Alluvial Fan Task Force

California Department of Water Resources Project

Minutes Plenary Meeting #3
Friday, February 8, 2008
Los Angeles County Fire Station #129 Training Building
42110 6th St., Lancaster, CA 93534
Lancaster, CA

Members Present: Riverside County Supervisor Marion Ashley, San Diego County Supervisor Bill Horn, Los Angeles County Supervisor Michael Antonovich, San Bernardino County Supervisor Paul Biane, Paul Novak, Danielle Borish, Ed Bortugno (for Rebecca Wagoner), Theodore Masigat (for Tammy Conforti),Mike Fox, Rick Iger, Georgia Celehar, Dusty Williams, Chris Stone, Sara Agahi, Paul Quill, Dale Casey, Tom Davis, Tom Scott, Joan Taylor, Norman Meek, Stephanie Pincetl, Brain Moore (for Ali Sahabi), Kathleen Webb, Tom O'Keefe, Marty Teal, Ralph Wagner, Eric Shamp, Scott Steinmetz, Lee Reader, John McCarthy, Mark Grey, Sergio Vargas, Dave Mlynarski

State and Federal Representatives Present: Ray Lenaburg, Ricardo Pineda, Mark Stuart, Stephan Lorenzato, Pete Sorenson, Chris Adams, Maria Lorenzo-Lee

Technical Consultants Present: Susan Lien Longville, Susan Carpenter, Cameron Barrows, Bo Cutter, Doug Hamilton, Massoud Rezahkani, Tom Spittler, Jeremy Lancaster, Lisa Pierce, Boykin Witherspoon, Gigi Hanna

Members Absent: Kern County Supervisor Jon McQuiston, Tom Davis, Ali Sahabi, Vana Olson, Ray Torres, Mark Pisano, Duane Young

Technical Consultants Absent: Suzie Earp, Lynn Merrill**,** Bill Short

State and Federal Representatives Absent: Mike Anderson, Tammy Conforti, Steve Cowdin, Dave Gutierrez, Greg Krzys, Rebecca Wagoner.

Others Present: Mekbib Degaga, Chris Champine, Dustin Steiner, Terry Rogers, George Ribble, Sean Carlson.

Meeting called to order: at 9:30 a.m. by AFTF Facilitator, Susan Carpenter.

Welcome:

- Meeting Host, Los Angeles County Supervisor Michael Antonovich

Meeting Theme: *Mitigating for sustainable development and evaluating proposed projects on alluvial fans*

Susan Carpenter asked the group to peruse an "Agreements in Principle" list for what a model ordinance for sustainable, flood safe development on alluvial fans should include. These principles were based on comments from participants in previous meetings about issues to consider during the task force's deliberations. Each table was given a score sheet and asked to mark each principal, indicating whether the entire table would agree to the principle or agree with minor modifications. For those principles where there was no agreement, they were asked to skip the principle and continue with the list. The principles, and the # of tables (out of 8 tables total), in agreement without modification were:

1. Be tailored to all levels of development specified on local General Plans (individual property owners, small parcels and master developments). 4 Tables
2. Define a science-based, legally defensible method for assessing the build-ability of an alluvial fan property. 2 Tables
3. Encourage multi-disciplinary, watershed-based partnerships between property owners, local/state/federal agencies, and NGO's. 5 Tables
4. Include an acceptable analytical tool to identify active fans, behavioral characteristics and downstream implications. 2 Tables
5. Include a methodology to calculate the 1% (and .5%) chance of flood (with and without post-fire implications (consider hazard matrix with numeric values weighed on case-by-case basis). 2 Tables
6. Include local methods to communicate flood risk and tools for flood risk disclosure and notification. 7 Tables
7. Clearly define the requirements and predictable outcomes for property owners (consider CEQA-type checklist). 1 Table
8. Include a financial plan for capital costs of flood protection and on-going costs of operation and maintenance. 4 Tables
9. Be implemented and integrated with existing local plans. 3 Tables
10. Address wildfire protection. 2 Tables
11. Address the cumulative effects of hydro-modification from developments and the downstream impacts. 2 Tables
12. Evaluate future conditions. 3 Tables
13. Address the implications of seismic activity (earthquakes). 2 Tables
14. Consider the implications of climate change on alluvial fans including water supply reliability. 2 Tables
15. Address any foreseeable public safety issues for the community in which development occurs. 3 Tables

Susan Carpenter said that revisions would be made, based on the group's input and that these principles are designed to be strategic to give those writing the model ordinance

guidance and Susan Longville encouraged members to use the member website to provide any further input.
Susan Carpenter said that the process will be consensus driven, but if preponderance does not support a particular principle, the final documents will provide a minority statement to indicate the disagreement.

Panels/Presentations: (All PowerPoint presentations are available to participants on the password-protected AFTF website at http://www.alluvialfantaskforce.info Individuals needing a new passwords or having trouble with their password should contact ghanna@csusb.edu)

1. Doug Hamilton, P.E. of Exponent, presented a PowerPoint: Mitigation Measures for Sustainable Development on Alluvial Fans.

As an introduction, Hamilton provided a history of how flooding regulations came to be, starting with flooding in the 1960s, which prompted The 1968 National Flood Insurance Program:

> Language in those initial documents did not include discussion of mudslides, but large storms in 1969, and their resultant mudslides, were the impetus to the "mudslide amendment" to the NFIP, expanding the definition of flood from an inundation of water to also include inundation of mudslide caused by an accumulation of water on or below the ground. Language was further refined in 1976 to "mudslide (i.e. mudflow)" to distinguish a mudslide from a landslide. (The distinction was important because flood insurance was far less costly than other forms of insurance).
> About this time FEMA began mapping flood hazards on alluvial fans and work began on new floodplain management ordinance for alluvial fans, efforts that helped communities regulate development and also require people to purchase flood insurance.
> The NFIP regulations were again amended in 1989, to define alluvial fan flooding as: "flooding occurring on the surface of an alluvial fan or similar land form which originates at the apex and is character by high velocity flows, active processes of erosion sediment transport deposition and unpredictable flow paths." The section, 65.13 of the regulations also defined the requirement to remove an area from the "alluvial Fan Flood" zone, is to build a flood control facility designed to carry all the water from the apex of the fan. Determining the efficacy of a particular flood control facility requires an engineering assessment acceptable to FEMA, and it must consider fire, sediment and movement of debris.
> (Current discussions about regulating development within an alluvial fan need to be consistent with that federal regulation, he said, and elevating the property is not sufficient to allow building. The only option in this case would be to get the FEMA flood map changed).
> In 1999, FEMA adopted guidelines determining flood hazards on Alluvial fans and the only major discussion about the issue since then is the Alluvial Fan Task Force, he said.

Regarding mitigation on fans, Hamilton said there are only four choices—avoidance, structural flood control measures, multi-objective projects or remapping the flood zone—and provided examples of each:

- Avoidance—not putting houses or people there;

Ex: Snow Creek in the San Jacinto area alluvial fan. A steep composite fan with active channels.

- Structural Flood Control Measures- dams, basins, etc.
- Multi-Objective projects, which combine
  - Flood protection
  - Preservation/enhancement of existing habitat functions
  - Groundwater recharge
  - Recreation

  EX: San Sevaine Wash in San Bernardino County, 4.5 square miles where levies and basins slow down floodwaters/debris, allowing percolation while protecting nearby homes.

  EX: 1,000 Palms Wash in Palm Desert in a traditional active (100 percent) fan area created below hills formed by the San Andreas Fault. A residential development was designed with green areas—ball parks and golf courses—to meet flood control requirements (all the water from the apex of a fan) while providing recreational opportunities. Designed to reproduce the natural flow paths. When flooding occurs, the grass has strong enough erosion resistance. After a flood in 2005, the golf course had 8" of sediment, but it stayed in the channel.
- Remapping the existing hazard flow to show the actual hazard.

There are mitigation strategies that don't work, such as those found in Cable Creek Canyon in Devore. A fire in 2003, then storms shortly afterward proved the inadequacy of the levies used for flood control; people died in the massive flooding that followed.

He added that there is not a clear cut way of mitigating for fire except perhaps recognizing how bad it can get after a fire and then go from there. If you're talking about a large flood a year after a fire, there aren't a lot of flood control facilities that can handle that. Look at historical information, character of land surface in analysis.

2. Kathleen Gross, Senior Hydrologist, Maricopa County (AZ) Flood Control and Jonathan Fuller, a consulting geomorphologist work wing with the flood control district, presented a PowerPoint: Methods of Alluvial Fan Delineation and Lessons Learned by the Flood Control District of Maricopa County, AZ

They provided Maricopa County statistics: in south central Arizona, comprising 9,200 square miles of land (the 14th largest county in the U.S.), with 3.7 million residents, growing by 100,000/ year. The County includes 25 communities, with the Flood Control District (FCDMC) for 12 of the 25 communities, as well as the unincorporated area.

They discussed Maricopa County alluvial fan characteristics (significant differences between their fans and others in Arizona and in California):

- Low slopes
- Water flood dominated (rather than debris flow dominated)
- Located away from the mountain front
- Limited aerial extent (they are small)
- Relatively small peaks
- Not a lot of vegetation
- Low flood volume
- Transitions to sheet flow
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Then they discussed the history of fan delineation in Maricopa County:

- There were several Alluvial Fan Floods in the 1970s, but outside of Arizona, which led to FEMA adopting its Fan Method in 1979.
- Alluvial fan delineations began in Arizona in the early 1980s, which caused some discomfort as floodplain managers and others wondered what the delineations meant and how they would be used.
- Then the National Research Council Report in 1996 created a three-stage method for assessing flood hazards on alluvial fans.
- Arizona Adopted and codified that method in its *Piedmont Flood Hazard Assessment Manual* (PFHAM), produced in 1997.
- In 2002, the FEMA Guideline –Appendix G also set forth a similar three-stage method for assessment:
    - The three-stage NRC/PFHAM/FEMA method of fan delineation:
        1. Is it an alluvial fan?
            - Landform delineation
            - If not a fan, use other techniques
        2. Is it an active alluvial fan?
            - Stable/Unstable portions of alluvial fans
            - Key characteristic: flow path uncertainty
            - Geologic, field and historic data
        3. Fan floodplain delineation, using available technology.
            - Available Methodologies
                - FEMA Fan Model-Hydraulics-geomorphic
                - 100-year Floodplain (FIRM)

Whereas FEMA regulates all of Maricopa's Fan zones in the active area as unnumbered Zone A, the county instituted different levels of hazards within Zone A. They include:

- Alluvial Fan High Hazard (Active, unstable) = AFHH greatest instability
- Alluvial Fan Unknown Flow Distribution (Transition) – AFUHD downstream from highest hazard areas
- Approximate Alluvial Fan Floodway (Flow Corridors) =AAFF, from a planning perspective made sense not to block of an entire fan
- Alluvial Fan Zone A (Sheet) = AFZA, extensive sheet flows in this area.

- Riverine Zones (Inactive and Stable) = AE

The delineation is acceptable to FEMA, allowing the county to develop work maps with these delineations marked as "administrative flood zones" with the county's terms, making it a very effective flood management tool for the county.

To manage these sub-zones the PFHAM created, the county has rules. In the FEMA AO zones, Maricopa County requires:

- elevated structures, one foot above regulatory water surface level for lowest floor;
- Required to provide conveyance;
- Enforced via drainage regulations, they are required to maintain flow exit and entrance points (flow rate and character must remain the same);
- Require erosion control;
- Everyone subject to flood insurance.

Under the PFHAM Floodplain Delineations, Active Alluvial Fans=Floodways and are no-build zones. If there is a desire to building, developer must:

- Provide structural solutions
- Mitigate flood hazard
- Provide an engineering report and analysis (which could result in removal of floodplain/insurance requirement)

Nevertheless, the county does not allow homes to be constructed in areas it considers flood zones until FEMA makes its determination.

On Inactive Fans, those delineated thusly:

- Sheet flow areas (AFZA)
- Approximate Floodway (AAFF)
- Riverine Floodplain (A, AE)

Maricopa County requires:

- Elevation on fill; potential discharge must be identified
- Local floodway revisions (with engineering back-up). Reasonable modification is allowed because these are not formal FEMA floodways.
- LOMR
- Erosion control

If there is a desire to develop on a delineated alluvial fan, the developer has two choices to mitigate: structural (basins, channels and dams) and non-structural (using open space for golf courses, which can be impractical for large fans).

"We've told developers: if you want this area developed, there is going to be a price."

The County's future needs and direction include:

- Fan-specific development standards and engineering guidelines;

- Quantification of development impacts to determine of encroachment is allowable in active areas, and what kind of standards needed?
- Acceptable sediment methodologies.
- Consideration of range of return periods, rather than limiting to 100-year event.
- Documentation standards—what goes into an engineering report.
- Design on how to fit piecemeal development into the standards, and distinguish requirements between a single lot and a master planned community.
- Education for developers and floodplain managers, using cross-pollination of expertise between geologists and engineers.

Currently the Flood Control district is revising the PFHAM to quantify stability through field characteristics, adding engineering applications to help define where true hazards are; and adding a composite analysis, using geomorphic, geologic and hydrologic data to get more robust results.

The conclusions they've made are:

- Any methodology needs to be flexible because of difference between fans.
- The three-stage method avoids over and under design
- Local flood zone designations are possible and they aid in our regulation of these fans.
- You can work with FEMA to see what can the FIRM panels to do for you
- Fan development is more complicated and more costly. The landowners and the developer need to understand that it must be accounted for in their cost.

3. Susan Carpenter and Susan Longville asked the group to do an exercise: Evaluation of Proposed Development on Alluvial Fans

Members used a decision support tool developed by the AFTF management team to evaluate the attributes of eight hypothetical alluvial fans proposed for development and the risks and benefits of development in that location. The results, as well as each group's response to the tool itself, were collected and may be used later to further refine the tool.

Meeting Adjourned: 3 p.m.
Next Meeting: Friday, March 14, 2008
San Bernardino County Department of Behavioral Health facility: 850 E. Foothill Blvd, Rialto, CA 92376

Minutes respectfully submitted to the AFTF members by Gigi Hanna, AFTF Administrative Coordinator. Please contact ghanna@csusb.edu if corrections are necessary.