

**PIMA COUNTY
FLOOD CONTROL DISTRICT**

**PROPOSED 2004
FLOOD CONTROL BOND PROJECTS**

September 2003



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September 18, 2003

INTRODUCTION

The Pima County Flood Control District was established in 1979 after the Arizona Legislature authorized the formation of county flood control districts within the State of Arizona for the purpose of administering, constructing, and maintaining regional flood control systems within each county. The legislation was enacted in the wake of devastating floods, which caused enormous property damage and the loss of numerous lives throughout Arizona.

Since 1979, the Pima County Flood Control District (District) has been actively engaged in flood control and floodplain management activities to minimize flood damages and protect the public from risks associated with flooding and erosion. The District developed a unified regional approach for flood loss prevention through the use of structural flood control improvements and nonstructural floodplain management programs to address flood safety issues, reduce risks from repetitive flood damages, and provide flood control infrastructure that supports comprehensive land use goals including urban in-fill and preservation of natural floodplain functions.

REGIONAL FLOOD CONTROL GOALS AND OBJECTIVES

Flood control problems along the major water courses and drainage areas are often regional in nature and require a uniform approach to achieve control of flooding and erosion hazards. Due to the interconnectedness of the watercourse system within Pima County, regional flood control projects may not follow jurisdictional boundaries, and, in many cases, the improvements constructed in one jurisdiction may benefit a downstream jurisdiction. Factors that influence where regional capital flood control improvements may be needed include:

- Potential flood damage costs to the community, residential population and businesses;
- Protection of regional infrastructure improvements such as roadways and utilities;
- Minimizing future flood damage potential in developing areas; and
- Protection of older areas developed, prior to floodplain management regulations.

The regional goals and objectives of the District represent a balance of flood control and resource protection. In any comprehensive plan, certain approaches are more appropriate for specific instances, yet in an overall flood hazard reduction program, there must be a balance of nonstructural flood control measures and structural flood control measures.

FLOOD CONTROL NEEDS

The District's Capital Improvement Program (CIP) goal is to provide regional flood control projects that maximize public benefits and provide the greatest reduction for future flood damage.

Potential Community Flood Damage Costs

Flood control needs can be qualitatively determined based on the property value that may be subject to

future flood damage and the area of property within a regulated FEMA floodplain. The Federal Emergency Management Agency (FEMA) provides National Flood Insurance to residents and businesses nationwide. In Pima County, the number of flood insurance policies issued and the dollar value of the insurance varies by jurisdiction. The total value of private property covered by federal flood insurance within all of Pima County is \$594,326,000. The City of Tucson accounts for \$284,700,000 in value of coverage, or 47.90% of the total value, and the unincorporated area accounts for \$294,000,000 in value of coverage, or 46.11% of the total value. Marana has the next highest potential for damage with a coverage value of \$22,000,000.

Required Flood Control Infrastructure and Programs

Flood control infrastructure and programs to address structural and nonstructural flood control needs include:

- *Recovery.* Provide structural flood and erosion protection in areas degraded by past sand and gravel operations, landfills, and flood events; and mitigation to prevent repetitive damages.
- *Prevention.* Develop flood control infrastructure to prevent urban flooding including regional detention and storm drainage systems to remove existing development from federally regulated floodplains and other flood hazard areas. Separately from capital improvement projects to prevent flooding, the District also provides for operation and maintenance of flood control structures and floodplain management through building permit requirements.
- *Restoration.* Re-establishment of river systems and floodplains to restore floodplains, sediment balance, and riparian habitat to minimize erosion hazards, provide stormwater quality benefits and riparian corridors.
- *Preservation.* Acquisition of floodprone and riparian land to preserve natural floodplains, stream systems, and riparian habitat as a nonstructural approach to prevent future potential for flooding, erosion and degradation of the community's water resources and riparian habitat.

FLOOD CONTROL CAPITAL IMPROVEMENT PROGRAM

The District's early flood control Capital Improvement Program (CIP) was primarily in response to flood disasters that occurred in 1978, 1979, and 1983. Flood control improvements to address flood damage were provided using bond funds in the 1980s. These bond programs for flood control capital improvements provided \$20.6 million in 1979, \$63.8 million in 1984, and \$24.9 million in 1986. The 1984 Bond Program was developed in response to flood damage after the October 1983 Flood and provided \$63.8 million in local funding to match \$24.1 million in state and federal financial assistance for a total of \$87.9 million.

Voters' approval of the May 1997 Bond Program provided \$21,500,000 for flood control improvements for flood and erosion control along stretches of the Santa Cruz River that were not addressed after the 1983 and 1993 flood events, and for urban flood control improvements in areas that were developed before floodplain management guidelines were adopted.

In addition to these bond projects, the District also has projects funded by federal and state financial aid with the District providing a local share using the flood control tax levy revenues. These projects are referred to as non-bond projects in order to distinguish between the primary funding sources. These non-bond projects complement the bond projects by addressing additional segments of the Santa Cruz River and Rillito River and urban drainage, as well as providing for environmental restoration and floodprone land acquisitions.

River System Structural Recovery and Flood Damage Prevention Projects

- *FC-1 Bank Stabilization from Grant Rd. to Ft. Lowell Rd.* This 1997 bond project provides bank stabilization and is intended to be a continuation of river linear park improvements tied to the Santa Cruz River Park through downtown Tucson.
- *FC-3, Lower Santa Cruz Flood Levee.* This 1997 bond project provides a levee system for flood protection to an area of Marana that has historically experienced flood disasters.

River System Restoration Projects¹

- *FC-2 Santa Cruz River Valencia to Irvington Road.* This 1997 bond project with the United States Army Corps of Engineers, called Paseo de las Iglesias, extends from the north boundary of the San Xavier District of the Tohono O'Odham Nation to 22nd Street. This project is intended to provide bank stabilization, structural and non-structural controls, and environmental restoration along the Santa Cruz River.
- *Tres Rios del Norte and El Rio Antiguo.* These are two non-bond projects with the United States Army Corps of Engineers to plan and prepare feasibility studies for environmental restoration along the Santa Cruz River from Prince Road to Sanders Road (Tres Rios del Norte), and the Rillito River from Campbell Avenue to Craycroft Road (El Rio Antiguo).

Urban Drainage

- *South Central Tucson and the City of South Tucson.* Three 1997 bond projects are focused on controlling flooding in neighborhood areas (east of Interstate 10 and south of the Southern Pacific Railroad) within the urban core of the City of Tucson and South Tucson. The projects include FC-4 Mission Wash, FC-5 City of Tucson Drainage Improvements, and FC-6 South Tucson Drainage Improvements. Other urban flood control projects are located within Sahuarita, Oro Valley, and unincorporated urban areas such as Green Valley.
- *Arroyo Chico.* This is a non-bond project with the United States Army Corps of Engineers is being constructed as a two-phase project to provide flood control from Alvernon Road and 22nd Street to the Santa Cruz River along Arroyo Chico Wash, Railroad Wash, and High School Wash in the urban core of Tucson.

Preservation

- *Floodprone Land Acquisition.* Since the District created the Floodprone Land Acquisition Program (FLAP), approximately 12,000 acres of floodprone land have been acquired. Most recently, this program has been used to acquire properties within the Black Wash floodway and in the Upper Canada del Oro Wash after flood damages in August 2003. Preservation of floodplain areas have included the Old West Branch of the Santa Cruz River in the urban area and the Upper Santa Cruz River 100-year floodplain in Canoa Ranch.

A complete listing and status of all bond projects and non-bond projects is provided in Table 1. The project status indicates the task by project, ranging from planning, design, land acquisition, and construction.

¹Funding for these feasibility studies is provided by the District and United States Army Corps of Engineers; however, to construct the proposed improvements, it will require funding from Pima County general obligation bonds.

TABLE 1: STATUS OF BOND AND NON-BOND FLOOD CONTROL PROJECTS FY 1995/96 TO FY 2003/03

BOND PROGRAM PROJECTS

NON-BOND PROGRAM PROJECTS

Construction Status

Completed

FC-1 Santa Cruz Bank Stabilization: Grant Rd. to Ft. Lowell Rd.
 FC-3 Lower Santa Cruz Flood Control Levee
 FC-6 South Tucson Drainage Improvements
 FC-9 Green Valley Drainageway No. 9
 FC-11 South Tucson 4th Avenue Drainage
 FC-12 Fairview Limberlost
 FC-14a Tucson Diversion Channel Phase 1: Park Trails

Completed

FC-89-001 Rillito Creek Bank Stabilization
 FC-92-005 Phase 1 of Arroyo Chico: Randolph South Detention Basin
 FC-01-002 South Tucson: 10th Avenue Drainage
 FC-97-07 Santa Cruz River Study
 FC-98-002 and FC-98-006 Ajo Detention Basin Restoration and Wetlands
 FC-97-033 Highplains Recharge Project

Under Construction

FC-8 Oro Valley Drainage Improvements
 FC-10 Continental Vista

Under Construction

FC-00-005 Shannon Road: Palmdale Drainage

Design Status

Design - 50% or More

FC-13 Holladay/Forest Drainage
 FC-7 Sahuarita Drainage

Design - 50% or More

FC-97-009 Tanque Verde Creek: Sabino Canyon/Craycroft
 FC-92-005 Phase 2 of Arroyo Chico
 FC-00-004 Cortaro Mesquite Bosque

Design - 25% to 50%

FC-4 Mission View Wash
 FC-5 City of Tucson Drainage Improvements

Design - 25% to 50%

FC-98-005 Rillito River/ Swan Wetlands
 FC-87-046 Floodprone Land Acquisition

Design - 0% to 25%

FC-2 Santa Cruz River: Valencia to Irvington
 FC-14b Tucson Diversion Channel Improvements

Design - 0% to 25%

FC-00-001 Tres Rios del Norte -Rillito River Restoration

PROPOSED 2004 FLOOD CONTROL BONDS

The current planning for flood control capital improvements is based on regional plans for land use, flood control, floodplain management, and environmental protection that have been developed and adopted by Pima County and incorporated municipalities. For unincorporated areas, these documents include Pima County's 2001 Update to the Comprehensive Land Use Plan and the Sonoran Desert Conservation Plan. Similarly, comprehensive land use plans and flood control and stormwater management plans, for the City of Tucson, Oro Valley, Marana, South Tucson, and Sahuarita, identify specific flood control and floodplain management needs for existing and developing urban areas.

The District works with the City of Tucson and other municipalities in developing flood control elements that are suitable for the individual municipal land use plan and stormwater plans for flood control and floodplain management. The District's proposed capital improvement projects include flood control projects are located in Tucson, Marana, Oro Valley, Sahuarita, and South Tucson.

The proposed 2004 flood control bond projects would provide for:

- River system environmental restoration along the Santa Cruz River and Rillito River;
- River system flood and erosion control with linear river park improvements for Pantano Wash and the Canada del Oro Wash;
- Urban drainage improvements to address chronic flooding problems in existing urban areas; and
- Floodprone and riparian land acquisition to preserve floodplain functions and riparian habitat in urban and rural areas.

River System Environmental Restoration

Currently, the District is conducting feasibility studies with the United States Army Corps of Engineers for flood and erosion control, riparian restoration, and water resources along the Santa Cruz River and Rillito River. Essential components of the project address floodplain properties owned by the District along major rivers to provide expansion of riparian restoration and implementation of flood and erosion control measures to address public safety including channel stabilization and tributary drainage management. This project meets long-range plans for the major rivers and tributaries for the enhancement of floodplains and river systems, as well as providing corridors for riparian habitat and open space within the urban areas.

River Flood Control, Erosion Control and Linear Park Project

This project will continue the development of structural and nonstructural flood control and erosion control improvements along the Pantano Wash and the Canada del Oro Wash. This project meets the long-range goals for the major river systems to provide structural improvements to protect public infrastructure and private property, as well as providing a venue for future development of continuous river open space and trail systems in the urban areas.

Urban Drainage Infrastructure Project

This project is for critical flood prevention improvements that protect public safety through a combination of nonstructural and structural measures for flood control and erosion control to address long-standing flooding problems where residential and commercial properties have experienced repeated flooding and flood-related loss. These high priority urban drainage improvements for each jurisdiction will be based on municipal plans such as the City of Tucson's Tucson Stormwater Management Study, which meets regional land use goals to provide flood control infrastructure to support urban in-fill development.

Floodprone and Riparian Land Acquisition Project

This project promotes the purchase of floodprone and riparian properties in order to protect public safety and preserve natural floodplain characteristics. The regional goal is to provide adaptive floodplain management in urban areas and protect upper watershed areas. This program provides a cost-effective, non-structural strategy to remove people and property from exposure to flood hazards, preserve flood water storage capacity, reduce the need for structural flood and erosion protection, facilitate protection of water resources including groundwater recharge and water quality, maintain urban open space corridors, and preserve and enhance riparian habitat and corridors.

Pima County Bond Project Proposal

CIP Bond Program – May 2004
Bond Advisory Committee Presentation

Flood Control District



Pima County Bond Project Proposal

Flood Control District

2004 General Obligation Bond Proposal Summary

2004 GO Bond Authorization

River System Environmental Restoration Project	\$15,000,000
River Flood Control, Erosion Control, and Linear Park Program	\$7,500,000
Urban Drainage Infrastructure Program	\$27,500,000
Floodprone and Riparian Land Acquisition Program	\$10,000,000
<i>Total Proposal</i>	\$60,000,000

Pima County Bond Project Proposal

Flood Control District

River System Environmental Restoration Project

Scope:

Project long term goals include riparian restoration and flood hazard mitigation. Along the major rivers and tributaries in the metropolitan area. Currently planning and feasibility studies are underway with the U.S. Army Corps of Engineers for involving riparian restoration, groundwater recharge, flood control and recreational opportunities along the Santa Cruz River and Rillito River. Other essential components of the project address floodplain properties owned by the Flood Control District along major rivers to provide expansion of riparian restoration recreational opportunities and implementation of flood and erosion control measures to address public safety. Specific and critical sub-project efforts including land acquisition, riparian restoration, channel stabilization, groundwater recharge, and tributary drainage management are described in the addendum (See final page).

Location:

General : Santa Cruz River , Rillito River, Canada del Oro Wash, Tanque Verde Creek, Black Wash and Other Major Rivers and Tributaries

Justification/Benefit:

Meets long range plans for the Major Rivers and Tributary Corridors. Preserves and enhances floodplains and river systems as well as providing corridors of natural biological diversity, opportunities for preservation and recovery of Priority Vulnerable Species listed in the Sonoran Desert Conservation Plan, and provides recreational benefits for the community.

Cost Estimate:

This Project: \$20,000,000

Funding Sources:

\$15,000,000 General Obligation Bonds
\$5,000,000 Additional funding may be available from: Flood Control District Tax Levy and local jurisdictions.
Potential Funding: U.S. Army Corps of Engineers (65% federal : 35% local Flood Control District tax levy)

Project Duration:

Planning/Design/Procurement: 36 Months
Construction: 24 Months
Total: 60 Months

Project Considerations

Multi-jurisdictional Considerations:

Project footprint includes Town of Marana, City of Tucson, and Pima County, and includes in all Supervisor Districts.

Right-of-Way Impacts:

Not known at this time. Minimal right-of-way needs along Santa Cruz River and Rillito River.

Environmental Concerns:

Project goal is based on restoring riparian habitat.

O&M Impacts/Funding:

Operation and maintenance cost will be shared among all the local sponsors and are estimated to be \$80,000 annually.

Pima County Bond Project Proposal

Flood Control District

River Flood Control, Erosion Control, and Linear Park Program

Scope:

Evaluate, design, and develop structural and nonstructural drainage and erosion control improvements on Pantano Wash from 22nd Street to Kenyon Drive and Craycroft Road to Grant Road. Future develop continuous river park and trail systems including bike paths, walking paths, landscaping, restrooms, ramadas, and picnic areas along the Pantano that will join existing segments to create a continuous linkage from the confluence with the Rillito upstream to Houghton Road. Develop continuous river open space and trail systems including bike paths along the Cañada del Oro from La Cholla Blvd. to La Cañada Drive.

Location:

Pantano Wash –
22nd to Kenyon and Craycroft to Grant
Cañada del Oro Wash –
La Cholla Blvd. to La Cañada Drive

Justification/Benefit:

Meets long range plans of the River Park Master Plan. Meets long range river plans for Tucson, Marana, and the Town of Oro Valley. Protects public safety and residential and commercial development adjacent to river courses through structural and nonstructural drainage improvements. Enhances connectivity of major river system flood control features, open space areas, and linear park corridor system. Creates contiguous corridors of multi-use recreational opportunities, provides recreational and aesthetic benefits for the community, preserves and enhances corridors of natural biological diversity, and preserves areas of riparian habitat through acquisition.

Cost Estimate:

This Project: \$10,000,000

Funding Sources:

\$7,500,000 General Obligation Bonds
\$2,500,000 Additional funds from the
FCD Tax Levy

Project Duration:

Planning/Design/Procurement: 24 Months
Construction: 12 Months
Total: 36 Months

Project Considerations

Multi-jurisdictional Considerations:

Project footprints include Marana, City of Tucson, and Pima County, and includes, or is immediately adjacent to, all the Supervisor Districts.

Right-of-Way Impacts:

Not yet determined.

Environmental Concerns:

Project goal is based on providing drainage improvements and enhancing the linear river park system. Although some habitat may be impacted, mitigation and additional landscaping will be done to avoid adverse impacts.

O&M Impacts/Funding:

Not yet determined.

Pima County Bond Project Proposal

Flood Control District

Urban Drainage Infrastructure Program

Scope:

Evaluate, design, and construct drainage improvements that protect public safety through a combination of nonstructural and structural improvements that enhance flood control, erosion control. Develop structural and nonstructural solutions to long-standing flooding problems where residential and commercial properties have experienced repeated flooding and flood-related loss. Highest priority drainage reaches will be chosen in each jurisdiction based on methods similar to those used in the City of Tucson's "Tucson Stormwater Management Study" (TSMS).

Location:

City of Tucson: Columbus Wash; Arroyo Chico – Alvernon to Rosemont; Nebraska Wash; and various other TSMS priorities

Town of Oro Valley: Projects identified in Stormwater Management Plan

Town of Marana: Barnett Floodway Channel

Town of Sahuarita

City of South Tucson

Green Valley

Ajo

Justification/Benefit:

Alleviates chronic flooding, protects residential and commercial development adjacent to river courses, and safeguards flood protection benefits provided by currently existing facilities.

Provides flood control infrastructure to support urban in-fill development and Comprehensive Land Use Plan.

Cost Estimate:

This Project: \$35,000,000

Funding Sources:

\$27,500,000 General Obligation Bonds

\$8,000,000 from the FCD Tax Levy

Potential cost sharing with local jurisdictions

Project Duration:

Planning/Design/Procurement: 36 Months

Construction: 24 Months

Total: 60 Months

Project Considerations

Multi-jurisdictional Considerations:

Project footprints include numerous areas in the Green Valley, City of South Tucson, Town of Marana, City of Tucson, Town of Sahuarita, and includes all of the Supervisor Districts.

Right-of-Way Impacts:

Not yet determined.

Environmental Concerns:

Project goal is based on providing drainage improvements. Although some habitat may be impacted, mitigation will be done to avoid adverse impacts.

O&M Impacts/Funding:

Operation and maintenance cost will be the responsibility of the local jurisdictions.

Pima County Bond Project Proposal

Flood Control District

Floodprone and Riparian Land Acquisition Program

Scope:

Purchase floodprone properties in order to protect public safety and preserves natural floodplain characteristics. Purchase land or secure drainage and conservation easements where appropriate. Development floodplain and watershed management plans.

Adaptive floodplain management in urban areas to preserve floodplain, protect riparian areas, provide floodplain management, and stormwater quality benefits

Upper watershed protection in rural to preserve overbank flood storage, preserve floodplain characteristics, minimize future flooding and protect riparian areas

Locations:

First Priority Public Safety: Canada del Oro Wash; Tanque Verde Creek; Black Wash; Brawley Wash; Old Channel of the West Branch of the Santa Cruz River .

Second Priority SDCP Riparian "A List": Cienega Creek; Davidson Canyon Wash; Sabino Creek (near Coronado NF); and Bear Canyon Wash.

Third Priority SDCP Riparian "B List": Sutherland Wash; Tanque Verde Creek; Agua Caliente Wash ; Rincon Creek; Altar Wash .

Justification/Benefit:

Cost-effective strategy to remove people and property from exposure to flood hazards. Creates flood water storage capacity, minimizes flood damages, reduces the need for structural flood and erosion protection, facilitates groundwater recharge, creates passive-use recreational opportunities, maintains urban open space corridors, preserves and enhances riparian habitat and corridors of natural biological diversity, and meets the land acquisition goals of the Sonoran Desert Conservation Plan.

Cost Estimate:

This Project: \$12,000,000

Funding Sources:

\$10,000,000 General Obligation Bonds
\$2,000,000 Additional funds from the FCD Tax Levy

Project Duration:

Ongoing as funding and floodprone properties are available.

Project Considerations

Multi-jurisdictional Considerations:

Project footprints include numerous areas in the Green Valley, Town of Marana, City of Tucson, and includes all of the Supervisor Districts.

Right-of-Way Impacts:

None.

Environmental Concerns:

Project goal is based on reducing flood risks and preserving or improving natural floodplain function.

O&M Impacts/Funding:

Operation and maintenance cost are usually negligible, including the occasional cost of fencing or removing debris, and are the responsibility of Pima County Flood Control District.

Pima County Bond Project Proposal

Flood Control District

Addendum: Specific sub-project efforts critical to the overall success of Environmental Restoration Projects and Potential USACE projects.

Tres Rios del Norte Environmental Restoration Project

Land acquisition for Environmental Preservation and Restoration particularly within the reach between El Camino del Cerro and Ina Road.

Channel Stabilization Design and construct in-channel modifications (i.e.: pilot channels and grade control structures), channel bank terracing, and low flow erosion stabilization particularly within the SCR between El Camino del Cerro and Avra Valley Road.

Tributary Watersheds Design and construct modifications for tributary washes to provide detention basins to enhance storm water harvesting and alleviate drainage problems. Tributary watersheds to include Gardner Lane/Ruthrauff Basins and Interstate-10/Cortaro Farms floodplain.

Riparian Restoration Design and construct riparian vegetation and irrigation distribution system for plant irrigation within the study area. Including restoration along the Lower Santa Cruz River utilizing effluent from the Rillito and Marana Treatment Facilities.

Groundwater Recharge Transform abandoned sand and gravel pits into recharge basins.

Paseo de las Iglesias Environmental Restoration Project

Land acquisition for Environmental Preservation and Restoration Acquire land particularly within the reaches between Silverlake Road and Ajo Highway, Irvington Road to Valencia Road, the sand and gravel operation upstream of Valencia Road and properties along the Old West Branch of the Santa Cruz River.

Channel Stabilization Design and construct in-channel modifications (i.e.: pilot channels and grade controls) throughout the study reach. Design and construct channel bank terracing and stabilization particularly along the SCR between Silverlake Road and Ajo Highway and Irvington and Valencia Roads.

Tributary Watersheds Design and construct modifications for tributary washes to alleviate drainage problems and enhance water harvesting.

Riparian Restoration Design and construct riparian vegetation and irrigation distribution system for plant irrigation within the study area.

El Rio Antiquo Environmental Restoration Project

Land acquisition for Environmental Preservation and Restoration Acquire land particularly in the river bend area.

Channel Stabilization Design and construct in-channel modifications (i.e.: pilot channels and grade controls), channel bank terracing and stabilization throughout the study reach.

Tributary Watersheds Design and construct modifications for tributary washes to alleviate drainage problems and enhance water harvesting including Finger Rock Wash water harvesting and restoration.

Riparian Restoration Design and construct riparian vegetation and irrigation distribution system for plant irrigation within the study area.