13	0.25	0.50	3.84	--	0.17	0.34	0.69	5.26
2	--	--	--	--	2.20	--	--	--	--	3.02
3	--	--	--	--	0.90	--	--	--	--	1.23
4	--	--	--	--	1.58	--	--	--	--	2.17
5	0.05	0.06	0.09	0.53	2.64	0.07	0.09	0.12	0.72	3.62
6	--	0.20	0.79	1.22	2.01	--	0.27	1.08	1.68	2.76
7	--	--	--	--	0.03	--	--	--	--	0.04
8	--	--	--	0.08	0.19	--	--	--	0.11	0.26
9	0.44	0.62	0.76	0.84	1.31	0.60	0.85	1.04	1.16	1.79
10	0.18	0.30	0.51	0.94	1.63	0.24	0.40	0.70	1.29	2.23
11	--	0.02	0.05	0.13	0.48	--	0.03	0.06	0.18	0.66
12	--	0.57	0.57	0.57	0.57	--	0.78	0.78	0.78	0.78
13	0.01	0.02	0.14	0.57	0.85	0.01	0.03	0.19	0.79	1.16
14	0.01	0.03	0.14	0.22	0.39	0.01	0.04	0.19	0.31	0.54
15	--	--	--	0.08	0.75	--	--	--	0.11	1.03
16	0.03	0.16	0.41	0.85	1.59	0.04	0.22	0.57	1.16	2.17
17	--	--	--	--	0.09	--	--	--	--	0.13
18	--	--	--	--	1.93	--	--	--	--	2.65
19	--	0.08	0.20	0.64	2.08	--	0.10	0.28	0.87	2.85
20	1.30	1.85	1.85	1.85	1.85	1.78	2.54	2.54	2.54	2.54
21	0.12	0.17	0.34	0.37	0.50	0.17	0.23	0.46	0.51	0.68
22	0.39	0.39	0.39	0.39	0.39	0.53	0.53	0.53	0.53	0.53
23	--	--	--	--	0.02	--	--	--	--	0.03
24	0.26	0.26	0.26	0.29	0.67	0.35	0.35	0.35	0.40	0.92
<b>TOTAL</b>	<b>2.79</b>	<b>4.85</b>	<b>6.74</b>	<b>10.09</b>	<b>28.49</b>	<b>3.83</b>	<b>6.65</b>	<b>9.24</b>	<b>13.83</b>	<b>39.06</b>

## EXISTING CONDITIONS

### EXISTING PUBLIC SANITARY SEWAGE CONVEYANCE FACILITIES

The layout and ~~types~~type of public sewage conveyance facilities presently in use within the ~~proposed~~ Town's DMA planning area have been dictated primarily by topography, and to a slightly lesser degree, by the order in which ~~certain segments of~~ the overall service planning area ~~were physically~~was developed.

The ~~involved~~ public gravity conveyance facilities within the Town include approximately 200 miles of gravity main (8-inch thru 48-inch ID) comprised of vitrified clay pipe ~~{(VCP)}~~, polyvinyl chloride ~~{(PVC), VCP, PVC}~~, lined concrete, and ductile iron pipe ~~{(DIP)}~~, and approximately 500 manholes and several cleanouts. The conveyance facilities range from new to over 40 years of age. ~~Within the sewer infrastructure serving the Town are the~~ The following active public wastewater pumping systems (WWPSs) ~~and inactive (in standby mode) publically owned WWPSs exist within the sewer infrastructure serving the Town:~~

#### Active :

- Continental Ranch Regional WWPS (CRRWWPS)
- Dove ~~Me~~Mountain WWPS
- Rillito Vista WWPS
- Saguario Springs WWPS (constructed but not yet accepted or in service)

#### Inactive (Standby):

- Cortaro Farms ~~Red~~Road WWPS
- Peppertree Ranch WWPS
- Twin Peaks ~~Red~~Road WWPS
- El Uno Minor WWPS

Figure 56 displays the location of each of these ~~WWPSs; the location of the facilities' pumping stations~~ WWPS and the routes and sizes of the associated force mains.

The existing sanitary sewage flows from Basins 9, 16, 20, 21, 22, and 24 ~~all~~ are currently conveyed by either gravity ~~(alone)~~ or a combination of gravity and pumping, to the Ina Road ~~WPCF~~WRF for treatment. The current flow rate projections are provided in Table 4. The current flows from the ~~balance (with the exception of the Rillito Vista area which is conveyed to, lifted into, and treated at the public Rillito Vista WWTF) of the proposed DMA~~ other basins in the planning area

are conveyed by either gravity ~~-(alone)~~ or a combination of gravity and pumping to the Marana ~~WWTF~~ WRF for treatment, except for the Rillito Vista area, which is served by the public Rillito Vista WRF.

**Figure 56. Public Wastewater Pumping Systems**

**Table 4. Tabulation of Currently Sewered Basins and the Involved Public WRF**

<u>Basin</u> <sup>3</sup>	<u>Existing Flow Range</u> (62 to 85 gpcd) (PDWF mgd)	<u>Means of Conveyance</u> <u>to Public WRF</u>	<u>Public WRF</u>
<u>9</u>	<u>.44 – .60</u>	<u>Gravity and CRRWWPS</u> <sup>1</sup>	<u>Ina Road</u> <sup>2</sup>
<u>16</u>	<u>.03 – .04</u>	<u>Gravity and CRRWWPS</u> <sup>1</sup>	<u>Ina Road</u> <sup>2</sup>
<u>22</u>	<u>.39 – .53</u>	<u>Gravity and CRRWWPS</u> <sup>1</sup>	<u>Ina Road</u> <sup>2</sup>
<u>21</u>	<u>.12 – .17</u>	<u>Gravity and CRRWWPS</u> <sup>1</sup>	<u>Ina Road</u> <sup>2</sup>
<u>20</u>	<u>1.30 – 1.78</u>	<u>Gravity and CRRWWPS</u> <sup>1</sup>	<u>Ina Road</u> <sup>2</sup>
<u>24</u>	<u>.26 – .35</u>	<u>Gravity</u>	<u>Ina Road</u> <sup>2</sup>
<b><u>TOTAL</u></b>	<b><u>2.54 – 3.47</u></b>		<b><u>Ina Road</u></b> <sup>2</sup>
<u>14</u>	<u>.010 – .014</u>	<u>Gravity</u>	<u>Rillito Vista</u>
<b><u>TOTAL</u></b>	<b><u>.010 – .014</u></b>		<b><u>Rillito Vista</u></b>
<u>10</u>	<u>.18 – .24</u>	<u>Gravity</u>	<u>Marana</u>
<u>5</u>	<u>.05 – .07</u>	<u>Gravity</u>	<u>Marana</u>
<b><u>TOTAL</u></b>	<b><u>.23 – .31</u></b>		<b><u>Marana</u></b>

- Notes: 1. CRRWWPS is the Continental Ranch Regional Wastewater Pumping System.  
2. Basins 9, 16, 20, 21, and 22 flow to the CRRWWPS. The CRRWWPS conveys all flow tributary to it to the Ina Road WRF. Basin 24 flow is conveyed by gravity to the Ina Road WRF.  
3. All basins in the proposed Marana service area not specifically noted in Table 4 currently have no sewage tributary to a Public WRF.

~~A certain few~~Some of the existing conveyance facilities within the ~~proposed~~Town’s ~~DMA~~~~now~~~~routinely~~planning area carry significant volumes of sanitary sewage, generated ~~from within~~ areas upgradient from and outside of the ~~proposed DMA boundaries~~,Town’s planning area tributary to the Ina Road ~~WPCF~~. ~~The three infrastructural~~WRF. Three examples ~~involve~~include the North Rillito Interceptor, and the Cañada del Oro (CDO) Interceptor, entering Basin 24, and the Cortaro Farms Road Trunk Sewer (~~through~~flowing by gravity from Basin 22 to the CRRWWPS). ~~The latter example can be operationally rectified by again~~The Cortaro Farms Road Trunk Sewer flow can be redirected by placing the Cortaro Farms WWPS (currently in inactive status) into active status (~~which would, instead, send~~, sending the tributary sewage; ~~primarily, Basin 22 flow~~) to directly to the Ina Road WRF via the CDO Interceptor ~~and on into the Ina Road WPCF~~.

The sewage conveyance facilities serving Basins 9, 16, 19, 20, 21, and 22 have evolved through the implementation of a phased series of public WWPSs. Currently, only the CRRWWPS is in active service (the Saguaro Springs WWPS and its force main have been constructed but not yet approved, accepted and/or placed into active service). Three other public WWPSs within the gravity system tributary to the CRRWWPS are in standby status (~~the~~ Cortaro Farms Road WWPS, ~~the~~ Peppertree Ranch WWPS, and the Twin Peaks WWPS), ~~within/along the gravity system tributary to the CRRWWPS are in inactive/standby status~~. These facilities are ready to be re-activated ~~should~~if a significant operational problem ~~occur~~occurs within the CRRWWPS.

Figure 67 displays the sewer basin areas currently being served by the three existing public wastewater treatment facilities within the Town’s ~~proposed DMA boundaries~~. planning area.

Existing wastewater flows from Basins 9, 16, 20, 21, 22, and 24 are treated by the Ina Road ~~WPCF~~WRE. The Marana ~~WWTF~~WRE accepts flows from Basins 5 and 10.

Figure 7. Sewer Basins Currently Served by the Three Existing WREs and Impact of Significant Infrastructure Features on Positioning of Basin Boundaries

Basin 14 is served by the Rillito Vista ~~WWTP~~WRF. Figure ~~6~~7 also illustrates how ~~certain topographical and infrastructural~~topographic and infrastructure features within the planning area were used to establish ~~individual basin boundaries for the Sewer Basins within the proposed DMA.~~boundaries for the sewer basins within the planning area.

#### TOPOGRAPHY AND POTENTIAL IMPACTS ON SEWERAGE SYSTEM PLANNING

The Town’s planning area contains a variety of topographic features ranging from steep terrain to flat agricultural areas. These areas can be effectively serviced with the appropriate combinations of gravity sewers and WWPSs.

Significant sections of farmland in the Town’s planning area are being developed for residential and commercial projects. Low-slope land surface features create sewage collection system planning, design, installation, and maintenance challenges. Low-slope terrain can affect the positioning of the sewer drainage basin boundaries and the WRF locations (Town of Marana Sewer Basin Study 2008).

The planning for each WRF noted in this 208 Plan Amendment includes a provision of a relatively deep (25 feet to 35 feet) influent sewage lift station at the headworks. Headworks lift stations are more important when the portions of the service area immediately upstream of the respective WRF have lower-sloped terrain. In the event of a long run of low-slope gravity sewers, it may become necessary to install one or more WWPSs at intervals along the main system.

To keep low-slope terrain gravity sewers functioning properly at varying levels of liquid flow; internal diameter sizing and pipe gradients will need to be carefully evaluated, especially where “oversizing” is needed to facilitate future sewage flows. The primary goal is to achieve sewage conveyance systems that operate with minimal off-gassing of odor, solids deposition and/or internal corrosion potential. The proper maintenance schedule for cleaning gravity sewer mains is also vital to its proper functioning.

#### **EXISTING WASTEWATER TREATMENT FACILITIES**

The infrastructure currently serving the wastewater demands ~~of the Marana community comprises of two~~within the Town’s planning area consists of ~~one~~ regional wastewater treatment ~~plants, a few lift stations~~plant, and several smaller ~~local~~public and private treatment facilities.~~Refer to Figure 2 for the location of these facilities.~~, as shown on Figure 2. Figure 6 displays the existing public

wastewater pumping systems located within the planning area. The primary existing wastewater treatment plants serving the Town are the Ina Road ~~WPCF~~WRF and the Marana ~~WWTF~~WRF.

~~The Ina Road WPCF is located in Section 6, Township 13 South, Range 13 East and Section 1, Township 13 South, Range 12 East, at I-10 and Ina Road in Sewer Basin 24. The facility was originally designed for 25 million gallons per day (mgd), with a peak capacity of 53 mgd. The facility operated as a Class B, high purity oxygen activated sludge system with the following components: influent screening, grit removal, primary sedimentation, activated sludge with high purity oxygen, secondary sedimentation, effluent disinfection, and dechlorination. In 2006, an additional 12.5 mgd, Class A+ Biological Nutrient Removal Activated Sludge process was completed, increasing the total plant capacity to 37.5 mgd. The methods of disposal used include onsite irrigation and discharge into the Santa Cruz River resulting in recharge in the Lower Santa Cruz Managed Recharge Project (e.g., in channel recharge). The sludge produced as a byproduct of treatment is gravity thickened, anaerobically digested, and dewatered. Based on the ROMP, Pima County plans to upgrade the Ina Road facility to 50 mgd.~~

**~~Figure 6. Sewer Basins Currently Served by the Three Existing WWTP and Impact of Significant Infrastructure Features on Positioning of Basin Boundaries~~**

~~The Marana WWTF is adjacent to Marana Road and Luckett Road in Sewer Basin 6. It is located in Section 14, Township 11 South, Range 10 East. The original 0.23 mgd design capacity plant, comprised of two facultative/evaporation ponds operated in series, opened in 1986. Since then, the WWTF has been expanded over years to accommodate development within its service area. The current total capacity of the Marana WWTF is 0.7 mgd. The two facultative/evaporation ponds original designed were decommissioned and one is converted to be an emergency influent storage pond. The system currently consists of four 0.05 mgd Smith & Loveless packaged plants (a total capacity of 0.2 mgd), and one 0.5 mgd BIOLAC® treatment system. Reclaimed water is permitted by ADEQ to be used onsite for irrigation and for the Marana Riparian Habitat Restoration site. Effluent is also discharged to the Santa Cruz River under an AZPDES permit.~~

~~The future status of the Marana WWTF is uncertain at this time since there are areas outside of the proposed Town DMA boundaries that may be continued to be served by this facility. Some of the operational alternatives identified for the Marana WWTF include continuing operations under Pima County with an agreed payment of service for flows treated from the Town, transfer ownership of the plant from Pima County to the Town with an agreed to payment of service for flows originating outside of the Town, operate the Marana WWTF under Town control until a replacement WRF is operational, or close the plant when a replacement WRF is operational. It is likely that any of these scenarios would require an IGA between Pima County and the Town.~~

Several ~~smaller~~relatively small wastewater treatment plants are located within ~~Pima County portion of the planning boundaries.~~These area. The private facilities include the Adonis Sanitary Sewerage Facility, the ~~public Rillito Vista WWTP, the Marana High School WWTP, and the MTC WWTF~~Marana High School WRF, and the MTC WRF. Pima County operates the Rillito Vista WRF. As new public WRFs are constructed, the Town will coordinate with the owners and

operators of these smaller public and private systems to evaluate treatment alternatives and retirement of these facilities.

The Adonis Sanitary Sewerage Facility serves the wastewater needs of the Adonis Mobile Home Park. This subdivision is located near Grier Road, east of I-10, in Sewer Basin 12. The Adonis Homeowners' Association owns and operates the facility. ~~There are,~~ which serves approximately 150 units in the subdivision. The 208 Plan update for Marana, as completed by Malcolm Pirnie in 2000, recommends that wastewater from this subdivision be conveyed to the Marana ~~WWTF~~ WRF or to the facility being planned for the La Mirage Estates subdivision.

~~The Rillito Vista WWTP serves the Rillito Vista subdivision. This facility is located between Avra Valley and Tangerine Roads and between I-10 and the Santa Cruz River in Sewer Basin 15. The Rillito Vista subdivision contains 60 lots. The facility is a stabilization/evaporation pond with a design capacity of 0.020 mgd. Based on the 2006 PAG Areawide Water Quality Plan, the current flows average 0.010 mgd. The facility is owned and operated by PCRWRD.~~

The Marana School District operates the Marana High School ~~WWTF~~ WRF, which serves the Marana High School. ~~The high school is,~~ located between Sanders and Sandario Roads north of Emigh Road in Sewer Basin 19. ~~It~~ Marana High School was once served by a septic system, but is currently served by a 0.07 mgd package plant.

MTC ~~operate~~ privately owns and operates a wastewater treatment plant that serves the wastewater needs of a 450-person correctional facility. ~~This facility is privately owned and operated by MTC.~~ The MTC treatment plant is located in Sewer Basin ~~55,~~ west of Sanders Road and north of Silverbell Road. It consists of primary treatment, secondary treatment, disinfection, filtration, and sludge dewatering. Treated effluent is used for turf and agricultural irrigation. The design capacity of the treatment facility was recently expanded from 65,000 to 130,000 gallons per day ~~(gpd).~~

### Wastewater Service Agreements

~~During the 208 Plan Amendment review process, it was recognized that certain areas currently being served by Pima County that are within the Town's proposed DMA boundary and areas outside of the DMA boundary made be better served by either Pima County or the Town. Although it is the Town's intent to provide wastewater collection and treatment services to all areas within its planning area and DMA boundaries, it was proposed that when new sewer service is requested, the project be evaluated by Pima County and the Town to determine which entity would be best to serve the area. For example, Basin 24 has been identified by the Town as an area that needs additional coordination with Pima County to determine whether the collection and treatment flows to the Ina Road WPCF continue under Pima County control. Additionally, similar conditions currently exist in other basins (e.g. 9, 16, 22, and 23).~~

~~Sewer service outside of the DMA boundaries provided by the Town as well as flows treated by Pima County facilities originating from the Town's DMA could be managed under an IGA between the Town and Pima County. Cost of service arrangements can be made by either party depending on the terms of the IGA.~~

~~Another approach that could be considered by Pima County and the Town is an arrangement similar to the Sub-Regional Operating Group (SROG) in the Phoenix metropolitan area. Basically, the purpose of the SROG is to have each member (Glendale, Mesa, Phoenix, Scottsdale, Tempe) have representation for the Industrial Pretreatment Programs within their own jurisdiction with multi-city coordination to encourage compliance with federal requirements. Each SROG city and other local jurisdictions hold monthly meetings to provide collaboration on wastewater treatment issues.~~

The Rillito Vista WRF serves the 60-lot Rillito Vista subdivision. This facility is located between Avra Valley Road and Tangerine Road, and between I-10 and the Santa Cruz River, in Sewer Basin 15. The facility is a stabilization/evaporation pond with a design capacity of 0.020 mgd. Based on the 2006 PAG Areawide Water Quality Plan, the current flows average 0.010 mgd. The facility is owned and operated by PCRWRD.

The Ina Road WRF is located in Section 1, Township 13 South, Range 12 East, at I-10 and Ina Road in Sewer Basin 24. According to publicly available information, the facility was originally designed for 25 mgd, with a peak capacity of 53 mgd. Until recently, the facility operated as a Class B, high-purity oxygen-activated sludge system with influent screening, grit removal, primary sedimentation, activated sludge with high-purity oxygen, secondary sedimentation, effluent disinfection, and de-chlorination. In 2006, an additional 12.5 mgd Class B+ Biological Nutrient Removal Activated Sludge process was added, increasing the total plant capacity to 37.5 mgd. The methods of disposal include onsite irrigation and discharge into the Santa Cruz River, resulting in recharge in the Lower Santa Cruz Managed Recharge Project (e.g., in-channel recharge). The sludge produced as a byproduct of treatment is gravity-thickened, anaerobically digested, and dewatered.

According to the Regional Optimization Master Plan (ROMP), Pima County plans to upgrade the Ina Road facility to 50 mgd and achieve a reclaimed water quality standard of B+ or A+. As stated in the ROMP,

“if the effluent is Class A+, Tucson Water would be able to decommission its pressure filter treatment system at Roger Road WRF and feed effluent directly into the reclaimed water distribution system after chlorination to meet residual requirements. Tucson Water will construct the necessary filtration system (as required for Class B+), pump station,

reservoir, pipeline and chlorine feed facility at Ina Road WRF to provide its reclaimed water needs.”

The Marana WRF is located in Section 14, Township 11 South, Range 10 East, adjacent to Luckett Road in Sewer Basin 5. The original 0.23 mgd design capacity plant opened in 1986, and consisted of two facultative/evaporation ponds operated in series. Since then, the WRF has been expanded to accommodate development within its service area. The current total capacity of the Marana WRF is 0.7 mgd. The original facultative/evaporation ponds were decommissioned in 2000, and one has been converted to an emergency influent storage basin. The system currently consists of four 0.05 mgd Smith & Loveless packaged plants (total capacity of 0.2 mgd), and one 0.5 mgd BIOLAC® treatment system. Reclaimed water is permitted by ADEQ to be used onsite for irrigation and for the Marana Riparian Habitat Restoration site. Effluent is also discharged to the Santa Cruz River under an AZPDES permit.

The Marana WRF currently receives flow from various locations in north Marana. The Town anticipates that the facility will continue to provide WRF services for an unknown period of time. The Town’s Sewer Basin Study provides a plan for the design and construction of new wastewater facilities which would intercept flows from various locations in the north Marana area. As new facilities are designed and constructed, the functions performed at the Marana WRF may be amended to provide ancillary or emergency treatment. The ultimate role of the Marana WRF is unknown at this time, but the facility may be integrated into the operations of the Town as the services provided by the Town continue to increase.

**EXISTING SEWER BASINS**

~~The delineated sewer basins that contain existing units and that are attached to the existing treatment plants are~~ Basins 5, 9, 10, 14, 16, 20, 21, 22, and 24. ~~A24 contain existing sewer connections and deliver to existing treatment plants. Table 5 provides a summary of the flows in these basins-is provided in Table 4. Refer to Figure 5 for the existing public wastewater pumping systems located within the planning area.~~ There are no existing public sewers in Basins 11, 12, and 18. Private facilities currently provide wastewater treatment in Basin 11 (Adonis) and Basin 18 (Marana High School).

**Table 45. Estimate of Existing Wastewater Connections and Flows by Sewer Basin**

Basin	Residential Units	Non-Residential Acres	Total Equivalent Dwelling Units	Existing Flow Range (62 to 85 gpcd) (mgd)	
5	147	22	324	0.05	0.07
9	1,895	26	2,619	0.44	0.60
10	1,060	--	1,060	0.18	0.24
14	60	--	60	0.01	0.01
16	189	--	189	0.03	0.04

20	6,301	362	7,770	1.30	1.78
21	739	--	739	0.12	0.17
22	2,317	3	2,329	0.39	0.53
24	11	408	1,531	0.26	0.35
<b>TOTAL</b>	<b>12,719</b>	<b>821</b>	<b>16,621</b>	<b>2.78</b>	<b>3.81</b>

~~As previously stated, it is the~~The Town's ~~intent~~ intends to provide wastewater collection and treatment services to all ~~areas~~ basins within its planning area ~~and established DMA boundaries. For areas.~~ Areas outside of the Town's planning area requiring wastewater collection and treatment services ~~that are outside of the Town's established DMA boundaries, it is expected that an IGA will be entered into by the appropriate parties. To address these conditions in the future, it is recognized that~~ the ~~may be served based on appropriate agreements developed by the affected parties. The~~ 208 Plan Amendment, planning area, and DMA boundaries ~~may need to~~ will be updated to reflect ~~the~~ change ~~changes~~ in the wastewater service area.

## ~~WASTEWATER~~**WATER RECLAMATION FACILITY** **ALTERNATIVES**

### TREATMENT SYSTEM DESCRIPTION

~~A total of six~~Six proposed WRF alternative sites ~~are~~were identified and evaluated at specified locations throughout the Town’s planning area, including one in the northwest corner of the Pinal County portion of the Town’s planning area and one ~~at~~just north of the Pima County line. As described later in this section, ~~three~~two WRFs are expected to be constructed ~~relative~~pursuant to the PAG 208 Plan Amendment, but all six of the sites were evaluated as part of the Town’s Sewer Basin Study. ~~It should be noted that the County Line WRF may be located in Pinal County or Pima County depending on the final site selection process and has been included in the PAG and CAAG 208 Plan Amendments for further discussion. The selected alternatives presented below considered sewer basin flows, sewer~~ The WRF site locations were determined based on sewer basin flows, existing and likely future collection system alignments, land ownership and acquisition, site and environmental constraints, and reclaimed water reuse demand scenarios. use opportunities.

Biosolids generated from wastewater treatment will be dewatered for landfill disposal and/or used for agricultural land application.

The following six locations were analyzed:

#### Potential locations within Pima County (PAG 208):

- Rillito Narrows WRF located in Basin 20 near the existing ~~Continental Ranch Regional Pumping Station (CRRPS)~~CRRWWPS
- Sandario WRF located in Basin 19 as an alternative to serve flows from the Rillito Narrows
- Cottonwood WRF located in Basin 10 south of the Barnett drainage channel
- Airport WRF located in Basin 13 near Avra Valley and High Plains recharge project ~~sites~~site

#### Potential locations within Pinal County (CAAG 208):

- County Line WRF located north of the Pima County line near the northern boundary of Basin 5
- ~~County Line WRF located south of Pinal Air Park Road near the northern boundary of Basin 5~~ North Pinal WRF located near the northwestern corner of Basin 1 in Pinal County to be presented in a CAAG 208 Plan Amendment

The 2008 Town of Marana Sewer Basin Study evaluated three alternative ~~approaches~~configurations for ~~sewering the Town planning area~~WRFs, and described the advantages and disadvantages of each alternative. As noted in the Sewer Basin Study, ~~the~~ six existing wastewater treatment plants in the planning area (two public and four private) ~~would be capable of eventual closure due to~~could eventually be removed from service following the development of the planned wastewater infrastructure. Of the three alternatives, Alternative 3 was chosen as the preferred alternative.

The following sections provide a ~~brief~~ description of the three alternatives considered ~~for in~~ the ~~most recent~~Marana Sewer Basin Study ~~prepared for the Town. The order in which these~~. These three alternatives are presented ~~will begin~~ with the preferred alternative (Alternative 3) first, followed by Alternatives 1 and 2. ~~The Town's Sewer Basin Study should be referred to for a detailed description.~~ Detailed descriptions and comparison of these three alternatives ~~including~~are provided in the Sewer Basin Study. The Capital Improvement Plan (CIP) and cost estimates for Alternatives 3 are provided in the following section.

**ALTERNATIVE 3 (PREFERRED ALTERNATIVE 3 was selected as)**

Alternative 3, the Town’s preferred alternative ~~and~~, includes ~~consideration of three~~two new WRFs in Pima County as illustrated in Figure 7, ~~including the County Line WRF which may be located in Pinal County or Pima County.~~ 8. The sewer basins ~~and that would be served by this alternative and~~ the projected average daily sewer flow rates ~~that would be served by this alternative are indicated on~~ are provided in Table 5. ~~There are sewer basin flows~~6. Flows from Pima County ~~that are projected at buildout to be served by the North WRFs in Pinal WRF County,~~ as illustrated in Figure 8. ~~Although it is expected that this alternative would require two major lift stations, it does provide gravity feed from Sewer Basin 9 to the Cottonwood WRF. Another advantage is that the Sandario WRF site is in an industrial area and near potential reclaimed water reuse and recharge areas. The Town has indicated a preference for the treatment plant locations presented in~~9. The Town selected Alternative 3. ~~The selection of this alternative is~~3 based upon ~~the desire to balance~~balancing the number and size of treatment plants against the cost and issues related to operation and maintenance (O&M), and capital improvement costs associated with the collection system and the reclaimed water recharge and ~~reuse system. Reduced size for collection system and reclaimed distribution system components will allow for lower overall capital costs as well as O&M costs. The location of certain facilities will also support the use of hydropower available through Cortaro Marana Irrigation District (CMID), which will result in reduced O&M costs.~~ use system. Reclaimed water use options will be investigated during design and permitting of the WRFs and could include, but are not limited to, direct delivery to parks, schools, road medians, golf courses, and other landscaping demands, as well as environmental, agricultural, industrial and construction uses.

Advantages:

- Provides gravity service from Sewer Basin 9 to the Cottonwood WRF.
- The Sandario WRF site is in an industrial area and near potential reclaimed water use and recharge locations.
- Reduced capacities for collection system and reclaimed distribution system components will allow for lower overall capital costs and O&M costs.
- Certain facilities may use hydropower, which will result in reduced O&M costs.
- The WRF locations near the Santa Cruz River will allow the Town to better support reuse and recharge opportunities in the Tres Rios del Norte project.
- ~~• The WRF locations near the Santa Cruz River in a number of locations will also allow the Town to support the Tres Rios del Norte project through reuse and recharge opportunities. In addition, to the extent practical the WRF locations will be farther from residential and commercial areas, and closer to industrial sectors. This allows the, which enhances potential for nearby direct reuse opportunities, as well as reduced and reduces potential for issues associated with WRF’s WRFs in residential areas.~~

**Table 5. Alternative 3—Wastewater Reclamation Facilities and Flow Projection**

WRF	Basins Served	Projected Wastewater Flow (mgd)			
		2013	2018	2028	Buildout
County Line WRF	5, 6, 7, 11	—	0.9	1.9	5.2
Cottonwood WRF	8, 9, 10, 12, 13, 14, 15, 18	0.9	1.3	3.3	7.6
Sandario WRF	16, 19, 20, 21, 22, 23	3.3	4.0	4.1	6.4
<b>TOTAL</b>	<b>--</b>	<b>4.2</b>	<b>6.2</b>	<b>9.3</b>	<b>19.2</b>

- The Cottonwood WRF can supply reclaimed water to parks along the Santa Cruz River and existing landscaping, median, and other similar uses through the Town’s existing non-potable delivery system.

Disadvantages:

- Keeps the CRRWWPS lift station in service.
- Likely requires the Airport lift station near the Marana Airport and the Santa Cruz River.
- Proposed Cottonwood WRF is located near planned low-density development.
- Requires crossing the CAP pipeline near Tangerine Road.

**Figure 78. Preferred Alternative 3 – 20-Year Proposed Water Reclamation Facilities**

**Figure 89. Preferred Alternative 3 Water Reclamation Facilities at Buildout**

**Table 6. Alternative 3 – Wastewater Reclamation Facilities and Flow Projection**

WRF	Basins Served	Projected Wastewater Flow (mgd)			
		2013	2018	2028	Buildout
Cottonwood WRF	8, 9, 10, 12, 13, 14, 15, 18	0.9	1.3	3.3	7.6
Sandario WRF	16, 19, 20, 21, 22, 23	3.3	4.0	4.1	6.4
<b>TOTAL</b>	--	<b>4.2</b>	<b>5.3</b>	<b>7.4</b>	<b>14.0</b>

As indicated in Table 6, the Cottonwood WRF and the Sandario WRF are projected to be operational within five years from the approval of this 208 Plan Amendment. The Cottonwood WRF will be the first facility to be designed, permitted and constructed. The Town will offer to provide service in the new WRFs to replace smaller existing wastewater facilities.

### ALTERNATIVE 3 CAPITAL IMPROVEMENT PROJECTS AND COSTS

The Sewer Basin Study presents 5-year, 10-year, 20-year, and buildout CIPs to implement the proposed wastewater infrastructure. Cost estimates are provided in Tables 7 and 8 for the Alternative 3 CIP. CIP costs are allocated to existing system and growth-related benefits. The following provides a breakdown of CIP components. Table 7 provides the cost breakdown for the 5-year CIP and Table 8 provides the 10-year CIP costs.

#### 5-Year CIP Components

##### WRFs:

- 1.5 mgd Cottonwood WRF
- 3.5 mgd Sandario WRF

##### Gravity Mains:

- 13,000 lf of 21-inch gravity main in Basin 9
- 10,100 lf of 21-inch gravity main in Basin 12
- 20,700 lf of 36-inch in Basin 19

##### Lift Stations:

- Existing CRRWPS upgrade

##### Force Mains:

- Continental Ranch West Force Main

#### 10-Year CIP Components

##### WRFs:

- Upgrade Sandario WRF to 4.0 mgd

##### Lift Stations:

- Airport Lift Station

**Table 7. Town of Marana Sewer Basin Study CIP – 5-Year Alternative 3**

Project	Description	Sewer Length (ft)	Buildout Capacity <sup>(1)</sup>	20-Year Capacity <sup>(1)</sup>	2013 Projected Capacity (mgd)			Phase I (2013)			
					Total	Existing	Growth	Phase I Cost	Allocated to Existing	Allocated to Growth	
W R F s	<u>Cottonwood WRF</u>	<u>Located in northwest corner of Basin 10; projected 20-year flow is 3.3 mgd</u>	<u>==</u>	<u>7.6</u>	<u>3.3</u>	<u>1.5</u>	<u>0.6</u>	<u>0.9</u>	<u>\$ 22,500,000</u>	<u>\$ 9,000,000</u>	<u>\$ 13,500,000</u>
	<u>Sandario WRF</u>	<u>Located in northwest corner of Basin 10; projected 20-year flow is 4.1 mgd</u>	<u>==</u>	<u>6.4</u>	<u>4.1</u>	<u>3.5</u>	<u>1.9</u>	<u>1.6</u>	<u>\$ 52,500,000</u>	<u>\$ 28,500,000</u>	<u>\$ 24,000,000</u>
G r a v i t y M a i n s	<u>Basin 9 Gravity Main</u>	<u>18-inch gravity sewer serving Basin 9</u>	<u>13,000</u>	<u>1.3</u>	<u>0.84</u>	<u>==</u>	<u>0.45</u>	<u>0.2</u>	<u>\$ 1,950,000</u>	<u>\$ 680,000</u>	<u>\$ 1,270,000</u>
	<u>Basin 12 Gravity Main</u>	<u>Upsizing 15-inch sewer that serves Basin 12 only to 24-inch that will serve Basins 8, 9, 12, and 15</u>	<u>10,100</u>	<u>2.1</u>	<u>1.5</u>	<u>==</u>	<u>0.4</u>	<u>0.8</u>	<u>\$ 760,000</u>	<u>\$ 150,000</u>	<u>\$ 610,000</u>
	<u>Basin 19 Gravity Main</u>	<u>36-inch gravity sewer serving Basins 16, 19, 20, 21, 22, and 23</u>	<u>20,700</u>	<u>6.4</u>	<u>4.1</u>	<u>==</u>	<u>1.8</u>	<u>0.8</u>	<u>\$ 6,210,000</u>	<u>\$ 1,750,000</u>	<u>\$ 4,460,000</u>
L i f t S t a t i o n	<u>Existing CRRWWPS</u>	<u>Upgrade to existing CRRWWPS</u>	<u>==</u>	<u>4.3</u>	<u>3.5</u>	<u>==</u>	<u>1.8</u>	<u>0.7</u>	<u>\$ 1,000,000</u>	<u>\$ 420,000</u>	<u>\$ 580,000</u>

<b>F o r c e M a i n</b>	<u>Continental Ranch West Force Main<sup>(2)</sup></u>	<u>30-inch force main connects to CRRWWPS and conveys flow generated in Basins 16, 20, 21, and 22 to the Basin 19 gravity sewer</u>	<u>3,500</u>	<u>2.1</u>	<u>3.5</u>	<u>=</u>	<u>1.8</u>	<u>0.7</u>	<u>\$ 3,500,000</u>	<u>\$ 3,000,000</u>	<u>500,000</u>
<b>Total</b>									<b><u>\$ 88,420,000</u></b>	<b><u>\$ 43,500,000</u></b>	<b><u>\$ 44,920,000</u></b>

<sup>(1)</sup> Sewer capacity shown here is ADFW based on 62 gpcd only used for calculating the percentage of contribution from existing customers or growth

<sup>(2)</sup> Additional studies should be completed to determine if a gravity main can be installed by tunneling or similar to avoid an extended length of force main

All costs in 2008 dollars

**Table 8. Town of Marana Sewer Basin Study CIP – 10-year Alternative 3<sup>(1)</sup>**

<u>Project</u>		<u>Description</u>	<u>5-year CIP</u>	<u>10-year Upgrade</u>	<u>Phase II (2018)</u>
<u>WR</u> <u>F</u>	<u>Sandario WRF</u>	<u>Located in northwest corner of Basin 10</u>	<u>3.5</u>	<u>4.0</u>	<u>\$ 7,500,000</u>
<u>Lift</u> <u>Station</u> <u>on</u>	<u>Airport Lift Station<sup>(2)</sup></u>	<u>Located on the border of Basin 13 and Basin 10</u>	<u>--</u>	<u>7.8</u>	<u>\$ 6,500,000</u>
<u>Total</u>					<u>\$ 14,000,000</u>

<sup>(1)</sup> Sewer lines are not addressed in the 10-year CIP  
<sup>(2)</sup> Design flow (PDWF plus 25 percent more)  
 All costs in 2008 dollars

**ALTERNATIVE 1**

Alternative 1 ~~included consideration of four~~includes three new WRFs in Pima County at buildout as illustrated in Figure 9. ~~This alternative included the County Line WRF.~~10. The sewer basins and ~~the~~ projected average daily sewer flow rates ~~that would be served by~~for this alternative are ~~indicated on~~provided in Table 6. ~~9.~~This alternative would requirerequires the ~~largest number of WRFs that would need to be constructed and operated, and was not preferred for this reason and due to some WRFs being in close proximity to~~most WRFs, and places the Rillito Narrows WRF near residential developments and in an area with known cultural resources.

**Table 69. Alternative 1 – Wastewater Reclamation Facilities and Flow Projection**

WRF	Basins Served	Projected Wastewater Flow (mgd)			
		2013	2018	2028	Buildout
<del>County Line WRF</del>	<del>5, 6, 7, 11</del>	<del>—</del>	<del>0.9</del>	<del>1.9</del>	<del>5.2</del>
Cottonwood WRF	8, 10, 12, 14, 15	0.9	1.2	1.9	3.5
Airport WRF	13, 18, 19, 23	--	0.3	1.2	4.9
Rillito Narrows WRF	9, 16, 20, 21, 22	3.3	3.8	4.3	5.6
<b>TOTAL</b>	--	<b>4.2</b>	<del>6.2</del> <u>5.3</u>	<del>9.3</del> <u>7.4</u>	<del>19.2</del> <u>14.0</u>

Advantages:

- By taking advantage of existing force mains, reclaimed water from the proposed Rillito Narrows WRF can supply the reclaimed water distribution system that currently serves the Dove Mountain golf courses.
- Distributed WRFs enable reclaimed water use in the local area, with smaller distribution system infrastructure than a regional WRF system. Reclaimed water from each of the WRFs can be used in parks, schools, road medians, golf courses, and other landscaping demands, as well as environmental, agricultural, industrial and construction uses.
- The Airport WRF is located in an area that has favorable recharge characteristics, and a planned municipal park near the WRF site will use reclaimed water.
- The Cottonwood WRF can supply reclaimed water to parks along the Santa Cruz River and existing landscaping, median, and other similar uses through the Town’s existing non-potable delivery system.

Disadvantages:

- Alternative 1 has the largest number of WRFs to administer, operate, and maintain.
- The proposed Rillito Narrows WRF site is near an existing residential area.
- There are known archeological sites in the vicinity of the proposed Rillito Narrows WRF.

- Two WRFs (Airport and Cottonwood) are less than three miles apart.
- This alternative may require a lift station to cross the CAP canal near Avra Valley Road.

**Figure 10. Alternative 1 – 20-Year Proposed Water Reclamation Facilities**

**ALTERNATIVE 2**

Alternative 2 includes ~~consideration of two~~ one new ~~WRFs~~ WRF in Pima County at buildout as illustrated in Figure ~~10–11~~. The sewer basins and the projected average daily sewer flow rates ~~that would be served by~~ for this alternative are ~~indicated on~~ provided in Table ~~7–10~~. Although this alternative ~~presented the least amount of WRFs, it as was not preferred because it required at least three major~~ requires only one WRF, it is the most expensive alternative and would require at least three additional lift stations and larger infrastructure for collection and reclaimed/recharge delivery systems. In addition, the Cottonwood WRF ~~that is,~~ located near low-density development, would be almost double in the size ~~compared to~~ of the same facility per Alternative 3.

**Table 710. Alternative 2 – Wastewater Reclamation ~~Facilities~~ Facility and Flow Projection**

WRF	Basins Served	Projected Wastewater Flow (mgd)			
		2013	2018	2028	Buildout
<del>County Line WRF</del>	<del>5, 6, 7, 11</del>	<del>—</del>	<del>0.9</del>	<del>1.9</del>	<del>5.2</del>
Cottonwood WRF	8, 9, 10, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23	4.2	5.3	7.4	14.0
<b>TOTAL</b>	<b>--</b>	<b>4.2</b>	<b>6.2</b>	<b>9.3</b>	<b>19.2</b>

Advantages

- Of the three alternatives, this alternative has the fewest WRFs to administer, operate, and maintain.
- This alternative takes advantage of the economies of scale with respect to the cost of constructing WRFs.
- There are fewer WRFs near expected higher density residential areas.

Disadvantages

- Larger infrastructure required for collection and reclaimed delivery systems due to one centrally located regional WRF. The size, complexity and cost associated with modifications to a centralized facility are formidable.
- The CRRWWPS would remain in service. However, its tributary area would be reduced by routing Basin 9 flows across I-10 at Tangerine Road.
- Requires two new major lift stations to pump sewage to the Cottonwood WRF basin.

~~Figure 9. Alternative 1 – 20-Year Proposed Water Reclamation Facilities~~ Figure 1011. Alternative 2 – 20-Year Proposed Water Reclamation Facilities

### WASTEWATER SERVICE AGREEMENTS

The Town recognizes that special consideration must be given to areas within the Town's planning area where continued service by Pima County facilities may be appropriate, and that areas outside of the planning area may actually be better served by the Town's future facilities. The Town intends to provide effective and efficient wastewater collection and treatment services to its entire planning area.

Pima County and the Town need to have further discussions regarding transitional and permanent service to Basin 24, which currently flows by gravity into the Ina Road WRF. Additionally, conditions exist in other basins (e.g. 9, 16, 22, and 23), where flows from outside the planning area flow by gravity into the Town's planning area.

When new sewer service is requested within certain fringe areas, the project should be evaluated by Pima County and the Town to determine which entity would better serve the area. Sewer service provided by the Town outside of the planning area, as well as flows treated by Pima County facilities originating from within the Town's planning area, should be addressed by an intergovernmental agreement (IGA) between the Town and Pima County.

Multi-jurisdictional and cooperative wastewater planning is necessary and occurs in other Arizona communities. The SROG in the Phoenix metropolitan area is the result of a Joint Exercise of Powers Agreement between the cities of Glendale, Mesa, Phoenix, Scottsdale, and Tempe for the liability, ownership, and operation of the jointly owned wastewater treatment facilities.<sup>4</sup> SROG membership includes representation for the industrial pretreatment programs within their own jurisdiction with multi-city coordination to encourage compliance with federal requirements.<sup>5</sup> Each SROG city owns a percentage of the 91<sup>st</sup> Avenue wastewater treatment facility operated by the City of Phoenix. SROG members and representatives from other local jurisdictions hold monthly meetings to provide collaboration on wastewater treatment issues.

## **WATER RECLAMATION FACILITY PROCESS ALTERNATIVES**

The WRF process alternatives being considered for implementation in the Town include ~~two~~ ~~types of~~ treatment systems capable meeting setback requirements (see Table 11, page 56) for full ~~aesthetics~~ aesthetic, noise, and odor control as well as producing high quality effluent. These ~~two~~

<sup>4</sup> <http://www.amwua.org/srog.html>

<sup>5</sup> <http://phoenix.gov/PCD/srog.html>

systems ~~are described below and~~ include the ~~sequencing batch reactor (SBR) and membrane bioreactor (MBR). Oxidation ditch technologies were considered, but excluded due to potential issues with facility footprint size (e.g. larger land area) and set back requirements.~~ SBR, MBR, and oxidation ditch as further described below. Each new WRF will be designed to meet A+ Reclaimed Water Quality standards. A detailed DCR for the new WRFs will be prepared by the Town following the approval of this 208 Plan Amendment.

### SEQUENCING BATCH REACTOR

The sequencing batch reactor is a fill-and-draw activated sludge system for wastewater treatment. In this system, wastewater is added to a single “batch” reactor, treated to remove undesirable components, and then discharged. Equalization, aeration, and clarification can all be achieved using a single batch reactor. SBR systems have been successfully used to treat both municipal and industrial wastewater. ~~They~~ An SBR system would include a filtration system to meet A+ Reclaimed Water Quality standards. SBRs are uniquely suited for wastewater treatment applications characterized by low or intermittent flow conditions. (EPA, 1999).

An advantage of the SBR is that wastewater treatment process steps are completed in a single reactor vessel. This leads to operating flexibility and control. There is also a minimal site footprint, and capital cost savings can be achieved through the elimination of clarifiers and other equipment.

~~The SBR plants compared~~ Compared to conventional systems, SBR plants require a higher level of sophistication for operations and a higher level of maintenance primarily due to more complicated controls, automated switches, and automated valves.

### MEMBRANE BIOREACTOR

~~Membrane bioreactors combine~~ The membrane bioreactor (MBR) combines biological processes and membrane technology to treat wastewater. Like the SBR, treatment is achieved within one process unit, ~~typically with a smaller footprint.~~ The membrane pore openings generally range from 0.1–0.5 mm. The most common MBR configuration is to have the membrane immersed in the wastewater. Another approach is the sidestream configuration, where the wastewater is pumped through the membrane module and then returned to the bioreactor. The mixed liquor suspended solids (MLSS) concentration is very high (up to 20,000 mg/L) compared to conventional activated sludge plants. One advantage includes the very high standard of treatment. The dependence on disinfection is also reduced, since the membranes trap a significant proportion of pathogenic organisms. Also, MBRs offer a very small footprint (WIOA, 2007).

### OXIDATION DITCH

An oxidation ditch is a modified activated sludge biological treatment process that uses long solids retention times (SRTs) to remove biodegradable organics. Oxidation ditches are typically complete mix systems, but they can be modified to approach plug flow conditions. Typical oxidation ditch treatment systems consist of a single- or multi-channel configuration within a ring-, oval-, or horseshoe-shaped basin. As a result, oxidation ditches are called “racetrack type” reactors. Horizontally or vertically mounted aerators provide circulation, oxygen transfer, and aeration in the ditch. Preliminary treatment, such as bar screens and grit removal, normally precedes the oxidation ditch. Primary settling prior to an oxidation ditch is sometimes practiced, but is not typical. Tertiary filters may be required after clarification, depending on effluent quality requirements. Disinfection is required and reiteration may be necessary prior to final discharge. Flow to the oxidation ditch is aerated and mixed with return sludge from a secondary clarifier (EPA, 2000).

Advantages of the oxidation ditch include the ability to achieve removal performance objectives with low operational requirements and operation and maintenance costs. Oxidation ditches also provide an added measure of reliability and performance over other biological processes owing to a constant water level and continuous discharge, thus eliminating the periodic effluent surge common to other biological processes such as SBRs. Another advantage is the long hydraulic retention time and complete mixing, minimizing the impact of a shock load or hydraulic surge. This technology also produces less sludge than other biological treatment processes owing to extended biological activity during the activated sludge process. This process is also energy efficient, resulting in reduced energy costs compared with other biological treatment processes.

Disadvantages of the oxidation ditch include relatively high effluent-suspended solids concentrations compared to other modifications of the activated sludge process and the need for a larger land area than other activated sludge treatment options. The larger land area can prove costly, limiting the feasibility of oxidation ditches in urban and suburban areas where land acquisition costs are relatively high (EPA, 2000).

### **ENHANCED TREATMENT**

~~Research has documented that many~~Many chemicals and microbial constituents that have not historically been considered ~~as~~ contaminants are present in the environment on a global scale. These “emerging contaminants” are commonly derived from municipal, agricultural, and industrial wastewater sources and pathways (USGS, 2007). Endocrine disrupting chemicals (EDCs) and pharmaceuticals and personal care products (PPCPs) are two groups of emerging

contaminants that have been receiving significant recent media exposure ~~in recent months.~~ EDCs are a vast group of chemicals that impact hormone function in animals. PPCPs include detergents, antimicrobials, over-the-counter medicines, and various household chemicals (AwwaRF, 2007). These compounds are being detected in trace concentrations in waters around the world. Although the health risks of these contaminants are not fully understood and regulatory standards have not been established, they pose a concern for the future of wastewater treatment methods. Local monitoring and testing programs will likely increase to evaluate the problem of EDCs and PPCPs, as well as implementing source control prevention. Research is currently underway ~~on enhancing~~ to enhance treatment methods to remove these compounds from wastewater treatment facilities and to prevent them from entering the environment. Enhanced treatment methods include advanced oxidation processes, activated carbon, reverse osmosis, and nanofiltration (AwwaRF, 2007).

## RECLAIMED WATER

~~It is~~ Through the ownership and operation of the Town's ~~intent to own and operate WRFs as a DMA to have legal access to~~ WRFs, effluent ~~as a~~ will become an available and valuable renewable water ~~supply resource.~~ Reclaimed water generated within the Town's ~~service~~ planning area ~~would~~ will be put to its highest beneficial use to augment water supplies with a non-groundwater source. The proposed locations of the WRFs as described in preferred ~~alternative (No. 3) provides~~ Alternative 3 provide opportunities to ~~more~~ distribute reclaimed water effectively and efficiently ~~distribute reclaimed water~~ to end users while minimizing delivery infrastructure requirements. Reclaimed water ~~could~~ will be used, ~~but is not limited to the irrigation of landscapes, turf facilities, to irrigate parks, school yards, agriculture, road medians, and golf courses; for environmental, agricultural, construction and industrial purposes;~~ and for underground storage ~~from recharge facilities at recharge facilities.~~ Reclaimed water use will be evaluated during the WRF design and permitting phase. The direct use of reclaimed water will be maximized based on area demand and will be further evaluated during the APP application process. To accommodate seasonal excess reclaimed water, each WRF will be designed to convey the entire volume of reclaimed water to constructed recharge basins for storage and recovery.

The Town's existing non-potable water distribution system extends to North Marana customers and is primarily used for the irrigation of common areas. As effluent becomes available, and demands increase, the reclaimed water delivery system will expand accordingly. This system has

delivered an annual average of 238 af in the past three years. Tucson Water delivered 2,875 af in 2008 to meet Dove Mountain’s reclaimed water demand.

~~The reuse of effluent~~ Reclaimed water from wastewater originating in Pima County and treated by a WRF in Pinal County will also be put to its highest beneficial use through direct use and recharge. Effluent utilization as a renewable water supply is consistent with the ADWR water management goals for the Tucson AMA and ~~Assured Water Supply (the AWS) program. Reclaimed water would be used by the Town as a designated water provider under the AWS rules program. The Town will use reclaimed water~~ to reduce groundwater pumping and ~~to~~ provide a renewable water supply to offset CAGRD groundwater replenishment obligations and recharge activities ~~by the CAGR~~D.

## IMPACTS OF PROPOSED FACILITIES

The proposed ~~wastewater treatment facilities~~ WRFs planned within the Town’s planning area ~~would will~~ have certain beneficial impacts ~~on new and existing WRFs.~~ Each new WRF will be designed to treat wastewater to achieve ~~the highest reclaimed water reuse standard (i.e. A+) and reclaimed water would~~ A+ reclaimed water quality standards by applying BADCT for the selected WRF based on the future DCR. Other positive impacts of new WRF technologies include reduced land area requirements (i.e. smaller footprint), aesthetics, and noise and odor control to meet more restrictive setback requirements. Reclaimed water will be put to its highest beneficial use. ~~Effluent would be efficiently distributed to meet reclaimed water demands resulting in reduced dependency on groundwater supplies. With the construction of new WRFs under the ownership and operation of the Town there is increased opportunity to enhance effluent water quality and put it to a beneficial use in areas that currently do not have access to effluent supplies. With both the legal and physical availability of effluent, the Town can enhance~~ The Town can increase the basin-wide use of reclaimed water supplies, reduce groundwater dependency, and manage water resources consistent with the ADWR management plan goals.

Future development based on ~~the~~ service area expansion will provide housing and employment opportunities ~~for Pima County residents. in the planning area.~~ Commercial development will provide retail sales tax revenues ~~for the Town and Pima County~~ and an increased tax base.

## FINANCING

The Town ~~is~~ has adequate financial capacity to meet the responsibilities of a wastewater utility. No financial constraints have been identified. The Town is a legally incorporated ~~in the State of~~ Arizona ~~and~~ municipal corporation that can meet the financial requirements and demonstration ~~according to Arizona Administrative Code (AAC) R18-9 of A.A.C. R18-9-A203(B)(2).~~ The Town has the financial ~~capability to~~ capacity to administer, design, permit, construct, operate, close, and ensure proper post-closure activities. ~~Financial~~ of the utility. Methods of financing and financial resources available to the Town include:

- User ~~Fee Rate Structure~~ fee rate structure
- Impact ~~Fees~~ fees
- Connection and hookup fees
- Turn-on fees, penalties, interest, and miscellaneous non-rate revenues
- ~~Accepting grants or~~ Grants and other funding
- ~~Incurring long~~ Long or short term debt

The Town issued a 2007 contract to develop an economic model of the potential costs and wastewater fees, including impact fees, required to support comprehensive wastewater services planned by the Town. The firm that performed the analysis is a nationally-recognized financial consultant used by several Arizona communities for rate modeling and by the Water Infrastructure Finance Authority of Arizona for statewide water and wastewater rate analysis. The Town's evaluation included the following:

- Identification of customer base, annual growth projections, and phase-in approach
- Development of operational assumptions
- Development of CIP:
  - Plant location, capacity and estimated costs
  - Plant phasing for immediate versus future needs
  - Additional collection system infrastructure needed
  - Potential treatment costs by Pima County
- Identification of existing customer versus future customer breakdown for each CIP
- Determination of operation by Town staff or private firm
- Cost differential between the Town providing service versus Pima County
- Debt financing

Assumptions for the development of the wastewater fees and impact fees include:

- Wastewater treatment service would be provided by Pima County under contract until such time a new WRF is completed. Pima County would charge the Town a flat cost per 1,000 gallons for treatment.
- Assuming that new WRFs will be replacement facilities, a portion of the overall costs is attributable to impact fees, while the remainder is generated by the rate payers.
- The Town will negotiate with Pima County for interim pretreatment service for a fee.
- The Town will operate the collection system within the Town limits. Operation and maintenance costs were based on contracting with a private firm on an interim basis.
- A separate agreement would be developed for the operation of lift stations.

The Town's proposed rate structure is projected to be sufficient to fund all anticipated operating costs, capital outlays, debt service requirements of the CIP and WRFs, and bondholder debt coverage. CIP financial rate studies will be updated annually and new rate models will be developed for the Town's review and approval.

Pima County is currently the largest provider of wastewater service within Town limits and most of Pima County, so residents and businesses are familiar with PCRWRD's level of service and costs. Key Town goals are to ensure quality service and to adopt a rate structure comparable to and not exceeding Pima County's. The Town's rate analysis indicates that the Town will meet these key goals.

The 2008/2009 Town budget for the Sewer Fund is \$40,000,000. The construction of new WRFs will likely be funded by ~~selling~~the sale of bonds, ~~which~~. The debt will be ~~redeemed~~serviced by a combination of user fees and ~~new development~~impact fees. Other financing sources may include impact fees and/or developer contributions ~~from individual developers~~. Estimated costs to construct WRFs associated with Alternative 3 were described previously in the Water Reclamation Facility section.

## CONSTRUCTION

The ~~WRF(s)~~Town will ~~be constructed~~construct WRFs according to specified engineering plans for the facility. The WRF design report and ~~plan~~construction drawings will be submitted to ADEQ as part of the APP application approval process. Each WRF will be constructed in phases to meet the wastewater treatment needs as areas develop. Consistency of each new WRF with the PAG

Areawide Water Quality Management Plan will be determined either through a 208 Plan Consistency Report or 208 Plan Amendment.

~~For the construction of any of the sewage facilities, an Arizona Pollutant Discharge Elimination System (AZPDES)~~An AZPDES permit and Storm Water Pollution Prevention Plan (SWPPP) will be required for the construction of any of the sewage facilities. The SWPPP is required to prevent any discharges of contaminants or sediment from the construction site to a navigable waterway of the United States. The SWPPP permit will go into effect once the Notice of Intent (NOI) is filed with ADEQ and approved. The SWPPP is ~~to be maintained~~effective from ~~first~~initial grading to final site stabilization and filing of a Notice of Termination (NOT). In addition to the SWPPP and prior to the construction of a sewer collection system, Construction Authorization will be obtained from ADEQ.

## INDUSTRIAL PRETREATMENT PROGRAM

The Town will develop ordinances that regulate commercial and industrial pretreatment requirements to prevent unwanted substances from entering the sewer collection and treatment system. During the interim period to adopt these requirements, the Town ~~will~~plans to implement the ~~industrial pretreatment regulations~~best management practices established by ~~the~~ Pima County Industrial Wastewater Program. ~~The Town has also approached Pima County to enter into a contract to exercise Pima County's pretreatment program in the Town during the sewer system transition.~~ Pretreatment Program.

## ENVIRONMENTAL IMPACT OF PROPOSED CONSTRUCTION

~~Positive impacts are expected from the development~~Development of the Town's new WRFs. ~~Using proper~~ is expected to have positive environmental impacts. Best management practices to prevent storm water runoff will mitigate any negative impacts to surface water and groundwater from construction activities. ~~The project is~~ Facilities will be designed to prevent damage ~~to facilities~~ from a 100-year storm event. The ~~WRF(s)~~WRFs will be located outside or above the 100-year floodplain and protected from the erosion hazard setback if necessary. Possible pollutants resulting from excavation during construction could be construction debris, fuels, and sediment from the erosion of cleared soils. ~~Erosion~~ the construction documents for the proposed improvements will include erosion control, fuel storage, and site cleanup requirements that

minimize the potential ~~of~~for pollution ~~will be included in the construction documents for the proposed improvements.~~ The contractor will ~~follow county, state, and federal~~be required to comply with all applicable construction requirements. ~~The Town has also been delegated the authority by ADEQ to implement the storm water program in the town.~~

## SETBACK REQUIREMENTS

The setback requirements per ~~AAC~~A.A.C. Section R18-9-B201.I for a treatment plant will be satisfied based on the flow rate of each WRF. Each plant will be designed to meet the setback requirements ~~for buildout capacity as~~ listed in Table ~~8.11~~.

Table ~~8.11~~. Setback Requirements

Sewage Treatment Facility Design Flow (gallons per day)	No Noise, Odor, or Aesthetic Controls (feet)	Full Noise, Odor, and Aesthetic Controls (feet)*
3,000 to less than 24,000	250	25
24,000 to less than 100,000	350	50
100,000 to less than 500,000	500	100
500,000 to less than 1,000,000	750	250
1,000,000 or greater	1,000	350

\* "Full noise, odor, and aesthetic controls" means that all treatment components are fully enclosed, odor scrubbers are installed on all vents, and fencing is aesthetically matched to that in the area surrounding the facility.

Note: The owner or operator may decrease setbacks if setback waivers are obtained from affected property owners in which the property owner acknowledges awareness of the established setbacks, the basic design of the sewage treatment facility, and the potential for noise and odor.

## PERMITS

All ~~of the~~ permits that are required for ~~the~~ construction and operation of the WRF will be obtained by the Town in a timely manner. The following permits or approvals are required:

- Section 208 Plan Amendment – ~~The~~ PAG is the Designated Planning Agency for Pima County, and has the responsibility to implement an ~~Area-wide~~ Areawide Water Quality Management Plan under Section 208 of the ~~Clean Water Act (CWA)~~. ~~This~~. The approval of this 208 Plan Amendment ~~or 208 Consistency Review Report~~ for Marana will establish the Town as ~~a~~ the DMA for the Town’s planning area and meet 208 planning requirements.
- Section 208 Consistency Report – If required, upon determination of each WRF site location, analysis, and design, the Town will prepared a 208 Consistency Report for approval through PAG’s 208 Planning Process.
- Aquifer Protection Permit (~~APP~~) – An ~~Arizona State~~ individual APP will be obtained as required ~~by the Environmental Quality Act~~ for wastewater treatment facilities ~~that may discharge to the aquifer.~~ The individual APP application will be submitted to ADEQ upon completion of the WRF design and demonstration of BADCT. Industrial pretreatment of wastewater will be addressed under agreements between Marana and the commercial or industrial facility.
- Reclaimed Water Use Permit – An appropriate Reclaimed Water Use Permit will be obtained from ADEQ prior to using treated effluent for any identified reuse option. A ~~Notice of Intent (NOI)~~ for a Type 2 Reclaimed Water General Permit for Direct Use of Class A+ Reclaimed Water will be submitted to ADEQ upon approval of the APP.
- ADWR Underground Storage Facility (USF) Permit – A USF permit will be obtained to allow the Town to accrue effluent storage credits from recharge activities.
- ADWR Groundwater Savings Facility (GSF) Permit – A GSF permit will be obtained to allow the Town to accrue “in-lieu” storage credits for effluent delivered for agricultural use.
- ADWR Recovery Well Permit – A Recovery Well permit will provide the authority to withdraw effluent recharge credits for intended uses.

- Construction Authorization – Authorization to construct a WRF will be obtained from ADEQ.
- Pima County Air Quality Permit – This permit will be required for the WRF backup power generators.
- ~~AZPDES Discharge Permit is not expected to be required due to the intent that 100 percent of the effluent would either be reused or recharged. An AZPDES Discharge Permit may be considered for an emergency backup disposal method. If an AZPDES Discharge Permit is required due to disposal into a Waters of the United States, this permit will be applied for and obtained from ADEQ.~~ SWPPP – A SWPPP will be required for the construction phase of the WRF. Erosion control procedures outlined in the AZPDES Construction General Permit will prevent sediment runoff from the temporary land disturbance caused by excavations.
- AZPDES Discharge Permit – The Town will acquire an AZPDES discharge permit for emergency discharge only. The AZPDES permitting program also regulates sewage sludge under Section 405 of the CWA. Title 40 of the Code of Federal Regulations (CFR), Part 503 regulates the quality and disposal of sludge. In addition, if required, the ~~National Pollutant Discharge Elimination System (NPDES)~~ NPDES Form 2S, Part 2, Biosolids will be submitted. Disposal alternatives for sludge generated by the WRF are dewatering and disposal at an ADEQ certified sanitary landfill and/or agricultural land application.
- ~~The AZPDES permitting program also regulates sewage sludge under Section 405 of the CWA. Title 40 of The Code of Federal Regulations (CFR), Part 503 regulates the quality and disposal of sludge. In addition, if required the National Pollutant Discharge Elimination System (NPDES) Form 2S, Part 2, Biosolids will be submitted. Sludge generated by the WRF will be dewatered and disposed of at an ADEQ certified sanitary landfill.~~

The closest lined landfill accepting dewatered sludge for disposal is:

Cactus Regional Landfill  
22481 E. Deep Well Ranch Road (at Highway 79)  
Florence, Arizona 85232  
Telephone: (602) 268-5060

Operated By:

Cactus Waste Systems, L.L.C.  
955 E. Javelina Avenue, #B-111  
Mesa, Arizona 85204

An alternative disposal location is:

Butterfield Station Municipal Solid Waste Landfill  
40404 S. 99th Avenue  
Mobile, Arizona 85239  
Telephone: (602) 437-3165

Operated By:

Waste Management, Inc.  
2425 South 40th Street  
Phoenix, Arizona 85034  
Telephone: (602) 256-0630

- ~~AZPDES SWPPP will be required for the construction phase of the WRF. Erosion control procedures outlined in the AZPDES Construction General Permit will protect sediment runoff from the temporary land disturbance caused by excavations.~~
- ~~Construction Authorization will have to be obtained from ADEQ.~~
- ~~A Pima County Air Quality Permit will be required for the WRF backup generator.~~
- ~~ADWR USF Permit will be considered for effluent disposal in recharge basins.~~

## CONSTRUCTION SCHEDULE

Construction will be phased based upon the demand for wastewater ~~needs~~services within the Town's ~~service~~planning area. The Cottonwood WRF and the Sandario WRF will be the first two facilities ~~that will be~~ constructed per the Town's Sewer Basin Study ~~are the Cottonwood WRF and the Sandario WRF.~~ Upon completion of the DMA and 208 Amendment process, ~~the~~ The Town will initiate the construction of the first phase facilities for these ~~two~~ WRFs upon completion of this 208 Plan Amendment process. The anticipated implementation schedule for the construction of the ~~facilities~~ WRFs is provided ~~as follows:~~ in Table 12.

**Table 12. Preferred Alternative WRF – Accumulative Phased Construction Schedule**

WRF	Phase 1 (5-Year)	Phase 2 (10-Year)	Phase 3 (20-Year)	Buildout
Cottonwood WRF (mgd)	1.5	1.5	3.5	7.6
Sandario WRF (mgd)	3.5	4.0	4.5	6.4
<b>TOTAL</b>	<b>5.0</b>	<b>5.5</b>	<b>8.0</b>	<b>14.0</b>

The 20-year capacity for the Cottonwood WRF is anticipated to be ~~3.3~~3.5 mgd, and the 20-year Capacity for the Sandario WRF is anticipated to be ~~4.1~~4.5 mgd. The capacity of these facilities will be phased according to the development of flows within the basins served by these plants, with first phase capacities ~~first phases of these treatment plants will be 1.0~~of 1.5 mgd and ~~4.0~~3.5 mgd for Cottonwood WRF and Sandario WRF, respectively. ~~The Figure 12 provides a template for the anticipated phased construction of the preferred alternative for the PAG 208 Plan Amendment is presented in Table 9. Table 9 design, permitting, and construction timeline projected for each WRF.~~ **Preferred Alternative WRF – Accumulative Phased**

**Figure 12. Design, Permitting and Construction Schedule Timeline Template**

WRF	Phase 1 (5-Year)	Phase 2 (10-Year)	Phase 3 (20-Year)	Buildout
County Line WRF (mgd)	-	1.0	2.0	5.2
Cottonwood WRF (mgd)	1.5	1.5	3.5	7.6
Sandario WRF (mgd)	3.5	4.0	4.5	6.4
<b>TOTAL</b>	<b>5.0</b>	<b>6.5</b>	<b>10</b>	<b>19.2</b>



## NON-POINT SOURCE ISSUES AND MITIGATION PROCEDURES

~~Non point source issues are not considered a problem due to the~~The denitrification process at the WRFs will produce high quality ~~of~~ reclaimed water (i.e. Class A+).~~The denitrification process at the WRF will reduce nutrient pollution and reclaimed~~ and will minimize non-point source issues. Reclaimed irrigation systems will be designed to maximize application efficiency and minimize runoff. Grading plans and storm water drainages will be properly designed, and construction SWPPPs will be implemented for required construction activities.

~~Treated effluent from the WRF(s) will be primarily used to meet landscape water demands. When seasonal landscape irrigation water demands are less than the amount of reclaimed water generated, excess water would likely be disposed of in recharge disposal basins.~~

## IMPLEMENTABILITY

The WRFs ~~are expected to~~will provide wastewater service to the first phase development and subsequent phasing requirements within the Town's planning area.~~Any subsequent~~ Subsequent WRF ~~phase~~phases will begin prior to reaching practical operational capacity to ensure adequate sewer service for continued development until buildout or as delineated in the APP. ~~The Reclaimed Water System will provide Class A+ quality water for reuse.~~ Specific individual APP and Reuse Permit requirements will be followed according to ADEQ regulations.

## OPERATION AND MAINTENANCE OF PROPOSED WASTEWATER TREATMENT FACILITY

The Town will operate and maintain the ~~WRF~~WRFs in ~~the CAAG and PAG~~its planning ~~areas.~~area. ADEQ Certified wastewater treatment operators Wastewater Treatment Operators will be employed to operate the ~~WRF~~WRFs.

## ENFORCEMENT ACTIONS AND REMEDIES

~~No~~ADEQ has brought no enforcement actions ~~or remedies have been rendered to the Town.~~and sought no remedies against the Town. Contingency Plan requirements outlined in the approved APP will be followed.

## DESIGNATED MANAGEMENT AGENCY BOUNDARY EXPANSION

This 208 Plan Amendment will establish the Town as the DMA [for the planning area](#) as presented. ~~As a DMA~~ [With the authority granted to it by virtue of its DMA designation](#), the Town will provide sewer collection and wastewater treatment services ~~as described in this plan.~~ ~~The Town will be established as a DMA through this 208 Plan Amendment.~~ ~~The Town's associated DMA boundary for this area of Pima County is as described.~~ [for the planning area](#). As an established DMA, the Town will have the authority ~~requirements of~~ [to implement](#) Section 208 of the CWA Sections 208(b)(2)(C)(iii), 208(b)(2)(D), and 208(c)(1) and regulations in 40 CFR 130.6(c)(5).

## REFERENCES

Arizona Department of Water Resources, [ADWR](#) 2008. Annual Water Withdrawal and Use Report, Provider Summary 2007 for Provider Number 56-000107.0000. Town of Marana, March 28, 2008.

Arizona Department of Water Resources, ~~2007a~~, [ADWR 2007](#). Designation of Assured Water Supply Decision and Order, May 14, 2007.

Arizona Department of Water Resources, [ADWR](#), 1999. Third Management Plan 2000-2010. Tucson Active Management Area, June 1999.

~~Arizona Department of Water Resources. ADWR, 2007. Groundwater Site Inventory (GWSI) Database.~~

~~Arizona Department of Water Resources. ADWR, 1999. Third Management Plan for the Tucson Active Management Area, 2000—2010.~~

[AwwaRF, 2007: American Water Works Association Research Foundation, "Removal of EDCs and Pharmaceuticals in Drinking and Reuse Treatment Processes," 2007.](#)

Central Arizona Water Conservation District. District, 1995. Member Service Area Agreement Between Central Arizona Water Conservation District and the Town of Marana. December 12, 1995.

[Eberly, L.D. and Stanley, T.B. Jr., 1978. Cenozoic Stratigraphy and Geologic History of Southwestern Arizona, Geological Society of America Bulletin, v. 89.](#)

[EPA, 1999: United States Environmental Protection Agency, “Wastewater Technology Fact Sheet: Sequencing Batch Reactors.” http://www.epa.gov/owmitnet/mtb/sbr\\_new.pdf, Date Accessed: November 8, 2007.](http://www.epa.gov/owmitnet/mtb/sbr_new.pdf)

[EPA, 2000: United States Environmental Protection Agency, “Wastewater Technology Fact Sheet: Oxidation Ditches.” http://www.epa.gov/owm/mtb/oxidation\\_ditch.pdf, Date Accessed: November 8, 2007.](http://www.epa.gov/owm/mtb/oxidation_ditch.pdf)

Mason, Dale A., and Bota, ~~Liciniu~~Liciniu, 2006. Regional Groundwater Flow Model of the Tucson Active Management Area, Tucson, Arizona: Simulation and Application. ADWR Modeling Report No. 13.

[Pima Association of Governments \(PAG\), 2006: “Areawide Water Quality Management Plan.”](#)

Town of Marana Utilities Department, 2008. Internal Customer Billing Records, February, 2008.

[Tucson Water, Water Use Data Provided by Melodee Loyer, Email Communications Dated April 9 and April 14, 2009.](#)

USGS, 2007: ~~united~~United States Geological Survey, “Emerging Contaminants in the Environment,”<http://toxics.usgs.gov/regional/emc/>, Date Accessed: September 24, 2007

[WIOA, 2001: Water Industry Operators Association, “Membrane Bioreactors: Wastewater Treatment Applications to Achieve High Quality Effluent.” http://wioa.org.au/conf\\_papers/01/paper8.htm, Date Accessed: November 8, 2007.](http://wioa.org.au/conf_papers/01/paper8.htm)

**APPENDIX A**  
**208 AMENDMENT CHECKLIST**  
**Section 208 Clean Water Act**  
**40 CFR Part 130.6**

<u>Requirement</u>	<u>Provide Brief Summary On How Requirements Are Addressed</u>	<u>Addressed On Page</u>
<p><b><u>AUTHORITY</u></b></p> <p><u>Proposed Designated Management Agency (DMA) shall self-certify that it has the authorities required by Section 208(c)(2) of the Clean Water Act to implement the plan for its proposed planning and service areas. Self-certification shall be in the form of a legal opinion by the DMA or entity attorney.</u></p>	<p><u>The Town self-certifies that it has the authorities required by Section 208(c)(2) of the Clean Water Act to implement the plan for its planning and service areas.</u></p>	<p><u>Appendix C</u></p>
<p><b><u>20-YEAR NEEDS</u></b></p> <p><u>Clearly describe the existing wastewater treatment (WWT) facilities:</u></p> <ul style="list-style-type: none"> <li><u>● Describe existing WWT facilities.</u></li> </ul>	<p><u>Refer to Figure 2 for existing wastewater facilities in the Town’s planning area. The existing wastewater facilities currently serving the Town’s planning area comprises of two regional WRFs and several smaller wastewater treatment facilities. The primary wastewater facilities located in the Town’s planning area are the Ina Road and the Marana WRFs. The smaller treatment facilities include the Adonis Sanitary Sewerage Facility, the Rillito Vista WRF, the Marana High School WRF, and the Management and Training Corporation (MTC) WRF.</u></p>	<p><u>7, 20, 21</u></p>
<ul style="list-style-type: none"> <li><u>● Show WWT certified and service areas for private utilities and sanitary district boundaries if possible.</u></li> </ul>	<p><u>Refer to Figure 1 for the Town’s planning area. The Town is pursuing DMA status to provide wastewater collection and treatment services to customers within its planning area.</u></p>	<p><u>1, 4, 6</u></p>
<p><u>Clearly describe alternatives and the recommended WWT plan:</u></p> <ul style="list-style-type: none"> <li><u>● Provide POPTAC population estimates (or COG-approved estimates only where POPTAC not available) over 20-year period.</u></li> </ul>	<p><u>The PAG POPTAC adopted the population estimates and projections provided by the Town as described in the Population section. The methodology used by the Town to estimate population and projected wastewater flow rates were based primarily on planned land uses described in the Marana General Plan, development plans, and available specific plans.</u></p>	<p><u>12</u></p>
<ul style="list-style-type: none"> <li><u>● Provide wastewater flow estimates over the 20-year planning period.</u></li> </ul>	<p><u>The estimated 20-year wastewater flow for the proposed WRFs within PAG 208 planning area for the Town is 7.4 mgd. The</u></p>	<p><u>22, 24, 28</u></p>

**APPENDIX A**  
**208 AMENDMENT CHECKLIST**  
**Section 208 Clean Water Act**  
**40 CFR Part 130.6**

<u>Requirement</u>	<u>Provide Brief Summary On How Requirements Are Addressed</u>	<u>Addressed On Page</u>
	<u>Cottonwood and Sandario WRFs are projected to ultimately operate at 3.3 mgd and 4.1 mgd, respectively.</u>	
<ul style="list-style-type: none"> <li><u>• Illustrate the WWT planning and service areas.</u></li> </ul>	<p><u>Refer to Figures 1 and 2 for the Town’s planning area. Figures 8 and 9 display the proposed WRFs for the Town’s preferred alternative for the 20-year and buildout projections, respectively.</u></p>	<p><u>23, 26, 28</u></p>
<ul style="list-style-type: none"> <li><u>• Describe the type and capacity of the recommended WWT Plant.</u></li> </ul>	<p><u>The WRF design will be selected based on an evaluation of alternative treatment processes. The Town has expressed specific interest in membrane bioreactor and sequencing batch reactor technology, although other processes will be considered. The effluent will be treated to meet ADEQ Class A+ Reclaimed Water standards. For the preferred alternative, the projected 20-year treatment capacity is 4.1 mgd for Sandario WRF and 3.3 mgd for the Cottonwood WRF.</u></p>	<p><u>22, 24, 28</u></p>
<ul style="list-style-type: none"> <li><u>• Identify water quality problems, consider alternative control measures, and recommend solution for implementation.</u></li> </ul>	<p><u>No water quality problems are anticipated. Effluent treatment will be designed to meet ADEQ Class A+ Reclaimed Water Reuse standards.</u></p>	<p><u>30</u></p>
<ul style="list-style-type: none"> <li><u>• If private WWT utilities with certificated areas are within the proposed regional service area, define who (municipal or private utility) serves what area and when. Identify whose sewer lines can be approved in what areas and when?</u></li> </ul>	<p><u>The owners and operators of the existing private and public wastewater treatment plants will be provided the opportunity to retire operations and connect to the Town’s WRF systems when the new WRFs are operational. Infrastructure requirements to connect to the Town’s collection system will be evaluated if the private or public plant decides to close its existing facility.</u></p>	<p><u>20, 21</u></p>
<ul style="list-style-type: none"> <li><u>• Describe method of effluent disposal and reuse sites (if appropriate).</u></li> </ul>	<p><u>All available reclaimed water will be used for irrigation and/or recharge. Reuse sites include, but are not limited to turf facilities, parks, school yards, road medians, and agriculture. Recharge basins will be designed to accommodate the disposal of 100 percent of the generated effluent to avoid discharge and accommodate potential</u></p>	<p><u>3, 30</u></p>

**APPENDIX A**  
**208 AMENDMENT CHECKLIST**  
**Section 208 Clean Water Act**  
**40 CFR Part 130.6**

<u>Requirement</u>	<u>Provide Brief Summary On How Requirements Are Addressed</u>	<u>Addressed On Page</u>
	<u>seasonal reductions in reclaimed water deliveries. Recharge projects will be permitted through ADWR to allow the accumulation of storage credits based on an Underground Storage Facility or a Groundwater Savings Facility permit.</u>	
<ul style="list-style-type: none"> <li><u>If Sanitary Districts are within a proposed planning or service area, describe who serves the Sanitary Districts and when.</u></li> </ul>	<u>No sanitary districts are located within the planning area.</u>	<u>N/A</u>
<ul style="list-style-type: none"> <li><u>Describe ownership of land proposed for plant sites and reuse areas.</u></li> </ul>	<u>The Town will own the land proposed for the plant sites. Reuse areas would include public areas, private land holdings, and Town owned facilities.</u>	
<ul style="list-style-type: none"> <li><u>Address time frames in the development of the treatment works.</u></li> </ul>	<u>The proposed WRFs will be constructed in phases based on the demand for the existing and future developments within the Town’s planning area. The processes to permit, design, and construct the Cottonwood and Sandario WRFs will begin immediately following the Town obtaining DMA status. The first phase of the Cottonwood and Sandario WRFs are planned to have a treatment capacity of 0.9 mgd and 3.3 mgd, respectively.</u>	<u>35</u>
<ul style="list-style-type: none"> <li><u>Address financial constraints in the development of the treatment works.</u></li> </ul>	<u>The Town has no anticipated financial constraints for the development of the treatment works.</u>	<u>31</u>
<ul style="list-style-type: none"> <li><u>Describe how discharges will comply with EPA municipal and industrial stormwater discharge regulations (Section 405, CWA).</u></li> </ul>	<u>Stormwater will be diverted away from the WRFs. Stormwater originating onsite will be managed according to regulations.</u>	<u>31</u>

**APPENDIX A**  
**208 AMENDMENT CHECKLIST**  
**Section 208 Clean Water Act**  
**40 CFR Part 130.6**

<u>Requirement</u>	<u>Provide Brief Summary On How Requirements Are Addressed</u>	<u>Addressed On Page</u>
<ul style="list-style-type: none"> <li><u>Describe how open areas &amp; recreational opportunities will result from improved water quality and how those will be used.</u></li> </ul>	<u>Class A+ reclaimed water will be used, but not limited to the irrigation of turf facilities, regional parks, community parks, and school yards, providing open areas and recreational opportunities.</u>	<u>30</u>
<ul style="list-style-type: none"> <li><u>Describe potential use of lands associated with treatment works and increased access to water-based recreation, if applicable.</u></li> </ul>	<u>The land associated with the WRFs will be dedicated specifically to wastewater treatment. Water based recreational facilities are not planned.</u>	<u>N/A</u>
<p><b>REGULATIONS</b></p> <ul style="list-style-type: none"> <li><u>Describe types of permits needed, including NPDES, APP and reuse.</u></li> </ul>	<u>As a DMA, the Town will start the process to obtain the permits needed to construct and operate a WRF. This process includes preparing a 208 Plan Consistency Report or 208 Plan Amendment, obtaining an Individual APP and Reclaimed Water Reuse permit for each WRF, and an AZPDES for emergency discharges. In addition, AZPDES SWPPPs will be applied for construction purposes.</u>	<u>33, 34</u>
<ul style="list-style-type: none"> <li><u>Describe restrictions on NPDES permits, if needed, for discharge and sludge disposal.</u></li> </ul>	<u>AZPDES Discharge Permit is expected to be acquired for emergency discharge only. It is expected that 100 percent of the reclaimed water would either be directly used or recharged. If it is determined that an AZPDES Discharge Permit is required due to disposal into a Waters of the United States, this permit will be obtained from ADEQ.</u>	<u>33, 34</u>
<ul style="list-style-type: none"> <li><u>Provide documentation of communication with ADEQ Permitting Section 30 to 60 days prior to public hearing regarding the need for specific permits.</u></li> </ul>	<u>Additional documentation of communication with ADEQ Permitting Section will be provided 30 to 60 days prior to any public noticing or hearing requirements.</u>	
<ul style="list-style-type: none"> <li><u>Describe pretreatment requirements and method of adherence to requirements (Section 208 (b)(2)(D), CWA).</u></li> </ul>	<u>The Town will require pretreatment of wastewater originating from industrial uses. Initially the Town may enter into an agreement with Pima County to provide these services on an interim basis. Upon completion and operation of its WRFs, the Town will develop a pretreatment program that meets CWA requirements.</u>	<u>32</u>

**APPENDIX A**  
**208 AMENDMENT CHECKLIST**  
**Section 208 Clean Water Act**  
**40 CFR Part 130.6**

<u>Requirement</u>	<u>Provide Brief Summary On How Requirements Are Addressed</u>	<u>Addressed On Page</u>
<ul style="list-style-type: none"> <li>Identify, if appropriate, specific pollutants that will be produced from excavations and procedures that will protect ground and surface water quality (Section 208(b)(2)(K) and Section 304, CWA).</li> </ul>	<p>Sediment erosion control procedures will be a requirement in construction documents. SWPPP will be developed and implemented during construction activities.</p>	35
<ul style="list-style-type: none"> <li>Describe alternatives and recommendation in the disposition of sludge generated. (Section 405 CWA)</li> </ul>	<p>Sludge will be treated to meet the regulations for agricultural land application and/or landfill disposal.</p>	33, 34
<ul style="list-style-type: none"> <li>Define any nonpoint issues related to the proposed facility and outline procedures to control them.</li> </ul>	<p>There are no nonpoint issues related to the proposed WRFs. The WRF will be protected from stormwater runoff with proper site grading.</p>	36
<ul style="list-style-type: none"> <li>Describe process to handle all mining runoff, orphan sites and underground pollutants, if applicable.</li> </ul>	<p>Not Applicable</p>	N/A
<ul style="list-style-type: none"> <li>If mining related, define where collection of pollutants has occurred, and what procedures are going to be initiated to contain contaminated areas.</li> </ul>	<p>Not Applicable</p>	N/A
<ul style="list-style-type: none"> <li>If mining related, define what specialized procedures will be initiated for orphan sites, if applicable.</li> </ul>	<p>Not Applicable</p>	N/A
<p><b>CONSTRUCTION</b></p> <ul style="list-style-type: none"> <li>Define construction priorities and time schedules for initiation and completion.</li> </ul>	<p>The Town will initiate the permitting and design of the Cottonwood and Sandario WRFs upon obtaining DMA authority. Following the approval of the necessary permits, the Town will likely start with the construction of the Cottonwood WRF. The construction period is expected to take approximately 1.5 years.</p>	35
<ul style="list-style-type: none"> <li>Identify agencies that will construct, operate and maintain the facilities and otherwise carry out the plan.</li> </ul>	<p>As the DMA, the Town will be responsible to carry out the components of the plan including the operation and maintenance of the said facilities. The WRF(s) contractor information will be</p>	4, 36

**APPENDIX A**  
**208 AMENDMENT CHECKLIST**  
**Section 208 Clean Water Act**  
**40 CFR Part 130.6**

<u>Requirement</u>	<u>Provide Brief Summary On How Requirements Are Addressed</u>	<u>Addressed On Page</u>
	<u>available following bid review and contractor selection.</u>	
<ul style="list-style-type: none"> <li><u>Identify construction activity-related sources of pollution and set forth procedures and methods to control, to the extent feasible, such sources.</u></li> </ul>	<u>Possible pollutants could include sediment from the erosion of cleared soils and construction debris. Erosion will be control based on grading plans and implemented stormwater pollution protection plans (under AZPDES).</u>	31
<p><b><u>FINANCING AND OTHER MEASURES NECESSARY TO CARRY OUT THE PLAN</u></b></p> <ul style="list-style-type: none"> <li><u>If plan proposes to take over certificated private utility, describe how, when and financing will be managed.</u></li> </ul>	<u>It is the Town’s intent to provide wastewater collection and treatment services to customers within its entire planning area. The Town will provide an opportunity for smaller public and private wastewater facilities within its planning area to connect to the Town’s system. The retirement (closure) of these systems will be addressed on an individual basis.</u>	20, 21
<ul style="list-style-type: none"> <li><u>Describe any significant measure necessary to carry out the plan, e.g., institutional, financial, economic, etc.</u></li> </ul>	<u>There are no significant measures necessary to carry out the plan other than that to obtain the proper permitting. Agreements with Pima County to provide interim service while new infrastructure is being constructed may be necessary. The Town has no financial or economic limitations.</u>	31
<ul style="list-style-type: none"> <li><u>Describe proposed method(s) of community financing.</u></li> </ul>	<u>The proposed methods of financing includes user fees, impact fees, connection and hookup fees, turn-on fees, accepting grants or other funding, and/or incurring long or short term debt.</u>	31
<ul style="list-style-type: none"> <li><u>Provide financial information to assure DMA has financial capability to operate and maintain wastewater system over its useful life.</u></li> </ul>	<u>The Town under contract with a rate consultant developed an economic model of the potential costs and wastewater fees required to support comprehensive wastewater services planned by the Town. The Town’s proposed rate structure is projected to be sufficient to fund all anticipated operating costs, capital outlays, debt service requirements on the CIP and WRF, and dept coverage by the bondholder. The Town has the legal and ethical onus to operate its infrastructure with fiscal responsibility.</u>	31
<ul style="list-style-type: none"> <li><u>Provide a time line outlining period of time necessary for carrying out plan implementation.</u></li> </ul>	<u>Based on the Town of Marana Sewer Basin Study, it is projected that the proposed WRFs will be constructed following permit and</u>	22, 24, 25, 35

**APPENDIX A**  
**208 AMENDMENT CHECKLIST**  
**Section 208 Clean Water Act**  
**40 CFR Part 130.6**

<u>Requirement</u>	<u>Provide Brief Summary On How Requirements Are Addressed</u>	<u>Addressed On Page</u>
	<u>design approvals. The Cottonwood WRF and the Sandario WRF are expected to become operational within the next five years.</u>	
<ul style="list-style-type: none"> <li>● <u>Provide financial information indicating the method and measures necessary to achieve project financing. (Section 201 CWA or Section 604 may apply).</u></li> </ul>	<p>The Town is legally incorporated in the State of Arizona and can meet the financial requirements and demonstration according to Arizona Administrative Code (A.A.C.) R18-9-A203(B)(2).</p>	31
<p><b><u>IMPLEMENTABILITY</u></b></p> <ul style="list-style-type: none"> <li>● <u>Describe impacts and implementability of Plan.</u></li> <li>● <u>Describe impacts on existing wastewater (WW) facilities, e.g., Sanitary district, infrastructure/facilities and certificated areas.</u></li> </ul>	<p>Upon implementation, the Town’s plan will provide a positive impact by maximizing the use of A+ reclaimed water as a renewable water supply. Higher water quality parameters will be achieved than what is currently produced by area wastewater treatment systems. Existing wastewater facility owners and operators will be provided the opportunity to connect to the new WRFs. Conversion of existing wastewater treatment systems to the Town’s WRFs will enhance water quality treatment and reuse opportunities, thus protecting the quality and quantity groundwater resources. The Town would obtain DMA authorities for its planning area that is presently served by Pima County.</p>	1, 4, 36
<ul style="list-style-type: none"> <li>● <u>Describe how and when existing package plants will be connected to a regional system.</u></li> </ul>	<p>When the new WRFs are operational, the owners or operators of the existing package plants will be provided an opportunity to connect to the new WRFs.</p>	20
<ul style="list-style-type: none"> <li>● <u>Describe the impact on communities and businesses affected by the plan.</u></li> </ul>	<p>The plan provides a positive impact on communities and business as a result of the utilization of effluent as a renewable water resource. Reduced impacts on groundwater resources benefit the Town and the region. A renewable water resource is also provided for the establishment of outdoor recreational facilities. Another benefit for local commerce is the ability to streamline the application process for new developments by placing the sewer service application and</p>	30

**APPENDIX A**  
**208 AMENDMENT CHECKLIST**  
**Section 208 Clean Water Act**  
**40 CFR Part 130.6**

<u>Requirement</u>	<u>Provide Brief Summary On How Requirements Are Addressed</u>	<u>Addressed On Page</u>
	<u>capacity assurances under the Town’s jurisdiction.</u>	
<ul style="list-style-type: none"> <li>● <u>If a municipal wastewater (WWT) system is proposed, describe how WWT service will be provided until the municipal system is completed; i.e., will package plants and septic systems be allowed and under what circumstances. (Interim services).</u></li> </ul>	<u>The Town proposes to enter into agreements with Pima County to continue to provide wastewater collection and treatment services until the new WRF(s) is operational. The Town will develop an ordinance similar to Pima County that regulates the use of septic systems. This plan identifies the flexibility to allow existing septic systems to remain operational and the construction of new septic systems under Pima County requirements if sewer connections are not feasible.</u>	<u>24, 25</u>
<p><b><u>PUBLIC PARTICIPATION</u></b></p>		
<ul style="list-style-type: none"> <li>● <u>Submit copy of mailing list used to notify the public of the public hearing on the 208 amendment. (40 CFR, Chapter 1, part 25.5)</u></li> </ul>	<u>All public notices will be satisfied through PAG.</u>	
<ul style="list-style-type: none"> <li>● <u>List location where documents are available for review at least 30 days before public hearing.</u></li> </ul>	<u>All public notices will be satisfied through PAG.</u>	
<ul style="list-style-type: none"> <li>● <u>Submit copy of the public notice of the public hearing as well as an official affidavit of publication from the area newspaper. Clearly show the announcement appeared in the newspaper at least 45 days before the hearing.</u></li> </ul>	<u>All public notices will be satisfied through PAG.</u>	
<ul style="list-style-type: none"> <li>● <u>Submit affidavit of publication for official newspaper publication.</u></li> </ul>	<u>All public notices will be satisfied through PAG.</u>	
<ul style="list-style-type: none"> <li>● <u>Submit responsiveness summary for public hearing.</u></li> </ul>	<u>All public notices will be satisfied through PAG.</u>	

Document comparison by Workshare Professional on Friday, June 26, 2009 4:48:07 PM

Input:	
Document 1 ID	WORLDOX://Z:\REDLINE MARKUP For Distribution 040109 with Accept Changes 062609.doc
Description	REDLINE MARKUP For Distribution 040109 with Accept Changes 0
Document 2 ID	C:\DOCUME~1\fcassidy\LOCALS~1\Temp\workshare\wmt empd18\~wtf0CFD4FFE.doc
Description	C:\DOCUME~1\fcassidy\LOCALS~1\Temp\workshare\wmt empd18\~wtf0CFD4FFE.doc
Rendering set	standard

Legend:	
	<u>Insertion</u>
	<del>Deletion</del>
	<del>Moved from</del>
	<u>Moved to</u>
	Style change
	Format change
	<del>Moved deletion</del>
Inserted cell	
Deleted cell	
Moved cell	
Split/Merged cell	
Padding cell	

Statistics:	
	Count
Insertions	1492
Deletions	944
Moved from	70
Moved to	70
Style change	0

Format changed	0
Total changes	2576