EXISTING CONDITIONS REPORT

Alamo Wash Basin Management Plan

Prepared for:

Pima County Regional Flood Control District
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July 13, 2017
CMG Project No. 16-043

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SECTION 1 INTRODUCTION

1.1 Project Purpose

At the request of City of Tucson, Pima County Regional Flood Control District (RFCD) commissioned a regional basin management study of the Alamo Wash Watershed, including the Arcadia, Sahuara, and Van Buren Wash Watersheds. RFCD selected CMG Drainage Engineering, Inc. (CMG) and JE Fuller to conduct this study, with CMG serving as the prime consultant. The study entitled Alamo Wash Basin Management Plan (AWBMP) included updating the floodplain delineations and identifying existing constraints to aid in the development of alternatives for improving drainage conditions in the regional study area. This need for this study was first identified in the *Tucson Floodplain Management Plan* (2016) (Reference No. 1) as a Flood Hazard Mitigation Project. This Existing Conditions Report is one component of the study that has been prepared for the RFCD to document existing drainage conditions, which were used to help identify flood hazard locations and determine viable drainage improvements.

1.2 Study Area Description

The AWBMP area lies entirely within the corporate boundaries of the City of Tucson. The four main watercourses evaluated in this report are the Alamo, Arcadia, Sahuara, and Van Buren Wash watersheds; however, the study domain will evaluate all flooding sources, including those not previously identified in the *Flood Insurance Study* (Reference No. 7) The study area is bounded on the west by Swan Road, on the south by the Irvington Road and on the east by the Rose Hill and Atterbury Watersheds. All flow generally drains to the north and west, to its confluence with the Rillito Creek. The total drainage area is approximately 9.6 square miles. A location map for the project study area is provided on Figure 1. The jurisdictional boundaries and land ownership are shown on Figure 2.

SECTION 2 LAND USE AND FACILITIES

2.1 Land Ownership

The study area is comprised of two primary watercourses: Alamo Wash and Arcadia Wash; two tributary street watercourses: Sahuara and Van Buren; and a dense network of streets that drain an urban area that is located entirely within the City of Tucson corporate limits. The primary watercourses are mostly in dedicated drainageways or easements with an occasional traversing of private property; all other surface and subsurface waterways are in roadway right-of-way. Land throughout the study area is primarily privately owned with various municipally owned parcels and institutional ownership. Figure 2, Jurisdictional and Land Ownership Map identifies the distribution of parcel ownership throughout the study area.

2.2 Existing Land Use

The study area saw significant development between 1960 and 1980 and can be described as built-out. Generally speaking all land within the study boundary has been developed since the early 1980's and the land-use has been established since that time. The residential areas are older established neighborhoods whereas the commercial areas have gone through a state of re-development and the only land-use change occurs due to re-development. The only significant undeveloped parcels in the study area are owned by the Arizona State Land Department and are at the very top of the watershed.

Residential land-use dominates the watershed with core commercial at most of the major arterial intersections. Governmental land-use is the third largest land-use which includes parks, schools, and other municipally owned parcels. See Figure 3, Existing Land Use.

The primary watercourses are used heavily for recreation in the lower part of the watershed and serve as natural resource area in an otherwise very urban landscape. Much of the channels are inhabited by riparian species and mature trees on the banks.

Zoning exists and is inconsequential hydrologically except for infill and re-development. This watershed does not have any formally designated industrial land-use within it. See Figure 4, Existing Zoning.

2.3 Proposed Land Use

The study area is almost entirely built-out. Some infill is occurring and some Tucson Unified School District (TUSD) owned parcels are being re-purposed or sold for re-development. These school sites will fall under the Tucson Development Code and will be required to retain/detain their increases in runoff due to increases in impervious surfaces.

2.4 Transportation and Utilities

The transportation corridors in this study area have been established since the late 60's with the development boom and generally cross the study area from east to west and north to south in a typical urban grid. As mentioned earlier, much of the stormwater conveyance in this watershed is

dependent upon the public roadway right-of-way and in researching the transportation, careful consideration was taken to document the upcoming improvements from regional and local transportation plans. When planning a watershed for drainage improvements it is very important to consider timing of other infrastructure improvements to lessen the disruption to drivers and consolidate forces so all infrastructure reaches its useful life without being prematurely reconstructed for other purposes. See Figure 5 for Regional Transportation Areas Map.

Utilities are significant constraints in the watershed, especially considering the built-out nature of the watershed and that utilities will occupy almost every available public corridor. Effort was taken to collect roadway as-builts which include the location of utilities in the public right of way. Figure 6, Data Collection identifies the locations where plans were collected. Figure 7, Drainage Inventory shows locations of exposed (from erosion) utilities discovered during field reconnaissance.

2.5 Spatial Data

Electronic data prepared for this project are based on the digital projection shown below:

Horizontal Datum:	NAD83 (HARN)
Projection:	Arizona State Plane, Central Zone
Units:	International Feet
Vertical Datum:	NAVD88

Pima County's GIS Department provided 2015 bare earth LIDAR data which was prepared under the management of the Pima Association of Governments (PAG), for this study. Topographic mapping with 2-foot interval contours was generated by utilizing Pima County's 2015 bare earth LIDAR data (Reference No. 9).

Aerial Photography for the study area is National Agricultural Imagery Program (NAIP) 2015 data set, which has 1-meter resolution. The data is referenced directly from ESRI's software server.

Ashby Surveying & Drafting, Inc. performed supplemental field surveys for the drainage structures within the study area in 2017. The survey data collected included culvert sizes, materials, invert elevations, and structure geometrics at the inlets and outlets.

SECTION 3 DATA COLLECTION EFFORTS

3.1 Previous Drainage and Flood Insurance Studies

3.1.1 *Tucson Stormwater Management Study (TSMS): Phase II, Stormwater Master Plan, Final Report*; Simons, Li & Associates, Inc. 1995

The objective of this document was to present the fiver major components of the Stormwater Master Plan: (1) Preservation of Naturally Vegetated Watercourses, (2) Flood Hazard Studies, (3) Stormwater Quality Investigations, (4) Stormwater Capital Improvement Projects, and (5) Miscellaneous Capital Projects. Specific to our study area, the Alamo Wash was included in this comprehensive study and had two capital projects ranked within the top 25.

3.1.2 *Tucson Stormwater Management Study (TSMS): Phase II, Stormwater Master Plan, Existing Conditions Hydrologic Modeling*; Simons, Li & Associates, Inc. 1993

This study presents the methodology and results of the City-Wide hydrologic analysis for existing conditions, which includes the Alamo Wash Watershed. The existing regulatory discharge for Alamo Wash is documented within as well as the 3-hour distribution that is utilized in rainfall-runoff modeling.

3.1.4 *Detailed Verification of TSMS Hydrology for Alamo Wash Flood Control Improvement Project, Fort Lowell Road to the Rillito Creek, Tucson, Arizona;* Simons, Li & Associates, Inc. 1998

This letter report documents the verification process of the 100-year peak discharge used for the Alamo Wash Flood Control Improvement Project which included a channelization and bank protection for the downstream segment of Alamo Wash to its confluence with the Rillito River.

3.1.6 *Flood Insurance Study Vol. I-V for Pima County, Arizona and Incorporated Areas*; Federal Emergency Management Agency, 2012

This countywide Flood Insurance Study (FIS) investigates the existence and severity of flood hazards in, or revises and updates previous FISs/Flood Insurance Rate Maps (FIRMs) for the geographic area of Pima County, Arizona, including: the Cities of South Tucson and Tucson, and the Towns of Marana, Oro Valley, and Sahuarita, and the unincorporated areas of Pima County (hereinafter referred to collectively as Pima County) and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This FIS has developed flood risk data for various areas of the county that will be used to establish actuarial flood insurance rates.

3.1.7 *Alamo Wash: Indian House Road to Wilmot Road – Letter of Map Revision Technical Data Notebook*; CMG Drainage Engineering, Inc., 2015

This study presents supporting information for a Letter of Map Revision (LOMR) for the Alamo Wash between Indian House Road and Wilmot Rd. The study updated the effective model with FEMA approved TSMS hydrology and incorporated new storm drain features that had not previously been incorporated in the modeling effort. CMG provided new hydraulic models and as-built plans to show the floodplain limits should be revised.

3.1.8 *Flood Risk Map: Tucson, Arizona*; Federal Emergency Management Agency, Version 2.3.3.2

This map presents flood risks by category and areas of mitigation interest (AOMI). Developed by FEMA it is a tool to help prioritize areas of mitigation for grant funding. But, it will also be utilized to help prioritize projects during the alternative analysis component of this study.

3.1.9 *Proposal for Improvement District Alamo Wash, Fort Lowell to Rillito River, ICON Consultants USA, Inc. 1994.*

This document was a proposal to create an improvement district for improvements to the lower Alamo Wash reach. The document presents support and justification for the creation of a district. It's not clear whether this received any traction or was created, but it's clear that the improvements did go in and this document would be valuable for historical purposes only. Only the cover page was scanned and this document resides in the TDOT's warehouse.

3.1.10 *LOMR Application for Alamo Wash – Fort Lowell Road to Rillito Creek, Tucson, AZ. Simons, Li & Associates, Inc. 2000.*

This document was a copy of the application to revise the FEMA floodplain along the lower Alamo Wash to reflect improvements that were made to the channel from Fort Lowell to Rillito Creek. While valuable for historical purposes, the information is dated and the model output is obsolete. The model does not reflect current conditions in the field. Only the cover page was scanned and this document resides in the TDOT's warehouse.

3.2 Previous Drainage Complaints

Drainage complaints compiled between 1980 and 2014 by the City of Tucson were reviewed to determine if the complaints help substantiate floodplain delineations or vice versa. Complaints were categorized as Paper Drainage Complaints (pre-1999) and Electronic Drainage Complaints (post-1999).

The Paper Drainage Complaints were collected from archive and represent 33 drainage complaints from a period of approximately 20 years. These complaints were screened for relativity but in some cases the complaints may be obsolete now due to the issue being addressed.

The Electronic Drainage Complaints were screened for their applicability and pertinence to the existing conditions analysis. The initial 2,100 complaints in the prescribed Township Section and Range were then screened and pared down to 121 complaints that were helpful as references to the existing conditions study. All complaints are tabulated in Appendix A and shown spatially on Figure 6, Data Collection Exhibit.

3.3 Historical Flooding Records

Over 40 years of stream gage data have been recorded on the Alamo Wash. This record tells us that there have been some notable events and one event in 1988, recorded as 4,000 cubic feet per second (cfs), that according to the flood frequency analysis was close to the 1% chance event of 4,600 cfs (Reference No. 8). Further accounts were collected from searches of news archives and correlate well with the stream gage records.

On August 11, 1995, the Alamo Wash claimed the life of a 43-year old woman when she tried to cross the wash at the Stella Road dip crossing in what gage records appear to show was a 10-year event (Reference No. 3).

On August 18, 1998, the Arcadia Wash claimed the life of a 39-year old man at the at-grade crossing of Fairmount Ave during what appears to be a 5-year event on the Alamo Wash gage. His body was carried 8-miles downstream (Reference No. 3).

On September 8, 2014, the Alamo Wash flowed with what appears to be a 5-year event per gage records and resulted in a fatality at the Calle Betelgeux at-grade crossing (Reference No. 5).

On August 9, 2016, the Alamo Wash gage recorded a peak flow of approximately 1,500 cfs which is close to a 5-year event. No reports of casualties were found associated with the Alamo Wash; however, there were swift water rescues in other parts of Tucson. The photo to the right is a picture of the Arcadia Wash upstream of its confluence with Alamo Wash. See Appendix C, Data Collection for historical records and published historical accounts of flooding.

Doug Kreutz, Arizona Daily Star (Ref: No. 3)

Approximately 17 years of stream gage data was recorded on the Arcadia Wash. An historic peak of 1,210 cfs was recorded in 1971, and denoted as the highest flow since 1963. There were no historic news accounts to corroborate this event.

3.4 Construction Plans and As-builts

Construction documents for existing public drainage features throughout the watershed were collected and logged into our Data Collection Database. When modeling the watershed with the FLO-2D program, information pertaining to the size, dimensions, material, and functional condition of existing drainage infrastructure is needed to guide decisions on input into the model. The Data Collection Database which presents the results of the data collection efforts is in Appendix C. Figures 6 and 7, Data Collection and Drainage Inventory collectively present the availability and location of plans and specific structures throughout the study area.

3.5 Gage Data

The United States Geological Survey (USGS) operated a stream gage recording station (Short ID 4855.7) on the Alamo Wash (Alamo Wash at Tucson, AZ #09485570) from 1976 – 1992 after which the RFCD continued to operate from 1993 – present. Because of the operational change of ownership there were two distinct data sets collected. The USGS data was downloaded from the National Water Information System (NWIS): Web Interface in the Watstore file format. The Pima County data set was obtained from Lynn Orchard, Principal Hydrologist with the RFCD. RFCD's information was not formatted for use in any statistical program software, so the decision was made to compile the supplemental years from the Pima County operation period into the USGS Watstore File Format. The data was vetted with historical information from Weather Underground website for the dates listed in the systematic record. Several spikes in flow were invalidated because of the vetting process. More details about the application of this data can be found in the *Technical Memorandum: Alamo Wash Basin Management Plan – Summary of Flood Frequency Analysis* (Reference No. 8).

USGS also operated a stream gage recording station (Short ID 4855.5) on the Arcadia Wash (Arcadia Wash at Tucson, AZ #09485550) just downstream of Pima Street from 1966 – 1983. Their published statistics on the gage are found in *Statistical Summaries of Streamflow Data and Characteristics of Drainage Basins for Selected Streamflow-Gaging Stations in Arizona Through Water Year 1996* (Reference No. 13), page 500. The published 1% discharge event is listed as 1,920 cfs.

3.6 Field Review

A field review was conducted March 1, 2017 with the project team to visit key locations in the watershed and confirm on-ground conditions. The following individuals were present for the field review:

Sandy Steichen, Pima County
Elizabeth Leibold, City of Tucson
Jerry Curless, CMG
John Wallace, JE Fuller
Jiankang Wang, CMG
Scott Altherr, CMG
Laura Mielcarek, Wheat Design Group
Nanette Pageau, Kaneen
Diane Luber, Kaneen
Cyrus Miller, JE Fuller

Photo: Stop along the Arcadia Wash at Beverly Ave Crossing

3.7 Public Open House

A very valuable data gathering and outreach tool was the Public Open House. While the open house format was for the purposes of informing the public of the ongoing study; the public was also encouraged to share information with the project team. The medium for sharing was a public comment form linked to a location that was marked on maps that were present at the open house. The first open house was held March 22, 2017 at Sky Island Charter School which is located in the middle of the study area. Attendance was estimated at around 125 based on the sign-in sheet. Approximately 62 comment forms were collected from that open house event which identified issues, concerns, and historical information on flooding. These forms were compiled into a spreadsheet and it is included in Appendix B. Comments forms were also geo-spatially located and are included on Figure 6, Data Collection Exhibit. GIS users can query the locations to link the locations and comment form spreadsheet by opening the .mxd file in the electronic deliverable (Appendix D).

3.8 Previously Identified or Designed Projects

There were two Capital Improvement Projects within the project study area identified as part of the 1995 Tucson Stormwater Management Study (TSMS) (Reference No. 1). Neither has been designed or constructed likely due to a lack of available funding. The third listed below was not identified within TSMS and was located during an as-built search from the City's Map Tucson web interface.

3.8.1 Box Culverts at Seven (7) Road Crossings (Not Designed/TSMS Project ID: 31)

This project would have designed and constructed seven (7) new or upgraded box culvert structures at the following road crossings of the Alamo and Arcadia Washes: Alamo Wash at Sahuara Ave, Broadway Blvd, Wilmot Rd, 22nd St, Golf Links Road; and the Arcadia Wash at 5th St and Rosemont Blvd. This project was ranked 22nd of 47 listed projects. The estimated project cost was $480,000 in 1995 dollars.

3.8.2 Van Buren and Sahuara Ave Storm Drains (Not Designed/TSMS Project ID: 32)

This project would have designed and constructed 10-year capacity storm drains along both Van Buren and Sahuara Avenues between Speedway and the Alamo Wash confluence. This project was ranked 13th of 47 listed projects. The estimated project cost was $3.5 Million in 1995 dollars.

3.8.3 Grant Rd to Broadway Blvd Bank Protection (Designed/ E-85-15)

This project, designed in 1985, is labeled a "study" however it has all the components of a construction document set. These drawings are plan and profile drawings of bank stabilization, grade control and profile control. It's not clear if these were intended to be constructed or just advanced to design to get an estimated construction cost.

SECTION 4 ENVIRONMENTAL CONDITIONS

4.1 ERZ and WASH Watercourses

Environmental Resource Zone (ERZ) and Watershed, Amenities, Safety, and Habitat (W.A.S.H.), are defined in the Unified Development Code Section 5.7 – Environmental Resource Zone Overlay Zone and Tucson Code Chapter 29 Article VIII – Watercourse Amenities, Safety and Habitat Code, respectively. The ERZ regulations serve to protect significant natural channels, which provide habitat for wildlife and support flood control, erosion mitigation, and groundwater recharge efforts. The W.A.S.H. regulations are intended to maximize groundwater recharge, protect existing vegetation, and ensure that development does not generate any long term, adverse impact to vegetation.

The main branches of both the Alamo Wash and Arcadia Wash are designated as W.A.S.H. watercourses. As this study advances towards identifying improvement alternatives this designation will serve to limit certain types of improvements that are not compatible with the goals and objectives of the W.A.S.H. ordinance. These W.A.S.H. segments are shown on Figure 7, Data Collection Exhibit.

4.2 Critical Basins

According to City of Tucson GIS, the Alamo Wash Watershed is not designated as a balanced or critical basin management area. Per City of Tucson floodplain regulations, proposed development must employ some form of peak and volumetric reduction. Without the critical basin designation, developments can generally just ensure that their proposed post developed runoff does not exceed pre-developed conditions.

4.3 Riparian Areas

The City has issued an Interim Watercourse Preservation Policy, as part of Resolution 20505, which provides direction for applying existing codes while a consolidated preservation ordinance is being crafted. Under this policy the watercourses designated by any of the following codes or overlays are to be preserved and protected in a manner consistent with the appropriate regulations:

- W.A.S.H. ordinance (Reference No. 11)
- ERZ ordinance (Reference No. 10)
- Pima County Ordinance 2005-FC2 (Reference No. 6)
- Shaw 1994 riparian habitat delineations
- Riparian Habitat from TSMS Phase II Stormwater Master Plan
- Unclassified and undocumented riparian habitat of equivalent value to the above criteria

Existing environmental conditions are shown on Figure 7.

SECTION 5 EXISTING DRAINAGE FACILITIES & WATERSHED CONDITIONS

Watershed conditions are generally consistent throughout the study area as the land-use has been established for over 40 years, with some exceptions to the lower reaches of the main channels. The channel systems are deep and in many cases improved and have the capacity to convey a significant amount of water. Streets are the secondary drainage conveyance mechanism that distribute flow to the channels. Streets either carry the flow as surface flow between the curbs or as subsurface flow in a storm-drain system. Table 1, Drainage Inventory summarizes the statistics of drainage features in the watershed.

Table 1, Alamo Wash Watershed Drainage Inventory

Drainage Feature Type	Unit	Quantity
Open Channel (main)	mi	13.3
Open Channel (tributary)	mi	23.4
Bank Protection	mi	1.9
Stormdrain	mi	23.1
Culverts	ea	24
Bridges	ea	23
Pedestrian Bridges	ea	15
Catch Basins	ea	475

Locations of existing drainage infrastructure are shown on Figure 8 and a drainage inventory is included in Appendix C.

In addition to the significant quantities of infrastructure that are currently in place, there is also areas identified from the field that are failing or represent a potential hazard and may need to be included as part of an alternative solution. Two of these conditions are shown on Figure 8: exposed utilities and bank erosion. Drainage Inventory tables are provided in Appendix C.

The watershed is very urban and is experiencing “clear water” conditions meaning that sediment supply is low due to the developed nature and the channel flows with an appetite for sediment. The observed condition in much of the watershed is that at-grade crossings act as grade control, but in many cases the channel bed profile is lower than the road on both upstream and downstream sides of the crossing. This condition supports the assertion of the “clear water” characteristic, because if sediment supply were available the channel bed profile elevation would

be equal to the upstream side of the road crossing. This may present an advantage during the alternatives analysis as a lower bed profile may allow accommodation of cross-drainage structures at some of the present at-grade crossings.

Bank erosion does exist, but there is surprisingly very little quantity of erosion in comparison to the length of the watercourses. Much of the channel has reached an equilibrium with the current sediment supply. The channels vary from mildly sloped sandy bottom washes, to steeper scoured out channel bottom with exposed hard-pan material. Multiple outcrops serve as natural grade control along the reach.

Lowering of the channel bed profile has occurred as evidenced by exposed utility lines. Up to nine (9) locations of exposed utility crossings were observed.

Significant household waste has been dumped along the banks of the channels. This waste and other ambient windblown litter collects in the channels. Shopping carts and mattresses are also abundant in the Alamo Wash channel. The Alamo Wash channel vegetation was well maintained upstream of Stella Road. Downstream of Stella Rd, the vegetation is largely unmaintained and naturally growing desert and riparian varieties of trees. Both Alamo and Arcadia Wash watercourses are mostly improved fully-lined or bank protected channels downstream of Grant Rd and Craycroft Rd.

Failure of existing bank protection is occurring in locations throughout the watershed. Much of the failures occur on older slope stabilization methods that are undocumented and have probably served their useful life. Another observation of this watershed is the constant battle of erosion downstream of the road crossings at the interface between built and natural channel. It is evident that City crews have been making repairs and patches and battling erosion by dumping assorted materials at these interfaces. This practice appears to require a significant amount of resources and may not be the most operationally efficient means of fighting the erosion. It appears that when protection is extended downstream of the road that the erosion is just transferred downstream to the terminus of the new protection.

Aggradation is occurring in the lower reach of the Alamo Wash and could be affecting capacity to convey flow. Public comment obtained at the Open House (See Section 3.7) has shown that there is a general agreement that the wash is filling with sediment and that the loss of conveyance could have led to the flooding adjacent to the channel in 2014.

SECTION 6 GIS MAPS

The Figures 6 and 7 maps were created with ArcGIS .mxd files. The .mxd files have been provided on the DVD in Appendix D and are intended to be completely interactive. Using the hyperlink tool in ArcGIS, the user can pull up documents/photos related to the items on the maps. In addition to the figures, an .mxd is provided entitled, "Field Conditions Assessment_Photos" which is a geospatially correct database of photos and direction of photo in the project area that can be utilized to confirm field conditions.

SECTION 7 REFERENCES

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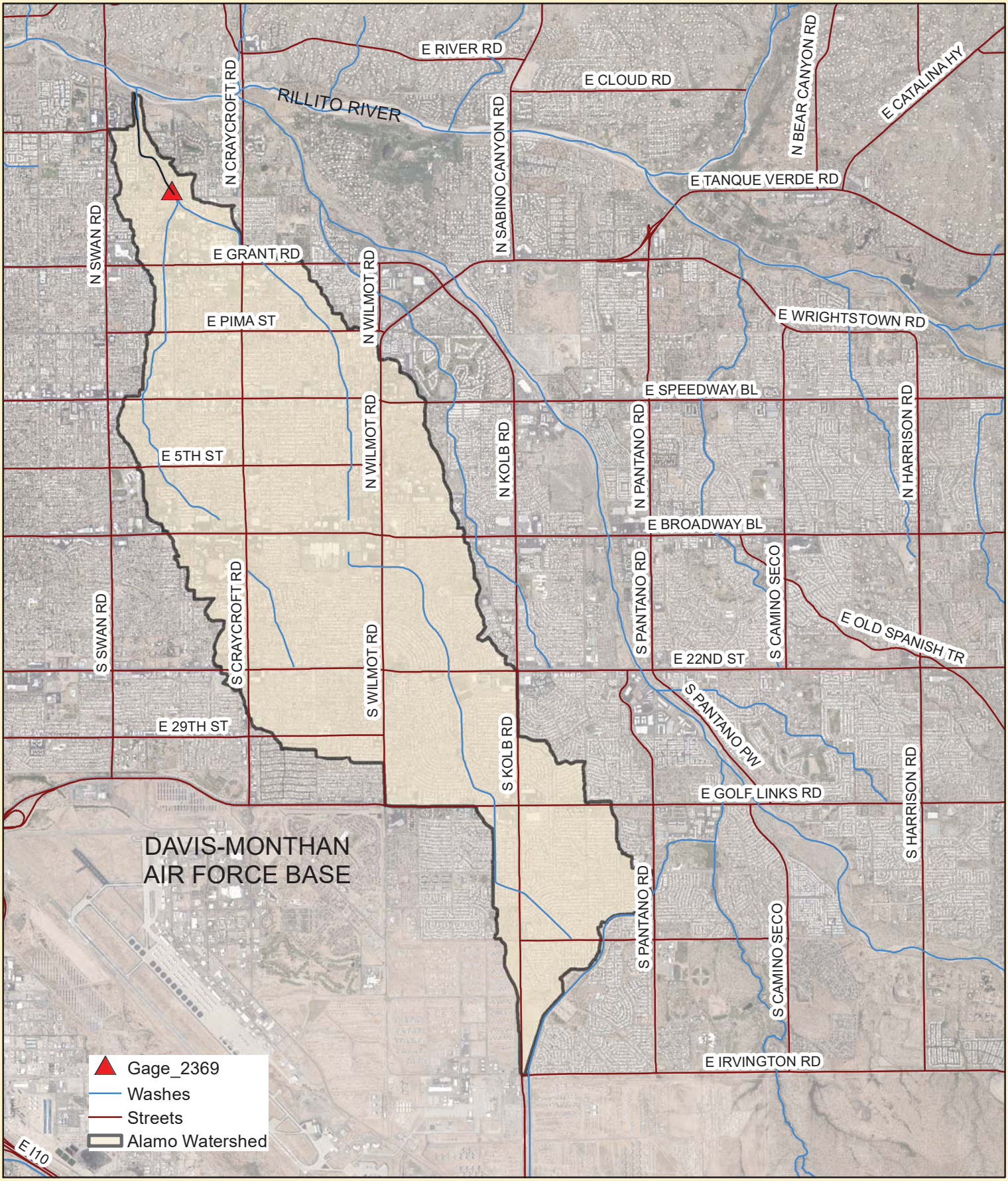
12. www.TucsonAZ.gov *Interim Watercourse Preservation Policy*.
13. USGS. Pope, Rigas, and Smith. *Statistical Summaries of Streamflow Data and Characteristics of Drainage Basins for Selected Streamflow-Gaging Stations in Arizona Through Water Year 1996.* WRIR 98-4225. 1998.

FIGURES



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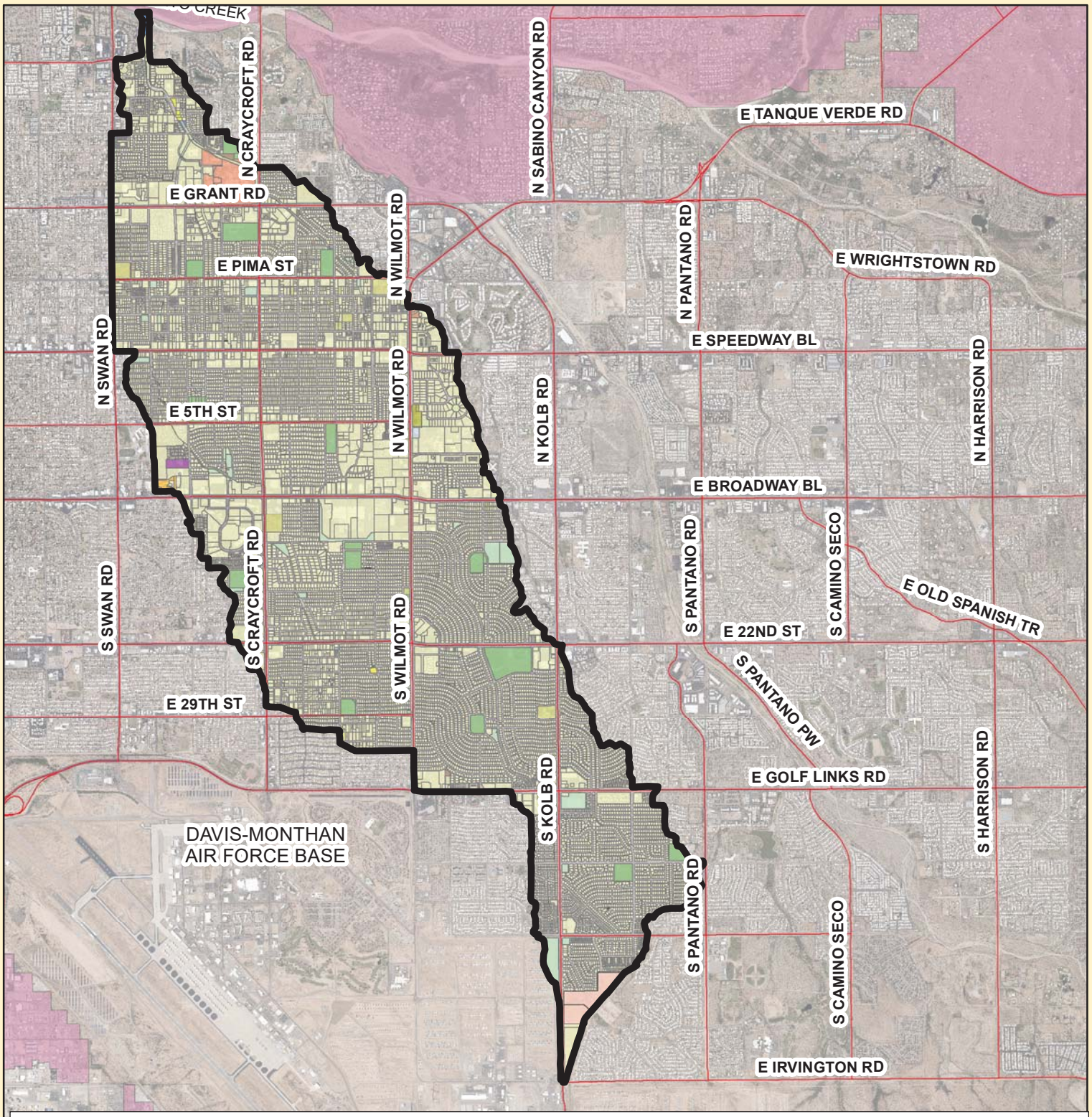
http://www.rfcd.pima.gov

FIGURE 1 - STUDY AREA LOCATION MAP

ALAMO WASH - BASIN MANAGEMENT PLAN

0 0.5 1 2 Miles

CITY OF TUCSON



LEGEND

- STUDY AREA BOUNDARY
- TUCSON
- UNINCORPORATED PIMA COUNTY

OWNERSHIP

- ALL OTHER VALUES
- PLACE OF WORSHIP
- CITY OF TUCSON
- HOSPITAL
- PIMA COMMUNITY COLLEGE DISTRICT
- PIMA COUNTY
- PIMA COUNTY FLOOD CONTROL DISTRICT
- PIMA COUNTY LIBRARY DISTRICT
- STATE OF
- TUCSON SCHOOL DISTRICT NO 1
- UNISOURCE ENERGY CORPORATION
- USA, POSTAL SERVICE

PIMA COUNTY FLOOD CONTROL

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FIGURE 2 - JURISDICTIONAL BOUNDARIES

ALAMO WASH - BASIN MANAGEMENT PLAN

0 0.5 1 2 Miles

CITY OF TUCSON

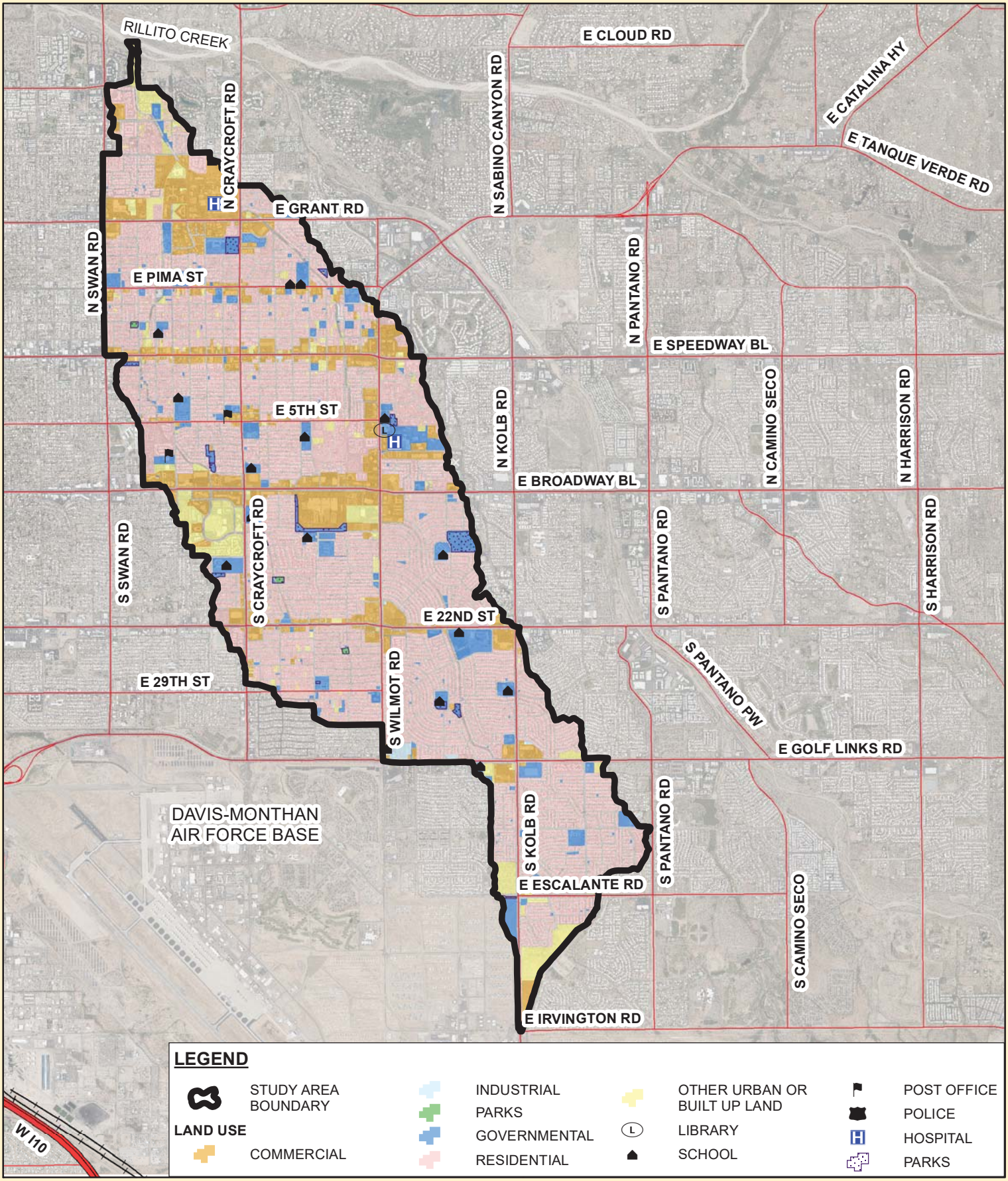

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FIGURE 3 - EXISTING LAND USE MAP

ALAMO WASH - BASIN MANAGEMENT PLAN

0 0.5 1 2 Miles

CITY OF TUCSON

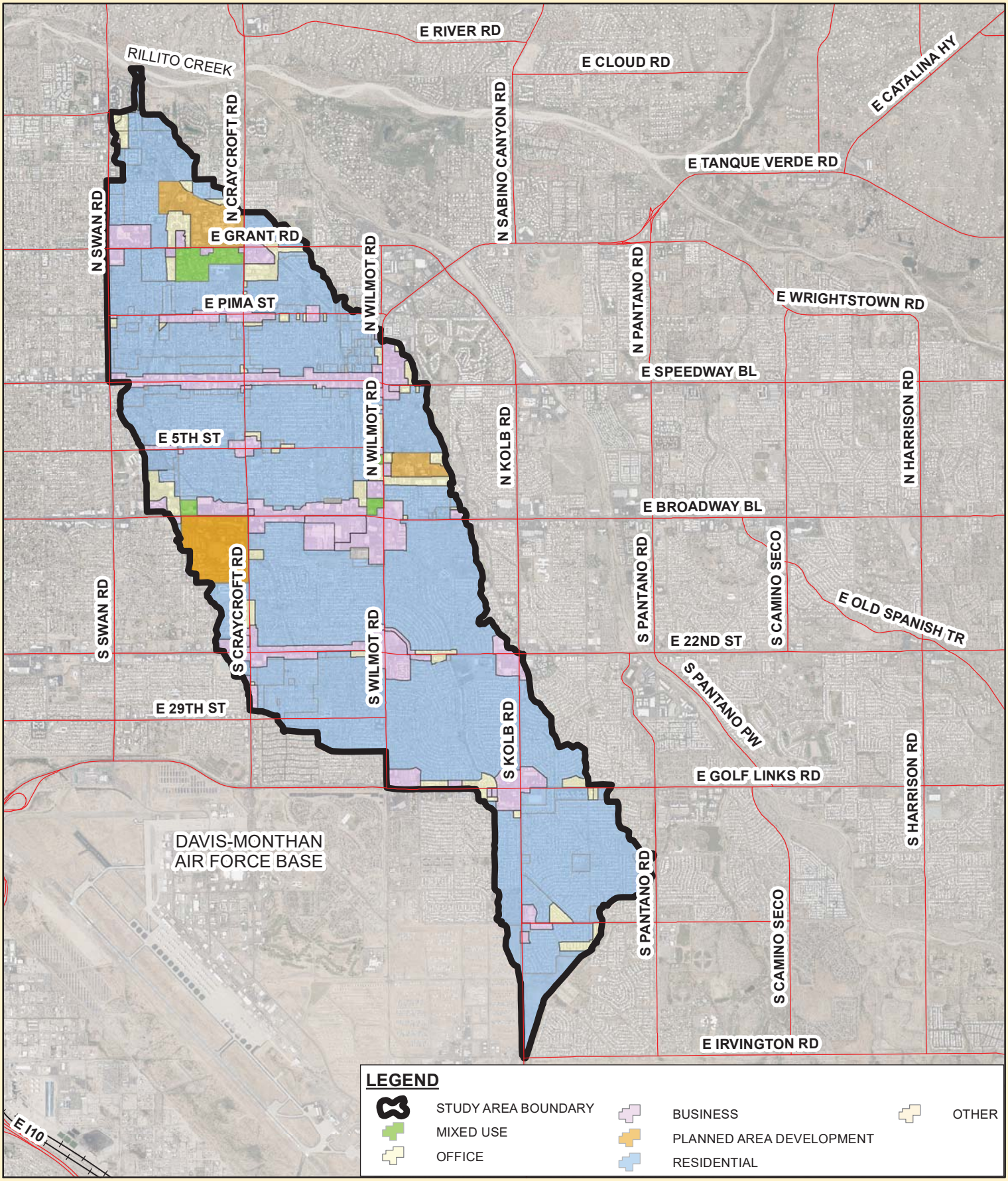

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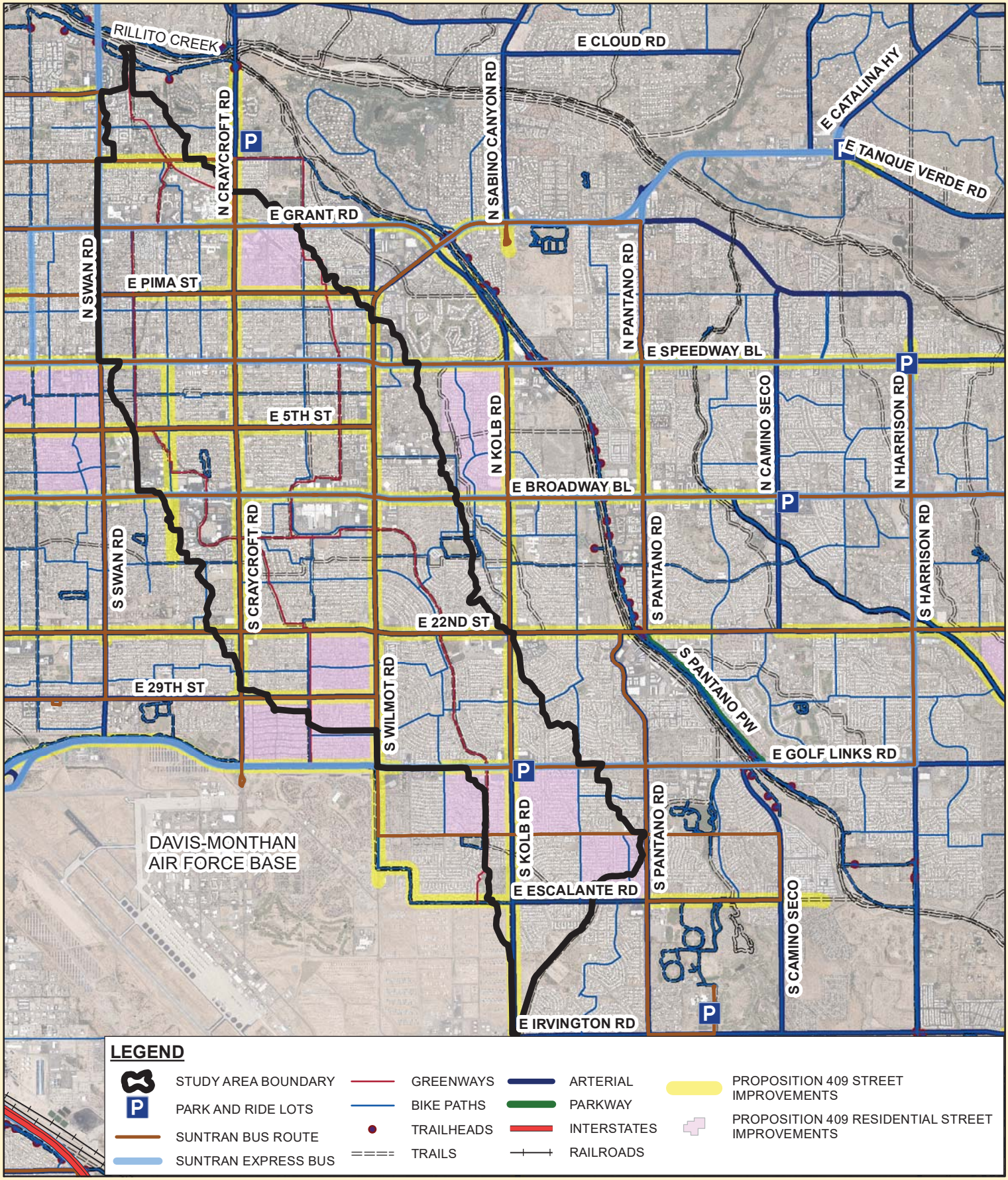
FIGURE 4 - EXISTING ZONING MAP

ALAMO WASH - BASIN MANAGEMENT PLAN

0 0.5 1 2 Miles

CITY OF TUCSON



PIMA COUNTY FLOOD CONTROL

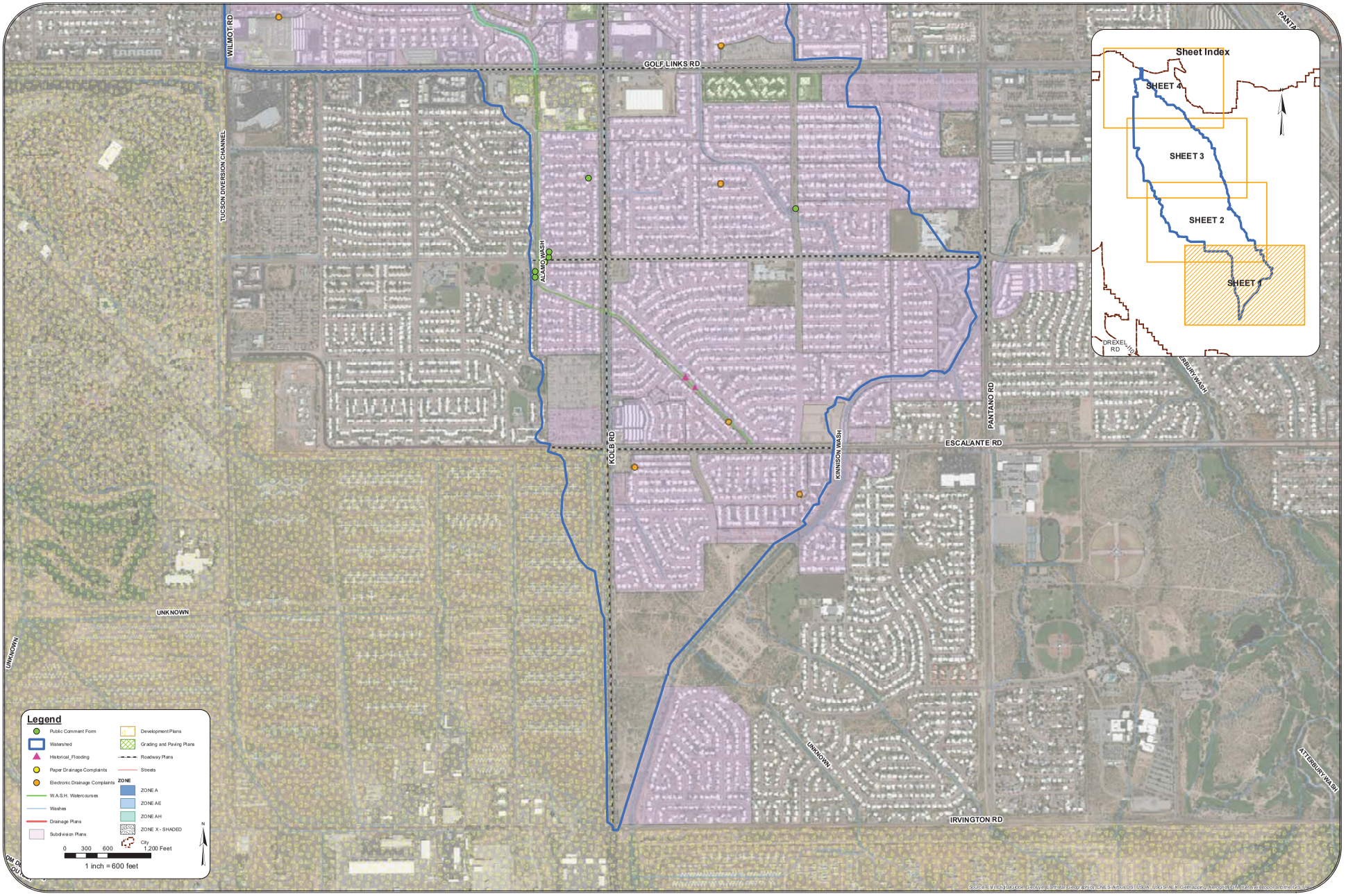
Pima County Regional Flood Control District
201 N. Stone Ave - 9th Floor
Tucson, Arizona 85701-1797
(520) 724-4600, FAX: (520)724-4621
http://www.rfcd.pima.gov

FIGURE 5 - REGIONAL TRANSPORTATION PLAN

ALAMO WASH -BASIN MANAGEMENT PLAN

0 0.5 1 2 Miles

CITY OF TUCSON



Regional Flood Control District
201 N. Stone Ave., 8th Floor
Tucson, AZ 85701

PIMA COUNTY FLOOD CONTROL

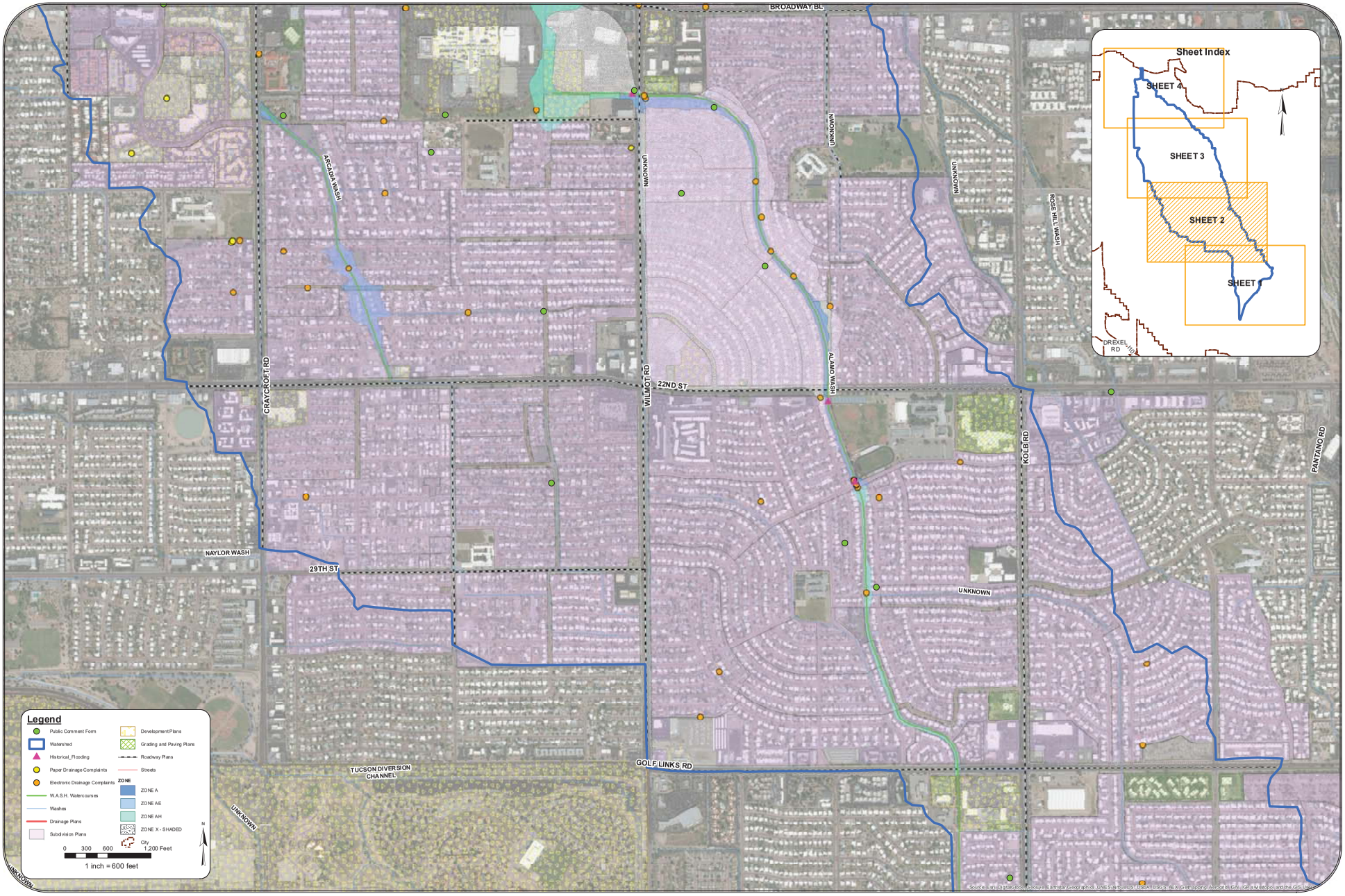
CMG DRAINAGE ENGINEERING, INC.
3555 N Mountain Ave - Tucson, Arizona 85719 - (520) 882-4244

FIGURE 6
DATA COLLECTION EXHIBIT
ALAMO WASH - BASIN MANAGEMENT PLAN

PROJECT NO.
16-043

DRAWING NAME
DATA COLLECTION

SHEET 1



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3555 N Mountain Ave -Tucson, Arizona 85719 - (520) 882-4244

FIGURE 6
DATA COLLECTION EXHIBIT
ALAMO WASH - BASIN MANAGEMENT PLAN

PROJECT NO.
16-043

DRAWING NAME
DATA COLLECTION

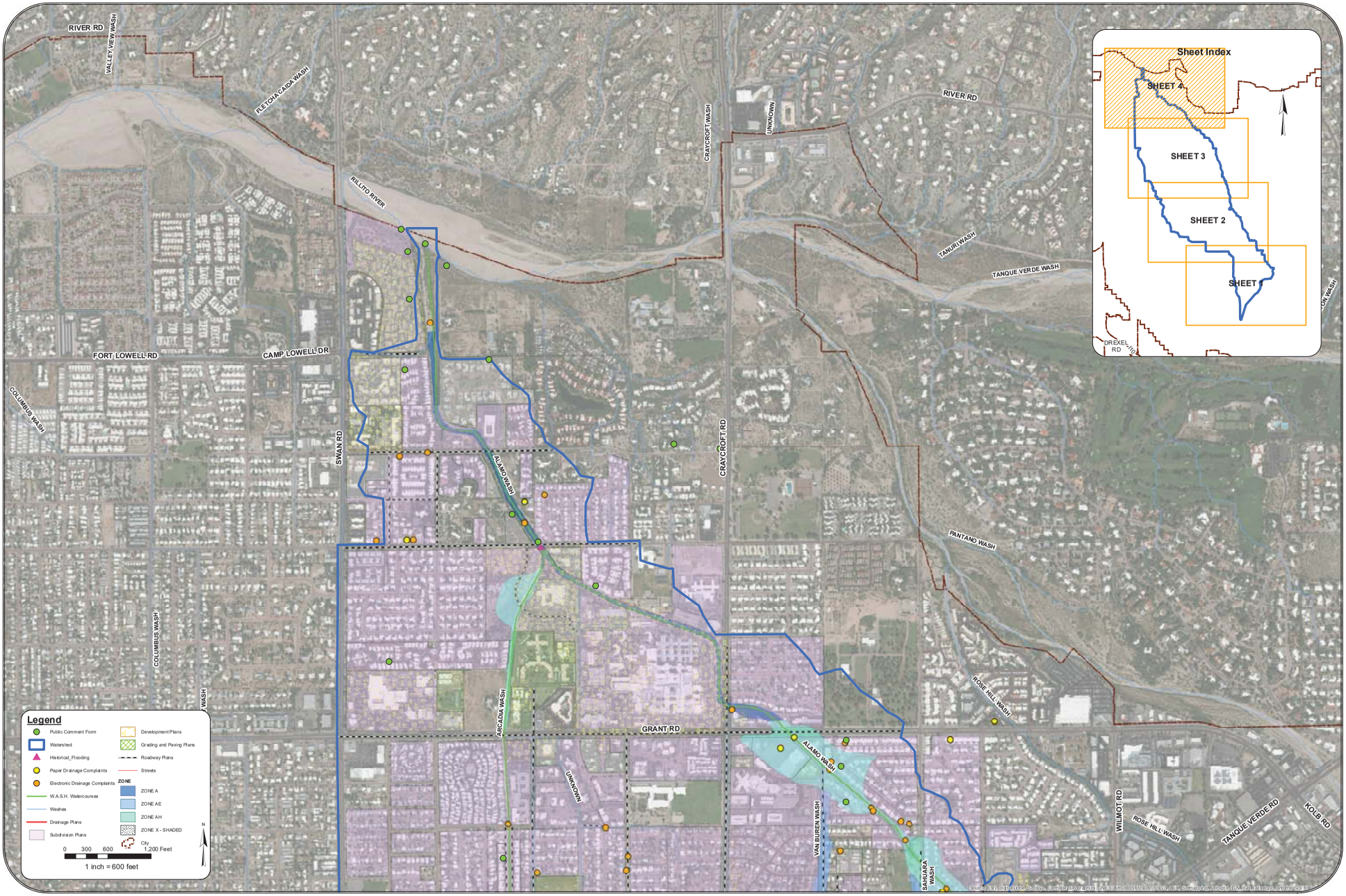
SHEET 2

PROJECT NO. 16-043
DRAWING NAME DATACOLLECTION
SHEET 3

FIGURE 6
DATA COLLECTION EXHIBIT
ALAMO WASH - BASIN MANAGEMENT PLAN

CMG DRAINAGE ENGINEERING, INC.
3555 N Mountain Ave -Tucson, Arizona 85719 - (520) 882-4244

PIMA COUNTY FLOOD CONTROL
Regional Flood Control District
201 N Stone Ave, 9th Floor
Tucson, AZ 85701



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Tucson, AZ 85701

PIMA COUNTY FLOOD CONTROL

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3555 N Mountain Ave - Tucson, Arizona 85719 - (520) 882-4244

FIGURE 6
DATA COLLECTION EXHIBIT
ALAMO WASH - BASIN MANAGEMENT PLAN

PROJECT NO.
16-043

DRAWING NAME
DATA COLLECTION

SHEET 4

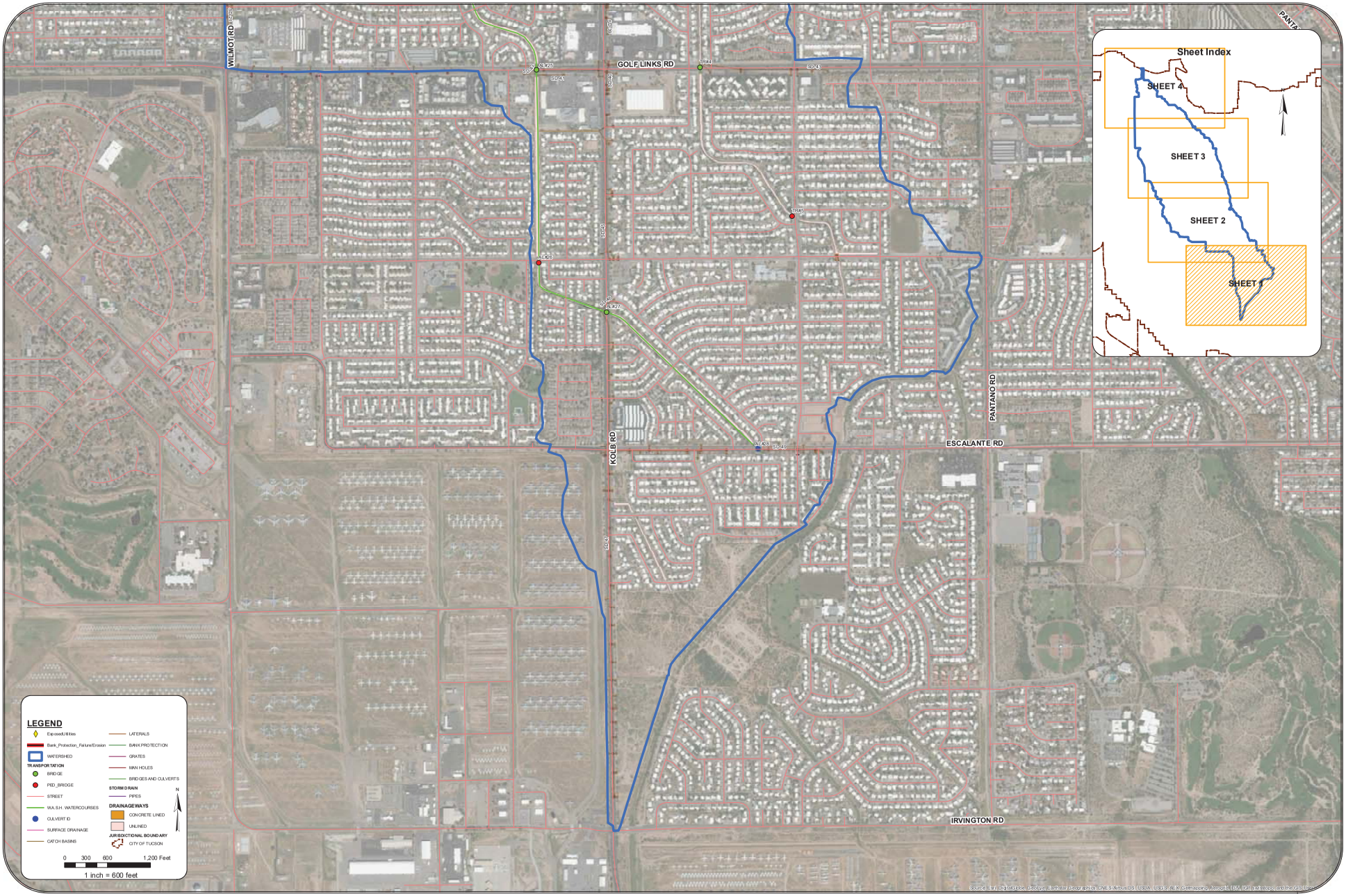

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FIGURE 7
DRAINAGE INVENTORY EXHIBIT
ALAMO WASH - BASIN MANAGEMENT PLAN

PROJECT NO.
16-043

DRAWING NAME
DRAINAGE INVENTORY

1

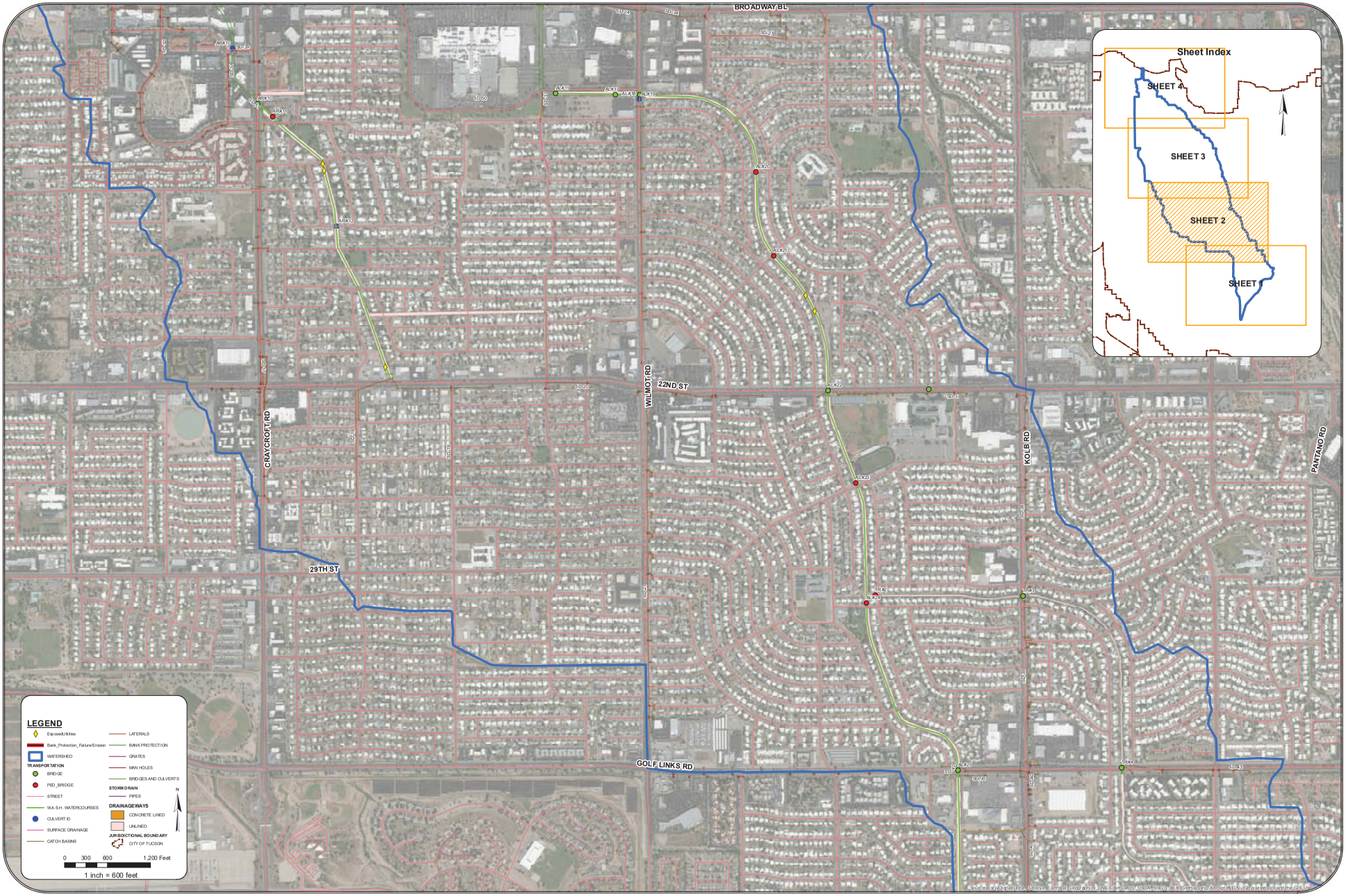

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FIGURE 7
DRAINAGE INVENTORY EXHIBIT
ALAMO WASH - BASIN MANAGEMENT PLAN

PROJECT NO.
16-043

DRAWING NAME
DRAINAGE INVENTORY

2

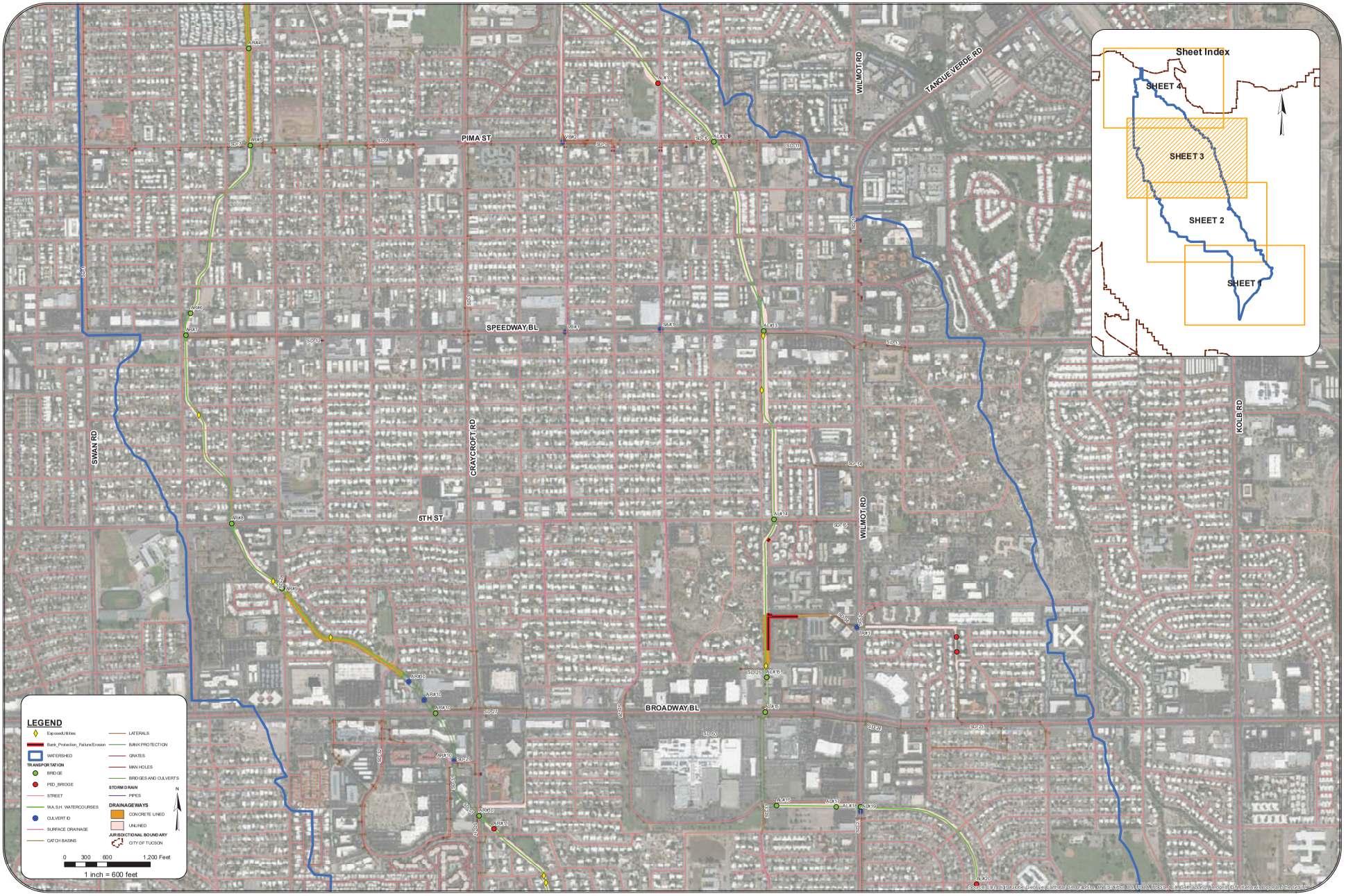

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FIGURE 7
DRAINAGE INVENTORY EXHIBIT
ALAMO WASH - BASIN MANAGEMENT PLAN

PROJECT NO.
16-043

DRAWING NAME
DRAINAGE INVENTORY

3

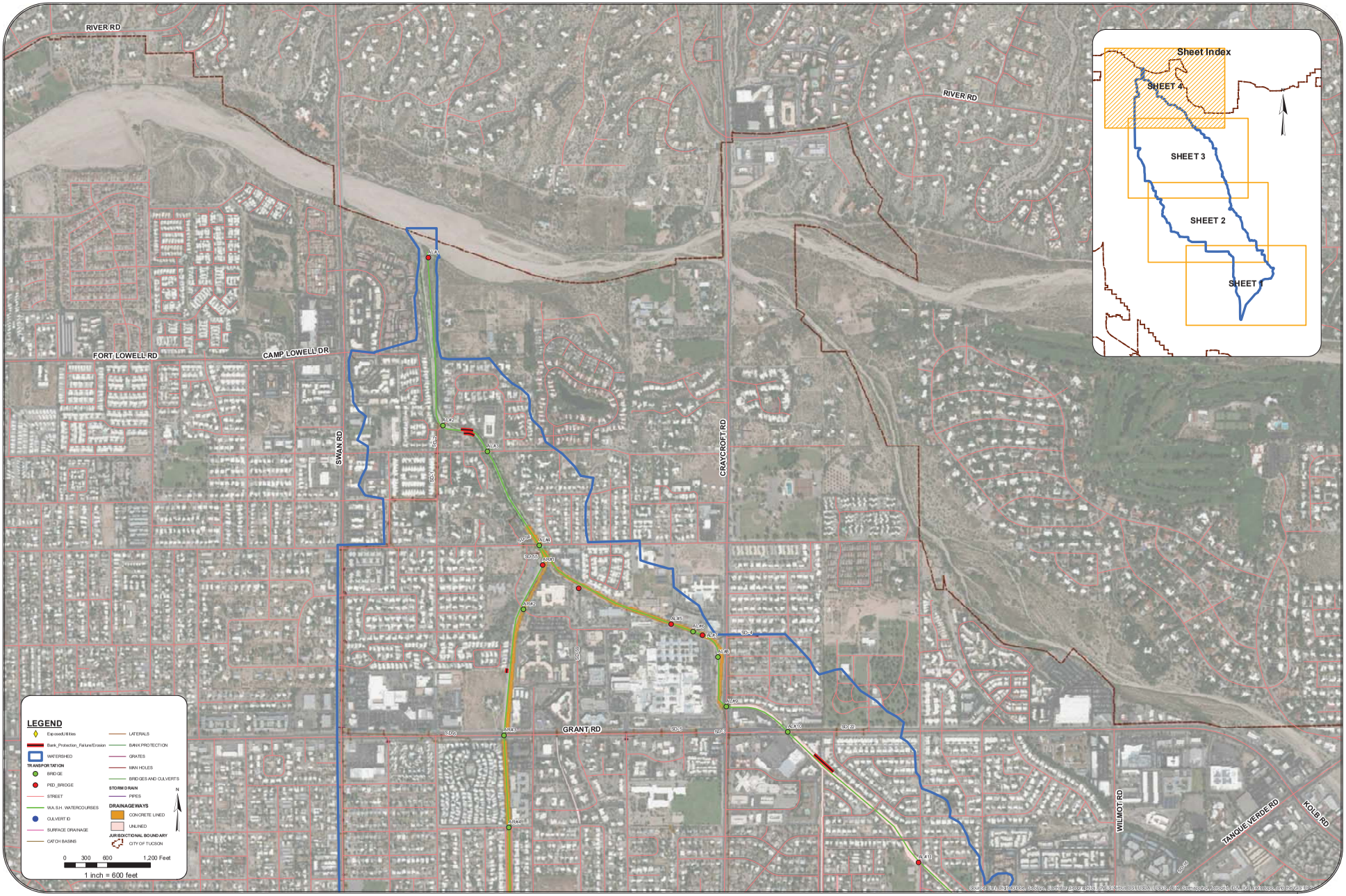

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FIGURE 7
DRAINAGE INVENTORY EXHIBIT
ALAMO WASH - BASIN MANAGEMENT PLAN

PROJECT NO.
16-043

DRAWING NAME
DRAINAGE INVENTORY

4

APPENDIX A

DRAINAGE COMPLAINTS

Alamo Wash BMP
Drainage Complaints 1980-Present

Electronic Complaints Post 1999			
Complaint No	**Block Address**	**Location**	**Complaint Description**
833	6000 Block E. 2nd St.		Trash in drainageway, causing obstruction.
844	5600 Block E. 5th St.		Sill depositing in parking lot.
859	5700 Block E. Grant		Trash and debris in ddrainage way.
860	1200 Block N. Beverly		Drainage coming into home from neighbor driveway.
867	5700 Block E. Grant Rd.		Trash and debris in drainage way.
923	7000 Block Calle Betelguex		Ponding.
930	5th St. and Chantilly		Ponding in intersection.
962	5900 Block E. Lester		Neighbor dumping cuttings into wash.
1042	300' N. of Grant and Craycroft.		Piping behind bank pot.
1048	1600 Block N. Beverly		Street draining to property.
1060	2000 Block N. Cloverland		Needs grass overgrown along road.
1093	4800 Block E. Glenn		Street drans to property.
1127	5100 Block E. Patricia	Rosemont, Patricia	Street flooding
1227	6500 Block E. Shephard Hills Dr		Alley runoff into yard.
1242	6200 Block E. Bellvue		Parking lot runoff into property.
1251	14th and Wilmot		Violation, rading in Alamo wash with a permit
1252	Sidney and 19th		Ponding at intersection.
1305	1400 Block N. Alamo Pl.		Silt clogging wash.
1337	5700 Block E. Speedway.		Structure flooded.
1423	5700 E. Speedway		"Shop flooded."
1426	5300 Block E. Beverly Fair		Ponding in yard.
1479	200 Block S. Craycroft Rd.		Street draining to property.
1587	5400 Block E. Pima		Ponding on road way.
1597	1700 Block N. McKinley		Ponding in street.
1688	6400 Block E. Printer Udell		Yard flooded by street RO.
1728	4800 Block E. Lester Pl		Water off street to property.
1738	5300 Block E. Bellevue		House flooded.
1756	5100 Block E. Citrus		Flooded by school.
1793	2100 Block E. Rainbow Vista Dr.		Yard flooded.
1855	1200 Block N. Magnolia		Alley pording.
3353	5300 Block E. Lee St.	Remington Park drainage	1" of rain, wall openings down on west side "swale pitched to west". Check this - appears accurate at 6"lower +or-.Lot to lot existing drainage patterns. Flooding history.
3369	6400 Block E. Calle Pegaso	Same as address	Water run-off, alley turns into river instead of going down - goes through neighbor's then goes into her property. (Flooding). Dirt/gravel in street
3377	1900 Block Avenida Planeta	West of Kolb	2 ditches that come together. Water overflowing.
3379	1200 Block S. Avenida Sirio	Young Explorers School, same as above address (1/2 way between Wilmont and Kolb next to Alamo wash	Young Explorers School is getting flooded. Call first to make appointment
3382	6500 Block E. Calle Bellatrix	same as address	Back yard retaining wall, water comes up from wall into her house. Major flooding problem
3384	6100 Block E. Bellevue		Foot of water in her house yesterday. (In 100 yr. Floodplain).
3385	2000 Block N. Sahuara 85712 (Waverly and Sahuar	North of house	Erosion near the wash, close to the house, past the fence.
3388	1600 Block S. Avenida Planeta	Avenida Planeta / Betelgeux near Kolb	Drainage along speed bump floods side of front yard leaving debris.
3418	5300 Block E. 3rd Street	same as address	During heavy rains, water runs down "channel" cut through alley, breaks out and flows west to east into property. They think they're in a low spot and when street floods, it flows south to north into driveway
3427	600 Block N Rook Ave.	Alamo Wash North of 5th street	Concrete bank protection has failed during last storms (monsoon) . Concerned about the embankment
3478		Arcadia Wash North of Seneca	Extensive vegitation in concrete channel
3483	6100 Block E. Rosewood St.		Yard being flooded due to backup of Alamo Wash
3503	3900 E. Timrod	Behind 4959 E. Bellevue in arroyo	Arcadia Wash lies west along townhome association and property owners are concerned with erosion along the banks
3508	6100 Block E. 2nd	Obstructions built in wash by kids	Berm built to clear path in wash by bicyclist to cross wash.Also pointed out that spillway where 2nd st dumps into Alamo Wash is over grown with weeds
3518	500 Block S. Kenyon Dr.	Alamo Wash behind his house	Concerned with excessive vegitation and trash in wash. Also, with people dumping trash into wash
3521	4900 Block E. Rosewood St.	Behinde complainants property along Arcadia Wash	Concerned about condition of embankmen, being eroded. City has dumped dirt on it in the past but is just washed away each time and it gets worse. Also, pointed out that a water line that crosses the wash has been exposed and hit by a rock
3523	6700 Block E. Calle Betelgeux	Alamo Wash and Calle Betelgeux	Concrete bank protection is being undermined at alamo wash and Betelgeux
3588	4000 Block S. Lone Palm Dr.	4000 - 4006 Soutrh one Palm Dr.	Speed Humps to be put on Sept. 31, Believes that it will cause major flooding when humps are put in. Part of street is owned by Association
3601	6400 Block E. Brian Kent	Along the eastern perimeter of his property.	Stormwater ftrom street is flooding his front yard. This has only started to occuring after the street was overlayed
3605	100 Block N Placita del Saco	Drainage Channel, northwest of complainants home.	Scour Hole being developed where drainages converge , causing water to pond and a mosquito breeding area
3641	7100 Block E. Sylvane	Alley behind complainants address	Water is entering property owners yard though alley.
3642	1400 Block N. Beverly Ave	NE Corner of Beverly Ave. & Fairmount St.	Storm Runoff is enering yard and erodeing property.
3654	Ridgeway Dr.	Alamo Wash, east of Ridgeway and north of Fairmount	Erosion along west bank is effectin a large paloverde tree.
3655	7400 Block E. Golflinks Rd.	Cross Ridge Subdivision	Water pooling in alley west and north of Cross ridge subdivision
3661	5600 Block E. 8 th Street	Same	Saguaro cactus has been knocked over by street runoff.
3666	7300 Block E. Random Ridge Drive	Alley adjacent to complanants property	Runoff from alley is entering his property after the COT has graded the alley
3697	1900 Block N Beverly Av		Excessive amount of stormwater is conveyed through Beverly Ave.
3700	5300 Block E. Lee Street	Rear of lot	Complaimant is receving increased stormrunoff from the Remington Park Subdivison.DR# 1620, C12-94-015
3712	6100 Block E. Rosewod Avenue		I was at a public meeting last night and Cathy Kent, 6119 East Rosewood Avenue, 748-9381 asked who she could contact about sand build-up in the Alamo Wash next to the City owned parcel for Well C-026B. She said when the sand builds up, water from the wash gets divert
3716	5300 Block E. Waverly	Beverly Ave.	Believes that construction on Pima (Pima Street drainage & road improvements) has increased the amount of street flows in Beverly Avenue
3721	6500 Block E Calle Mercuric		Water from alley entering complainants property. Alley's grade is higher than adjacent properties
3722	700 Block S Kenyon Dr	Alamo Wash	Concerned that excessive vegetation along wash is a flood hazard. Wants vegetation removed.
3725	6500 Block E Calle Mercuric	Alley	Stormwater runoff from alley is entering there property.
3732	5900 Block E Broadway Boulevard	Broadway & Chantilly	Retention Basin in the northeast corner of Park place Mall is bleeding out in an unacceptable amount of time
3781		Alamo wash near Calle Betelgeux & Ave. Sirio	Palo Verde tree stuck in the wash & scour hole near the bank
3783	1400 Block N. Beverly	East to the house (2232K, X)	runoff from Beverly converge with Fairmount, flooding & erosion of the front yard & driveway
3786	2100 Block N. Rainbow Vista Drive	Craycroft/Grant (2251K, Alamo wash	Near Sahuara Street, flow from street/neighbor into her porch, garage. Alamo wash got debris, some dirt bermed her yard gone that was done before
3787	5600 Block E. 3rd St	5th / Craycroft (2251K	flow from Van Buran back up from Speedway, 12" water, need CIP project. He will contact Andy McGovern/Design Eng
3803		Betelguex dip crossing just west of Palo Verde High School	Scour hole at the north side the existing concrete.
3819	5300 Block E. Lee Street		Complanant is experincing increased stormwater runoff from adjacent property, Remington Park Subdivsion
3830		Broadway/Chantilly, north of Park Place	Andy McGovern passed the info from Don: a small basin north of Broadway received flow from Park Place detention basin can not drain totally due to the exit pipe invert is lower than the small basin. Debris & tarsh with ponding water will create mosquito problem in summe
3840	4900 Block E. Fort Lowell	Alamo wash to the west of the property	litter in the Alamo wash
3848	4800 Block E. Fort Lowell	East entrance of LaToluca Town homes, Ft Lowell between Swan & Craycroft	Ward 2/Carol West - ponding
3849	5700 Block E. 19th St.	22 St, Craycroft, 20th/19th St./Van Buran St. Wash	Grass, debris clogging the barricade pole may create hazard
3850	5600 Block E. 3Rd. St.	Craycroft, 3Rd. St.	Van Buren Wash back up
3853		Alamo wash at Seneca	Erosion both side of the wash
3855	4900 Block E. Lee	Arcadia wash near the house (Lee & Santa Rosa)	ponding & mosquito
3913	2900 Block N. Rosemont	Intersection of Rosemont & Patricia (near Glenn/ Alamo Wash/ Craycroft) 1644K E	Water ponding at the intersection. See FCI# 1100 & 1127
3916	La Toluca Townhomes	Ft.lowell	Flooding in the townhome entrance
3932	4200 Block E. 1st. St.	Alamo wash downstream of Glenn	Standing water in the wash, West Nile concern
3946		Marta Hillgrove near Wilmot & Speedway	Street flooding due to topograph
3952	5600 Block E. 7th St.	Leonora/7th St.	02/19/2005 rain came from the south west into her strage room and damaged books.Not able to bring the carbage can to the rear alley. Flow from Leonora into the east side carport area due to insufficient swale.
3965		Alamo Wash at Fairmount	big erosion hole with ponding water, mosquito concerr
3990	6300 Block E. Scarlett St.		It appears that the alley between my house and the Alamo wash is slanted in the wrong direction. This results in quite a bit of water building up in my backyard
3996	5800 Block E. 4th St.		Storm drain clogged right in front of the house.

Alamo Wash BMP
Drainage Complaints 1980-Present

4002	7700 Block E. Logan Place		The sewer behind the house is exposed
4006	6100 Block E. Rosewood		standing water on Rosewood and Alamo wash.
4017	4900 Block E. 4th St.		There is standing water about 6" east of his house in the ditch.
4029	5700 Block E. 3rd St.		Theres a puddle in the back alley, so needs grading to drain the standing water
4032		Alamo Wash Bridge of 5th St.	Needs clean-up, garbage, debirs and shopping carts,inside the alamo wash
4033	500 Block E. Brighton Lane	Brodway/Craycroft	Debris and unwanted trees east of the house in the alley
4093	600 Block S. Kenyon Drive	Alamo Wash	Has flooded two time and s covered with trees, brushes and debris
4116	4900 Block E. 4th St.		Standing water at the east side of his house may breed mosquitoes.
4125	2300 Block N. Rainbow Vista Dr.		Wants to know if his home was flooded in the flood of 1983 or 1993. Just wants a call because suspects flood problem:
4138	3900 Block S. Winter Palm Drive	Eastside Clean Up	Runoff came from Palm Grove Cluster Town homes and blocked sidewalk functioned as a dam and created a standing water situation
4142		3900 S. Snapdragon & 7151 E. Desert Aire Drive	Standing water.
4154	5800 Block E. 4th St.		After pipe installed owners out dirt and filled up with fence or wall between each other
4157	900 Block S. Mann Ave.	Alley in back of his house	Recycle Gabage Bucket Yard.
4161	7200 Block E. Desert Aire Drive	Back Alley	wash at the west/ clean up kolb/escalate
4180	Park Mall on the East side, North of 14th St.	Park Mall Detention basin standing water- Mosquitoe concern	Mosquitoe Concern
4220	5700 Block E. Hawthorne	Speedway and Craycroft	neighborhood flood
4244		5700 block of east whittier	city alley flooding complaint
4248	5400 Block E. 18th st.		Misellaneous
4250	7300 Block E. Tamara	Stella and Kolb	runoff from back alley- back yard pool (flooded
4254	7300 Block E. Bellingham	Alamo Wash	wash/debris/growth
4278		Alamo wash south of 5th street	street will put a grade control srtructure to prevent future erosion and to priotect property
4280	4800 Block E. Glenn Street		drainage issues at her property.
4308	5800 Block E.4th St.		storm sewer problem
4312	100 Block N. Avenidade San Ramon		backyard flood from overflow of drainage ditch.
4321	100 Block N. Avenida	Broadway/Wilmot	Flooding, pool mud
4324		north of Pima street	spray mosquitecide in water to prevent breeding.
4363	5300 Block E. willard	Willard	Neighbor dumped dirt behind or to the west of the house drainage way.
Paper Complaints Pre-1999			
50	6119 E. Rosewood	Rosewood & Alamo Wash	Wall (City Built) next to property and bordering Alamo was is falling apart at the base due to the traffic using space as a turn-around
187	6224 E. Fairmont		1" of mud in swimming pool, 6" of water in yard. Office bldg built to the east & a ladies club built to the south the year before
205	6074 E. Pima	Alamo Street at Pima	Paving and Building put in next door causing flooding suggested berms.
303	1734 N. Van Buren	Alley behind Van Buren	Asphalt, Water doesn't drain out of alley. Asphalt wall needs to be cut in order for positive grade to be achieved. Large hole at the end of alley needs to be filled in
-	5945 E Baker	Alamo Wash South of Speedway	Ponding water south of Speedway, she thinks maintenance crews were overzealous in cleaning out Alamo Wash
504	5756 E. Holmes	Alley	Alley flooding house due to grading issues. City graded the alley to allow for positive drainage
567	5643 E. 3rd St	Speedway & Craycroft	Flooding up to door-standing water. 5600 block drainage problems
577	6065 E Fairmont	Fairmont/Alamo Wash	Water headed west on Fairmont tries to join wash it is moving so fast that it starts to back up onto Joseph's property
630	4945 E Adams	Arcadia Wash Between Fairmont & Lee	Water stands after flows from X secn Rosa & Fairmont S to Adams St due to ponding water in Arcadia Wash
704	5310 E Fairmont		Drainage through yard
741	1475 N. Wilmot	Fairmont/Wilmot	Wall errected by Townhouse Association to the west of the above property (Apt Complex) obstructing flow to street
864	4831 E Glenn	Alamo Wash near house	Trucks hauling dirt from wash/ constr site - bad dust problem
860	1182 N. Beverly	neighbors house	Sustained water in structure several years prior
859	5714 E Grant	Arroyo on S side of Grant btween Craycroft & Rainbow Vista	People throw trash, and water from heavy rains brings more trash that collects at this location. The results are very unsightly as well as very unhealthy. Occasionally, the odor is very objectionable
844	5639 E. 5th St	Front Parking lot	Water runs down Leonora at a high velocity. Storm water continues across 5th st and into Parking lot, depositing debris, silt and gravel on lot
819	5062 E. South Regency	Rosemont Regency Townhomes, NW Rosemont & Broadway	Due to new Post Office construction next door, entire neighborhood is experiencing high water (water coming over 2-1/2' retaining wall
935	6704 E. Rosewood Cl		Drainage from neighbors swimming pool and street flow into driveway, depositing mud and silt. Complaintant feels street not graded properly to allow drainage to flow into ditch. Also has white stinky stuff in front yard
962	5919 E. Lester	Halfway between Pima & DIP Section crossing on Sahuara	Home owner on 5900 block east of Lester Dr. Left bank of wash behind house w/pink wall (address unknown) us dumoing palm frand cuttings into wash
1100	5085 E. Patricia		Berm installed by County while Bank Protecting Alamo Wash ponds water & causes shallow flooding. Possible to cut berm to drain water
1068	NE Corner Shopping Center	South of Grant Rd At Van Buren St	Drainage problem on Van Buren wash & Alamo Wash? Call for more information, Claims erosion bank protection @ convergence of washes. Can something be done? - normal erosion
1223	6100 E Bellvue	Alamo Wash 1 block N of Speedway Blvd	Alamo-Dorado Apts - 6100 E Bellvue unpermitted fill in wash
1313		Alamo Wash at Lee	Concrete dumped, also lots of debris around post barricades dead tree falling appart dropping branches into wash
1320	5936 E Grant Rd		Water fromalley flooded garage Saturday and yesterday since alley was paved. Owner will not sweep out the garage until the COT looks at it
1337	5744 E. Speedway		Water from alley entered rear of garage into storage area & flooded workshop, knocking over an oil pump and spreading oil over a large area of the floor
1609	5332 E. 10th St	North of Toys-R-Us in alley	Contractor removed berm in the alley put there by Street for runoff control berm has asphalt over it
1583	5925 E. Lester		Pima Street improvement Sahuaro Wash diverting water into Alamo Wash from Pima St.
2154	6502 E. Speedway Blvd		Says "work the Water Dept. did has affected (worsened) his situation.
2142	6065 E. Grant Rd	Old Farm Business Complex	Area behind storage building - bank protection cracked and failing
2497	6262 E. Timrod	Timrod and Wilmot	Back yard floods.
2627	432 N. Williams Blvd, Suite 1C	SW side of property	Flooding
3001	5437 E. 18th St	Drainageway	Mrs. Doyal wants drainageway adjacent to subject location, deepended. Jose Pazos #403 wants engineering/floodplains advise call to arrange meeting times. (Zone X
2114	5437 E. 18th St	Vail Middle School	Vail middle School blocking the drainage.
3250	Williams Center	AOL Detention Basin	Detention and retention facilities are inadequate in the Williams Center area (particularly at the A.O.L site) the complaintant is particularly concerned about the amount of head cutting in the Arcadia Wash

APPENDIX B
PUBLIC COMMENT FORM MATRIX

Comment Form Number	Name	Comment
2	Jennifer Quintana Diaz	By Palo Verde High School, 1302 S Avenida Vegas, Tucson AZ. In between Kolb and 22nd. Behind the high school in the neighborhood there is a canal where the water accumulates and affects the people driving and also people walking.
3		See attached comments, petition, & photos
4	Ted Ramirez	Heavy build up with sandbars, trees, vegetation, & overgrowth. The water is being channeled into one outlet at the bridge where it dumps into the Rillito. In a heavy storm water backs up causing it to breech over the banks, and flood apartments. Can some maintenance be done at the outlet at the Rillito, now before the monsoon? This would greatly improve the flow. Please feel free to contact me if there are any questions.
5	Bill Halvorson	Alamo Wash between Speedway and Lee is experiencing a lot of erosion- undercutting trees along the wash (which is deep in the Southern section of this reach) and side cut erosion with water coming off streets and parking lots and entering the wash. I have attached 5 photos as representing these problems. An apartment house at Belleview and a condo development north of Fairmount are going to be impacted. (See attached photos)
8	Russ Hanbey	1) Exceptional amount of human debris builds up between wash outlet into Rillito Creek and Swan Bridge after low elevation rain events.
10	Michele Foutz	The sand and sedimentation at the Alamo Wash (North most end) has built up since 2002. Our 40 house community is surrounded by cement and concrete lined drainage systems that were backed up -(not flowing) into the Alamo Wash in 2014. The Alamo Wash flood waters breeched the wash, flooded the walkways/path and came right up to the block walls that surround our homes. Summerlin Villas Apartments were flooded and sustained damaged to cars/garages. 2014 flood. Barrio del Este Community where Alamo and Rillito Washes meet.

11		The Alamo Wash is a natural trail for wild animals, at least near 5th St. It also has some of the last cottonwood trees (I've been told) in the area. I would hope that whatever measures are taken would take the animals into consideration, with little to no impact, please. These animals include a bobcat and its cubs for months after their birth, coyotes & javelinas. The bobcat is especially important to me. Thank you!
13	Mathhew Lukacs	Street flooding-- major streets. Kolb Rd from Harrison to Broadway. Golf Links from Prudence to Wilmot. Wilmot from Escalante to Grant. Mann Avenue from Stella to Broadway. Issue: water does not drain off fast enough to not cause traffic issues and hinders emergency vehicles as well. Issue #2: Not enough economic incentive for more residents of flood Basin to invest in rain harvesting.
14	lzch	1) Live next to Arcadia Wash- end of my property often sees water lapping onto my property. How/or who may I contact to have them look at the problem? 2) How often may one expect to have debris cleaned out of the Arroyo?
15	Glenn Paxton	Please notify me about the below question. Please check address from Assessor's owner records. Is (7019) Desert Springs in the federal or local flood plain or both? If so is there anyway to get an exemption?
16		Please arrive at your venue early, set up and adjust your AV equipment prior to giving your presentation.
18	Ann & Bill Holden	We have a drainage ditch fed by a culvert from noth of 22nd and runoff from Alamo Rd itself. Water can stand in that ditch for several days after a rain- a real breeding ground for mosquitos. City is pretty good about keeping the grass and weeds under control.
20	ME Loreto	My home backs up to the Alamo Wash. The wash in my area has eroded a lot in recent years. There are a large number of transients/homeless in the wash, living, spending days there-- doesn't that add to the stress in habitat, etc.?!

22	Henry J Fleischmann	A lot of brush buildup in wash between 5th St. & Rosewood.
23	Wayne LaMothe	Alamo wash itself between Fairmount and Lee Street. 1. Mosquito abatement! We have already had one community member die from a mosquito borne disease.2. Huge amount of bank erosion along the east side of this area of the wash. The wash is coming dangerously close to the properties located on the west side of Alamo Place.
26	Mary Williams	Golf Links/Kolb- parallel to Alamo Wash off Birch. The brush & trees in the wash are frequently set on fire. We try to get illegal dumping of trash and debris reported for clean up. (Stella to Golf Links). The jail crew occasionally cuts trees and cleans up that area- this is greatly appreciated by the residents. Homeless set up in the tunnels under Golf Links. This is a concern for their safety as well as the associated panhandling in the Rolling Hills shopping center. Access to the shopping center for pedestrians & bicyclists from the west side of the wash could be better. There is a cement path within the wash that the kids use for bikes & skateboards-- fun for them if not too many weeds.
27	Marisol Ramos	This is a great urban path. It provides off the street connection between streets for bikers & walkers. Since the Alamo connects to "The Loop" (or the Rillito Path), it would be a great way to expand "The Loop"'s reach. More urban paths!! :) By the way... there are many of these paths over the Alamo Wash...they are just not connected nor maintained...yet! :)
28	Manuel Ramos	In my opinion the section from Fort Lowell to Rillito River has been collecting sand and dirt over the years. That can be a problem for the flow of water during a storm.
29	Ronals A Pelech	My thoughts are not really directly connected to drainage issues. Citrus Street does not really have much of an issue. My thought is about bats that roost under the bridge on Fort Lowell that crosses Alamo Wash. In April and into early June hundreds of bats take to the sky just as it gets dark from this bridge. It is quite a sight. I wonder whether anything you will do will impact these beneficial mammals. Please take the bats into account with any recommendations you make to the bridge and this area. I like to walk to that area to view the bats. The time of their flight changes according to the exact time the sun sets.

30	Gabriel Davila	Trees please! Is a non-profit organization that has adopted several wash sites in Tucson. The 2 areas marked on the master maps are sections of the Alamo Wash that our organization has adopted and conducted clean-ups. Please call Gabriel Davila to learn how to volunteer.
31		Concern- Alamo Wash bank erosion behind my property @ 440 Placita Mira 85711.... Who is controlling authority for the wash.
32	Susan Johnston	The "dip" on 14th St (off Craycroft) seems to drain rather quickly after rainfall. There are a couple of evacuation streets available as well, so you are never stranded. The problem I do observe is after it drains, there is a lot of debris hung up and around the posts, and perhaps the city could clean these out sooner. This is my observation of 20 years living at the address below. Thank you.
33	Mireya Osuna	1. My property is on FEMA floodplain-- how do I go about challenging FEMA's and having my property re-evaluated or map revison. Any assistance to facilitate this proccess is greatly appreciated. 2. Mosquitos in this area is a huge health issue-spraying the area would be helpful. 3. Smell of stagnated water is over whelming. 4. Safety -- kids play in washes - barriers could helps. I appreciate the setting up of these meetings to inform us of the study, it was nicely done, thank you. Mireya Osuna
34	Elyse Benson	Is your study including a survey of existing invasive SPP in the washes and how will you address control?
35	Kathleen & Ron Dehn	5 fires last year 2016 from Calle Luna - Marte
36	Tommie Wilson	Build up sides of the wash. Mosquito control- we've had one death from West Nile. Why has it taken so long to decide to do this study. What is this costing us besides 2 more years of wait and see.
39	Jeff Rosenberg	Comment regarding 5654 E Pima St southwest corner Van Buren/Pima. Water backs up at grill in Van Buren when debris washes down. Could additional grills be installed in street at Lee Street & Van Buren? When existing grill backs up at Pima water comes up sidewalk to flow west to curb drain in Pima.

42	Jules & Louisa Gericke	1. Please see the Frances Blvd wash town house community concerns & safety suggestions as attached. 2. See petition attached.
44	Bob Schmalzel	I live in a portion of the Alamo Wash Basin that has a surpising number of transients and drug users who seek "quiet" spaces. I would like both Pima County staff and the engineers to carefully consider in the planning process and maintenance how to not create more havens for drug use, public defecation, prostitution, camp sites. That said, I am in favor of retention and detention basins.
45	Al Vasquez	Concerned about Alamo Wash being used as dumping ground for landscapers etc. Dead dry branches and debris accumulateing on bank behind our residence, 222 N Frannea Dr, highly flammable fire hazard. Also destorys the natural beauty, serenity of the wash. Purchased this property recently, not familiar with water flow problems as of yet. Who do we contact for "no dumping" signs or enforcement. Would like to clean up at least our segement.
48	George Franklin	Thank you. I learned Sahuara & Van Buren are considered "washes." I have alternate routes to avoid the washes when there is flooding so I don't see it as a problem. Sahuara & Hampton St.
51		The area of concern is the Arcadia Wash. 1. At times the wash runs almost black for the first 15 to 20 minutes, contaminated? 2. The cleaning of the wash is a must to help prevent flooding. 3. The run off water all along the wash increase it's flow, there for the size of the wash should increase all the way to the river. I believe the Arcadia Wash could use work in this area? The culverts under main roads can handle more water than wash itself. The point is to reduce the floodplaim. I apologize for being late. Will this do any good?

52	Declined	East side yard (sidewalk area) washes deeper and deeper by the curb with each flood, especially in monsoon. Last year, Arcadia wash, flooding has been up to 1/2 of hubcaps at E 23rd to old Corbett Sch. Along Sahuara I parked once before rain, then it rained so i waded to my car, opened drivers door and a car came by drenching me and my drivers side upholstery with filthy water.
53		2005 LA Fitness Ctr did not have drainage basins to retain run off of parking lot that added to Park Mall run off. What are building requirements for retention at runoff from parking lots. Develop more retention and recharge in Basin areas.
55	Pame Todd	The Alamo needs "routine maintanence" to clear the build up where it dumps into the Rillito. The path is being breeched fairly often during monsoons.
58	Charles Allen	Hydrology and public safety are appropirately key elements of the study, but mention was made of an ongoing sociological/recreational "greenway" component. What agencies/individuals can be contacted about such land use policies in the watershed? Specific issues: 1. An increase of campsties in the Alamo Wash between 5th and Pima with attendant litter, sanitation, and open fire issues. 2. Encounters between hikers/dog walkers and wildlife transiting the wash (coyotes, javelinas, bobcat) leading to human injury and extermination of the "offending" animals using the same corridor.
60	Colleen Sackhelm	Do not eliminate floodplains. No more channelization. Water Harvesting. Reproduce floodplain function. Trails and vegetation on sides of Alamo don't deteriorate-- Slows down flooding and speed of water.

61	Ida Valdez	As far as Rosemont Regency is concerned, the biggest concern is street flooding from Rosemont Blvd flowing into the entrance of our complex before water gets to Arcadia Wash. A large sewer pipe crosses the wash and abstructs debris (including furniture) that gets thrown into the wash. The wash gets severly overgorwn with large trees and bushes that also block the flow. Note: Fred did a great job. The others need to learn how the microphone works. Difficult to understand with mic noise.
62	Bruce N Edards	Alamo wash south of Pima is all concrete. Area behind my home is natural. When the water gains speed from the concrete area and more north behind my property it creates great amounts of erosion that is slowly moving toward my property line. This also creates a very steep and dangerous bank. Thanks.
63	Bev Mahl	I marked 2 places off and on Stella. I avoided these 2 when I am at Stella and Wilmot--use Golf Links -> Kolb -> Stella & South on Prudence to get home. The one on Prudence/Stella needs to have the bushes DUG out- water flows over the foot bridge and backs up on Prudence.
71	Fred Rose	Water coming from back property washing across 1620 and 1626 N Sahuara Ave making houses sink and foundations cracking. Why do you have to have FEMA on this St can't sell my house. Made road deeper. Have pictures.
73	Rebecca Holman	At the end of Del Valle Ave @ Sears park always floods. Beverly and Craycroft flood drains, clogged with debris.

78	Beryl Baker	Notice said presentation was to be at 6:30 we arrived at 6:20 and it was already almost over. Use TSMS data as base, including no cement in washes, natural washes are better in the long run. Use any funds to have people become the solutuion by having funding for all the people to H2o harvest on their properties instead of big projects. H2o harvesting would help w/ solution in this watershed as well as creating a place of beauty and/or sustainable into future water shortages.
80		(1026 N Sahuara Ave.) Property (Church) Water runs to the back yard..flooding my back yard. I believe there is an easement (That could releave the issue in my back yard.) Sahuara Wash is not an issue and would like to have Pima remap this property.
83	Mary Kolba	We are getting water/rain runoff from Whitmore Elem. We have hired an engineer to help deal with drainage on Desert Glenn Townhouses HOA. 2701 N Cloverland. However, we can't do anyting about draingae off the playground at Whitmore Elem. I have pictures taken during rain/flooding events.
85	Sandra Cliché	I own 6038 E Fairmount St property and want bank protection; with the city's help and resources. Home owner tax payers like me cannot afford or have the ability to bank protect from Speedway north to Lee St. Thanks for the opprotunity to meet other Alamo Wash home owners & hopefully strategize a plan to communally protect our homes proactively. :)

86	Steve	I purchased my home and 2 vacant lots in 1996. Before I purchased my home I visited City of Tucson Permits and inquired if my lots being in a floodplain would prevent me from building on the 2 lots. They indicated the lots were buildable especially since developing the land would create more property taxes. At that time no one ever mentioned needing a hydrology study. I bought the lots with plans to build on them. Four years later I returned with some building plans and was told I need hydrology study. They said the hydrology study was a detail and they believed I could get my building plans approved. At the time I delayed because of the $10,000 cost of the study. Last year I returned to the City of Tucson and spoke to their hydrologists. He put me in touch with someone familiar with the flood maps. I made a deal to pay $5k in cash for the study. But when I asked him if he thought I would be able to build he said proabbly NOT- very unlikely. The City Hydrologist has said the same thing which is why he put me in touch with the hydrologist. I have been paying property taxes on these 2 lots for 21 years and bought them with the understanding (from talking to the City of Tucson) that I could easily build on them. Those lots should be worth $30k to $40k each. I could probably sell them for $5k each which won't even equal the property taxes I've paid over the years. HELP! Steve

89	Renee Dowing	My concern is Arcadia Wash at 10th St & Beverly & downstream to the bridge over Rosemout. When water stands (or rises into the floodplain) in the big pool behind the hotel @ 10th & Beverly, or in the area downstream of the concrete area just below, the City comes in, dumps giant loads of dirt and drives heavy machinery down into the culvert and on a little way into the wash. (It can't get far because the wash narrows abruptly.) The dirt dumping is just a stupid waste because it washes away in the first heavy rain. The clearing is ineffective because the machines cannot get very far down the wash. I complained to the Mayor's office & Steve Kozachik asked that a better solution be found. Then they dumped a huge load of boulders just below the concrete, which has resulted in gravel & soil collecting on the concrete; which will soon be covered with trees and weeds again (which the city seems interested in tearing out) I love the wildlife along the wash and in the beautiful reclaimed water-- recharge area @ the south end of HU Park, & would like to see crews hand clear fallen treets and other trash blocking the wash (& liable to get caught under the bridge @ Rosemont) AND a better solution to mosquitos in the standing puddles. (Some of us throw drinks? in) I pick up trash in the wash, where i walk my dog almost daily, and would like to see it cared for properly. Thank you for hosting this and asking for our opinions. Also, the "bunny hills" - the bike jumps the kids build behind Target-- meed to be left alone. Kids need a place to play! BTW- since the south end of the park was replaced with native vegetation, it has attracted serious burdens.
90	Gary Geisler	Protect More washes! What are the real problems? How much real damage is occuring? Does using conrete in washes really help or hinder damage to propert? How do we address the issue? City of Tucson Fred Felix/Pima Co.
91	Julian Ballesteros	I live in 5749 E 14th street. No flooding problems. Thanks to God! However, in the wash Arcadia 14th East Craycroft that wash floods-after drain normally there are a lot of trash- branches- that keep residential flooding water that is becoming source for mosquitos.
93	Susan Beardsley	You are going to study this for 2 years? When do you start clean up? Clean up Golf Links to 22nd. Please get the dead stuff out and the garbage out.

94	David Batchelder	
95	William Walkup	Rain collecting systems -> as people build these rain collecting systems, we are removing rain water and storing it temp. which "subtracts" the G.P.M. flowing into a wash. If my home collects 10,000 gallons and 25% of residences do the same, that is a lot of water collected and not flowing into the wash. Possible data from permits to install rain collecting systems (i.e. sq. ft of roofspace) also keep $2000 incentives for building rain collecting systems to promote building them. No water=no life -> how about a campaign to teach every home owner, school child about conservation. I took the Pima Ext. water harvesting class offered on Pima. We will be installing our system this year. 5815 e 15th St Tucson AZ 85711. And God bless schools like Sky High School for teaching the importance of water. What about tax credits for installing permiable pavement for home driveways.
96	James Harkin	Our home is mid-block 5833 East 14th Street, North side of Street between Sahuara and McKinley. West of our home 4th St peaks and pushes water East to West away from Sahuara Wash. There is a underground culvert that connects 4th to 3rd Street flowing North. Once saw the culvert and it appears about 10 " diameter. Over time, the pipe fills up with debris (vegetation, dirt, dead cats) that backs up storm flow to depths of several inches and more, water advances up our driveway. At times back-up has flowed into yards West of culvert with real property drainage. Multiple calls sooner (water brings team from city of Tucson to 'Roto-Rooter' pipe from 4th St and 3rd St. I have seen backflow which is substantial flushing from culvert pipe. For awhile the pipe drains well and then less well en route to holding flooded street for several days. In these times we have water. Front property with attendant' street damage and public health risks and potential property damage. What to do? Redirect 4th street to Sahuara Wash? Replace culvert that dates to 1950s (and crosses private property)? Do nothing with consequent experience of street flooding? Thank you.

98	James & Victoria Orr	**1.** Extreme overgrow vegetation **2**. lack of mountain view due to overgrown veg. A- purchased our home 27 years ago with Mtn views now can NOT see it. Home value declined **3**. fire hazard- smokers going up/down alleys and lightening 4. Electrical poles/wires now surrounded by growth A- flooding could take down affecting homeowners ultilities **5**.Flooding- we have a chain Link fence- water overflows into backyard after flooding alleys twice up to our back home patio **6.** animals-bugs-& people hiding in overgrowth- personal safety --> have to walk along wash to take garbage out **7.** Graffiti- drug deals-- illegal dumping in wash **8.** Flooding debris clogs wash and sticks among vegetation looking like a dump zone- collects at Yale Bridge catches on trees and bushes, some big items... Ex Dumpsters-Doors-- Grocery carts- toys **9.** once an exposed sewer pipe broke in middle of wash-water flowing out. 2 reported and it took 3-4 days for someone to look/fix it **10**. I have a video on my cell phone from last summer (Aug 9, 2016) **11.** Yale/Forham Bridge needs to be replaces neighborhood school children cross daily **12.** I have been trying to contact regarding this for years with no response **13**- Read about the Rillito clean up done Sept 2016.. Why not the Alamo Residential areas?
102		Build bridges everywhere there is a dip such as at this point. This will prevent cars being swept away and bridges are great opprotunities for architecture and art.
105	me Oh	My property is on the FEMA flood plain- I need assistance is getting a map revision of the area, to eliminate flood insurance. It is causing a financial hardship. Mosquitos are a huge issue in the area, any assistance provided would be appreciated. Foul smell from wash is also an issue. Thanks, Rainbow Dr.
106	Sandra Almasy (Speaking for neighbors too)	(We're at the corner of "Vernice.") Please do not put concrete behind out street. (Unfortunately, there is already concrete just to the east of us near Kolb) There is no flooding problem or erosion problem and we love the greenery and wildlife. There is no problem with the street crossing there at Stella- very infrequent inconveniance, adn easy alternatives.
151		My neighbor was flooded as I had to open my gates to let the water flow through. I live at 6119 E Rosewood St. She is on Hawthorn.

152	Ying Cho	What chance of flooding? What is the flooding history of this particular area?
155	Roger McMonus	1) I thank you for this work 2) Alamo wash is an impacted corridor and wildlife habitat we want to protect 3) FEMA flooding guidance is important and it would be good to justify where appropriate a lowering of fees, 4) Alamo wash is dangerous to pedestrian traffic from 5th street to Broadway as it is very deep and steep- we need simple barriers and warning signs to prevent accidents, and Alamo wash is treasured by our community as a recreational and walking area.
195	Terry Hendricks (Flood Control District)	The gentleman did not want to leave his name. This location has extreme bad scour at the storm drain outlet is getting deep.

APPENDIX C
DATA COLLECTION & DRAINAGE INVENTORY SUMMARIES

Date: 12/16/2016 Alamo Wash Basin Management Plan

Estimated Drainage Structures (Culverts&Bridges)

ID	Structure ID	Wash Name	Roadway	Bridge/Culvert	Size	Comments	Plan ID
Alamo Wash (Main Wash)							
1	AL#1	Alamo Wash	Rillito River Pass	Bridge		Pedestrian Bridge, With Pier	D-98-002, D-84-008 (Ped Bridge plan unable to locate)
2	AL#2	Alamo Wash	Valley Ranch Dr	Bridge		No Pier	D-98-002, GR-99-004
3	AL#3	Alamo Wash	Fort Lowell Rd	Bridge		No Pier	D-84-008, D-87-010
4	AL#4	Alamo Wash	Glenn St	Bridge		No Pier	D-65-006, D-71-008, D-84-008, I 88-001
5	AL#5	Alamo Wash	N/A	Bridge		Pedestrian Bridge, No Pier	D-84-008
6	AL#6	Alamo Wash	New Hospital Rd	Bridge		No Pier	D-84-008
7	AL#7	Alamo Wash	N/A	Bridge		Pedestrian Bridge, No Pier	D-84-008
8	AL#8	Alamo Wash	Silver St	Bridge		No Pier	D-74-005
9	AL#9	Alamo Wash	Craycroft Rd	Culvert	2 Span - Precast RC Deck Slab Bridge		D-129, D-83-006, I-66-028
10	AL#10	Alamo Wash	Grant Rd	Culvert	3 Span - RC Deck Bridge		D-83-006, E-84-007, E-85-015, I-64-046, I-66-028, I-2010-004
11	AL#11	Alamo Wash	Downstream of Sahuara Ave	Bridge		Pedestrain Bridge, With Pier	E-85-015, I-849
12	AL#12	Alamo Wash	Pima St	Bridge		No Pier	E-84-015, E-85-015, I-85-074
13	AL#13	Alamo Wash	Speedway Blvd	Bridge		No Pier	D-94-001A, E-85-015, I-65-066, I-843, I-849
14	AL#14	Alamo Wash	5th St	Culvert	3 Span - RC Deck Bridge, (3-18'X10' RC Cells)		D-2006-006, E-85-015, I-798
15	AL#15	Alamo Wash	Broadway Blvd	Stormdrain			D-2015-001, E-85-015, I-86-083
16	AL#16	Alamo Wash	Park Mall near Sears	Culvert	3-10'x6' RCBC		D-64-006, I-64-025, D-2015-001
17	AL#17	Alamo Wash	West of Wilmot Rd	Bridge		No Pier	GR-88-124, GR-90-017, I-2004-025 (Bridge plan unable to locate)
18	AL#18	Alamo Wash	Wilmot Rd	Culvert	3-10'x5' RCBC		D-64-006, I-63-030, I-99-057
19	AL#19	Alamo Wash	Wilmot Rd	Culvert	1-5'x5' RCBC		D-64-006, I-63-030, I-99-057
20	AL#20	Alamo Wash	Upstream of Malvern St	Bridge		Pedestrain Bridge, With Pier	I-715B (Ped Bridge Plans unable to locate)
21	AL#21	Alamo Wash	Upstream of Yale Dr	Bridge		Pedestrain Bridge, With Pier	I-715B (Ped Bridge Plans unable to locate)
22	AL#22	Alamo Wash	22nd Street	Culvert	3-10'x5' RCBC		I-62-012
23	AL#23	Alamo Wash	Downstream of Calle Betelgeux	Bridge		Pedestrain Bridge, With Pier	I-748N, U-2000-016
24	AL#24	Alamo Wash	Downstream of Calle Marte	Bridge		Pedestrain Bridge, With Pier	I-748C, U-94-006, U-2006-016
25	AL#25	Alamo Wash	Golf Links Rd	Culvert	2-12'x4' RCBC		I-77-016, I-2007-013, I-2008-034, U-2005-012
26	AL#26	Alamo Wash	Upstream of Stella Rd	Bridge		Pedestrain Bridge, No Pier	D-2002-004, I-69-048, I-70-035
27	AL#27	Alamo Wash	Kolb Rd	Culvert	2-12'x3' RCBC		I-81-036, U-2015-011
28	AL#28	Alamo Wash	Escalante Rd	Culvert	2-6'x3' RCBC		D-2008-001, I-86-032
				Total:	17	Bridges (include 9 Pedestrain Bridges)	
					10	Culverts	
					1	Stormdrain	

ID		Wash Name	Roadway	Bridge/Culvert	Size	Comments	Plan ID
Arcadia Wash (Main Wash)							
1	AR#1	Arcadia Wash	N/A	Bridge		Pedestrain Bridge, No Pier	D-84-008, D-85-022, E-84-007, I-94-004
2	AR#2	Arcadia Wash	Wyatt Dr	Bridge		No Pier	GR-88-128, I-88-057
3	AR#3	Arcadia Wash	Grant Rd	Culvert	5 - 10' X 8' RCBC		D-85-022, E-86-001, I-66-028
4	AR#4	Arcadia Wash	Seneca St	Culvert	3-10'x7' RCBC		E-124, E-86-001, I-63-039, I-80-028, I-81-015
5	AR#5	Arcadia Wash	Pima St	Culvert	3-12'x5' RCBC		E-124, I-79-007, I-85-083
6	AR#6	Arcadia Wash	Downstream of Speedway Blvd	Culvert	3-10'x5' RCBC		I-64-055, U-2010-011
7	AR#7	Arcadia Wash	Speedway Blvd	Culvert	3-10'x4' RCBC		E-144, I-62-015, I-64-055, I-65-004, I-65-066, I-616, U-2010-011
8	AR#8	Arcadia Wash	5th St	Culvert	3-10'x5' RCBC		I-798, I-90-029
9	AR#9	Arcadia Wash	Rosemont Blvd	Culvert	3-10'x5' RCBC		D-73-013, E-124, E-130, E-84-020, I-77-042, I-78-011, U-2015-017
10	AR#10	Arcadia Wash	Broadway Blvd/Craycroft Rd	Stormdrain			D-62-001, D-66-009, D-74-003, D-85-005, E-132, E-62-002, I-65-050, I-74-001, I-77-013, I-77-020, I-86-042,I-96-060, I-624, U-2007-004
11	AR#11	Arcadia Wash	North of 14th St	Bridge		Pedestrain Bridge	I-839, E-62-002
12	AR#12	Arcadia Wash	South Wilshire Dr	Culvert	2-8'x5.5' RCBC		I-755
				Total:	3	Bridges (include 1 Pedestrain Bridge)	
					8	Culverts	
					1	Stormdrain	

ID		Wash Name	Roadway	Bridge/Culvert	Size	Comments	Plan ID
No Name Wash (Trib to Alamo Wash; between 5th St and Broadway Blvd)							
1	Tr#1	No Name	Wilmot Rd to West	Stormdrain			E-70-006, D73-001, E-83-007, I-72-076, I-83-047, i-860
				Total:	1	Stormdrain	

ID		Wash Name	Roadway	Bridge/Culvert	Size	Comments	Plan ID
No Name Wash (Trib to Alamo Wash; between 22nd St and Stella Rd)							
1	TR#2	No Name	West of Avenida Planeta	Bridge		Pedestrain Bridge, With Pier	U-73-002, U-2005-12, I-2007-13
2	TR#3	No Name	Kolb Rd	Culvert	2-10'x4' RCBC		I-77-017, GR-2008-067
3	TR#4	No Name	Golf Link Rd	Culvert	2-10'x3' RCBC		I-77-017, GR-2008-067
4	TR#5	No Name	West of Prudence Rd	Bridge		Pedestrain Bridge, No Peir	I-70-006
5	TR#6	No Name	Stella Rd	Culvert	3-36" RCP		D-2002-004, I-70-006, I-71-024
				Total:	2	Bridges (both are Pedestrain Bridges)	
					3	Culverts	

* No Drainage Structures need to be surveyed for Sahuara Wash and Vanburen Wash

Agency	Document/Data Type	ID	Doc No.	Electronic/Hard Copy (E/H)	Information Contains								Folder
					Drainage Structures	Design Q	HGL	BFE	Floodplain Limits	Elevation data	Riparian Habitat	Aerial Photo	
City of Tucson	Summerlin Villas Development Plan	GD#1	(GR-98-010) Same as DP#1_D 98012_BK. 18 PG.33	X		X				X			Grading_Plans
City of Tucson	Village Offices, Lots 1-59 GP	GD#2	GR-2001-073	X	X					X			Grading_Plans
City of Tucson	Valley Ranch Lots 1-63 GP	GD#3	GR-99-004	X	X	X				X			Grading_Plans
City of Tucson	Plaza Palomino GP	GD#4	GR-84-087A	X									Grading_Plans
City of Tucson	5020 E Ft Lowell GP	GD#5	GR-2009-045	X		X							Grading_Plans
City of Tucson	Canciones Subdivision Lots 1-9 Private Sewer Plans	GD#6	GR-2000-032	X						X			Grading_Plans
City of Tucson	Glenn Medical Cntr GP	GD#7	GR-2006-071	X		X				X			Grading_Plans
City of Tucson	Tucson Medical Cntr Rehab	GD#8	GR-89-003	X									Grading_Plans
City of Tucson	Information Resource Mngt	GD#9	GR-87-054	X						X			Grading_Plans
City of Tucson	Wyatt Street Improvements PH	GD#10	GR-88-128	X	X	X				X			Grading_Plans
City of Tucson	Tucson Medical Cntr Parking Lot	GD#11	GR-90-020	X	X	X				X			Grading_Plans
City of Tucson	Medical Office for Tucson	GD#12	GR-90-037	X						X			Grading_Plans
City of Tucson	Wyatt Medical Offices GP	GD#13	GR-88-111	X						X			Grading_Plans
City of Tucson	Forum at Tucson GP	GD#14	GR-88-042	X						X			Grading_Plans
City of Tucson	Tucson Medical Plaza GP	GD#15	GR-85-134	X									Grading_Plans
City of Tucson	The Atruim Office Bld Parcel B	GD#16	GR-89-094	X						X			Grading_Plans
City of Tucson	Wyatt Streeet Improvements Gp	GD#17	GR-88-086 (DUPLICATE)	X	X	X				X			Grading_Plans
City of Tucson	Tucson Medical Center I.R.M.	GD#18	GR-88-057	X	X					X			Grading_Plans
City of Tucson	Anderson De Bartolo Pan Corp	GD#19	GR-84-066	X						X			Grading_Plans
City of Tucson	CrossRoads Festival PH II GP	GD#20	GR-88-083	X									Grading_Plans
City of Tucson	Tucson Medical Plaza GP	GD#21	GR-85-134	X						X			Grading_Plans
City of Tucson	Tucson Medical Park West II GP	GD#22	GR-84-086	X									Grading_Plans
City of Tucson	Lot 4 of Tucson Medical Park 2	GD#23	GR-85-008	X									Grading_Plans
City of Tucson	Circle K GP	GD#24	GR-84-085	X						X			Grading_Plans
City of Tucson	Metaxa Plaza GP	GD#25	GR-86-035	X						X			Grading_Plans
City of Tucson	Dental Office Bld for Craycroft	GD#26	GR-85-055	X									Grading_Plans
City of Tucson	Grading Permit	GD#27	GR-85-039	X									Grading_Plans
City of Tucson	PH III TUSD Ft Lowell Elem GP	GD#28	GR-90-036	X									Grading_Plans
City of Tucson	Centuras Office Bldg GP	GD#29	GR-86-148	X									Grading_Plans
City of Tucson	Pima Office Plaza GP	GD#30	GR-86-158	X									Grading_Plans
City of Tucson	Lindenwood Subdivision GP	GD#31	GR-87-051	X						X			Grading_Plans
City of Tucson	Fairfield Pima Office GP	GD#32	GR-86-016	X						X			Grading_Plans
City of Tucson	Ridgepointe Condominuims GP	GD#33	GR-85-099	X	X	X				X			Grading_Plans
City of Tucson	Harlows Landscape Center &	GD#34	GR-91-007	X						X			Grading_Plans
City of Tucson	Pima Wilmot Office Complex GP	GD#35	GR-97-007	X						X			Grading_Plans
City of Tucson	Alamo Ave Apts GP	GD#36	GR-88-104	X						X			Grading_Plans
City of Tucson	Grading Permit	GD#37	GR-87-032 No Documents found	X									Grading_Plans
City of Tucson	Fairmount Ave GP	GD#38	GR-87-096	X						X			Grading_Plans
City of Tucson	N Wilmot Executive Offices GP	GD#39	GR-84-056	X									Grading_Plans
City of Tucson	El Dorado Parking Structure GP	GD#40	GR-2001-041	X	X	X				X			Grading_Plans
City of Tucson	Emergency Suite Addition El	GD#41	GR-84-090	X									Grading_Plans
City of Tucson	Retail Stores Bldg GP	GD#42	GR-85-151	X									Grading_Plans
City of Tucson	Tucson Limb & Brace GP	GD#43	GR-85-130	X	X	X				X			Grading_Plans
City of Tucson	Tucson MTX GP	GD#44	GR-89-096	X						X			Grading_Plans
City of Tucson	Office Club GP	GD#45	GR-89-044	X		X				X			Grading_Plans
City of Tucson	Speedway/Beverly Cntr GP	GD#46	GR-88-136	X									Grading_Plans
City of Tucson	IAP Apartments GP	GD#47	GR-2002-033	X						X			Grading_Plans
City of Tucson	Nickerson Development/Sevits	GD#48	GR-89-031	X		X				X			Grading_Plans
City of Tucson	Eastgate APT GP	GD#49	GR-84-072	X									Grading_Plans
City of Tucson	Enterprize Rent-A-Car GP	GD#50	GR-2002-021	X						X			Grading_Plans
City of Tucson	Speedway Plaza GP	GD#51	GR-85-084	X									Grading_Plans
City of Tucson	LeeWood Nursing Home GP	GD#52	GR-86-090	X						X			Grading_Plans
City of Tucson	Checker Auto Speedway Blvd &	GD#53	GR-99-020	X		X			X	X			Grading_Plans
City of Tucson	6080 E Bellevue St Private On-	GD#54	GR-2008-045	X					X	X			Grading_Plans
City of Tucson	Center Plaza GP	GD#55	GR-87-016	X						X			Grading_Plans
City of Tucson	Brock Residence INN GP	GD#56	GR-84-054	X						X			Grading_Plans
City of Tucson	Rasisson/Friend Suite Hotel GP	GD#57	GR-85-005	X						X			Grading_Plans
City of Tucson	Hermosa Village Senior Apts GP	GD#58	GR-2007-121	X						X			Grading_Plans
City of Tucson	Fudruckers Restaurant GP	GD#59	GR-85-091	X						X			Grading_Plans
City of Tucson	Sycamore Square Apts Site	GD#60	GR-86-072	X						X			Grading_Plans
City of Tucson	7-Eleven Food Stores GP	GD#61	GR-86-049	X									Grading_Plans
City of Tucson	Holy Resurrection Church GP	GD#62	GR-2006-068	X		X				X			Grading_Plans
City of Tucson	Indian House Village Lots 1-5 GP	GD#63	GR-2008-018	X		X				X			Grading_Plans

Agency	Document/Data Type	ID	Doc No.	Electronic/Hard Copy (E/H)	Information Contains								Folder
					Drainage Structures	Design Q	HGL	BFE	Floodplain Limits	Elevation data	Riparian Habitat	Aerial Photo	
City of Tucson	Cigna Tucson GP	GD#64	GR-90-059	X						X			Grading_Plans
City of Tucson	St. Michaels & All Angels Paarish	GD#65	GR-98-004	X						X			Grading_Plans
City of Tucson	St. Josephs Hospital Women's	GD#66	GR-2007-135	X						X			Grading_Plans
City of Tucson	St. Josephs Hospital Medical	GD#67	GR-2008-072	X	X	X				X			Grading_Plans
City of Tucson	St. Josephs Hospital Medical	GD#68	GR-86-170	X						X			Grading_Plans
City of Tucson	Desert Bloom Medical Office	GD#69	GR-2009-034	X						X			Grading_Plans
City of Tucson	St. Josephs Site/Utility Plan	GD#70	GR-88-089	X						X			Grading_Plans
City of Tucson	Broadway/Jessica Retail Center	GD#71	GR-86-007	X						X			Grading_Plans
City of Tucson	Highland Vista Park GP	GD#72	GR-2008-049	X						X			Grading_Plans
City of Tucson	Toys R Us/Kids R Us GP PH I &	GD#73	GR-90-080 & GR-90-092	X						X			Grading_Plans
City of Tucson	Williams Centre United Bank GP	GD#74	GR-86-009	X						X			Grading_Plans
City of Tucson	Grading Permit	GD#75	GR-87-004 (no plan found)	X									Grading_Plans
City of Tucson	Williams Centre Garden Offices	GD#76	GR-85-098	X						X			Grading_Plans
City of Tucson	Williams Centre Technical	GD#77	GR-2000-041	X	X	X	X			X			Grading_Plans
City of Tucson	Williams Centre Blks 8 & 9 GP	GD#78	GR-2002-076 & GR-2007-165	X						X			Grading_Plans
City of Tucson	The Springs GP	GD#79	GR-86-015	X						X			Grading_Plans
City of Tucson	Office Max GP	GD#80	GR-2000-003	X						X			Grading_Plans
City of Tucson	Arbys GP	GD#81	GR-90-058	X						X			Grading_Plans
City of Tucson	Wienerschnitzel GP	GD#82	GR-2001-065	X						X			Grading_Plans
City of Tucson	El Dorado theatre Plitt Theatre	GD#83	GR-87-078	X						X			Grading_Plans
City of Tucson	New Parcel Lot 14th St GP	GD#84	GR-88-124 & GR-90-017	X						X			Grading_Plans
City of Tucson	Hampton Inn GP	GD#85	GR-2008-080	X		X			X	X			Grading_Plans
City of Tucson	Lucky Shopping Center GP	GD#86	GR-86-129 & GR-87-121	X						X			Grading_Plans
City of Tucson	5755-59 E 22nd St. GP	GD#87	GR-86-154 & GR-91-019	X		X				X			Grading_Plans
City of Tucson	Proposed Retail Center GP	GD#88	GR-87-033 & GR-87-077	X						X			Grading_Plans
City of Tucson	Pizza Hut GP	GD#89	GR-2000-047	X						X			Grading_Plans
City of Tucson	Grading Permit	GD#90	GR-86-053	X						X			Grading_Plans
City of Tucson	Whataburger Gp	GD#91	GR-2008-008	X		X				X			Grading_Plans
City of Tucson	Grading Permit	GD#92	GR-87-46 (NOT FOUND)	X									Grading_Plans
City of Tucson	Grading Permit	GD#93	GR-88-08 (NOT FOUND)	X									Grading_Plans
City of Tucson	Circle K 22nd/Kolb GP	GD#94	GR-88-084	X						X			Grading_Plans
City of Tucson	American Self Storage II GP	GD#95	GR-86-149	X		X				X			Grading_Plans
City of Tucson	Golf Links Self Storage GP	GD#96	GR-86-082	X	X	X				X			Grading_Plans
City of Tucson	Lutheran Church of theKing, LCA	GD#97	GR-88-106	X						X			Grading_Plans
City of Tucson	El Rio Health Center SE Clinic GP	GD#98	GR-2009-004	X		X			X	X			Grading_Plans
City of Tucson	Lee/Kolb Car Wash GP	GD#99	GR-87-126	X									Grading_Plans
City of Tucson	Walgreens Store GP	GD#100	GR-2008-067	X						X			Grading_Plans
City of Tucson	Dunkin Donuts GP	GD#101	GR-88-100	X									Grading_Plans
City of Tucson	Dave Noel Multi-Use Bldg GP	GD#102	GR-89-066	X		X				X			Grading_Plans
City of Tucson	Brake Max 6 GP	GD#103	GR-2001-064	X	X					X			Grading_Plans
City of Tucson	Cross Ridge Lots 1-35 GP	GD#104	GR-99-002	X						X			Grading_Plans
City of Tucson	Villa Monterey GP	GD#105	GR-84-021	X						X			Grading_Plans
City of Tucson	Rincon Baptist Church GP	GD#106	GR-2006-035	X						X			Grading_Plans
City of Tucson	Enchanted Vista Lots 1-42 GP	GD#107	GR-99-016	X		X			X	X			Grading_Plans
City of Tucson	Rincon Aviador PH I GP	GD#108	GR-98-006	X	X	X				X			Grading_Plans
City of Tucson	Quik Mart GP	GD#109	GR-85-011	X						X			Grading_Plans
City of Tucson	Villas Escalante lots 1-51 GP	GD#110	GR-2007-027	X		X				X			Grading_Plans
City of Tucson	Lee Street Apts GP	GD#111	GR-84-71	X						X			Grading_Plans

Agency	Document/Data Type	ID	Doc No.	Electronic/Hard Copy (E/H)	Information Contains								Folder
					Drainage Structures	Design Q	HGL	BFE	Floodplain Limits	Elevation data	Riparian Habitat	Aerial Photo	
City of Tucson	Camp Lowell Dr Paving Improvement Plans	RD#1	I-99-031, I-2002-029	X	X	X							Roadway_Plans
City of Tucson	Fort Lowell Rd Paving Improvement Plans	RD#2	I-79-015, I-81-043, I-85-053, L-2000-02, S-79-020	X									Roadway_Plans
City of Tucson	Torino Ave Dirt Street Paving Program 1992-1993	RD#3	I-92-001	X									Roadway_Plans
City of Tucson	San Francisco Blvd District Paving Improvement	RD#4	I-79-021, I-92-001	X									Roadway_Plans
City of Tucson	Arcadia Ave Paving Improvement Plans	RD#5	I-62-015, I-63-039, I-64-055, I-76-017, I-80-008, I-85-052A, I-585, I-627, I-630, E-144-001, F-91-002, GR-84-076, S-64-007, S-64-020	X	X							X	Roadway_Plans
City of Tucson	Orlando Ave Paving Improvement Plans	RD#6	I-79-021, I-81-003, D-73-007	X									Roadway_Plans
City of Tucson	Glenn St Misc Spot Improvements, District Paving Improvements, & Road Recovery and Overlay Plan	RD#7	I-79-015, I-86-028, I-88-001, I-850, I-90-011, I-2005-019, S-79-020, S-93-013, S-2005-045, U-2004-029 (not scanned in COT database), U-91-001	X									Roadway_Plans
City of Tucson	Grant Road District Paving Improvement, Misc Ramps & Median Modifications	RD#8	I-66-028, I-70-009, I-85-052, I-85-052a, I-85-053, I-85-083, I-86-012, I-89-012, I-99-025, I-2006-072, U-84-005,	X	X	X				X			Roadway_Plans
City of Tucson	Wyatt Dr Paving Improvement Plans	RD#9	I-88-057, GR-88-086	X	X	X				X			Roadway_Plans
City of Tucson	Craycroft Rd District Paving Improvement	RD#10	I-64-020, I-64-046, I-65-050, I-65-070, I-70-024, I-77-013, I-82-020, I-83-011, I-85-024, I-96-007, I-96-060, I-2003-005, I-2004-037, I-2006-072, I-2010-004, I-665, I-839, S-79-029, S-84-010, U-92-005, U-99-006, U-2005-019, U-2007-004, U-2009-032C	X	X							X	Roadway_Plans
City of Tucson	Speedway Blvd District Paving Improvement	RD#11	I-64-055, I-65-004, I-65-066, I-73-038, I-74-026, I-616, I-849, I-84-053, I-85-053, I-96-006, U-2010-011	X	X							X	Roadway_Plans
City of Tucson	Van Buren Ave District Paving Improvement	RD#12	I-63-023, I-665, I-843	X									Roadway_Plans
City of Tucson	Beverly Ave Paving Improvement Plans	RD#13	I-581, I-665, I-75-026, I-82-008, I-93-025, I-626, L-76-005, D-83-006	X	X								Roadway_Plans
City of Tucson	Cloverland Ave Paving Improvement Plans	RD#14	I-66-036	X									Roadway_Plans
City of Tucson	Frances Blvd Paving	RD#15	I-81-015	X	X								Roadway_Plans
City of Tucson	Pima Street Paving Improvement Plans	RD#16	I-62-002, I-62-021, I-66-028, I-73-038, I-74-005, I-74-006, I-79-007, I-85-074, I-83-052, I-85-074,I-85-083, I-93-007, I-93-023, I-2006-067, I-2009-024, S-93-013, S-2001-005, U-2009-024	X	X	X				X		X	Roadway_Plans
City of Tucson	Wilmot Rd Paving Improvement Plans	RD#17	I-63-030, I-66-007, I-68-021, I-71-066, I-72-076, I-76-022, I-77-041, I-83-047, I-84-021, I-84-042, I-86-04, I-87-061, I-87-061, I-89-047, I-96-006, I-99-057, I-2000-030, I-2001-025, I-2003-003, I-2004-025, I-2004-064, I-2007-038, I-860, F-2000-004, S-77-015, S-82-032, S-88-041, U-92-005, U-2005-012, U-2015-009	X	X	X				X		X	Roadway_Plans
City of Tucson	Rosemont Blvd District Paving Plans	RD#18	I-73-037, I-77-042, I-78-011, I-84-079, I-86-037, I-92-026, I-576, I-583, I-611, I-644, I-772, S-82-032, S-85-008, S-2008-011, U-2015-017	X						X			Roadway_Plans
City of Tucson	Sahuara Ave Paving Plans	RD#19	I-63-017, I-69-022, I-77-015, I-92-040, I-94-009, I-	X									Roadway_Plans
City of Tucson	McKinley Ave Paving Plans	RD#20	I-71-065, I-72-048	X									Roadway_Plans
City of Tucson	Brighton Ave Paving Plans	RD#21	I-81-012	X									Roadway_Plans
City of Tucson	5th St Paving Plans	RD#22	I-85-035A, I-90-029, I-798, I-2003-003, I-2004-014, I-2004-065	X	X								Roadway_Plans
City of Tucson	Broadway Blvd Paving Plans	RD#23	I-65-008, I-65-072, I-65-083, I-70-008, I-73-037, I-74-001, I-76-017, I-77-020, I-82-008, I-85-055, I-86-010, I-86-037, I-86-083, I-87-018, I-87-061, I-96-060, I-97-051, I-99-057, I-586, I-624, I-848, I-848A (Drainage Structures), I-2007-052, I-2007-029, I-2015-004, S-82-007, S-83-035, S-2004-047, U-71-002, U-71-003, U-84-005, U-92-005, U-96-003, U-2004-028, U-2009-029, U-2009-035, U-2013-020, U-2015-009	X	X							X	Roadway_Plans

Agency	Document/Data Type	ID	Doc No.	Electronic/Hard Copy (E/H)	Information Contains								Folder
					Drainage Structures	Design Q	HGL	BFE	Floodplain Limits	Elevation data	Riparian Habitat	Aerial Photo	
City of Tucson	22ND St Paving Plans	RD#24	I-62-012, I-67-027, I-72-017, I-96-025, I-2000-030, I-2007-048, I-748S, D-73-010, PS-0018, S-77-015, S-87-019, S-2008-014, T-176, U-2005-010, U-2005-019, U-2013-006	X	X					X		X	Roadway_Plans
City of Tucson	29th St Paving Plans	RD#25	I-855, F-2000-005, S-81-014, U-73-001, U-2005-017, U-2009-032C	X									Roadway_Plans
City of Tucson	Golf Links Rd Paving Plans	RD#26	I-66-007, I-77-015, I-77-016, I-77-017, I-84-018, I-2001-025, I-2007-013, I-2008-034, F-84-005, L-74-003, L-87-001, S-2012-006, U-73-002, U-77-003, U-2005-012	X	X					X			Roadway_Plans
City of Tucson	Kolb Rd Paving Plans	RD#27	I-72-097, I-75-031, I-77-017, I-77-018, I-81-036, I-81-037, I-83-009, I-92-028, I-96-025, I-98-072, I-99-004, I-2007-013, I-2007-038, i-2007-048, F-84-009, L-87-003, S-84-044, S-87-019, S-92-028, S-99-001, S-2012-006, U-73-002, U-77-003, U-92-005, U-99-006, U-2015-011, U-2015-017	X	X					X		X	Roadway_Plans
City of Tucson	Alley Widening Plan	RD#28	S-691	X									Roadway_Plans
City of Tucson	14TH St District Paving Plans	RD#29	I-73-014	X									Roadway_Plans
City of Tucson	Mann Ave District Paving Plans	RD#30	I-64-001, I-80-043	X									Roadway_Plans
City of Tucson	Pantano Road Paving Plans	RD#31	I-71-006, I-86-052, I-99-036	X	X	X				X			Roadway_Plans
City of Tucson	Stella Road Paving Plans	RD#32	I-69-044, I-69-048, I-70-006, I-70-025, I-70-035, I-70-059, I-71-024, I-72-006, I-72-084, I-76-010, I-86-084, I-92-015, I-92-021, I-97-038, I-2002-052, I-838, F-98-004, S-91-007, D-2002-004, U-77-003, U-92-005	X	X	X				X		X	Roadway_Plans
City of Tucson	Escalante Rd Paving Plans	RD#33	I-82-059, I-86-032, D-2008-001, S-84-044, U-95-	X	X					X			Roadway_Plans
City of Tucson	Ridgeway Road Street Paving Improvement Plans	RD#34	I-86-004A	X									Roadway_Plans
City of Tucson	Irvington Road Improvement Plans	RD#35	I-73-006, I-83-009, I-2003-040, S-92-027, U-2005-016										Roadway_Plans

Agency	Document/Data Type	ID	Doc No.	Electronic/Hard Copy (E/H)	Information Contains								Folder
					Drainage Structures	Design Q	HGL	BFE	Floodplain Limits	Elevation data	Riparian Habitat	Aerial Photo	
City of Tucson	Alamo Wash, From Rillito River to the Arcadia Wash split to end	DR#1	D-64-006, D-65-006, D-71-008,D-73-007, D-74-005, D-82-008, D-83-002, D-83-006, D-84-008, D-87-010, D-94-001A, D-98-002, D-129, D-2006-006, D-2015-001, E-62-003, E-70-006, E-72-001, E-84-007, E-84-015, E-85-015, E-93-008, E-140, E-158, GR-90-017, H-2002-081, I-81-037, I-94-004, I-2004-025, I-2004-076, I-835, I-2004-076, L-99-001	X									
City of Tucson	Arcadia Wash Channelization	DR#2	D-62-001, D-66-009, D-66-010, D-73-013, D-74-003, D-82-008, D-83-002, D-83-006, D-84-008, D-85-005, D-85-022, E-62-002, E-84-007, E-84-020, E-86-001, E-124, E-130, E-132, E-144, G-86-001, I-94-004										
City of Tucson	Swan Rd Storm Sewers Grant Rd. North	DR#3	D-73-001	X	X (D-73-001)					X (ID-73-001)			Drainage_Plans
City of Tucson	Stella Rd Storm Sewers and Drainage Structures, Kinnison Wash and Atterbury Wash @ Stella and Escalante Study Map & Pipe Plan @ Escalante, Box Culvert at Escalante & Kinnison Wash	DR#4	D-78-002, D-2002-004, D-2008-001, E-72-001, E-74-001, E-75-003, I-81-037	X	X (D-78-002, D-2002-004, D-2008-001, E-72-001, E-74-001, E-75-003 , E-139, I 81-037)	X (D-2002-004, D-2008-001, E-74-001, E-75-003)				X (D-2002-004, E-72-001, E-74-001, E-75-003, I-81-037)			Drainage_Plans
City of Tucson	Swan Rd Storm Sewers Grant Rd. North	DR#5	D-73-007	X						X (D-73-007)			Drainage_Plans

APPENDIX D
DIGITAL FILES ON COMPACT DISK