5. EXISTING WASTEWATER TREATMENT FACILITIES AND OTHER POINT SOURCE NPDES DISCHARGES

All existing wastewater treatment facilities, both public and private, consistent and inconsistent with the 208 Plan, are shown on Figure 5-1.

5.1. DRAINAGE AREAS AND SUB-BASINS

Locations of wastewater treatment facilities and their corresponding sewer service areas are based in large part on topography and on proximity to demand centers (i.e., areas with high population densities). In most cases, wastewater treatment facilities are located at the “downstream” end of their sewer service areas, so that sewage can flow by gravity to the treatment facility. A lift station is needed if sewage must flow across a topographic divide, or if land surface gradients are insufficiently sloped over large lateral distances, in which case a lift station is needed to avoid placing sewer lines at great depths below land surface at their downstream end.

Because topographic constraints and the geographic distribution of population are such key factors in siting wastewater treatment facilities, Pima County is divided into a number of drainage areas or “sewer basins” for regional wastewater treatment planning purposes. These sewer basins are delineated such that it is practical for a particular treatment facility or lift station to serve the entire area within a sewer basin. The locations and boundaries of 22 wastewater drainage areas were delineated in the original 1978 PAG 208 Plan. The areas were based on natural topographic features, with the actual service areas of sewerage systems constituting only a small fraction of any drainage area.

For this update to the 208 Plan, PAG relied on sewer basins delineated by Pima County Wastewater Management Department for its Facility Plan update. These basins are shown on Figure 5-2.

5.2. METHODS FOR DELINEATING CURRENT SERVICE AREAS AND ESTIMATING SERVICE AREA POPULATION

This chapter includes descriptions of service areas for all of the public wastewater treatment facilities in Pima County. “Service area” in this chapter refers to the approximate area currently served by the facility as of the early 2000s. Service areas for private facilities are not described in this chapter; they are discussed in Chapter 4.

Service areas for public facilities were delineated using one of five methods described below.

1) Subdivision boundaries. PAG used this method for small facilities serving a clearly defined subdivision or subdivisions, based on the locations of sewer lines and subdivision boundaries. In these cases, PAG simply equated the service area to the subdivision extent of the existing sewer lines. The sewer line locations and subdivision boundaries were obtained from the Pima County Land Information System (PCLIS) GIS data set version 28. This method was used for Rillito Vista and Arivaca Junction.
Figure 5-1. Existing Wastewater Treatment Facilities in Pima County
2) **Pima County Facility Plan Update.** For Roger Road, Ina Road and Avra Valley, PAG delineated the service areas using the tributary sewer sub-basins identified in the GIS shapefiles used for Pima County’s draft Facility Plan Update. PAG merged all of the tributary sub-basins into one service area polygon for each of the three facilities. Only the sewer sub-basins that had existing sewer lines within them (based on a 2002 sewer line shape file in PCLIS) were included in the current service area for each facility.

3) **Orthophotography.** For the Fairgrounds and Desert Museum facilities, PAG delineated the service area using 2002 aerial orthophotography. The service areas encompass the buildings that are currently served by the treatment plants.

4) **Orthophotography/Parcels/Sewer Lines.** For the Marana, Corona de Tucson and Green Valley facilities, PAG delineated the current service area using the 2002 PCLIS sewer line shape file along with the PCLIS parcel shape file and 2002 aerial orthophotography. By overlaying the aerial photography and parcel boundaries on the sewer line map, it was possible to determine which areas were currently served by these facilities, as of 2002. For Mount Lemmon, Pima County Wastewater Management Department staff provided an aerial photograph with the parcels currently served by the Mount Lemmon facility highlighted.

   The Marana and Corona de Tucson areas in particular are experiencing rapid growth. Thus the actual 2005 service areas could be larger than what PAG delineated for these facilities.

5) **Town of Sahuarita staff.** For the Sahuarita facility, PAG relied on information provided by staff with the Town’s public works department (Hamilton, 2005). Town staff identified the subdivisions served by the facility, and PAG used this information to delineate the service area. In addition, PAG referred to *Master Sewer Basin Study for the Sahuarita Wastewater Treatment and Reclamation Facility* (MMLA, 2003) document for existing sewer line locations to include in the current service area.

PAG did not delineate a service area for the Randolph Park Wastewater Reclamation Facility. This facility takes a portion of the wastewater flow en route to the Roger Road WWTF and treats it for reuse on turf facilities.

PAG estimated the population served by public wastewater treatment facilities using one of the following methods.

1) **Pima County Wastewater Management Department Data.** For the Roger Road, Ina Road and Avra Valley facilities, PAG used 2005 population estimates provided by Pima County Wastewater. Pima County Wastewater, in coordination with Tucson Water, developed these estimates for its draft Facility Plan Update. The estimates were based on projections developed at the Traffic Analysis Zone (TAZ)\(^3\) level by PAG from the 2000 Census.

2) **Full and Partial Traffic Analysis Zone (TAZ) Populations.** For the Green Valley WWTF, whose service area encompasses multiple Traffic Analysis Zones (TAZ), PAG used the total PAG 2005 projected population (extrapolated from the 2000 Census) for each TAZ.

\(^3\) Traffic analysis zones are geographic areas of varying size that are delineated for the purpose of tabulating transportation-related data, such as population. See Figure 7-2 for a TAZ map.
in the service area to estimate the total service area population. In cases where a TAZ was crossed by a service area boundary, we assumed that the population was evenly distributed across the TAZ. The fraction of the TAZ population within the service area was therefore assumed to be the same as the fraction of the TAZ area within the service area. The fractional population was calculated using an ArcGIS intersection tool.

3) **Full TAZ population.** For the Mount Lemmon and Marana wastewater treatment facilities, whose current service areas each fall within a single TAZ, PAG assumed the service area population was the total 2005 projected population of the TAZ in which the service area was located. In these areas, the TAZ encompassing the service area was generally unpopulated or uninhabitable outside the areas currently served by the WWTF.

4) **Daily Wastewater Flows.** The estimated population of the Corona de Tucson WWTF service area was based on the daily flows at the facility. Population served by facility was estimated assuming a per capita volume of wastewater generation of 85 gallons per day.

5) **Number of lots in subdivision(s) served.** For the Rillito Vista and Arivaca Junction wastewater treatment facilities, which serve specific subdivisions, PAG used the total number of lots in the subdivisions and an average household size of 2.59 people per owner-occupied unit (from the Pima County Sonoran Desert Conservation Plan report *Housing in Pima County*, 2001) to estimate the population served.

The Desert Museum and Fairgrounds wastewater treatment facilities serve particular locations rather than areas with a permanent population. For these facilities, we did not estimate a “service area population.” There is typically no permanent population served by these facilities.

**5.3. Public Wastewater Treatment Facilities in the Metropolitan Area**

Public wastewater treatment facilities are those operated by a Designated Management Agency (DMA) – either Pima County Wastewater Management Department or the Town of Sahuarita – for purposes of treating domestic, commercial and industrial wastewater from the general public. All other facilities are considered “private” for PAG 208 planning purposes, even if they are operated by a public entity.

For this update to the 208 Plan, “public facilities in the metropolitan area” are defined as those public facilities located within the contiguous, urbanized portion of the Tucson metropolitan area: Ina Road Water Pollution Control Facility, Roger Road Wastewater Treatment Facility, and the Randolph Park Water Reclamation Facility (Figure 5-3). This definition, which is used solely for the purpose of this report, is consistent with the original PAG 208 Plan. It does not necessarily correspond to other definitions of “metropolitan area” or “metropolitan facilities.” The list of metropolitan facilities might change as the metropolitan area grows and becomes more contiguous.

Principal data sources for this section include:

- *Pima County Wastewater Management Department 4 Year Review 1998-2002*;
- Pima County Wastewater Staff Report to the Wastewater Management Advisory Committee 4/21/05;
- *The Pima County Effluent Generation and Utilization Report 2004*;
• facility capacity and flow data for Fiscal Year 2003-04 provided electronically by Pima County Wastewater Management Department on April 22, 2005;
• GIS files for Pima County’s draft Facility Plan Update; and
• the Pima County Land Information System GIS data set version 28.

5.3.1. Roger Road Wastewater Treatment Facility
The Roger Road Wastewater Treatment Facility was constructed in 1951 along the east side of the Santa Cruz River at roughly the Roger Road alignment (Figure 5-4). It was originally owned by the City of Tucson and remained under the City’s ownership at the time the original 1978 PAG 208 Plan was adopted. However, the City transferred ownership of the Roger Road plant to Pima County in 1979 pursuant to an Intergovernmental Agreement (IGA), consistent with the recommendations of the original 208 Plan and EPA’s desire for consolidation of the metropolitan sewerage system.

5.3.1.1. Service area boundaries
The Roger Road WWTF service area (Figure 5-4) encompasses most of the City of Tucson and most of the major Tucson metropolitan area. It extends from the Tucson Mountains on the west, to roughly Rillito Creek on the north, to the Rincon Mountains on the east, and continues south beyond the current City limits. The Ina Road WPCF service area lies to the north of the Roger Road service area.

5.3.1.2. Service area population
The population served by the Roger Road WWTF in 2005 is 497,039, based on PAG 2005 population projections at the TAZ level, as assigned to tributary sewer-basins by Pima County Wastewater for its Facility Plan update.

5.3.1.3. Service area land uses
Based on current zoning, land uses in the Roger Road WWTF service area consist of 69.5 percent residential, 17 percent industrial, 6.5 percent commercial, 3.8 percent specific plan, 1.4 percent federal and state land and 0.8 percent multiple use.

5.3.1.4. Treatment method
The Roger Road facility’s treatment process consists of: headworks for initial screening of large materials and settling out of heavy sand and rocks; clarifiers to separate sludge and scum; biotowers to remove suspended particles by biological treatment; and chlorination.

5.3.1.5. Discharge method and location
Effluent is discharged to the Santa Cruz River in accordance with an AZPDES permit and Aquifer Protection Permit. Effluent is also reused for turf irrigation and other purposes, primarily through the City of Tucson’s reclaimed water system which includes additional treatment before distribution to customers. Biosolids are conveyed to the Ina Road Water Pollution Control Facility for processing.

5.3.1.6. Capacity
The Roger Road facility’s rated capacity is 41 MGD.

5.3.1.7. Current flows
The Roger Road plant received flows averaging 37 MGD during Fiscal Year 2003-2004.
Figure 5-3. Public Metropolitan Wastewater Treatment Facilities
Figure 5-4. Roger Road WWTP Current (2005) Service Area
5.3.2. Ina Road Water Pollution Control Facility
The Ina Road Water Pollution Control Facility began operation in 1977. The facility has always been owned by Pima County. It is located on the east side of the Santa Cruz River, south of Ina Road (Figure 5-5).

5.3.2.1. Service area boundaries
The Ina Road facility serves the Catalina foothills, the far northeast part of the Tucson metropolitan area, much of the urbanized part of the lower Canada del Oro watershed and Oro Valley, and southern Marana. The approximate, current service area boundaries are shown on Figure 5-5. Wastewater from the Continental Ranch area is conveyed to the Ina Road WPCF via the Continental Ranch Pump Station. Wastewater from areas along the lower slopes of the Tortolita Mountains is conveyed to Ina via the Tortolita Mountain Pump Station and the Camino de Oeste interceptor.

5.3.2.2. Service area population
The population served by the Ina Road Water Pollution Control Facility is 217,888, based on PAG 2005 population projections at the TAZ level, as assigned to tributary sewer-basins by Pima County Wastewater for their Facility Plan update.

5.3.2.3. Service area land uses
Based on current zoning, land uses in the Ina Road WWTF service area consist of 85.5 percent residential, 7.2 percent specific plan, 3.4 percent commercial, 3.3 percent open space, 3 percent multiple use, 0.7 percent agriculture, 0.07 percent federal and state land, and 0.02 percent rural commercial.

5.3.2.4. Treatment method
Ina Road’s treatment processes include high purity oxygen activated sludge for the 25 MGD treatment train and biological nutrient removal activated sludge for the 12.5 MGD treatment train currently under construction.

The existing facility consists of the following wet stream treatment units and processes (Malcolm Pirnie, 2000):

- emergency wastewater holding ponds
- influent screening
- influent pumping
- grit removal
- primary sedimentation
- activated sludge using high-purity oxygen
- final sedimentation
- chlorine disinfection
- chlorine reduction

and the following treatment for biosolids:

- gravity thickening
- flotation thickening
- anaerobic digestion
- sludge dewatering
5.3.2.5. Discharge method and location
Effluent is discharged to the Santa Cruz River in accordance with an AZPDES permit and Aquifer Protection Permit. Biosolids from both Ina Road and Roger Road are centrifuged at the Ina Road facility and applied to agricultural fields under contract to a private firm. A small amount of effluent is reused at the Arthur Pack golf course (581.4 acre-feet in 2004) and for on-site irrigation (Pima County WWM, 2005a).

5.3.2.6. Capacity
The current capacity is 25 MGD, with an expansion to 37.5 MGD using a new 12.5 MGD biological nutrient removal system expected to be completed in the near future.

5.3.2.7. Current flows
Average daily inflow of influent is approximately 25 MGD.

Figure 5-5. Ina Road Water Pollution Control Facility Current (2005) Service Area

5.3.3. Randolph Park Wastewater Reclamation Facility
The original Randolph Park WRF was put into operation in 1975. It was temporarily removed from active service in 1995. A replacement facility has been constructed and has resumed operation. The facility is owned by Pima County.
5.3.3.1. Service area boundaries
This facility treats wastewater en route to the Roger Road facility. The treated effluent is reused on turf facilities. PAG did not delineate a service area for this facility.

5.3.3.2. Service area population
PAG did not estimate a service area population for this facility. Its service area lies within that of the Roger Road facility.

5.3.3.3. Service area land uses
The area tributary to Randolph Park is within the Roger Road service area.

5.3.3.4. Treatment method
The Randolph Park treatment method is described as follows in *The Pima County Effluent Generation and Utilization Report 2004* (Pima County WWM, 2005a):

Influent to the WRF is processed through a series of mechanically mixed anoxic basins. Effluent from these basins enters a mixed-liquor channel where it is distributed to six parallel aeration and membrane bioreactor cassette basins. Activated sludge is returned to the cassette basin for reuse, while skimmed solids and excess activated sludge are pumped through a force main. Effluent is disinfected through an in-vessel, low-pressure, high-output, ultraviolet disinfection system.

5.3.3.5. Discharge method and location
Effluent is reused on the adjacent Randolph Park, Randolph Golf Course and Dell Urich Golf Course, and is delivered into the City of Tucson’s reclaimed water system. The Tucson Reclaimed Water Plant is located near Pima County’s Roger Road facility.

5.3.3.6. Capacity
The facility is currently rated at 3.0 MGD.

5.3.3.7. Current flows
Flows were 1.4 MGD to 1.6 MGD as of September 2005 (Tucson Water, 2005).

5.4. PUBLIC WASTEWATER TREATMENT FACILITIES OUTSIDE THE METROPOLITAN AREA
This section discusses existing wastewater treatment facilities other than the Roger Road, Ina Road and Randolph Park facilities. Only publicly owned facilities (i.e., those owned by Pima County or the Town of Sahuarita) are included in this section, and are shown on Figure 5-6.

Principal data sources for this section include:

- *Pima County Wastewater Management Department 4 Year Review 1998-2002*;
- Pima County Wastewater Staff Report to the Wastewater Management Advisory Committee 4/21/05;
- *The Pima County Effluent Generation and Utilization Report 2004*;
- facility capacity and flow data for Fiscal Year 2003-04 provided electronically by Pima County Wastewater Management Department on April 22, 2005;
- facility data provided electronically by the Town of Sahuarita on April 27, 2005;
- GIS files for Pima County’s draft Facility Plan Update; and
- the Pima County Land Information System GIS data set version 28.
Figure 5-6. Public Non-Metropolitan Wastewater Treatment Facilities
5.4.1. Marana Wastewater Treatment Facility
The Marana WWTF is located one-half mile east of the Santa Cruz River, in an agricultural area three miles west of Marana (Figure 5-7). The facility is one-half mile north of Marana Road and one mile west of Luckett Road, in Township 11 South, Range 10 East, Section 14. The facility, which has been owned by Pima County since 1980, previously consisted only of two ponds operating in series. The 2000 Marana 208 Update stated that average flows at that time were 27,000 gallons per day from approximately 100 residential and fewer than 10 commercial dischargers. Since that time, the facility has been expanded to include three package treatment plants, each rated at 50,000 GPD.

5.4.1.1. Service area boundaries
The Marana WWTF currently serves a relatively small area in Marana (Figure 5-7). Areas served include residential areas in central Marana (north and south of Grier Road, east of Sanders Road) and the new Gladden Farms development south of Moore Road and east of Sanders Road. As of early 2005, there also were plans for constructing sewers to serve the existing Honea Heights subdivision (Town of Marana, 2005), which was previously served by individual on-site systems. Honea Heights is located north of the Santa Cruz River, east of Sanders Road.

Figure 5-7. Marana WWTP Current (2002) Service Area
5.4.1.2. Service area population
The projected 2005 population for the TAZ in which the service area is located is 2616.

5.4.1.3. Service area land uses
Land use in the service area is primarily residential, consisting of 66 percent small lots (< 2.5 acres, mixed use); and 21 percent medium lots (between 2.5 and 25 acres, mixed use). Approximately 12 percent of the service area corresponds to a specific plan. Only 0.4 percent is zoned commercial. The surrounding area is mostly farmland.

5.4.1.4. Treatment method
The Marana WWTF consists of three 50,000 GPD Smith and Loveless biological nutrient removal package treatment plants. The facility also has two lined facultative/evaporative basins, one of which is used as an overflow basin.

5.4.1.5. Discharge method and location
Effluent is discharged to the Santa Cruz River via an AZPDES permit or reused on site.

5.4.1.6. Capacity
As of December 2005, four package plants had been installed, raising the capacity of the Marana facility to 0.2 MGD. Replacement of the existing package plants with a new 0.5 MGD facility is expected in 2006, followed by a new 1.5 MGD BNROD facility in 2007.

5.4.1.7. Current flows
Average daily flow in FY2003-04 was 0.04475 MGD.

5.4.2. Avra Valley Wastewater Treatment Facility
The Avra Valley WWTF is owned and operated by Pima County. It is located approximately 20 miles southwest of Tucson in southern Avra Valley, north of Highway 86 and east of Three Points (Figure 5-8). This is a semi-rural but rapidly growing area.

5.4.2.1. Service area boundaries
The current service area for the Avra Valley WWTF (Figure 5-8) is roughly centered on the intersection of Highway 86 (Ajo Way) and San Joaquin Road. From this point the service area extends roughly four miles to the north, four miles to the south, four miles to the west and three miles to the east.

5.4.2.2. Service area population
The estimated population served by the Avra Valley WWTF in 2005 was 12,104.

5.4.2.3. Service area land uses
Land uses in the service area include rural residential (70.7 percent), urban residential (9.4 percent), commercial (1.5 percent), industrial (1.7 percent), multiple use (1.0 percent), specific plan (4.7 percent), and federal and state land (10.9 percent).

5.4.2.4. Treatment method
This facility uses a biological nutrient removal, oxidation ditch (BNROD) treatment process. The process is described in The Pima County Effluent Generation and Utilization Report 2004 (Pima County WWM, 2005a) as follows:

Influent is equalized in a 1.37 million gallon basin prior to being pumped to a channel that discharges into the 1.2 MGD oxidation ditch. The process is based on extended
aeration, nitrification, and de-nitrification within the oxidation ditch by cycling the aeration on and off. The activated sludge mixed liquor flows into two secondary clarifiers…. The clarifiers are designed to provide quiescent conditions for the sludge to settle.

Figure 5-8. Avra Valley WWTP Current (2005) Service Area

5.4.2.5. Discharge method and location
Effluent disposal consists of on-site irrigation reuse, evaporation, percolation, and discharge to Black Wash via a spray field in accordance with an AZPDES permit. Use of effluent for a riparian restoration project has been proposed. According to Pima County Wastewater (2005a), sludge is returned to the oxidation ditch or wasted to thickeners and then stored in drying beds.

5.4.2.6. Capacity
The current design capacity of the Avra Valley WWTF is 1.2 MGD (Pima County WWM, 2005b).

5.4.2.7. Current flows
Average daily flow for March 2005 was 1.016 MGD (Pima County WWM, 2005b).

5.4.3. Green Valley Wastewater Treatment Plant
The Green Valley WWTP is south of Tucson along the east side of the Santa Cruz River (Figure 5-9). It serves the retirement community of Green Valley and a small southern part of the Town of Sahuarita. It is owned and operated by Pima County.
5.4.3.1. Service area boundaries

The Green Valley WWTP service area (Figure 5-9) extends along both sides of Interstate 19, primarily serving properties west of the Santa Cruz River, but also some properties east of the river. The service area extends roughly 9.5 miles north to south, from about a half-mile south of Twin Buttes Road, to about a mile and a half south of the Duval Mine water line road. Along most of its length, the current service area is between one and four miles wide from east to west.

Figure 5-9. Green Valley WWTP Current (2002) Service Area

5.4.3.2. Service area population

The estimated 2005 service area population is 17,469.

5.4.3.3. Service area land uses

Most of the service area is the retirement community of Green Valley. The facility also serves parts of the Town of Sahuarita. Land use in the service area is primarily residential and commercial.

5.4.3.4. Treatment method

The Green Valley WWTP has two treatment trains with a common headworks consisting of automatic screens and degritting. The two treatment trains are described in The Pima County Effluent Generation and Utilization Report 2004 (Pima County WWM, 2005a) as follows:
The first (process) is a 2.1 MGD treatment process made up of two trains of primary and secondary aerated lagoons followed by two effluent maturation/settling lagoons and four percolation basins. This treatment process produces Class B effluent. The second process is a 2.0 MGD Biological Nutrient Removal Oxidation Ditch (BNROD), which operates on an extended aeration, nitrification, and denitrification process within the oxidation ditch by cycling the aeration on and off. The activated sludge mixed liquor flows into two secondary clarifiers. Sludge is returned to the oxidation ditch or wasted solids management facilities onsite. Clarified effluent is then filtered and disinfected. This treatment process produces Class A+ effluent.

5.4.3.5. Discharge method and location
Effluent is delivered to the Robson Quail Creek recharge basins. Effluent also is disposed via percolation and reused on-site. The County also has entered into an agreement with ASARCO to use biosolids for reclamation of mine tailings (Pima County WWM, 2005b).

5.4.3.6. Capacity
The facility’s design capacity is 4.1 MGD. The new BNROD treatment train has a capacity of 2.0 MGD. The older aerated lagoon system has a capacity of 2.1 MGD.

5.4.3.7. Current flows
Average inflow in FY 2003-04 was 1.63 MGD.

5.4.4. Corona De Tucson Wastewater Treatment Facility
The Corona de Tucson WWTF is located southeast of Tucson (Figure 5-10) in an area that is currently rural but facing very rapid population growth. The plant site is northwest of the intersection of Sahuarita Road and Houghton Road. It is owned and operated by Pima County Wastewater Management Department. Because of rapid growth in the area, and forecasts that the rapid growth will continue, this facility was the subject of a PAG 208 Consistency Report approved by the Regional Council in December 2004.

5.4.4.1. Service area boundaries
As of 2002, the only areas served by the Corona de Tucson WWTF were south of Sahuarita Road, including parts of the Santa Rita Ranch, Santa Rita Bel Air Estates and New Tucson subdivisions east of Houghton Road and a small part of the New Tucson subdivision west of Houghton Road (Figure 5-10). The service area has since expanded and continues to expand.

5.4.4.2. Service area population
The population served by the Corona de Tucson facility is rather small but expected to grow rapidly. The 2000 Census showed a population of 993 for the Traffic Analysis Zones in which the service area is located. The 2005 PAG population projections for these zones indicate a population of 3,396.

Average annual daily flows at the facility were 0.058 MGD in 2002 and 0.065 in 2003 (Pima County WWM and PAG, 2004). Assuming an average of 85 gallons of wastewater generated per person per day, this translates to a service area population of 682 in 2002 and 765 in 2003.

5.4.4.3. Service area land uses
Land uses include residential (48.1 percent), commercial (7 percent), multiple use (12.9 percent), and specific plan (31.7 percent).
5.4.4.4. Treatment method
As of December 2004, when the PAG Regional Council approved a 208 Consistency Report for a facility expansion, the Corona de Tucson WWTF consisted of two facultative stabilization lagoons operating in series. However, plans were already under way at that time to upgrade the facility by installing an aeration system and implementing soil aquifer treatment to expand the treatment capacity to 300,000 GPD. Aerators already had been installed as of April 2005.

5.4.4.5. Discharge method and location
As of December 2004, discharge consisted of evaporation. Discharge via soil aquifer treatment will commence after approval of the new APP for the upgraded facility.

5.4.4.6. Capacity
This facility previously had a design capacity of 0.117 MGD. Minor modifications have expanded the capacity to 0.300 MGD, pending approval of an APP for the increased capacity.

5.4.4.7. Current flows
Average daily flow in FY2003-04 was 0.064 MGD.

Figure 5-10. Corona de Tucson WWTF Current (2002) Service Area
5.4.5. Mount Lemmon Wastewater Treatment Facility

The Mount Lemmon WWTF is owned and operated by Pima County Wastewater Management Department. It is located near the small community of Summerhaven on Mount Lemmon, north of Tucson.

The facility was constructed by Pima County in 1982 after a series of events in the late 1970s and early 1980s. Sabino Creek, a popular recreation area with headwaters on Mount Lemmon, was polluted in the 1970s. Marshall Gulch picnic ground was closed in 1975 because of the pollution, the major source of which was attributed to the discharge of inadequately treated sewage (PAG, 1977). Pima County and the Arizona Department of Health Services agreed on a Stipulation of Facts and Consent Order related to the water quality situation in July 1980. The Consent Order required construction of a new wastewater treatment facility. In April 1981, the State issued a prohibition against the surface discharge of treated wastewater into Sabino Creek, thus forcing the County to find a different disposal site for treated effluent. In September 1981 the PAG Regional Council approved a 208 Plan Amendment that recommended construction of a new wastewater treatment plant that would discharge on National Forest land in the San Pedro River watershed, and limiting sewerage service to only the 47 properties the County was obligated to serve at that time (PAG, 1977; PAG, 1981). The U. S. Forest Service has since approved an additional 30 connections, provided the daily average flows do not exceed 12,500 GPD average flow and 17,000 GPD daily maximum flow (Pima County WWM, 2005b).

5.4.5.1. Service area boundaries

The Mount Lemmon WWTF service area illustrated on Figure 5-11 is within the community of Summerhaven. Only a small number of the lots (77) can be served pursuant to an agreement between Pima County and the USFS.

5.4.5.2. Service area population

The 2005 population estimate for the TAZ encompassing Summerhaven was 132. The TAZ includes all of Summerhaven and vacant USFS land. As noted above, only 77 lots can be served by this facility, based on agreements with the USFS.

5.4.5.3. Service area land uses

The service area is primarily residential, with a few commercial customers such as restaurants and gift shops. The service area was severely impacted by the 2003 Aspen fire, with most of the buildings in Summerhaven destroyed. The WWTF itself was spared.

5.4.5.4. Treatment method

The facility uses an oxidation ditch for treatment (Pima County WWM, 2005a).

5.4.5.5. Discharge method and location

Effluent disposal consists of spray irrigation on 10 acres of vacant USFS land on the San Pedro River watershed side of Mount Lemmon. The disposal area burned in the 2002 Bullock Fire, causing some damage to the disposal system. The damage has since been repaired.

5.4.5.6. Capacity

The current capacity of the Mount Lemmon facility is 0.015 MGD.

5.4.5.7. Current flows

Average daily flow in FY2003-04 was 0.00162 MGD. Flows are currently minimal as a result of the 2003 Aspen fire that destroyed most of the residential area served by the facility.
5.4.6. Arivaca Junction Wastewater Treatment Facility
The Arivaca Junction WWTF is located approximately 30 miles south of Tucson, near the Santa Cruz County line, west of the Santa Cruz River. It is owned and operated by Pima County and serves a rural area.

5.4.6.1. Service area boundaries
The Arivaca WWTF service area (Figure 5-12) encompasses a small rural residential area west of I-19 and north of Arivaca Road.

5.4.6.2. Service area population
The Arivaca Junction service area encompasses 323 lots. This corresponds to a service area population of 840 people, assuming 2.59 persons/household.

5.4.6.3. Service area land uses
The service area for this facility is entirely residential.

5.4.6.4. Treatment method
The facility consists of a single 3.2 acre, 15-foot-deep, unlined, partially mixed aerated lagoon (Pima County WWM, 2005a).
5.4.6.5. Discharge method and location
Effluent disposal consists of evaporation, percolation, and reuse at the Reventone Ranch.

5.4.6.6. Capacity
The permitted treatment capacity of the Arivaca Junction facility is 0.10 MGD (Pima County WWM, 2005a).

5.4.6.7. Current flows
Average daily flows in FY 2003-04 were 0.06132 MGD.

5.4.7. Rillito Vista Wastewater Treatment Facility
Pima County’s Rillito Vista WWTF is located northwest of Tucson, between Avra Valley Road and Tangerine Road, and between Interstate 10 and the Santa Cruz River (Figure 5-13). It serves the Rillito Vista subdivision.

5.4.7.1. Service area boundaries
The service area boundaries correspond to the Rillito Vista subdivision boundaries (Figure 5-13).
5.4.7.2. Service area population
The subdivision has 60 lots. This corresponds to a service-area population of 156 people, based on the average owner-occupied rate (2.59 persons/household) published in the Pima County SDCP Housing Report.

5.4.7.3. Service area land uses
The entire service area is residential.

5.4.7.4. Treatment method
The facility consists of two stabilization/evaporation/percolation ponds. Only one pond is used at a time, with the inactive pond dried and scraped before being returned to service.

5.4.7.5. Discharge method and location
Effluent disposal consists of evaporation and percolation.

5.4.7.6. Capacity
The current capacity at Rillito Vista is 0.020 MGD (Pima County WWM, 2005a).

5.4.7.7. Current flows
Current inflows average 0.010 MGD (Pima County WWM, 2005a).
5.4.8. Arizona-Sonora Desert Museum Wastewater Treatment Plant

The Arizona-Sonora Desert Museum (ASDM) has its own wastewater treatment facility in the Tucson Mountains west of Tucson (Figure 5-14). The facility serves ASDM, which is a zoo, natural history museum and botanical garden. ASDM also has a restaurant, a gift shop and several snack shops. The wastewater treatment facility only serves ASDM. It does not serve any off-site properties.

The facility operates pursuant to Aquifer Protection Permit number P100628, which specifies a maximum monthly average domestic wastewater flow of 15,000 gallons per day. The treatment system consists of settling tanks, a flow equalization basin, subsurface leach beds, recirculating sand filter, and disposal trenches. Sludge is hauled off-site for disposal.

The ASDM WWTP was previously operated by Pima County Wastewater Management Department, but has been turned over to the ASDM. The facility APP identifies Pima County Parks and Recreation Department as the land owner of the facility site and Westland Resources Inc. as the operator.

Figure 5-14. Arizona-Sonora Desert Museum WWTF Service Area

5.4.9. Pima County Fairgrounds Wastewater Treatment Facility

The Pima County Fairgrounds WWTF is located southeast of Tucson at the county fairgrounds south of Interstate 10 and west of Houghton Road (Figure 5-15). The facility only serves the
fairgrounds, and typically only has measurable flow in the month of April when the Pima County Fair is held (Pima County WWM, 2005a). However, the fairgrounds also are used for a variety of public meetings and events (Pima County WWM, 2002).

The facility consists of two primary stabilization ponds and an overflow pond. The facility has a capacity of 0.035 MGD (Pima County WWM, 2005c). It is operated by the Pima County Wastewater Management Department.

Figure 5-15. Pima County Fairgrounds WWTF Current Service Area

5.4.10. Sahuarita Wastewater Treatment Plant
The Sahuarita Wastewater Treatment Plant was constructed pursuant to a 208 Plan Amendment adopted by the PAG Regional Council in March 1999. It is located west of the Santa Cruz River and south of Pima Mine Road (Figure 5-16). The 208 Plan Amendment outlined a six-phase plan leading to a buildout capacity of 3.0 MGD. Construction of the first two phases was completed by January 2005, with plans for construction of the third phase to begin in 2005 (Town of Sahuarita, 2005).

The 1999 208 Plan Amendment identified the areas to be served by the Sahuarita plant and the areas that would remain under Pima County’s service area. See Chapter 4 for more details about the respective Designated Management Areas.
5.4.10.1. Service area boundaries
The facility serves the Rancho Sahuarita development, including Rancho Resort.

5.4.10.2. Service area population
The facility has 2,380 service connections.

5.4.10.3. Service area land uses
Land uses in the service area are predominantly residential.
5.4.10.4. Treatment method
Treatment consists of oxidation ditches using a biodenitrification process.

5.4.10.5. Discharge method and location
Effluent is discharged to on-site rapid infiltration basins.

5.4.10.6. Capacity
The permitted capacity is currently 0.25 MGD.

5.4.10.7. Current flows
Current flows are 0.22 MGD.

5.5. NON-PUBLIC WASTEWATER TREATMENT FACILITIES
Non-public wastewater treatment facilities in Pima County include:

- Adonis
- Ajo Improvement Co.
- Arizona State Prison (not consistent with 208 Plan)
- Lukeville
- Marana High School
- Milagro Subdivision
- MTC
- Organ Pipe Cactus National Monument
- Saguaro Ranch Guest Ranch (proposed)
- Sahuarita High School Wetlands
- University of Arizona Science and Technology Park
- U. S. Forest Service – Palisades Ranger Station

These facilities are discussed in Chapter 4.

5.6. OTHER POINT SOURCES
Other point sources in Pima County for which PAG has NPDES permits on file include:

- Twin Buttes Mine
- Davis-Monthan Air Force Base
- O’Malley Companies Groundwater Treatment System
- Tucson Rock and Sand, Inc. (draft permit only on file)

These facilities are described in a separate document (Water Quality Permits in Pima County) that PAG prepared in 1999 to compile information on all permitted facilities in the county.

Additional facilities with AZPDES permits in Pima County include (ADEQ, 2005b):

- Tucson Electric - North Loop Generating
- Tucson Fire Station #10

PAG also has a draft NPDES permit on file for the City of Tucson’s proposed Atturbury Wash constructed wetlands project, which involves the discharge of reclaimed water to an unnamed
wash tributary to Atturbury Wash. This project has been found to be consistent with the PAG 208 Plan.

One point source identified in the original PAG 208 Plan that is still active is the Pima County Animal Control Center, located at 400 West Silverbell Road, on Tucson's west side (Figure 5-17). The facility includes a 21,000-gallon lined evaporation pond used for disposal of waste tick-dip solutions generated at the facility. The facility is operated in accordance with Aquifer Protection Permit number P-100634. The permit stipulates that there shall be no discharges to the ground surface or to any waters of the United States. Therefore the facility does not have a NPDES permit.

Figure 5-17. Pima County Animal Control Center

A number of wastewater treatment facility point sources identified in the original 1978 PAG 208 Plan no longer exist. These include:

- Arizona Youth Center
- Asthmatic School
- Branding Iron
- Catalina
- Gilbert Ray Campground
- Mountain Gardens
- Puerto Del Norte
- Santo Tomas
Other point sources identified in the original 208 Plan that no longer exist include:

- Arizona Feeds Poultry Farm
- Pacific Fruit Express
- Shamrock Farms

PAG’s NPDES permit files include several draft NPDES permits for facilities which have closed or no longer discharge to waters of the United States, or which never received a final permit (PAG, 1999). These include:

- Tucson Electric Power – DeMoss Petri station (permit #AZ0022641)
- “A” Mountain Swimming Facility (permit #AZ0022781)
- Canada Hills Water Company / El Conquistador WWTP (permit #AZ0023370)
- Hughes Aircraft Company (permit #AZ0110264)

5.7. MUNICIPAL STORMWATER NPDES DISCHARGES

Several entities in PAG’s region are regulated under the NPDES municipal stormwater permit program. Because Arizona obtained primacy for the NPDES program in 2002, ADEQ now issues NPDES permits (known as “AZPDES” permits) in Arizona. Under this program, entities identified as municipalities in federal regulations must obtain AZPDES permits for stormwater discharged from their areas. The permits include a variety of provisions aimed at protecting the water quality of waterbodies receiving the stormwater discharges. The following entities are regulated by municipal stormwater AZPDES permits:

- City of Tucson
- Pima County
- Town of Oro Valley
- Town of Marana
- City of South Tucson
- Pascua Yaqui Tribe
- Davis-Monthan Air Force Base
- University of Arizona

Issuance of AZPDES permits to these entities for stormwater discharges is consistent with the PAG 208 Plan.

5.8. EXISTING DISCHARGES AND WWTFs THAT ARE NOT CONSISTENT WITH THE 208 PLAN

As discussed in Chapter 4, the Arizona State Prison wastewater treatment facility is not consistent with the PAG 208 Plan. The prison should be served by Pima County Wastewater Management Department, which is the Designated Management Agency for the area.

The Adonis Mobile Home Park owns and operates a sanitary sewerage facility in the vicinity of Grier Road and I-10 in Marana. Although the Adonis facility is briefly mentioned in previous 208 Plan Amendments, it was not included in the original 208 Plan, nor was it the specific focus of any 208 Plan Amendment. The most recent 208 Plan Update for the Marana area (Malcolm Pirnie, 2000) notes that Pima County Wastewater had recommended that wastewater from the Adonis Mobile Home Park be conveyed to the Marana WWTF or to a facility being planned for
the proposed La Mirage Estates subdivision. Removal of the Adonis WWTF and connection of the mobile home park to a public conveyance system would be consistent with the 208 Plan.

5.9. **ON-SITE WASTEWATER TREATMENT SYSTEMS**

Homes and businesses that are not connected to sewers are served by on-site wastewater treatment facilities. On-site facilities include conventional septic tanks or alternative systems where conditions preclude the use of septic tanks. In Pima County, on-site facilities are used in rural areas where sewer service is not available and lot sizes are one acre or larger. Many areas in Avra Valley, Marana, and semi-rural areas bordering the Tucson metropolitan area rely heavily on septic tanks for wastewater service. Some homes within the metropolitan area also discharge to septic tanks; in most cases these homes were constructed before sewer service was available. It was beyond the scope of this update to identify the locations of existing on-site systems or to plan the locations of future on-site systems. The original 1978 208 Plan identified the non-sewered population in each sewer drainage area and provided pollutant loading estimates. An update of this information could be included in a future update to the 208 Plan.

5.10. **WASTEWATER RECLAMATION FACILITIES AND EFFLUENT REUSE SITES**

Two facilities in eastern Pima County have been constructed for the sole purpose of wastewater reclamation: the Tucson Reclaimed Water Plant at Roger Road and Pima County’s Randolph Park Wastewater Reclamation Facility. The Randolph Park facility is described above. Its location is shown on Figure 5-3.

The Tucson Reclaimed Water Plant, which is owned by the City of Tucson, is located next to Pima County’s Roger Road Wastewater Treatment Facility, north of Sweetwater Drive between Interstate 10 and the Santa Cruz River (Figure 5-18). The facility receives effluent from the County’s Roger Road WWTF and provides additional treatment consisting of pressure filtration and chlorination. The reclamation facility supplies Tucson Water’s reclaimed water system, which delivers reclaimed water to locations throughout the metropolitan Tucson area (Figure 5-18). Backwash water from the filtration plant is piped to the Sweetwater Wetlands for natural treatment by the wetlands.

In addition to the Roger Road filtration and chlorination facility and the Sweetwater wetlands, Tucson Water's reclaimed water system includes the Sweetwater Recharge Facilities, where Roger Road WWTF effluent and the treated backwash water from the filtration plant are delivered to a series of recharge basins along the Santa Cruz River. Through soil aquifer treatment, the basins provide additional treatment for the water. Several extraction wells recover the recharged water and return it to the reclaimed water system, where it is chlorinated and delivered to customers.

In addition to the facilities described above, several WWTFs around the county generate effluent that is reused to some extent on-site or at nearby locations in accordance with reuse permits. These are discussed above and in Chapter 3.

PAG policies strongly encourage the reuse of treated wastewater to reduce the reliance on groundwater. Therefore, the facilities described above are consistent with the 208 Plan and are expected to expand as demand for reclaimed water increases in the future.
Figure 5-18. Reclaimed Water Facilities