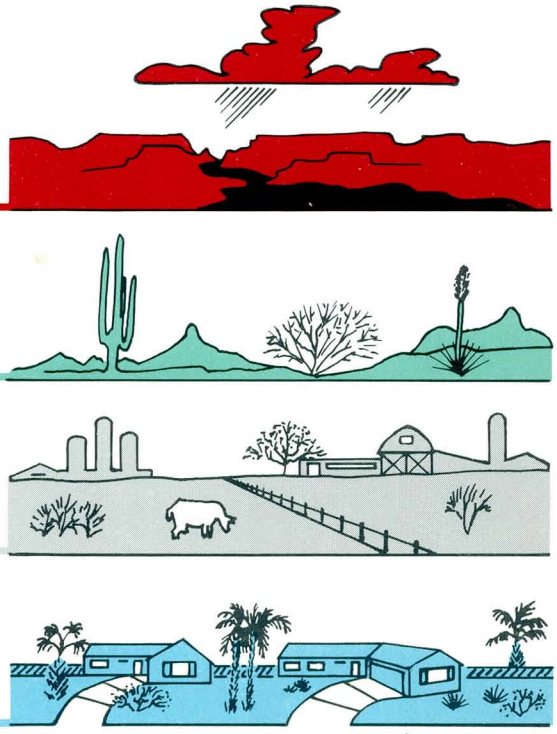


FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

APPEAL
to
Scottsdale Alluvial
"Fans 5 & 6"
February 26, 1992

APPEAL
to
Scottsdale Alluvial
"Fans 5 & 6"
February 26, 1992

APPEAL TO PRELIMINARY FIRMS FOR FEMA DESIGNATED FANS 1-6 NORTH SCOTTSDALE FLOOD INSURANCE STUDY

Flood Control District of Maricopa County
2801 West Durango
Phoenix, Arizona 85009
(602) 506-1501

February 26, 1992

OFFICE OF THE BOARD OF SUPERVISORS

MARICOPA COUNTY BOARD OF SUPERVISORS
County Administration Bldg. 301 W. Jefferson Phoenix, Arizona 85003

(602) 262-3415

FEB 2 6 1992

Clemence "Bud" Schauerte, Administrator
Flood Insurance Administration
Federal Emergency Management Agency
Washington, D.C. 20472

Subject: Appeal of Flood Elevation Determination

Dear Mr. Schauerte:

This letter is a formal appeal of the flood elevation determination of the Scottsdale Alluvial Fan flood insurance study. This appeal is authorized under the National Flood Insurance Program and Related Regulations, Part 67 - Appeals From Proposed Flood Elevation Determinations.

This appeal specifically concerns alluvial fans 5 and 6 located in the northeast part of Maricopa County. The preliminary Flood Insurance Rate Maps were published July 9, 1991. The affected panels are: 815, 820, 1210, 1220, 1230 and 1235.

Attached is the technical information in support of this appeal required under NFIP, Section 67.6 - Basis of Appeal.

Sincerely,

Betsey Bayless

Betsey Bayless, Chairman
Maricopa County Board of Supervisors

Enclosures

Copy to: Arizona Department of Water Resources
City of Phoenix
City of Scottsdale
FEMA Region IX

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009
Telephone (602) 506-1501
Fax (602) 506-4601

D. E. Sagramoso, P.E., Chief Engineer and General Manager

February 26, 1992

Mr. John L. Matticks
Assistant Administrator
Federal Insurance Administration
Federal Emergency Management Agency
Washington, D.C. 20472

SUBJECT: Appeal to Preliminary FIRMs for FEMA Designated Fans 1-6, North Scottsdale Flood Insurance Study

Dear Mr. Matticks:

The Flood Control District of Maricopa County, the City of Phoenix, and the City of Scottsdale (referred to hereinafter as the "Communities") have been working together during this appeal period in order to reach a consensus of opinion regarding the above study. The Communities are each submitting technical information and other issues of study procedure in support of each other and this appeal.

Agreement has been reached between the Communities on the methodology to be employed for the watershed hydrology, geomorphology, geology, hydraulics, and floodplain mapping techniques. A comprehensive list of referenced and technical reports are provided for your review in support of this appeal. Based upon the methods described in the relevant reports, per the appeal's procedure, an alternative floodplain delineation has been established for the watershed sources identified as Washes 5, 6A, 6B, & 6C (hereinafter referred to as "Washes 5 & 6").

The resulting floodplain delineations are clearly based upon better scientific and technical data than the Preliminary FIRM proposed by FEMA and documentation addresses issues as outlined per Section 67.6 of 44CFR, Chapter 1, of the National Flood Insurance Program and related regulations.

The information provided is an appeal to the floodplain determination and findings of FEMA's Technical Evaluation Contractor (TEC), Michael Baker, Jr. (MBJ), who has supplanted the original study contractor's work with their own assessment of the flood hazards. It is our belief that major dissimilarities exist between the initial study contractor's floodplain delineation and that proposed by the TEC. This warrants review by an independent technical review contractor per sound engineering practices and the intent of the review procedures outlined in FEMA 37.

The preliminary FEMA designated Fans 5, 6A, 6B, & 6C (Washes 5 & 6) are being appealed per Attachment C. Each "Appeal Basis" refers to published technical articles, books, maps, or enclosed reports and analyses. Each "Appeal Basis" is an independent point of appeal; therefore, each "Appeal Basis" has a corresponding "Appeal Request," which states in detail the activity being requested from FEMA for each "Appeal Basis." Per Section 67.8 (e), we request copies of technical documentation that supports FEMA's position if a denial of an "Appeal Request" is made.

Finally, we are appealing the delineation based upon its noncompliance with Section 64.3. The alluvial fan model uses a composite of velocity head and water depth to generate an energy depth which is used in defining an AO Zone. Section 64.3 states only water depths will be used in designating AO Zones. More specifically, Zone AO applies only to where depths of water are greater than one (1) foot. More succinctly, all those areas designated as Zone AO1 should be designated Zone X.

The Communities believe that the floodplain delineations as submitted, more closely reflect true flood hazard conditions and their adoption will allow better floodplain management, a better reflection of true floodplain risks and the dangers to be administered by the Communities under their floodplain management program. It is therefore respectfully requested that the current floodplain delineations be dismissed and the floodplain delineations prepared by the Communities be adopted for regulatory and actuarial purposes.

Sincerely,

Joe Tram

Joe Tram
Special Projects Branch Manager

ATTACHMENT C

APPEAL BASIS
PER SECTION 67.6 OF THE NFIP
FOR
THE PRELIMINARY FLOODPLAIN DELINEATION STUDY OF WASHES 5 & 6
WITHIN
THE SCOTTSDALE ALLUVIAL FANS 1-6, MARICOPA COUNTY

1. Appeal Basis: The hydrological analysis, prepared by Michael Baker Jr. (MBJ), and used to develop the preliminary FEMA floodplain delineation maps, is inappropriate and not consistent with current local gauge data analyses and the HEC-1 model analysis prepared and approved by all of the local communities and supported as follows:

   a. (WRA), Sensitivity Analysis, Enclosure 1
   b. Frequency Analyses of USGS Gauge Data, by FCDMC, Enclosure 2
   c. (CVL), Hydrologic Review of FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 3
   d. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4

   Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

   a. the hydrologic analysis prepared by MBJ be dismissed from any further application to the study area;
   b. the hydrologic analyses documented in the WRA report be adopted by FEMA;
   c. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
   d. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

2. Appeal Basis: Per the following technical reports, FEMA letter and Figure 1, the subject site is not an active alluvial fan. "Soils in this area have substantial clay and calcium carbonate content. These properties provide cohesion to the soils; thereby, making them resistant to erosion. Many of the streams in this area exhibit thick accumulations of calcium carbonate (caliche) on their beds and banks, which further add to channel stability. These properties are not characteristic of active alluvial fans." (From [b] below).

a. USGS Water Resources Investigations Report 91-4171, Enclosure 5
b. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4
c. (CBA), Geology and Soils Study for a Nine Square Mile Area in the Northwestern Portion of the City of Scottsdale, Enclosure 6
d. (SCS), Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Enclosure 7
e. USGS Maps, Enclosure 8
f. Aerial Maps, Enclosure 9
g. Physical Geology, by Robert J. Foster, Copyright 1971
h. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10
i. Alluvial Fan Data Collection and Monitoring Study, by CH2M Hill and R.H. French, Ph.D., P.E., Enclosure 11
j. FEMA letter dated October 3, 1991, Enclosure 12

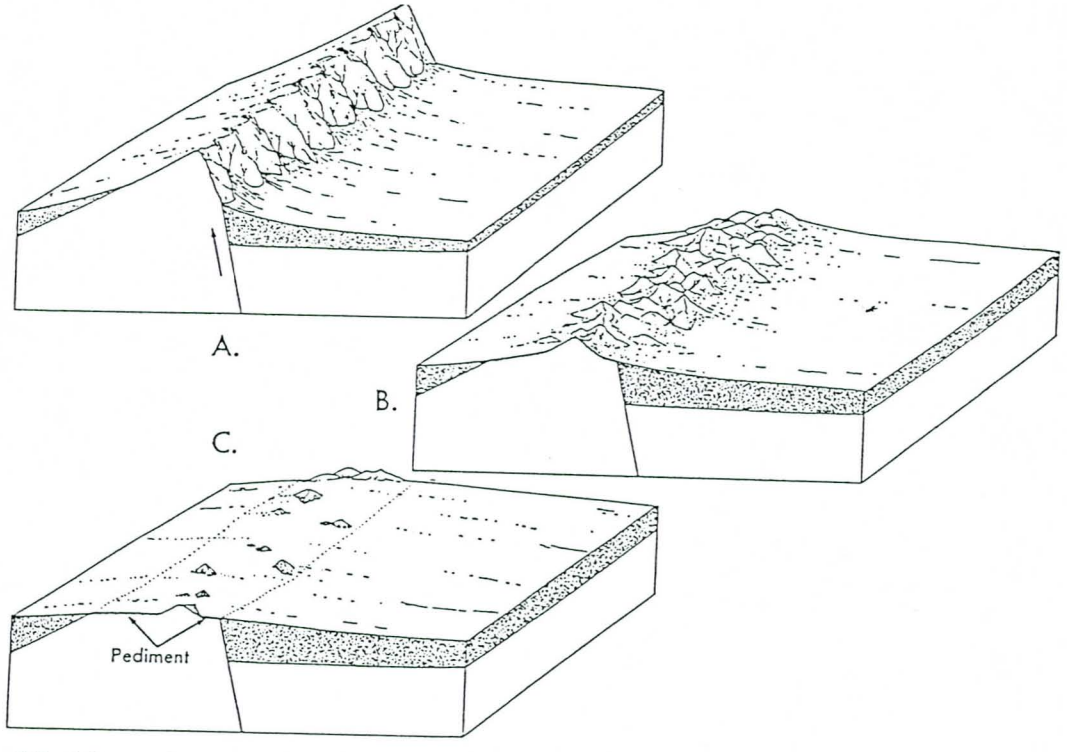


FIG. 9-3. *Formation of pediments. A. Shortly after uplift. B. Pediments have begun to form. C. Late stage. The mountain range is mainly pediment.*

Figure 1 - from Physical Geology by Foster

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the assumption that this study area is an active alluvial fan be dismissed;
b. the application usage of the alluvial fan model to Washes 5 & 6 be dismissed;
c. the preliminary FEMA floodplain delineations be dismissed for Washes 5 & 6 as invalid; and,
d. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA

3. Appeal Basis: Per FEMA 37, 1985, Appendix 5, page A5-1; and per FEMA 37, 1991, page A5-3, the alluvial fan methodology is only to be used on active alluvial fans. Washes 5 & 6 are not active alluvial fans as substantiated in the following reports and letter from FEMA.

a. USGS Water Resources Investigations Report 91-4171, Enclosure 5
b. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4
c. (CBA), Geology and Soils Study for a Nine Square Mile Area in the Northwestern Portion of the City of Scottsdale, Enclosure 6
d. (SCS), Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Enclosure 7
e. USGS Maps, Enclosure 8
f. Aerial Maps, Enclosure 9
g. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10
h. Alluvial Fan Data Collection and Monitoring Study, by CH2M Hill and R. H. French, Ph.D., P.E., Enclosure 11
i. FEMA letter dated October 3, 1991, Enclosure 12

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

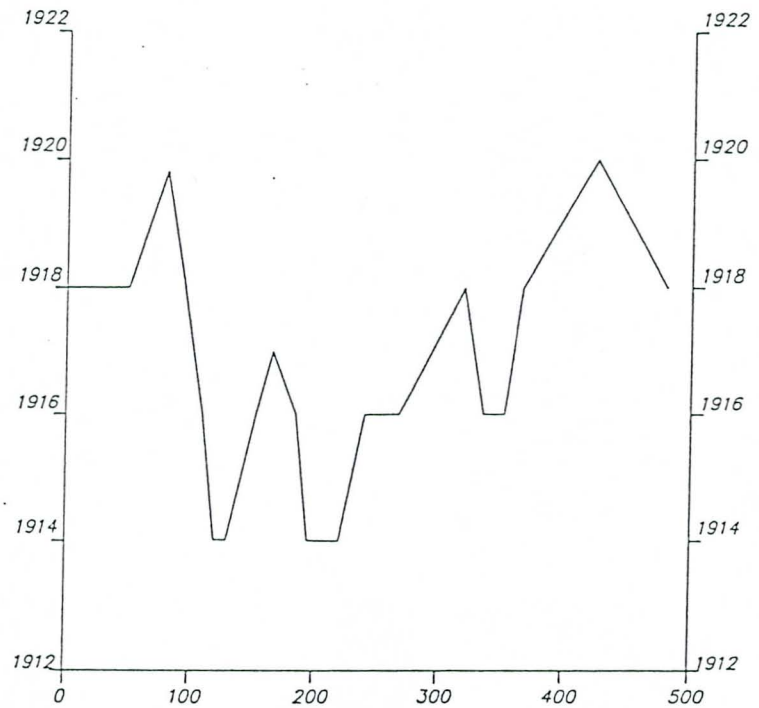
a. the assumption that this study area is an active alluvial fan be dismissed;
b. the application of the alluvial fan model to Washes 5 & 6 be dismissed;
c. the preliminary FEMA floodplain delineations for Washes 5 & 6 be dismissed as invalid; and,
d. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

4. Appeal Basis: The definition of the 100-year flood discharge for the alluvial fan methodology as defined in FEMA 37, 1985 and 1991, is only applicable if all of the assumptions within Dawdy's paper are valid. The definition is only applicable in defining the .01 probability and does not assess whether structures will be inundated from more frequent events. That is, runoff will be conveyed in existing channels at greater depths and velocities creating a more frequent flood hazard and a greater probability of being inundated for actuarial and flood management purposes.

   a. FEMA 37, 1991; last line page A5-1 and items 1-3 page A5-2, Enclosure 13
   b. Entrenched Channels and Alluvial Fan Flooding, ASCE Conference, by Edward Mifflin, Enclosure 15
   c. (CVL), Geomorphologic Discripton & Hydraulic Analyses for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10
   d. FEMA 37, 1985, Enclosure 14

   Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

   a. the assumption that this study area is an active alluvial fan be dismissed;
   b. the application of the alluvial fan model to Washes 5 & 6 be dismissed;
   c. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
   d. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) prepared by the local agencies be adopted by FEMA, Enclosure 33.



5. Appeal Basis: The regime equations for the single and multiple channel analysis within the FEMA alluvial fan method are only valid if all the assumptions that were used in deriving the regime equations are met. Channel depths and velocities are based upon erosion of the channel banks to a point where dD/dW=-.005 for single channels per Dawdy (Enclosure 16), and 3.8 times the width of the single channel for the split channel region per DMA report (Enclosure 17). The following reports substantiate the geomorphic stability of the study area and channel banks. Therefore, the FEMA regime equations are invalid.

   a. USGS Water Resources Investigations Report 91-4171, Enclosure 5
   b. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4
   c. (CBA), Geology and Soils Study for a Nine Square Mile Area in the Northwestern Portion of the City of Scottsdale, Enclosure 6
   d. (SCS), Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Enclosure 7
   e. Preliminary Flood Insurance Maps showing soils stable for average velocities in excess of 8 fps in incised washes, Enclosure 18
   f. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10

   Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

   a. the assumption that this study area is an active alluvial be dismissed;
   b. the application of the alluvial fan model to this watershed be dismissed;
   c. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
   d. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

6. Appeal Basis: Channel depths and velocities within the FEMA model are based upon a point where dD/dW=-.005 for single channels per FEMA methodology. These do not adequately reflect the velocities and depths of existing channels as indicated by a typical channel cross-section from the study area and assessed through FEMA methodology, versus normal channel conveyance methods in the single channel study area.

Table 3: Uniform Flow Computations for Locations Along Washes 5 & 6

X-Sec ID	Wash	Q_{100}[1] (cfs)	Depth	Velocity (fps)	FEMA[2] Depth (ft)	FEMA[2] Velocity (fps)
1	6b & c	1655	2.4	6.5	2	6
2	6b & c	1655	2.5	6.0	2	6
3	6b & c	995	2.9	5.0	2	6
4	6b & c	552	2.2	5.3	2	5
5	6a	3215	6.4	12.7	3	8
6	6b & c	386	2.6	5.4	1	4
7	6b & c	166	1.2	4.1	1	4
8	6a	3215	2.5	5.6	1	4
9	5	475	1.2	6.9	1	4

From CVL, Geomorphologic Description and Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, Enclosure 10

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the assumption that this study area is an active alluvial fan be dismissed;
b. the usage of the alluvial fan model on this watershed be dismissed;
c. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
d. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

7. Appeal Basis: In the multiple channel areas, an equivalent single channel width equal to 3.8 times the channel width in the single channel region is used to define depths and velocities. Per the DMA Engineering Report, page 72, (Enclosure 17). "This indicates that the current is not necessarily constant, but migrates from sub-channel to sub-channel if the basic width formula still holds true." The basic width formula holds true only if the soil is erodible to dD/dW=-.005. The depths and velocities of the multi-channel area are based upon the equivalent single channel width, and do not even reflect true average depths or velocities even if the method was applicable.

FEMA CALCS Multi-Channel	CALCS for Single Channel assuming erodible soil
$d = .925n^{.6}s^{-.3}q^{.36}$	$d = .2054n^{.6}s^{-.3}q^{.36}$
$v = .3033n^{-.6}s^{.3}q^{.24}$	$v = .3463n^{-.6}s^{.3}q^{.24}$
$w = 3.8(9.408)q^{2/5} = 35.75q^{2/5}$	$w = 9.408q^{.4}$
Assume q = 2500 cfs	Assume q = 2500 cfs
n = .03 s = .02	n = .03 s = .02
d = .61 ft.	d = 1.35 ft.
v = 5.04 fps	v = 5.76 fps
w = 817 ft.	w = 215 ft.(3.8)=817 ft.

Appeal Request: Based upon the provided technical evaluation which substantiates the described appeal basis, it is requested that:

a. the assumption that this study area is an active alluvial be dismissed;
b. the application of the alluvial fan model on this watershed be dismissed;
c. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
d. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

8. Appeal Basis: In the multiple channel areas, the hydraulic radius is approximated by the depth of water within the composite channel. Per the DMA Engineering Report, page 72, (Enclosure 17). "This indicates that the current is not necessarily constant, but migrates from sub-channel to sub-channel if the basic width formula still holds true." The hydraulic radius assumption holds true only if the soil is erodible to dD/dW=-.005. The hydraulic radius of the multi-channel area are based upon the equivalent single channel width versus the hydraulic radius or area and wetted perimeter of the single channel within the multiple channel reach of which there are 3.8 within the equivalent channel. By doing this, FEMA is not even reflecting the higher velocities and depths that would be generated by their method if it was applicable.

FEMA Multi-Channel Calcs.	FEMA Single Channel Calcs.
Assumes a wide rectangular channel and approximates the hydraulic radius R, by the depth of water.	
$w=(3.8)(9.408)q^{.4} = 35.7504q^{.4}$	$w=.38(9.408q^{.4}) = 35.75q^{.4}$
$q= 1.486/n\ w(q)\ d^{5/3}\ s^{1/2}$	$q=1.486/n\ w(q)\ d^{5/3}\ s^{1/2}$
$q= 53.1251/n\ q^{2/5}\ d^{5/3}\ s^{1/2}$	$q= 13.98/n\ q^{2/5}\ d^{5/3}\ s^{1/2}$
$d=.0922n^{.6}\ s^{-.3}\ q^{.36}$	$d=.2054n^{.6}\ s^{.3}\ q^{.36}$
$v=1.486/n\ (.0922n^{.6}\ s^{-.3}\ q^{.36})^{.67}\ s^{.5}$	$v=1/486/n\ (.2054n^{.6}\ n^{.3}\ q^{.36})^{2/3}\ s^{1/2}$
$v=.3033n^{-.6}\ s^{.3}\ q^{.24}$	$v=.3463n^{-.6}\ s^{.3}\ q^{.24}$
Assuming q = 2500 cfs n = .03 s = .02	
d=.61 ft. v=5.04 fps w=817 ft.	d=1.35 ft. v=5.76 fps w=817 ft.

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the assumption that this study area is an active alluvial fan be dismissed;
b. the application of the alluvial fan model to this watershed be dismissed;
c. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
d. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

9. Appeal Basis: Per letter from MBJ dated December 4, 1991, top widths were used in determining "probability splits." This determination is only valid if the assumption that the hydraulic radius is equal to the depth of flow is valid. In stable channels with non erodible sides, the determination of split flows or conveyance capacity by top width is not valid when a comparision of the cross-sections are assessed by the two methodologies.

FEMA Channel
$w = 9.48\ q^{.4}$

Assume Q = 2500 cfs

width/ft.	Q cfs	depth
216	2500	1.6
150	992	1.1
100	360	.73
75	175	.55
25	11	.18

Width is a function of depth and Q and therefore, top width can be used for probability splits.

Stable Channel
Top w = 100 ft.

Q = 2500 ft.

width/ft.	Q cfs	depth
100	2500	5.0
100	992	2.0
100	360	.72
100	175	.58
100	11	.11

Width is not an indicator of conveyance capacity.

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the assumption that this study area is an active alluvial fan be dismissed;
b. the application of the alluvial fan model to this watershed be dismissed;
c. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
d. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

10. Appeal Basis: Per Enclosure 16 by Dawdy, upon which FEMA's model is based, it states that the method is based upon empirical geomorphologic principles. His second assumption is that the fan is erodible enough such that "each event forms a single channel and flow remains in that channel through the event." The DMA report (Enclosure 17) also assumes the single channel regime assumptions and then multiples by 3.8 for the multiple channel region. USGS Enclosure 28, page 16 states, "Because the basic assumptions are questionable, Dawdy's procedure appears to need further testing before it is used for flood studies in the Great Basin." Based upon the following reports, this assumption is invalid due to the soil stability and entrenched channels.

    a. USGS Water Resources Investigations Report 91-4171, Enclosure 5
    b. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4
    c. (CBA), Geology and Soils Study for a Nine Square Mile Area in the Northwestern Portion of the City of Scottsdale, Enclosure 6
    d. (SCS), Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Enclosure 7
    e. Preliminary Flood Insurance Maps showing soils stable for average velocities in excess of 8 fps in incised washes, Enclosure 18
    f. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10
    g. USGS, Water Supply Paper 2316, Enclosure 28

    Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

    a. the assumption that this study area is an active alluvial fan be dismissed;
    b. the application of the alluvial fan model to this watershed be dismissed;
    c. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
    d. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

11. Appeal Basis: Per Enclosure 16 by Dawdy, upon which FEMA's model is based, it states that the method is based upon geomorphologic principles. His third assumption is that the fan is erodible enough such that "flood channels are distributed uniformly across any contour." The DMA report (Enclosure 17) also assumes the single channel regime assumptions and then multiples by 3.8 for the multiple channel region. Based upon the following report, this assumption is invalid due to the soil stability and entrenched channels. USGS Enclosure 28, page 16 states, "Because the basic assumptions are questionable, Dawdy's procedure appears to need further testing before it is used for flood studies in the Great Basin."

    a. USGS Water Resources Investigations Report 91-4171, Enclosure 5
    b. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4
    c. (CBA), Geology and Soils Study for a Nine Square Mile Area in the Northwestern Portion of the City of Scottsdale, Enclosure 6
    d. (SCS), Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Enclosure 7
    e. Preliminary Flood Insurance Maps showing soils stable for average velocities in excess of 8 fps in incised washes, Enclosure 18
    f. (CVL), Geomorpholic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10
    g. USGS, Water Supply Paper 2316, Enclosure 28

    Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

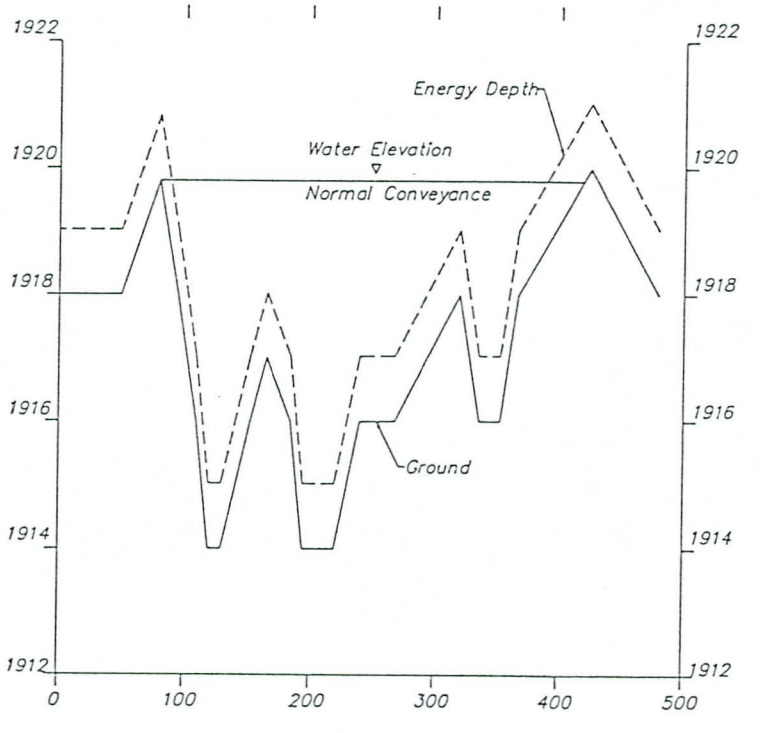
    a. the assumption that this study area is an active alluvial be dismissed;
    b. the application of the alluvial fan model to this watershed be dismissed;
    c. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
    d. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

12. Appeal Basis: The FEMA methodology assumes a constant energy depth elevation across a contour for modeling and delineating flood depths. A cross-section of the study area with the FEMA flood depths indicates that the flooding hazards are far greater along the main channels of the washes than the flood hazards depicted by the FEMA model (AO 1), thus giving a false sense of security and underestimating flood damages.

a. Topo by Cities of Scottsdale and Phoenix (Enclosure 19)
b. Cross-sections by FCD (Enclosure 20)
c. (CVL), Geomorpholic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10

Appeal Request: Based upon the provided technical evaluation which substantiates the described appeal basis, it is requested that:

a. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
b. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.



ELEVATION 1920 A'

13. Appeal Basis: The FEMA methodology assumes a constant energy depth across a contour delineating flood depths and does not measure elevations from the thalwag of the wash ignoring the topographic relief across a DFA. Based upon this procedure which ignores topographic relief and thalwag elevations, the use of the avulsion coefficient is inappropriate in that there is no wash from which the runoff is to avulve. In addition, the assessment of flooding hazards must be based upon channel conveyance and existing topographic relief, versus a probabilistic model that has no site specific ground truth and generates erroneous depths and velocities when measured from ground elevations or the invert of the wash, thus giving a false sense of security and underestimating flood hazards.

a. Topo by Cities of Scottsdale and Phoenix, Enclosure 19
b. Cross-sections by FCD, Enclosure 20
c. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, and 6C, February 1992, Enclosure 10

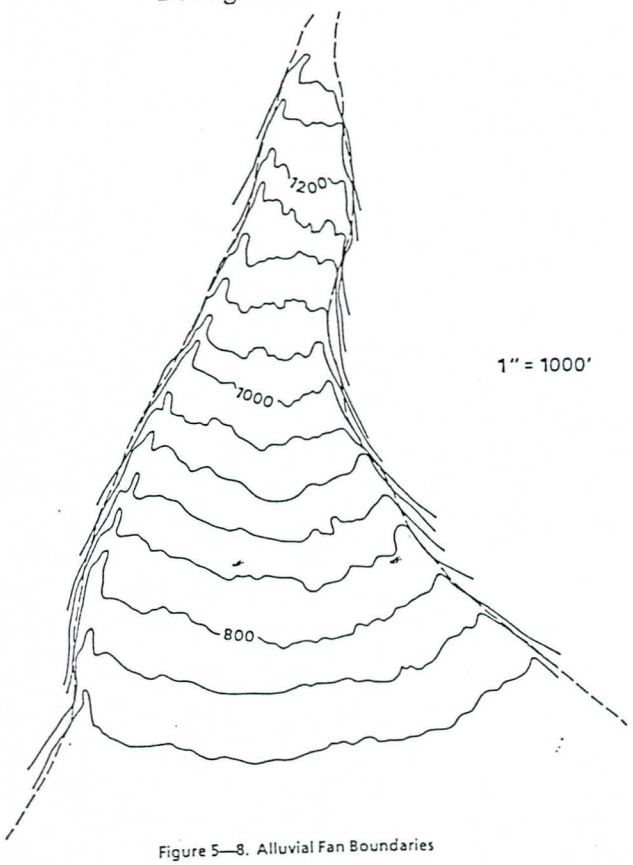


Figure 5—8. Alluvial Fan Boundaries

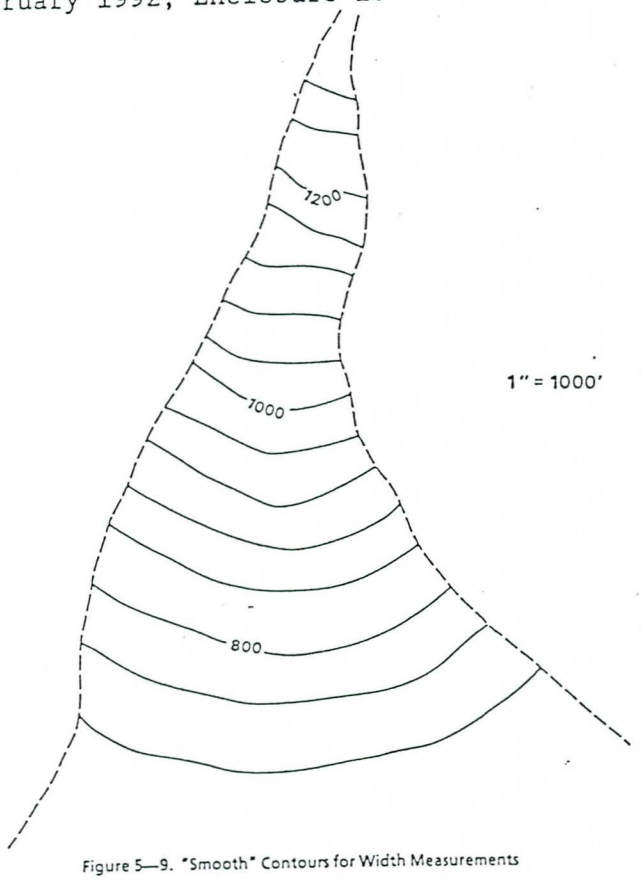


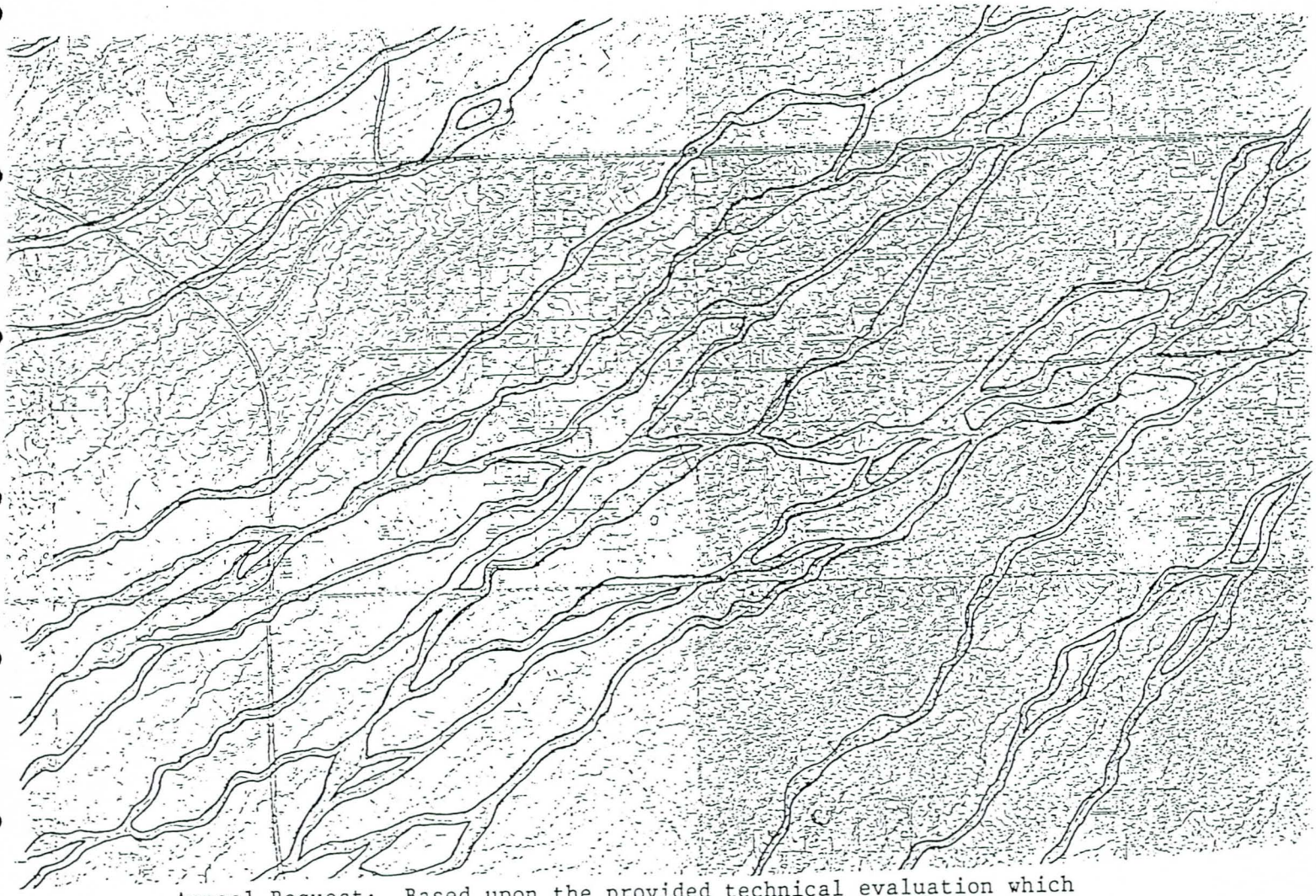
Figure 5—9. "Smooth" Contours for Width Measurements

Appeal Request: Based upon the provided technical evaluation which substantiate the described appeal basis, it is requested that:

a. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
b. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

14. Appeal Basis: The FEMA methodology assumes a constant energy depth across a contour for modeling and delineating flood depths. A comparison of the FIS to existing topography indicates that runoff would be primarily conveyed in major corridors which have more frequent and greater depths of flooding than those drainage swales collecting only local runoff or sheetflow. The flood hazard in these areas would be greater than the generalized AO1 depth which does not recognize this hazard.

    a. Topo by Cities of Scottsdale and Phoenix, Enclosure 19
    b. Proposed Delineation

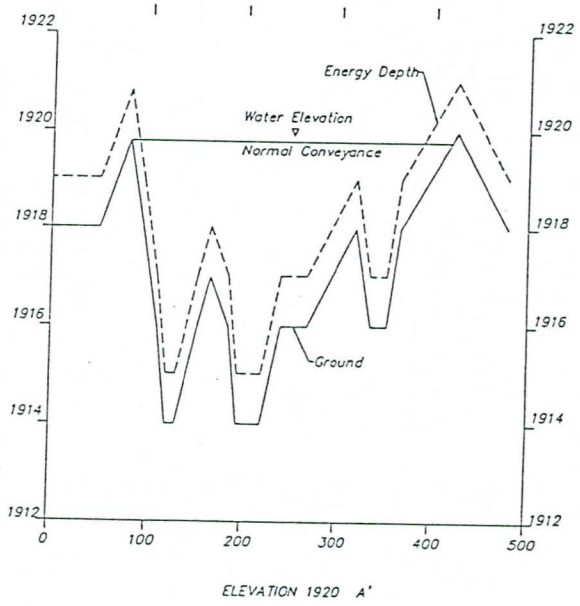


Appeal Request: Based upon the provided technical evaluation which substantiate the described appeal basis, it is requested that:

a. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
b. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

15. Appeal Basis: The FEMA methodology assumes a constant energy depth above a contour for development standards (60.3.c.7), requiring the same design standards whether a structure is in the swale or on a ridge, thus giving a false sense of security and underestimating flood damages for those that are located in the swale and resulting in unsound floodplain management practices due to the difference in perceived and actual flood depths and velocities.

a. Topo by Cities of Scottsdale and Phoenix, Enclosure 19
b. Cross-sections by FCD, Enclosure 20
c. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10



ELEVATION 1920 A'

FEMA requires development to the energy grade line regardless of topography or realistic water depths.

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

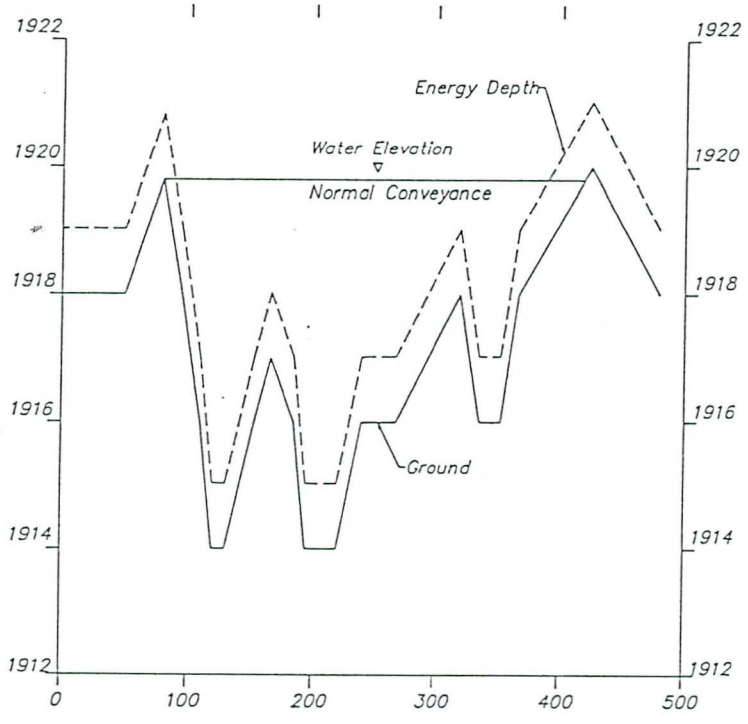
a. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
b. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

16. Appeal Basis: The FEMA methodology assumes typical exponents for the regime relations. The original work on hydraulic geometry of rivers, by Leopold and Maddock (USGS Professional Paper 252, 1953 Enclosure 29), shows that there is a lot of scatter and that the average exponents probably have little meaning for an individual site. In addition, none of the sites that were used to define the regime equations for the FEMA model were from Arizona. FEMA has not documented from a technical standpoint that the referenced sites have the physical characteristics that support the use of the regime model for this specific site. USGS Enclosure 28, page 16 states, "Because the basic assumptions are questionable, Dawdy's procedure appears to need further testing before it is used for flood studies in the Great Basin."

Appeal Request: Since FEMA has not provided the technical documentation to substantiate the use of the model on a site specific area as outlined in the described appeal basis, it is requested that:

a. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
b. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

17. Appeal Basis: The FEMA methodology assumes a constant energy depth above a contour for development standards, which cannot be technically or scientifically substantiated in that water seeks a level cross-sectional elevation when being conveyed downstream, leading to unsound floodplain management, development standards, and actuarial rates.



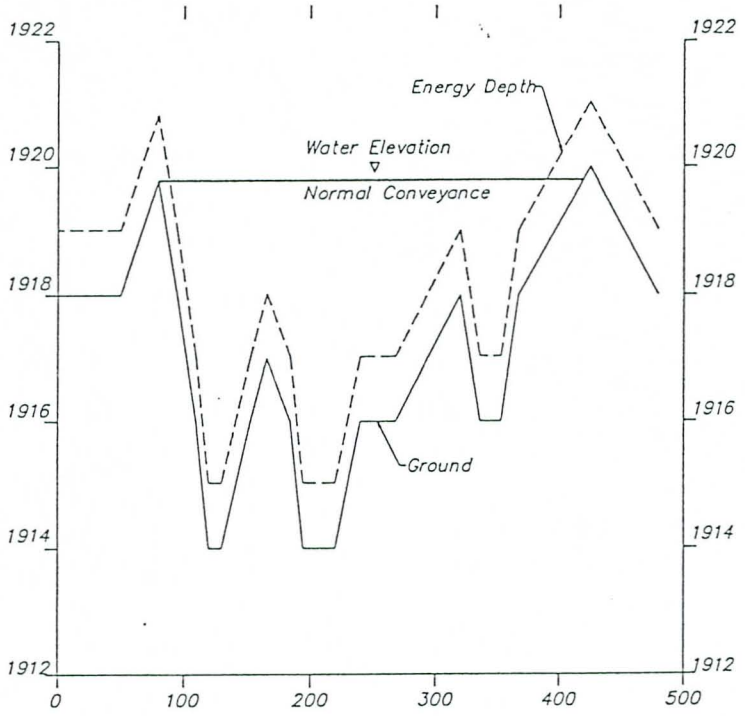
ELEVATION 1920 A'

FEMA requires development to be at the energy depth line regardless of topography or realistic water depths.

Appeal Request: Based upon the provided technical evaluation which substantiates the described appeal basis, it is requested that:

a. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
b. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

18. Appeal Basis: The FEMA methodology gives a constant energy depth elevation above a contour for development standards, requiring the same design standards whether a structure is in the swale or on the hill, causing increased cost for unnecessary flood protection for those that are located on hills and increased liability for those in the swales.



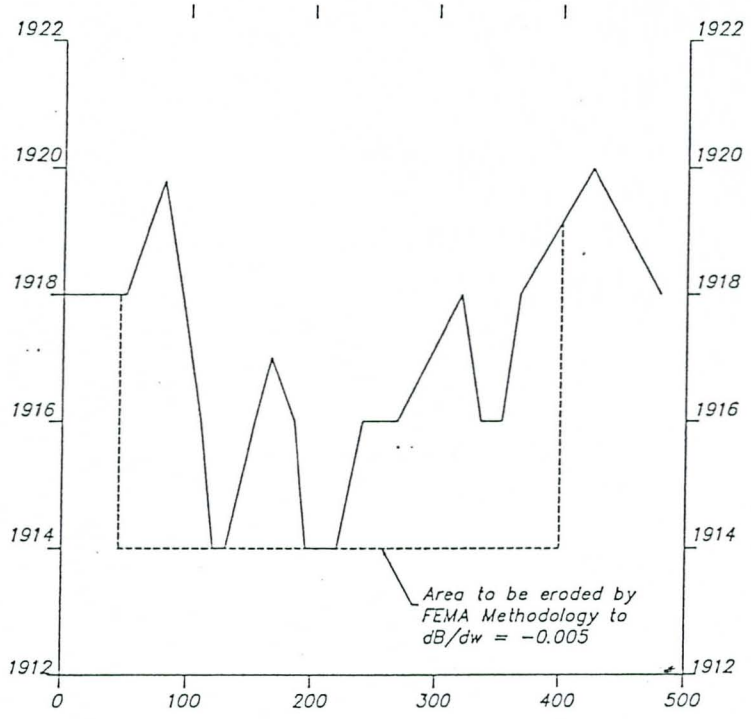
ELEVATION 1920 A'

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
b. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

19. Appeal Basis: The FEMA methodology is based upon the assumption that the channel banks will erode and stabilize at a depth of dD/dW=-.005. Based upon this assumption there would not be any overland flow, but flow would be conveyed in incised channels at a specified depth. As such, the depth number being specified is not a true reflection of the depth of inundation or degree of flooding.

    a. Topo by Cities of Scottsdale and Phoenix, Enclosure 19
    b. Cross-sections by FCD, Enclosure 20



ELEVATION 1920 A'

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
b. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

20. Appeal Basis: The FEMA methodology does not comply with the NFIP, Section 64.3, in designating water depths as defined under Zone AO. The NFIP specifically references water depths in designating AO Zones. Those greater than one (1) foot are within the AO Zones those less than one foot are within a Zone X. It does not address an averaging of depth which infers that only some of the people are being protected.

a. NFIP Regulations, Enclosure 21
b. FEMA Guidelines 37, Enclosures 13 and 14

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
b. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

§ 64.3 Flood Insurance Maps.

(a) The following maps may be prepared by the Administrator for use in connection with the sale of flood insurance:

(1) Flood Insurance Rate Map (FIRM): This map is prepared after the risk study for the community has been completed and the risk premium rates have been established. It indicates the risk premium rate zones applicable in the community and when those rates are effective. The symbols used to designate those zones are as follows:

Zone symbol	
A	Area of special flood hazard without water surface elevations determined.
A1–30, AE	Area of special flood hazard with water surface elevations determined.
AO	Area of special flood hazards having shallow water depths and/or unpredictable flow paths between (1) and (3) ft.
A99	Area of special flood hazard where enough progress has been made on a protective system, such as dikes, dams, and levees, to consider it complete for insurance rating purposes.

21. Appeal Basis: The FEMA methodology assigns an average depth number to areas of inundation instead of defining known depths and interpolating or extrapolating fixed depths, thus underestimating flood damages in some areas and overestimating them in other areas. This inconsistency in defining flood hazards results in undue economic hardship in low risk areas and inadequate protection in high risk areas, besides not correctly defining actuarial rates.

    a. NFIP Regulations, Enclosure 21
    b. FEMA Guidelines 37, Enclosures 22 and 23
    c. Flooding and Alluvial Fan Flood Hazards, Tortolita Piedmont, Pima County, Arizona

"The Special Flood Hazard Area on each alluvial fan is subdivided into separate AO zones. Those zones are labeled with depths and velocities rounded to the nearest whole foot and foot per second, respectively. For example, all points that are subject to alluvial fan flooding with a 100-year depth between 1.5 and 2.5 feet and a 100-year velocity between 6.5 and 7.5 feet per second are included in an area labeled Zone AO (depth 2 FT, Velocity 7 FPS)."

Per FEMA 37, 1991, Appendix A5-3

Appeal Request: Based upon the provided technical evaluation which substantiates the described appeal basis, it is requested that:

a. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
b. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

22. Appeal Basis: The Slope Map by the USGS indicates transverse slopes along washes are greater than longitudinal slopes, thus indicating that runoff is converging to designated conveyance corridors versus spreading out as typical of an alluvial fan. The watersheds for Washes 5 & 6 exhibit "tributary flow patterns which are inconsistent with alluvial fan type flooding and the FEMA methodology."

a. USGS Slope Map for Cave Creek Quadrangle, Enclosure 22
b. Topo by Cities of Scottsdale and Phoenix, Enclosure 19

Appeal Request: Based upon the provided technical evaluation which substantiates the described appeal basis, it is requested that:

a. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
b. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

23. Appeal Basis: Alluvial fan flooding is defined in Section 59.1 of the NFIP Regulations as flooding occurring on the surface of an alluvial fan or similar landforms, which originates at the apex and is characterized by high velocity flows, active processes of erosion, sediment transport and deposition, and unpredictable flow paths. The following reports substantiate that the subject area is not subject to alluvial fan type flooding, based upon depths, velocities, and that flow paths are predictable.

a. Topo by Cities of Scottsdale and Phoenix, Enclosure 19
b. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4
c. (CBA), Geology and Soils Study for a Nine Square Mile Area in the Northwestern Portion of the City of Scottsdale, Enclosure 6
d. (SCS), Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Enclosure 7
e. Video of Area by FCD, Enclosure 23
f. Downstream Hazard Classification Guidelines, USBR, Enclosure 24

Appeal Request: Based upon the provided technical evaluations which substantiate the described appeal basis, it is requested that:

a. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
b. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

24. Appeal Basis: The depths and velocities noted on the preliminary FIRM maps at the lower boundaries of the floodplain delineations which were computed with the alluvial fan model are not consistent with federally documented depth hazard classifications. (Velocities defined by FEMA are 3 fps at an energy depth of one (1) foot, which equates to a water depth of .67 fps.)

Per Figures 2, 3, 4, 5, and 6, from Downstream Hazard Classification Guidelines, Enclosure 24. The hazards are depicted in the low danger zone.

Appeal Request: Based upon the provided technical evaluation which substantiate the described appeal basis, it is requested that:

a. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
b. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

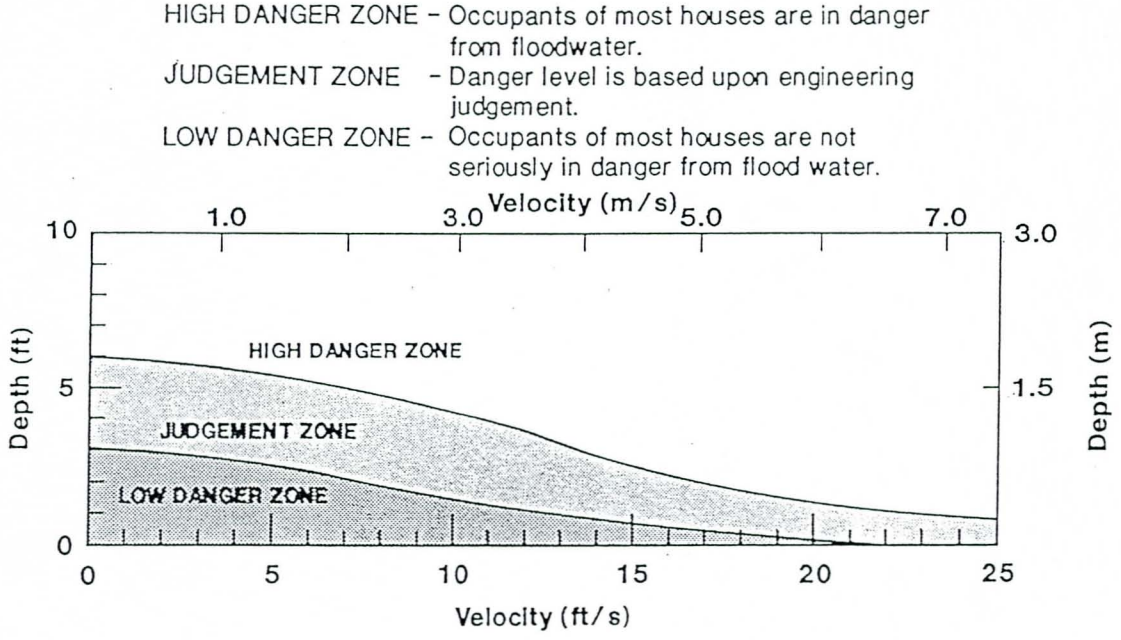


Figure 2. – Depth–velocity flood danger level relationship for houses built on foundations.

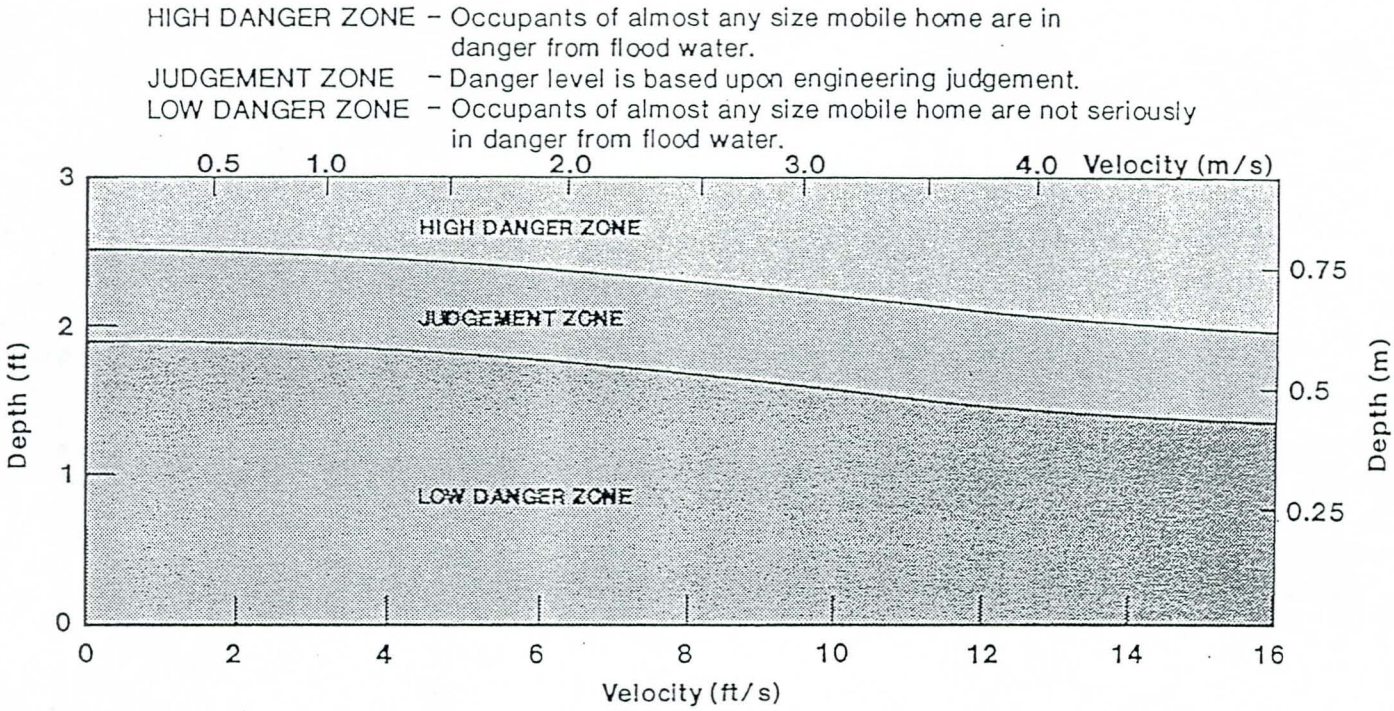


Figure 3. – Depth–velocity flood danger level relationship for mobile homes.

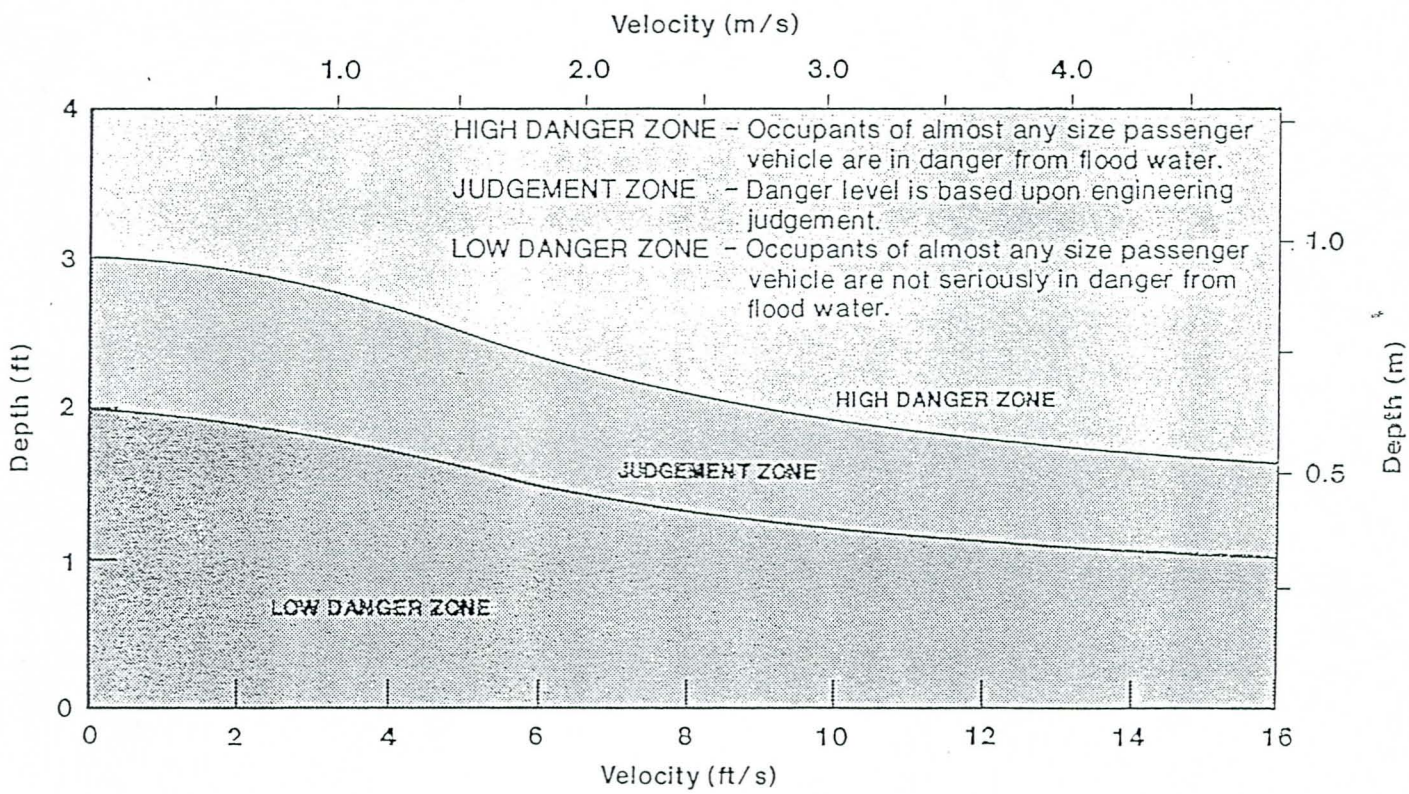


Figure 4. – Depth–velocity flood danger level relationship for passenger vehicles.

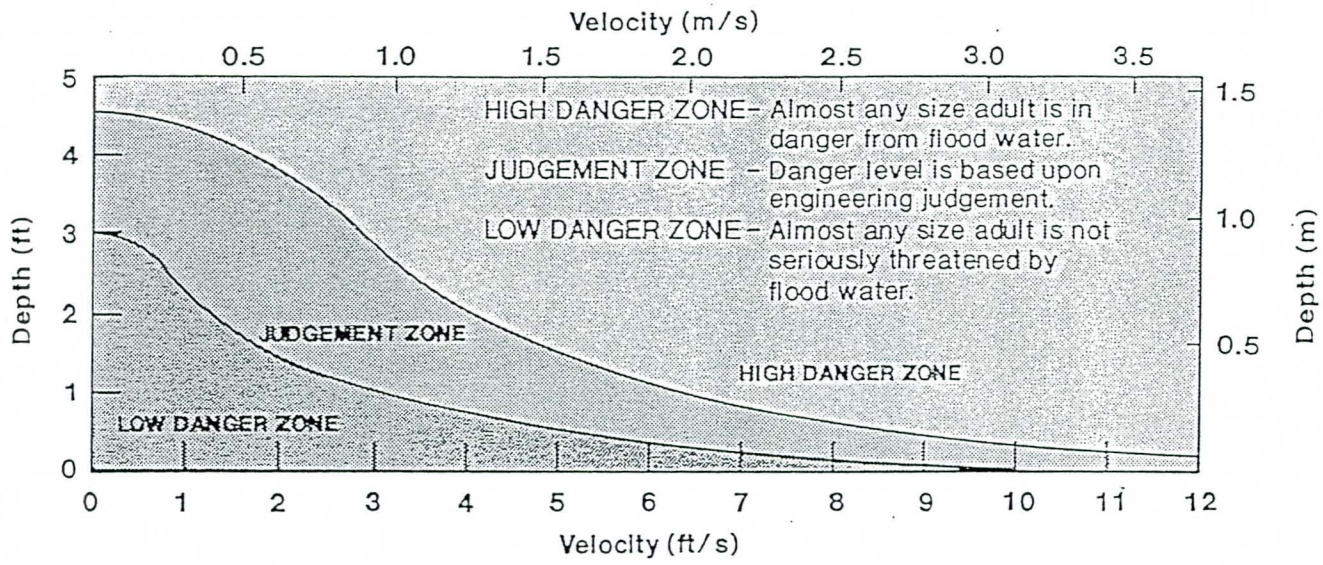


Figure 5. – Depth–velocity flood danger level relationship for adults.

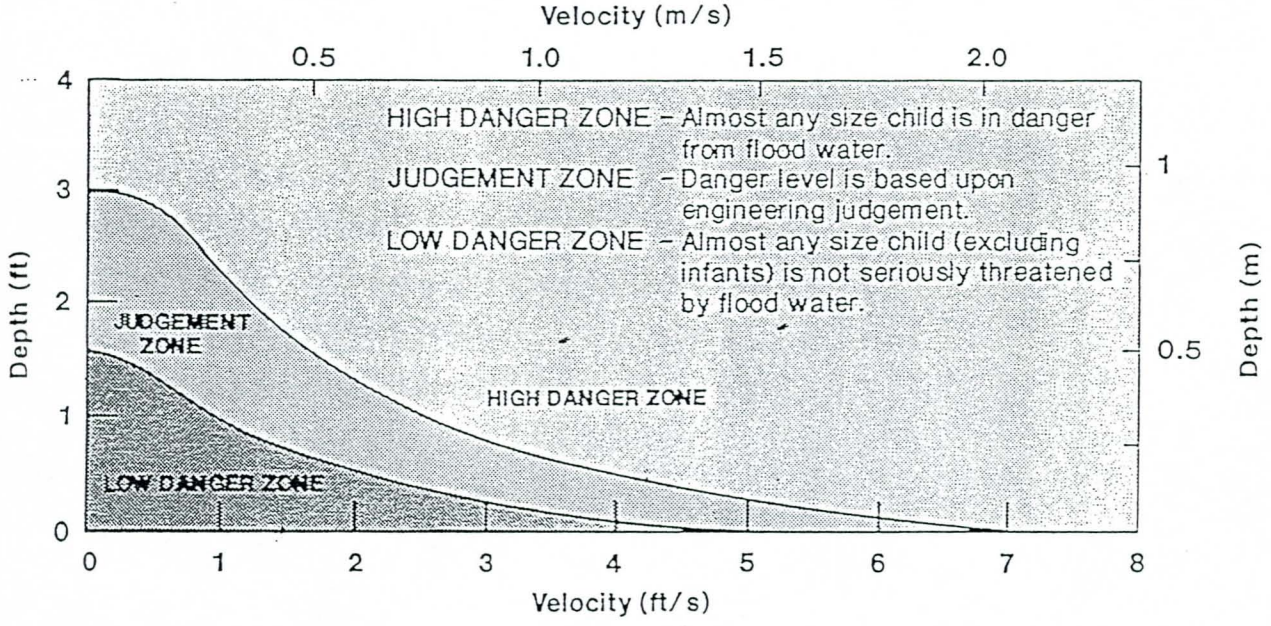


Figure 6. – Depth–velocity flood danger level relationship for children.

25. Appeal Basis: Geomorphic data indicates soil development, thus negating the assumption that this is an active alluvial fan where the area is in a continual flux, not allowing time for soils to develop.

    a. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10 Soils Profile Data,
    b. (SCS), Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Enclosure 7
    c. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4

    Appeal Request: Based upon the provided technical evaluation which substantiates the described appeal basis, it is requested that:

    a. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
    b. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

26. Appeal Basis: The areas along Washes 5 & 6 are not characteristic of alluvial fans, which have the distinct feature, whereby the slopes in all directions from the apex are approximately the same per the 1985 DMA Report, page 66. Rather the area consists of alluvial deposits which have caused the formation of a piedmont plain upon which local runoff has characterized the development of the currently observed drainage pattern. Scope area map shows the transverse slopes to the washes are promoting tributary flow patterns instead of radial flow patterns normally found in alluvial fans.

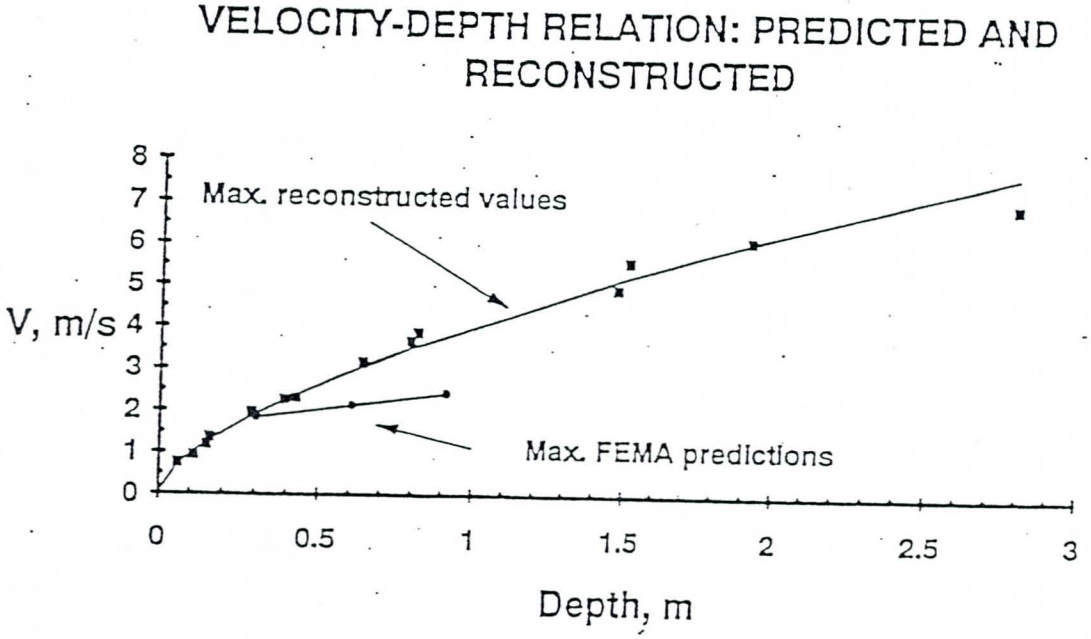
    a. Topo by Cities of Scottsdale and Phoenix, Enclosure 19
    b. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4
    c. (CBA), Geology and Soils Study for a Nine Square Mile Area in the Northwestern Portion of the City of Scottsdale, Enclosure 6
    d. (SCS), Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Enclosure 7
    e. Video of Area, by FCD, Enclosure 23
    f. DMA Report, Enclosure 17
    g. USGS Slope Map for Cave Creek Quadrangle, Enclosure 22

    Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

    a. the assumption that this study area is an active alluvial be dismissed;
    b. the application of the alluvial fan model on this watershed be dismissed;
    c. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
    d. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

27. Appeal Basis: Hydraulics developed by FEMA methodology do not realistically reflect true velocities or depths, nor is it based upon channel conveyance indicative of the exisitng topography.

    a. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10
    b. Hydraulics by FCD



This graph depicts the velocity-depth trend of maximum values obtained from the hydraulic modelling of 14 individual reaches conveying floodwaters during the 1988 Wild Burro flood. The individual points represent the maximum depth and channel velocity for individual cross-sections in each reach. Also shown is the entire range of the maximum velocity and depth values predicted by the FEMA model.

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

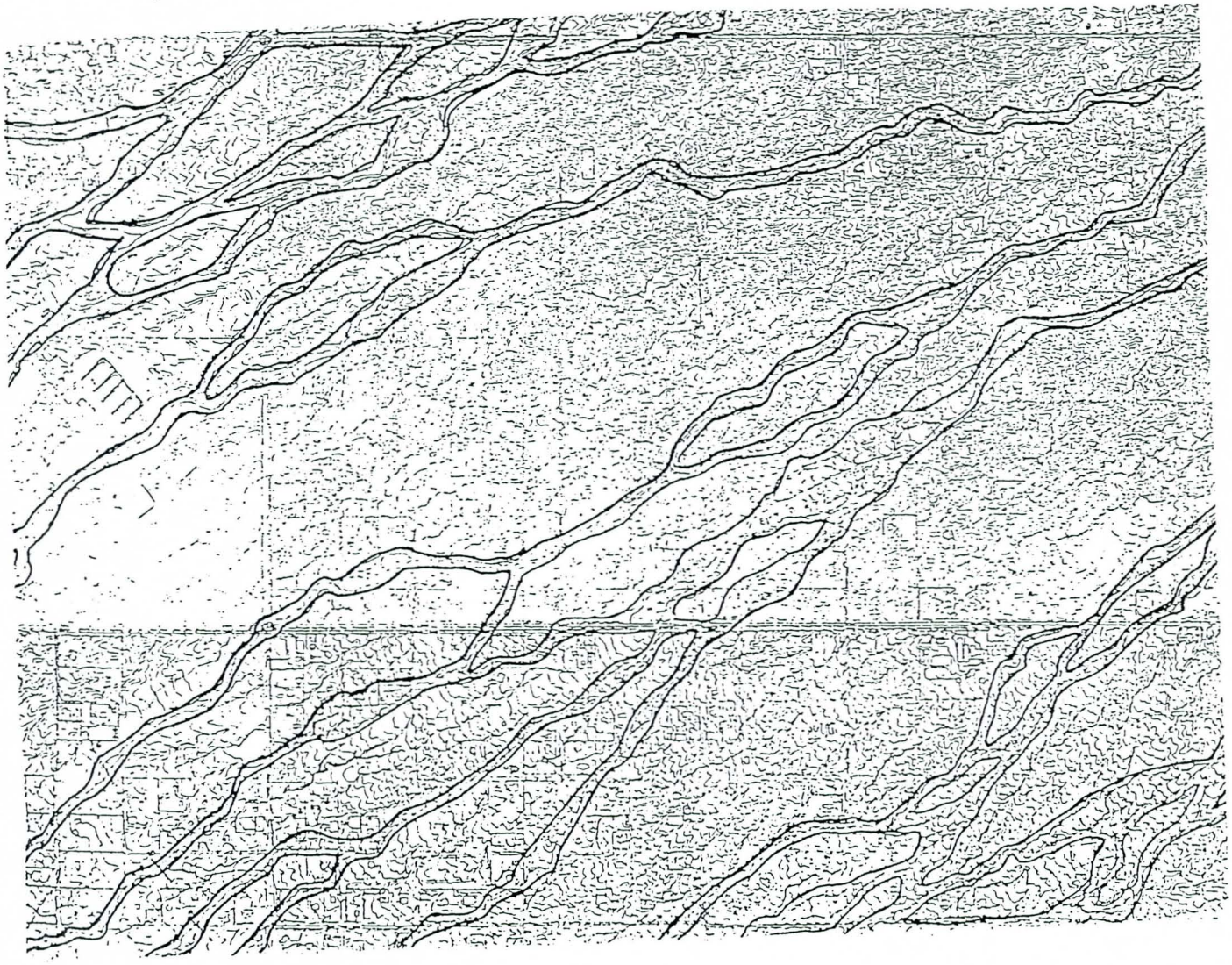
a. the application of the alluvial fan model to Washes 5 & 6 be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

28. Appeal Basis: Cross-section data indicates Alluvial Fan method inappropriate for Washes 5 & 6 since it ignores the conveyance capacity of existing washes, nor does it accurately model stable channels or sheetflow from stable channels across erosion resistant soils with significant cross-sectional relief. In addition, this method is not applicable to sheetflow or stable channel conditions in that it does not assess tributary inflow or "fan" runoff.

    a. Cross-sections by FCD, Enclosure 20
    b. Entrenched Channels and Alluvial Fan Flooding, ASCE Conference, by Edward Mifflin, Enclosure 15

    Appeal Request: Based upon the provided technical evaluation which substantiates the described appeal basis, it is requested that:

    a. the application of the alluvial fan model to Washes 5 & 6 be dismissed;
    b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
    c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.



29. Appeal Basis: Bank material indicates that it is not an alluvial fan and indicates that there is a distinction between bank and channel material. It also indicates that there is a high clay content for cohesion and also indicative of soil development.

a. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10
b. Soil Testing Report, Construction Inspection and Testing, Job No. 92-4727, February 11, 1992, Enclosure 25
c. (CBA), Geology and Soils Study for a Nine Square Mile Area in the Northwestern Portion of the City of Scottsdale, Enclosure 6
d. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4
e. (SCS), Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Enclosure 7

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

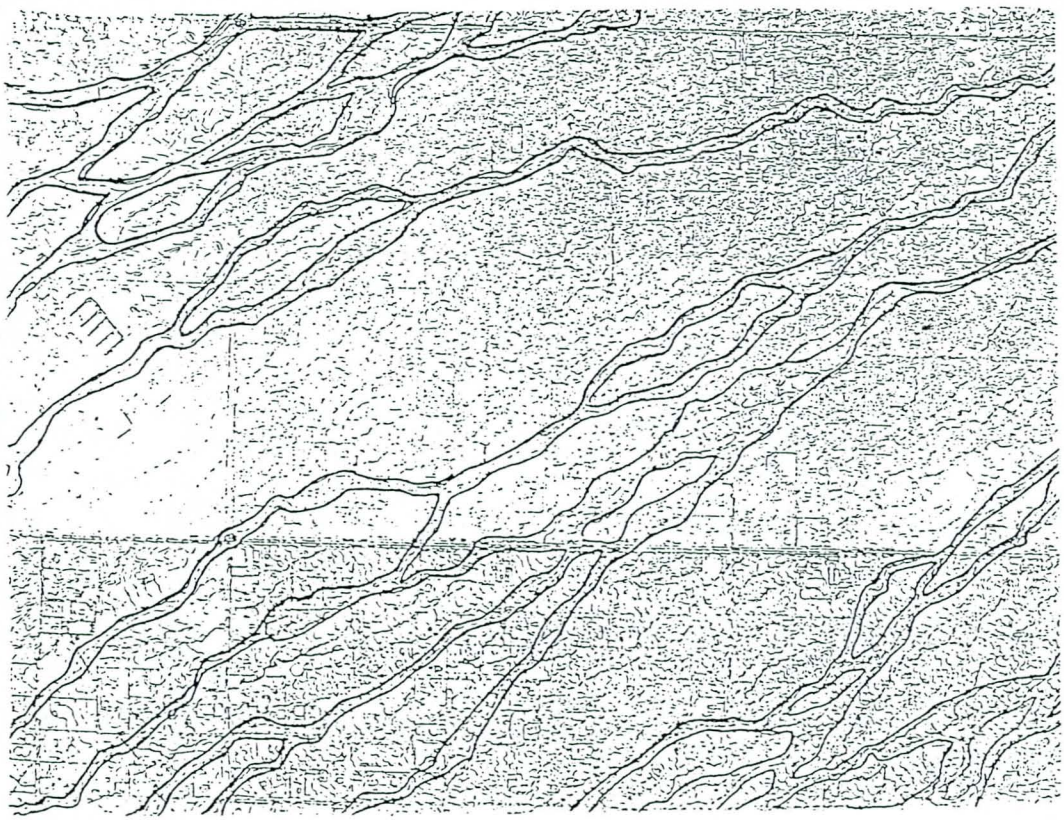
a. the application of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

30. Appeal Basis: The flow patterns of Washes 5 & 6 are not characteristic of alluvial fans which have a distinct feature, whereby the slopes in all directions from the apex are approximately the same as defined in the DMA Report.

a. Video by FCD, Cave Buttes Dike #2, Enclosure 23
b. Topo by Cities of Scottsdale and Phoenix, Enclosure 19
c. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the application of the alluvial fan model on fans 5 & 6 be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.



31. By taking and assuming a uniform contour elevation across a fan, FEMA is modeling the flow as if it is upon the fan's surface instead of being conveyed within the fan. Based upon this assumption and the relief that is present within the study area, this application of the methodology is inappropriate.

    a. FEMA 37, Appendix 2 & 5
    b. Entrenched Channels and Alluvial Fan Flooding, ASCE Conference, by Edward Mifflin, Enclosure 15

    Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

    a. the application of the alluvial fan model on this watershed be dismissed;
    b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
    c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

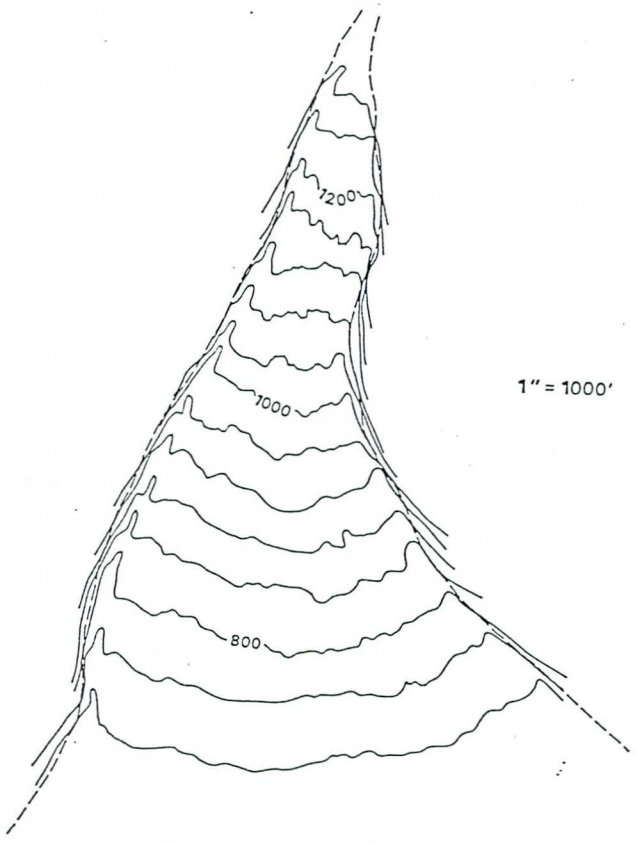


Figure 5—8. Alluvial Fan Boundaries

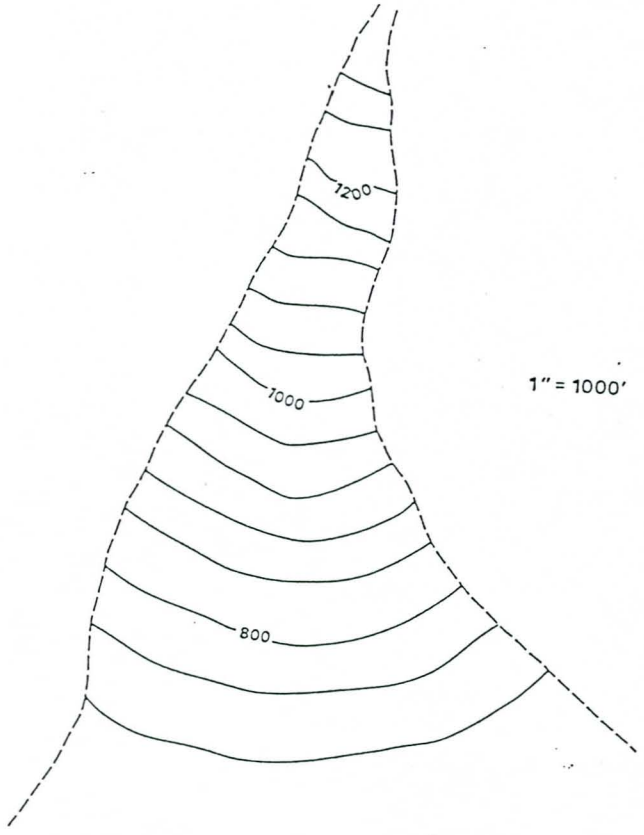


Figure 5—9. "Smooth" Contours for Width Measurements

32. Appeal Basis: The FEMA alluvial fan methodology does not reflect true flood hazards for Washes 5 & 6, nor did it take into consideration cohesive soils, the presence of large trees along the defined channels, the absence of abandoned channels with large trees, and the lack of evidence of recent lateral movement of channel bank which would indicate that the method is inapplicable to this site.

a. Video by FCD, Cave Buttes Dike #2, Enclosure 23
b. Aerial Maps of Study Area, Enclosure 9

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

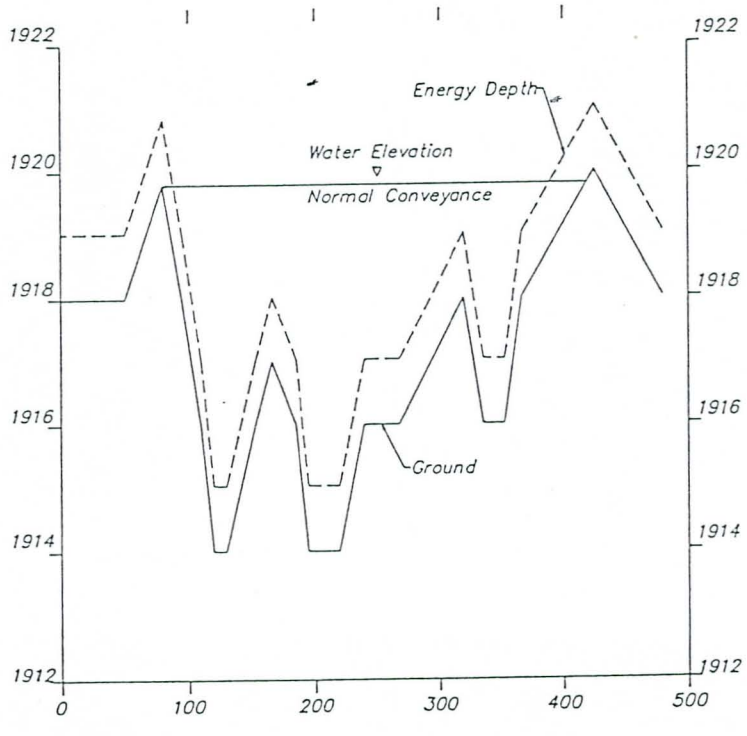
a. the application of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

33. Appeal Basis: The FEMA alluvial fan methodology does not reflect the 1 percent chance of inundation. Those areas that are in the current channel or low flow path have a higher degree of flooding from more frequent events. The flood hazards in the existing channels are greater than those in the overbank or other areas within the "fan," as defined by the FEMA methodology which assumes a consistent elevation across a specified contour designation.

a. Cross-sections by FCD, Enclosure 20
b. Entrenched Channels and Alluvial Fan Flooding, ASCE Conference, by Edward Mifflin, Enclosure 15
c. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10

Appeal Request: Based upon the provided technical evaluation which substantiates the described appeal basis, it is requested that:

a. the application of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.



34. Appeal Basis: Per USGS Water Supply Paper 2316, "Methods for delineating Flood-Prone Areas in the Great Basin of Nevada and Adjacent States," by D. E. Burkham, addresses Dawdy's methodology and the assumptions within the model. In closing, he states, "Because the basis assumptions are questionable, Dawdy's procedure appears to need further testing before it is used for flood studies in the Great Basin." Although Arizona is not in the Great Basin, we question whether the concerns raised in this paper have been addressed. In addition, the paper references other work that tends to refute assumptions within the procedure. The following reports substantiate that the subject site is not an active fan, that the assumptions within the FEMA model are not being met, and there is no documentation that the assumptions inherent in the FEMA method are applicable to this specific site and in fact based upon the following reports, the method is inapplicable.

a. USGS Water Resources Investigations Investigation Report 91-4171, Enclosure 5
b. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4
c. (CBA), Geology and Soils Study for a Nine Square Mile Area in the Northwestern Portion of the City of Scottsdale, Enclosure 6
d. (SCS), Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Enclosure 7
e. USGS Maps, Enclosure 8
f. Aerial Maps, Enclosure 9
g. Physical Geology, by Robert J. Foster, Copyright 1971
h. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10
i. Alluvial Fan Data Collection and Monitoring Study, by CH2M Hill and R. H. French, Ph.D., P.E., Enclosure 11
j. FEMA letter dated October 3, 1991, Enclosure 12
k. Methods for Delineating Flood-Prone Areas in the Great Basin of Nevada and Adjacent States, USGS Survey Water Supply Paper 2316

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the assumption that this study area is an active alluvial fan be dismissed;
b. the application usage of the alluvial fan model to Washes 5 & 6 be dismissed;
c. the preliminary FEMA floodplain delineations be dismissed for Washes 5 & 6 as invalid; and,
d. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

35. Appeal Basis: FEMA did not substantiate technical differences between areas designated as flood hazards and those that were not within the study site and designated in the proposed delineation.

a. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10
b. (SCS), Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Enclosure 7
c. Topo by Cities of Scottsdale and Phoenix, Enclosure 19
d. Cross-sections by FCD, Enclosure 20
e. Video by FCD, Cave Buttes Dike #2, Enclosure 23
f. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4

Appeal Request: Based upon the provided technical assessment which substantiates the described appeal basis, it is requested that:

a. the application of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

36. Appeal Basis: Technical discrepancies in the methodology exist in that depths become greater as the delineation proceeds downstream within the AO1 Zone, contrary to normal hydraulics.

Preliminary FEMA FIRM map 815

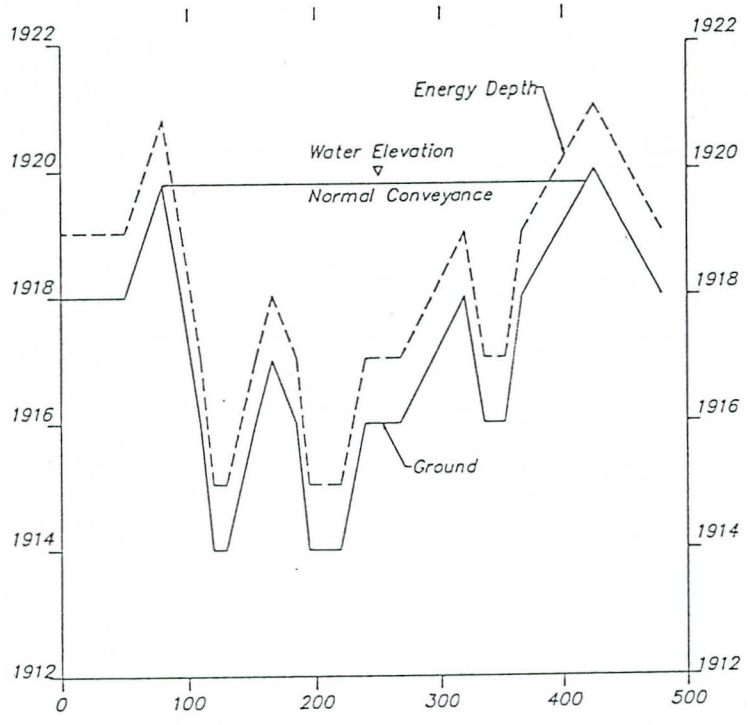
1. energy depth
2. velocity
3. total head

Section 30	NW4, Section 21	NE4, Section 21
T5N, R3E	T5N, R4E	T5N, R4E
AO1	AO1	AO1
V = 3 fps	V = 4 fps	V = 5 fps
D = .86 ft.	D = .75 ft.	D = .60 ft.

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the application of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

37. Appeal Basis: The preliminary FIS prohibits sound floodplain management by not addressing realistic depths and velocities. Developers and engineers will be referencing average depths and velocities for development standards. The confrontation and mandating development to higher depths and velocities undermines the credibility of the maps, FEMA, and local floodplain management. Conveyance corridors will not be developed and continuity of flow will not be maintained.



Local communities mandate development be done above 100-year elevation based upon normal conveyance. FEMA only requires development to the energy depth noted on the map (A01).

Appeal Request: Based upon the provided technical evaluation which substantiates the described appeal basis, it is requested that:

a. the application of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

38. Appeal Basis: Study does not prohibit development in areas subject to high flood hazards nor does it address maintaining continuity of flow. In fact, by defining average depths and velocities it promotes the filling in of washes and blocking of conveyance by stating that the flow is only a specified depth contrary to depths and velocities developed using other methods. What is the intent of defining "average depths and velocities?" The velocities cannot be used for design purpose nor can finished floors be set to average depths.

    Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

    a. the application of the alluvial fan model on this watershed be dismissed;
    b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
    c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

39. Appeal Basis: The saying, if it walks like a duck, quacks like a duck, and looks like a duck, then it must be a duck, is becoming somewhat trite. Ornithologists have spent numerous decades categorizing ducks in the order Anseriformes, family Anatidae, and have further subdivided within that family. Engineers have quantified open channel flow into steady flow and unsteady flow which is further subdivided into uniform and varied flow and unsteady uniform and unsteady varied flow. In a like manner scientists and engineers have broken alluvial fans into active and inactive, and refined the definition of potential flood hazards into 10 degrees of flood hazards. While this definition of flood hazard may need further refinement it is based on hydrologic, hydraulic, topologic, and geomorphologic parameters of these landforms. The FEMA method is based on assumptions deriving average hydraulic geometry conditions which are not substantiated by the charactierists of many alluvial fans in Arizona. There is no documentation that the assumptions inherent in the FEMA method are applicable to this specific site and in fact based upon the following reports, the method is inapplicable. While FEMA may want to use its methodology nation wide and have it uniformily accepted, hydrologic, topologic, geomorphic and other scientific and technical information tends to indicate otherwise.

a. USGS Water Resources Investigation Report 91-4171, Enclosure 5
b. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4
c. (CBA), Geology and Soils Study for a Nine Square Mile Area in the Northwestern Portion of the City of Scottsdale, Enclosure 6
d. (SCS), Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Enclosure 7
e. USGS Maps, Enclosure 8
f. Aerial Maps, Enclosure 9
g. Physical Geology, by Robert J. Foster, Copyright 1971
h. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10
i. Alluvial Fan Data Collection and Monitoring Study, by CH2M Hill and R. H. French, Ph.D., P.E., Enclosure 11
j. FEMA letter dated October 3, 1991, Enclosure 12
k. USGS Water Supply Paper 2316, Enclosure 28

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the assumption that this study area is an active alluvial fan be dismissed;
b. the application usage of the alluvial fan model to Washes 5 & 6 be dismissed;
c. the preliminary FEMA floodplain delineations be dismissed for Washes 5 & 6 as invalid; and,
d. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

40. Appeal Basis: The FEMA model assumes that fan watersheds do not contribute to the peak nor does tributary flow affect the peak. The methodology does not address this issue in setting flow depths or velocities which results in unsound floodplain management. A true assessment of the flooding potential for a site on the fan is not made. Or, by not assessing on fan drainage, the methodology is not truly defining the .01 probability of inundation for a point on the fan, which is contrary to the NFIP requirements for setting actuarial rates and sound floodplain management.

    a. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10
    b. FEMA Report, Preliminary FIS, July 9, 1991, Section 10.3, p. 192

    Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

    a. the usage of the alluvial fan model on this watershed be dismissed;
    b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
    c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

41. Appeal Basis: The application of the FEMA alluvial fan model, to Washes 5 & 6 by MBJ, was not conducted in a manner consistent with either the 1985 or 1991 FEMA 37 guidelines. Furthermore, the application of the FEMA alluvial fan model to Washes 5 & 6 was not justified as being appropriate or was it adequately documented by MBJ. Supporting documentation:

    a. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10
    b. (FEMA & MBJ), Flood Insurance Study Correspondence in Support of an Appeal for FEMA designated Washes 1-6, 6B, & 6C, February 1992, Enclosure 31
    c. FEMA 37, 1985 and 1991 Guidelines and Specifications for Study Contractors, Enclosures 13 and 14

    Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

    a. the assumption that this study is an active alluvial fan be dismissed;
    b. the application of the alluvial fan model to this watershed be dismissed;
    c. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
    d. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

42. Appeal Basis: The flow paths of the major streams below the designated apices for Fans 5 & 6 are predictable and therefore the location of the apices is not in compliance with NFIP regulations, Section 59.1, definition of an apex.

Preliminary FIS Panel 820, July 9, 1991

Appeal Request: Based upon the provided technical evaluation which substantiates the described appeal basis, it is requested that:

a. the application of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

43. Appeal Basis: FEMA's methodology is based upon probability and does not quantify or qualify an active versus inactive alluvial fan nor have a set nomenclature for defining when the methodology should be used. Draft criteria has been applied to the subject area which indicates it is not an active alluvial fan.

Alluvial Fan Data Collection and Monitoring Study, by CH2M Hill and R. H. French, Ph.D., P.E., Enclosure 11

Table 1
Characteristics of Arizona Alluvial Fans

FEMA ALLUVIAL FAN	ACTIVE ALLUVIAL FAN	INACTIVE ALLUVIAL FAN	DISTRIBUTARY FLOW SYSTEM
Radiating Channel Pattern	Radiating Changes to Sheet Flow	Tributary Drainage Pattern	Radiating Changes to Tributary
Abandoned/Discontinuous Channels	Abandoned/discontinuous Channels	Continuous Channels	Discontinuous Channels
Unpredictable Channel Location	Frequent Channel Movement	Stable Channels	Rare Channel Movement
Channel Movement by Avulsions	Stream Capture or Avulsions?	No Channel Movement	Channel Movement by Stream Capture
Channelized Flow (No overbank or sheet)	Channel Flow Changes to Sheet Flow	Channelized Flow (overbank possible)	Channel Flow and Sheet Flow
Regular Channel Geometry	Variable Channel Geometry	Regular Channel Geometry	Variable Channel Geometry
Channel Capacity = Q	Low Channel Capacity	High Channel Capacity	Variable Capacity
Cumulative Capacity Constant Downfan	Capacity Decrease Downfan	Capacity Increase Downfan	No Definite Trend
Uniform Vegetation in Floodplain	Uniform Vegetation in Floodplain	Diverse Vegetative Community	Diverse Vegetation
Uniform Topography (Low crenulation)	Uniform Topography (Low crenulation)	Topographic Relief (High crenulation)	Medium to Low Topographic Relief
Debris Flows Important	Debris Flows Possible	No Debris Flows	Minor (or no) Debris Flows
Weak Soil Development	Weak Soil Development	Strong Soil Development	Variable Soil Development
No (or buried) Desert Varnish	No (or buried) Desert Varnish	Varnished Surfaces Possible	Varnished Surfaces Possible
No Caliche	No Caliche	Caliche Horizons	Caliche Horizons Possible
No Surface Reddening	No Surface Reddening	Surface Reddening	Minor Reddening
Overall Deposition	Overall Deposition	Overall Erosion	Local Erosion and Deposition
Slope Not a Factor	Slope Decrease Downfan	Slope Variable	Slope Increase @ Apex

Appeal Request: Based upon not defining the applicability of the methodology on a scientific or engineering matrix which substantiates the described appeal basis, it is requested that:

a. the usage of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

44. Appeal Basis: Arizona Geology Report indicates that there is a good correlation between geomorphology and flooding, and that the FEMA methodology is not universally applicable to all "alluvial fans" as they are currently being applied by FEMA.

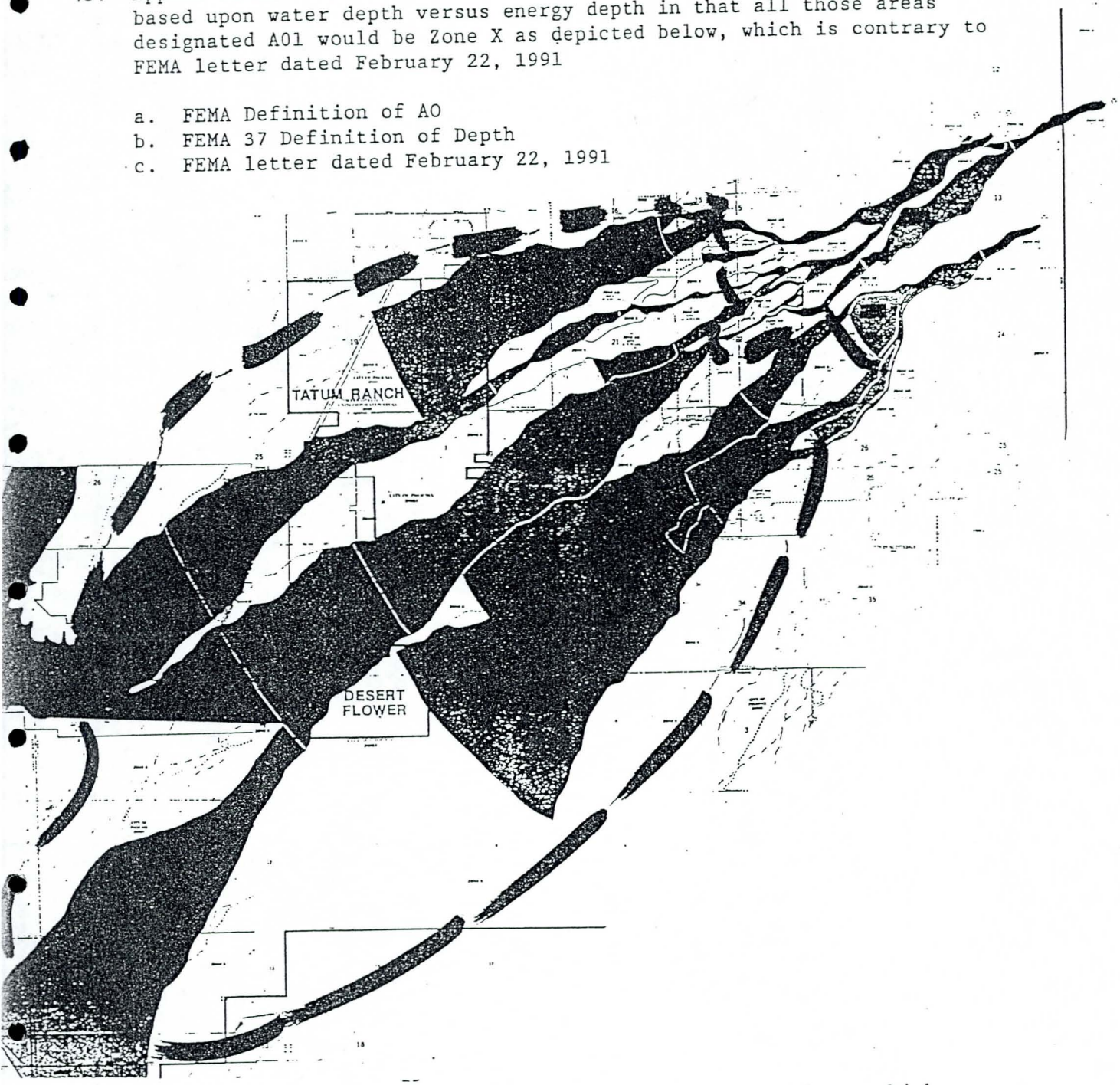
    a. Arizona Geology, Vol. 21, No. 4, Winter 1991
    b. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4
    c. (CBA), Geology and Soils Study for a Nine Square Mile Area in the Northwestern Portion of the City of Scottsdale, Enclosure 6
    d. Alluvial Fan Data Collection and Monitoring Study, by CH2M Hill and R. H. French, Ph.D., P.E., Enclosure 11

    Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

    a. the application of the alluvial fan model on this watershed be dismissed;
    b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
    c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

45. Appeal Basis: Areal extent of flooding would be different if modeled based upon water depth versus energy depth in that all those areas designated A01 would be Zone X as depicted below, which is contrary to FEMA letter dated February 22, 1991

    a. FEMA Definition of AO
    b. FEMA 37 Definition of Depth
    c. FEMA letter dated February 22, 1991



Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the usage of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

46. Appeal Basis: Soil analysis indicates that the bank soil profile is different than the center line wash soil profile contrary to the letter of MBJ of December 4, 1991.

a. Soil Testing Report, Construction Inspection and Testing, Job No. 92-4727, February 11, 1992, Enclosure 25
b. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4
c. Letter from MBJ dated December 4, 1991, Enclosure 32

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the application of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

47. Appeal Basis: The current preliminary delineation uses probability splits. Probability splits infer stability in order to maintain the same ratio of conveyance which is contrary to the assumptions within the FEMA alluvial model and not in compliance with the equation which defines the .01 percent flooding on alluvial surfaces.

    a. Entrenched Channels and Alluvial Fan Flooding, ASCE Conference, by Edward Mifflin, Enclosure 15
    b. Letter from MBJ dated December 4, 1991, Enclosure 32

    Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

    a. the application of the alluvial fan model on this watershed be dismissed;
    b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
    c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

48. Appeal Basis: Within the current study, probability splits are based upon top widths of existing channels and the assumption that the width is a function of depth which then derives a capacity split. In stable channel geometry, there is no correlation between depth, top width or conveyance. Based upon the fact that the subject site is stable, the use of top widths to define probability splits cannot be substantiated.

a. USGS Water Resources Investigations Report 91-4171, Enclosure 5
b. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4
c. Geology and Soils Study for a Nine Square Mile Area in the Northwestern Portion of the City of Scottsdale, Enclosure 6
d. (SCS), Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Enclosure 7
h. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the application of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor' floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

49. Appeal Basis: Three assumptions are used by Dawdy to support the alluvial fan methodology per FEMA 37, 1990, page A5-2. While FEMA 37 acknowledged that alluvial fans are formed over a "geologic" time the model is applied to the 100-year event which occurs within an "engineering" time scale. The presence of exisitng drainage networks, flood control improvements, streets, topography, and vegetation will influence flood flow paths over an "engineering" time scale. FEMA has not assessed the infrastructure and development within their modeling procedure and as such we question whether all the areas still have the same probability of inundation.

a. USGS Water Resources Investigations Report 91-4171, Enclosure 5
b. Topo by Cities of Scottsdale and Phoenix, Enclosure 19
c. Existing Conditions Impacting Flood Flow Paths for FEMA Designated Washes 5, 6A, 6B, & 6C, Coe & Van Loo Consultants, Inc., February 25, 1992, Enclosure 30

Appeal Request: Flow paths are not random or unpredictable in this area and use of the alluvial fan model is inappropriate; it is therefore requested that:

a. the application of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

50. Appeal Basis: The preliminary Firm Maps do not reflect FEMA methodology for channel widths downstream of the defined apices. If the methodolodgy defines a width of the channel, it should reflect a single channel width versus expanding and contracting based upon the constraints of stable channel hydraulics.

a. Preliminary FIS Panel 820, July 9, 1991, Enclosure 18
b. Entrenched Channels and Alluvial Fan Flooding, ASCE Conference, by Edward Mifflin, Enclosure 15

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the usage of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

51. Appeal Basis: The hydrology and floodplain delineation that are under appeal were prepared by Michael Baker Jr. (MBJ). Per sound engineering practices and Section 67.8.b of the NFIP, any scientific or technical review of this appeal must be done by someone other than the technical contractor who did the study which is being appealed.

    a. Hydrology from Micheal Baker Jr.
    b. Hydraulics from Michael Baker Jr.
    c. Letter from Cela Barr Associates
    d. Letter from FEMA,
    e. NFIP

    Appeal Request: Based upon the provided data analyses which substantiate the described appeal basis, it is requested that the technical and scientific review of this appeal be done by a technical review contractor other than MBJ.

52. Appeal Basis: The preliminary FIRM maps were prepared using United States Geological Survey (USGS) topographic mapping at a scale of 1 inch = 2000 feet with 10 foot contour interval. The flood hazard zone and delineation for the subject alluvial fan flooding appears to be dependent on the available map information versus geomorphic information. Where there is detailed topo FEMA has defined flood corridors. Where there is 10 foot contour there is fan flooding. The communities have obtained detailed topography of the study area for Washes 5, 6A, 6B, & 6C at a scale of 1 inch = 100 feet with 2 foot contour interval. The new topography is more detailed, is more recent, and shows some of the effects of manmade features within the study area; therefore, allowing for a more detailed floodplain delineation.

a. Topo by Cities of Scottsdale and Phoenix, Enclosure 19
b. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10
c. (CVL), Existing Conditions Impacting Flood Flow Paths for FEMA Designated Washes 5, 6A, 6B, & 6C, February 25, 1992, Enclosure 30
d. FEMA National Flood Insurance Program and Related Regulations, Revised October 1989 and October 1990

Appeal Request: The "wash corridor" floodplain delineations use recent detailed topography. The preliminary FIRM is based upon inferior data which does not show the changed physical conditions in the study area. It is therefore requested that:

a. the preliminary FIRM maps be dismissed in areas where more detailed and recent topography is available; and
b. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

53. Appeal Basis: The FEMA methodology does not address or account for infiltration and attenuation of peak discharges in entrenched upper piedmont stream reaches or in the distributary flow areas.

Appeal Request: Based upon the provided technical deficiency which substantiates the described appeal basis, it is requested that:

a. the usage of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

54. Appeal Basis: The preliminary FIS report indicates that the flood depths and velocities presented in the study were determined using FEMA methodology for analyzing areas subject to alluvial fan flooding. It is questionable whether an independent contractor using the FEMA methodology would obtain the same probability split and be able to reproduce the same delineations.

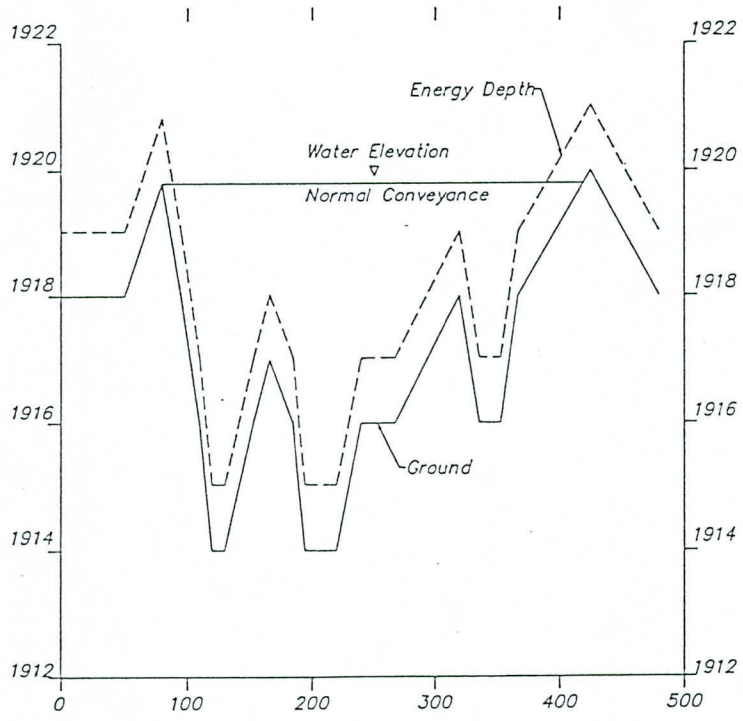
Appeal Request: Based upon the provided technical evaluation which substantiates the described appeal basis, it is requested that:

a. the usage of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

55. Appeal Basis: Flood level is related to the conveyance and slope of the channel and the flood depths and velocities vary across the channels. Using an AO Zone with an implied uniform depth and velocity across the channels is a misrepresentation of reality. To enforce such a depiction on informed landowners may cause considerable damage to the flood insurance program in the arid southwest and continue to erode the credibility of the FEMA alluvial fan method.

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the usage of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.



56. Appeal Basis: Conveyance-slope computations for several cross-sections in the "split reaches" indicate that the peak discharge must exceed the 100-year discharge to have split flow, which contradicts the assumption that top widths generate appropriate probability splits or that based upon stable channel that splits occur.

(CVL), Geomorphologic Description & Hydraulic Analysis for FEMA designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the application of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

57. Appeal Basis: Based upon the following reports, there is little evidence of much aggradation, degradation, lateral movement of stream channels, eroded channel banks or avulsions. Instead the reports and documents indicate that the system of tributary and distributary stream channels that are in place are relatively stable.

a. USGS Water Resources Investigations Report 91-4171, Enclosure 5
b. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4
c. (CBA), Geology and Soils Study for a Nine Square Mile Area in the Northwestern Portion of the City of Scottsdale, Enclosure 6
d. (SCS), Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Enclosure 7
e. USGS Maps, Enclosure 8
f. Aerial Maps, Eclosure 9
h. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10

Appeal Request: Based upon the provided technical analyses which substantiate the described appeal basis, it is requested that:

a. the usage of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA.

58. Appeal Basis: Per the FCD letter of January 15, 1991, FCD questioned the designation of Fans 5 and 6, and the breaking out of Fan 6 into 6A, 6B, and 6C. In addition FCD questioned the inclusion of the additional fan areas since they were not considered geologically active under the initial study. The additional findings within the referenced documents substantiate that this area is not an active alluvial fan.

a. FCD letter dated January 15, 1991
b. USGS Water Resources Investigations Report 91-4171, Enclosure 5
c. (WRA), Geomorphic Evaluation of the McDowell Mountains Piedmont, Enclosure 4
d. (CBA), Geology and Soils Study for a Nine Square Mile Area in the Northwestern Portion of the City of Scottsdale, Enclosure 6
e. (SCS), Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Enclosure 7
f. USGS Maps, Enclosure 8
g. Aerial Maps, Enclosure 9
h. (CVL), Geomorphologic Description & Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, Enclosure 10

Appeal Request: Based upon the provided technical evaluation which substantiates the described appeal basis, it is requested that:

a. the usage of the alluvial fan model on this watershed be dismissed;
b. the preliminary FEMA floodplain delineations be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

59. Appeal Basis: The flood zone depths and boundaries presented on the FEMA Preliminary FIRM maps dated July 1991 do not reflect existing conditions at the time the maps were prepared. Road improvements were in place or under construction which were not considered in the preparation of work maps and yet have a major influence on the flow paths for FEMA designated Washes 5, 6A, 6B, & 6C.

a. (CVL), Existing Conditions Impacting Flood Flow Paths for FEMA Designated Washes 5, 6A, 6B, & 6C, February 25, 1992, Enclosure 30
b. Topo by Cities of Scottsdale and Phoenix, Enclosure 19

Appeal Request: The area impacted by Washes 5, 6A, 6B, and 6C are not subject to random flow, but are predictable flow paths determined by established road crossings; it is therefore requested that:

a. the application of the alluvial fan for Washes 5 and 6 be dismissed;
b. the Preliminary FIRM be dismissed as invalid; and,
c. the "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

60. Appeal Basis: Per Section 76.6 of the NFIP, the communities affected request that the hydrology and hydraulics and redelineation submitted with this appeal be adopted to reflect the communities' understanding of the flood hazards, and to maintain hydraulic conveyance corridors from the headwaters to the basin outlet.

By designating the area as an alluvial fan and disregarding the submitted technical data substantiating the appeal, FEMA would effectively undermine its own credibility and that which local floodplain administrators have with elected officials and the public they serve and protect. It is imperative to point out to FEMA that the local jurisdictions have some of the best and most aggressive floodplain and stormwater management practices in the country. It is also imperative to point out that SCS, USGS, professional engineers and geologists have designated that this area is not an active alluvial fan nor is it subject to alluvial fan type flooding. The communities are not resisting the flood hazard designation or floodplain delineations based on the lack of desire to effectively manage floodplains, but rather they see fault with the methods, models, and results which would lead to unsound floodplain management and inaccurate actuarial assessment of flood hazards.

Appeal Request: The "wash corridor" floodplains (delineated as non-alluvial fan, Zone A) as prepared by the local agencies be adopted by FEMA, Enclosure 33.

MARICOPA COUNTY
APPEAL BASED ON PROCEDURAL MATTERS

1) Appeal Basis: The City of Phoenix was not kept fully informed of the study limits and boundaries. A letter from FEMA to the City of Phoenix (dated 3/27/91) includes a chronology of events. This chronology states that, in the initial coordination meeting, *all flooding sources affecting the City, including the Scottsdale Alluvial Fan and Cave Creek Wash were discussed.* It is apparent that the study areas discussed included FEMA designated Washes 1, 2, 3, 4, 5, and 6 (now 6a). Washes 6b and 6c were not included in the original study prepared by Cella Barr Associates (CBA). Even at the intermediate meeting held on February 24, 1989, washes 6b and 6c were not included in the discussion of results. According to FEMA:

An intermediate meeting is usually held following the establishment of provisional flood elevations, flood plains, and floodways. This provisional information is presented to community officials by the Study Contractor to familiarize them with the proposed study results and provide them an opportunity to identify problems and suggest alternate floodway designs. (FEMA, 1985, p. 2-21)

Washes 6b and 6c were added to the study and, since they are the result of different flooding sources, they should be considered additions to the study and are technically washes 7 and 8 respectively.

The City of Phoenix, City of Scottsdale and the Flood Control District of Maricopa County (the "Communities") were not given an opportunity to *identify problems and suggest alternate floodway designs* since the revised alluvial fan boundaries were not received until November 20, 1990, after the final meeting.

Supporting Data:

1. Federal Emergency Management Agency, *Flood Insurance Study Guidelines and Specifications for Study Contractors*, September, 1985.

2. Federal Emergency Management Agency, *Chronology of Events, Restudy and Revision of Flood Hazards*, transmitted via letter, March 27, 1991.

Appeal Request: The chronology of events demonstrates that washes 6b and 6c were added to the study area by the Technical Evaluation Contractor (TEC) following the intermediate and final meetings without communications and agreement of the City of Phoenix, City of Scottsdale and Flood Control District of Maricopa County. It is therefore, requested that:

a) the floodplain study conducted by the TEC for FEMA for washes 6b and 6c be dismissed.

b) the floodplain study conducted by the Communities be adopted as having widespread support and acceptability amongst the community.

2) Appeal Basis: The City of Phoenix was not kept fully informed of the study as it progressed nor was the City requested to provide pertinent technical data. According to FEMA:

The Study Contractor shall coordinate all information developed for the FIS with the CCO and the community, State, and Federal agencies involved in water resources problems in the study area. Community officials are to be kept advised of the progress of the study and are to have ample opportunity to provide information for the study. (FEMA, 1985 p 2-20)

Immediately after authorization of the FIS, the Study Contractor shall request in writing that the community submit pertinent data concerning flood hazards, flooding experience, plans to avoid potential hazards, and such other data as shall be deemed appropriate.....(FEMA, 1985 p 2-21)

The City of Phoenix has no records indicating that such a request was made and it is not documented in FEMA's chronology of events. The chronology of events indicates no formal contact between the Study Contractor and the City of Phoenix from the time of the initial coordination meeting (February 25, 1988) to the intermediate meeting (February 24, 1989), a period of one year, and yet FEMA states:

The Study Contractor shall make periodic contacts with community officials to keep them informed of the progress of the FIS and to solicit pertinent information. Reports shall be prepared on all contacts made with local officials that result in important decisions. (FEMA, 1985 p 2-21)

Supporting data:

1. Federal Emergency Management Agency, *Flood Insurance Study Guidelines and Specifications for Study Contractors*, September, 1985.

2. Federal Emergency Management Agency, *Chronology of Events, Restudy and Revision of Flood Hazards*, transmitted via letter, March 27, 1991.

Appeal Request: The City of Phoenix was not an active participant in the study and was not provided ample opportunity for input. It is, therefore, requested that:

a) the floodplain delineations affecting areas under the jurisdiction of the City of Phoenix be dismissed.
b) the floodplain study conducted by the Communities be adopted as having widespread support and acceptability amongst the community.

3) Appeal Basis: The study of washes 1 - 4 follow standard FEMA methodologies using the FEMA alluvial fan model. The techniques applied by the Technical Evaluation Contractor (TEC) in their revisions to the original study by CBA for washes 5 and 6 do not follow standard procedures as outlined in the Flood Insurance Study Guidelines (FEMA, 1985). Additionally, the flooding sources for washes 6b and 6c were added to the study following completion of work by CBA. Contrary to the alluvial fan methodology, the TEC assumes that certain flow splits on the floodplain surface are stable. These assumptions and methods were established by the TEC following completion of the study by CBA on March 31, 1989 and yet are not substantiated anywhere. The proposed study approach, scientific and technical principles of the study should have been discussed at the initial meeting by CBA. As stated by FEMA:

At the initial community meeting, held prior to the start of the FIS, the responsibilities of the Study Contractor include a presentation of the nature of the FIS, the areas scheduled for study, the manner in which the FIS will be undertaken, the general scientific and technical principles to be applied, and the nature of the data to be obtained and produced. (FEMA, 1985, p. 2-21)

The methods of study and areas to be studied were not discussed at the initial meeting since their author, Michael Baker, Jr. (MBJ), was not present at the community meetings and two study washes were added in the maps presented by MBJ as transmitted on October 29, 1990 to the City of Phoenix.

Supporting Data:

1. Federal Emergency Management Agency, *Flood Insurance Study Guidelines and Specifications for Study Contractors*, September, 1985.

2. Federal Emergency Management Agency, *Chronology of Events, Restudy and Revision of Flood Hazards*, transmitted via letter, March 27, 1991.

3. Michael Baker Jr., Inc., Letter to Paul Kienow with 4 exhibits, October 29, 1990.

Appeal Request: New scientific and technical principles were applied to washes 5 and 6 (6a) and new study areas, washes 6b and 6c, were added by the TEC following completion of work by CBA. It is, therefore, requested that:

a) the floodplain studies conducted by the TEC for FEMA for washes 5, 6a, 6b and 6c be dismissed.

b) the floodplain study conducted by the Communities be adopted as having widespread support and acceptability amongst the community.

4) Appeal Basis: Throughout the study, and particularly upon receipt of work maps from the Study Contractor and the TEC, the Communities have not been in agreement regarding the hydrology or study methods proposed (reference letter from FCDMC dated 4/14/89). Despite these differences, FEMA has continued in its efforts to publish these maps according to FEMA:

If the FIS produces results that are in conflict with ongoing or completed studies of adjacent communities or other existing published or unpublished data from authoritative sources, such differences must be resolved during the course of the study prior to proceeding to the next task in sequence. (FEMA, 1985, p. 2-21)

Studies by CBA's geological consultant, Water Resources Associates and an independent study by Doorn & Péwé (1991) are authoritative sources and clearly indicate the geologic characteristics of the area. These conflicts were not resolved, yet, according to FEMA:

If the FIS produces results that are in conflict with ongoing or completed studies of adjacent communities or other existing published or unpublished data from authoritative sources, such differences must be resolved during the course of the study prior to proceeding to the next task in sequence. (FEMA, 1985, p. 2-21)

No report will be accepted without such agreement or consultation. (FEMA, 1985, p. 2-22)

The final community coordination meeting on October 24, 1991, should not have been held until such conflicts were resolved and before proceeding to the 90-day appeal period.

Supporting Data:

1. Federal Emergency Management Agency, *Flood Insurance Study Guidelines and Specifications for Study Contractors*, September, 1985.

2. Federal Emergency Management Agency, *Chronology of Events, Restudy and Revision of Flood Hazards*, transmitted via letter, March 27, 1991.

3. Flood Control District of Maricopa County, Letter to Jim Morris at ADWR with concerns about alluvial fan approach, April 14, 1989.

4. Cella Barr Associates, et al, *Geology and Soils Study for a Nine Square Mile Area in the Northwestern Portion of the City of Scottsdale, Arizona*, August, 1988.

5. Doorn & Péwé, *Geologic and Gravimetric investigations of the Carefree Basin, Maricopa County, Arizona*, 1991.

Appeal Request: There is scientific and technical data available from authoritative sources which is in direct conflict with the approach used by MBJ in their study. It is, therefore, requested that:

a) the floodplain delineations under the jurisdiction of the City of Phoenix and Maricopa County be dismissed.

b) the floodplain study conducted by the Communities be adopted as having widespread support and acceptability amongst the community.

5) Appeal Basis: Inadequate technical supporting data has been provided to support the decision-making process throughout the study. In a letter dated September 9, 1991, pertinent technical data was requested by the firm of Coe & Van Loo (CVL) for washes 5, 6a, 6b and 6c. A further letter was sent by CVL dated November 13, 1991, requesting a copy of a report or other documents to substantiate the study. A response letter by Michael Baker, Jr., Inc. (MBJ) transmitted explanations to the questions posed and a reference to a letter sent to the City of Phoenix, dated October 29, 1990.

The information provided was not documented during the course of the study, as would be good engineering practice, but following study completion. The supporting data is inadequate to support the study conclusions and no site photographs were provided showing how decisions regarding flow splits were made. However, according to FEMA:

Because FISs form the basis of Federal, State, and local regulatory and statutory enforcement mechanisms and are subject to administrative appeal and litigation, it is extremely important that all administrative processes and technical decisions are fully recorded and documented. (FEMA, 1985, p. 2-22)

...the Study Contractor must maintain an orderly file which documents the coordination activities and the technical decisions made during the course of the study. This is especially important in areas where nonstandard approaches are taken and where engineering judgment plays a significant role in decisions. (FEMA, 1985, p. 2-22)

The inability to produce this documentation is contrary to the guidelines as follows:

As a general guide, FIA should be able to completely and fully retrace the steps and decisions made during the study with the documentation contained in the study file maintained by the Study Contractor. Documentation should be a continuous effort throughout the conduct of the study. (FEMA, 1985, p. 2-22)

(Where) *Unusual conditions, necessitating departure from conventional methodologies, exist in the study area.*

> *Document all procedures necessitated by unusual conditions, citing references and presenting calculations and associated area. Use handwritten or coded comments in computer printouts to clarify unusual modeling situations. Include detailed printouts, channel cross-section plots, and photographs as aids in explaining unusual situations or decisions that require departure from normal procedures. Reference all communications with appropriate officials authorizing unusual procedures.* (FEMA, 1985, p. 5-4)

In the case of washes 5, 6a, 6b and 6c, a non-conventional methodology was applied rather than the standard FEMA alluvial fan model. The justification for this deviation from the norm should be well documented.

One such instance occurs when unusual situations exist in the study area requiring departure from, or modification to, the application of standard FIS methodologies. Complete documentation of all assumptions, methodologies, and deviation from standards is required by good engineering practice. (FEMA, 1985, p. 5-4)

Supporting Data:

1. Federal Emergency Management Agency, *Flood Insurance Study Guidelines and Specifications for Study Contractors*, September, 1985.

2. Federal Emergency Management Agency, *Chronology of Events, Restudy and Revision of Flood Hazards*, transmitted via letter, March 27, 1991.

3. Coe & Van Loo Consultants, Inc., Letter to FEMA requesting study data, September 9, 1991.

4. Coe & Van Loo Consultants, Inc., Letter to FEMA requesting supporting documentation, November 13, 1991.

5. Michael Baker, Jr., Inc., Transmittal letter to Coe & Van Loo with technical data for washes 5, 6a, 6b and 6c, September 26, 1991.

6. Michael Baker, Jr., Inc., Letter to Coe & Van Loo with an explanation of study procedure and response to CVL letter dated November 13, 1991, December 4, 1991.

Appeal Request: Documentation of the decision making process through the study is both inadequate and unavailable and study methods have not been justified, making an appeal response difficult. The methods used are unorthodox and should be fully traceable. It is, therefore, requested that:

a) the floodplain study conducted by the TEC for FEMA for washes 5, 6a, 6b and 6c be dismissed.

b) the floodplain study conducted by the Communities be adopted as having widespread support and acceptability amongst the community.

6) Appeal Basis: At project inception, Cella Barr Associates (CBA) was the acting Study Contractor (SC). Following completion of the work maps, and transmittals to the Communities on April 13, 1989, CBA ceased to provide technical input to the study, although remaining under contract to FEMA. MBJ, the Technical Evaluation Contractor (TEC) should only have served the role of reviewing and adjusting work by CBA, the designated SC. It is clear that, while FEMA has continued to call CBA the SC, the work prepared by CBA was dismissed as inadequate by the TEC and the TEC proceeded to reevaluate all study areas on the basis of new hydrology and boundaries. This relationship is illustrated in a letter from MBJ to the City of Phoenix dated October 29, 1990. MBJ states, *After identifying those 13 apexes, we delineated the boundaries of areas subject to flooding...*, MBJ conducted a field trip from August 20 to 23, 1990 to confirm their boundary assumptions. FEMA states:

Following submittal of the draft FIS and other items, the study will undergo review and processing for publication by FIA Technical Evaluation Contractors (TECs). The TECs will prepare preliminary FIS reports and maps for Study Contractor review, community review, and for the final community meeting. Prior to the final meeting, the TECs will maintain working level contact with the Study Contractors to resolve questions that arise during the review. (FEMA, 1985, p. 2-24, 1991, p. 12-1A)

At the start of the study the Study Contractor (SC) was Cella Barr Associates and the Technical Evaluation Contractor (TEC) Michael Baker. This relationship changed after the TEC adopted revised hydrology. Since that time the TEC has been responsible for all activities, effectively removing the SCs and TECs responsibilities for independent reviews.

The SC and TEC relationship has been established specifically to allow for a review from an independent source with concurrence obtained by both parties before preparation of final maps. This check and balance system was not provided in this study since CBA does not claim to be the author of the final product. There is no correspondence to suggest that CBA is in agreement with the final study results.

Supporting Data:

1. Federal Emergency Management Agency, *Flood Insurance Study Guidelines and Specifications for Study Contractors*, September, 1985.

2. Federal Emergency Management Agency, *Chronology of Events, Restudy and Revision of Flood Hazards*, transmitted via letter, March 27, 1991.

3. Michael Baker Jr., Inc., Letter to Paul Kienow with 4 exhibits, October 29, 1990.

Appeal Request: Michael Baker, Jr., Inc. has been acting as the effective" Study Contractor and Technical Evaluation Contractor for this study, thereby eliminating a system designed to provide both quality control and "checks and balances." It is, therefore, requested that:

a) Michael Baker, Jr., Inc. be removed from further review of this flood insurance study including this appeal.

b) the floodplain study conducted by the TEC for FEMA for washes 5, 6a, 6b and 6c be dismissed.

b) the floodplain study conducted by the Communities be adopted as having widespread support and acceptability amongst the community.

7) Appeal Basis: At the start of any Flood Insurance Study the study limits and fee negotiations are discussed at the "Initial Time and Cost Meeting." The "Initial Time and Cost Meeting" for this study was held on July 2, 1987. On February 25, 1988 the "Initial Community Coordination Meeting" (CCO) was held during which the areas of study are typically discussed with each of the communities' designated Chief Executive Officers (CEO). Following the initial CCO a public notice was placed in the Arizona Republic on March 10, 1988 (copy attached). That announcement indicates the study limits which in this case is described as "six (6) major washes in North Scottsdale." According to FEMA:

Immediately after executing the contract, an announcement shall be placed by the Study Contractor in a prominent local newspaper stating that a FIS is to be conducted and that information concerning the FIS may be forwarded to the Chief Executive Officer (CEO) of the community.... (FEMA, 1985, p 2-20)

While the advertisement was placed, it clearly does not define the six (6) washes as being within the jurisdiction of the City of Phoenix, thereby not allowing adequate input from the public affected by the washes impacting portions of Phoenix or unincorporated Maricopa County. In addition only six washes are mentioned. Two washes were added after the placement of the advertisement and, while the two washes added are from independent watersheds, they were designated as Washes 6B and 6C, whereas they are technically Washes 7 and 8.

The Study Contractor shall participate in coordination meetings with community officials and appropriate Federal and State officials as required by the CCO. Normally, three formal coordination meetings are held with the community.... (FEMA, 1985, p 2-21)

While the City of Phoenix was represented at each of the three formal coordination meetings, representation was provided for other study areas within the City of Phoenix. Since the six washes denoted in the advertisement were in "North Scottsdale" they were of apparently little interest to the City of Phoenix until the study limits were later expanded to include Washes 6B and 6C (not until October 29, 1990). Correspondence from the City of Phoenix clearly indicates their concerns over the inclusion of these study areas.

Supporting Data:

1. Federal Emergency Management Agency, *Flood Insurance Study Guidelines and Specifications for Study Contractors*, September, 1985.

2. Federal Emergency Management Agency, *Chronology of Events, Restudy and Revision of Flood Hazards*, transmitted via letter, March 27, 1991.

3. Public Notice, *Intent to Study*, March 10, 1988.

4. City of Phoenix, _____.

Appeal Request: The sequence of events indicates that Washes 6B and 6C were not included in the initial study and that it was not clearly stated that any of the washes to be studied were within the City of Phoenix or unincorporated Maricopa County. The public and the City of Phoenix were not alerted to this situation until late in the study process thereby not allowing for proper public involvement. It is therefore requested that:

a) the floodplain study conducted for FEMA Washes 6B and 6C be dismissed.

b) all floodplains which lie within the communities of the City of Phoenix and unincorporated Maricopa County be dismissed.

c) the floodplain study conducted by the Communities be adopted as having widespread support and acceptability amongst the community.

8) Appeal Basis: The City of Phoenix was not kept actively involved in the Flood Insurance Study review process from the study's inception. City of Phoenix staff are certain that they would have informed local landowners of the study's impacts and would have voiced stronger objections at project start, if the study limits and its effects had been thoroughly understood. At the study's start it was not clear to City staff that the "six (6) major washes in North Scottsdale," as defined in the Legal Notice published in March 10, 1988, were to have an impact on the City of Phoenix, or that the study was to be performed using the FEMA alluvial fan model. Not until the intermediate community coordination meeting held on February 24, 1989 did the floodplain effects of Washes 5 and 6 become clear. Even at that point, Washes 6B and 6C were not included in the study. According to FEMA:

...adequate consultation with the community officials shall be assured. (FEMA, 1990, Part 66.1)

(c) The Administrator or his delegate shall:

(1) Specifically request that the community submit pertinent data concerning flood hazards, flooding experience, plans to avoid potential hazards, estimate of historical and prospective economic impact on the community, and such other appropriate data (particularly if such data will necessitate a modification of a base flood elevation).

(2) Notify local officials of the progress of surveys, studies, investigations, and of prospective findings, along with data and methods employed in reaching such conclusions; and

(3) Encourage local dissemination of surveys, studies, and investigations so that interested persons will have an opportunity to bring relevant data to the attention of the community and to the Administrator. (FEMA, 1990, Part 66.1)

It is stated above that local officials will be notified of the nature and purpose of the study, the areas involved, the manner in which the study shall be undertaken and the general principles to be applied. As shown above, the areas of study were not clearly defined at project start and the study limits were expanded by MBJ. The nature and purpose of the study was not clear to City of Phoenix staff members, since the study was commissioned by the City of Scottsdale and appeared to remain within Scottsdale's jurisdiction.

The manner in which the study was undertaken and the general principles applied changed markedly after the TEC, MBJ assumed responsibility for the study's completion. While the FEMA alluvial fan methodology was applied, it was applied in a manner not described in the Flood Insurance Study Guidelines and inconsistent with the fan model theory. Despite these changes to the original contract study area and scope, the City of Phoenix was not notified in writing of the proposed changes. A reference by carbon copy is insufficient notification and illustrates FEMA's misunderstanding of the appropriate community coordinator.

Supporting Data:

1. Federal Emergency Management Agency, *National Flood Insurance Program and Related Regulations*, 1986, Revised 1990.

2. City of Phoenix, Letters of Correspondence with FEMA.

3. City of Phoenix, Letter to Mr. John Matticks of FEMA, February 12, 1991.

Since the study area did not appear to extend into the City of Phoenix corporate limits the community had no pertinent data to submit regarding historical flood hazards as noted above. The prospective economic impact could not be evaluated since no floodplains were defined as extending into Phoenix at the project start.

The exclusion of Washes 6B and 6C from the initial study, in particular, eliminated much of the recent hydrologic, hydraulic and floodplain studies conducted for the Tatum Ranch development. The inclusion of Tatum Ranch into the study area was not evident until the October 29, 1990 study was forwarded by FEMA's Technical Evaluation Consultant (TEC) Michael Baker, Jr. (MBJ).

According to FEMA:

> *(e) Before the commencement of an initial Flood Insurance Study, the CCO or other FEMA representative, together with a representative of the organization undertaking the study, shall meet with officials of the community. The state coordinating agency shall be notified of this meetings and may attend. At this meeting, the local officials shall be informed of (1) the date when the study will commence, (2) the nature and purpose of the study, (3) areas involved, (4) the manner in which the study shall be undertaken, (5) the general principles to be applied, and (6) the intended use of the data obtained. The community shall be informed in writing if any of the six preceding items are or will be changed after this initial meeting and during the course of the ongoing study.* (FEMA, 1990, Part 66.5)

Appeal Request: Correspondence in files maintained by the City of Phoenix and Flood Control District of Maricopa County and the Legal Notice of study commencement illustrate that the study of six (6) washes did not originally intend the study limits to extend within the City of Phoenix's jurisdictional boundaries. In addition, the technical basis for the study changed without any of the communities being informed of the changes in writing. It is therefore requested that:

a) the floodplain studies for all flooding sources affecting the City of Phoenix be dismissed.

b) the floodplain study conducted by the Communities be adopted as having widespread support and acceptability amongst the community.

ATTACHMENT D
LIST OF ABBREVIATIONS

CAP	Central Arizona Project
CBA	Cella Barr Associates
CCO	Community Coordination Officer
CEO	Chief Executive Officer (for Communities)
Communities	Flood Control District of Maricopa County, City of Phoenix, and City of Scottsdale acting jointly together with the support of local landowners and engineers
CVL	Coe & Van Loo Consultants, Inc.
DFA	Distributary Flow Area
FCDMC	Flood Control District of Maricopa County
FEMA	Federal Emergency Management Agency
FIA	Flood Insurance Administration
FIS	Flood Insurance Study
MBJ	Michael Baker Jr.
SC	Study Consultant
SCS	Soil Conservation Service
TEC	Technical Evaluation Contractor
USGS	United States Geological Survey
Washes 5 & 6	FEMA designated Washes 5, 6A, 6B, & 6C
WRA	Water Resources Associates

ATTACHMENT E

Work Maps and Preliminary Flood Maps submitted under seperate cover

ATTACHMENT F

1. Water Resources Associates, Inc., Sensitivity Analysis of Reata Pass Hydrology, Scottsdale, AZ
2. Frequency Analysis of USGS Gauge Data by FCDMC
3. Hydrologic Review of FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992, by Coe & Van Loo Consultants, Inc.
4. Water Resources Associates, Geomorphic Evaluation of the McDowell Mountain Piedmont
5. USGS Water Resources Investigations Report 91-4171
6. Cella Barr Associates, Inc., Geology and Soils Study for a Nine Square Mile Area in the Northwestern Portion of the City of Scottsdale
7. Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties
8. USGS Topo Maps of Cave Creek/Camp Creek Area
9. Aerial Maps of Study Area
10. Coe & Van Loo Consultants, Inc., Geomorphologic Description and Hydraulic Analysis for FEMA Designated Washes 5, 6A, 6B, & 6C, February 1992
11. Alluvial Fan Data Collection and Monitoring Study, by CH2M Hill and R. H. French, Ph.D., P.E.
12. FEMA letter dated October 3, 1991
13. FEMA 37, 1991 Guidelines and Specifications for Study Contractors
14. FEMA 37, 1985 Guidelines and Specifications for Study Contractors
15. Entrenched Channels and Alluvial Fan Flooding, by Edward Mifflin, p. 28; ASCE; Hydraulis/Hydrology of Arid Lands, 1990
16. Flood Frequency Estimates on Alluvial Fans, by Dawdy, November 1979
17. Alluvial Fan Flooding Methodology, an Analysis, DNA Consulting Engineers, October 1985
18. Preliminary FIS Panel 820, July 9, 1991
19. Topo from Cities of Scottsdale and Phoenix
20. Cross-sections of Study Site - Topo in Study Area
21. NFIP National Flood Insurance Program and Related Regulations, Revised October 1989 and October 1990
22. USGS Slope Map for Cave Creek Area
23. Video by FCD, Cave Buttes Dike #2
24. Downstream Hazard Classification Guidelines by USBR, 1988
25. Soil Testing Report, Construction Inspection and Testing, Job No. 92-4727, February 11, 1992
26. Preliminary FIS, July 9, 1991, Section 10.3, p. 192
27. Arizona Geology, Vol. 21, No. 4, Winter 1991
28. Methods for Delineating Flood-Prone Areas in the Great Basin of Nevada and Adjacent States, USGS Water-Supply Paper 2316, 1988
29. USGS Professional Paper 252, 1953
30. Existing Conditions Impacting Flood Flow Paths for FEMA Designated Washes 5, 6A, 6B, & 6C, Coe & Van Loo Consultants, Inc., February 25, 1992
31. Flood Insurance Correspondence in Support of an Appeal for FEMA Designated Washes 5, 6A, 6B, & 6C; February 1992
32. Letter from Micheal Baker Jr. dated Dec 4, 1991
33. Work Maps and Preliminary FIS indicating the "wash corridor" floodplains (designated as non-alluvial fan, Zone A)