

# Physical Infrastructure Connectivity

## Chapter 4: Physical Infrastructure Connectivity Goals and Policies



The Physical Infrastructure Connectivity chapter addresses aspects of physical infrastructure including:

- transportation;
- water resources, including conservation, supply, demand and quality;
- wastewater;
- energy, including alternative energy sources;
- waste removal and recycling;
- brownfield clean up and redevelopment potential;
- communications;
- public facilities and grounds;
- trails;
- flood control/drainage;
- county-wide infrastructure concurrency.

Elements in this chapter provide goals and policies related to the efficient use of existing and planned infrastructure needed to support current populations and accommodate future growth. Each of the topics in the chapter either cover a part of the County's critical infrastructure, connect people and goods or both. All are components of the outlined regional vision noted in Chapter 1.

The Background and Current Conditions Volume (Appendix A) summarizes all of the background data and analysis supporting these goals and policies.

This Comprehensive Plan introduces the concept of an Integrated Facilities Planning System (IFPS) that includes an Integrated Monitoring System based on Level of Service and other standards. The intent of the IFPS is to provide a more efficient and measurable planning process that allows for a comprehensive evaluation of infrastructure needs tied to the Capital Improvements Program (CIP). The IFPS is further described in Section 4.7.

This chapter meets the requirements set forth in Arizona Revised Statutes for the following required elements: Circulation (Transportation); Water Resources; Energy; and the portion of Environmental Planning requirement for air and water quality.

## 4.1 Transportation Element

The Transportation Element addresses existing and proposed freeways/roadways, bicycle and pedestrian routes/facilities, airports, rail, and any other modes of transportation appropriate for Pima County. It also correlates with the land use and economic development goals and policies. A well-functioning transportation system in Pima County is essential to ensure the efficient movement of people and goods, maintain the quality of life, and facilitate economic growth. The Transportation Element recognizes the need to develop policies and practices that create a sustainable and cost effective transportation system. The basis of this element is developing a transportation system that meets the mobility and accessibility needs of current and future residents and visitors in ways consistent with the character of the community as expressed throughout the comprehensive plan.

**Goal 1: Provide a comprehensive and multi-modal transportation system that provides mobility for all users and goods, and all modes of travel including automobile, transit, bicycling, and walking.**

- Policy 1:** Manage traffic congestion and demand through capacity improvements, land use decisions, transit service, and other comprehensive strategies.
- Policy 2:** Support transit service and programs, especially for those who are transit dependent, where ridership meets minimum thresholds.
- Policy 3:** Support multi-modal transportation and transit-oriented development to improve mobility and reduce traffic congestion.
- Policy 4:** Incorporate “complete streets” designs on arterials and collectors, where appropriate, to improve access for all roadway users, including bicyclists and pedestrians.
- Policy 5:** Encourage bicycling and pedestrian safety through education, engineering, enforcement and evaluation.

**Goal 1 Implementation Measures:**

- a. Update the Major Streets and Scenic Routes Plan, based on established and future land use patterns, including existing zoned land, to further define future right-of-way needs and support future growth.
- b. Work with stakeholders to periodically update all design manuals to ensure efficient use of resources, regionally appropriate alignment with current national standards and consideration of best practices.
- c. Work collaboratively with the Tohono O’Odham Nation, the Pascua Yaqui Tribe, National Park Services, Federal Highway Administration, Central Federal Lands and other state and federal agencies to access funding sources that benefit the entire region.
- d. Accelerate the identification and acquisition of rights-of-way for future transportation infrastructure, where feasible.
- e. Actively participate in the state planning efforts to explore the potential of an intercity passenger rail line connecting Southern Arizona with the Phoenix metro area.
- f. Engage business leaders and employers to identify transit needs for a growing workforce.

**Goal 2: Maintain the county roadway system in a state of good repair**

**Policy 1:** Prioritize roadway maintenance as a core service of Pima County.

**Policy 2:** Consider improvements that are based on ongoing evaluation of roadway conditions through the County’s Pavement Surface Evaluation and Rating system.

**Policy 3:** Evaluate existing legal mechanisms for roadway maintenance. Develop a sustainable and equitable participation program for roadway maintenance, resurfacing and improvements to improve major and local roadway conditions.

**Policy 4:** Support and seek alternative funding sources for roadway maintenance efforts.

**Goal 2 Implementation Measure:**

- a. Work with local and national legislators to develop a stable funding source for transportation improvements and maintenance.
- b. Collaborate with development industry stakeholders on identifying trade-offs and incentives to encourage more private sector participation in road maintenance.

### **Goal 3: Improve traffic safety and reduce accidents on county roads**

- Policy 1:** Prioritize roadway safety projects based on ongoing evaluation of crash statistics through the County's Safety Management System.
- Policy 2:** Manage roadway access points to improve safety and accessibility for all users.
- Policy 3:** Support efforts to educate drivers and users of all modes of transportation on traffic safety.
- Policy 4:** Advocate for legislative and other agency efforts to increase and improve funding for local government traffic safety programs.
- Policy 5:** Support additional efforts to enforce traffic laws to improve traffic safety and reduce accidents.
- Policy 6:** Support the reduction of wildlife/vehicle collisions.

#### **Goal 3 Implementation Measures:**

- a. Work with regional partners to prepare a regional access management plan.
- b. Work with Pima County Sheriff Department to plan, develop and implement a strategic traffic safety and speed management plan.
- c. Work with regional partners to develop and implement a region wide traffic signing and pavement marking management plan.
- d. Work cooperatively with the region's school districts and charter school providers to coordinate normal and special event traffic demand in an effective and reasonable fashion.
- e. Work collaboratively with transportation agency partners to evaluate the appropriateness of incorporating scale-dependent wildlife crossing features as part of County roadway improvement projects.
- f. On a region wide level, continue to work with other agency partners to evaluate opportunities to integrate wildlife crossing features into regional and roadway projects and corridors.

### **Goal 4: Promote economic development with strategic transportation investments.**

- Policy 1:** Support the growth of aerospace, defense, and logistics industries in and around all regional and military airport facilities.
- Policy 2:** Support transportation investments that assist current employers as well as bringing new and permanent jobs to Pima County.
- Policy 3:** Support efforts to expand rail infrastructure and intermodal connections throughout the region.

#### **Goal 4 Implementation Measures:**

- a. Conduct planning and seek regional support and funding for the Sonoran Corridor/Auxiliary Interstate Highway connecting 1-10 to 1-19.
- b. Petition the State Transportation Board to accept the Sonoran Corridor as a state highway under the operational management and control of ADOT.
- c. Support Tucson International Airport Master Plan and the development of a second main runway.
- d. Work with the Tucson Airport Authority, ADOT, Town of Marana, and Pinal County to provide the infrastructure needed to best position Ryan Airfield, Avra Valley Airport, and Pinal Airpark as sub-regional employers.
- e. Work collaboratively Port of Tucson and other community partners to position the Port as a key transportation and logistics center.
- f. Continue to work with PAG in the implementation of the most recent long-range transportation plan, the 2040 Regional Transportation Plan Update (RTP), prepared by PAG.
- g. Support any rail enhancements needed for the successful operation of the Port of Tucson.

## **4.2 Water Resources Element**

The state mandated water resources element requires that counties perform a basic known water supply and demand comparative analysis to show whether there is an impact of proposed new development on the overall water supply. In 2008 Pima County amended the water resource element to more adequately measure impacts of proposed development on water supply. Pima County is not a water provider and no new hydrogeologic studies are required to do this analysis. Consequently, quite a number of assumptions are required. The water quality portion of this element satisfies part of the state mandated Environmental Planning Element.

### [Pima County 2011-2015 Action Plan for Water Sustainability and Water Resource Policy](#)

The City of Tucson and Pima County completed a multi-phase water/wastewater infrastructure study in 2010. Phase 1, completed in February 2009, consisted of an infrastructure inventory. Phase 2 established a framework for sustainable water resources planning through the implementation of 19 goals and 56 recommendations. A five-year Action Plan for Water Sustainability (2011-2015) guides completion of the recommendations and each year the City and County transmit an annual report card tracking progress towards meeting those goals.

In 2007, the Board of Supervisors adopted a policy (F54.9) on County water rights acquisition, protection and management. The policy requires that Pima County water resources be used to the benefit of Pima County's citizens. It establishes a collaborative effort of numerous Pima County

Departments to identify County initiatives for improved management and utilization of County owned water rights. The County Water Management Committee has provided guidance in managing its water resources by building a database of water sources, rights and infrastructure while encouraging improved departmental maintenance, procedure and administration. Strategic planning for County reclaimed water, long term storage credits and groundwater and surface water rights will maximize resource value and efficient utilization.

The Pima County 2011-2015 Action Plan for Water Sustainability and the Water Rights Policy has numerous common goals and are complimentary plans that reinforce sustainable planning.

**Goal 1: Achieve water sustainability through comprehensive integrated planning that coordinates water supply, demand management, economic growth and respect for the environment**

**Policy 1:** Comply with all applicable goals and recommendations in the 2011-2015 Action Plan for Water Sustainability, approved by the Board of Supervisors and the City of Tucson Mayor and Council.

**Policy 2:** Maximize County water resource assets including groundwater rights, surface rights and production and use of reclaimed water to sustain and protect the County's natural environment consistent with Board of Supervisors Policy F 54.9 "Water Rights Acquisition, Protection and Management."

**Policy 3:** Make beneficial use of the Conservation Effluent Pool (CEP) for environmental restoration.

**Policy 4:** Increase reliance upon renewable water supplies.

**Policy 5:** Promote the efficient utilization of existing infrastructure and the prudent construction of additional infrastructure needed for a safe, reliable and renewable water supply.

**Policy 6:** Protect groundwater-dependent ecosystems including springs, perennial and intermittent streams and shallow groundwater areas.

**Policy 7:** Continue to evaluate Water Supply Impact Reviews of proposed comprehensive plan amendments larger than 4 acres and recommend approval based on no adverse impacts on the following 5 critical issues on existing water infrastructure and potential environmental constraints:

- a) Water service and renewable water supply options to site;
- b) Current and projected depth of groundwater and groundwater trend data at the site or wells, if known;
- c) Proximity of site or wells (if known) to areas of known or potential ground subsidence;
- d) Proximity of site and wells (if known) to known groundwater-dependent ecosystems; and

e) Location within a hydrogeologic basin, including depth to bedrock.

**Policy 8:** Continue to conduct a Water Resource Impact Assessment on any rezoning that requires a site analysis to be based on the five critical issues in Policy 7 above, plus information provided by the applicant in the Preliminary Integrated Water Management Plan included as part of the site analysis.

**Policy 9:** Minimize effect of development upon water supply for existing and future residents of Pima County through water conservation measures when appropriate to offset the impacts as conditions of rezonings.

**Goal 1 Implementation Measures:**

- a. Implement and update as needed the 2011-2015 Action Plan for Water Sustainability.
- b. Continue transmittal of Year End Progress Reports of the Action Plan recommendations.
- c. Develop strategies for the utilization of Pima County water resources consistent with the Water Rights Policy.
- d. Prepare a Watershed Management Plan which identifies the watersheds impacting Pima County, their drainage characteristics, regulatory and infrastructure needs.
- e. Continue to conduct Water Supply Impact Reviews on proposed comprehensive plan amendment requests larger than four acres.
- f. Continue to include the Preliminary Integrated Water Management Plans (PIWMP) as part of the site analysis and conduct Water Resource Assessments on all rezoning or specific plan requests that require a site analysis. Update the site analysis checklist as needed.
- g. Develop incentives to encourage beneficial use of stormwater and other water conservation measures.
- h. Develop a practicable method to assess both the increased water demand associated with new development and the offset measures that are proposed in Integrated Water Management Plans in order to compare them.

Water Supply and Demand Management

The Bureau of Reclamation and the Arizona Department of Water Resources (ADWR) studies recommend using all water supplies as efficiently as possible and the expansion of reclaimed water use for non-potable purposes to ease potable demand. Reclaimed water has and will continue to be a key water supply in the state's management plans and goal of safe yield, or hydrological balance. Yet both reports agree that no one strategy will solve future imbalance; augmentation of supply will be required despite conservation and reuse efforts.

Tucson Water recently released a Recycled Water Master Plan. New recycled water programs are predicated on the conclusion that the reclaimed water system is not expected to gain significant additional demand and new uses are needed to achieve full utilization and maximize water resource benefit. Full utilization is a compelling goal as Tucson Water expects shortages to the City's Central Arizona Project (CAP) allocation due to drought and climate change and is shifting strategy "to decrease reliance on CAP supplies." Plans for supplementing the City's CAP allocation include recycled water, Central Arizona Groundwater Replenishment District (GRD) replenishment, Arizona Water Banking Authority (AWBA) credits, long term storage credits and incidental recharge.

Tucson Water is considering to use unutilized recycled water for groundwater replenishment, through recharge, and then recover the water for advanced treatment before delivery as a supplement to potable water supplies- a process called "indirect potable reuse", one used by other communities in the Southwest. Indirect potable reuse is the primary strategy of Tucson Water's Recycled Water Master Plan to establish additional renewable water supplies, increase system reliability and retain a valuable water resource within the county.

In 2013, concerned about the ongoing drought and the continuing decline of water levels in Lake Mead and Lake Powell, the Department of the Interior and the Basin States set out to develop a drought response and sustainability plan for the Colorado River basin. The Lower Basin states have proposed to retain an additional 1.5 to 3 million acre-feet in Lake Mead over the next five years to reduce the risk of that reservoir dropping below the critical elevation of 1,000 feet. Central Arizona Project is partnering with other states and the U.S. Bureau of Reclamation to fund pilot Colorado River water conservation projects demonstrating cooperative, voluntary compensated demand reduction in the agricultural, municipal and industrial sector. The Colorado River System Conservation Program is a critical first step in conserving water within the Colorado System to protect reservoir levels.

## **Goal 2: Acknowledge new water supplies may be needed to ensure a secure water future**

**Policy 1:** Collaborate with water providers to support the development of new water supplies.

**Policy 2:** Consider use and underground storage of high-quality reclaimed water as viable future water supply strategies.

### **Goal 2 Implementation Measures:**

- a. Achieve full utilization of the County's reclaimed water as part of a strategy that best incorporates direct reuse, aquifer replenishment and accrual of long term storage credits.
- b. Support increased use of reclaimed water by water providers with reclaimed water entitlements.

- c. Support increased use of direct delivery of CAP water and a blend of recharge of CAP water and groundwater including wheeling agreements between water providers.
- d. Stay apprised of the Colorado River water supply and its impacts to local water providers.

**Goal 3: Support efficient water demand management practices and strategies that protect both local and basin-wide water supplies**

**Policy 1:** Integrate efficient water demand management practices and strategies in land use decisions.

**Policy 2:** Direct new development to areas that are served by water providers with a renewable and potable supply or the ability to create the same, and away from areas that are served by water sources that impact groundwater dependent ecosystems.

**Policy 3:** Encourage new construction to implement efficient water practices and use renewable water resources where feasible and available.

**Policy 4:** Encourage the use of renewable water sources including reclaimed water, CAP water and water harvesting.

**Policy 5:** Encourage efficient investment and coordination among regional public and private water and sewer providers for potable and renewable supply, treatment and conveyance infrastructure.

**Policy 6:** Promote, and incentivize, where appropriate, long-term water conservation strategies such as:

- a) Low water use fixtures and appliances in building codes;
- b) Low water use drought tolerant landscapes or xeriscapes;
- c) Drip irrigation;
- d) Increase use of reclaimed water and rainwater harvesting; and
- e) Low Impact Development (LID) principles such as preserving and recreating natural landscape features and minimizing effective imperviousness to create functional and appealing site drainage that treat stormwater as a resource rather than a waste product where applicable and feasible, such as curb cuts.

**Policy 7:** Continue to require that all solar energy generating fields utilize solar technologies that minimize consumption of water.

**Policy 8:** Continue to require a Preliminary Water Integrated Management Plan (PIWMP) for any rezoning that requires a site analysis. The PIWMP submittal requirements are as stipulated in the rezoning application and site analysis requirements.

**Policy 9:** Continue to apply conditions at the time of rezoning to offset or mitigate the findings of the PIWMP and WRIA. The following rezoning policies address the demand for water

resulting from future growth through rezoning, added to existing uses and are applied appropriate to the circumstances of each individual rezoning request outlined below:

- a) Applicants whose proposed rezoning site will be served by an existing water provider with physical access to a renewable and potable water supply, or the ability to create the same, shall provide written proof that effect as a condition of rezoning;
- b) Rezoning proposals without physical access to renewable and potable water supply, or the ability to create the same, and that are greater than one mile from a groundwater dependent ecosystem and whose wells draw water from an area greater than one mile from groundwater dependent ecosystems shall not be recommended for approval by staff until such a time as renewable and potable water supply is available in the area. Written proof that from water that the wells are outside of the groundwater dependent ecosystem shall be a condition of rezoning;
- c) Rezoning proposals without physical access to renewable and potable water supply, or the ability to create the same, and that are within one mile of a groundwater dependent ecosystem or have wells that are within one mile of a groundwater dependent ecosystem shall be recommended for denial by staff unless it can be shown that the increased demand does not have an impact on the groundwater dependent ecosystem OR the proposed demand has been reduced by additional conservation measures or offsets;
- d) All rezoning proposals shall include implementation of water conservation measures. These may include measures as provided in the site analysis requirements, Table B. The water conservation measures listed in the rezoning proposal shall become conditions of rezoning. Water conservation measures will be evaluated based on the severity of the water supply constraints of the entire rezoning proposal. Where groundwater withdrawal is within a mile from a groundwater dependent ecosystem, the conservation measures or offsets shall reduce the predicted increase in demand over existing zoning using the ADWR calculator;
- e) Water demand projections showing water demand below the average estimates for similar land use types shall be required to list water conservation measures or methods that are proposed to achieve the lower water demand. Implementation of water conservation measures listed in the rezoning proposal shall become conditions of rezoning;
- f) Rezoning requests proposing to employ water conservation measures for individual properties such as landscaping restrictions or private pool regulations shall be required to include the restriction in the Covenants, Codes, and Restrictions (CC&Rs);

- g) Rezoning proposals within one mile of a groundwater dependent ecosystem or that draws from a well within one mile of a groundwater dependent ecosystem that increase the water demand above existing zoning shall be fully offset in groundwater dependent ecosystems. Increases in water demand shall be offset by recharge, legal and verifiable water rights, or retirement or purchase of water rights from within the same or up-gradient shallow groundwater area. The applicant shall provide an estimate of the change in demand using the ADWR demand calculator;
- h) Rezoning proposals shall not increase the water demand above existing zoning in areas of isolated basins. Any increase in water demand shall be fully offset from within the same hydrogeologic basin by recharge, legal and verifiable water rights, or retirement or purchase of water rights. The applicant shall provide an estimate of the change in demand using the ADWR demand calculator; and
- i) A final Integrated Water Management Plan (FIWMP) shall be submitted at the tentative plat or development plan stage of a proposed project for which a rezoning has been approved. The FIWMP should include uses of all legally available water resources and pertinent details on reuse, replenishment, conservation and use of renewable supplies of water, all designed to minimize impacts to the aquifer.

**Goal 3 Implementation Measures:**

- a. Work collaboratively with water providers to establish goals for regional water use and reclaimed water.
- b. Support programs that conserve water within the Colorado River Basin system and protect Lake Mead operation.
- c. Work with stakeholders to update existing codes and regulations as necessary to include long-term water conservation strategies.
- d. Coordinate across departments to prepare and adopt voluntary Low Impact Development guidelines.
- e. Update water conservation measures (Table B of the rezoning site analysis requirements) to comprehensively address water conservation for proposed development (low water use toilets, water harvesting, etc.).
- f. Update the site analysis checklist to establish more detailed analysis of rezoning proposals that increase water demand in areas of shallow groundwater and within groundwater dependent ecosystems, and to provide specific standards to offset increased demand.
- g. Support educational programs on water conservation.
- h. Develop guidelines for water efficient solar systems or options to offset water use.

- i. Revise and update water conservation and management tools with input from stakeholders to achieve policy goals.

**Goal 4: Ensure a sufficient water supply for economic development**

**Policy 1:** Work with water providers and private sector stakeholders to identify areas with economic development potential that are lacking public water service and identify options for cost effective water service.

**Policy 2:** Emphasize water conservation and water efficiency when recruiting new businesses or expanding existing businesses.

**Goal 4 Implementation Measures:**

- a. Work cooperatively with water providers, other jurisdictions, Tucson Regional Economic Opportunities (TREO) and Tucson Regional Water Coalition (TRWC) to prioritize water supply for new economic development which both provide basic employment (jobs with a multiplier effect) and use water efficiently.
- b. Educate potential new businesses on water conservation strategies and approaches.

**Goal 5: Effectively protect groundwater quality**

**Policy 1:** Continue to assess soil and groundwater quality in the vicinity of all County-owned sites of concern, including landfills, and promptly implement clean-up activities where soil or groundwater has been affected.

**Policy 2:** Continue to operate existing remediation systems and monitoring programs until all contamination has been fully cleaned up.

**Policy 3:** Implement new programs to protect groundwater quality for County facilities that have the potential to impact groundwater.

**Policy 4:** Encourage coordination among County departments that use or generate hazardous materials and waste to institute groundwater pollution prevention policies and practices.

**Policy 5:** Support practices that reduce the generation of waste that could impact groundwater quality and implement spill management plans.

**Policy 6:** Encourage land use decisions that maintain the function and quality of watercourses and areas designated in the Sonoran Desert Conservation Plan as riparian and aquatic habitat.

**Policy 7:** Continue to protect groundwater dependent ecosystems.

**Goal 5 Implementation Measures:**

- a. Using a sustainability model, balancing existing and future water needs of residents, businesses and the natural environment; develop baseline data and measure future impacts to open space lands and riparian habitats within the

unincorporated area of the County to protect these groundwater dependent ecosystems.

- b. Provide needed resources to address any soil and groundwater remediation needed at county-owned sites of concern, including landfills.
- c. Implement the County's Municipal Separate Storm Sewer System Program.

### 4.3 Energy Element



#### *University of Arizona Solar Zone, Pima County, Arizona*

With 296 days of sunshine per year Pima County has one of the best solar resources in the world. With its proximity to major markets coupled with large expanses of flat rooftops and relatively flat, open landscape, Pima County is well positioned for developing a thriving renewable energy industry that is prepared to satisfy the demands of the low carbon economy of the future. Per dollar invested, renewable energy and efficiency generate more jobs than any other energy-related industry sector and they rely primarily on the local workforce, insuring the jobs stay local. With the potential to host more than 8,000 gigawatts of solar statewide, wide scale deployment over the next 10-15 years would generate tens of thousands of construction-phase jobs, \$10 billion in earnings and economic activity, and more than 4,000 permanent jobs and \$750 million annually in earnings and additional economic activity. Robust investment in the development of a clean, renewable energy supply, will build a foundation for economic stability and growth, generating thousands of new high-paying jobs, boosting economic activity, conserving scarce water supplies, improving public health and enhancing energy security.

This element meets the state requirement of the Energy Element.

#### **Goal 1: Support the increased use of clean alternative energy systems**

- Policy 1:** Encourage overall reduction in energy consumption through application of technology installation of low energy fixtures, public education and consumer awareness.
- Policy 2:** Promote the generation, transmission and use of a range of renewable energy sources such as solar, biofuels and wind power to meet current and future energy demands and decrease reliance on fossil fuels.
- Policy 3:** Encourage new development and redevelopment projects to generate their energy needs through on-site renewable sources to support the energy efficient methods and practices provided in the County Net Zero Energy Program Standard.

- Policy 4:** Continue to implement and expand the Renewable Energy Incentive District (REID).
- Policy 5:** Identify and consider incentives for new development and redevelopment that exceeds the energy efficiency requirements in the building code.
- Policy 6:** Promote and increase utilization of clean alternative/solar energy systems County-wide by:
- a) Creating educational programs to promote clean alternative/solar energy systems;
  - b) Providing information on all existing incentives for establishing solar energy systems and for participating in utility-scale community solar projects;
  - c) Providing design information on maximizing the use of solar energy systems and methods in new construction, remodels, and retrofits; and
  - d) Coordinating with local power utilities that are developing utility-scale renewable resources or participating in purchase agreements from renewable energy producers.
- Policy 5:** Encourage residential and nonresidential development to maximize the use of solar energy systems on individual sites and throughout the development.
- Policy 6:** Encourage the use of passive solar to reduce overall energy demand.
- Policy 7:** Mitigate urban heat island effect by reducing paved areas, increasing shade and applying other methods, where practical.
- Policy 8:** Encourage the replacement of traditional fossil fuel-fired equipment such as emergency generators and peak power-sharing generators with energy efficient systems.
- Policy 9:** Encourage, promote and support biogas utilization.
- Policy 10:** Continue to work collaboratively with all potential partners to explore new clean, renewable and cost efficient forms of energy as they emerge.

**Goal 1 Implementation Measures:**

- a. Create a review system that rewards developments that incorporate energy efficient systems or go beyond basic code requirements.
- b. Identify zoning and other code barriers that inhibit the use of the latest energy technologies.
- c. Modify standards to encourage alternative materials, more shade and smaller footprints for parking lot construction.
- d. Implement and periodically update the Biogas Utilization Master Plan recommendations.
- e. Work collaboratively with utility companies, other jurisdictions, the University of Arizona and other potential partners to reduce energy consumption and increase the use of clean energy systems and decrease reliance on fossil fuels in the region.

**Goal 2: Ensure that infrastructure, facilities and services planning is sensitive in character and location with historic resources and environment**

**Policy 1:** Coordinate with utility companies and other public service providers when planning infrastructure, facilities and services to facilitate that infrastructure and facility construction is sensitive in design and location to environmental and historic resources.

**Goal 2 Implementation Measure:**

- a. Coordinate with utility companies and infrastructure providers to facilitate design integrity with its surroundings.

Tradeoffs for Water, Energy Production and Economic Development

The development and implementation of renewable energy opportunities, efforts and projects can present significant challenges in ecosystem and water management and ecosystem tradeoffs, such as the large amount of energy required to pump and deliver water supplies.

Alternative clean energy sources may be utilized to operate pumps and supply water to agriculture and livestock. There is a direct correlation between the consumption of water and energy. Power plants require water for cooling, some of which is lost in the process, and energy is required to pump, move and treat water.

While some solar energy systems are water efficient by relying on processes that conserve water, others require large amounts of water for cooling and therefore are not consistent in a desert environment where water conservation is a priority.

For carbon footprint reduction, see 4.7 Public Buildings and Public Facilities Element.

**Goal 3: Minimize tradeoffs for human populations, energy production, habitat and economic development**

**Policy 1:** Balance energy production and economic development with available water and environmental resources.

**Policy 2:** Align energy and utility corridors with existing infrastructure, where feasible and appropriate, while minimizing natural environment disturbance.

**Goal 3 Implementation Measure:**

- a. Work with energy providers and regulators to minimize environmental and economic impacts.

### Energy to Support Economic Development

Receiving an annual average of 296 sunny days, the region was identified by the National Renewable Energy Laboratory (NREL) as one of the highest direct normal solar energy resources in the United States. Combined with the location of a major university, the establishment of the Arizona Research Institute for Solar Energy, the identification of the region as one of the best areas in the nation for solar energy production, and the draw for corporations to relocate here as a way to attract quality employees, Pima County is well positioned to offer opportunities to the emerging solar energy industry.

Local utility companies focus on providing energy services while maintaining and managing the electrical infrastructure that serves Pima County residents.

In 2010, Tucson Electric Power (TEP) began construction of the first solar photovoltaic array at the UA Solar Zone at The University of Arizona Tech Park (UA Tech Park). Today, the 200-acre parcel has become the centerpiece that could make the region a leader in solar energy production and innovation. The UA Solar Zone is currently the largest multi-technology solar generating facility in the world where different types of the latest solar technologies are being tested for energy, storage capacity and water efficiency. Energy production and distribution in Solar Zone facilities is managed by TEP. Over 300 MW of solar will be integrated within the TEP grid by 2014, which is the highest per capita solar in the nation.

### **Goal 4: Encourage the development of new supplies of energy particularly renewable energy in a redundant system to support economic development**

**Policy 1:** Strengthen partnerships with utility companies, The University of Arizona and other jurisdictions to lead efforts in establishing energy and renewable energy system production and innovation in the region to meet the energy needs of new and emerging industry.

**Policy 2:** Support utilities in creating redundancy in distribution for a reliable supply of energy.

## 4.4 Wastewater Treatment Element

The Pima County Regional Wastewater Reclamation Department (RWRD) provides design, management and maintenance of the sanitary sewer system including conveyance and treatment systems. The extension of sewer lines is the most significant public works infrastructure tool the County has to guide growth and development into suitable areas.

### **Goal 1: Efficiently manage and operate the County's wastewater system**

**Policy 1:** Enhance opportunities for aquifer recharging at the water reclamation facilities to:

- a) Increase our existing water supply; and
- b) Diversify our regional water resources.

**Policy 2:** Support future sewer system expansions into regional growth areas.

**Policy 3:** Encourage growth in areas with or in close proximity to existing infrastructure.

**Policy 4:** Utilize existing right-of-way for the placement and realignment of public sewer systems while preserving environmentally sensitive areas through a coordinated approach.

**Policy 5:** Continue to support development of regional economic opportunities and new development through well planned, infill sewer system capacity expansions.

**Policy 6:** Continue to improve operational efficiencies to reduce costs.

**Policy 7:** Periodically review policies that recover costs associated with new development to ensure that growth pays for itself.

**Policy 8:** Continue to monitor emerging technologies in wastewater and consider new technologies that improve cost and operational efficiencies within the public sewer system.

**Policy 9:** Incorporate emerging technologies and alternative design and construction practices into guidelines and standards that facilitate new development.

**Policy 10:** Include land use planning in the evaluations and planning for sewer system expansions.

#### **Goal 1 Implementation Measures:**

- a. Integrate land use planning changes into sewer system planning.
- b. Establish strategies to support growth close to existing sewer infrastructure and feasible extension of infrastructure to Focused Development Investment Areas.
- c. Continue to explore opportunities for aquifer recharge via water reclamation facilities.
- d. Assure that sewer conveyance system extensions are undertaken with priority to Focused Development Investment areas.

## 4.5 Environmental: Air Quality and Solid Waste Element

This element meets the state requirement for the portion of the Environmental Planning Element addressing Air Quality. Other aspects of the required element (Water Quality and Natural Resources) are addressed elsewhere in the plan and are so identified.

### Air Quality

Pima County Department of Environmental Quality (PDEQ) monitors ambient (outdoor) air pollutants throughout eastern Pima County. There are six criteria pollutants that are monitored in accordance with the National Ambient Air Quality Standards (NAAQS) set by the Environmental Protection Agency (EPA) to comply with the Federal Clean Air Act.

PDEQ issues air quality operating permits to facilities known as Stationary Sources which may be any building, structure or installation subject to regulation which emits or may emit air pollution. These facilities must comply with the conditions in their operating permits to limit air pollution. Other sources of air pollution include Fugitive Dust, Asbestos and Open Burning, which are also regulated by PDEQ.

The EPA has initiated an evaluation of the current ozone standard to determine if it sufficiently protects public health and the environment. If the standard is changed in the future, Pima County may be in nonattainment. Were that to happen, the County would need to develop an air quality control plan to reduce emissions to return the area to compliance.

### **Goal 1: Continue to monitor and reduce ambient (outdoor) air pollutants throughout eastern Pima County**

- Policy 1:** Update and amend as needed County ordinances related to monitoring and reducing air pollutants.
- Policy 2:** Continue to enforce and monitor all applicable permits and standards to reduce air pollutants in Pima County including fugitive dust, asbestos and open burning.
- Policy 3:** Work collaboratively with the Pima County Health Department to identify strategies to reduce adverse health impacts related to air quality such as recent increases in Valley Fever and other respiratory diseases.
- Policy 4:** Encourage land use patterns and transportation alternatives (walk, bike, and ride) that support the reduction of automobile emissions.

#### **Goal 1 Implementation Measure:**

- a. Continue to Implement existing dust, asbestos and open burning regulations and periodically update County ordinance related to reducing air pollutants.

Waste Removal, Recycling and Solid Waste

**Goal 2: Waste removal, recycling and solid waste are efficiently and safely managed to protect public and environmental health**

- Policy 1:** Continue to identify safe and efficient strategies and promote educational programs for waste removal, reduction, repurposing and recycling.
- Policy 2:** Ensure that hazardous and non-hazardous wastes are managed in an environmentally sound manner.
- Policy 3:** Encourage resource recovery from waste materials through suitable incentives and efforts.
- Policy 4:** Provide remedial responses and/or provide oversight to the uncontrolled releases of hazardous and petroleum substances into the environment.
- Policy 5:** Continue to work collaboratively with all service providers in the provision of solid waste and recycling services.
- Policy 6:** Consider revenue and/or amenity generating opportunities for the utilization of closed landfills for other appropriate land uses such as parks and open space.
- Policy 7:** Secure financial resources to comply with regulatory requirements in landfill closure activities.

**Goal 2 Implementation Measures:**

- a. Continue to enforce the Waste Hauler Program which requires inspection of septic tank cleaners, liquid waste haulers and pumper trucks on an annual basis.
- b. Continue to safely and efficiently implement the Waste Tire Program.
- c. Assure that all jurisdictions in the region cooperate to establish and financially support a Regional Household Hazardous Waste program.
- d. Develop and update periodically a public education program to educate the public about all County waste removal programs and the benefits of recycling.

## 4.6 Communications Element

### Communication Networks

The Pima County Wireless Integrated Network (PCWIN) system enables 30 fire and law enforcement agencies from Tucson to Ajo, from Sahuarita to Mount Lemmon, and from the Rincon Valley to Avra Valley, to talk to each other by radio in real time on a single system, regardless of their jurisdiction boundaries. This program includes the following Pima County departments:

- Sheriff's Department;
- Office of Emergency Management and Homeland Security;
- Facilities Management Department;
- Information Technology Department;
- Finance and Risk Management Department;
- Procurement Department;
- Department of Transportation;
- Regional Flood Control District;
- Regional Wastewater Reclamation Department;
- Capital Improvement Project Office; and
- Real Property.

### **Goal 1: Improve countywide response time for fire services, law enforcement, agencies, critical facilities and County departments through the Wireless Integrated Network and other emerging communication technologies**

**Policy 1:** Continue to implement the Pima County Wireless Integrated Network Plan.

**Policy 2:** Explore opportunities to improve the Pima County Wireless Integrated Network.

**Policy 3:** Co-locate fiber optic lines with other utilities as possible.

#### **Goal 1 Implementation Measures:**

- a. Work collaboratively with service providers to identify funding sources to include the latest communication technologies needed to provide critical services.
- b. Incorporate fiber network extension capabilities into major transportation corridor upgrade planning.

### New or Updated Communication Facilities

Fast, efficient, affordable and reliable communications networks, learning and collaborative technologies, and people-centric services – public, private, and hybrid – are fundamental to the County’s economic development and to its enhanced human infrastructure connectivity.

These networks, technologies and services are essential to the County’s and its citizen’s ability to meet social and environmental challenges and to seize forthcoming opportunities. They are where and how many of the County’s social, cultural, governance, and economic activities get done today, which will increasingly take place in the virtual realm.

The people’s ability to use these networks, technologies and services – as residents in communities, businesses, and cultural and educational organizations, and as economic and social actors – is increasingly important to everyday life.

### **Goal 2: Encourage and work to ensure universal access on a countywide basis to fast, efficient, affordable and reliable wireless and broadband communication networks, learning and collaboration technologies, and people-centric services that support economic development**

**Policy 1:** Support and participate in the countywide development of facilities that provide fast, efficient, affordable, equitable and reliable access to regional and community programs and services via wireless and broadband communication networks and learning and collaboration technologies.

**Policy 2:** Proactively explore and exploit opportunities to:

- a) Extend wireless and broadband communication networks;
- b) Learning and collaboration technologies; and
- c) People-centric services throughout the county’s communities and rural areas.

**Policy 3:** Promote and support the thoughtful use of new communication technologies such as:

- a) Wireless and broadband networks (including fiber networks);
- b) Learning and collaboration technologies; and
- c) People-centric services.

### **Goal 3: Explore the use of emerging, advanced communication networks and collaboration technologies**

**Policy 1:** Explore the use of emerging, advanced communication networks and collaboration technologies to:

- a) Enhance the County’s human-infrastructure connectivity; and

- b) Increase the capacity of the County and its people to anticipate, plan for and collaboratively meet social and environmental challenges and seize forthcoming opportunities.

**Goal 2-3 Implementation Measures:**

- a. Continuously evaluate the communication, learning and collaboration, and people-centric service needs of the County's residents, communities, businesses, cultural and educational institutions as a regular part of the comprehensive planning process.
- b. Procure, provide, and encourage the development of the latest emerging networks, technologies and services to meet the County's needs.
- c. Address changes in codes or ordinances as appropriate.

## 4.7 Public Buildings and Facilities Element

Like all local governments, Pima County owns or in some instances, leases, a vast inventory of both special use public facilities, and general office buildings, as well as physical plant, surface and subsurface infrastructure all of which must be maintained and periodically improved.

### Integrated Facilities Planning System

This Comprehensive Plan introduces the concept of an Integrated Facilities Planning System (IFPS) that includes an Integrated Monitoring System based on Level of Service standards, health impact assessments, and other techniques pertinent to the specific service rendered or facility constructed. The intent of the IFPS is to provide a more efficient and measurable planning process that allows for a comprehensive evaluation of infrastructure needs tied to the Capital Improvements Program (CIP). The intent in most cases is to create an interdisciplinary and collaborative method to plan and evaluate current county services, facilities and future improvements.

The IFPS and associated Monitoring System will be introduced to Pima County stakeholders. Stakeholders will have opportunity for input before the system becomes operational.

The use of the Integrated Facilities Planning System (IFPS) in coordination with the Capital Improvements Program (CIP) and other programs, as established by the County Board of Supervisors, will be the key implementation components of this Comprehensive Plan. The IFPS will rely on multi-department collaboration to ensure efficiencies, minimize cost, and better serve the community.

Pima County's Sustainability Program, managed by an interdisciplinary Steering Committee under the auspices of the Office of Sustainability and Conservation has effectively developed, updated and monitored an internal Sustainability Action Plan to make more efficient use of county facilities, reducing waste, energy, water and other resources. Lessons from the operation of the Sustainability Program can be employed in the establishment of the IFPS.

### **Goal 1: Explore the possibility of establishing a County-wide Integrated Facilities Planning System**

**Policy 1:** The Integrated Facilities Planning System will:

- a) Integrate land use decisions with transportation systems, flood control, infrastructure, library district, parks and recreation, safety, and other County services and facilities planning;
- b) Prioritize, schedule and identify funding for ongoing maintenance of County public facilities and infrastructure;

- c) Utilize the inter-departmental effort resulting in the Pima County Infrastructure Study as the framework to periodically assess the needs and deficiencies of each established planning area;
- d) Provide shared access among departments to databases to reduce duplication of efforts;
- e) Minimize costs, maximize resources and ease the process of grant writing and funding identification by working collaboratively;
- f) Rely on private/public partnerships for the provision of services, where applicable;
- g) Provide higher quality public facilities and services; and
- h) Assist in monitoring Comprehensive Plan progress.

Carbon Footprint Reduction



In 2007, the Board of Supervisors adopted the Pima County Sustainability Initiatives, Resolution No. 2007-84. This far-reaching resolution promotes creating and maintaining a sustainable community that supports individual well-being and opportunity, sound resource conservation and stewardship, and a strong and diverse economy for all of its residents.

The Pima County Board of Supervisors unanimously adopted the Sustainable Action Plan for County Operations (SAPCO) in August 2008 to implement the Sustainability Initiatives and in April 2012, the Board of Supervisors expanded the SAPCO by adopting the Health and Wellness Chapter.

Since 2008, the Sustainable Action Plan for County Operations (SAPCO) has been successfully implemented through the collaboration of County Departments and the dedication and volunteer efforts of more than 200 County employees. SAPCO addresses:

- Carbon footprint reduction;
- Renewable energy and energy efficiency;
- Green building and site design;
- Alternative fuel vehicles;
- Water conservation and management;
- Land conservation and management;

- Waste reduction;
- Green purchasing; and
- Health and wellness.

Since the Board of Supervisors adopted the Pima County Sustainability Initiatives Resolution in May 2007, County employees have achieved measurable improvements in the sustainability and efficiency of County government operations. With the aggressive implementation of all of the County's sustainability initiatives mentioned above, the County forecasts that it will actually generate less greenhouse gas in the year 2020 than in the year 2007, considerably reducing its carbon footprint.

## **Goal 2: Encourage, promote and support methods, principles and practices that result in carbon footprint reduction**

**Policy 1:** Continue to take a systematic approach to integrating the goals of sustainability into all facets of the way Pima County government operates by incorporating:

- a) Carbon footprint reduction;
- b) Renewable energy and energy efficiency;
- c) Green building;
- d) Alternative fuel vehicles;
- e) Water conservation and management;
- f) Land conservation and management;
- g) Waste reduction;
- h) Green purchasing;
- i) Health and wellness; and
- j) Site design.

**Policy 2:** Encourage new County development in the unincorporated areas of the County to reduce its carbon footprint by incorporating, where feasible and applicable:

- a) Renewable energy and energy efficiency;
- b) Green building methods and materials;
- c) Low Impact Development (LID) strategies of site design in suburban areas;
- d) Access to multimodal transportation to decrease reliance in automobile; and
- e) Pedestrian, bicycle and trail connectivity to increase health and wellness.

### **Goals 1 and 2 Implementation Measures:**

- a. Identify a systematic and effective approach to implement the IFPS.
- b. Continue to implement and update as needed the Sustainability Action Plan for County Operations.

- c. Comply with all applicable carbon footprint reduction, renewable energy, green building, water conservation, land conservation, waste reduction, green and healthy community principles adopted as part of the Pima County Comprehensive Plan.

### Public Facilities and Healthy Communities

A strong sense of community has been associated with improved well-being, increased feelings of safety and security, participation in community affairs and civic responsibility. A variety of strategies can incorporate public facilities mission with healthy community principles. These may include incorporation of arts and culture, grouping of public facilities that provide compatible functions, the integration of government facilities into mixed use projects, and the provisions of services to rural areas through existing or new multipurpose community centers.

### **Goal 3: Align County public facilities mission with healthy community principles**

- Policy 1:** Encourage new County facilities and the expansion of older facilities to be built to:
- a) Complement the scale, massing, character and identity of adjacent neighborhoods to create an authentic sense of place;
  - b) Incorporate courtyards, plazas, pocket parks, landscape amenities including shade trees, and public art to increase community interaction and create safety by design;
  - c) Group public facilities that provide complementary public services and have compatible functions to become a one-stop center to have multiple, cross-departmental benefits from such structures;
  - d) Incorporate horizontal and vertical mixed-use when designing new or expanding existing facilities to provide support services and retail to meet the needs of the community;
  - e) Be located in areas accessible by multiple forms of transportation (walking, biking, and transit);
  - f) Integrate pedestrian oriented features and bicycle facilities (parking, showers, etc.) to discourage automobile dependence and support healthy lifestyles;
  - g) Provide opportunities for farmers markets, healthy foods and community gardens, multipurpose community events;
  - h) Provide flexibility in the design of facilities to accommodate changing needs (meeting spaces, art studio space, temporary work space for small businesses and ventures, job and skill training, health programs, etc.); and

- i) Be consistent with the Maeveen Marie Behan Conservation Lands System (CLS) as applicable.

**Goal 3 Implementation Measure:**

- a. Prepare and adopt design guidelines based on healthy community principles for County public facilities.

## 4.8 Trails Element

The proposed regional trail system, as identified in the Pima Regional Trail System Master Plan is a blueprint for the development of a high quality, interconnected, multi-modal regional trail system in Eastern Pima County. The network will expand on the existing and planned river park system, and is intended to include natural tributary washes and upland segments, and road and utility rights-of-way that together will form an interconnected system linking urbanized areas with surrounding public preserves. Successful implementation of the Pima Regional Trail System Master Plan will require a collaborative effort between Pima County, local jurisdictions and land managing agencies.

Pima County is developing The Loop around metro Tucson with links to Marana, Oro Valley, Sahuarita, Green Valley and South Tucson. Pima County residents and visitors can enjoy more than 100 miles of shared-use paths that have already been completed.



*The Loop, Pima County, Arizona*

**Goal 1: Continue to support the development of a high quality, integrated and multi-use countywide trail system**

**Policy 1:** Continue to prioritize land acquisition to support the development of a high quality, integrated and multi-use countywide trail system.

**Policy 2:** Support and promote our natural resource-based trail system as a regional attraction promoting healthy lifestyles, economic development, and connectivity to a variety of destinations.

**Policy 3:** Implement the vision, goals and action plan identified in the Pima Regional Trail System Master Plan by:

- a) Providing a trails network throughout the region;
- b) Siting trails to ensure use does not conflict with natural and cultural resources;
- c) Expanding the system to connect recreation lands;
- d) Extending trails into urbanized areas where they are lacking;
- e) Creating connectivity between homes, schools, jobs and commerce;
- f) Increasing opportunities for interpretive experiences;
- g) Following all applicable standards and design considerations for trails; single-track trails; paths; river parks; greenways; enhanced bicycle/pedestrian corridors; trails parks; trail heads, entry nodes, boundary access points; crossings; signs; pedestrian districts; and pedestrian activity areas
- h) Accommodating all non-motorized users;
- i) Co-locating trails with other community facilities; and
- j) Including a Central Arizona Project (CAP) Loop Trail.

**Policy 4:** Continue to Require dedication of trails identified in the Pima Regional Trail System Master Plan as a condition for rezoning approval.

**Policy 5:** Encourage separation of trail corridors from wildlife corridors unless the trail corridor can be sited in a manner that poses no adverse impacts to native and migratory life.

**Policy 6:** Protect trail corridors that link individual public lands, connect public lands to existing or planned river parks, create local trail linkages to parks, schools and activity centers, or provide public access to established public lands trails.

**Policy 7:** Dedicate regulatory flood-prone areas, which are dedicated drainage easements to the Flood Control District and which have been identified as candidate trails to allow additional uses such as recreational and equestrian activities.

**Policy 8:** Promote vehicular access to trail heads at public preserve boundaries based on a determination by the Natural Resources, Parks and Recreation Department.

**Policy 9:** Dedicate public road rights-of-way and associated parking and multi-use trail staging areas as a condition of rezoning or specific plan approval in those cases where road access to public land trailheads is deemed critical by the Natural Resources, Parks and Recreation Department.

**Policy 10:** Continue to require, per Code, that Residential Recreation Areas comply with the following:

- a) Ensure that these areas are available for the use and enjoyment of subdivision residents;
- b) Protect and enhance community health and quality of life;
- c) Require that new recreation areas meet the minimum standards for safety and efficacy; and
- d) Encourage residential multi-modal opportunities, public safety and appropriate connectivity among parks, neighborhoods and commercial areas.

**Goal 1 Implementation Measures:**

- a. Implement the Pima County Trail System Master Plan.
- b. Work collaboratively with citizens to complete and expand The Loop.



*Trail System, Pima County, Arizona*

Trail System, Transportation Modes, Healthy Communities and Economic Development



***Trail Connectivity to Vibrant Activity Centers***

The County recognizes the connection between physical activity and healthy bodies and minds. Trails contribute to healthy lifestyles, provide access and serve as alternate transportation modes. They provide connectivity from neighborhoods to diverse land uses, recreation areas and open space. Trails provide an opportunity to exercise, breathe clean air, and reduce mental stress. They also provide opportunities for residents and visitors to learn about the lush Sonoran desert. When appropriately branded, such trails attract visitors to the area and serve as economic development tools.

**Goal 2: Integrate trail system, transportation modes, economic development and land use patterns with healthy community principles**

**Policy 1:** Support and promote The Loop as a regional attraction promoting healthy lifestyles, economic development and connectivity to a variety of destinations.

**Policy 2:** Support and promote our natural resource-based trail system (the trails in Pima Regional Trail System Master Plan, including the Arizona Trail, Anza Trail, and CAP Trail) as a regional attraction promoting healthy lifestyles, economic development, and connectivity to a variety of destinations.

**Policy 3:** Encourage the utilization of the urban trail system as an alternate transportation mode to decrease reliance on automobiles, reduce air pollution, increase overall health and serve economic development functions.

**Goal 2 Implementation Measures**

- a. Periodically update the Pima Regional Trails System Master Plan.
- b. Identify funds and design a program for the provision of recreational and cultural programs and activities appropriate for parks and recreation facilities along the Historic Anza Trail and the Loop.



*Multi-use trails activating the streets.*

## 4.9 Flood Control and Drainage Element



Arizona Revised Statutes Sections 48-3601 through 48-3650 direct each Flood Control District Board of Directors to adopt and enforce floodplain regulations consistent with criteria adopted by the Director of Arizona Department of Water Resources. The floodplain regulations adopted by the District are intended to carry out the requirement of the national flood insurance program. The purpose of floodplain regulations is to comply with the directive of ARS 48-3609 and 44 CFR Chapter 1 pertaining to the National Flood Insurance Program, to promote and protect the health, peace, safety, comfort, convenience and general welfare of the residents within the jurisdictional area of Pima County; to minimize public and private losses due to flood conditions in specific areas; and to enable Pima County and its residents to participate in the National Flood Insurance Program, receive Federal Disaster Assistance, obtain flood insurance and reduce the cost of flood insurance.

The Pima County Regional Flood Control District strives to use forward-looking floodplain management practices to minimize flood and erosion damages for all county residents, property and infrastructure. Regionally, the District is involved in a variety of flood monitoring, flood control and natural resource management activities. It also performs floodplain management activities within unincorporated portions of Pima County. While the District is a regional authority, undertaking flood mitigation efforts throughout Pima County, it does not regulate floodplains within incorporated areas or on Tribal Nations.

County efforts to comply with and exceed National Flood Insurance Program requirements have been so successful that residents are currently eligible for up to a 25 percent discount on flood insurance. By pursuing the goals below, the County plans to improve performance under the Federal Emergency Management Agency (FEMA) National Flood Insurance Program Community Rating System, thereby reducing rates even further, and more importantly doing the best we can to protect public safety.

To accomplish this, the District in addition to being the official depository and interpreter of FEMA Flood Insurance Rate Maps, also maps floodplains and riparian habitat which FEMA is not aware of based upon better local knowledge of conditions and risks. For the purposes of this plan, these risks are reflected by "Resource Areas" as shown on the 13 Regional Hydrology maps included at the end of this Chapter. These maps depict known flood related risks and flood control resources and define the areas for which the resources area provisions apply. The mapped resource areas consist of FEMA and locally mapped floodplains as well as Pima County Regulated Riparian Habitat. For accurate interpretation of the boundaries and characteristics of these areas including the applicable regulations, the District shall remain the final authority and may modify the boundaries of and add to these areas as new information becomes available.

**Goal 1: Minimize flood and erosion damages for all County residents, property and infrastructure**

- Policy 1:** Continue to monitor, control and manage natural resources to minimize flood and erosion damages by implementing the Floodplain Management Ordinance and addressing the impact of development on flooding, erosion and riparian habitat.
- Policy 2:** Update and implement the Federal Emergency Management Agency (FEMA) approved Pima County Multi-Hazard Mitigation Plan.
- Policy 3:** Preserve washes with a base flood peak discharge equal to or greater than 100 cfs as well as existing riparian habitat including Pima County Regulated Riparian Habitat in their natural condition.
- Policy 4:** Administer flood control planning and design on an area-wide basis in conformance with the Watershed Management Plan/Critical and Balanced Basin Map.
- Policy 5:** Require that drainage improvements are consistent with the overall character of the area and do not create nor worsen existing drainage problems.
- Policy 6:** Design road crossings of washes to cross the floodplain with minor encroachment.
- Policy 7:** Continue to require private and public utility projects to conform to all applicable requirements of Title 16 of the Pima County Code including Section 16.30 regarding Riparian Habitat Mitigation Plans (RHMPs).

**Goal 1 Implementation Measures:**

- a. Require, when appropriate, avoidance of development in Resource Areas as identified in the Regional Hydrology maps including FEMA and locally mapped floodplains, and Pima County Regulated Riparian Habitat (PCRRH). Encourage use of Flood Control District Modified Development Standards or the Zoning Code Transfer of Development Rights to maintain similar yields while

maintaining these areas as open space in order to increase public safety, and reduce infrastructure investment, maintenance and insurance costs.

- b. Preserve riparian areas by using the Flood Control District Modified Development Standards located in chapter 18 of the zoning code or other strategies for transferring densities to areas of the property outside of floodplains and riparian areas.
- c. As new floodplain mapping is completed, either by the District, or by a developer, update the Resource Areas on the Regional Hydrology Maps to reflect this new information.
- d. Work with construction industry stakeholders to review current riparian habitat protection ordinance to identify barriers and obstacles to development and adjust ordinance as necessary to accommodate.

### Storm Water Runoff

Pima County manages storm water to ensure public safety through three regulatory mechanisms:

- The Pima County Regional Flood Control District, through the Floodplain Management Ordinance, addresses the impact of development on flooding, erosion and riparian habitat.
- The Department of Environmental Quality administers programs to address storm water quality.
- The Pima County Building and Zoning codes contain provisions establishing minimum standards for site grading, site drainage and design.

### **Goal 2: Manage storm water to protect lives and property, to reduce flood risk and to assure no adverse impact to adjacent or downstream properties**

**Policy 1:** Continue to require new development to comply with all applicable requirements of the Floodplain Management Ordinance addressing the impact of development on flooding, erosion and riparian habitat.

**Policy 2:** Continue to require all new development to comply with all applicable provisions establishing minimum standards for site grading, site drainage and design included in the Pima County Building and Zoning codes.

#### **Goal 2 Implementation Measures:**

- a. Work with stakeholders to update as needed, the Pima County Floodplain Management Ordinance.

- b. Ensure new developments provide maximum encroachment limits and require that the floodprone areas within those limits are located within separate parcels or easements that are set aside as open space.
- c. Work with stakeholders to update as needed the building and zoning code to include the latest green standards for grading and site drainage and design.
- d. Create and adopt a Watershed Management Plan which identifies the watersheds impacting Pima County, their drainage characteristics, regulatory and infrastructure needs.

### Drainage Integration

By utilizing watercourses, riparian and upland habitat, and recreation, better drainage design can be achieved. New guidelines under development address water harvesting and habitat mitigation and offer further opportunity for integration, particularly for drought response.

### **Goal 3: Integrate watercourses, riparian and upland habitat, land use, recreation and drainage to achieve healthy development patterns**

- Policy 1:** Work to resolve potential regulatory and interpreted conflicts between the Zoning Code and the Floodplain Management Ordinance.
- Policy 2:** Continue to require development to conform to adopted Pima County code provisions that integrate watercourse, riparian and upland habitat, land use, recreation and drainage
- Policy 3:** Encourage the incorporation of green streets standards that integrate watercourse, riparian and upland habitat, recreation, alternate modes of transportation, shade and landscape amenities, drought tolerant plants and drainage as a form of water harvesting in new development and allow for the natural filtration of flood and rainwater, where applicable.
- Policy 4:** Consider, where appropriate and cost effective, the use of Low Impact Development (LID) principles in neighborhood scale subdivision or commercial development.

#### **Goal 3 Implementation Measures:**

- a. Prepare appropriate green street guidelines and standards for urban, suburban and rural areas.
- b. Prepare voluntary Low Impact Development (LID) guidelines for neighborhood scale subdivision or commercial development transportation projects, parks projects, resource conservation projects and public buildings.

- c. Emphasize the importance of site planning to identify Resource Areas to be avoided, encourage compact development footprints, and establish thoughtful placement of water harvesting in order to provide multiple benefits.
- d. Continue to utilize “Drainage Standards for Detention and Retention” for all new commercial, including Pima County projects, and subdivision development.

## 4.10 Countywide Infrastructure Concurrency Element

The Pima County Concurrency Management System provides the basis for monitoring infrastructure impacts of land development and helps determine if infrastructure improvements are keeping pace with the prevailing rate of land development.

### **Goal 1: Update and expand the existing Concurrency Management System which guides development to areas with in-place or planned infrastructure**

**Policy 1:** Update the established Concurrency Management System to:

- a) Establish standards for determining the adequacy of infrastructure and services owned and operated by the County;
- b) Serve as a tool for infrastructure capacity monitoring and upgrades; and
- c) Inform the Integrated Facilities Planning System and the Capital Improvements Program.

**Policy 2:** Ensure that the Concurrency Management System review for rezonings (including requests for waiver of the platting requirements of zoning plans), specific plans and requests for time extensions or modification for existing rezoning and specific plans includes:

- a) Wastewater treatment and conveyance/reclamation facility capacity;
- b) Flood control infrastructure and drainage capacity;
- c) Water supply infrastructure and capacity;
- d) Transportation infrastructure and capacity;
- e) Park and recreation infrastructure service delivery capacity (to include multi-use trail system);
- f) School capacity impact analysis; and
- g) Cost of development;

**Policy 3:** Require infrastructure improvements to be provided concurrently with development.

#### **Goal 1 Implementation Measures:**

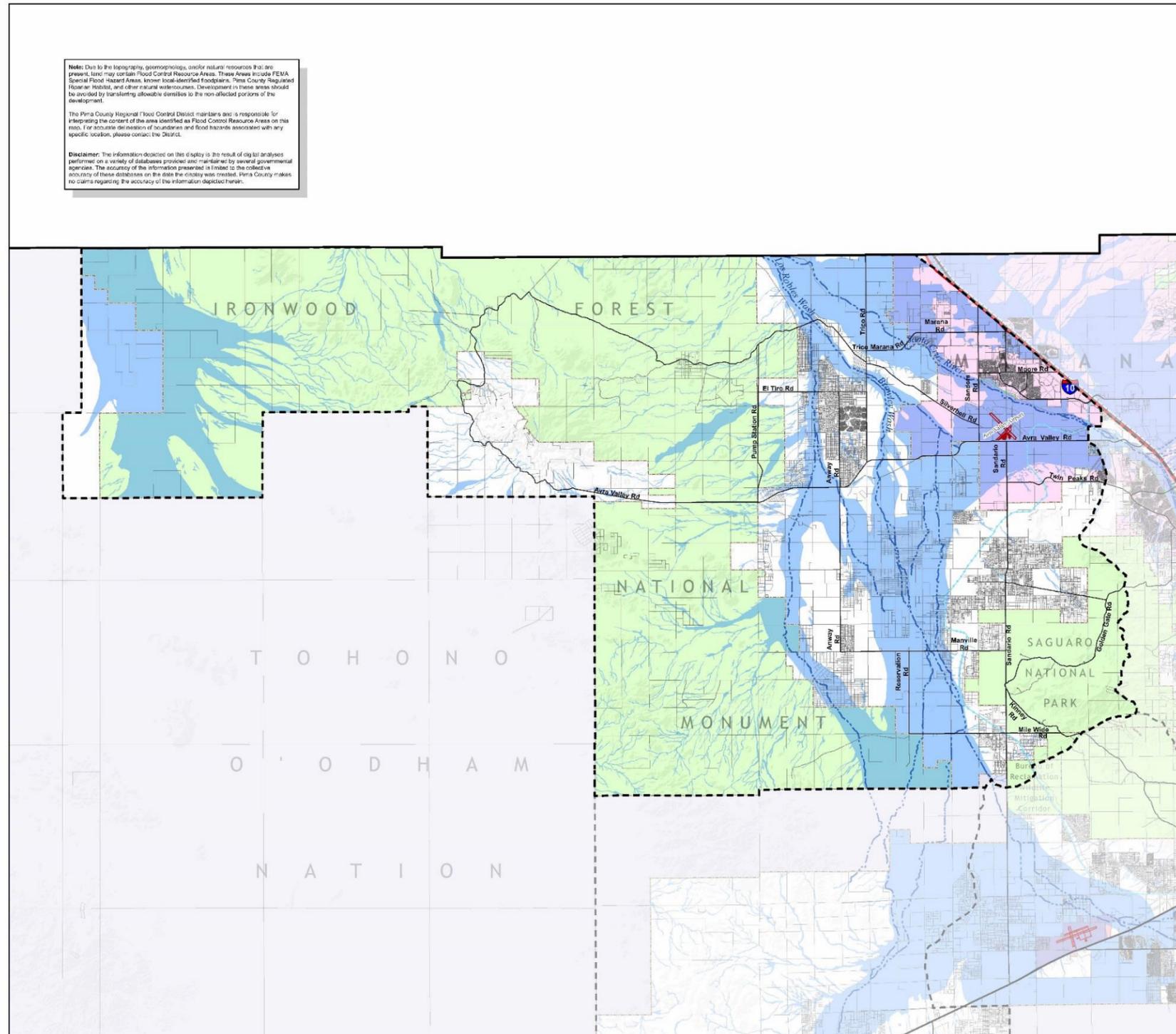
- a. Update and continue to implement the County Concurrency Management System cooperatively with planning, resource and infrastructure management departments.
- b. Consider updates to the Concurrency Management System addressing applicability to time extensions, waver of platting requirements of zoning plans and types of modifications of rezoning conditions.

- c. Work with stakeholders to update the Water Policy and Site Analysis Checklist Appendix A to provide clear guidance as to when, where, and how water supply impacts are to be mitigated, and to define when supply concurrency has been met.

Exhibit 4.9.1

Avra Valley  
Planning Area  
Regional Hydrology

October 17, 2014  
Second Draft



**Note:** Due to the topography, geomorphology, and/or natural resources that are present, land may contain Flood Control Resource Areas. These Areas include FEMA Special Flood Hazard Areas, known local-identified floodplains, Pima County Regulated Riparian Habitat, and other riparian watersheds. Development in these areas should be avoided by transferring allowable densities to the non-affected portions of the development.

The Pima County Regional Flood Control District members are responsible for interpreting the content of the area identified as Flood Control Resource Areas on this map. For accurate delineation of boundaries and flood hazards associated with any specific location, please contact the District.

**Disclaimer:** The information depicted on this display is the result of digital analyses performed on a variety of databases provided and maintained by several governmental agencies. The accuracy of the information presented is limited to the collective accuracy of these databases on the date the display was created. Pima County makes no claims regarding the accuracy of the information depicted herein.

Exhibit 4.9.2  
Tucson Mountains  
Planning Area  
Regional Hydrology

October 17, 2014

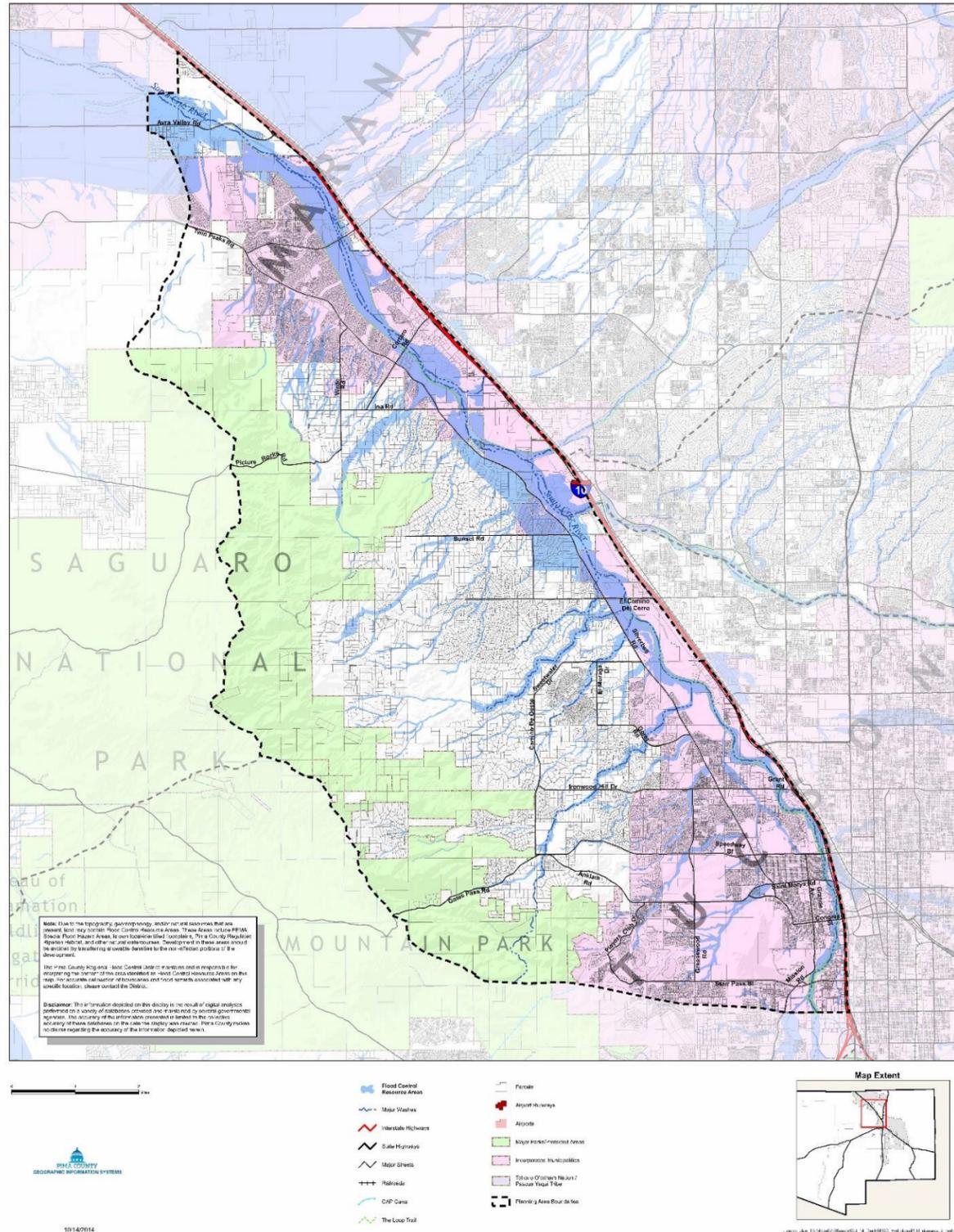


Exhibit 4.9.3

Southwest  
Planning Area  
Regional Hydrology

October 17, 2014

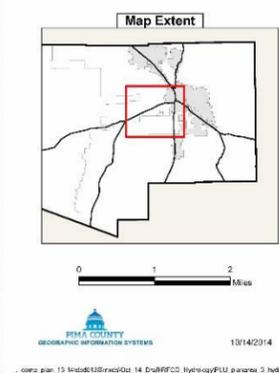
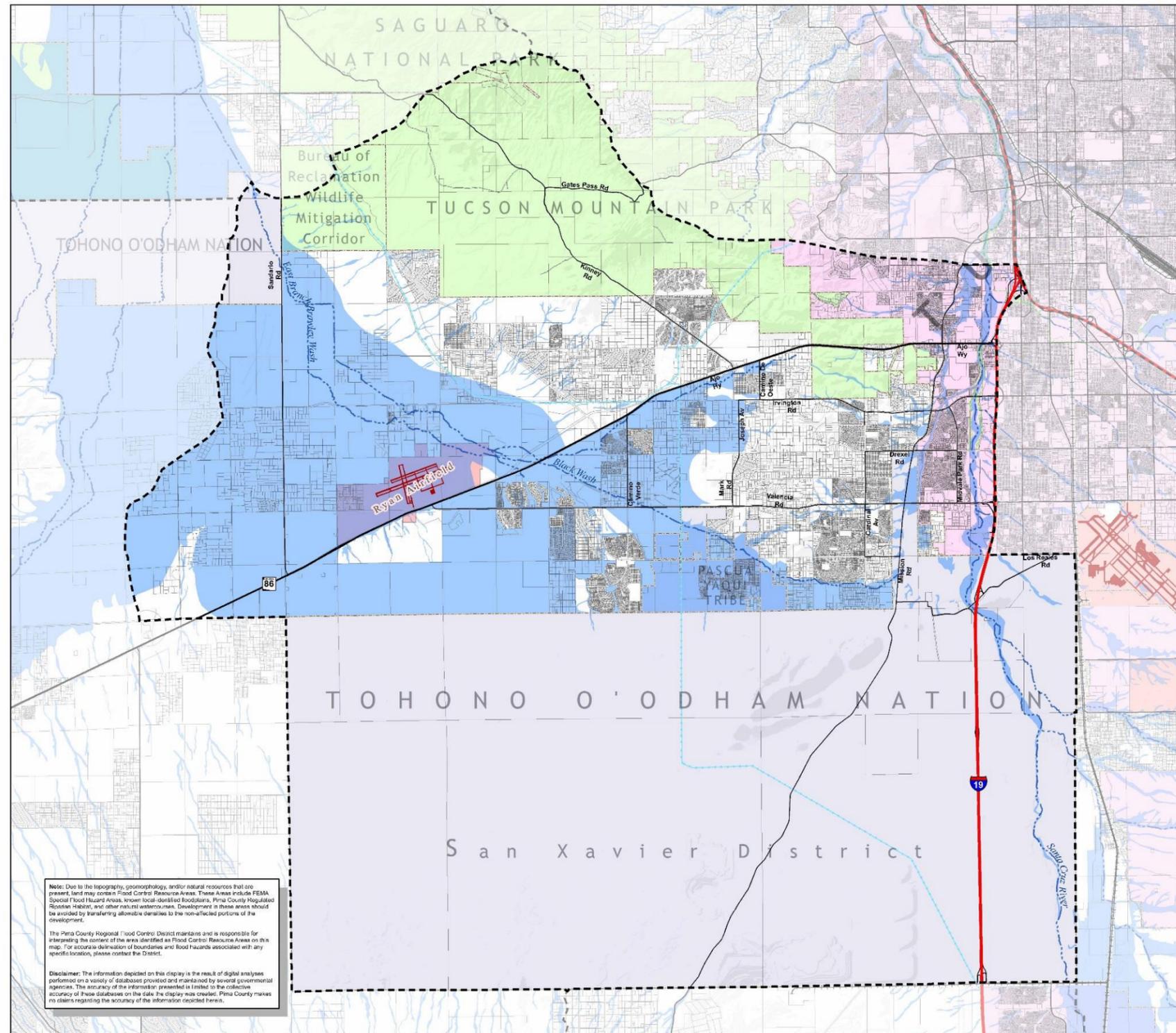


Exhibit 4.9.4

Altar Valley  
Planning Area  
Regional Hydrology

October 17, 2014  
Second Draft

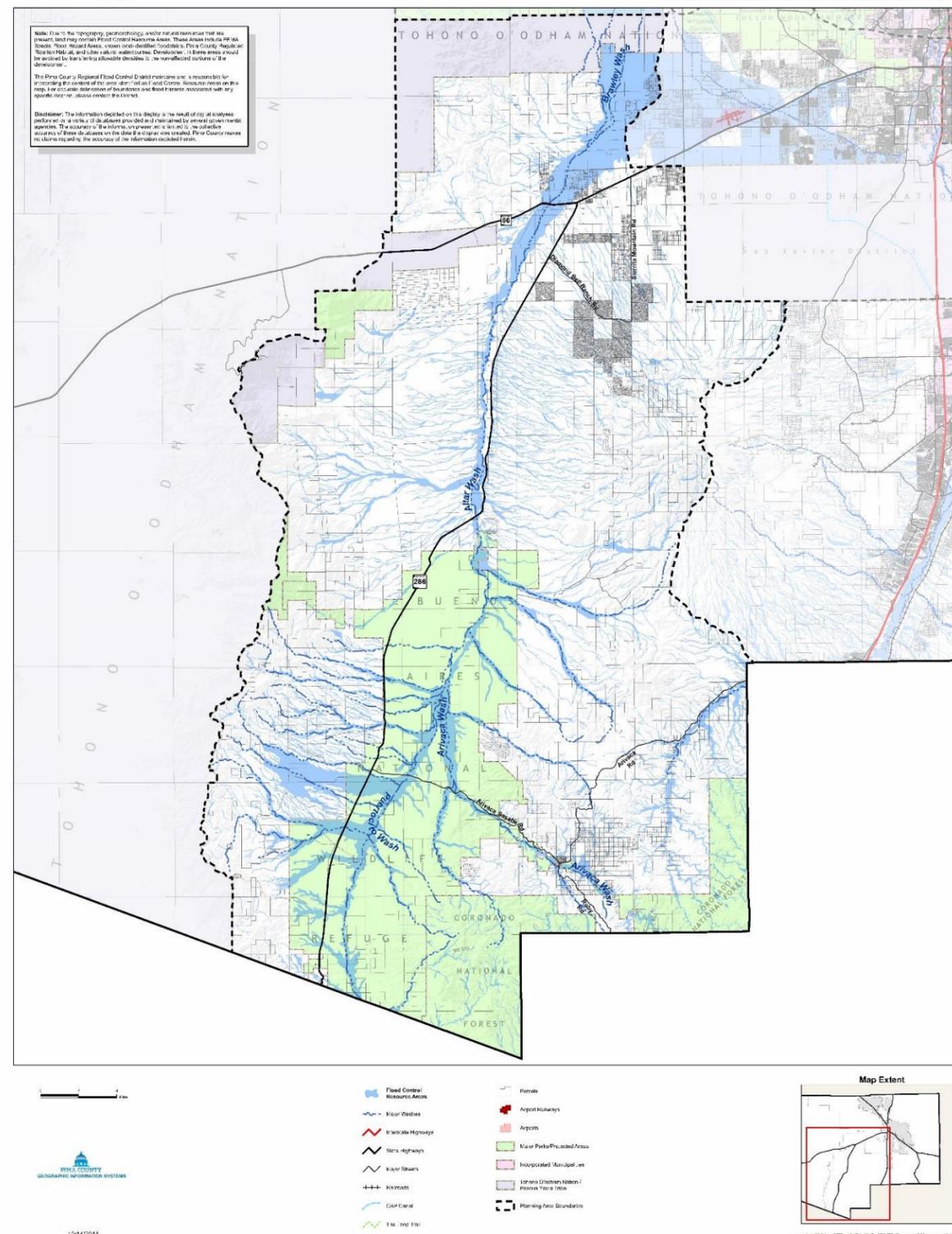
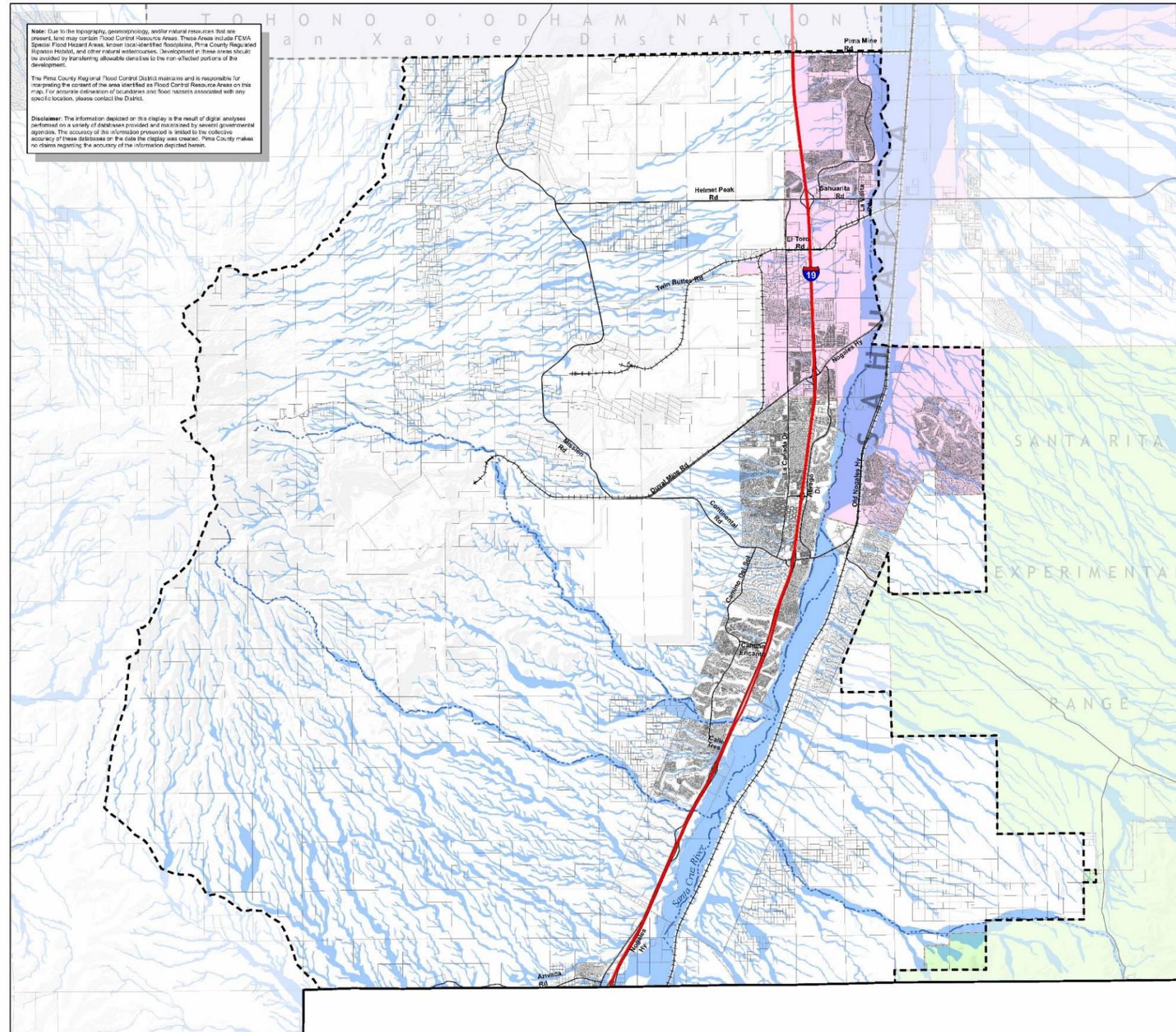


Exhibit 4.9.5

Upper Santa Cruz  
Planning Area  
Regional Hydrology

October 17, 2014



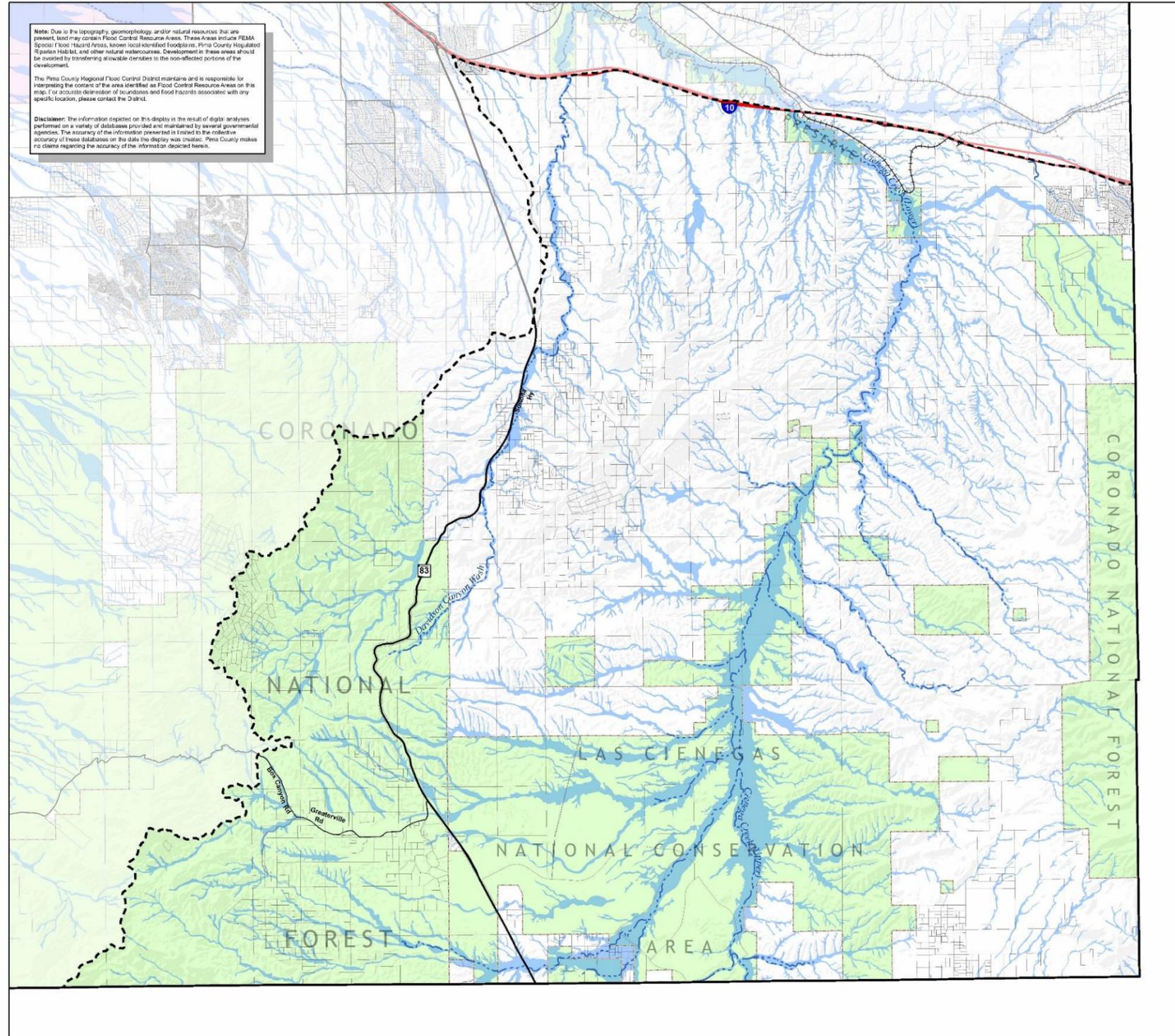


Exhibit 4.9.6

Mountain View  
Planning Area  
Regional Hydrology

October 17, 2014

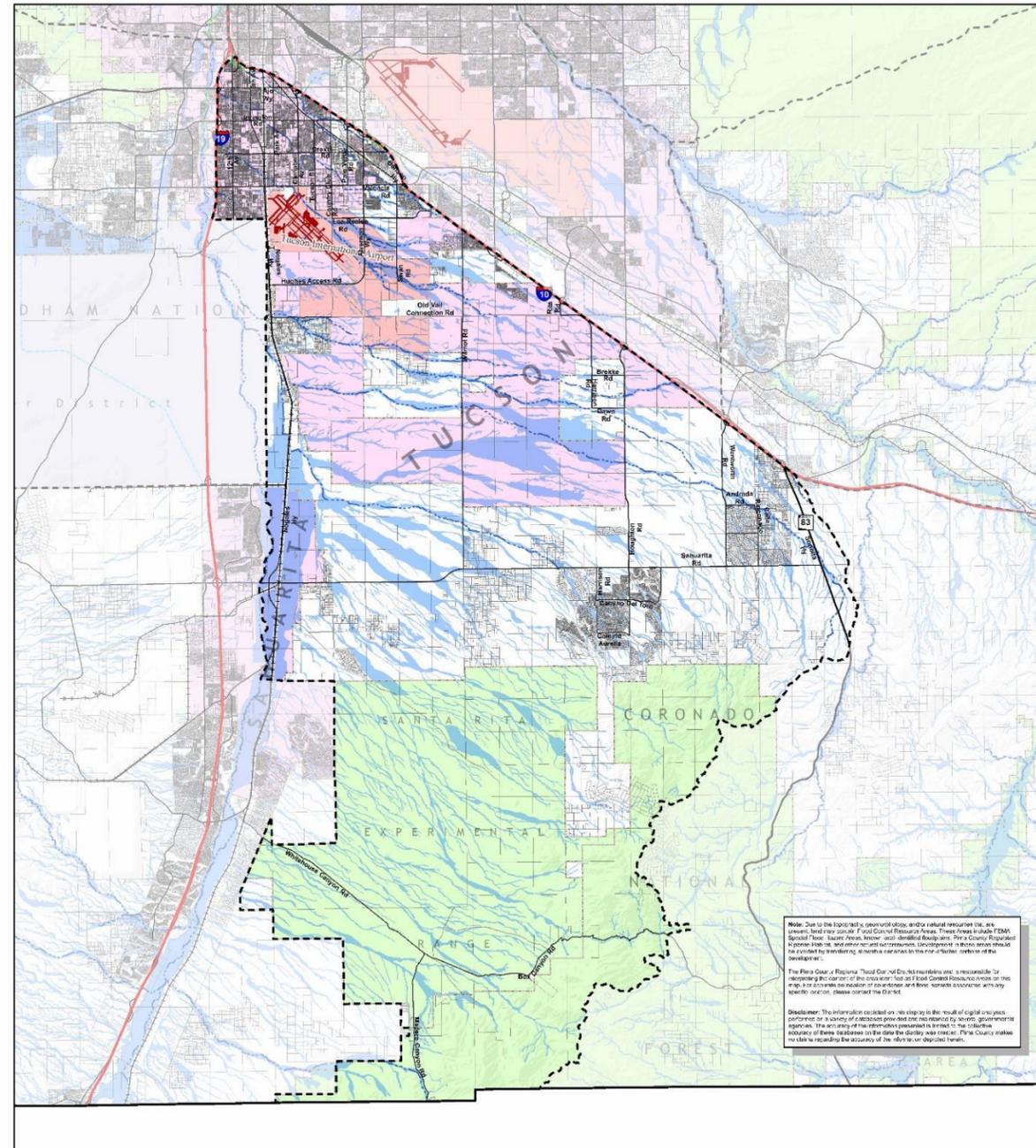
- Flood Control Resource Areas
- Major Washes
- Interstate Highways
- State Highways
- Major Streets
- Railroads
- CAP Canal
- The Loop Trail
- Parcels
- Airport Runways
- Airports
- Major Parks/Protected Areas
- Incorporated Municipalities
- Tohono O'odham Nation / Pascua Yaqui Tribe
- Planning Area Boundaries



Exhibit 4.9.7

Southeast  
Planning Area  
Regional Hydrology

October 17, 2014



Note: Due to the frequent change of data, and/or related resources, the information presented on this map is for informational purposes only. PIMA County does not warrant the accuracy of the information presented on this map. Users are advised to verify the information presented on this map with the appropriate agencies. The accuracy of the information presented is limited to the information available at the time the map was created. PIMA County makes no claim regarding the accuracy of the information depicted herein.

10/14/2014

**Map Extent**

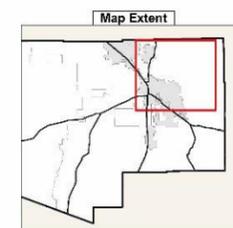
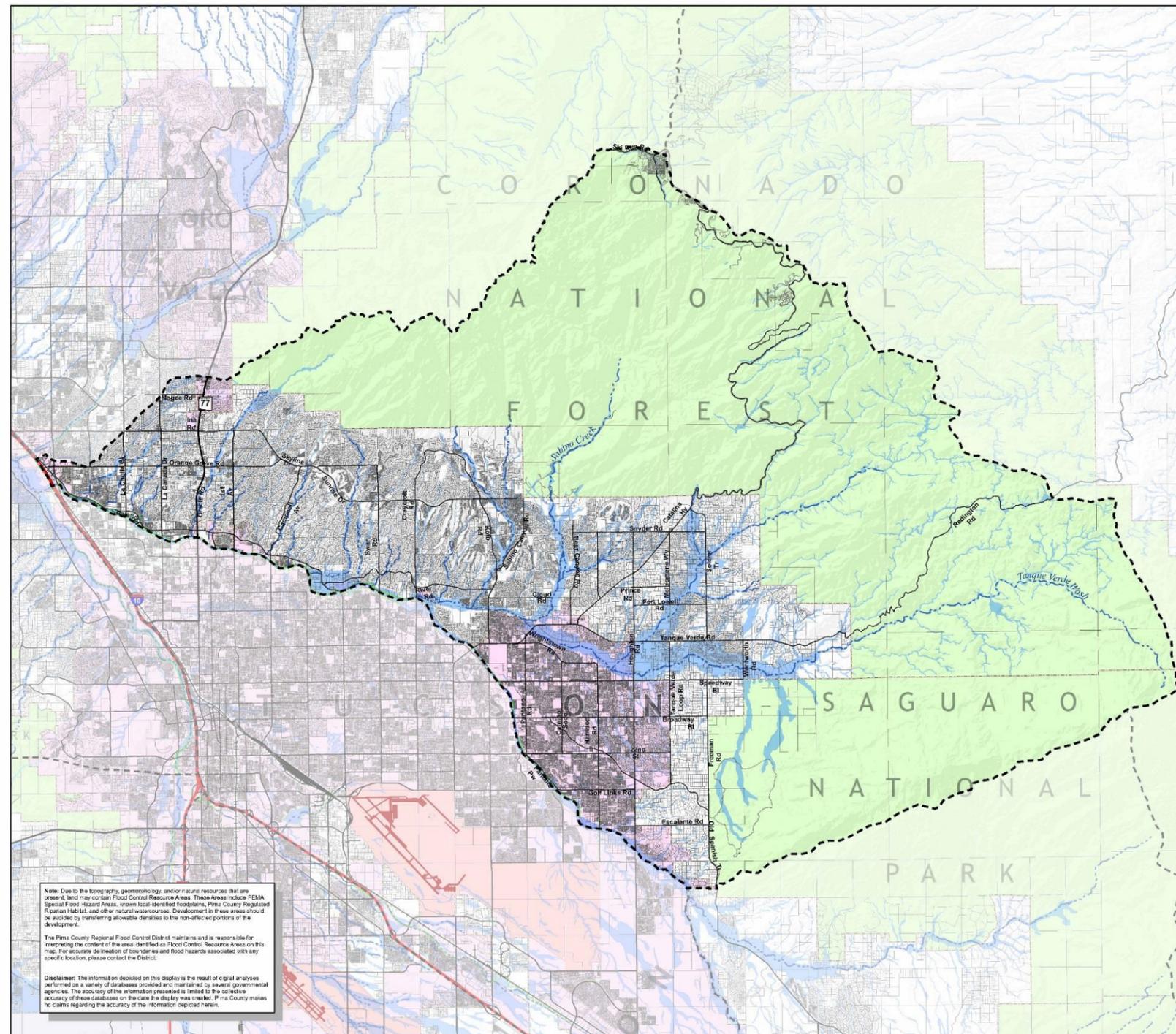
Legend:

- Flood Control Resource Areas
- Major Waterways
- Interstate Highways
- State Highways
- Major Streets
- Railroads
- CDP Canal
- Free Loop Road
- Water
- Airport Runway
- Airports
- Major Parks/Recreation Areas
- Incorporated Municipalities
- Tucson Ordinance "Water" Planning Year Title
- Planning Area Boundaries



**Exhibit 4.9.9**  
**Catalina Foothills**  
**Planning Area**  
Regional Hydrology

October 17, 2014  
Second Draft

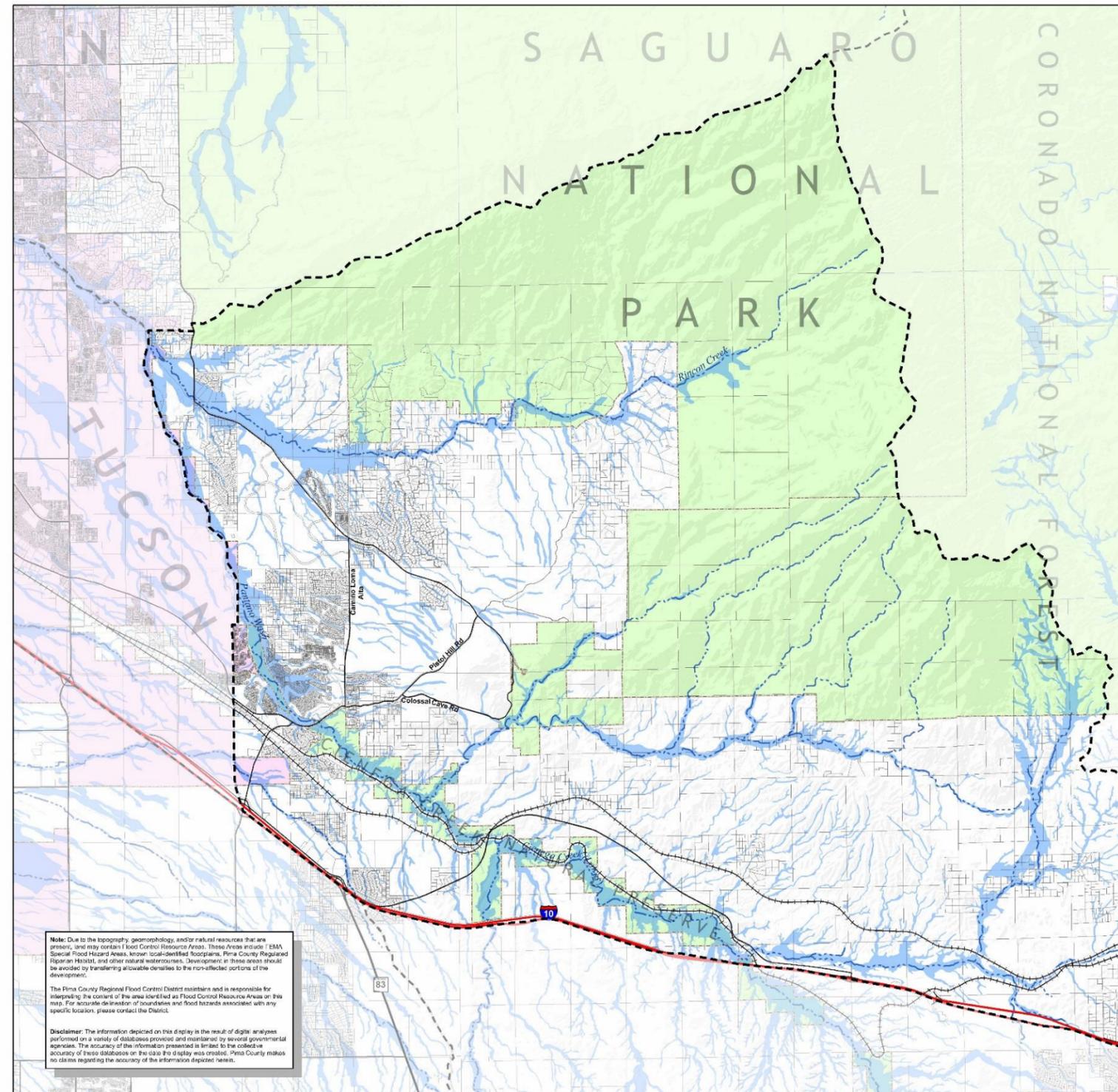


0 1 2  
Miles

Exhibit 4.9.10

Rincon Valley  
Planning Area  
Regional Hydrology

October 17, 2014



- Flood Control Resource Areas
- Major Washes
- Interstate Highways
- State Highways
- Major Streets
- Railroads
- CAP Canal
- The Loop Trail
- Parcels
- Airport Runways
- Airports
- Major Parks/Protected Areas
- Incorporated Municipalities
- Toxona O'odham Nation / Pasosoa Yaqai Tribe
- Planning Area Boundaries

**Note:** Due to the topography, geomorphology, and/or natural resources that are present, and may contain Flood Control Resource Areas. These Areas include FEMA Special Flood Hazard Areas, known local-identified floodplains, Pima County Regulated Riparian Habitat, and other natural watercourses. Development in these areas should be avoided by transferring allowable densities to the non-affected portions of the development.

The Pima County Regional Flood Control District maintains and is responsible for interpreting the content of the area identified as Flood Control Resource Areas on this map. For accurate delineation of boundaries and flood hazards associated with any specific location, please contact the District.

**Disclaimer:** The information depicted on this display is the result of digital analysis performed on a variety of databases provided and maintained by several governmental agencies. The accuracy of the information presented is limited to the collective accuracy of these databases on the date the display was created. Pima County makes no claims regarding the accuracy of the information depicted herein.

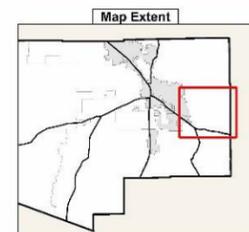
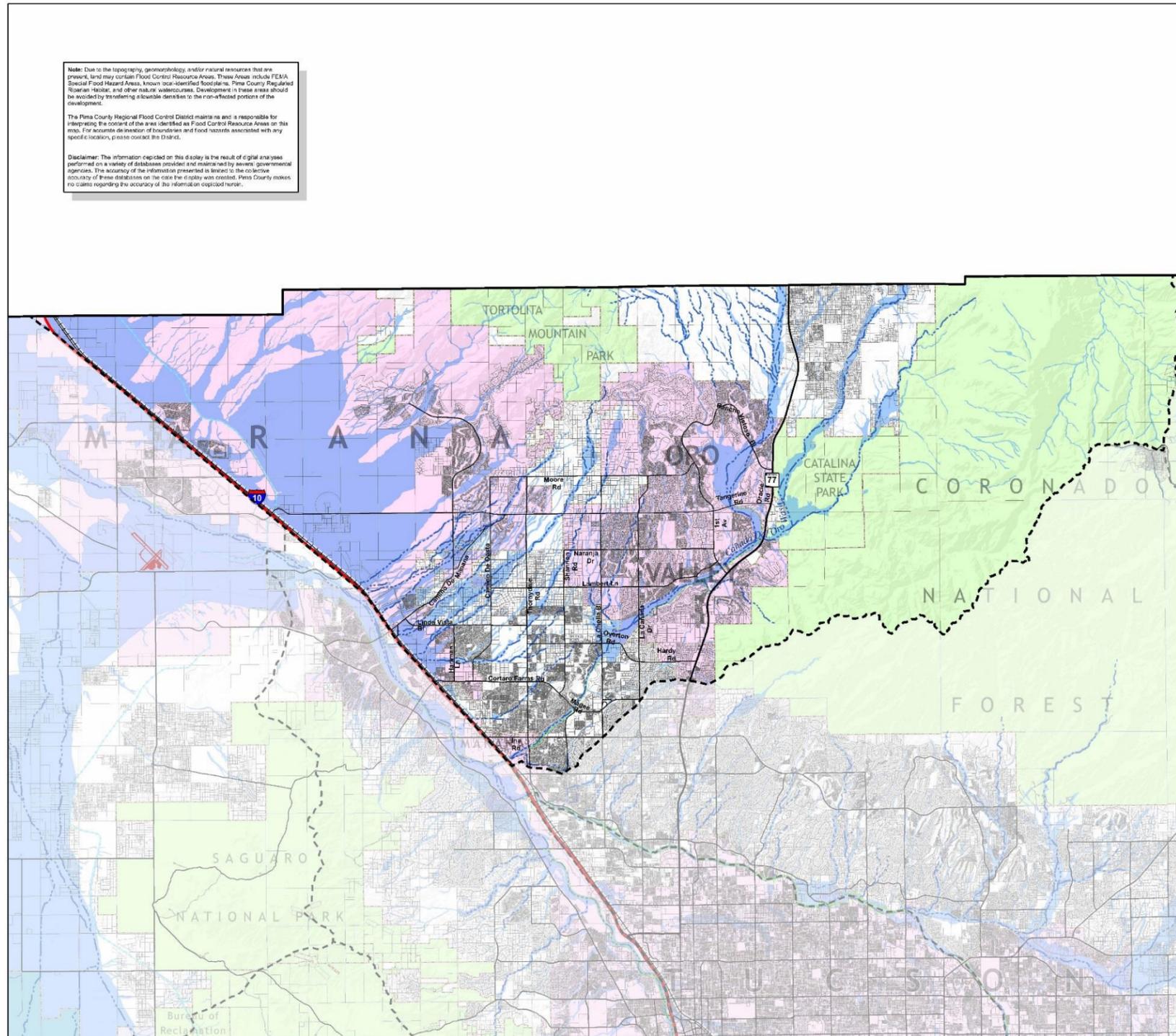


Exhibit 4.9.11

Tortolita  
Planning Area  
Regional Hydrology

October 17, 2014

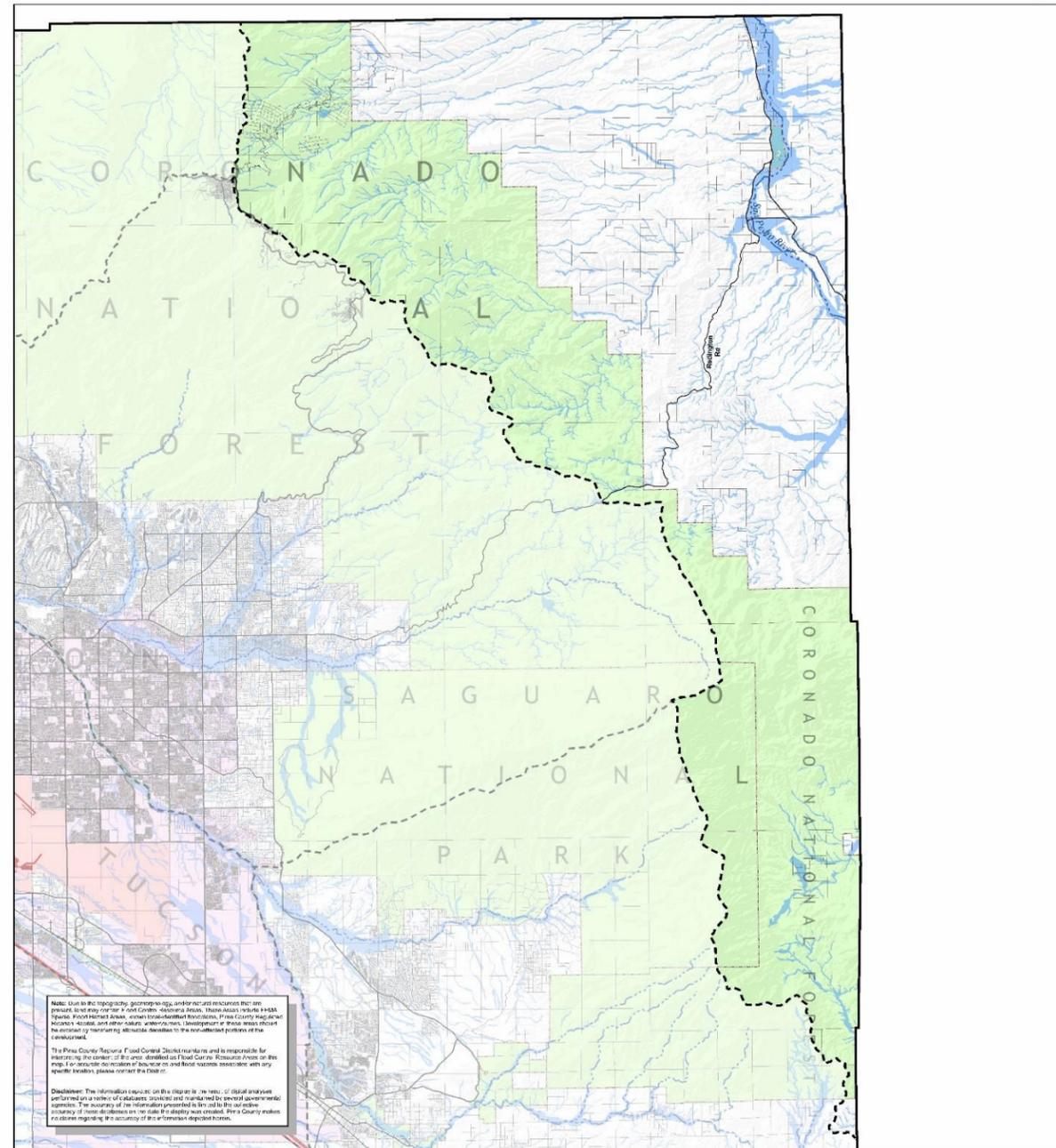


- Flood Control Resource Areas
- Major Washes
- Interstate Highways
- State Highways
- Major Streets
- Railroads
- CAP Canal
- The Loop Trail
- Parcels
- Airport Runways
- Airports
- Major Parks/Protected Areas
- Incorporated Municipalities
- Tohono O'odham Nation / Pascua Yaqui Tribe
- Planning Area Boundaries

Exhibit 4.9.12

San Pedro  
Planning Area  
Regional Hydrology

October 17, 2014



Note: Due to the topography, geology, and/or natural resources that are present in the region, certain areas are designated as Flood Control Resource Areas. These areas include, but are not limited to, flood-prone areas, areas with identified floodplains, areas with flood-prone soils, and other areas where the development of these areas should be restricted to minimize the potential for flooding.

The Pima County Regional Flood Control District maintains and is responsible for maintaining the center of the area identified as Flood Control Resource Areas on this map. For specific information on these areas, please contact the District.

Disclaimer: The information depicted on this map is the result of digital analysis performed on a series of data sources and is not intended to be used as a legal document. The accuracy of the information presented is limited to the best of our knowledge and is not intended to be used as a legal document. Pima County makes no claim regarding the accuracy of the information depicted herein.



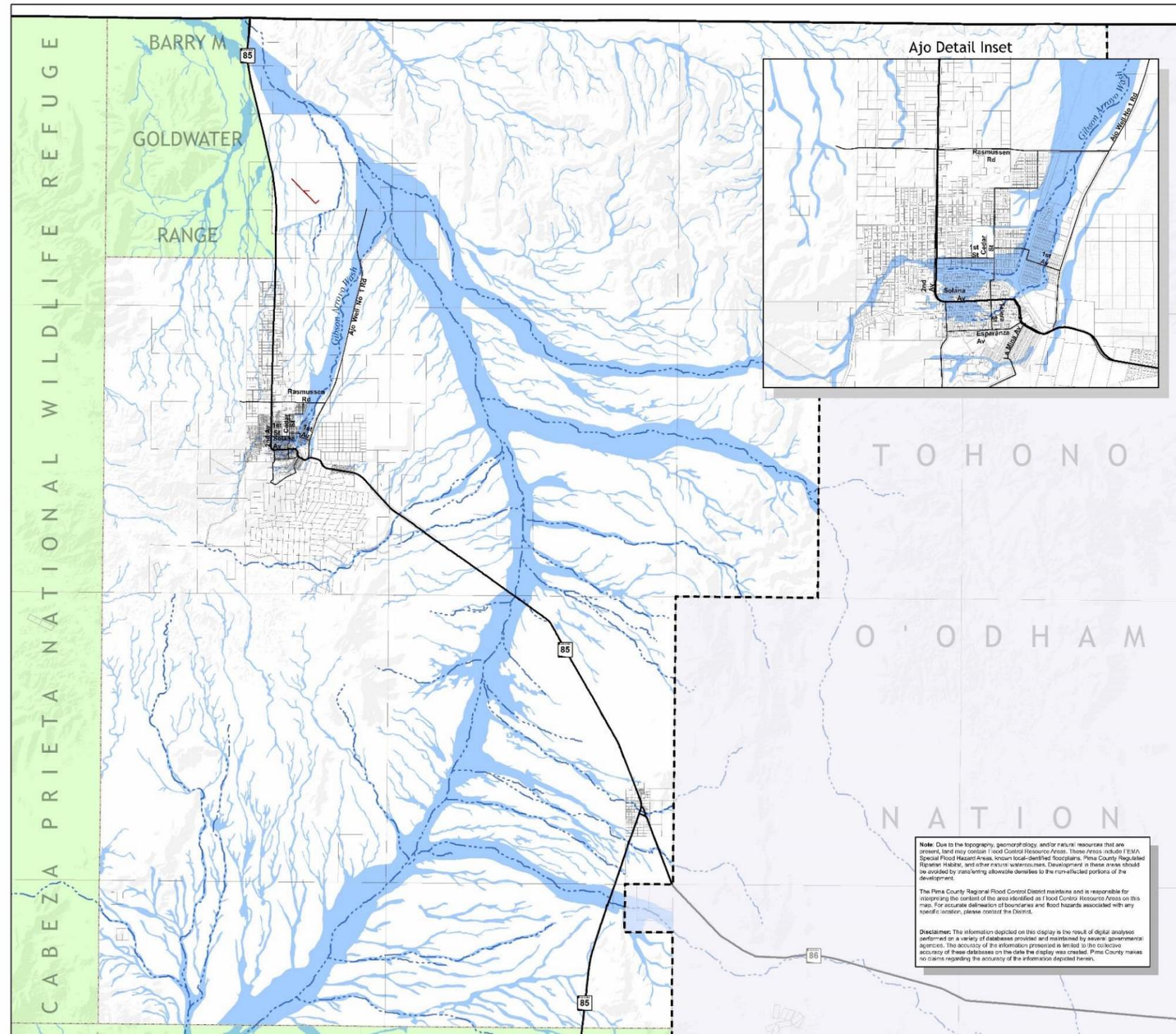


Exhibit 4.9.13

Ajo-Why  
Planning Area  
Regional Hydrology

October 17, 2014  
Second Draft