Kenneth Maits
Senior GIS Analyst

Terry Hendricks
Chief Hydrologist

Flood Control and GIS

Managing Floodplains in Pima County with GIS

5/15/2007

Pima County Regional Flood Control & GIS

- Who Are We and What Do We Do?
- The Impact of GIS on Flood Control
- Floodplain Management and GIS
- Impact of Flood Control on GIS
- The Future of GIS and Flood Control

Adapted from ARS48-3603: Powers, duties and immunities of district and board

- Minimize flood damages and the violence of flood events
- Prevent unwise encroachment and development within floodplains
- Protect the life and property of citizens living within floodplains
- Enhance property values of abutting floodplain areas
- Protect public health
- Reduce financial burden on communities with land subject to flood damages
- Enhance wildlife, recreation and riparian habitats along watercourses and floodplains
- Construct and maintain flood control facilities
- Regulate land and development within designated floodplain areas
- Levy taxes and issue bonds to finance its flood control system(s)
- Acquire real property through eminent domain, donation or other means
- Construct and operate groundwater recharge facilities that also have flood control benefits

Who We Are and What We Do!

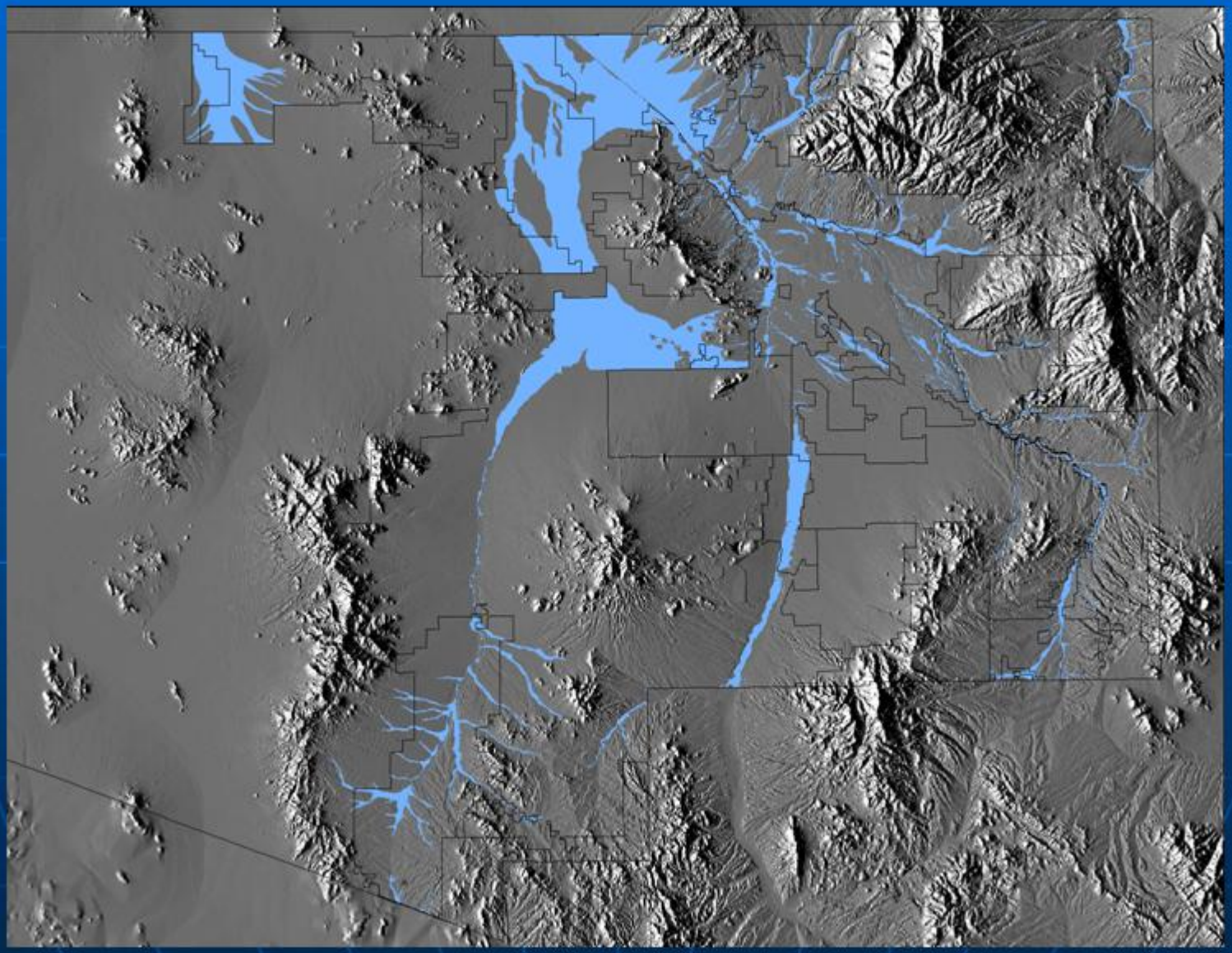
Our job at the Pima County Regional Flood Control District is to minimize flood and erosion damages for all county residents, property and infrastructure. The District is involved in a variety of flood control and natural resource management activities.

A Quick look at What We Do

Floodplain Management.

The District regulates building and development in designated floodplain areas through its Floodplain and Erosion Hazard Management Ordinance. Today virtually every manmade structure or modification made in a designated floodplain is subject to these regulations. Since 1978, the District has issued over 10,000 Floodplain Use Permits.

100 Year FEMA Floodplain



A Quick look at What We Do

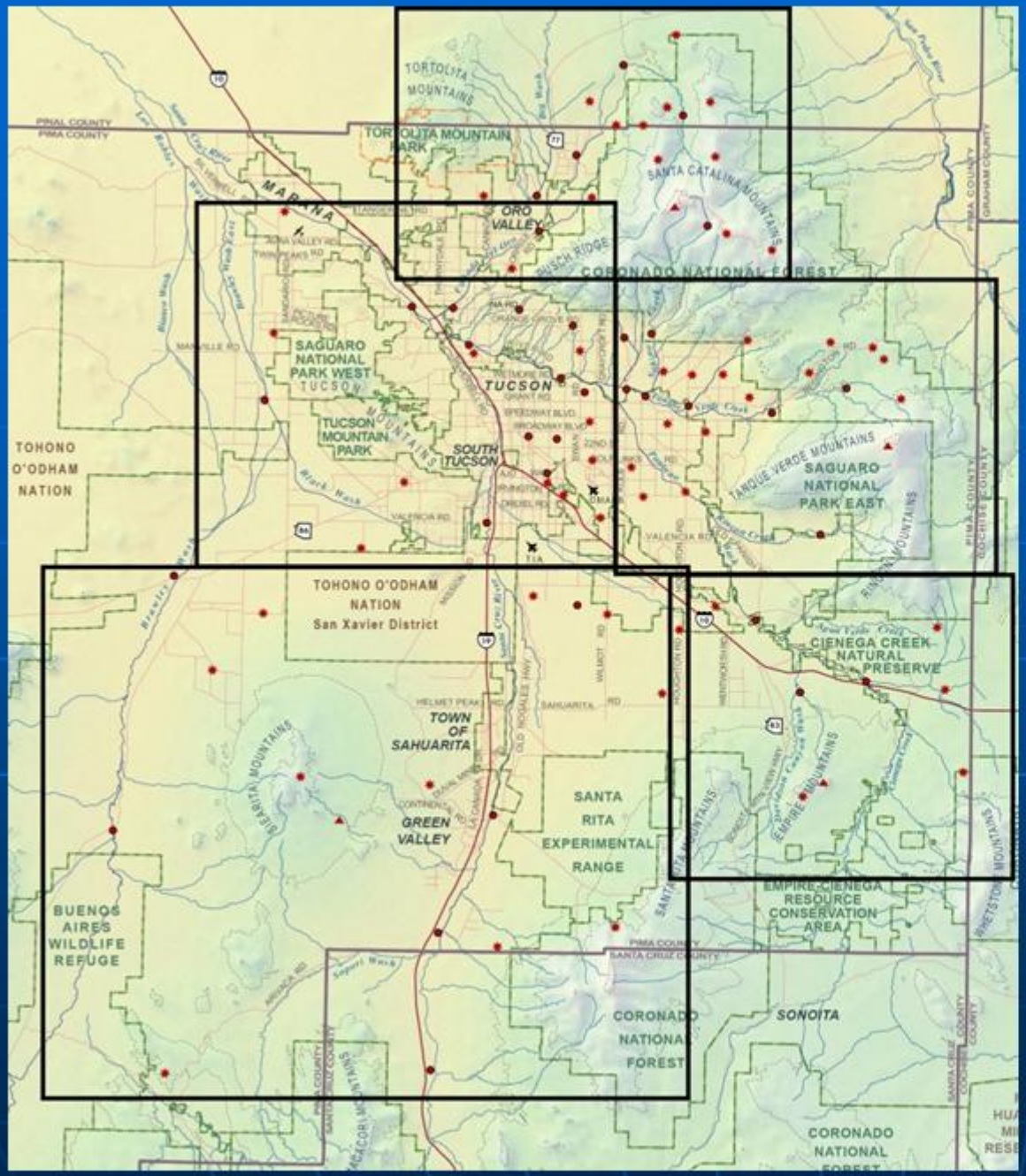
- **Structural Flood Control Facilities**
  - $ 280,000,000 in facilities since the district was formed.
  - These improvements include Levees, Regional Detention Basins, Bridges and more than 75 miles of Bank Protection.

A Quick look at What We Do

Flood ALERT System and Emergency Response.

ALERT (**A**utomated **L**ocal **E**valuation in **R**eal **T**ime)

- About 140 rain sensors, stream gauges and weather stations installed throughout the community.
- Monitors and records rainfall, stream flow and weather conditions
- Transmits real-time data to the District's base station and the Tucson office of the National Weather Service (NWS).
- The information is augmented with Doppler radar data and a network of volunteer weather watchers.
- The combination of the ALERT network and the NWS provide early warning capabilities and real-time storm monitoring



Alert System Map

Available on the Web

http://rfcd.pima.gov/alertsys/

A Quick look at What We Do

Floodprone Land Acquisition.

To date, the District has purchased over 7,000 acres of floodprone land, primarily through its Floodprone Land Acquisition Program (FLAP). Land acquisition is undertaken mainly as a means of removing buildings and residents from potential flood hazards.

A Quick look at What We Do

Other Activities

- River and basin management plans
- Flood insurance studies
- Participation in the national Community Rating System
- Management of natural resources associated with area streams and floodplains.
  - Adopted a series of riparian habitat regulations, which were incorporated into the Flood and Erosion Hazard Management Ordinance.
- Created several groundwater recharge projects.

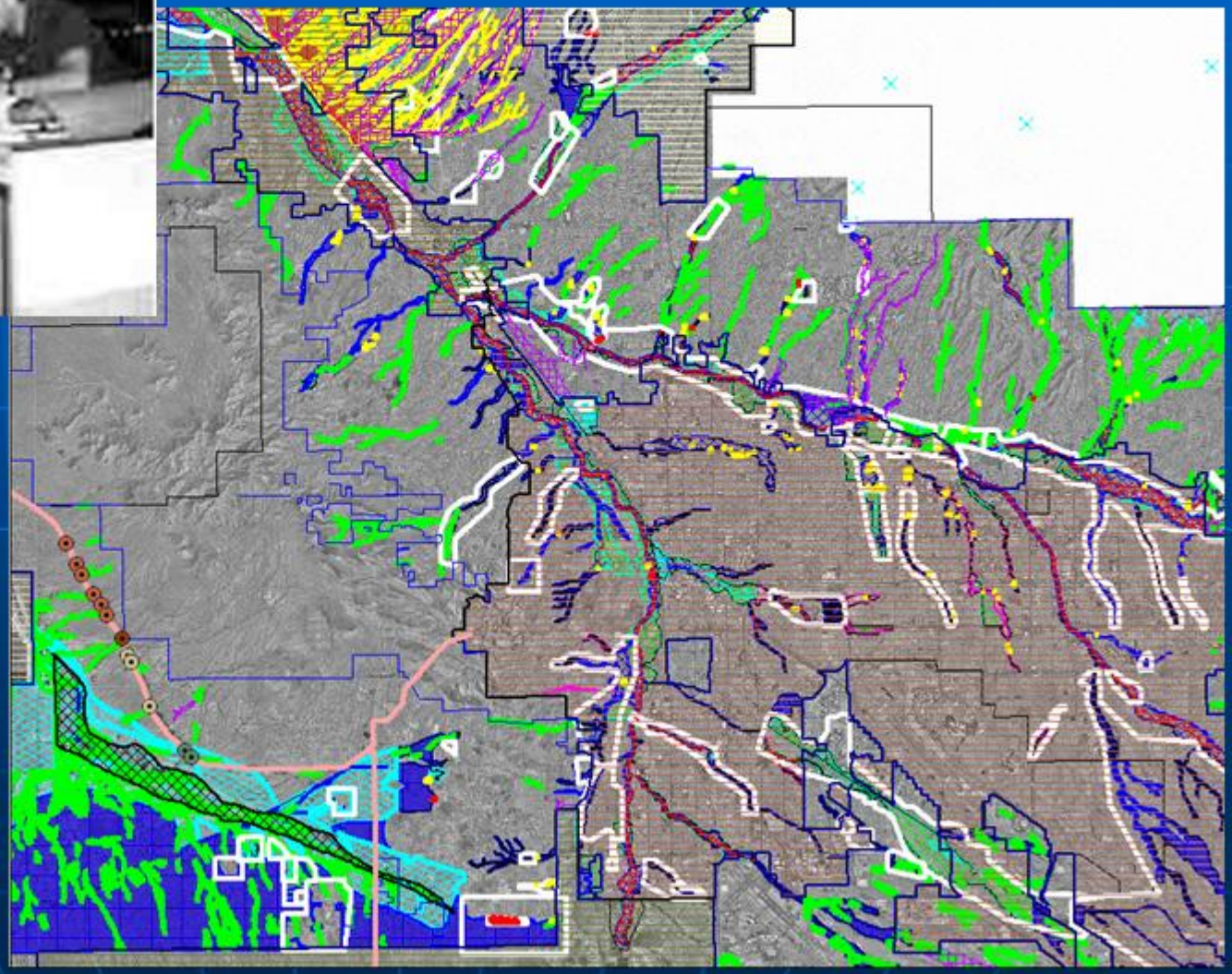
Regional Approach to Flood Control

The PCRFCD has direct control over major flood control improvements throughout the County.

The district focuses on regional responsibilities including constructing major flood control facilities, purchasing flood- and erosion-prone land and operating the community's flood warning system

3 of 5 Incorporated areas within the county have their own floodplain management programs.

Floodplain Management then and now



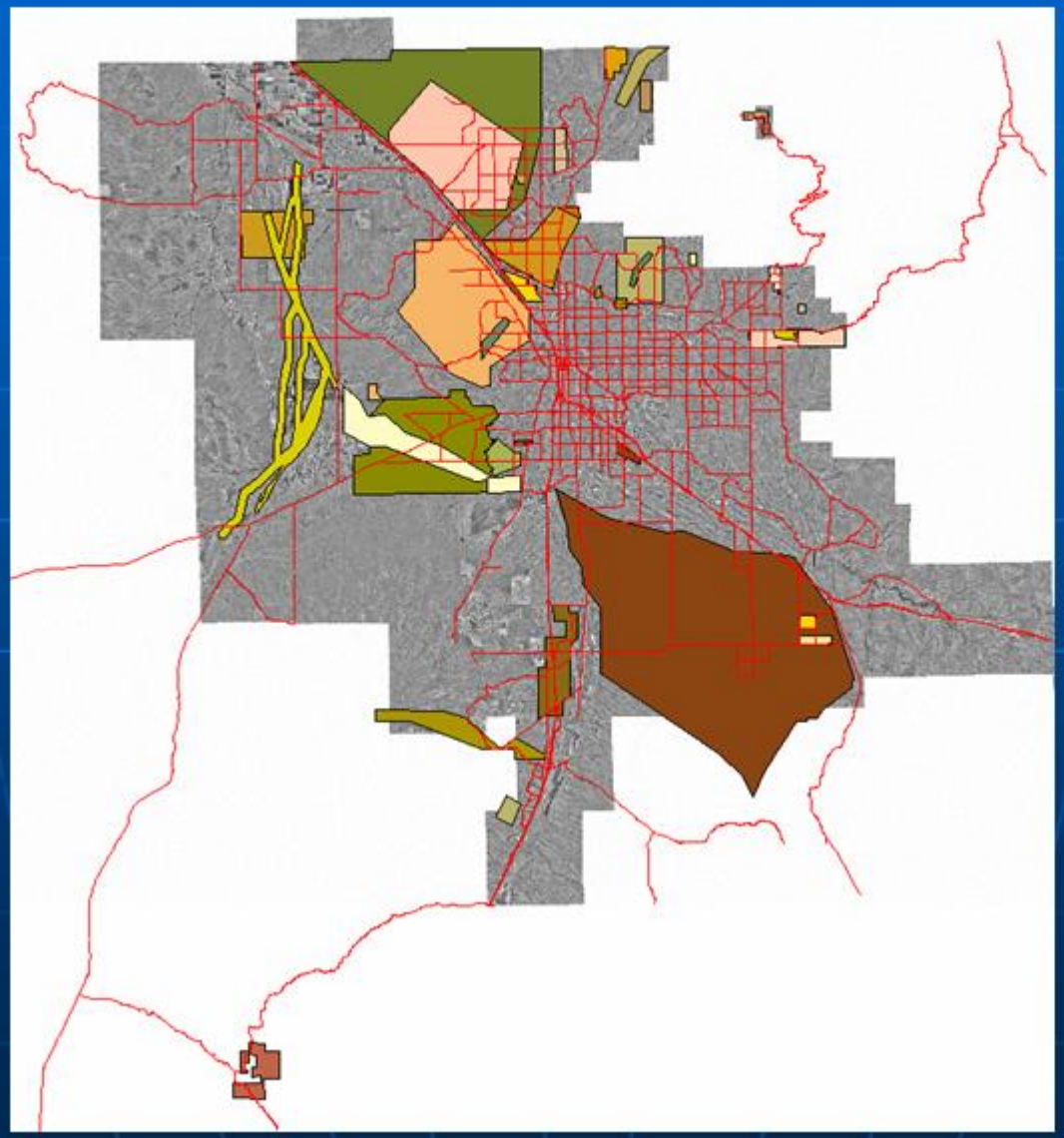
Then

- Paper or Sepia Maps
- Each parcel hand drawn
  - Protractor and compass
- Blue line paper, photo copies
- Stereo glasses
- Hand planimeter
- Recognition issues with Special Studies
- No PC

Now

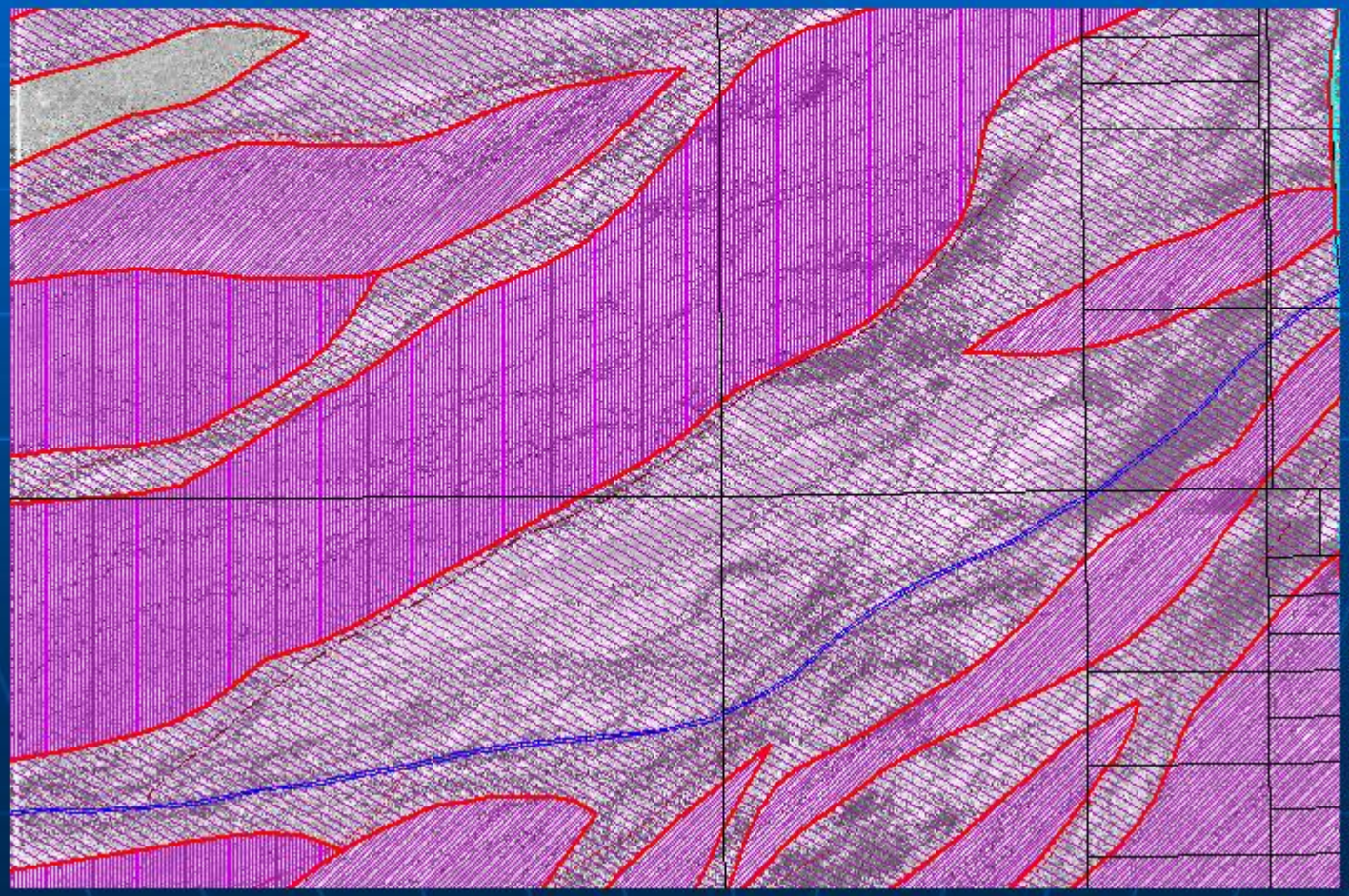
- Digital FIRMs
- Special Studies
- Search capabilities
- Query capabilities
- Near current parcel information
- Much more

Special Studies



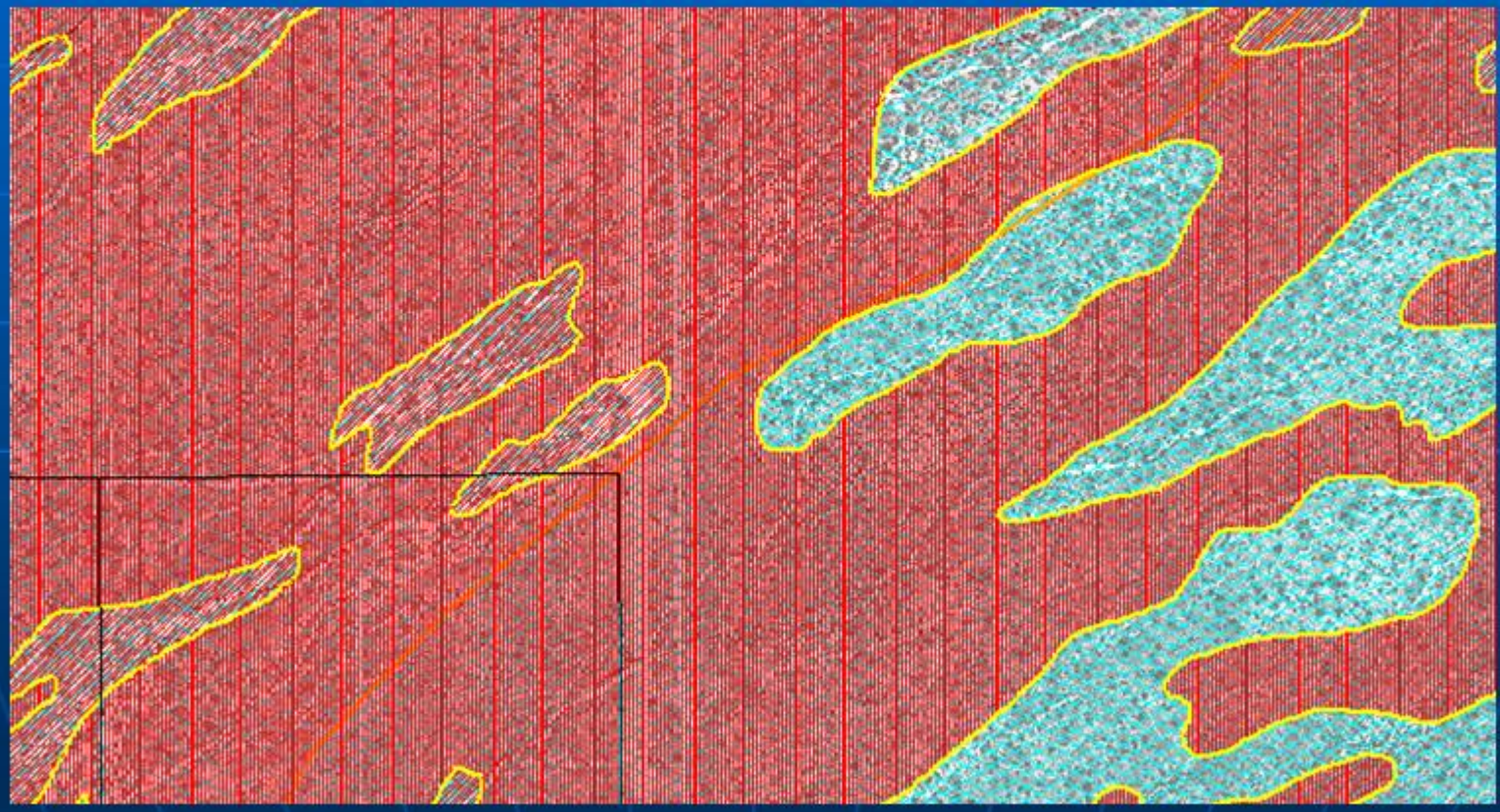
Special Studies

- T12 R10 Area



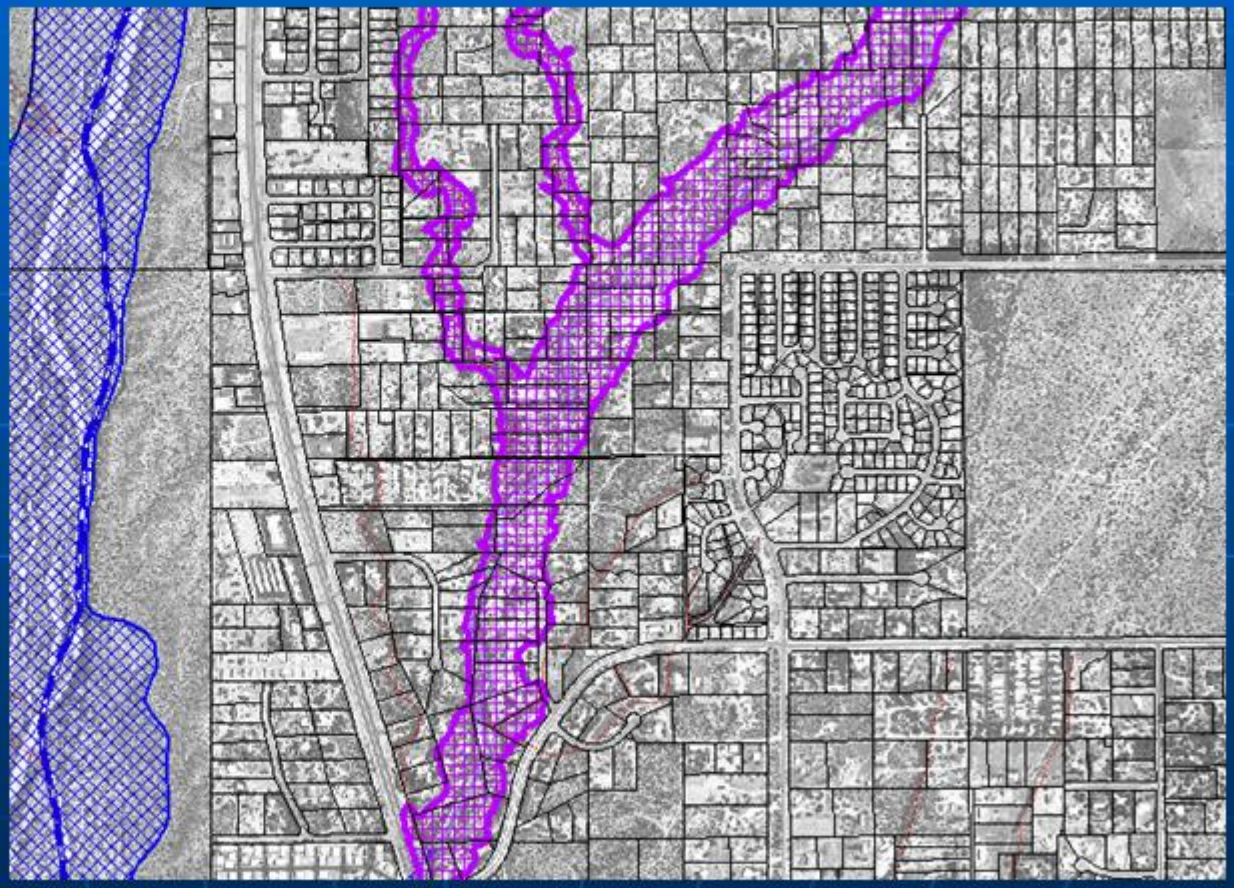
Special Studies

- Tortalita Soils



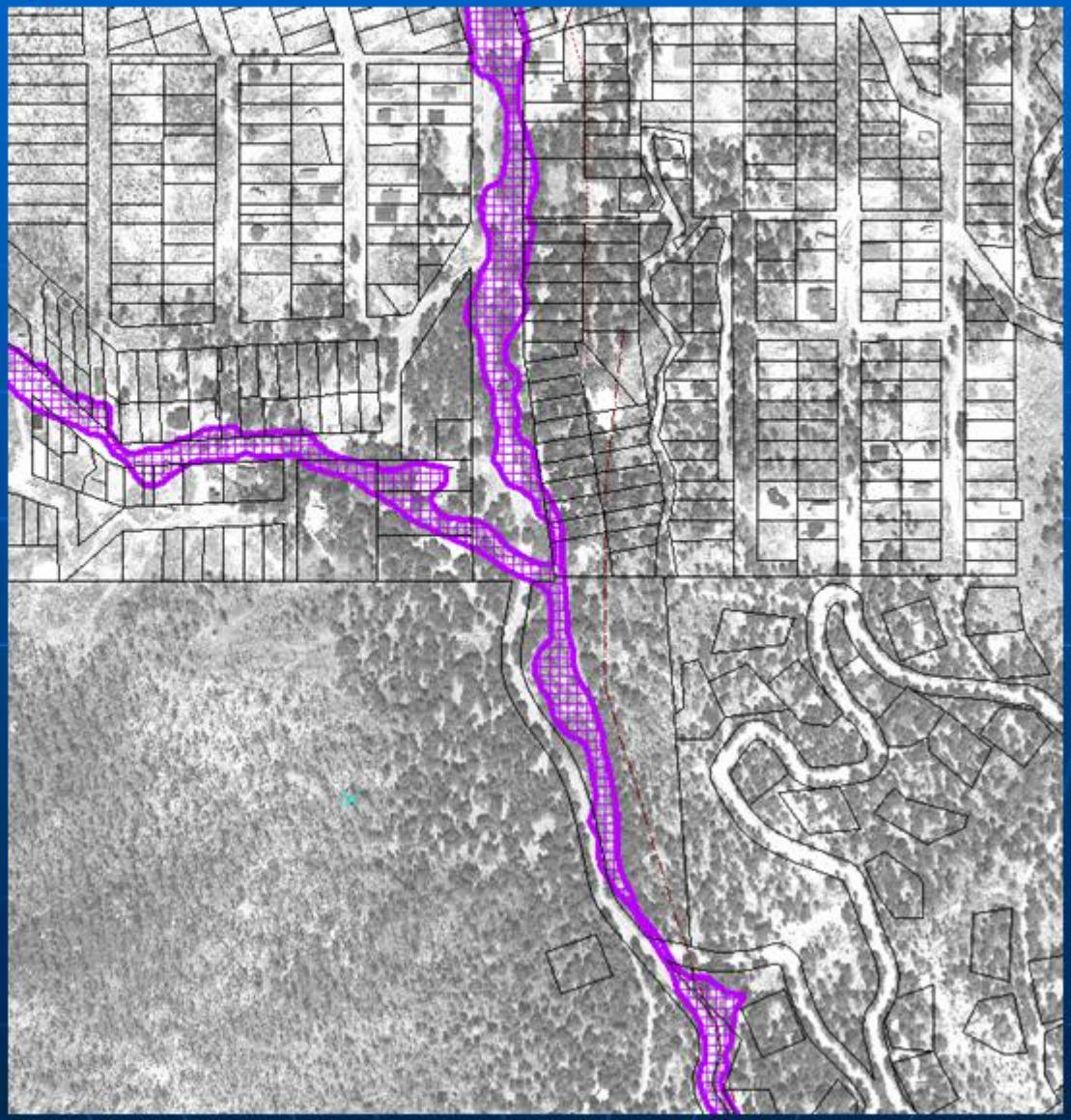
Special Studies

- 27 Wash

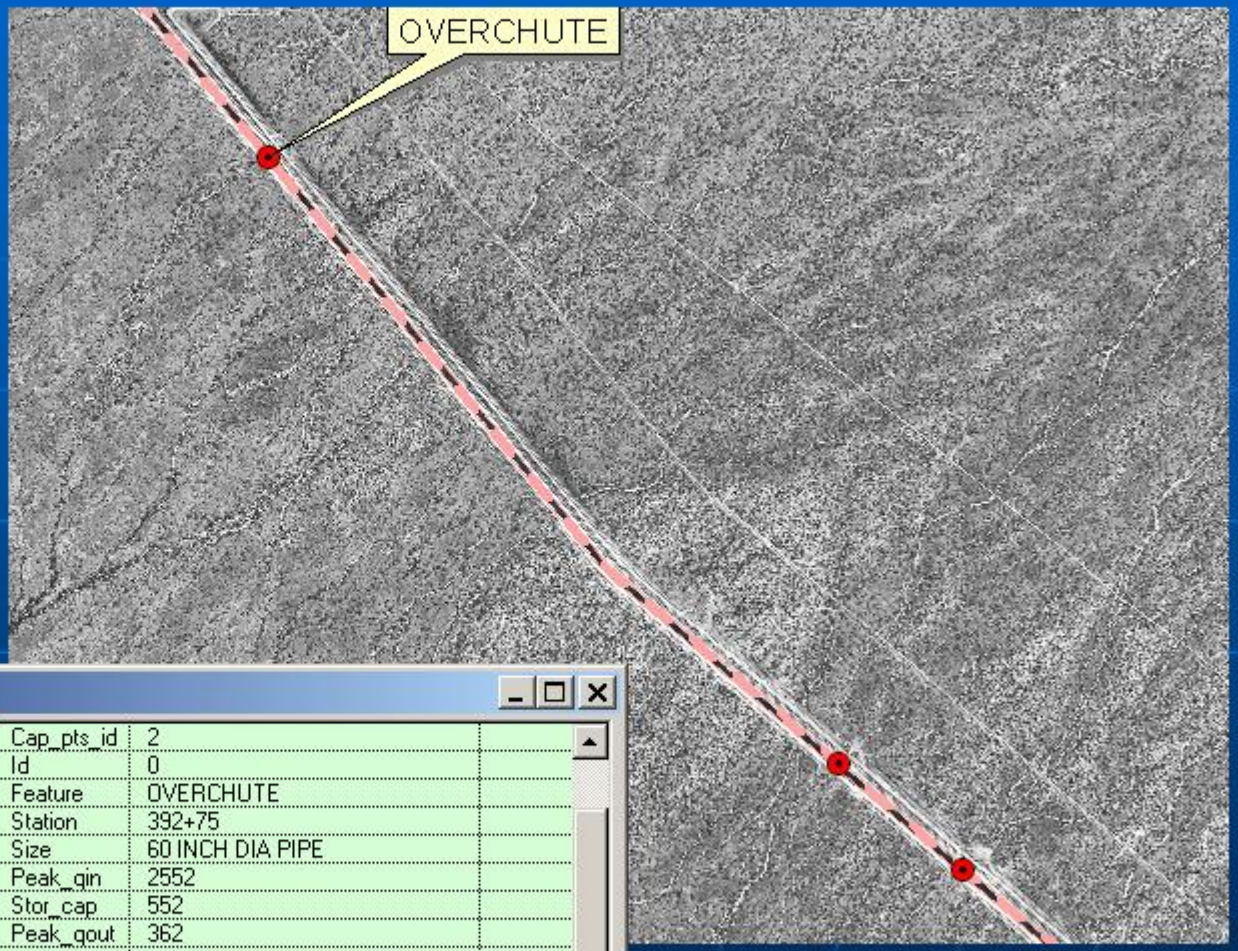


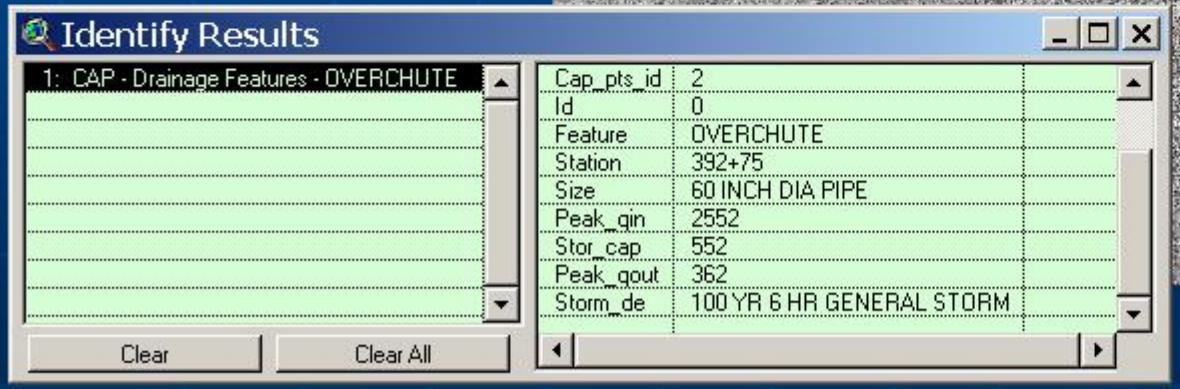
Special Studies

- Mount Lemon

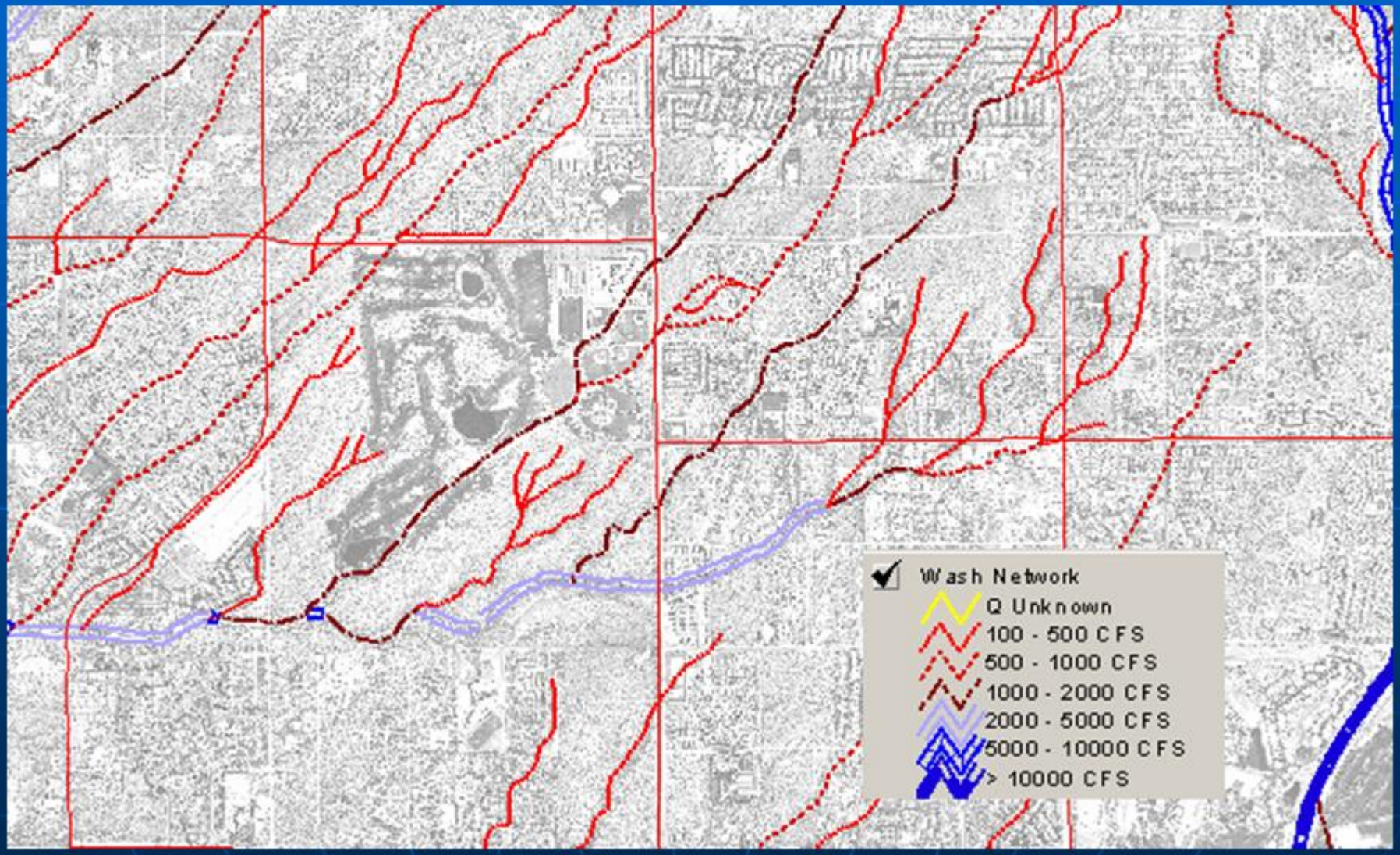


CAP information

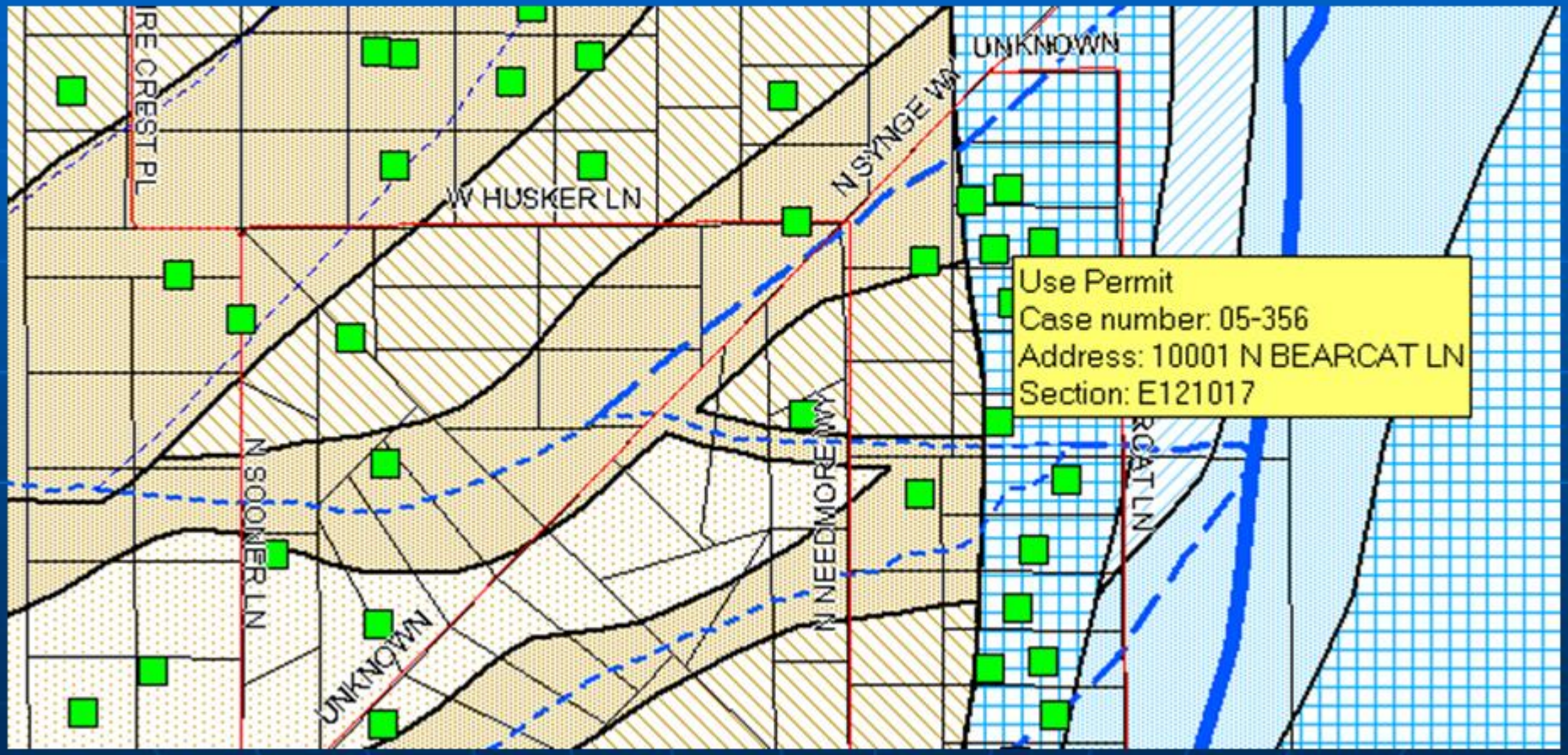




Stream Centerlines



Permits Data Base

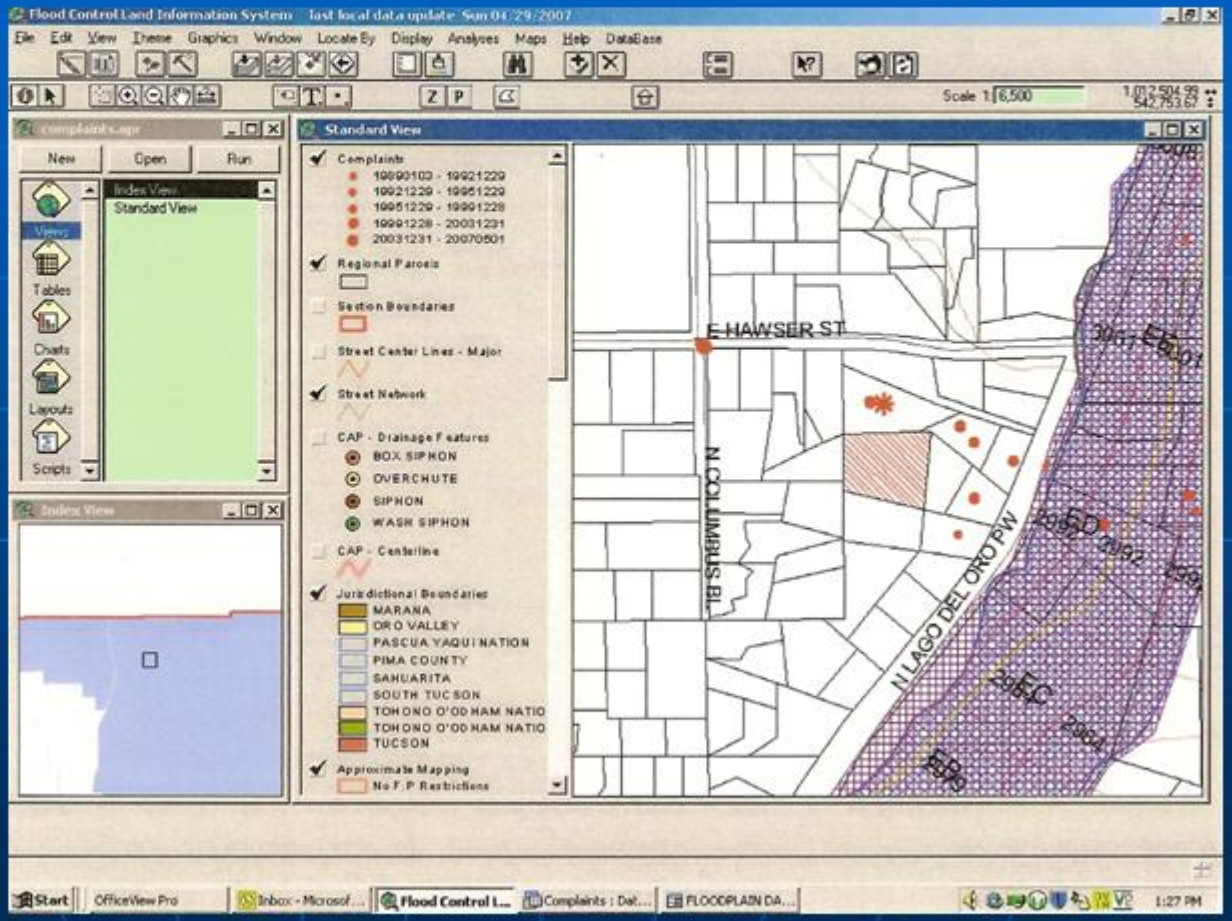


Complaints Data Base

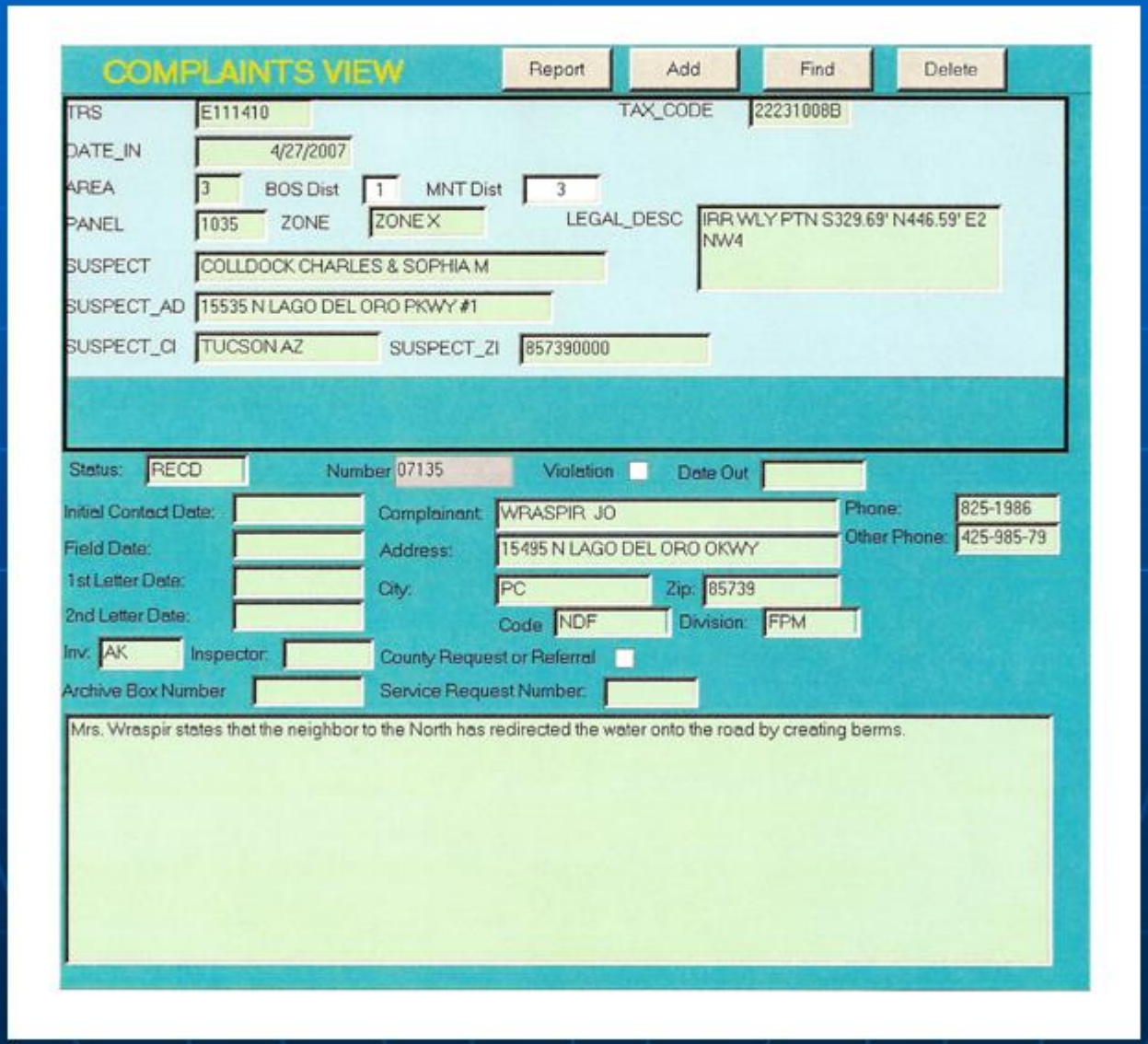
Complaint and Violation data currently entered using ArcView 3 application and Access Database.

Soon to be replaced by new ArcWeb based Application with Enterprise Database support.

Originally generated shapefiles. The new application will source the data in a geodatabase.



Complaints and Violations Data Base



COMPLAINTS VIEW

Report | Add | Find | Delete

TRS: E111410
TAX_CODE: 22231008B
DATE_IN: 4/27/2007
AREA: 3
BOS Dist: 1
MNT Dist: 3
PANEL: 1035
ZONE: ZONE X
LEGAL_DESC: IRR WLY PTN S329.69' N446.59' E2 NW4
SUSPECT: COLLDOCK CHARLES & SOPHIA M
SUSPECT_AD: 15535 N LAGO DEL ORO PKWY #1
SUSPECT_CI: TUCSON AZ
SUSPECT_ZI: 857390000

Status: RECD
Number: 07135
Violation: ☐
Date Out:
Initial Contact Date:
Field Date:
1st Letter Date:
2nd Letter Date:
Complainant: WRASPIR JO
Address: 15495 N LAGO DEL ORO OKWY
City: PC
Zip: 85739
Code: NDF
Division: FPM
Phone: 825-1986
Other Phone: 425-985-79
Inv: AK
Inspector:
County Request or Referral: ☐
Archive Box Number:
Service Request Number:

Mrs. Wraspir states that the neighbor to the North has redirected the water onto the road by creating berms.

Complaints and Violations Data Base

Drainage Complaint: 07135

TRS E111410 TAXCODE: 22231008B

DATE_IN 4/27/2007

AREA 3 BOS DIST 1 MNT DIST 3

PANEL 1035 ZONE ZONE X

SUSPECT: COLLDOCK CHARLES & SOPHIA M

SUSPECT ADDRESS: 15535 N LAGO DEL ORO PKWY #1

SUSPECT CITY: TUCSON AZ

SUSPECT ZIP: 857390000

LEGAL DESCRIPTION: IRR WLY PTN S329.69' N446.59' E2 NW4

Status: RECD Code: NDF Inv: AK Violation: ☐ County Request and Referral: ☐ * Complaint Source

Initial Contact Date:
Field Date:
1st Letter Date:
2nd Letter Date:
Date Out:

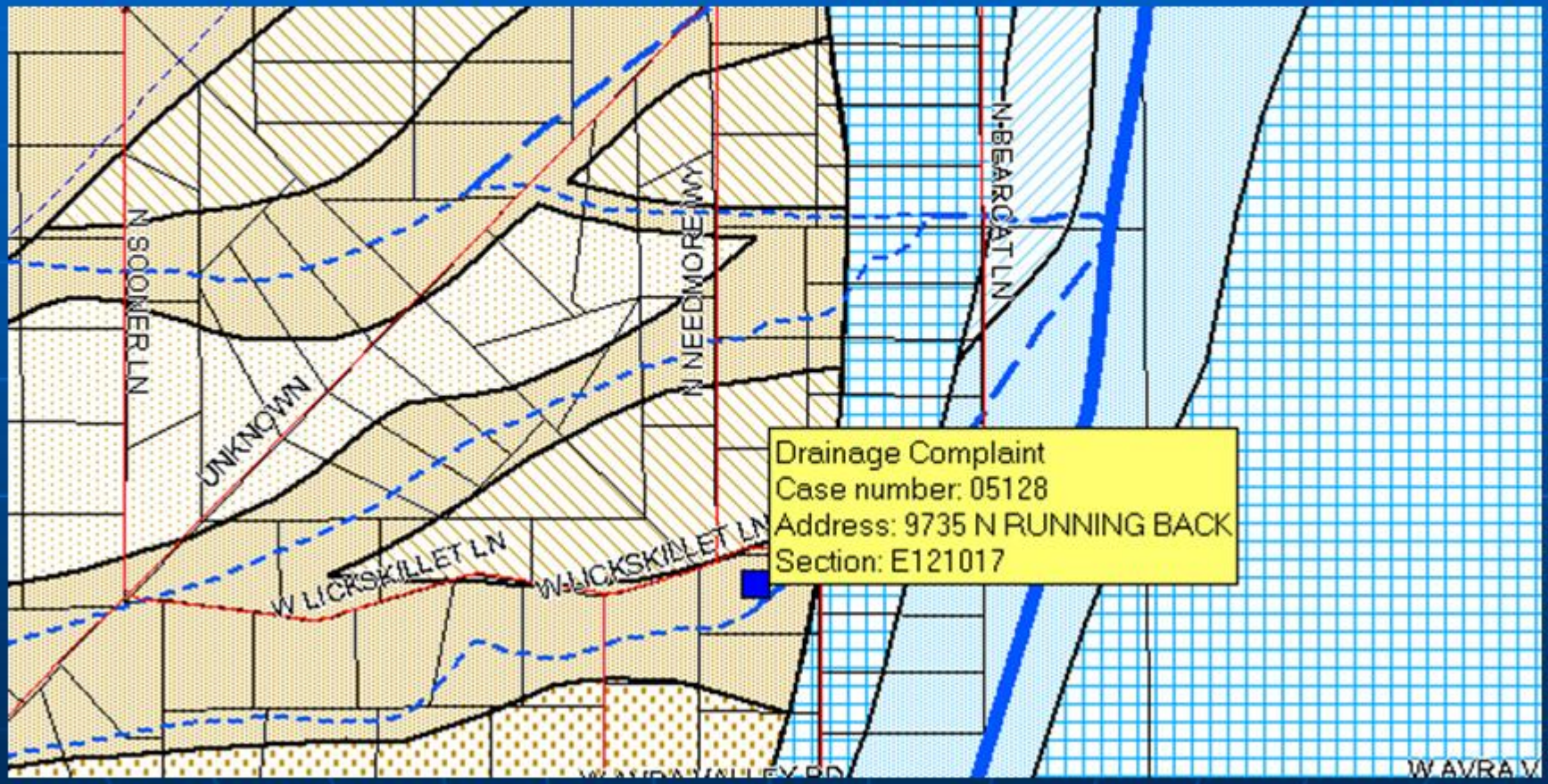
Complaintant: WRASPIR JO
Address: 15495 N LAGO DEL ORO OKWY
City: PC Zip: 85739
Inspector: Division: FPM

Phone: 825-1986
Other Phone: 425-985-79
Service Request #:
Archive Box Number:

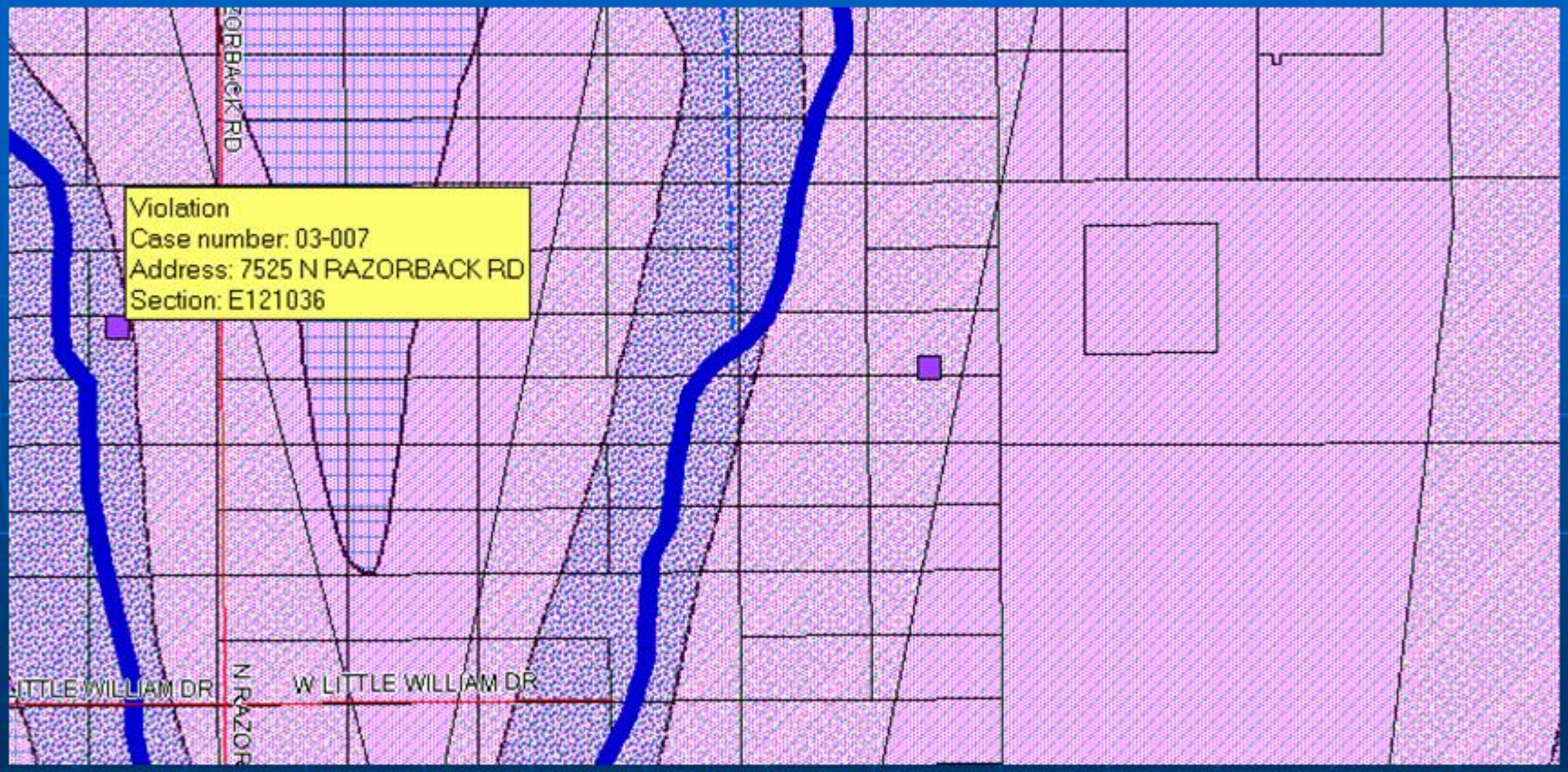
Nature of Problem

Mrs. Wraspir states that the neighbor to the North has redirected the water onto the road by creating berms.

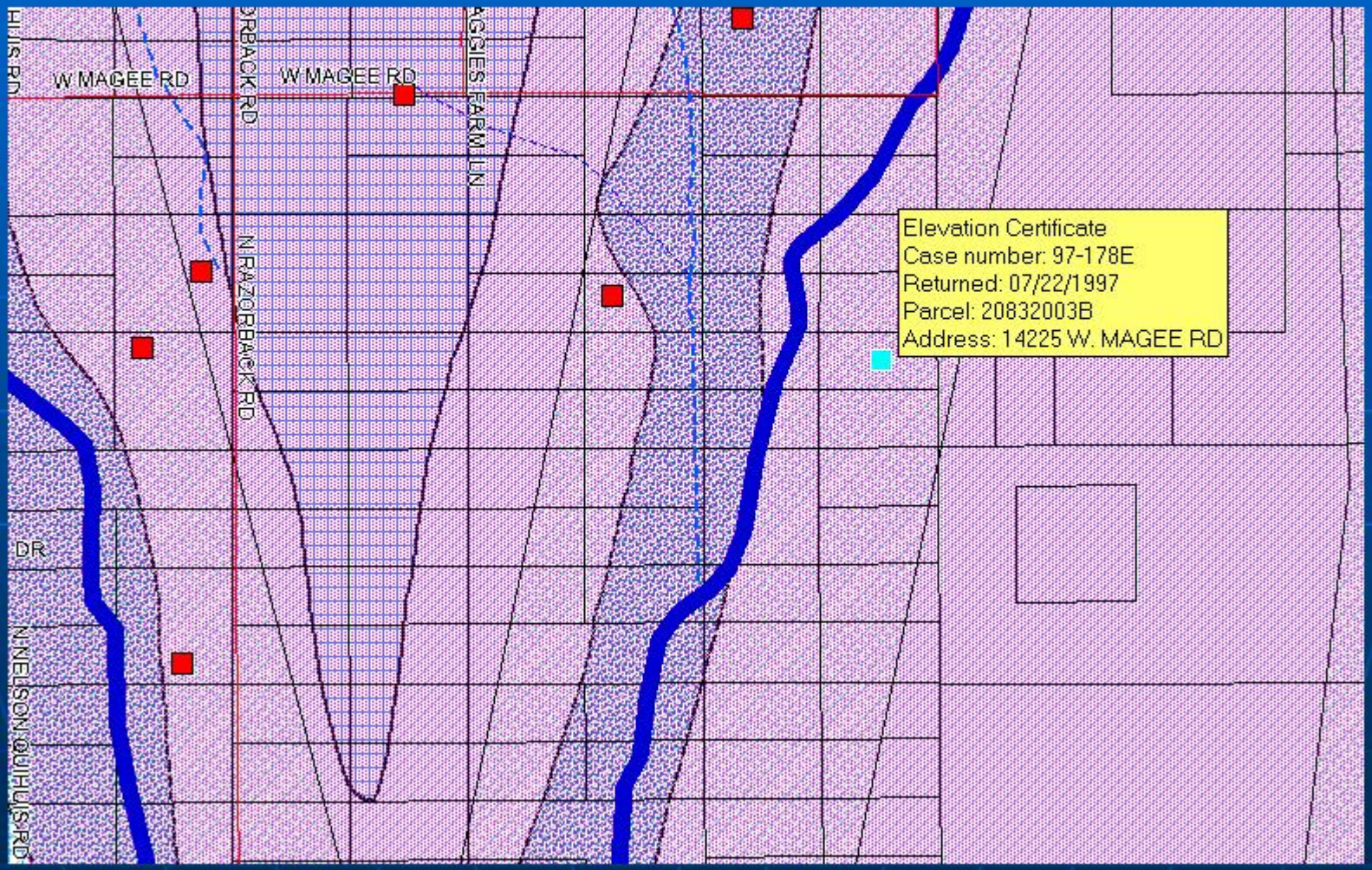
Complaints Data Theme



Violations Data Theme



Elevation Certificates Data Base



FPUP_97-178E-A

ELEVATION CERTIFICATE

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

OMB NO. 3067-0077
Expires May 31, 1996

Date Issued: Type 2 MKDAG

ATTENTION: Use of this certificate does not provide a waiver of the flood insurance purchase requirement. This form is used only to provide elevation information necessary to ensure compliance with applicable community floodplain management ordinances, to determine the proper insurance premium rate, and/or to support a request for a Letter of Map Amendment or Revision (LOMA or LOMR).
Instructions for completing this form can be found on the following pages.

SECTION A PROPERTY INFORMATION — FOR INSURANCE COMPANY USE

BUILDING OWNER'S NAME: McMasters Rebecca & Craig — POLICY NUMBER:

STREET ADDRESS (including Apt., Unit, Suite and/or Bldg. Number) OR P.O. ROUTE AND BOX NUMBER: 14225 W. Magee Rd — COMPANY NAIC NUMBER:

OTHER DESCRIPTION (Lot and Block Numbers, etc.): S 36 T 12 R 10

CITY: Tucson STATE: Az ZIP CODE: 85743

SECTION B FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

Provide the following from the proper FIRM (See Instructions):

1. COMMUNITY NUMBER	2. PANEL NUMBER	3. SUFFIX	4. DATE OF FIRM INDEX	5. FIRM ZONE	6. BASE FLOOD ELEVATION (in AO Zones, use depth)
040073	1560	B	8/12/95	AO(2)	2.0

7. Indicate the elevation datum system used on the FIRM for Base Flood Elevations (BFE): ☐ NGVD '29 ☐ Other (describe on back)
~~8. For Zones A or V, where no BFE is provided on the FIRM, and the community has established a BFE for the building site, indicate the community's BFE: _____ feet NGVD (or other FIRM datum-see Section B, Item 7).~~

SECTION C BUILDING ELEVATION INFORMATION

1. Using the Elevation Certificate Instructions, Indicate the diagram number from the diagrams found on Pages 5 and 6 that best describes the subject building's reference level _____ .
2(a). ~~FIRM Zones A1-A30, AE, AH, and A (with BFE). The top of the reference level floor from the selected diagram is at an elevation of _____ feet NGVD (or other FIRM datum-see Section B, Item 7).~~
(b). ~~FIRM Zones V1-V30, VE, and V (with BFE). The bottom of the lowest horizontal structural member of the reference level from the selected diagram, is at an elevation of _____ feet NGVD (or other FIRM datum-see Section B, Item 7).~~
N/A (c). FIRM Zone A (without BFE). The floor used as the reference level from the selected diagram is _____ feet above ☐ or below ☐ (check one) the highest grade adjacent to the building.
(d). FIRM Zone AO. The floor used as the reference level from the selected diagram is 2' feet above ☑ or below ☐ (check one) the highest grade adjacent to the building. If no flood depth number is available, is the building's lowest floor (reference level) elevated in accordance with the community's floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown
3. Indicate the elevation datum system used in determining the above reference level elevations: ☒ NGVD '29 ☐ Other (describe under Comments on Page 2). *(NOTE: If the elevation datum used in measuring the elevations is different than that used on the FIRM [see Section B, Item 7], then convert the elevations to the datum system used on the FIRM and show the conversion equation under Comments on Page 2.)*
4. Elevation reference mark used appears on FIRM: ☐ Yes ☒ No (See Instructions on Page 4)
5. The reference level elevation is based on: ☒ actual construction ☐ construction drawings
(NOTE: Use of construction drawings is only valid if the building does not yet have the reference level floor in place, in which case this certificate will only be valid for the building during the course of construction. A post-construction Elevation Certificate will be required once construction is complete.)
6. ~~The elevation of the lowest grade immediately adjacent to the building is _____ feet NGVD (or other FIRM datum-see Section B, Item 7).~~

SECTION D COMMUNITY INFORMATION

1. ~~If the community official responsible for verifying building elevations specifies that the reference level indicated in Section C, Item 1 is not the "lowest floor" as defined in the community's floodplain management ordinance, the elevation of the building's "lowest floor" as defined by the ordinance is _____ feet NGVD (or other FIRM datum-see Section B, Item 7).~~
2. Date of the start of construction or substantial improvement _____ .

FPUP_97-178E-B

SECTION E CERTIFICATION

~~This certification is to be signed by a land surveyor, engineer, or architect who is authorized by state or local law to certify elevation information when the elevation information for Zones A1-A30, AE, AH, A (with BFE), V1-V30, VE, and V (with BFE) is required. Community officials who are authorized by local law or ordinance to provide floodplain management information, may also sign the certification.~~ In the case of Zones AO and A (without a FEMA or community issued BFE), a building official, a property owner, or an owner's representative may also sign the certification.

Reference level diagrams 6, 7 and 8 - Distinguishing Features-If the certifier is unable to certify to breakaway/non-breakaway wall, enclosure size, location of servicing equipment, area use, wall openings, or unfinished area Feature(s), then list the Feature(s) not included in the certification under Comments below. The diagram number, Section C, Item 1, must still be entered.

I certify that the information in Sections B and C on this certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME: Rebecca McMasters — LICENSE NUMBER (or Affix Seal): owner

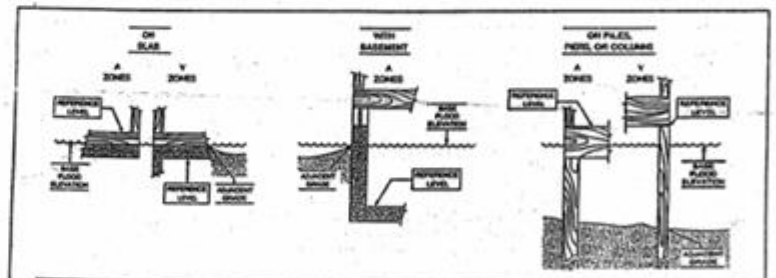
TITLE: 14225 W Magee — COMPANY NAME: Tucson — STATE: Az 85743

ADDRESS — CITY — STATE

SIGNATURE: Rebecca McMasters — DATE: July 22, 97 — PHONE: 682-8888 or 293-9775

Copies should be made of this Certificate for: 1) community official, 2) insurance agent/company, and 3) building owner.

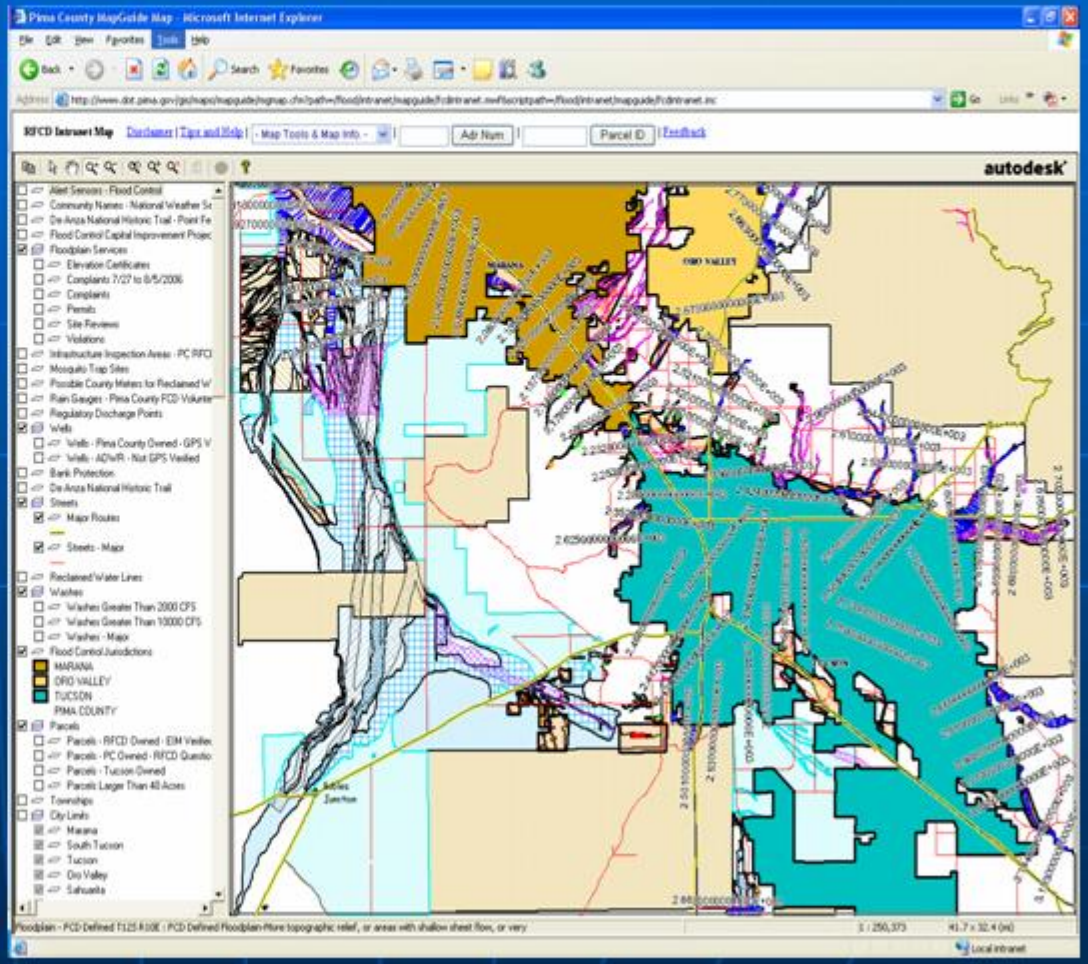
COMMENTS: Pima County Floodplain and Erosion Hazard Management Ordinance 1994-FC2 in Article XI requires the bottom of the structural frame of a manufactured home to be a minimum of one foot above the base flood elevation. For "A" or "AO" Zones Pima County requires the manufactured home floor reference level to be a minimum of one and one half feet above the bottom of the structural frame elevation which equals two and one half feet above the base flood elevation as listed in Item 6 of Section B of this form. This elevation certificate is to be certified in Sections C and E. A copy is to be returned within seven days of placement of the manufactured home, to Pima County Floodplain Management Section, 201 N. Stone 4th floor, Tucson, AZ 85701. Phone 740-6350.



The diagrams above illustrate the points at which the elevations should be measured in A Zones and V Zones.
Elevations for all A Zones should be measured at the top of the reference level floor.
Elevations for all V Zones should be measured at the bottom of the lowest horizontal structural member.

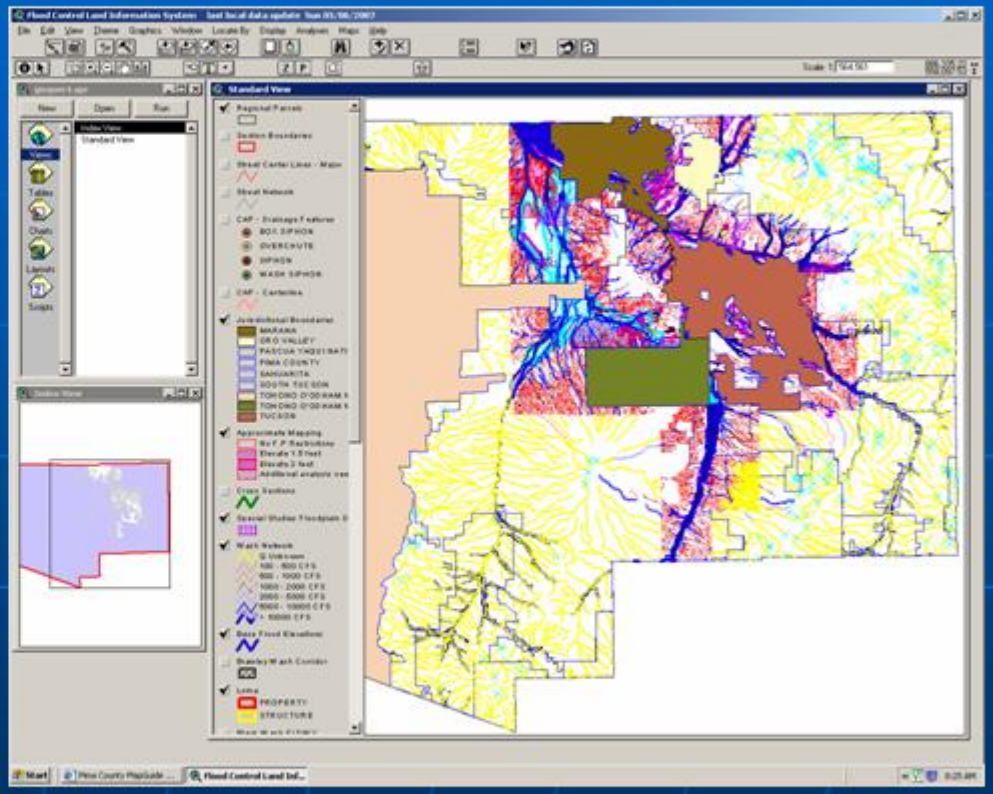
Flood Control Mapguide Map

Custom layers for floodplain management and permitting.



ArcView PCFCLIS Application

Being phased out in favor of the upcoming Combined Map Repository



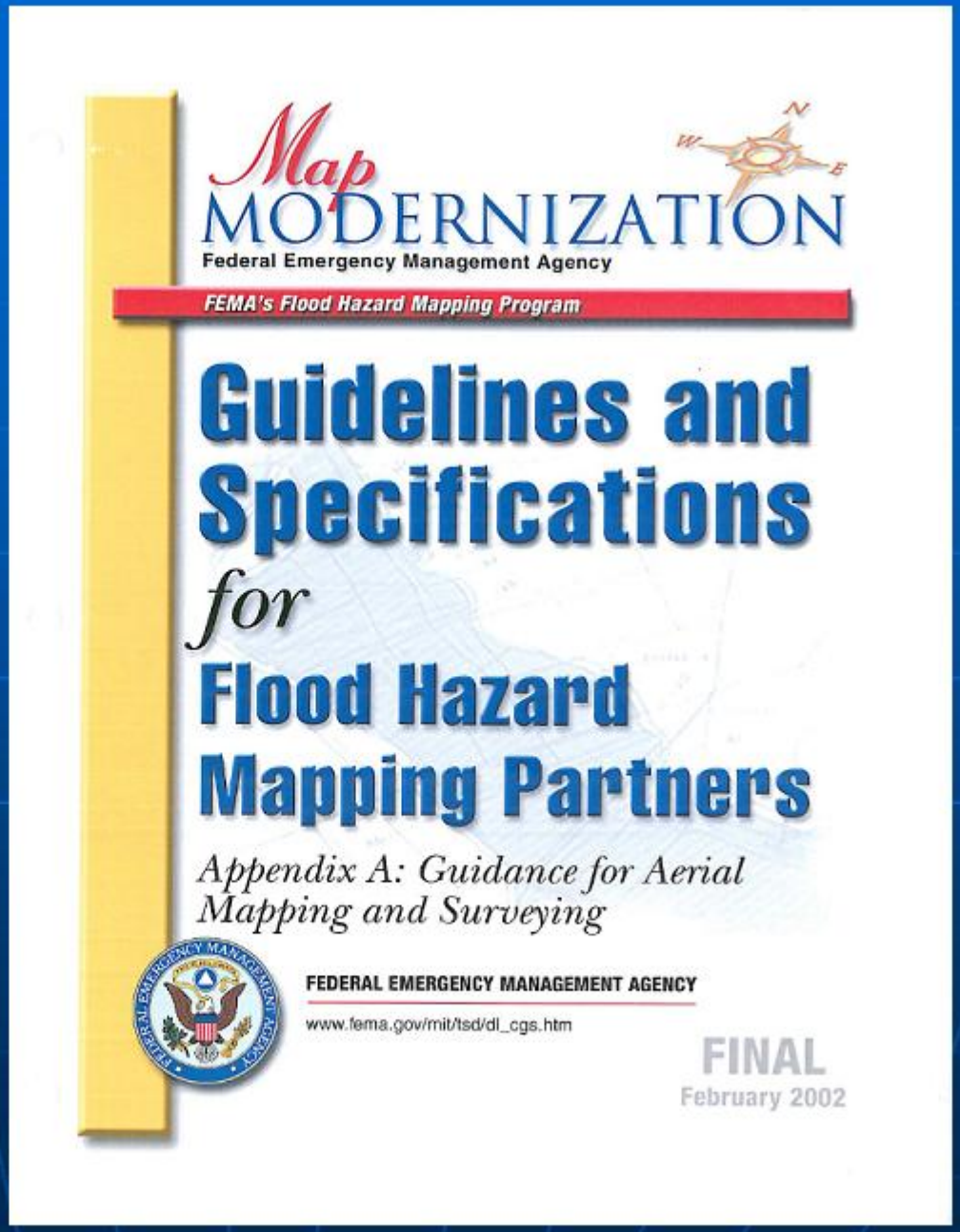
The use of GIS in map revisions

- FEMA is becoming more digital
- Engineering community and GIS issues
- Correcting unrecognized mistakes
- Preparing for the next D-FIRMs

FEMA is becoming more digital

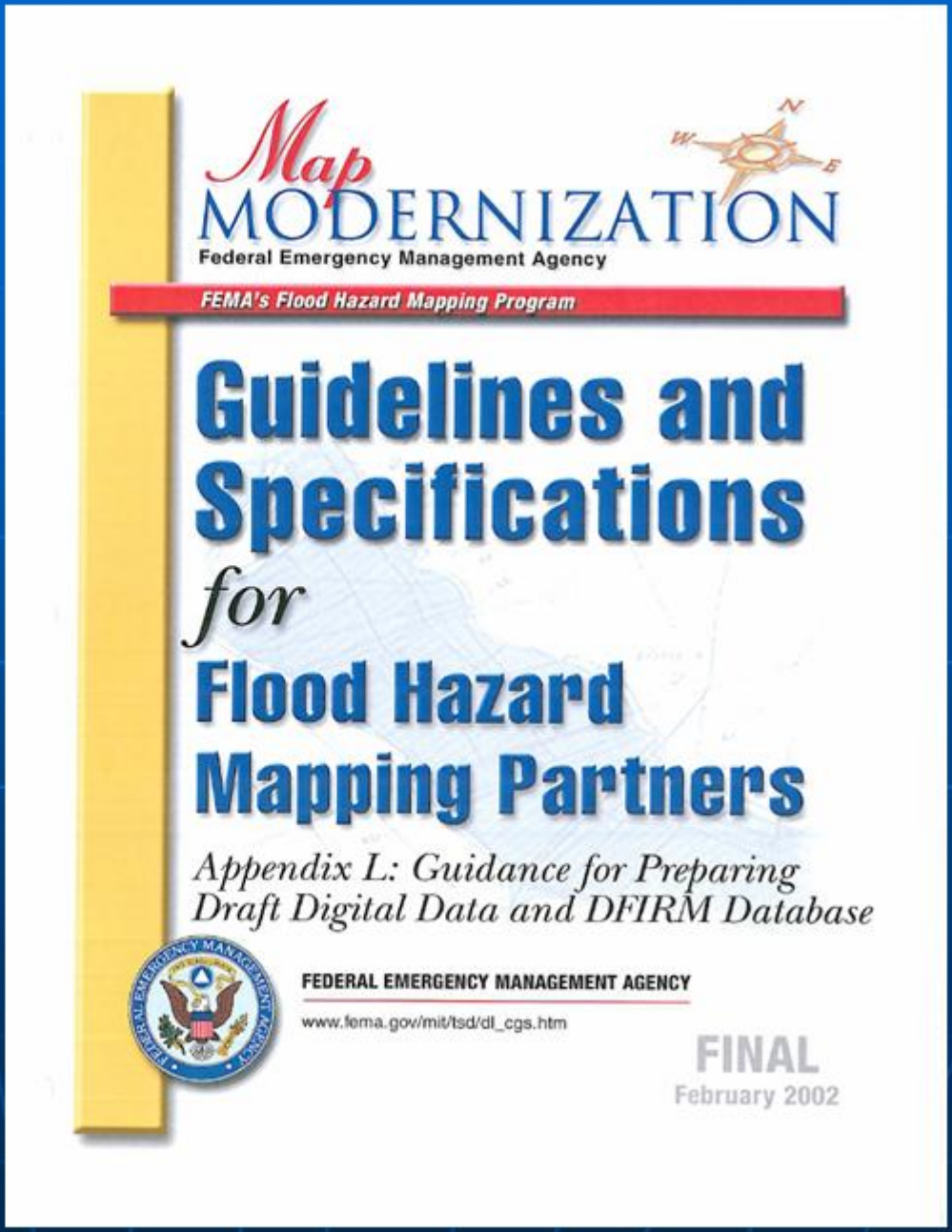
Aerial and Survey Control

57 pages



Digital Standards

177 pages



Engineering community and GIS issues

Incorrect map revisions

Duel projection issues

Pima County's Projection

Projection = State Plane, Arizona Central Zone
Datum = NAD83-92(HARN)
Units = International Feet

FEMA's Projection

Projection = UTM, Zone 12
Datum = NAD27
Units = Meters

Solution

- Provide D-FIRM data in both Projections
  - In AutoCAD or ESRI format
    - FIRM Panel Boundary
    - Flood Zones
    - Floodways
    - Base Flood Elevations
    - Cross-sections
    - FEMA Stream Lines (when available)
    - LOMR Boundaries
      - The District may not have complete LOMR information within the City of Tucson, Town of Oro Valley and Town of Marana
    - LOMAs (Letters of Map Amendment)
      - The District does not have any LOMA information within the City of Tucson, Town of Oro Valley and Town of Marana
    - PLSS Section Boundaries
    - Jurisdictional Boundaries
    - Parcel Boundaries (not available in outlying areas)
    - Street Network (not available in outlying areas)

Pima County Regional Flood Control District

REQUEST FORM AND DISCLAIMER FOR DIGITAL FIRM MAPS

Revised June 13, 2006

In an effort to minimize digital floodplain boundary errors, the Pima County Regional Flood Control District (District) will provide digital copies of the Flood Insurance Rate Maps (FIRMs) by panel number when requested via Email or FAX. The digital information will be in either the ArcView or AutoCAD format with the correct projection controls. The ArcView format is preferred. AutoCAD files will be delivered in 2004 format, unless requested otherwise upfront. The digital data will contain the FIRM panel(s) in both the Federal Emergency Management Agency (FEMA) and the District's projection schemes.

The FIRM panel data will include the following layers (Some layers may not be present in a given FIRM panel):

- ☐ FIRM Panel Boundary
- ☐ Flood Zones
- ☐ Floodways
- ☐ Base Flood Elevations
- ☐ Cross-sections
- ☐ FEMA Stream Lines (when available)

- ☐ LOMR Boundaries
  - The District may not have complete LOMR information within the City of Tucson, Town of Oro Valley and Town of Marana

- ☐ LOMAs (Letters of Map Amendment)
  - The District does not have any LOMA information within the City of Tucson, Town of Oro Valley and Town of Marana

- ☐ PLSS Section Boundaries
- ☐ Jurisdictional Boundaries
- ☐ Parcel Boundaries (not available in outlying areas)
- ☐ Street Network (not available in outlying areas)

Digital parcel boundaries and street network information will not be available for those areas of Pima County that have not gone through the parcel orthophoto-rectification process.

Digital LOMR CLOMR data in AutoCAD submitted for review by the local communities must be in version 2000 or earlier.

TERMS

By signing the request below, users of this information acknowledge that it is not guaranteed to be accurate, correct or complete; conclusions drawn from such information are the responsibility of the user. While every effort is made to ensure the accuracy and correctness, the District assumes no responsibility for errors or omissions, even if Pima County is advised of the possibility of such damage.

Users understand and acknowledge that the digital FIRM data is subject to constant change and its accuracy cannot be guaranteed. All data is provided AS IS, with all faults, and without warranty of any kind, either expressed or implied.

The data provided might have a number of errors, which may include, but are not limited to, the following:

- ☐ Spatial Errors: The areas depicted are approximate, and are not necessarily accurate to surveying or engineering standards. X/Y coordinates may be in error by several hundred feet or more. Parcel lines may not be in the right location.
- ☐ Registration Errors: GIS data layers may not overlay each other correctly.
- ☐ Attribute Errors: Database information may be incorrect.
- ☐ Currency Errors: GIS data layers, databases and documents may not be the most current available or may not depict the specified time. All data is subject to constant change. Data input lags real-world changes by varying periods of time.
- ☐ Completeness Errors: Data may be missing or data may be included that does not belong. Letters of Map Revisions (LOMRs) and Letters of Map Amendments (LOMAs) for incorporated cities and towns is incomplete. Users of this data are encouraged to check with local Floodplain Management Agency for LOMR and LOMA information.
- ☐ Projection Distortion: All map projections introduce distortion by representing the irregular shape of the earth's surface on flat maps. This affects feature shapes, angles, map distance, and areas.
- ☐ Calculation Errors: Results of calculations may not be exact due to rounding, precision of stored values or algorithm differences.
- ☐ Representation Errors: Maps or other displays may not properly represent the data. For instance, a white line on a white background would appear as if it wasn't there. Color-coded ("themed") map layer colors and categories may not match the current range of data values. Data may be displayed at an inappropriate scale.

In no event shall Pima County become liable to users of digital Flood Insurance Rate Map data, or any other party, of any loss or direct, indirect, special, incidental or consequential damages, including but not limited to, time, money or goodwill arising from the use or modification of the data.

I certify that I have read, understand, and agree to the terms as stated in this request.

Signature of Requestor	**Requestor's Name (printed)**
Date	**Requestor's Title**
Organization Name	**Contact Number**
E-mail Address	**FIRM Panel(s) requested (Use last 4 numeric digits)**

Digital data is requested in ☐ AutoCAD format ☐ ESRI format
Please FAX this form to (520) 243-1821, or e-mail a signed scanned copy (in Adobe Acrobat) to Terry.Hendricks@dot.pima.gov

Results

- Re-submittals to correct incorrect maps is near zero
- Easier and more accurate local review
- Faster and more accurate FEMA processing

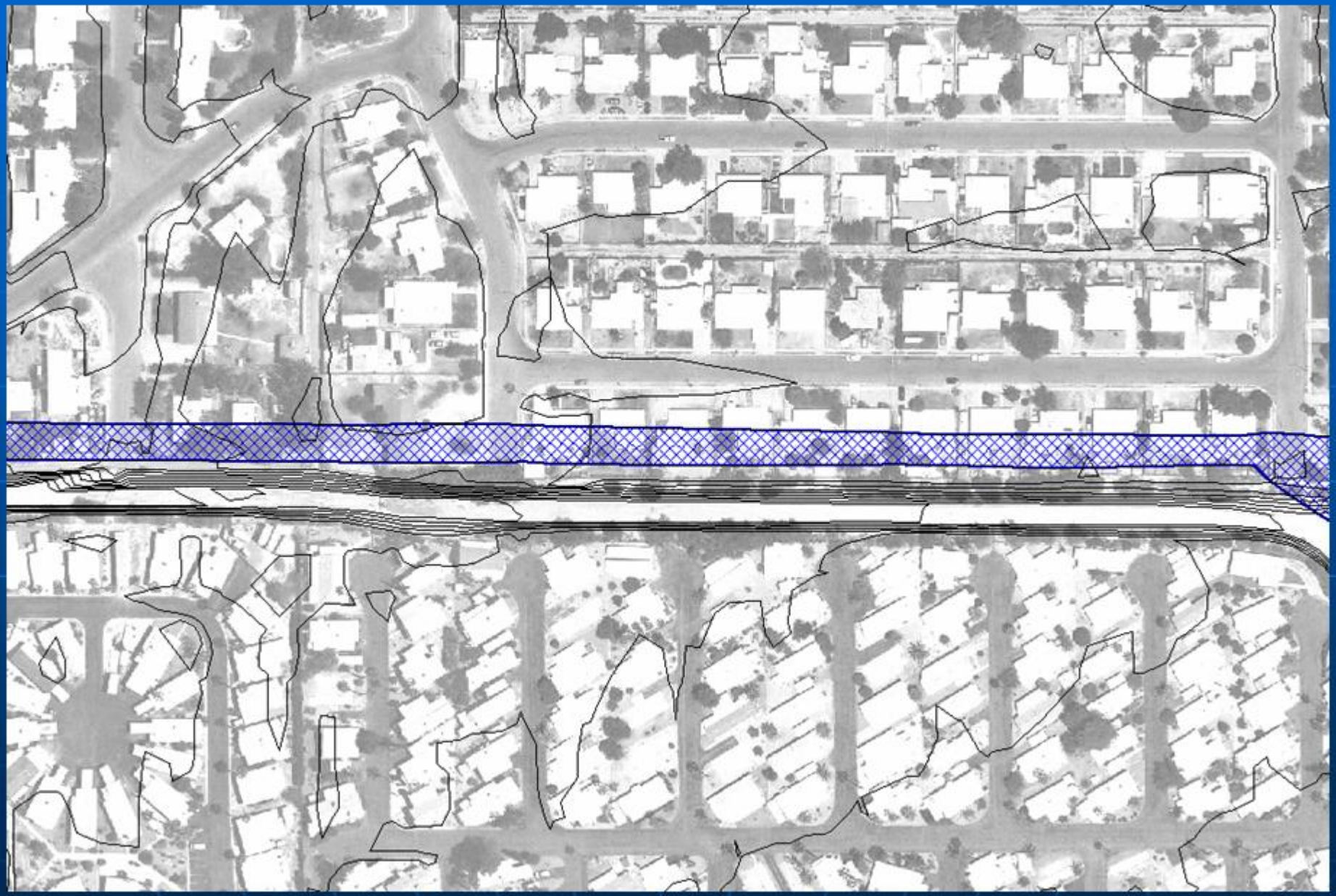
Correcting unrecognized mistakes

Problems associated with paper to digital transitions

- Limited photographic references
- Adjustments to mapping from inadequate horizontal and vertical controls
- Limitations to drafting

Our approach

- Coordinate review with other jurisdictions
- Combine data
- Provide copies of all work maps
- Provide PAG products



C:\Terry\mapping\D-FIRM map project\DFIRM by wash

- D-FIRM map project
  - DFIRM by wash
    - Airport Wash
    - Ajo
    - Alamo-Arcadia
    - Ankmal - A Washes
    - Arroyo Chico, highschool, naylor, citation, r
    - Atterburry
    - Bronx Wash
    - Cholla Wash
    - Christmas Wash
    - Columbus - Alvernon Wash
    - Del Cerro, Sweetwater, Roger, Trails End,
    - Earp Wash
    - El Rio Wash
    - El Vado
    - Enchanted hills Wash
    - Este Wash
    - Floodways
    - Flowing Wells Watershed (Wilson, Navajo,
    - Gardner Lane area
    - Greasewood Wash
    - Hidden Hills Wash
    - Julian Wash
    - Kennedy Wash
    - Kinnison Wash
    - Los Realses Improvement dist
    - Mosaic Wash
    - Pantano Wash
    - Rita Ranch area
    - Robb Wash
    - Rodeo Wash
    - Rolling Hills Wash
    - Rose Hill Wash
    - Sahuara - Van Buren washes
    - San Juan Wash

- Airport Wash
- Ajo
- Alamo-Arcadia
- Ankmal - A Washes
- Arroyo Chico, highschool, naylor, citation, railroad
- Atterburry
- Bronx Wash
- Cholla Wash
- Christmas Wash
- Columbus - Alvernon Wash
- Del Cerro, Sweetwater, Roger, Trails End, Painted Hills
- Earp Wash
- El Rio Wash
- El Vado
- Enchanted hills Wash
- Este Wash
- Floodways
- Flowing Wells Watershed (Wilson, Navajo, Cemetery)
- Gardner Lane area
- Greasewood Wash
- Hidden Hills Wash
- Julian Wash
- Kennedy Wash
- Kinnison Wash
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- Mosaic Wash
- Pantano Wash
- Rita Ranch area
- Robb Wash
- Rodeo Wash
- Rolling Hills Wash
- Rose Hill Wash
- Sahuara - Van Buren washes
- San Juan Wash
- Santa Cruz River
- Silvercroft Wash
- Tanque Verde Creek
- West Branch Santa Cruz (WBSCRD) diversion channel
- West Branch Santa Cruz River (WBSCR)
- Dfirm edits general notes.doc

Preparing for the next D-FIRMs

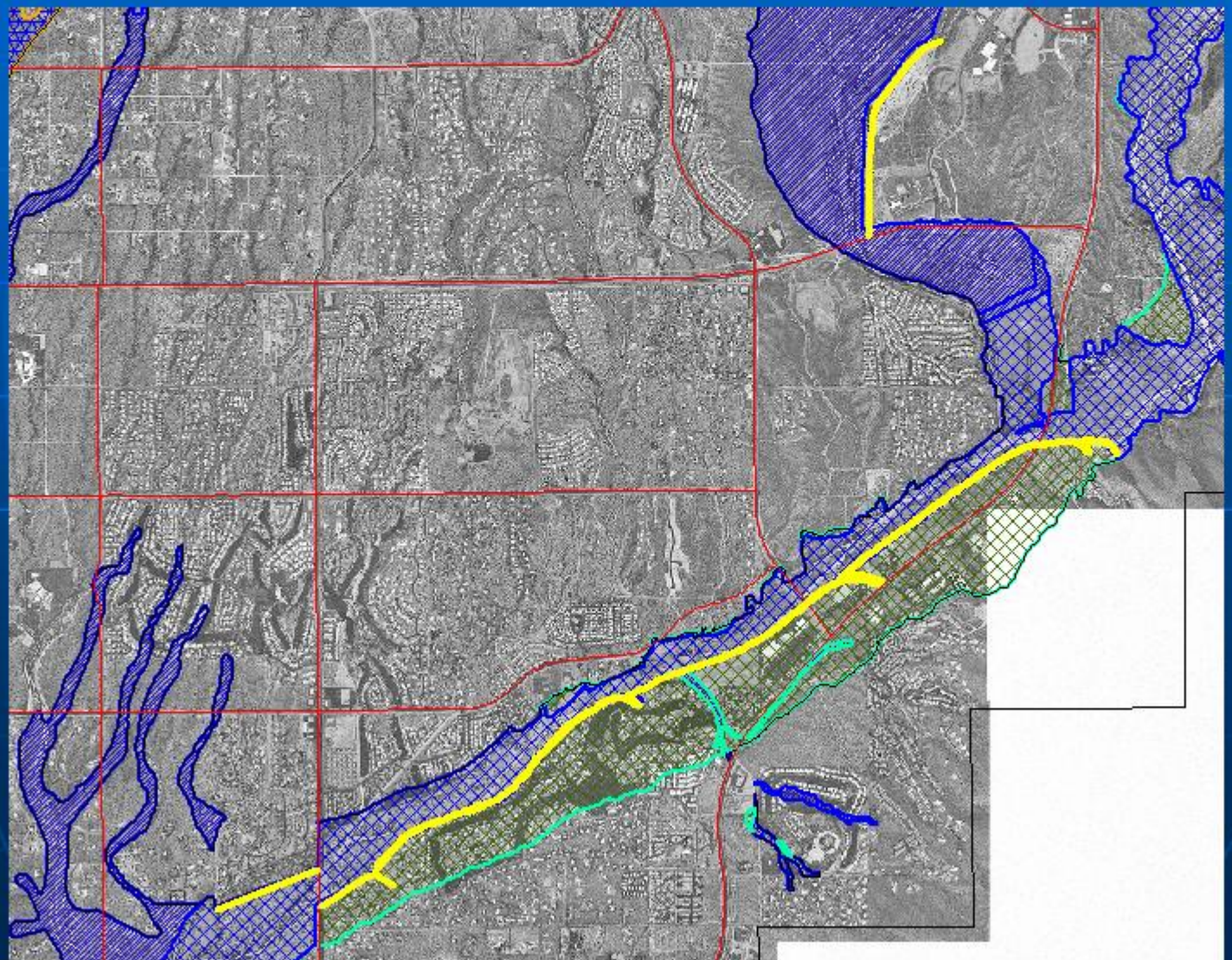
- Preliminary D-FIRMS in Sept. 2007
- LOMRs will be blended into new FP layers
- Communities must verify accuracy of
  - LOMR blending
  - Floodplain limits
- Communities must verify if LOMAs are valid

Preparing for the next D-FIRMs

- Centralized Data Base will
  - Increase accuracy of review
  - Provide comprehensive assessment of LOMRs and LOMAs

Preparing for the next D-FIRMs

- Levee Certifications



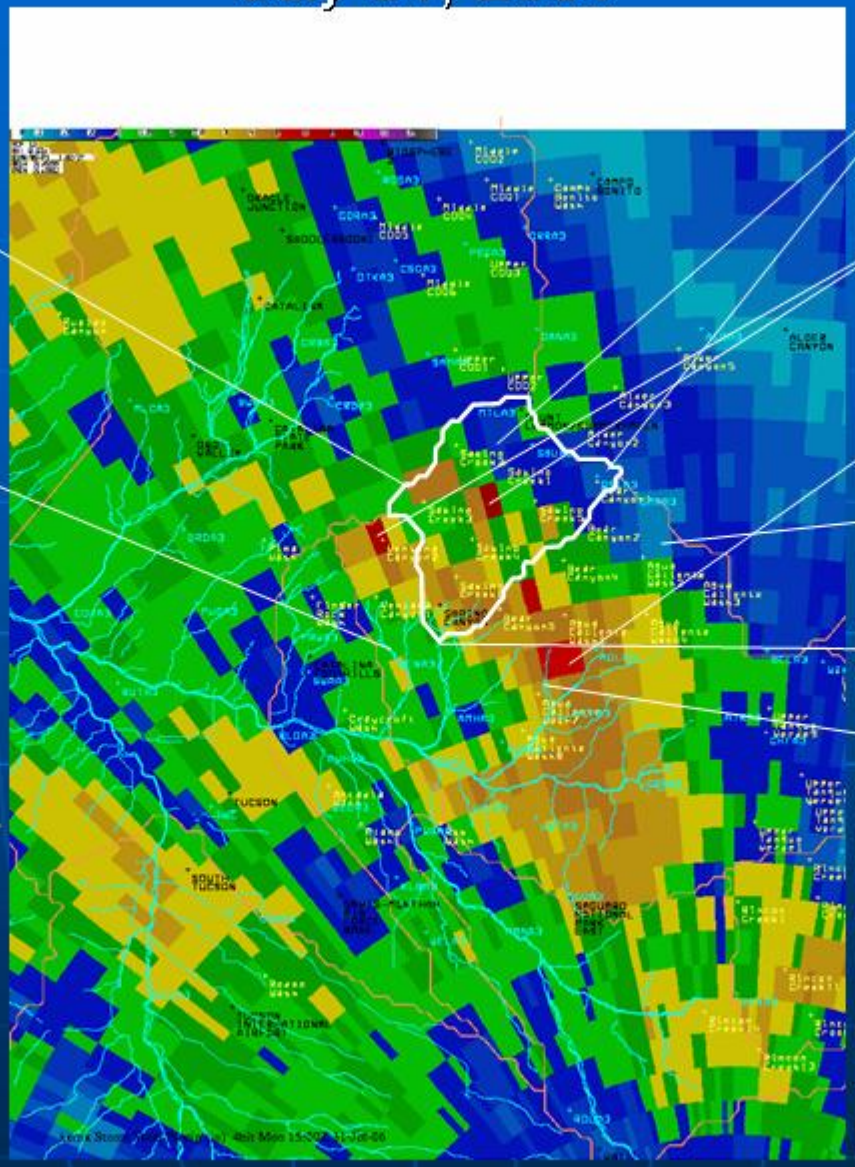
July August 2006 Flood Event

- 100 Year + Flood Event
- Multiple Watercourses impacted
- Damage to Public and Private Property

Cumulative Storm Total from NEXRAD and ALERT
July 31, 2006

Sabino watershed

Ventana - 1.3”



1.7” – Mt Lemmon & Whitetail

8-10”

5-6”

0.8” – Green Mtn.

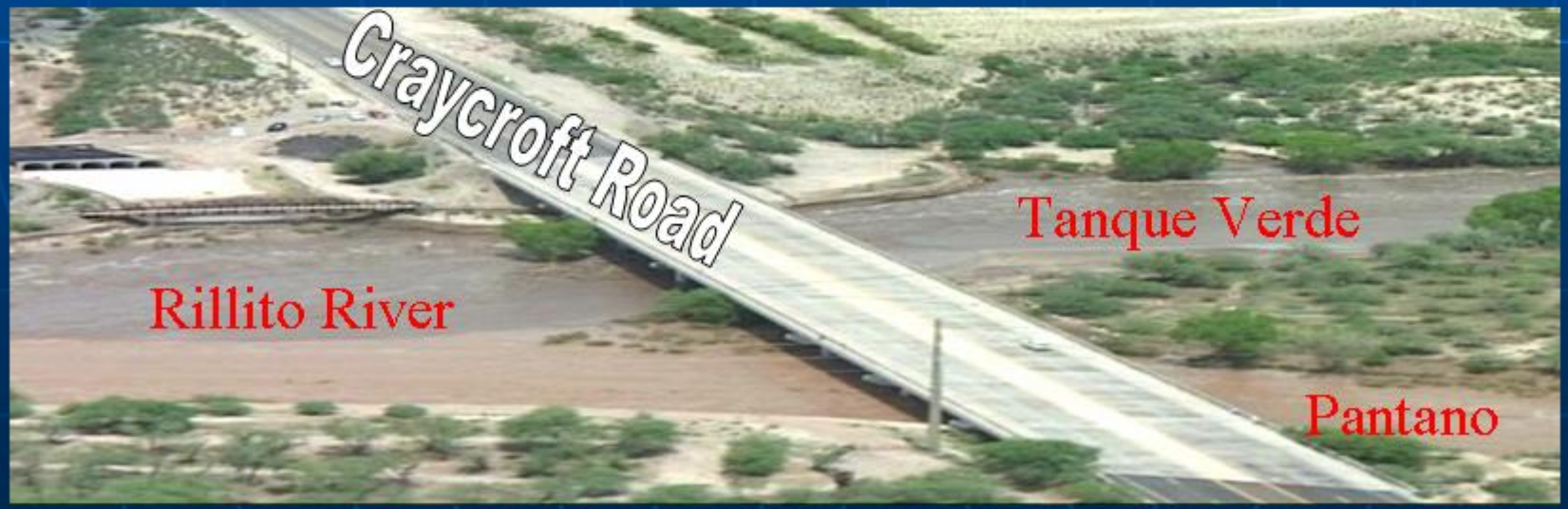
2.0” – Sabino

4.6” - Molino

ALERT System
Peak Storm Intensities
(in/hr)

Mt. Lemmon	0.4”
Whitetail	0.5”
Green Mtn.	0.3”
Ventana	0.5”
Sabino	0.5”
Molino	1.4”

USGS
science for a changing world


Craycroft Road
Tanque Verde
Rillito River
Pantano

July August 2006 Flood Event

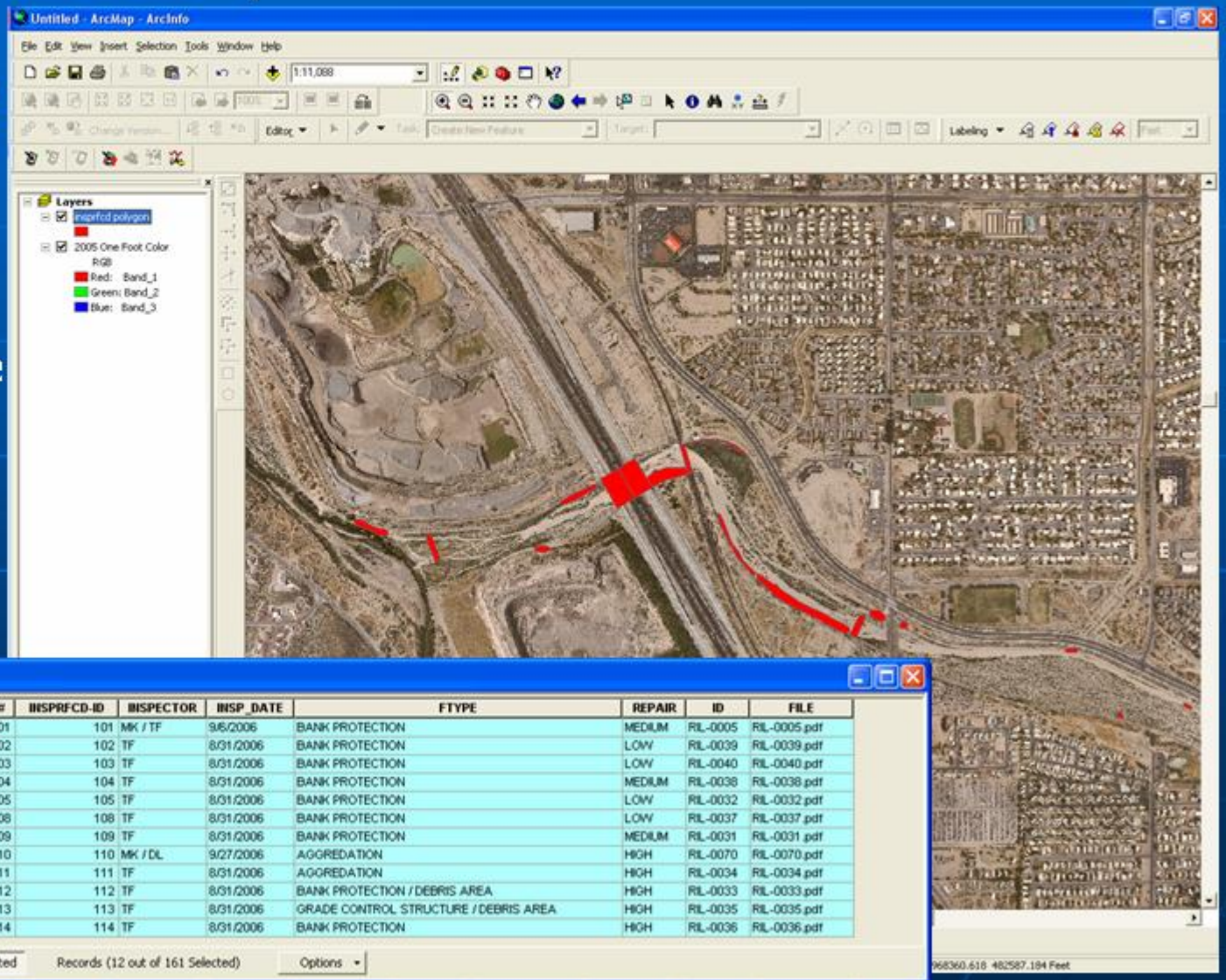
- Post Flood Damage Assessment
  - Inspections of Damaged Infrastructure
  - JE Fuller Restudy of Rillito River Capacity
  - LIDAR and Depositional/Erosional Areas
  - New Aerial Photo flights

River Channels inspected by Field Crews.

Shapefile created based on inspection data.

Polygons linked to scanned copies of field notes.

Precursor to our new Infrastructure Geodatabase.



Selected Attributes of insprfcd polygon

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102	Polygon	15937.248785	599.590625	102	102	TF	8/31/2006	BANK PROTECTION	LOW	RIL-0039	RIL-0039.pdf
103	Polygon	13049.26551	442.384123	103	103	TF	8/31/2006	BANK PROTECTION	LOW	RIL-0040	RIL-0040.pdf
104	Polygon	84399.942187	2293.625993	104	104	TF	8/31/2006	BANK PROTECTION	MEDIUM	RIL-0038	RIL-0038.pdf
105	Polygon	8549.023071	383.327187	105	105	TF	8/31/2006	BANK PROTECTION	LOW	RIL-0032	RIL-0032.pdf
108	Polygon	25557.134711	1517.454538	108	108	TF	8/31/2006	BANK PROTECTION	LOW	RIL-0037	RIL-0037.pdf
109	Polygon	23519.929245	909.765245	109	109	TF	8/31/2006	BANK PROTECTION	MEDIUM	RIL-0031	RIL-0031.pdf
110	Polygon	74330.425743	1125.088794	110	110	MK / DL	9/27/2006	AGGREDATION	HIGH	RIL-0070	RIL-0070.pdf
111	Polygon	44839.906499	1006.248514	111	111	TF	8/31/2006	AGGREDATION	HIGH	RIL-0034	RIL-0034.pdf
112	Polygon	71862.347687	1112.266099	112	112	TF	8/31/2006	BANK PROTECTION / DEBRIS AREA	HIGH	RIL-0033	RIL-0033.pdf
113	Polygon	14759.267944	712.4073	113	113	TF	8/31/2006	GRADE CONTROL STRUCTURE / DEBRIS AREA	HIGH	RIL-0035	RIL-0035.pdf
114	Polygon	13518.932097	1332.652546	114	114	TF	8/31/2006	BANK PROTECTION	HIGH	RIL-0036	RIL-0036.pdf

Record: 1 Show: All Selected Records (12 out of 161 Selected) Options

Field Inspection Document

RFCD RIVER INSPECTIONS September 2006

Reviewer: MK/TF Date: 9-6-06
River: Rillito Photo Page: R-5
Location ID: Rill-15 (250' W. of Orade Bridge)

- CHANNEL
  - > Aggredation > Degredation
- BANK PROTECTION
  - > Damage > Undercutting
- DEBRIS LOADING
  - > Abutments > Piers
  - > Trees / Brush
- GRADE CONTROL STRUCTURES
  - > Damage > Undercutting X
- Pictures: > 5 (76-80) grade control
  - > 3 (81-83) sediment bar
- Description: Scour hole 4'-5' deep, 6'-10' wide, downgradient side of vertical cement grade control structure. N 125' of channel only, remaining 250' ± of channel width heavily aggraded with 4'-6' deep of sediment.

Focus: tributaries, bends, control structures

Rillito Creek Post Flood Assessment

- Record Event

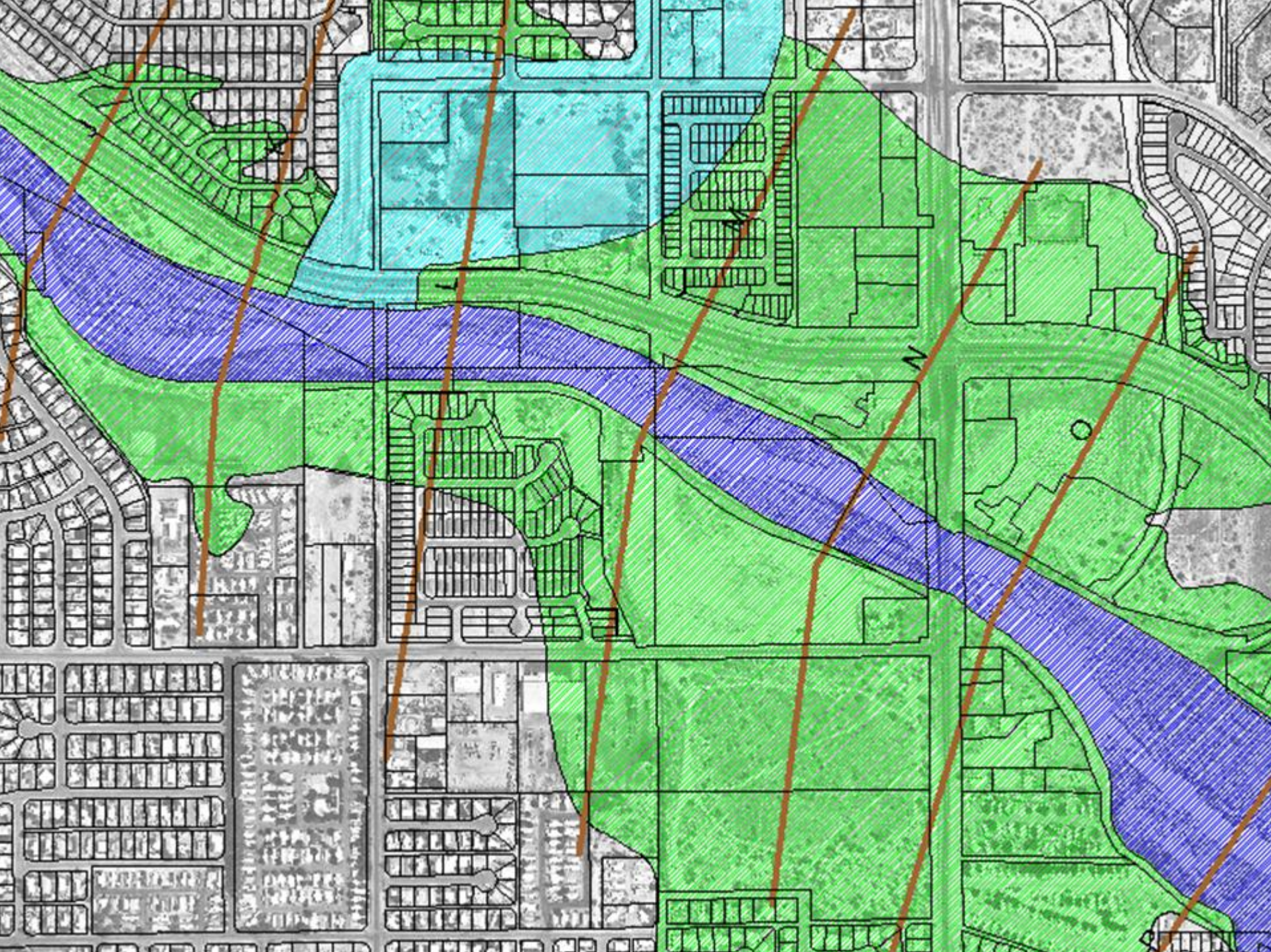
Rillito Creek	Published USGS Discharge Values For July 31, 2006	FEMA 100-year Discharge Values
At Dodge Boulevard	37,900 cfs	32,000 cfs
At La Cholla Boulevard	39,000 cfs	32,000 cfs

- Large areas of deposition
- Determining maintenance priorities

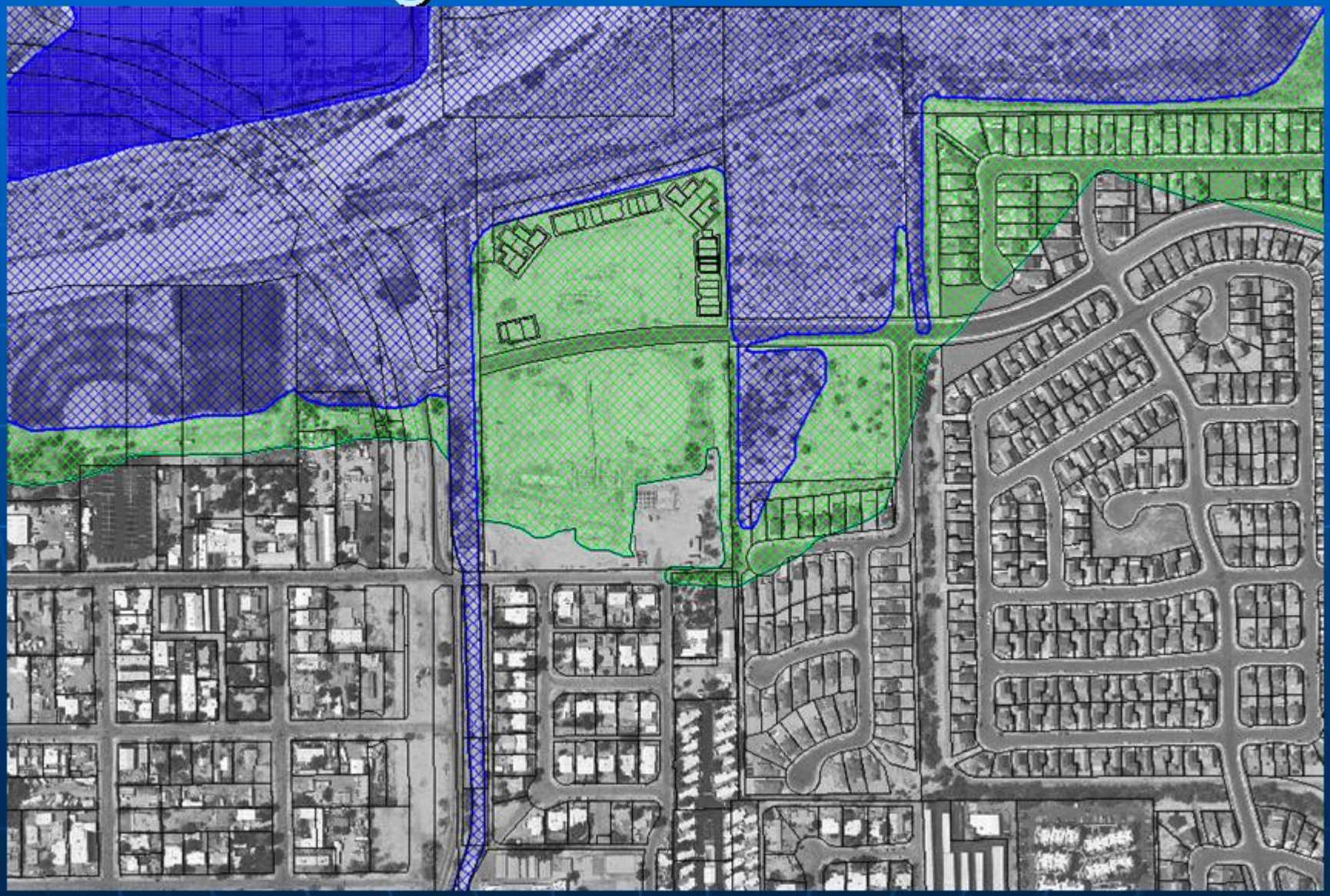
Mexico vía Pacífico
2006/ 9/ 5

Our Approach

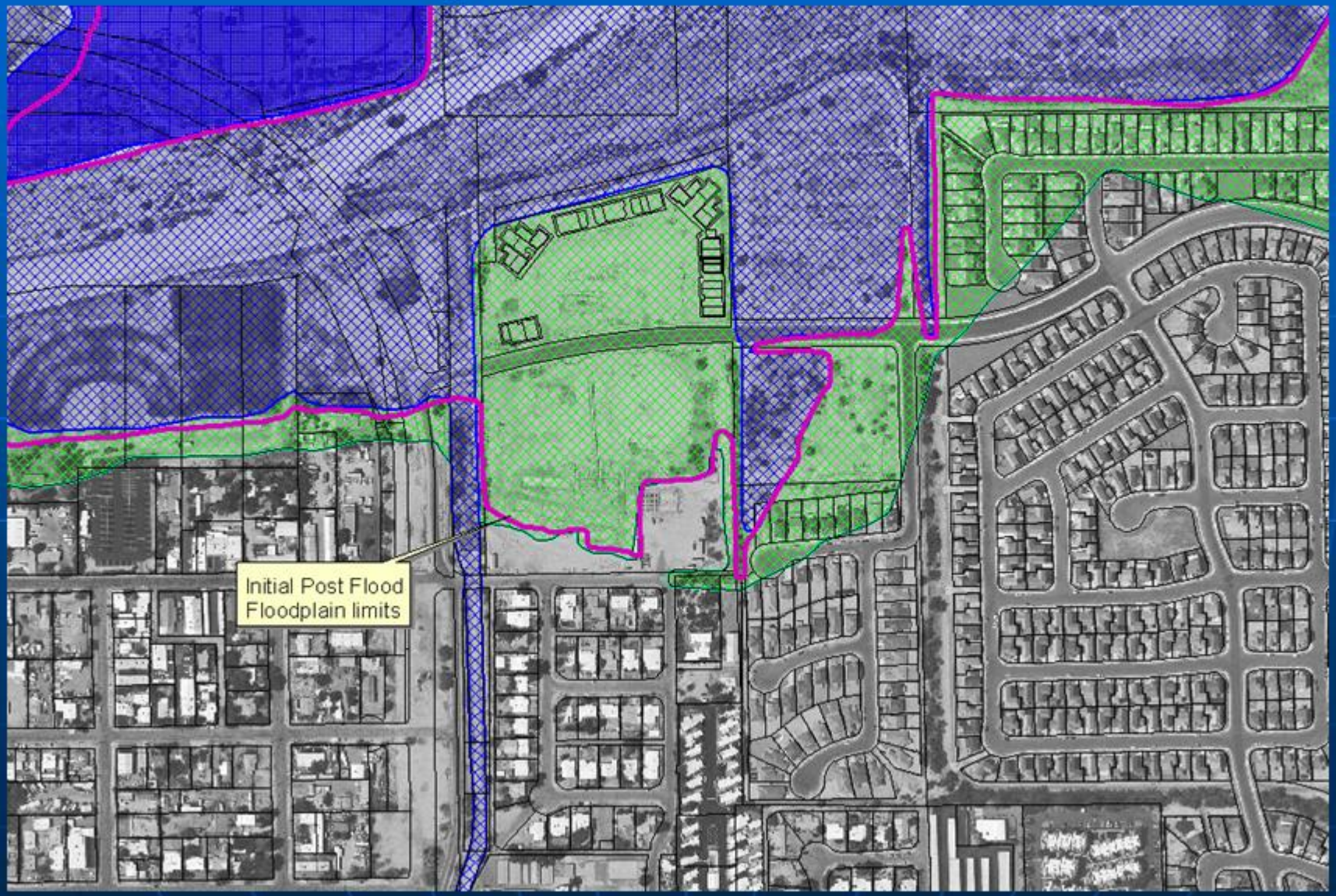
- Use the information from a recent LOMR
- FEMA cross sections same as in model
- GIS FEMA cross sections had Lat. & Long. references
- Fill in the gaps with HEC-RAS "Cross Section Interpolation Tool"
- Field truthing



Truthing with other GIS data



Truthing with other GIS data



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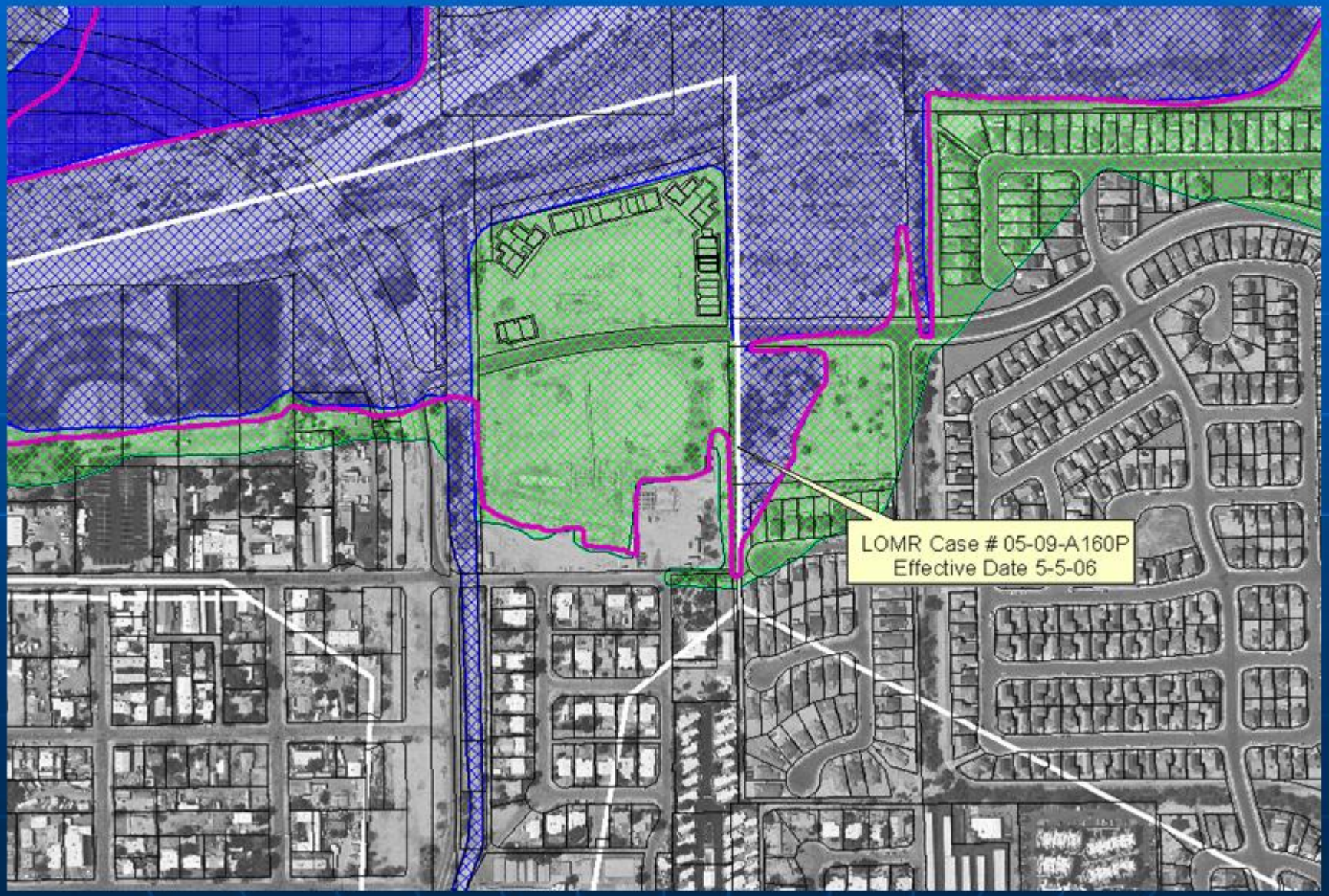

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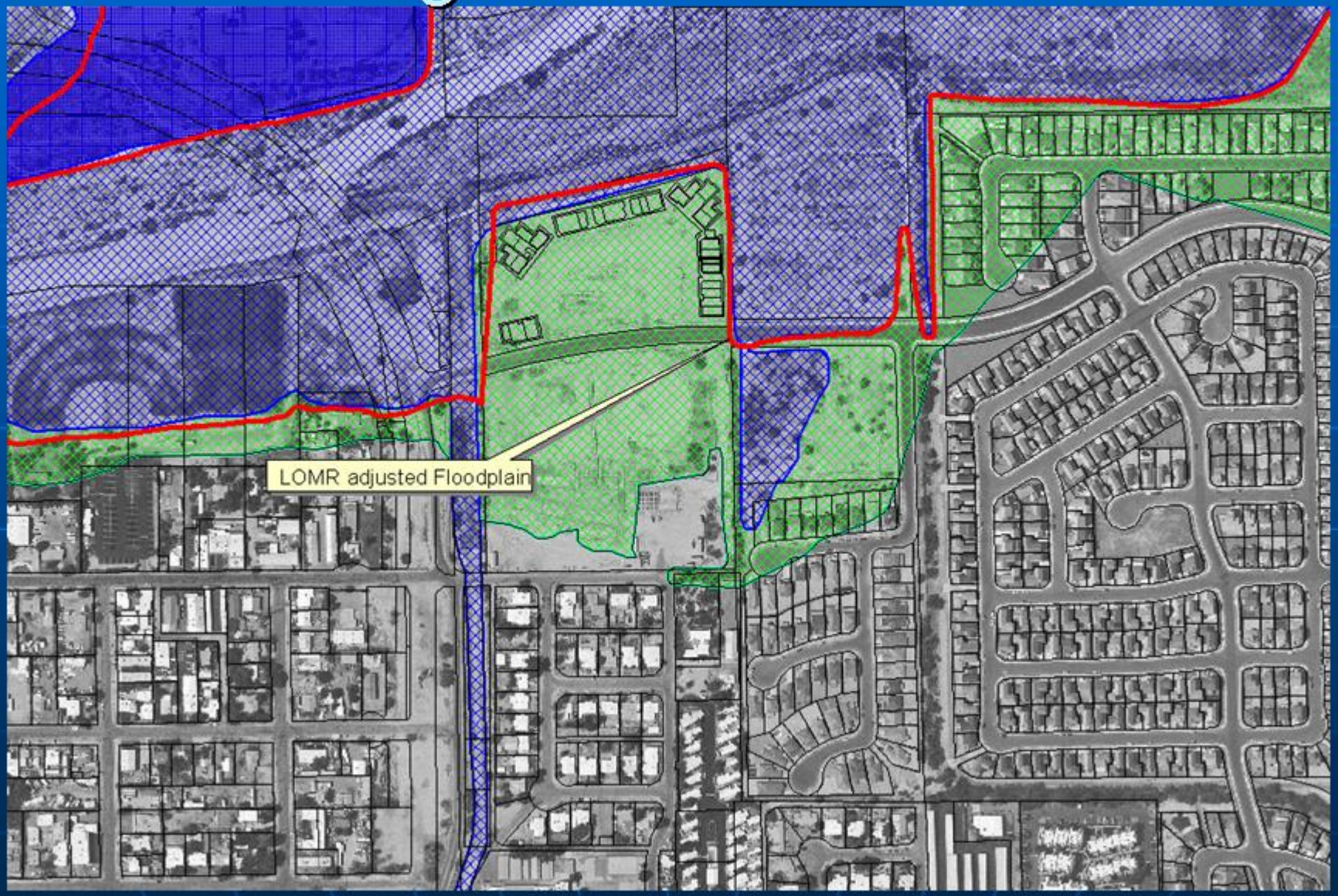
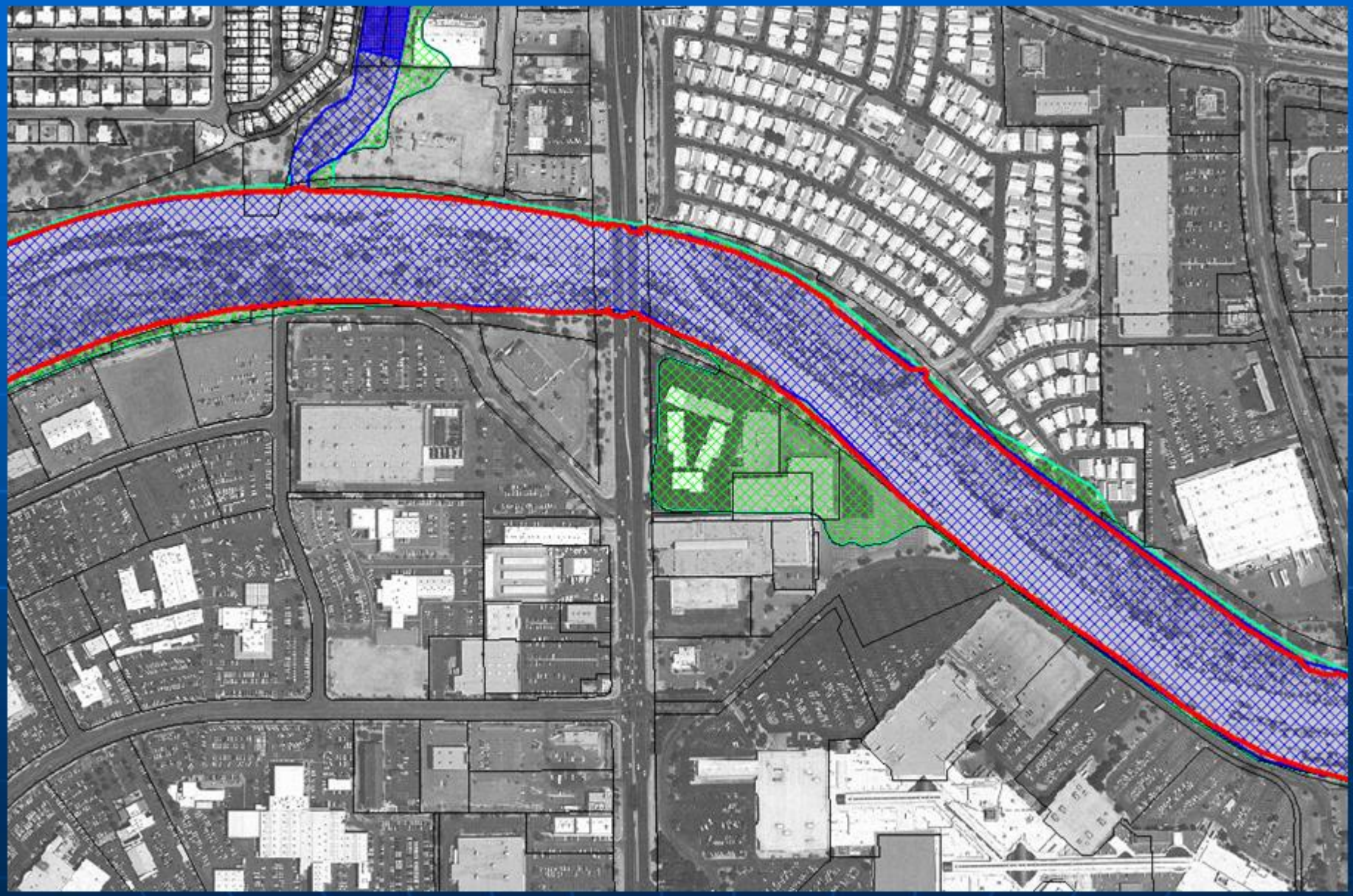
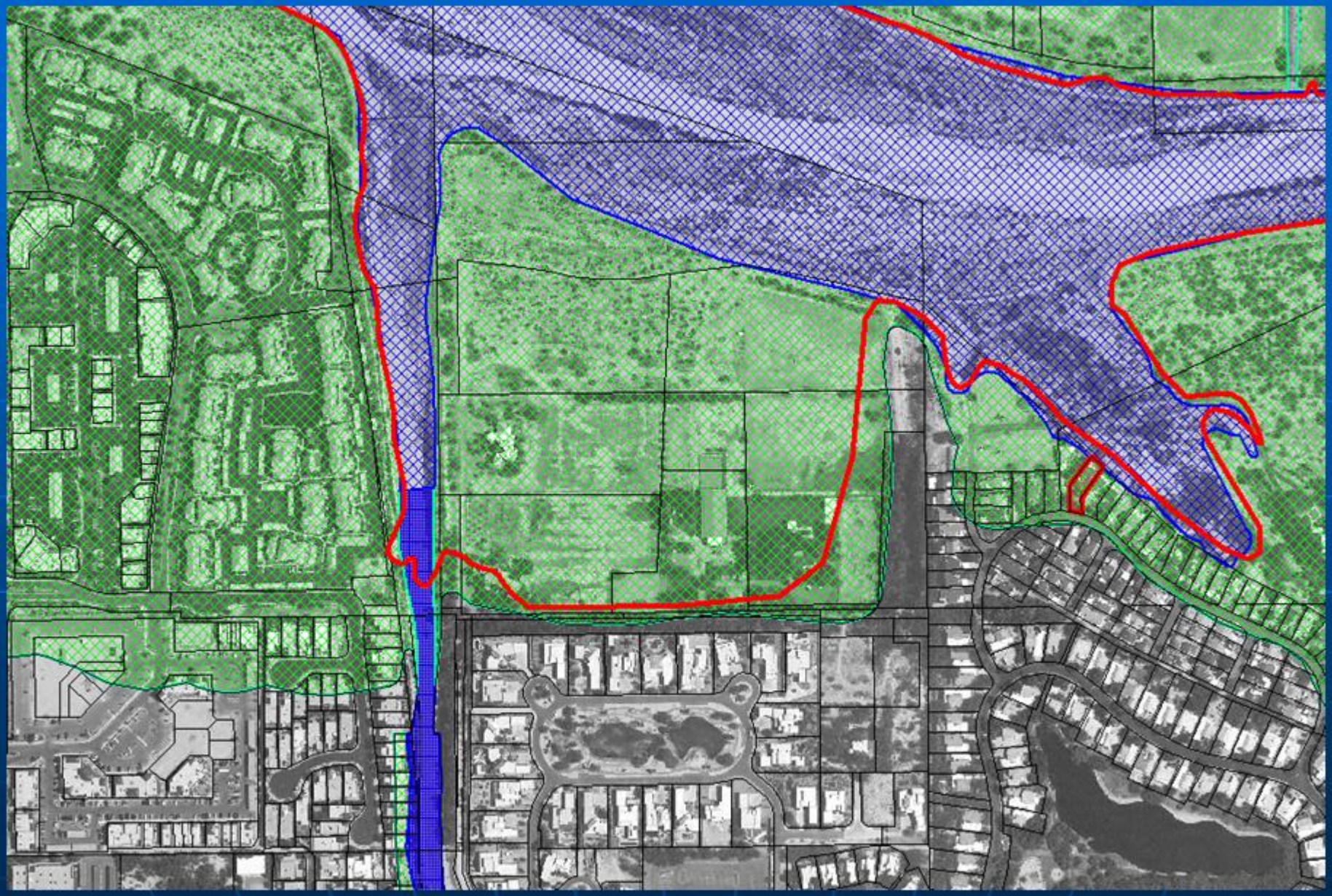
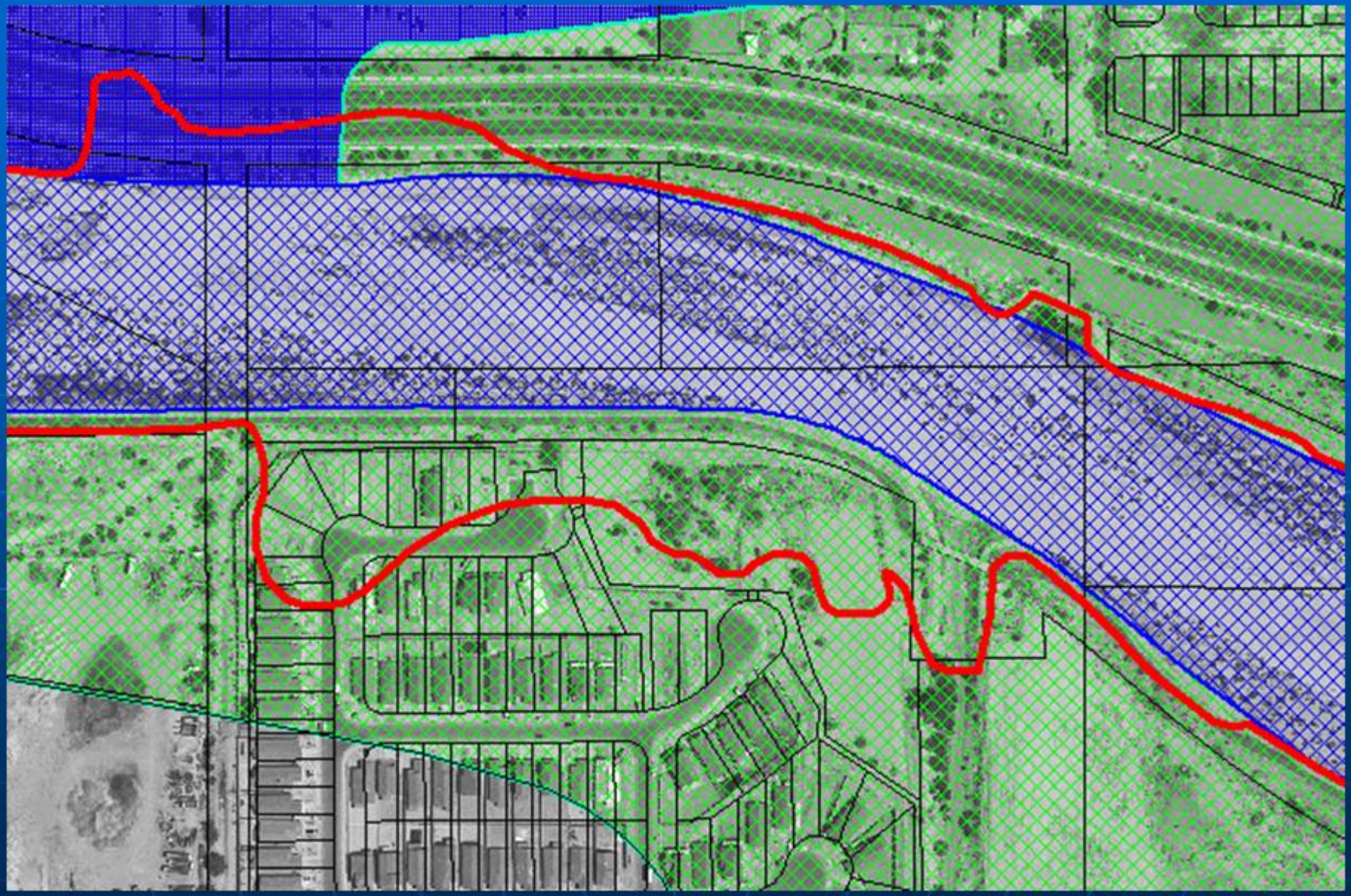






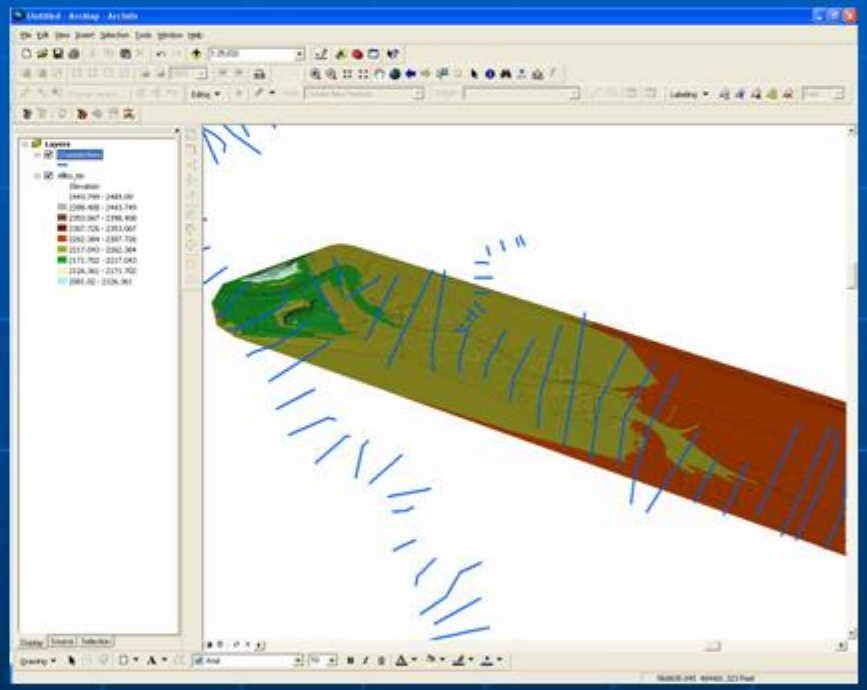


Use of LIDAR to Measure Erosion and Deposition

TIN Created based on Bare-Earth Lidar Data from 2005 Aerial Flight

Current Cross-Sections Surveyed

Compare 2005 Cross-Sections against the New Data to determine Deposition or Erosion.



Post Flood Aerials

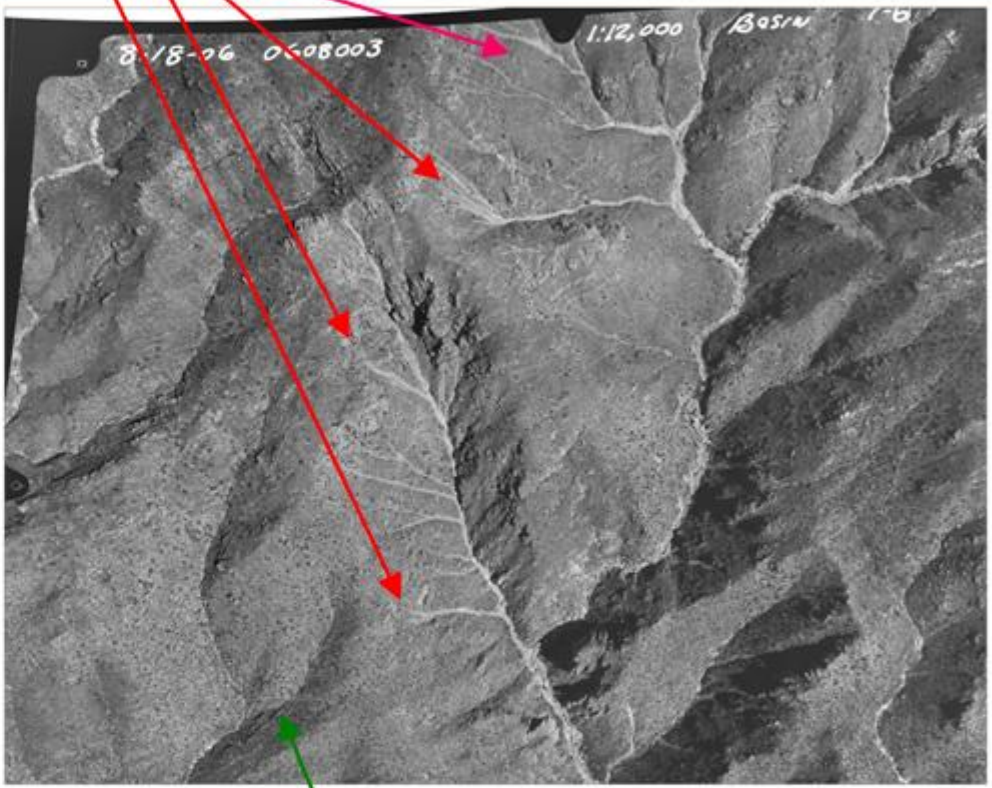
Allow for a "quick and dirty" visual comparison of water channels.

Potential Error from minor shifts in the registration of the photos.

Pre-flood Conditions

Post-flood Conditions

Debris flows



No debris flows

Soldier Canyon Wash 2002

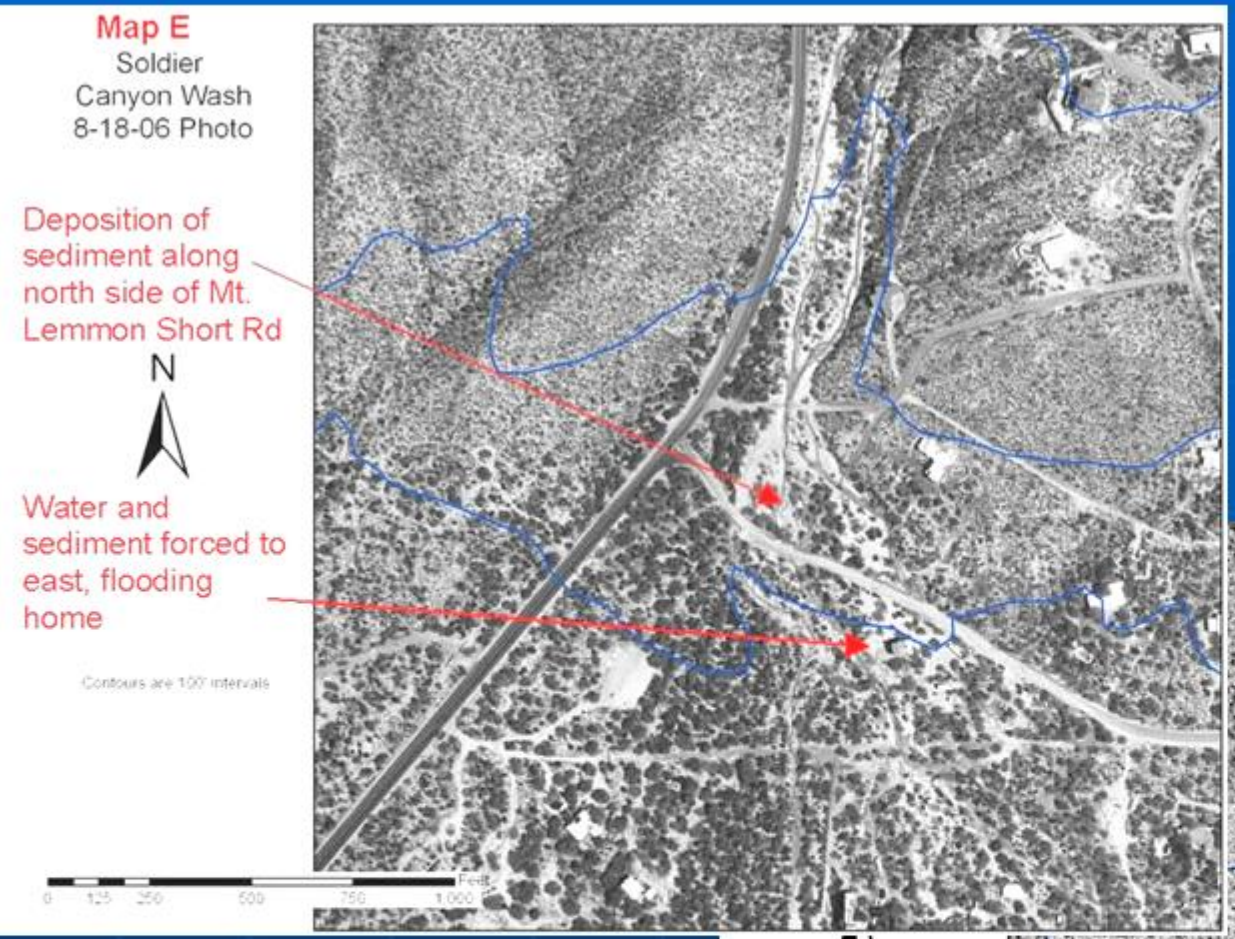
0 250 500 1,000 1,500 2,000 Feet

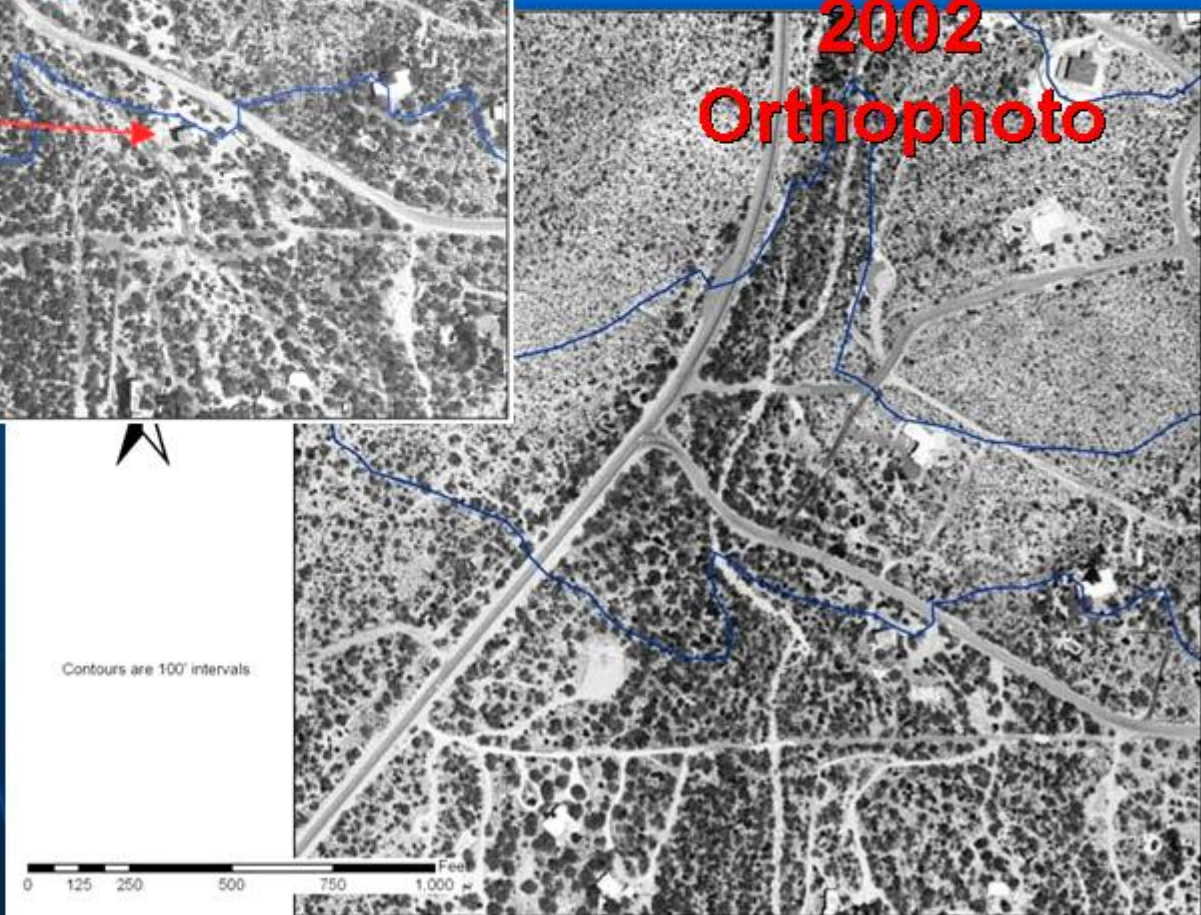
N

Soldier Canyon Wash 8-18-06

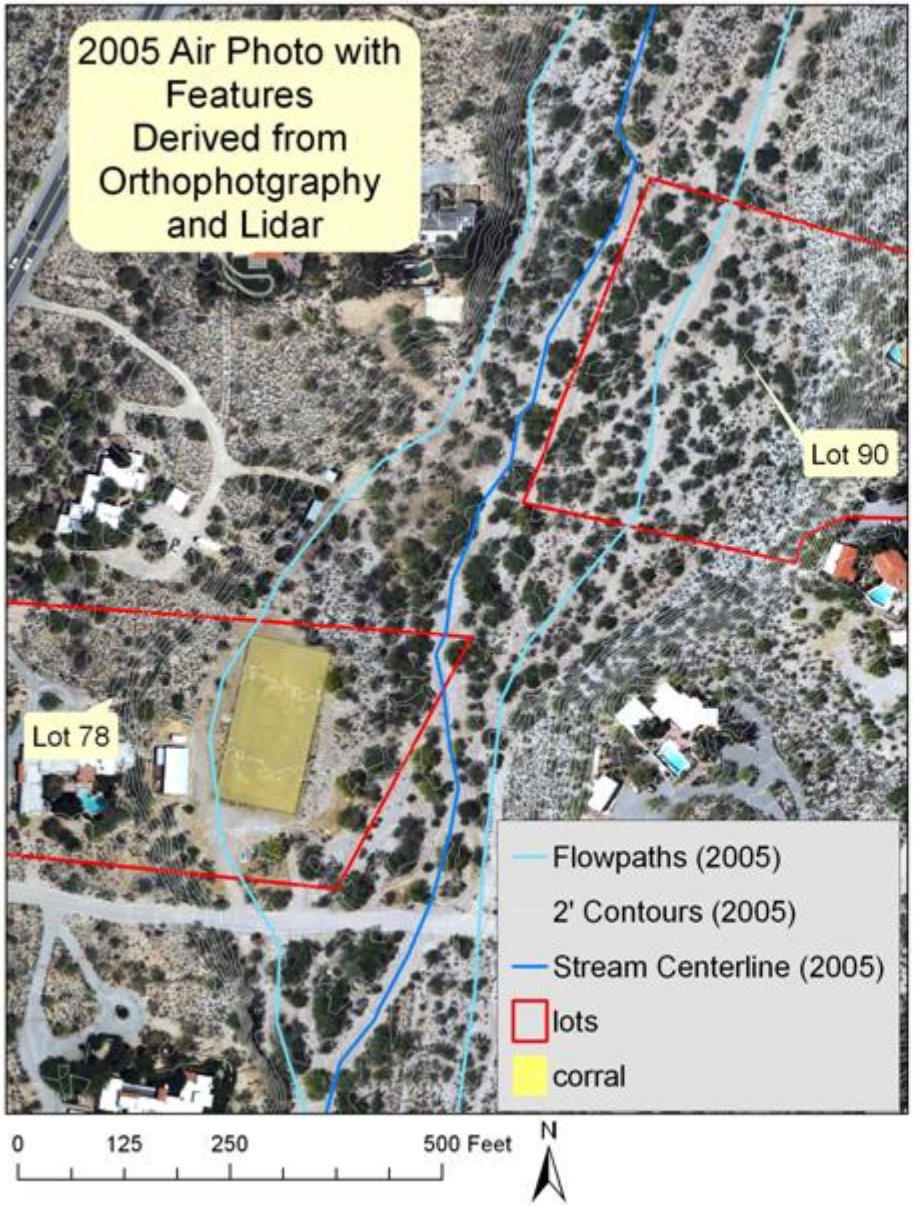
0 250 500 1,000 1,500 2,000 Feet

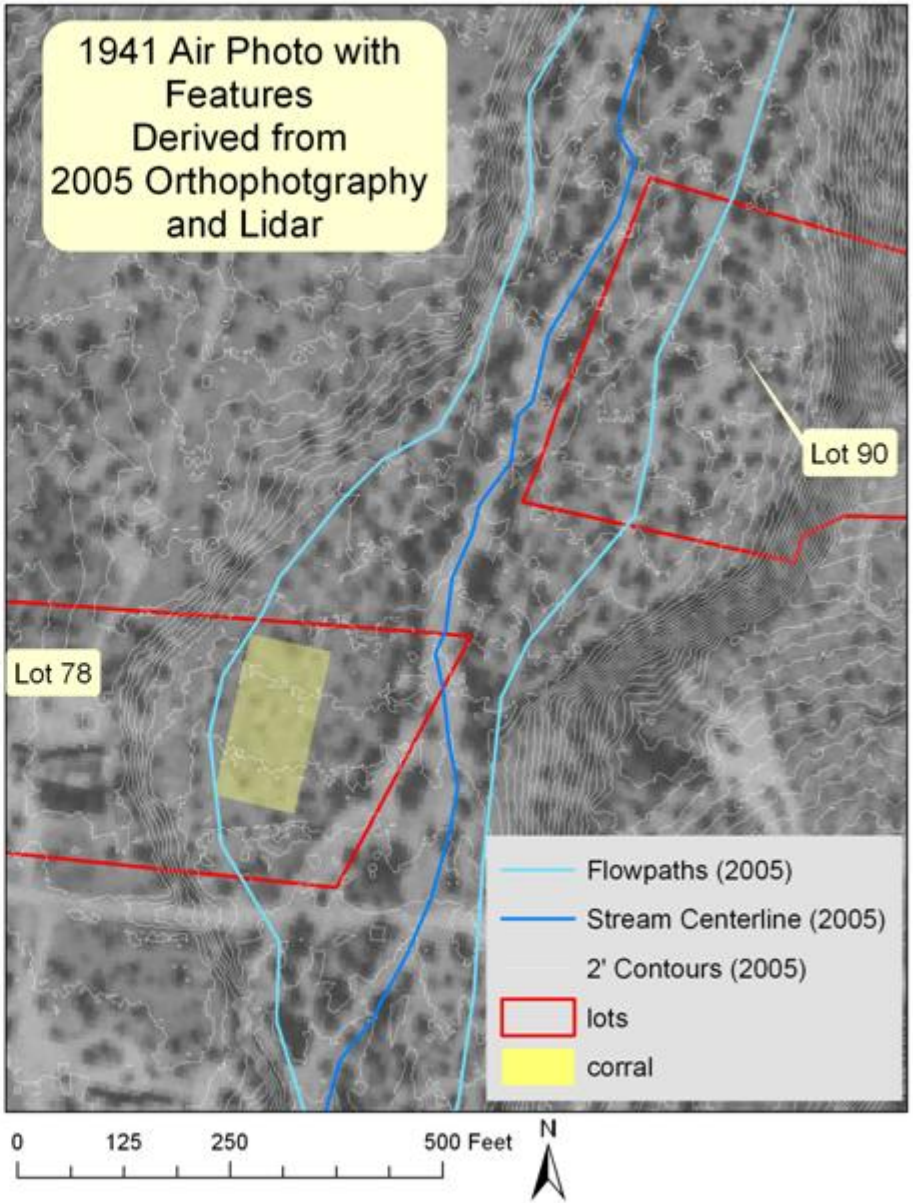
N

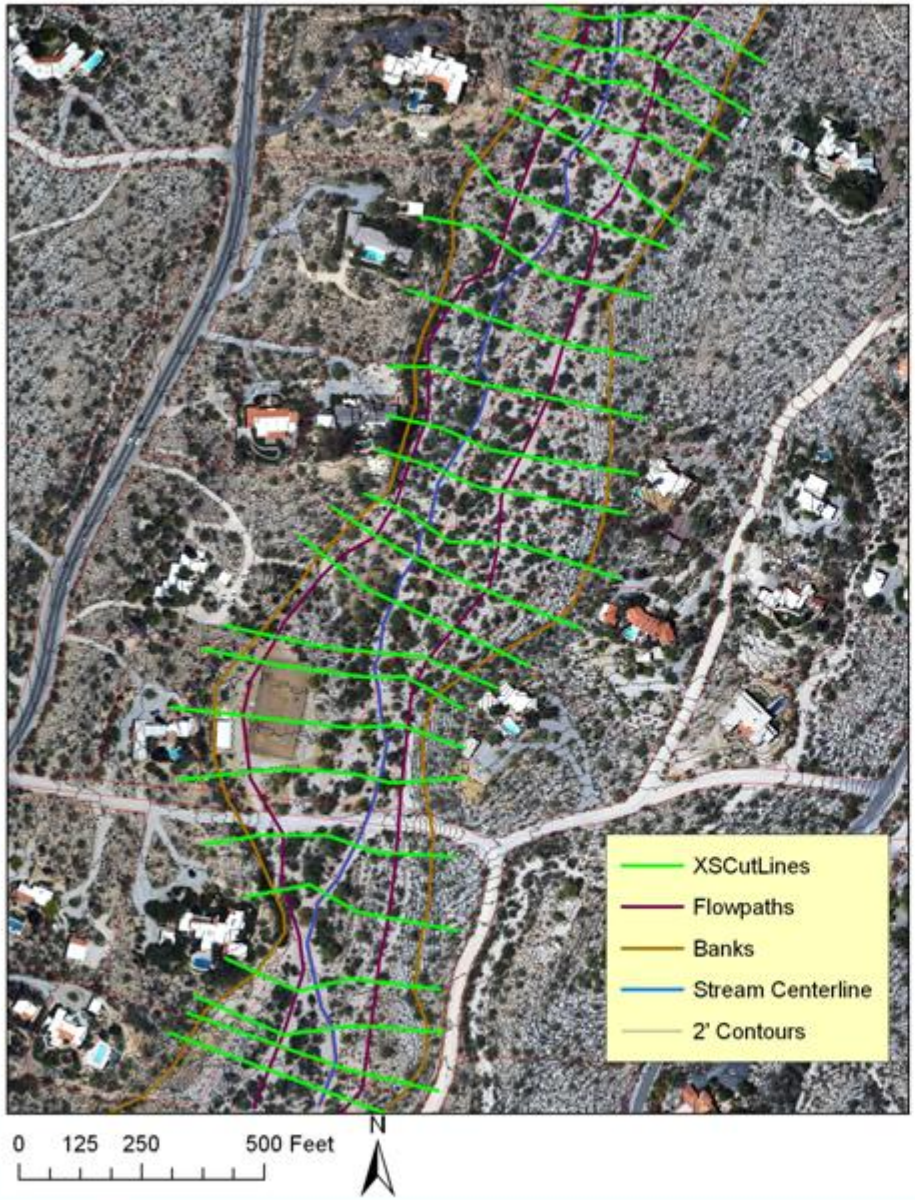

Map E
Soldier
Canyon Wash
8-18-06 Photo
Deposition of sediment along north side of Mt. Lemmon Short Rd
N
Water and sediment forced to east, flooding home
Contours are 100' intervals
0 125 250 500 750 1,000 Feet

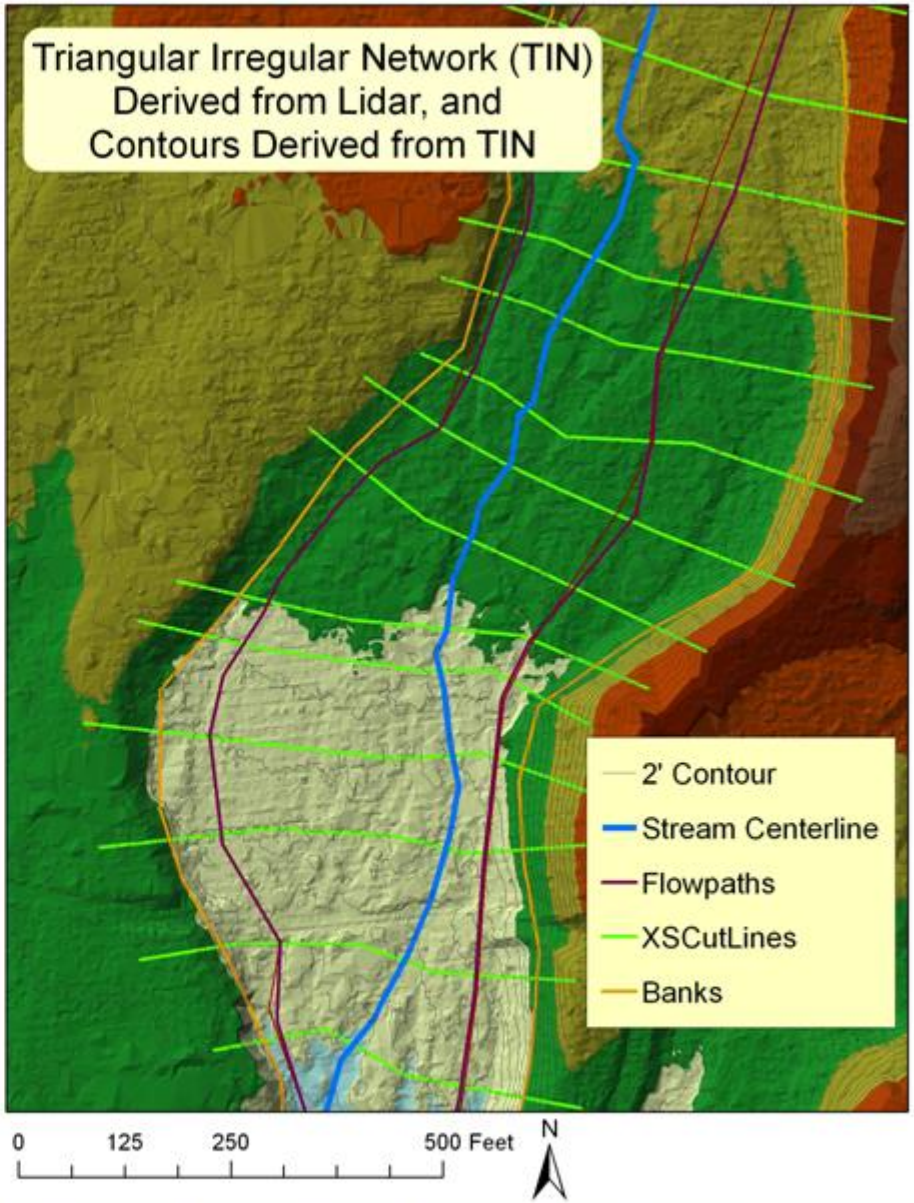

2002
Orthophoto
Contours are 100' intervals
0 125 250 500 750 1,000 Feet

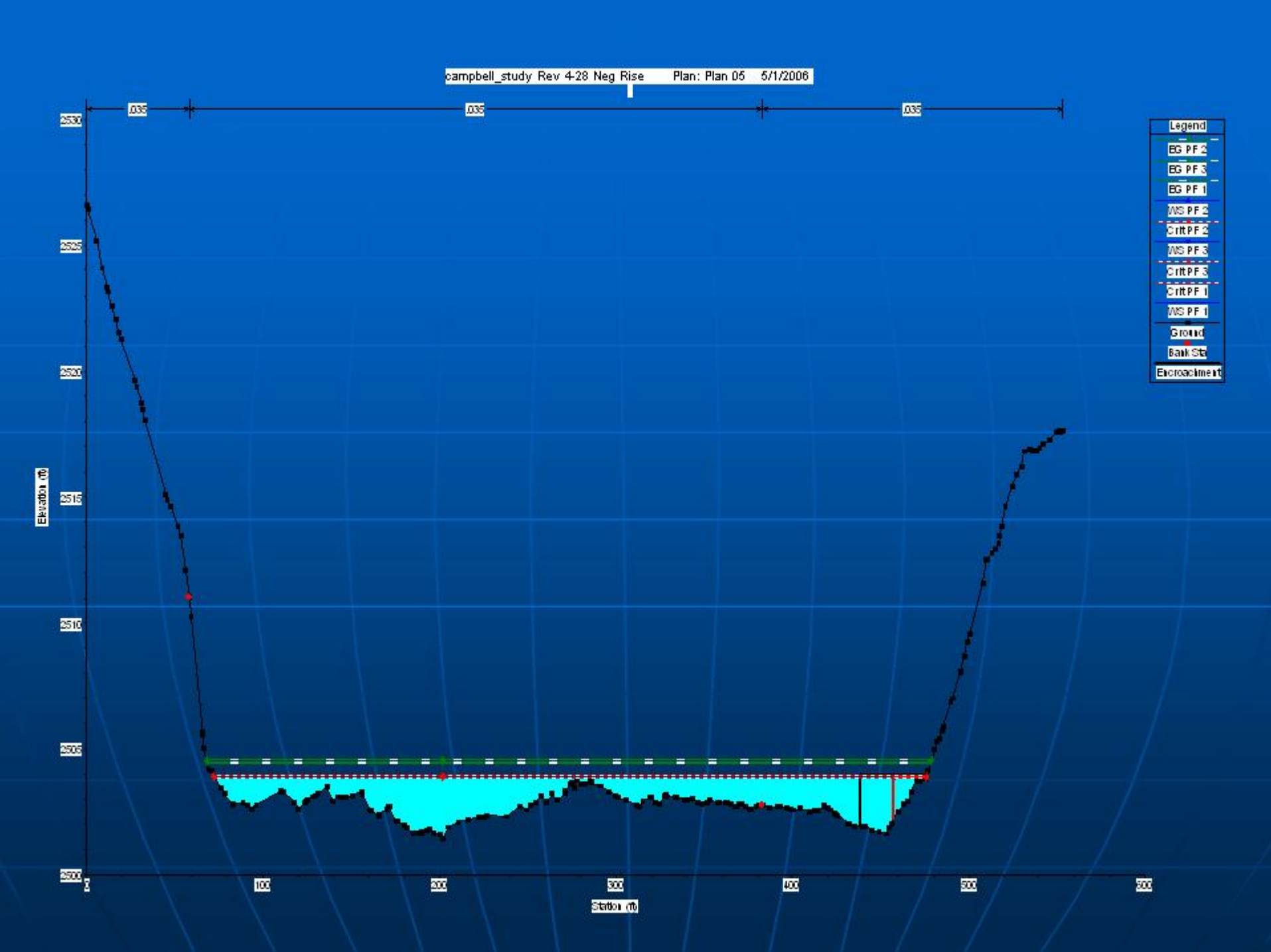
Floodplain Mapping with GIS

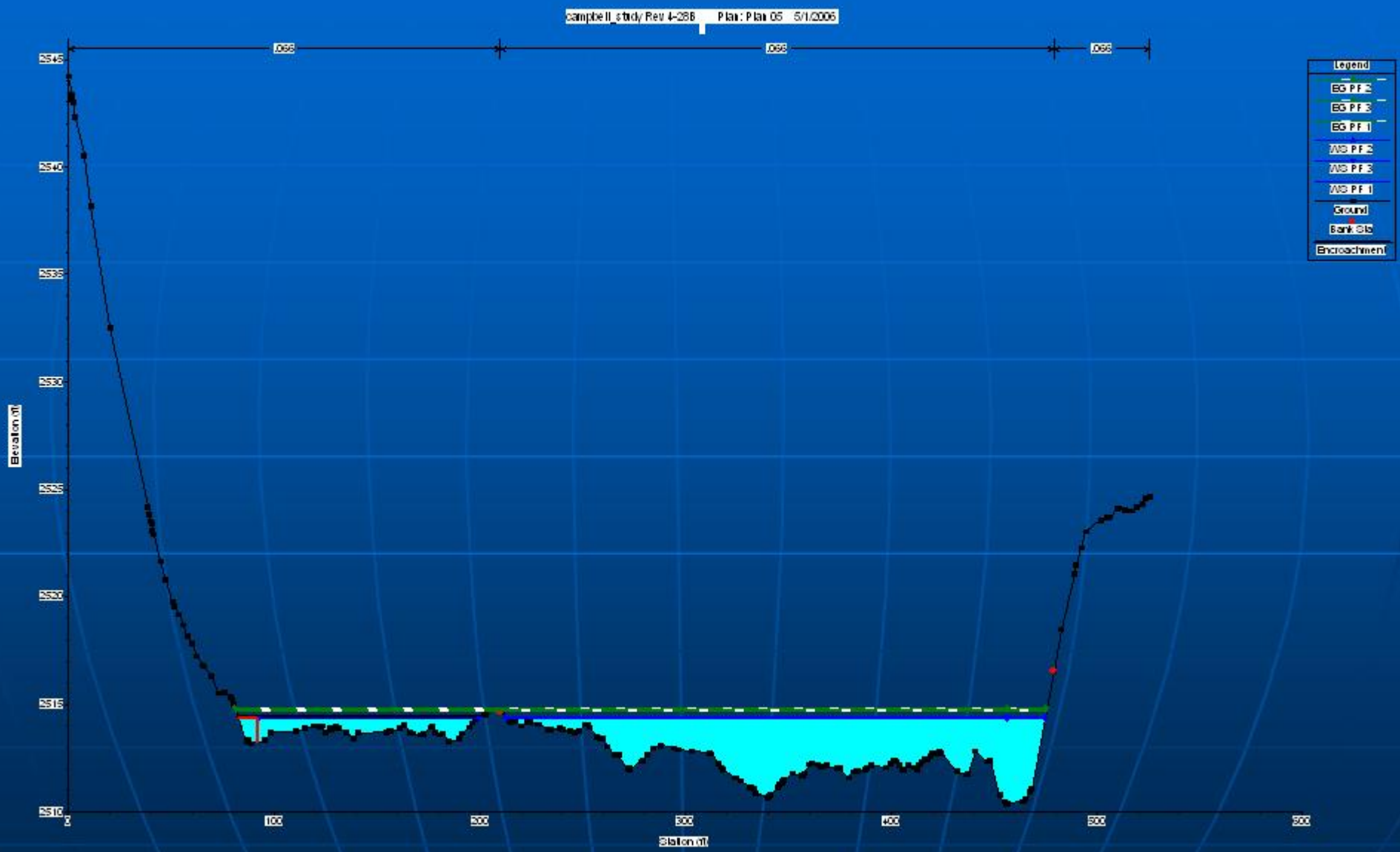

2005 Air Photo with Features Derived from Orthophotgraphy and Lidar
Lot 90
Lot 78
Flowpaths (2005)
2' Contours (2005)
Stream Centerline (2005)
lots
corral
0
125
250
500 Feet
N


1941 Air Photo with Features Derived from 2005 Orthophotgraphy and Lidar
Lot 90
Lot 78
Flowpaths (2005)
Stream Centerline (2005)
2' Contours (2005)
lots
corral
0
125
250
500 Feet
N


XSCutLines
Flowpaths
Banks
Stream Centerline
2' Contours
0 125 250 500 Feet
N


Triangular Irregular Network (TIN)
Derived from Lidar, and
Contours Derived from TIN
2' Contour
Stream Centerline
Flowpaths
XSCutLines
Banks
0 125 250 500 Feet
N


campbell_study Rev 4-28 Neg Rise Plan: Plan 05 5/1/2006
.035
.035
.035
Legend
EG PF 2
EG PF 3
EG PF 1
WS PF 2
Crit PF 2
WS PF 3
Crit PF 3
Crit PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
2530
2525
2520
2515
2510
2505
2500
0
100
200
300
400
500
600
Station (ft)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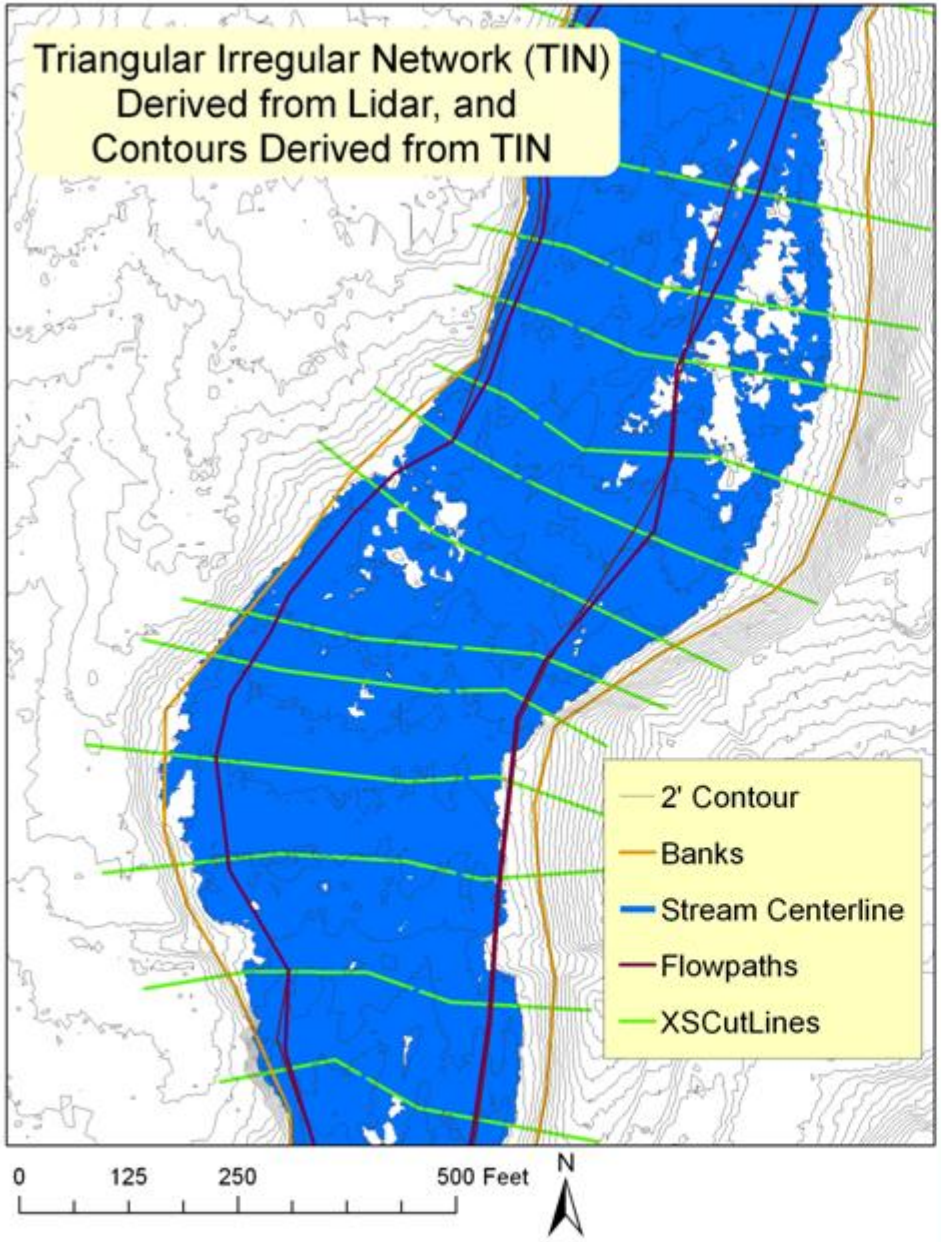
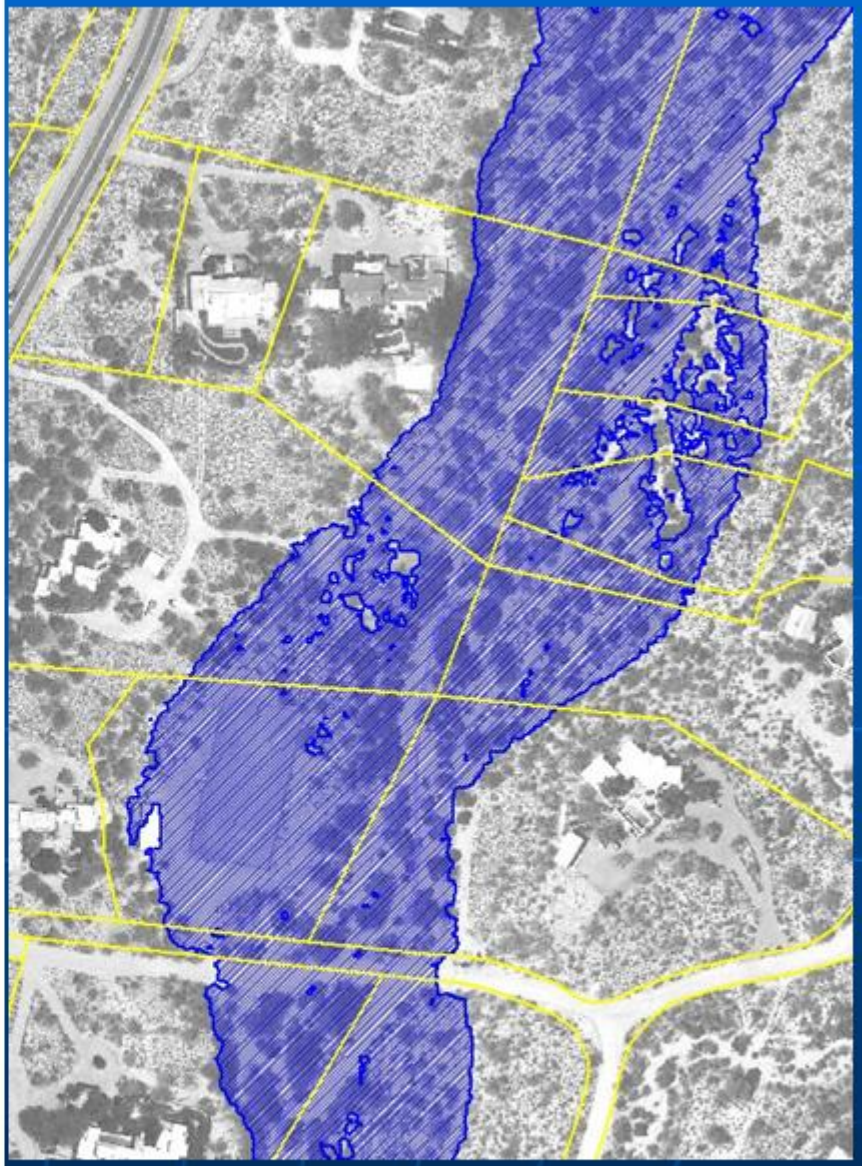
.066
.066
.066
Legend
EG PF 2
EG PF 3
EG PF 1
WS PF 2
WS PF 3
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


Triangular Irregular Network (TIN)
Derived from Lidar, and
Contours Derived from TIN
2' Contour
Banks
Stream Centerline
Flowpaths
XSCutLines
0
125
250
500 Feet
N



Pima County MapGuide Map - Microsoft Internet Explorer

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Address http://www.dot.pima.gov/gis/maps/mapguide/mgmap.cfm?path=/gis/maps/mapguide/dotmap65.mwf&scriptpath=/eim/intranet/ThemedMG/ThemedMG.inc&appname=eimmaps&LAT=32.2701048&LON=-110.940143 Go Links

EIM Theme: All Layers | Tips and Help | - Map Tools & Map Info - | TTRRSS | Adr Num | Parcels | Feedback

autodesk

- Zoning - Marana
- Zoning - Oro Valley Labels
- Zoning - Oro Valley
- Zoning - Tucson Labels
- Zoning - Tucson
- Zoning - Sahuarita Labels
- Zoning - Sahuarita
- Zoning - South Tucson Labels
- Zoning - South Tucson
- All Color Orthophoto Imagery
  - 1 Foot Resolution - All Color
- 2006/12 Landiscor Aerial Imagery
- 2006/03 USGS (MDA) Natural Color Ima
  - 03/2006
- 2005/09 Landiscor Aerial Imagery
- 2005/05 Color Orthophoto Imagery
  - 1 Foot Resolution
- 2004/08 Landiscor Aerial Imagery
- 2004 Hayhook Ranch Imagery
  - 04/2004
- 2003/03 Landiscor Aerial Imagery
- 2003 Ajo Orthophoto Imagery
  - 11/05/2003
- 2003 Mt. Lemmon Color IR Imagery
  - 1 Meter Resolution - Mt. Lemmon
  - Mt Lemmon ECW
- 2003 Rio Medio Grayscale Imagery
  - 1 Foot Resolution - Rio Medio
- 2002/04 Landiscor Aerial Imagery
- 2002 Rillito River Color Imagery
  - 1 Foot Resolution - Rillito
- All Grayscale Orthophoto Imagery
  - 1 Foot Resolution
- 2002 Grayscale Orthophoto Imagery
  - 1 Foot Resolution
- 2002 Color Orthophoto Imagery
  - 1 Foot Resolution
- 2001/08 Landiscor Aerial Imagery
- 2001 University of Arizona Color Imagery
  - 1 Foot Resolution - UofA
- 2000 Grayscale Orthophoto Imagery
  - 1 Foot Resolution
- 1998/04 Grayscale Orthophoto Imagery
  - 1 Foot Resolution
- 1996-1997 USGS Color Infrared Imagery

Parcels - Pima (Landbase) : 116021970-2801 W CALLE GARDENIAS -SOLER LEONIDA | 0 feature(s) selected | 1 : 1,091 | 959 x 718 (ft)

Done | Local intranet

Pima County MapGuide Map - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Address http://www.dot.pima.gov/gis/maps/mapguide/mgmap.cfm?path=/gis/maps/mapguide/dotmap65.mwf&scriptpath=/eim/intranet/ThemedMG/ThemedMG.inc&appname=eimmaps&LAT=32.2701048&LON=-110.940143E Go Links

EIM Theme: All Layers | Tips and Help | - Map Tools & Map Info. - | TTRRSS | Adr Num | Parcels | Feedback

autodesk

- Zoning - Marana
- Zoning - Oro Valley Labels
- Zoning - Oro Valley
- Zoning - Tucson Labels
- Zoning - Tucson
- Zoning - Sahuarita Labels
- Zoning - Sahuarita
- Zoning - South Tucson Labels
- Zoning - South Tucson
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  - 03/2006
- 2005/09 Landiscor Aerial Imagery
- 2005/05 Color Orthophoto Imagery
  - 1 Foot Resolution
- 2004/08 Landiscor Aerial Imagery
- 2004 Hayhook Ranch Imagery
  - 04/2004
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- 2003 Ajo Orthophoto Imagery
  - 11/05/2003
- 2003 Mt. Lemmon Color IR Imagery
  - 1 Meter Resolution - Mt. Lemmon
  - Mt Lemmon ECW
- 2003 Rio Medio Grayscale Imagery
  - 1 Foot Resolution - Rio Medio
- 2002/04 Landiscor Aerial Imagery
- 2002 Rillito River Color Imagery
  - 1 Foot Resolution - Rillito
- All Grayscale Orthophoto Imagery
  - 1 Foot Resolution
- 2002 Grayscale Orthophoto Imagery
  - 1 Foot Resolution
- 2002 Color Orthophoto Imagery
  - 1 Foot Resolution
- 2001/08 Landiscor Aerial Imagery
- 2001 University of Arizona Color Imagery
  - 1 Foot Resolution - UofA
- 2000 Grayscale Orthophoto Imagery
  - 1 Foot Resolution
- 1998/04 Grayscale Orthophoto Imagery
  - 1 Foot Resolution
- 1996-1997 USGS Color Infrared Imagery

Parcels - Pima (Landbase) : 116025970-0 - Double-click for address info. -CITY OF TUCSON | 1 : 1,091 | 959 x 718 (ft)

Done | Local intranet

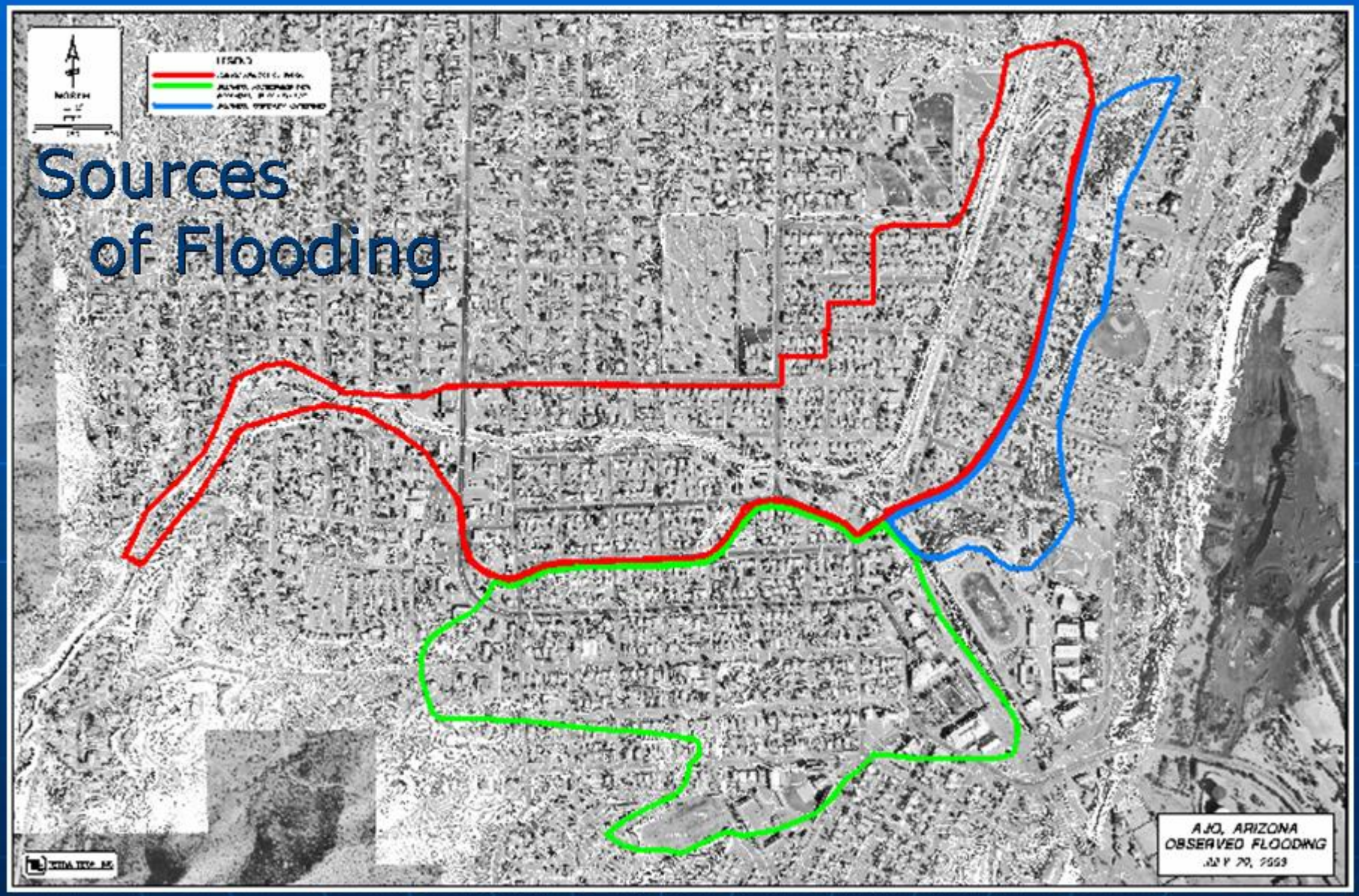
Impact of Flood Control on GIS

How flood event driven projects have improved the quality of the data in the County GIS library?

Ajo Flood

- July 29, 2003 from approximately 7:45 to 9:00 p.m.
- Unofficial rainfall amounts 2.7 to 4 inches of rain in one hour.
- Snowbird impact

Sources of Flooding



GIS Application

- Out of State Notifications
- Opportunity to improve GIS Parcel Base

Pima County RFCD Infrastructure Geodatabase

Intended Use

Data Structure

Future Development Plans

Intended Use

- Identify and Track Infrastructure
  - Identify Infrastructure
  - Track Infrastructure Attributes
  - Track Land on which Infrastructure exists
- Track Infrastructure Inspections
  - PDF Documentation
  - Photo Documentation

Identify and Track Infrastructure

- Import of Existing Data
  - Add existing data layers
- Creation of New Data
  - Draw new Polygons based on Aerial Photos
  - Select RFCD Land from Parcel Base
  - Group Infrastructure by "Facility"

What is a “Facility”

- A geographic area defined by manmade and/or natural features
  - A Drainage Basin divided by roadways
- A geographic area defined by the limits of a project
  - Ajo Detention Basin
  - A Subdivision or Other Development Area

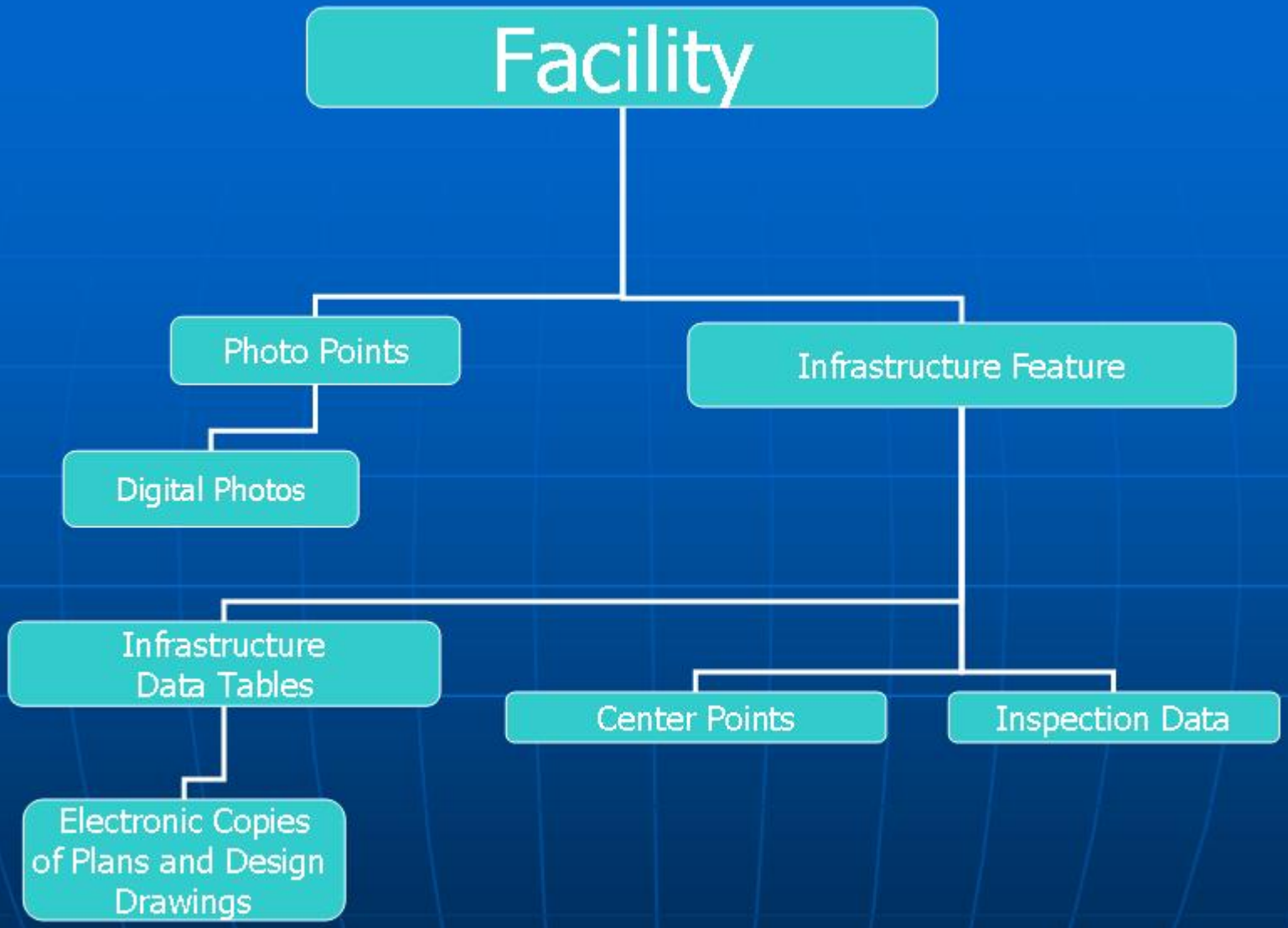
An Example Facility and Associated Infrastructure: Ajo Detention Basin

Track Inspections

- PDF Documentation
  - Scanned Images of Field Notes
  - Linked to Related Infrastructure
- Photo Documentation
  - Point Locations
  - Digital Photos

Data Structure

- Enterprise Geodatabase
  - Allows for Multiple Editors
  - Relationships between data themes
- Polygon Representations of Infrastructure
  - Related center point representation for display at smaller scale
- Related Data tables to store Feature Attributes


Facility
Photo Points
Infrastructure Feature
Digital Photos
Infrastructure Data Tables
Center Points
Inspection Data
Electronic Copies of Plans and Design Drawings

ArcCatalog - ArcInfo - Database Connections\kmaitsGisprod.sde\gisprod.GISDATA.Infrastructure

File Edit View Go Tools Window Help

Location: Database Connections\kmaitsGisprod.sde\gisprod.GISDATA.Infrastructure

Stylesheet: FGDC

- Database Connections
  - Add OLE DB Connection
  - Add Spatial Database Connection
  - kmaitsGisprod.sde
    - gisprod.GISDATA.Hydrology
    - gisprod.GISDATA.Infrastructure
    - gisprod.GISDATA.Land
    - gisprod.GISDATA.TransHistory
    - gisprod.GISDATA.Transportation
    - gisprod.dbo.fdatasets
    - gisprod.dbo.Table_Locks
    - gisprod.GISData.ACCESS
    - gisprod.GISData.BANKPROT
    - gisprod.GISData.BRIDGE
    - gisprod.GISData.CHANNEL
    - gisprod.GISData.CREW
    - gisprod.GISData.CTWALLFRDWALL
    - gisprod.GISData.CULVERT
    - gisprod.GISData.DAM
    - gisprod.GISData.DIPSECTION
    - gisprod.GISData.DRPSTRENDISP
    - gisprod.GISData.FACLINK
    - gisprod.GISData.FENCE
    - gisprod.GISData.FLAPGATE
    - gisprod.GISData.GATE
    - gisprod.GISData.GRADCONT
    - gisprod.GISData.GUARDRAIL
    - gisprod.GISData.INLETOUTLET
    - gisprod.GISData.INSPECTION
    - gisprod.GISData.INSPECTIONCREW
    - gisprod.GISData.LEVEE
    - gisprod.GISData.LINEMAT
    - gisprod.GISData.LNLINK
    - gisprod.GISData.PEDBRIDGE
    - gisprod.GISData.PHOTODATA
    - gisprod.GISData.PNTLINK
    - gisprod.GISData.POINTMAT
    - gisprod.GISData.POLYGONCENTROIDS
    - gisprod.GISData.POLYLINK
    - gisprod.GISData.POLYMAT
    - gisprod.GISData.PUMP
    - gisprod.GISData.rfcdComplainant
    - gisprod.GISData.rfcdComplaintForm
    - gisprod.GISData.SCUPPER
    - gisprod.GISData.STORAGECAPAC
    - gisprod.GISData.STORMDRAIN
    - gisprod.GISData.TRASHRACK
    - gisprod.GISData.WEIR
  - OwnerGisprod.sde
- Database Servers

Contents | Preview | Metadata

Name	Type
gisprod.GISDATA.CenterPoints	SDE Feature Class
gisprod.GISDATA.Facility	SDE Feature Class
gisprod.GISDATA.Facility_Faclink	SDE Relationship Class
gisprod.GISDATA.Facility_Photo	SDE Relationship Class
gisprod.GISDATA.FacilityToInfraLine	SDE Relationship Class
gisprod.GISDATA.FacilityToInfraPoint	SDE Relationship Class
gisprod.GISDATA.FacilityToInfraPoly	SDE Relationship Class
gisprod.GISDATA.FacilityToLand	SDE Relationship Class
gisprod.GISDATA.InfraLine	SDE Feature Class
gisprod.GISDATA.InfraLine_Fence	SDE Relationship Class
gisprod.GISDATA.InfraLine_Guardrail	SDE Relationship Class
gisprod.GISDATA.InfraLine_Land	SDE Relationship Class
gisprod.GISDATA.InfraLine_LineMat	SDE Relationship Class
gisprod.GISDATA.InfraLine_Lnlink	SDE Relationship Class
gisprod.GISDATA.InfraPoint	SDE Feature Class
gisprod.GISDATA.InfraPoint_Gate	SDE Relationship Class
gisprod.GISDATA.InfraPoint_PntLink	SDE Relationship Class
gisprod.GISDATA.InfraPoint_PointMat	SDE Relationship Class
gisprod.GISDATA.InfraPoint_Scupper	SDE Relationship Class
gisprod.GISDATA.InfraPoly	SDE Feature Class
gisprod.GISDATA.InfraPoly_Access	SDE Relationship Class
gisprod.GISDATA.InfraPoly_BankProt	SDE Relationship Class
gisprod.GISDATA.InfraPoly_Bridge	SDE Relationship Class
gisprod.GISDATA.InfraPoly_CenterPoints	SDE Relationship Class
gisprod.GISDATA.InfraPoly_Channel	SDE Relationship Class
gisprod.GISDATA.InfraPoly_Ctwallfrdwall	SDE Relationship Class
gisprod.GISDATA.InfraPoly_Culvert	SDE Relationship Class
gisprod.GISDATA.InfraPoly_Dam	SDE Relationship Class
gisprod.GISDATA.InfraPoly_DipSection	SDE Relationship Class
gisprod.GISDATA.InfraPoly_DrpStrEndDisp	SDE Relationship Class
gisprod.GISDATA.InfraPoly_FlapGate	SDE Relationship Class
gisprod.GISDATA.InfraPoly_GradCont	SDE Relationship Class
gisprod.GISDATA.InfraPoly_InletOutlet	SDE Relationship Class
gisprod.GISDATA.InfraPoly_Land	SDE Relationship Class
gisprod.GISDATA.InfraPoly_Levee	SDE Relationship Class
gisprod.GISDATA.InfraPoly_PedBridge	SDE Relationship Class
gisprod.GISDATA.InfraPoly_PolyLink	SDE Relationship Class
gisprod.GISDATA.InfraPoly_PolyMat	SDE Relationship Class
gisprod.GISDATA.InfraPoly_Pump	SDE Relationship Class
gisprod.GISDATA.InfraPoly_StorageCapac	SDE Relationship Class
gisprod.GISDATA.InfraPoly_Stormdrain	SDE Relationship Class
gisprod.GISDATA.InfraPoly_TrashRack	SDE Relationship Class
gisprod.GISDATA.InfraPoly_Weir	SDE Relationship Class
gisprod.GISDATA.Infrastructure_Topology	SDE Topology
gisprod.GISDATA.InspectionToInfraLine	SDE Relationship Class
gisprod.GISDATA.InspectionToInfraPoint	SDE Relationship Class

Library Data Layers

- Export from Geodatabase to Shapefile
  - Create 1 shapefile per Feature Type
  - Join attributes from Related Table
  - Library Process converts from Shape to Cover automatically
- Metadata
  - Metadata file for each shapefile

Future Developments

- Currently being integrated with new Violations, Complaints and Permits database.

Future Development

- Use of ArcPad Mobile GIS during Field work
  - Collect and Update data in the field using ArcPad.

Combined Map Repository

The COMBINED MAP REPOSITORY will

- Internet based website
- Have search capabilities that would provide floodplain information
- The information would be GIS based data
- Include aerial photography
- Link to official FEMA information.

Target Audience

- The general public
- Realtors
- Engineers
- Floodplain Administrators

The digital data will include FEMA

- SFHA Zone Designations
- Floodways
- BFEs
- Panel Numbers
- Panel Dates
- Community Numbers
- LOMR Information
- LOMA Information
- LOMC Information

The LOMR and LOMA information will include pdf links to scanned FEMA documentation.

 Date: January 27, 2003 Case No.: 03-09-0288A LOMA

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP AMENDMENT
DETERMINATION DOCUMENT (REMOVAL)

COMMUNITY AND MAP PANEL INFORMATION		LEGAL PROPERTY DESCRIPTION
COMMUNITY	PIMA COUNTY, ARIZONA (Unincorporated Areas)	Lot 145, Coronado Foothills Estates, as shown on the Plat recorded as Instrument No. 2994, in Book 16, Page 63, in the Office of the Recorder, Pima County, Arizona
	COMMUNITY NO.: 040073	
AFFECTED MAP PANEL	NUMBER: 04019C1635K	
	NAME: PIMA COUNTY, ARIZONA AND INCORPORATED AREAS	
	DATE: 02/08/1999	
FLOODING SOURCE: FINGER ROCK CANYON WASH		APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY: 32.332, -110.901 SOURCE OF LAT & LONG: PRECISION MAPPING STREETS 4.0 DATUM: NAD 83

DETERMINATION

LOT	BLOCK/ SECTION	SUBDIVISION	STREET	OUTCOME WHAT IS REMOVED FROM THE SFHA	ZONE	1% ANNUAL CHANCE FLOOD ELEVATION (NGVD 29)	LOWEST ADJACENT GRADE ELEVATION (NGVD 29)	LOWEST LOT ELEVATION (NGVD 29)
145	—	Coronado Foothills Estates	4231 East Havasu Road	Structure	X (unshaded)	2888.0 feet	2891.3 feet	—

Special Flood Hazard Area (SFHA) - The SFHA is an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood).

ADDITIONAL CONSIDERATIONS (Please refer to the appropriate section on Attachment 1 for the additional considerations listed below.)

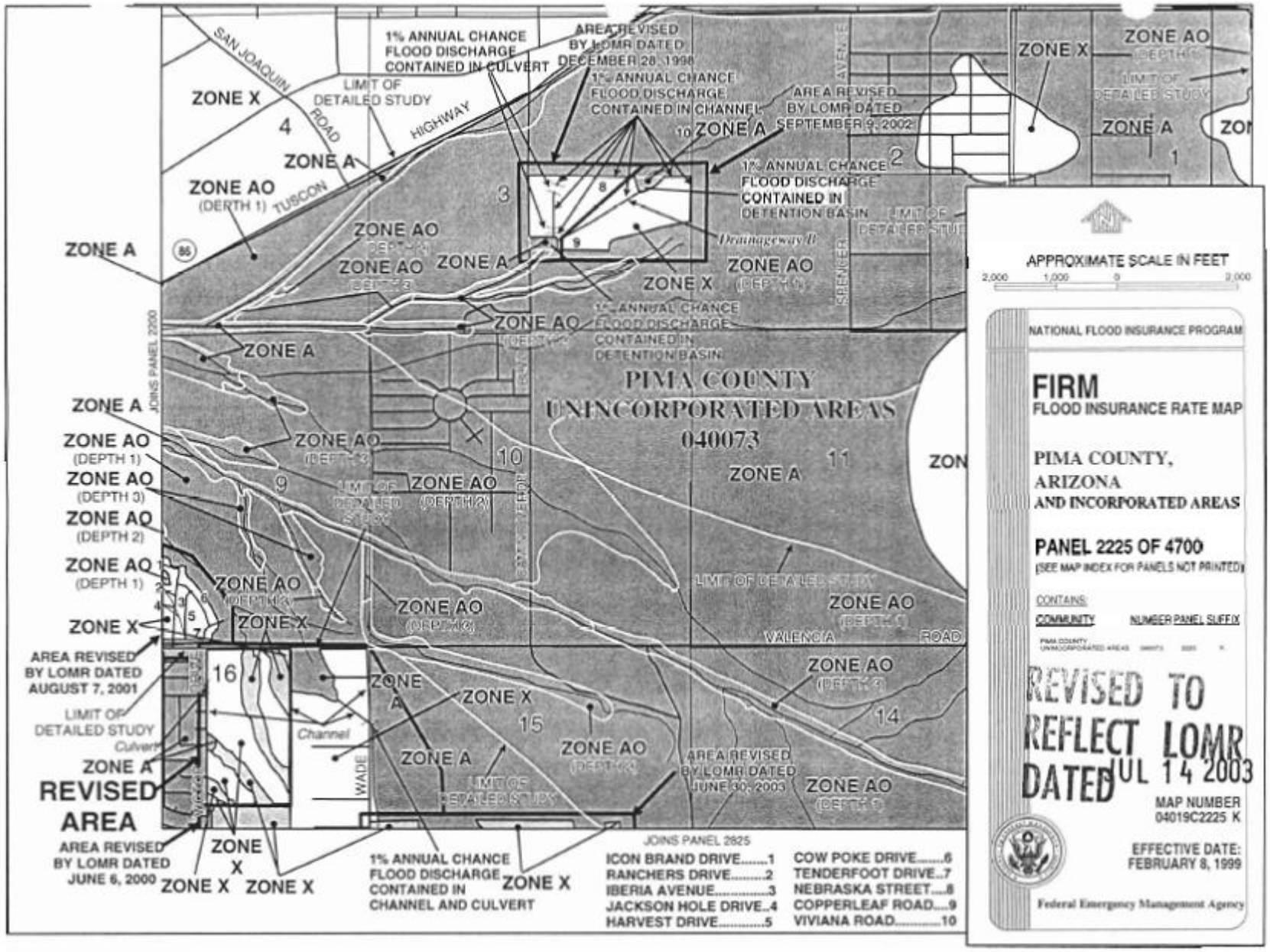
PORTIONS REMAIN IN THE SFHA

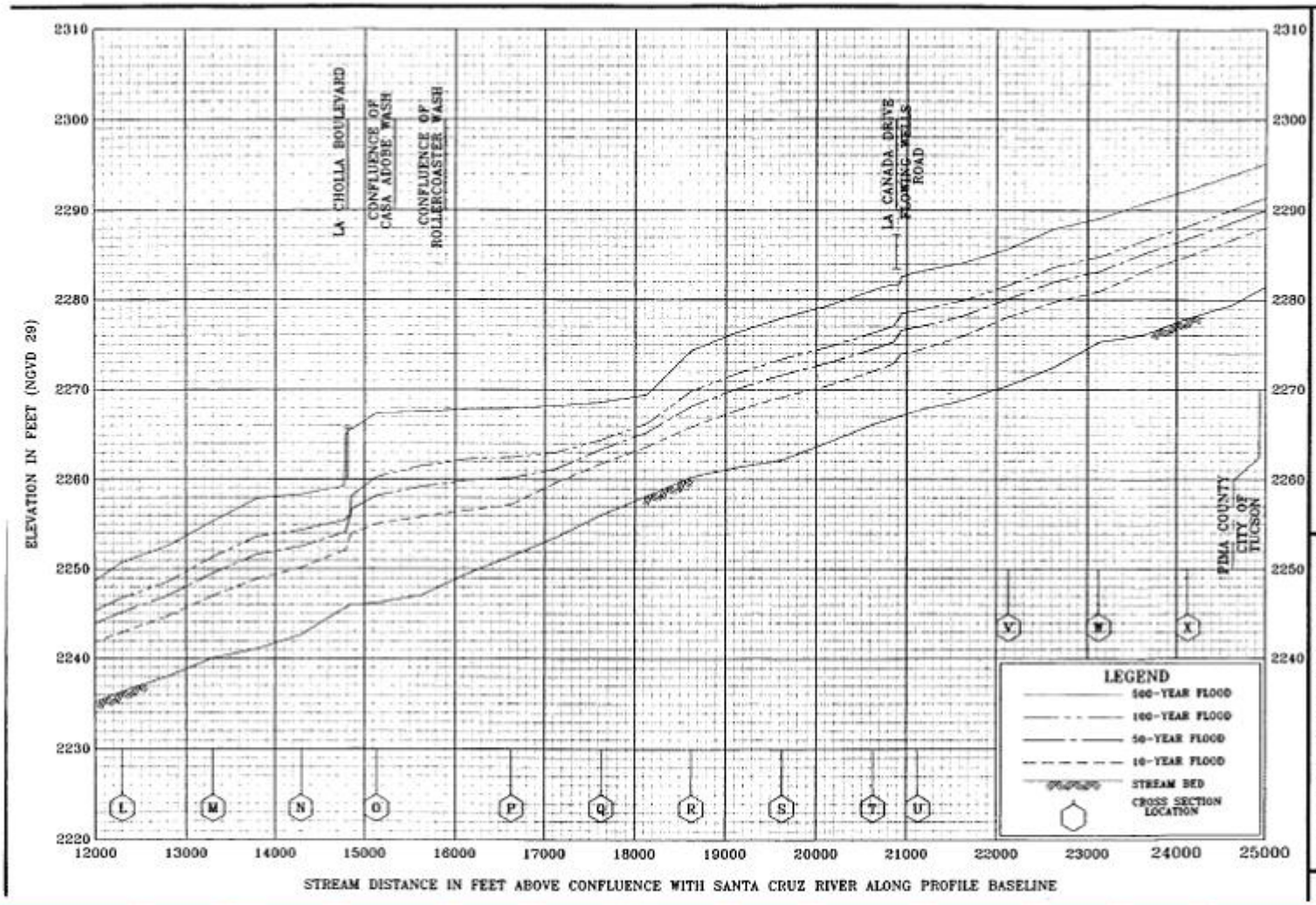
This document provides the Federal Emergency Management Agency's determination regarding a request for a Letter of Map Amendment for the property described above. Using the information submitted and the effective National Flood Insurance Program (NFIP) map, we have determined that the structure(s) on the property(ies) is/are not located in the SFHA, an area inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood). This document amends the effective NFIP map to remove the subject property from the SFHA located on the effective NFIP map; therefore, the Federal mandatory flood insurance requirement does not apply. However, the lender has the option to continue the flood insurance requirement to protect its financial risk on the loan. A Preferred Risk Policy (PRP) is available for buildings located outside the SFHA. Information about the PRP and how one can apply is enclosed.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, 3601 Eisenhower Avenue, Suite 600, Alexandria, VA 22304-6439.

Michael Grimm, Acting Chief
Hazards Study Branch
Federal Insurance and Mitigation Administration

Version 1.3.3 2418029CA503096520288


SAN JOAQUIN ROAD
TUSCON HIGHWAY
LIMIT OF DETAILED STUDY
1% ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN CULVERT
AREA REVISED BY LOMR DATED DECEMBER 28, 1998
1% ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN CHANNEL
AREA REVISED BY LOMR DATED SEPTEMBER 9, 2002
1% ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN DETENTION BASIN
1% ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN DETENTION BASIN
ZONE X
ZONE A
ZONE AO
(DEPTH 1)
(DEPTH 2)
(DEPTH 3)
JOINS PANEL 2200
PIMA COUNTY
UNINCORPORATED AREAS
040073
AREA REVISED BY LOMR DATED AUGUST 7, 2001
LIMIT OF DETAILED STUDY
Culvert
Channel
WADE
REVISED AREA
AREA REVISED BY LOMR DATED JUNE 6, 2000
AREA REVISED BY LOMR DATED JUNE 30, 2003
WALENCIA ROAD
SPENCER AVENUE
Drainageway B
JOINS PANEL 2825
ICON BRAND DRIVE.....1
RANCHERS DRIVE.....2
IBERIA AVENUE.....3
JACKSON HOLE DRIVE..4
HARVEST DRIVE.....5
COW POKE DRIVE.....6
TENDERFOOT DRIVE..7
NEBRASKA STREET....8
COPPERLEAF ROAD....9
VIVIANA ROAD.....10
APPROXIMATE SCALE IN FEET
2,000 1,000 0 2,000
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
PIMA COUNTY, ARIZONA
AND INCORPORATED AREAS
PANEL 2225 OF 4700
(SEE MAP INDEX FOR PANELS NOT PRINTED)
CONTAINS:
COMMUNITY
NUMBER PANEL SUFFIX
REVISED TO REFLECT LOMR DATED JUL 14 2003
MAP NUMBER
04019C2225 K
EFFECTIVE DATE:
FEBRUARY 8, 1999
Federal Emergency Management Agency



FLOOD PROFILES

RILLITO CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PIMA COUNTY, AZ

AND INCORPORATED AREAS

REVISED TO REFLECT LOMR DATED

124P

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
A	1,300	450	2,725	11.7	2,208.0	2,203.7	2,203.7	0.0
B	2,422	280	2,182	14.7	2,208.5	2,206.1	2,206.1	0.0
C	3,263	319	3,450	9.3	2,218.4	2,218.4	2,218.4	0.0
D	4,297	575	4,029	7.9	2,221.3	2,221.3	2,221.3	0.0
E	5,296	364	4,095	7.8	2,223.5	2,223.5	2,223.5	0.0
F	6,296	364	3,446	9.3	2,226.0	2,226.0	2,226.0	0.0
G	7,296	477	4,495	7.1	2,229.1	2,229.1	2,229.1	0.0
H	8,297	566	4,028	7.9	2,230.7	2,230.7	2,230.7	0.0
I	9,297	387	3,033	10.6	2,233.8	2,233.8	2,233.8	0.0
J	10,299	420	2,303	13.9	2,238.6	2,238.6	2,238.6	0.0
K	11,297	452	3,565	9.0	2,243.2	2,243.2	2,243.2	0.0
L	12,296	321	2,857	11.2	2,246.8	2,246.8	2,246.8	0.0
M	13,299	298	2,833	11.3	2,251.4	2,251.4	2,251.4	0.0
N	14,294	380	3,107	10.3	2,254.4	2,254.4	2,254.4	0.0
O	15,132	308	3,640	8.8	2,260.3	2,260.3	2,260.3	0.0
P	16,631	840	6,125	5.2	2,262.5	2,262.5	2,262.5	0.0
Q	17,629	690	3,661	8.7	2,264.5	2,264.5	2,264.5	0.0
R	18,629	333	2,934	10.9	2,269.9	2,269.9	2,269.9	0.0
S	19,628	337	3,251	9.8	2,273.4	2,273.4	2,273.4	0.0
T	20,628	362	3,273	9.8	2,276.3	2,276.3	2,276.3	0.0
U	21,129	402	3,731	8.6	2,278.8	2,278.8	2,278.9	0.1
V	22,134	400	3,044	10.5	2,281.6	2,281.6	2,281.6	0.0
W	23,124	418	3,262	9.8	2,284.8	2,284.8	2,284.8	0.0
X	24,128	436	3,271	9.8	2,288.3	2,288.3	2,288.3	0.0
Y	25,127	391	2,957	10.8	2,291.8	2,291.8	2,291.8	0.0
Z	26,292	285	2,449	13.1	2,296.0	2,296.0	2,296.0	0.0
AA	27,126	334	2,715	11.8	2,299.6	2,299.6	2,299.7	0.1
AB	28,126	370	3,057	10.5	2,302.8	2,302.8	2,302.8	0.0
AC	29,126	380	3,094	10.3	2,306.1	2,306.1	2,306.1	0.0

[1]Feet Above Santa Cruz River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

PIMA COUNTY, AZ
AND INCORPORATED AREAS

REVISED TO REFLECT LOMR DATED 2004

FLOODWAY DATA

RILLITO CREEK

Table 2. Summary of Discharges (Cont'd)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Year	50-Year	100-Year	500-Year
Navajo Wash					
At Oracle Road	3.4	--[1]	--[1]	2,104[2]	--[1]
At Mountain Avenue	3.0	--[1]	--[1]	3,081	--[1]
Naylor Wash					
At Reid Park	1.4	--[1]	--[1]	1,806	--[1]
At Belvedere Avenue	0.8	--[1]	--[1]	1,150	--[1]
Pantano Wash					
Near confluence with Rillito Creek at Craycroft Road	604	8,400	20,000	32,000	64,000
At Houghton Road	570	8,100	19,500	31,000	62,000
Above confluence with Rincon Creek	475	7,400	17,500	29,000	58,000
Pegler Wash					
At Shannon Road	2.9	1349	2556	3244	--[1]
Above confluence with Rillito Creek	3.7	1418	2706	3412	--[1]
Pima Wash					
Above confluence with Rillito Creek	9.8	1,800	4,050	5,300	10,700
Above confluence with Geronimo Wash	6.3	1,400	3,200	4,250	8,500
Prospect Canyon					
At Apex	3.43	1,960	4,870	6,550	11,450
Pusch Wash					
At U.S. Highway 89/80	1.16	1,750	3,000	3,580	5,300
At confluence with East and West Forks	0.90	1,420	2,500	2,860	4,180
Pusch Wash, West Fork	0.36	650	1,140	1,220	1,950
Pusch Wash, East Fork	0.51	960	1,590	1,910	2,770
Railroad Wash					
At Forgeus Avenue	0.6	[illegible]	--[2]	674	--[2]
At confluence with Tucson Arroyo	2.2	[illegible]	[illegible]	2,788	--[2]

Revised data

[1]Data not computed

[2]Flow reduced due to the existence of storm sewers that intercept a portion of the runoff

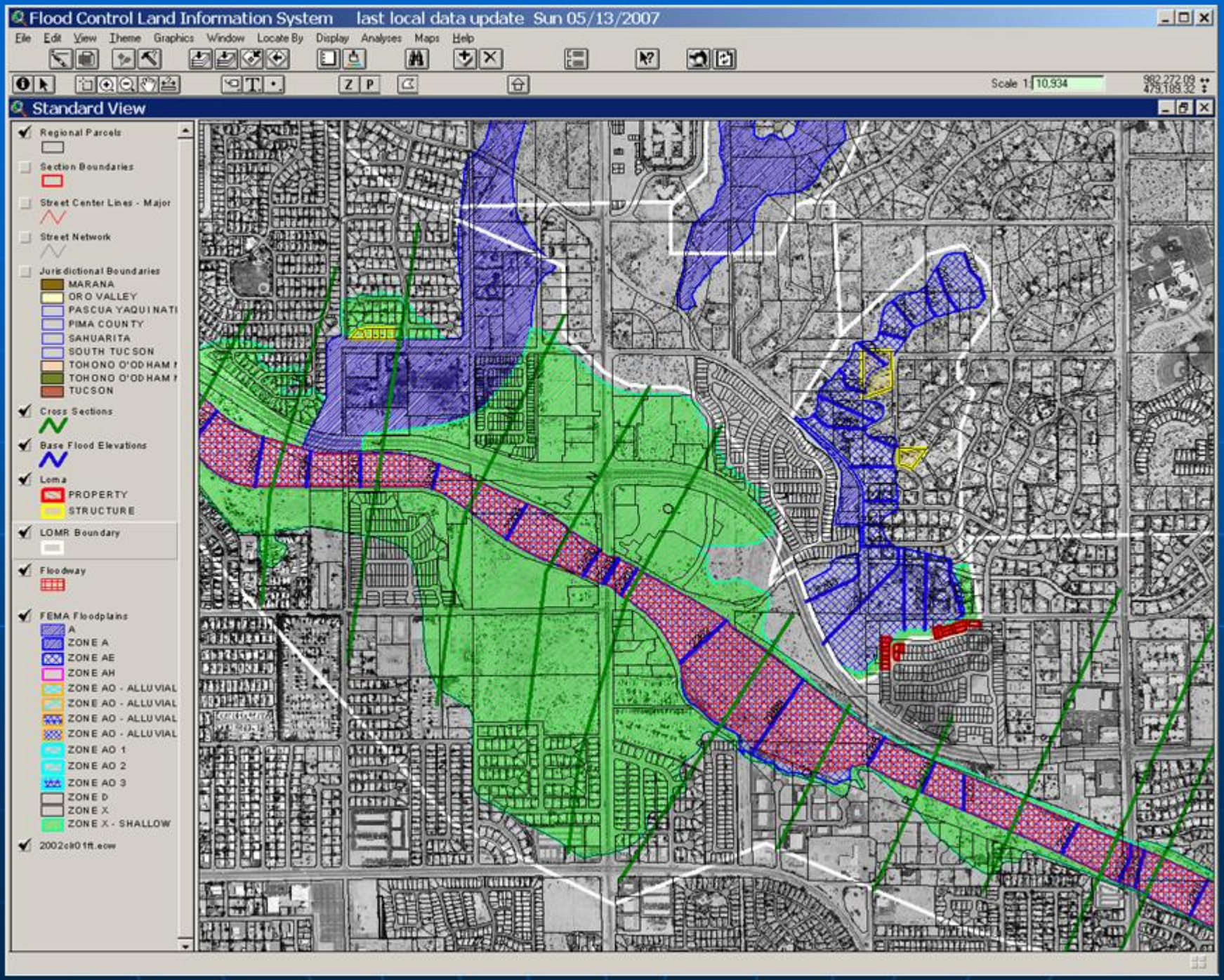
REVISED TO REFLECT LOMR DATED APR 2004

Goals

- User-friendly
- Understandable
- Direct the viewer to the requested information **and** to the necessary information.

Participants

- Pima County Regional Flood Control
- Town of Oro Valley
- City of Tucson
- Town of Marana
- City of South Tucson
- Town of Sahuarita
- Technical Services


Flood Control Land Information System
last local data update Sun 05/13/2007
File Edit View Theme Graphics Window Locate By Display Analyses Maps Help
Scale 1: 10,934
Standard View
Regional Parcels
Section Boundaries
Street Center Lines - Major
Street Network
Jurisdictional Boundaries
MARANA
ORO VALLEY
PASCUA YAQUI NATI
PIMA COUNTY
SAHUARITA
SOUTH TUCSON
TOHONO O'ODHAM
TOHONO O'ODHAM
TUCSON
Cross Sections
Base Flood Elevations
Loma
PROPERTY
STRUCTURE
LOMR Boundary
Floodway
FEMA Floodplains
A
ZONE A
ZONE AE
ZONE AH
ZONE AO - ALLUVIAL
ZONE AO - ALLUVIAL
ZONE AO - ALLUVIAL
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ZONE AO 3
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ZONE X - SHALLOW
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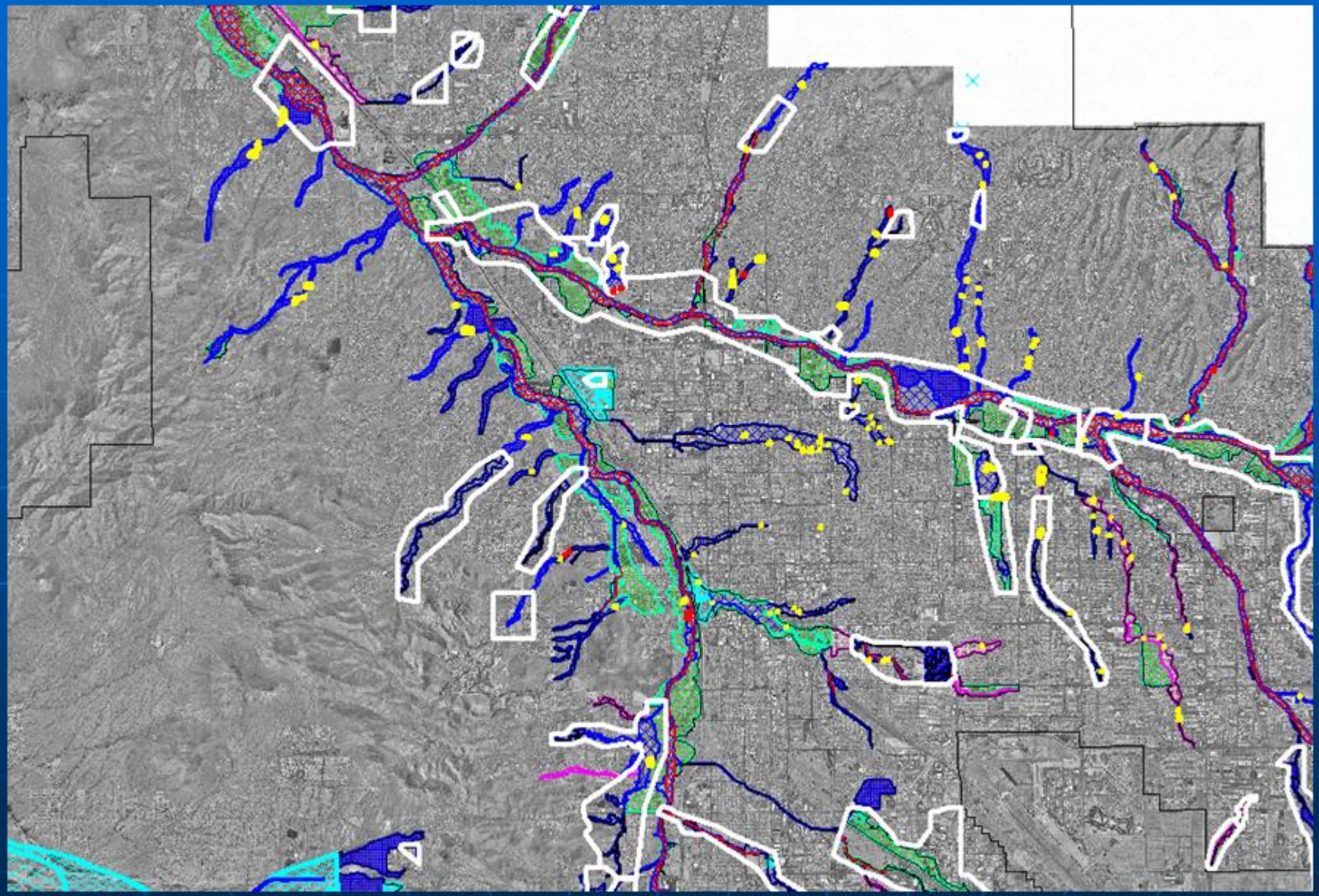

Questions