

Canyon Washes Independent Technical Panel

Leonard J. Lane, Waite R. Osterkamp, Douglas J. Plasencia

Findings and Recommendations

1.0 System Geomorphology

Channel systems, such as that of Campbell Wash, and their associated floodplains are integrated systems in that the floodplain hydrology, geomorphology, and vegetative conditions interact and directly reflect and respond to watershed processes. These systems are dynamic and may respond quickly to changes in any of the previously mentioned factors. Human encroachments within these systems will result in localized, and if sufficient in number or magnitude, regional scale impacts to the channel system. These systems are the integrated result of previous water and sediment discharges and therefore, they will react to future disturbances in water and sediment discharges.

Under natural conditions and over an extended time period, Campbell Wash will continue to react to hydrologic and geomorphic processes on the watershed. The trend will be towards a wider and more incised channel, and non-vertical rounded banks will result provided that the natural processes are not unduly impacted by human alteration. In the event that human encroachment with structures should alter flow paths, a likely result will be floodway widening accompanied by localized deepening of the flow paths via scouring of the braided channel network.

Changes of this sort will result in rapid erosion and channel change and likely, adverse impacts to property, infrastructure, access, and the biotic system.

1.1 Recommendation

An encroachment or modification of Campbell Wash floodway should only be permitted if there are no impacts due to that specific encroachment or modification, or from cumulative impacts that might result should similar types and degrees of encroachment or modification be allowed on other properties within the wash system. The intent of this recommendation is to recognize that the impact of an individual encroachment or modification, individually or if repeated at numerous other sites, could have an adverse effect on the floodway of the wash individually or cumulatively.

A report shall be prepared evaluating the localized and cumulative impacts and shall be prepared by qualified scientists and engineers. As a minimum this team shall include a hydraulic engineer, fluvial geomorphologist, and a natural scientist versed in the management of riparian habitats. This team should be knowledgeable in science as well as the regulatory process and management objectives for Campbell Wash. The permit should only be granted provided that the report concludes no individual or cumulative impact would occur.

Canyon Wash Technical Panel- Lots 78 and 90. May 23, 2006 FINAL DRAFT

2.0 Defining the Active Channel

Campbell Wash and similar washes present higher risks than other watercourses both in terms that flooding is much more confined and may be subject to rapidly increasing flood depth, and secondly because of the channel shape, the entire floodway is subject to frequent inundation. This condition is unlike a more traditional riverine situation in which there is a defined channel and a well defined floodplain bench. The Pima County Floodplain Ordinance discusses floodways and for small streams introduces the concept that a floodway can be the primary channel. Likewise as a practice, it is not typical to promulgate encroachment into an area that would be considered an “active” channel. Currently active or primary channel is not defined.

2.1 Recommendation

In addition to the existing County criteria for floodplain encroachment, the technical panel recommends that meeting any of the following criteria is sufficient to demonstrate encroachment into an active or primary channel.

- a. The encroachment is within a US Army Corps of Engineers (USACE) Jurisdictional Water.
- b. The encroachment is within an area of frequent inundation as indicated by the 25-year floodplain.
- c. The encroachment is in an area such that the area being encroached exceeds the county DV**2 criteria (need not be surrounded)
- d. Encroachment occurs in an area underlain by sand or gravel (unconsolidated alluvium) or subject to historic channel changes, especially by avulsion.

3.0 Lowest Floor Elevation

Campbell Wash and washes of similar form have confined floodplains that generally meet a steeply sloped bank. As compared to floodplains with gradually increasing elevation in the bank or overbank, the water surface in washes similar to Campbell Wash may increase significantly as additional flood waters enter the wash. Pima County requires that the lowest floor be one foot above the “base flood elevation”, or the 100-year flood level. This one foot of “freeboard” is included to account for uncertainties in estimating the water surface elevation. In steep banked washes these uncertainties will translate into much more abrupt increases in water surface as compared to other wash systems.

3.1 Recommendation

Due to the high risks within washes such as Campbell Wash, lowest floors should be the higher of the standard freeboard requirement or the 500-year water surface.

PIMA COUNTY REGIONAL FLOOD CONTROL DISTRICT GENERAL REQUIREMENTS FOR DEVELOPMENT WITHIN FOOTHILLS WASHES

June 2007

At the request of the Campbell Wash Coalition, the District's approval of engineering analysis for encroachment into Campbell Wash was overturned by the Pima County Board of Supervisors on 7/11/06. In response to the BOS' actions, the District convened an independent technical panel to provide recommendations for safe development within the geologic floodplain of the foothills washes. Their recommendations are listed below:

- A) A report for an encroachment or modification of the foothills wash floodway must be prepared evaluating the localized and cumulative impacts and must be prepared by qualified scientists and engineers. As a minimum this team must include a hydraulic engineer, fluvial geomorphologist, and a natural scientist versed in the management of riparian habitats. This team should be knowledgeable in science as well as the regulatory process and management objectives for the foothills washes. The Floodplain Use Permit should only be granted provided that the report concludes no individual or cumulative impact will occur.

- B) The Pima County Floodplain and Erosion Hazard Management Ordinance definition of floodway area (Section 16.08.360) includes the active or primary channel of a wash system. For the foothills washes, the following additional criteria demonstrates encroachment into the active or primary channel:
 - 1. The encroachment is within a US Army Corps of Engineers (USACE) Jurisdictional Water;
 - 2. The encroachment is within an area of frequent inundation as indicated by the 25-year floodplain;
 - 3. The encroachment is in an area such that the area being encroached exceeds the county DV**2 criteria (need not be surrounded); or:
 - 4. Encroachment occurs in an area underlain by sand or gravel (unconsolidated alluvium) or subject to historic channel changes, especially by avulsion.

- C) Due to the high risks within washes such as Campbell Wash, lowest floors should be the higher of the standard freeboard requirement or the 500-year water surface.

Proposed definition of Floodway

Started with Independent Technical Panel recommendation of Floodway for defining new floodway criteria in B.2.

Had to determine those watercourses that should be considered confined. Started with the Campbell Wash, looked at Pima Wash, Geronimo Wash, Yuma Mine Wash, and Woodland Wash.

16.08.350

Floodway area.

"Floodway area" means that portion of the floodplain which must be preserved in order to maintain the flood carrying capacity of the base flood. Floodway areas regulated by this title include:

- A. Federal floodway areas as delineated by FEMA;
- B. Administrative floodways for major watercourses with a base flood peak discharge of 2,000 cfs or more as determined through engineering analyses using ADWR standards or other applicable engineering method.
 1. Administrative floodway areas include the watercourse and the adjacent land areas that are necessary to convey the base flood without cumulatively increasing the water-surface elevation more than 1 foot above the base flood elevation under normal flow conditions;
 2. In addition, when geologic features confine the flow of a watercourse the following additional areas shall be considered floodway areas:
 - a. Areas necessary to convey the base flood without increasing the water surface elevation more than a tenth (0.1) of a foot above the base flood elevation under normal flow conditions,
 - b. Areas of frequent inundation as defined by the 4% annual chance (25-year) flood,
 - c. Areas with excessive flow depths and velocities (dv^2), as defined in 16.26.050.G, and
 - d. Active flow paths and channels based on the presence of unconsolidated alluvium related to fluvial processes and the potential for the flow paths to meander over time.
 3. A watercourse can be considered confined when the ratio of the wetted top-widths of the floodplains associated with the base flood and the 25-year flood is 1.25 or less and the height of the geologic features are at least 1.5 times the hydraulic depth of the base flood. The watercourse shall be considered confined through all reaches where this criteria is present both upstream and downstream of the subject area.
- C. The primary channel of all regulatory minor watercourses with a base flood peak discharge of less than 2,000 cfs; (Ord. 2010 FC-1; Ord. 2005 FC-2 § 2 (part), 2005; Ord. 1999 FC-1 § 1 (part), 1999; Ord. 1998 FC-1 Section 1, 1998; Ord. 1988 FC-2 Art. 4 (part), 1988)

Addendum 1 Ratio of 100-yr to 25-yr Foodplain Topwidth Geronimo Wash

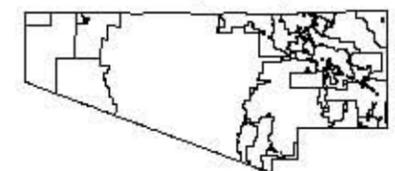
Legend

-  GER_X_section2
-  topo
-  strmajgdb

Yello Cross section: Ratio \geq 1.25
Blue Cross section: Ratio $<$ 1.25

Contour Interval: 40 ft

Ftma County Index Map



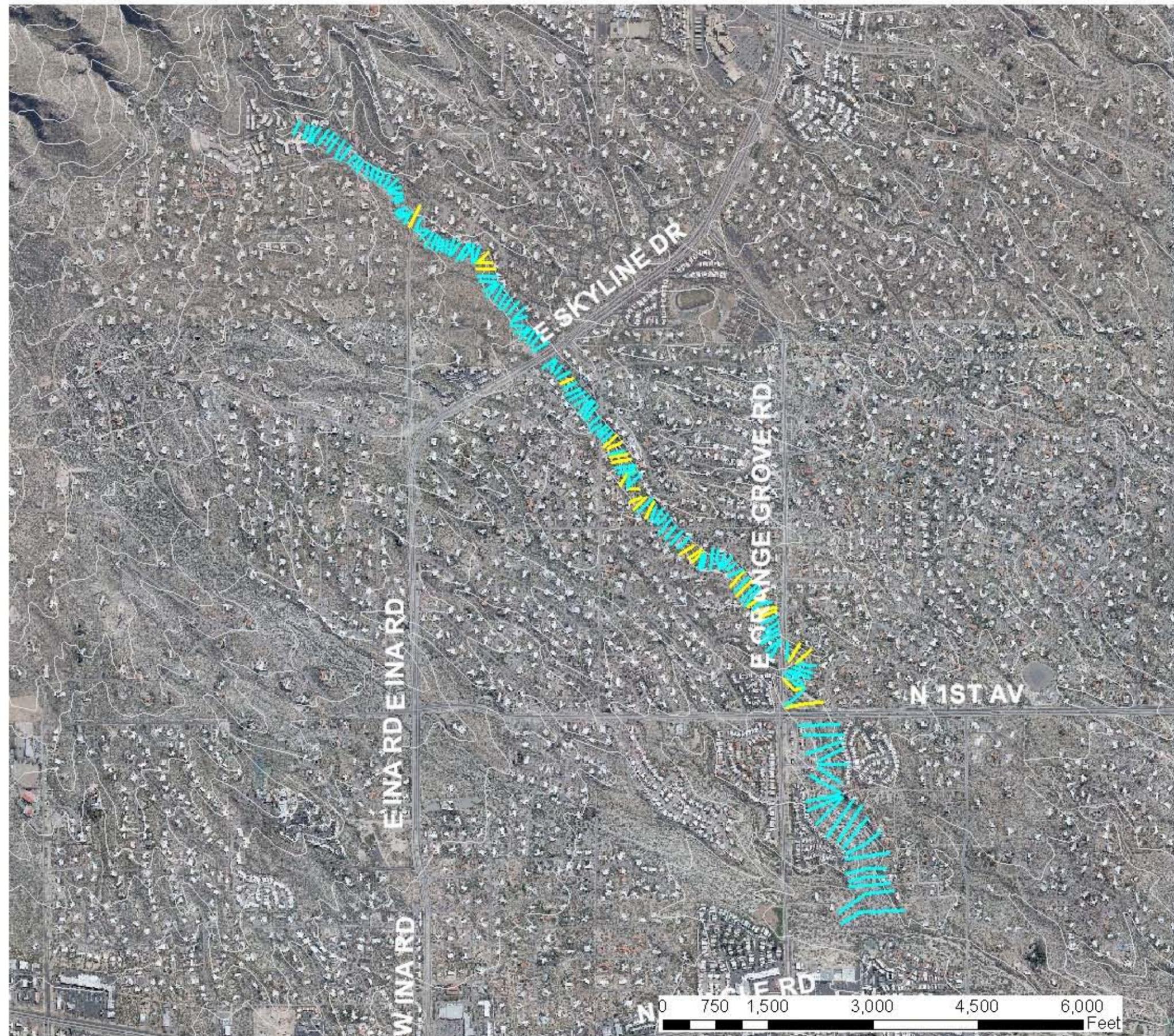
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This project is funded by the Department of Transportation, Federal Highway Administration, and the State of New Mexico.

Pima County Regional Flood Control District



Scale 1:50,000



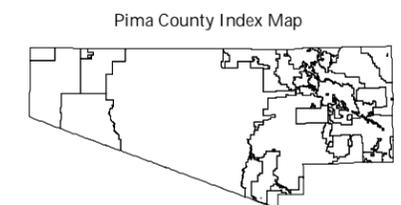
**Ratio of
100-yr to 25-yr
Floodplain Topwidth
Woodland Wash**

Legend

-  Woodland XS LT 1.25
-  Woodland XS
-  River
-  Contour 20

Yello Cross section: Ratio \geq 1.25
Blue Cross section: Ratio $<$ 1.25

Contour Interval: 20 ft



Index Map Scale 1:5,250,000

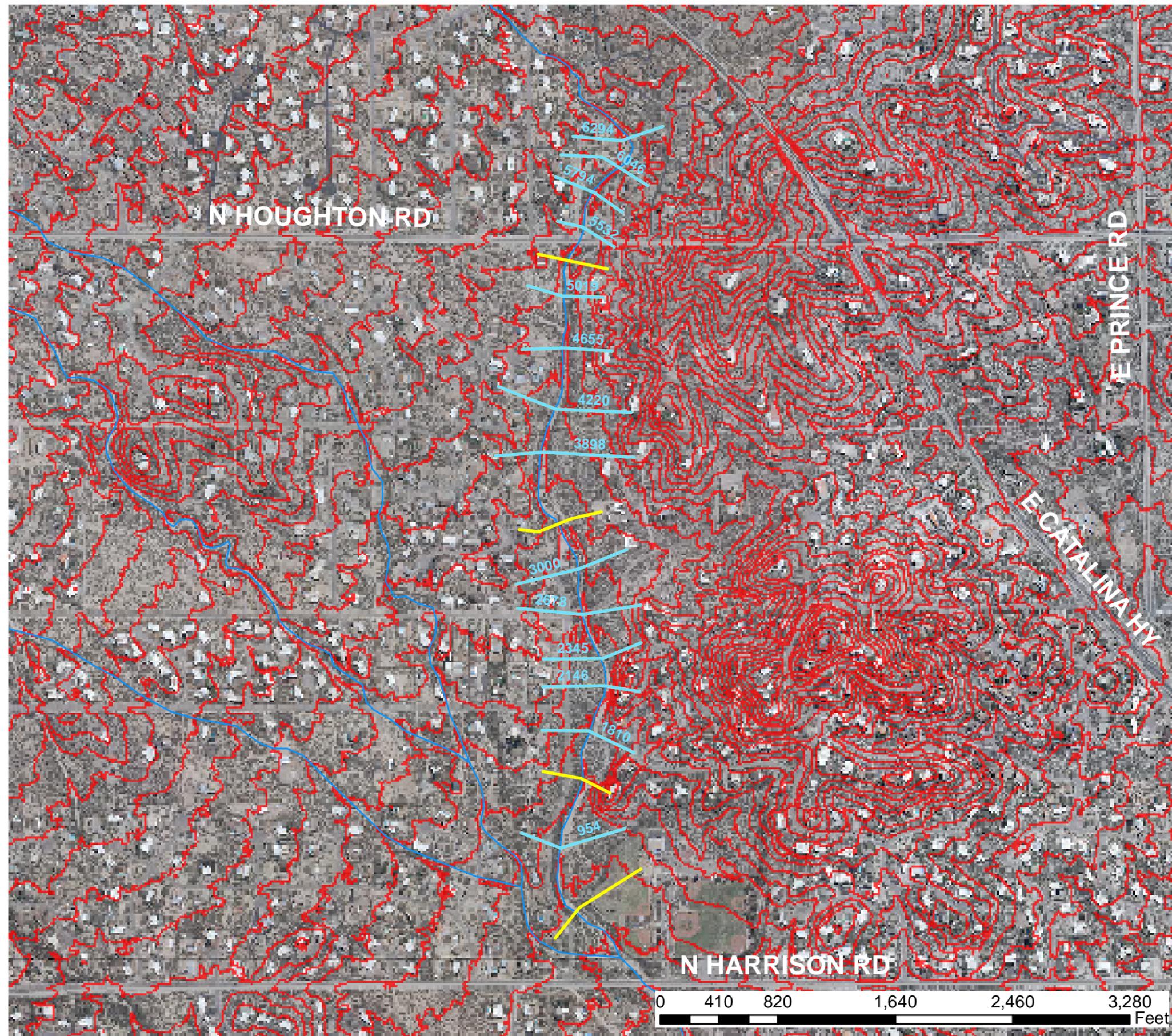
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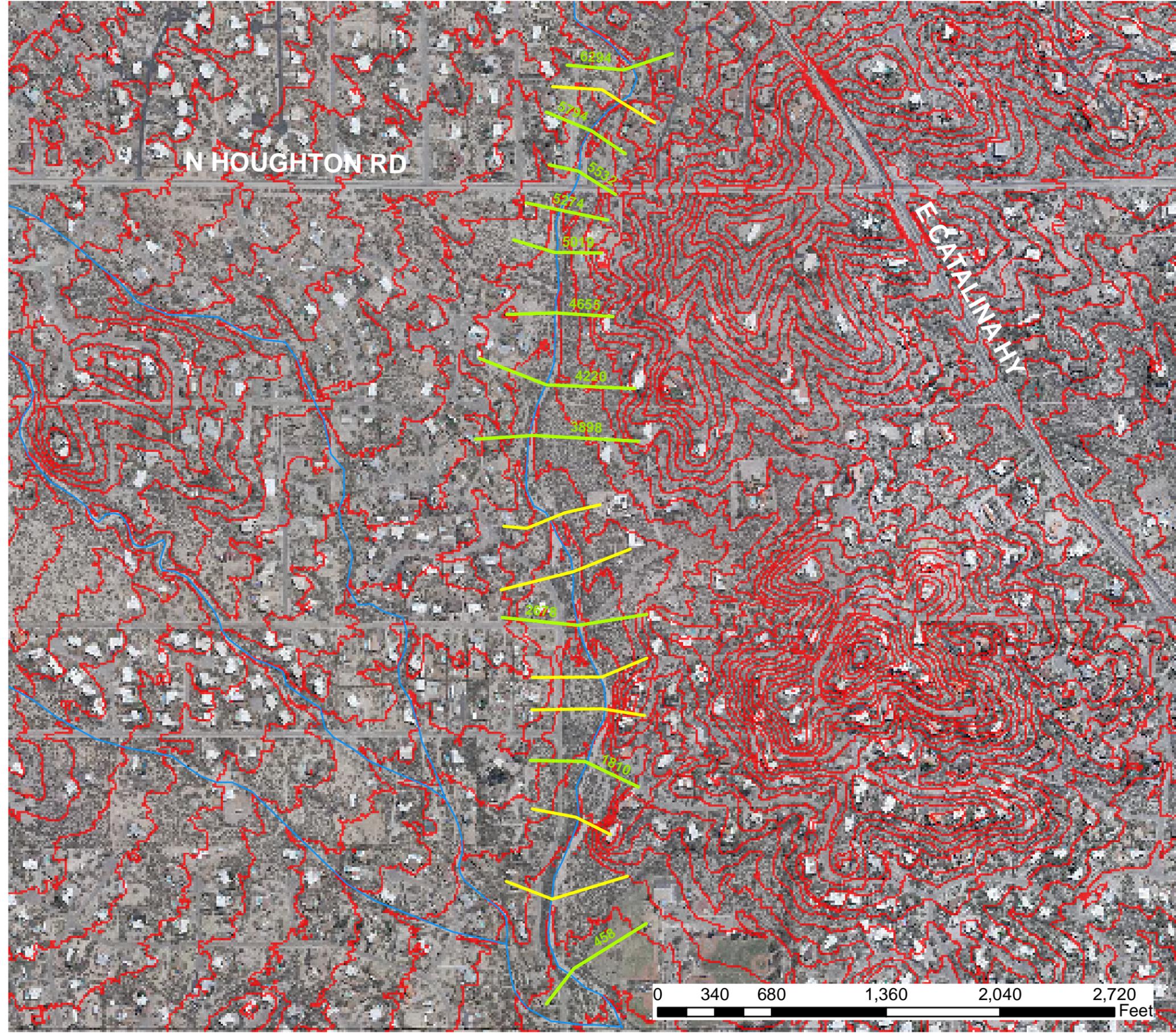
Pima County Regional Flood Control District



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**Unconfined at
1.5 x Hydraulic Depth
Woodland Wash**

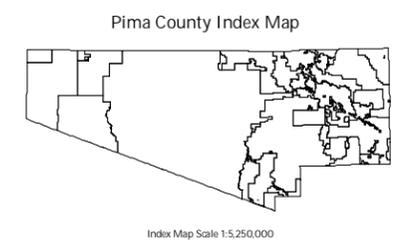


Legend

- Unconfined at 1.5 x Hyd Depth
- Woodland XS
- River
- Contour 20

Yello Cross section: Ratio >= 1.25
Blue Cross section: Ratio < 1.25

Contour Interval: 20 ft



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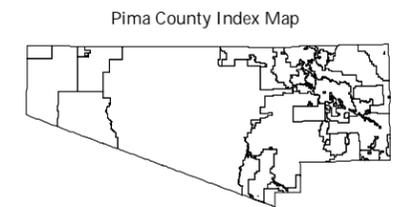
Unconfined at
1.5 x Hydraulic Depth or
100yr to 25 yr Topwidth > 1.25
Woodland Wash

Legend

-  Unconfined
-  Woodland XS
-  River
-  Contour 20

Yello Cross section: Ratio \geq 1.25
Blue Cross section: Ratio $<$ 1.25

Contour Interval: 20 ft



Index Map Scale 1:5,250,000

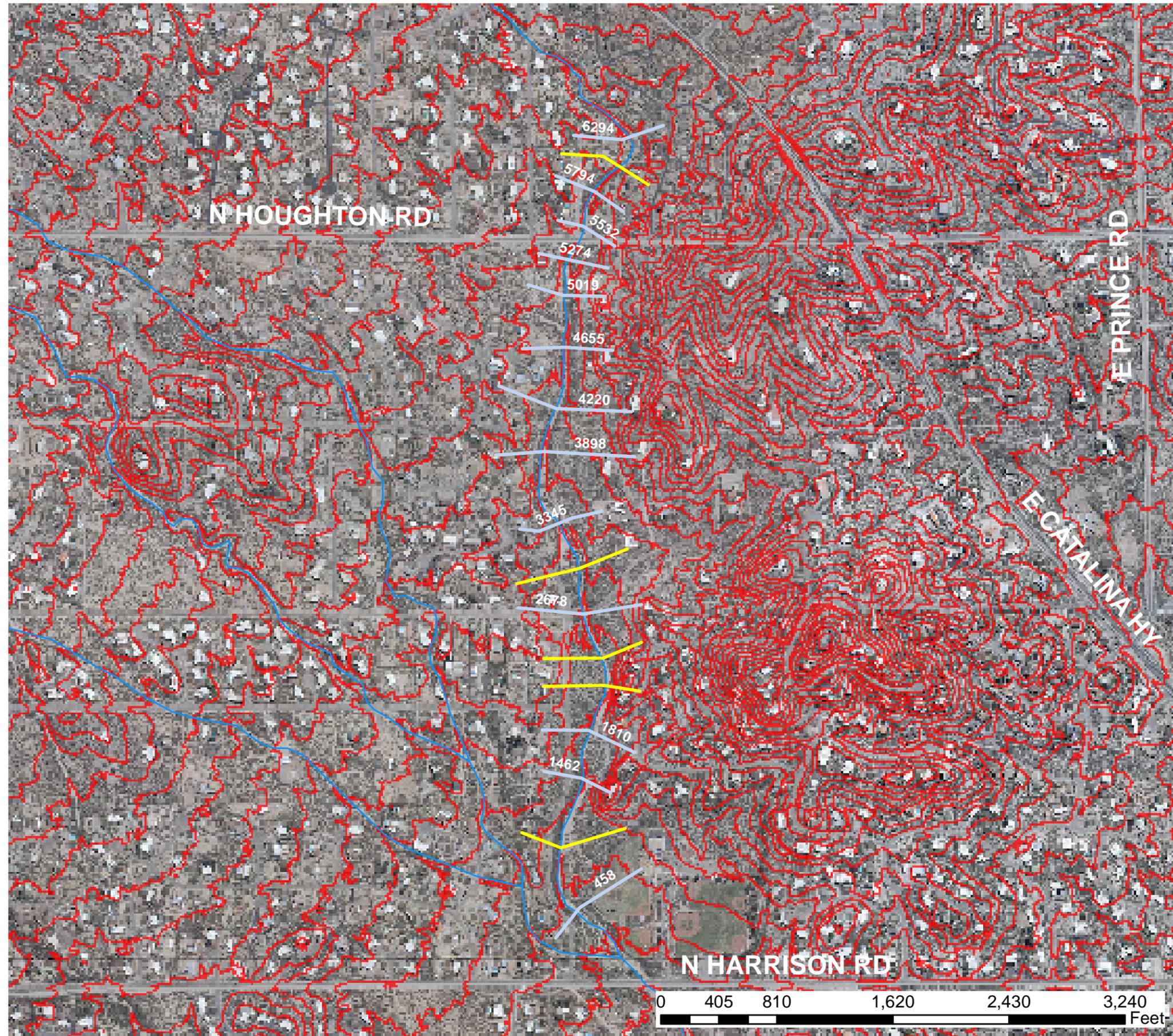
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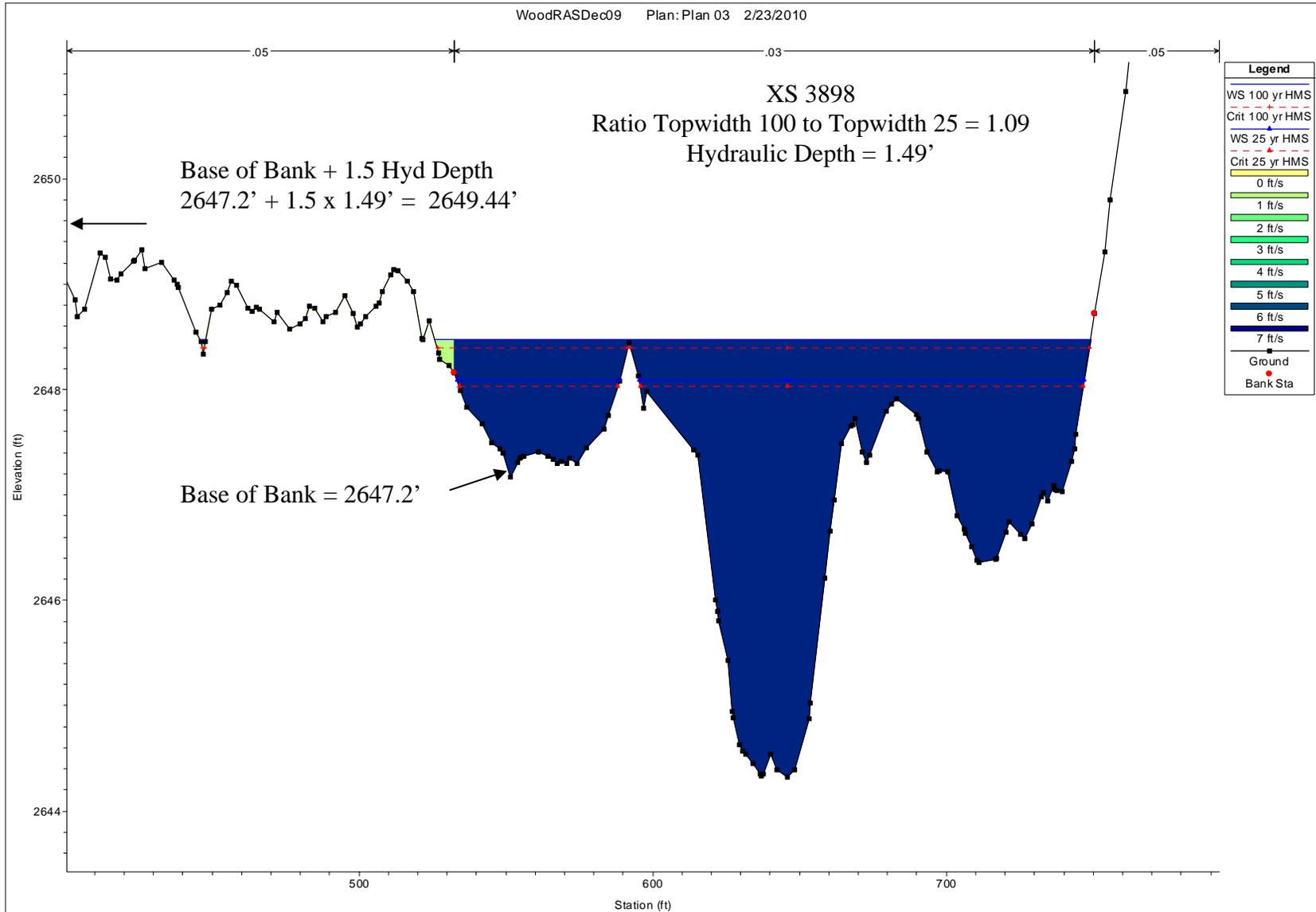
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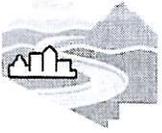
Pima County Regional Flood Control District



Scale 1:61,000







Location: FLOOD CONTROL - CONFERENCE ROOM Date: FEB 24

Meeting: OPEN HOUSE - Floodway Focus

	Name	Company	Phone #	Email
1	ERIC KAATZ	TEP	745-3196	EKAATZ@TEP.COM
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