SUN VALLEY AREA DRAINAGE MASTER PLAN

PROJECT ADMINISTRATION NOTEBOOK

Richard H. French, Ph.D., P.E.

December 2006

JE Fuller/ Hydrology & Geomorphology, Inc.

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Brian Iserman, P.E.
John Wallace, P.E.
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July 1, 2005

Valerie Swick
Flood Control District of Maricopa County
2801 W. Durango St.
Phoenix, AZ 85009

RE: Sun Valley ADMP- GIS data request

Dear Valerie:

To further enable JE Fuller/Hydrology & Geomorphology, Inc. to perform tasks outlined in the scope for Sun Valley ADMP, the following GIS data is being requested:

- Most recent & 1953 digital aerial photography
- FCD topographic 10' contours and DTM data (i.e. point files and breaklines).
- Index map of spatial distribution of 2' contours available for the area
- Existing and Planned Land Uses (MAG Coverage) Landscape character types, subtypes and units, FCDMC
- Various MAG coverage's including the Desert Spaces Plan, bikeways, cultural and sports attractions, outdoor recreation opportunities, municipal and supervisory district boundaries
- Maricopa County Regional Trail System in digital and hard formats
- Existing DISTRICT Facilities
- Floodplain (fpzfcd and fpzfema) polygons.
- Floodplain cross sections and baselines.
- Drainage Basin Boundaries (large and small areas)
- Soils & Nat Veg
- Surficial geology (AZGS)
- Land form & stability
- Streets
- Municipal boundaries
- CAP Alignment
- Parcels
- Sun Valley ADMP Study Limits
- Dam Locations
- Dam watersheds
- FRS flood pool limits
- Alert gauge locations

- Culvert locations
- Utility lines locations
- Alluvial Fan Apexes
- Master Planned Communities Boundaries
- State Land vs. Private Land (lndgvt)
- Township Range Section data
- Park boundaries

JE Fuller/Hydrology & Geomorphology, Inc. has included a shape file (in NAD83_ArizonaCentral_InternationFeet) of the area of interest. Please provide the vector data in .shp format and the raster images as Mr.SID.

Thanks for assisting us in this matter and please feel free to contact us with any questions/concerns regarding the above requested data.

Sincerely,

JE Fuller/Hydrology & Geomorphology, Inc.

Pat Quinn, P.E., R.L.S.
Project Manager

JE Fuller/ Hydrology & Geomorphology, Inc.

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July 1, 2005

Julie Cox
Flood Control District of Maricopa County
2801 W. Durango St.
Phoenix, AZ 85009

RE: Sun Valley ADMP- Request for the Sun Valley ADMS.

Dear Julie:

To further enable JE Fuller/Hydrology & Geomorphology, Inc. to perform tasks outlined in the scope for Sun Valley ADMP, the following reports and models are being requested:

- ALPHA White Tanks Wash - HEC-1 and HEC-2 models and reports
- HDR - Wagner Wash (Area 4). HEC 1 and HEC-2 models and reports

Thanks for assisting us in this matter and please feel free to contact us with any questions/concerns regarding the above requested data.

Sincerely,

JE Fuller/Hydrology & Geomorphology, Inc.

Pat Quinn, P.E., R.L.S.
Project Manager

JE Fuller/ Hydrology & Geomorphology, Inc.

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Jeff Despain, P.E.		

July 1, 2005

Valerie Swick
Flood Control District of Maricopa County
2801 W. Durango St.
Phoenix, AZ 85009

RE: Sun Valley ADMP- Request for the Sun Valley ADMS.

Dear Valerie:

JE Fuller/Hydrology & Geomorphology, Inc. requests the following data/reports for our use in the Sun Valley ADMP from the Buckeye/Sun Valley ADMS report:

- Volume I- Master Document Summary (Data Collection Report) in hard copy and database format
- Volume II- Project Survey Report
- Volume V- Area 3 Hydrology (APEX) in hard copy and WMS and other digital format
- Volume VI- Erosion and Sediment Transport Studies. Available input files would also be useful
- Volume VII & VIII- Geomorphic Studies

Thanks for assisting us in this matter and please feel free to contact us with any questions/concerns regarding the above requested data.

Sincerely,

JE Fuller/Hydrology & Geomorphology, Inc.

Pat Quinn, P.E., R.L.S.
Project Manager

JE Fuller/ Hydrology & Geomorphology, Inc.

Jon Fuller, PE, RG, PH, MS, CFM	Mike Kellogg, M.S., G.I.T.	8400 S. Kyrene Rd., Suite 201
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Jeff Despain, P.E.		

July 6, 2005

Valerie Swick
Flood Control District of Maricopa County
2801 W. Durango St.
Phoenix, AZ 85009

RE: Sun Valley ADMP – Data Collection Request

Dear Valerie:

JE Fuller/Hydrology & Geomorphology, Inc. requests the following data/reports for our use in the Sun Valley ADMP:

- A copy of the report and maps of the Archeological Assessment for the Sun Valley ADMP area (Jim Rodgers). The data provided in this report will be used to input shapefiles of project areas and archeological sites into Arc GIS.
- Biological Evaluation for the Sun Valley ADMP area (Ecoplan/Tim Wade). As part of this request, three deliverables are needed.
  1) A hard copy of the Biological Evaluation report.
  2) GIS shape files pertaining to the Biological Evaluation.
  3) Digital photographs that are identified with their respective photographic points.
- Most recent report of the Literature Search for Alluvial Fan Methodology (PBS&J).
- Skyline Wash FDS report (DEI/Hoskin).

Thank you for assisting us in this matter. Please feel free to contact me with any questions/concerns regarding the above requested data.

Sincerely,

JE Fuller/Hydrology & Geomorphology, Inc.

Pat Quinn, P.E., R.L.S.
Project Manager

JE Fuller/ Hydrology & Geomorphology, Inc.

Jon Fuller, PE, RG, PH, MS, CFM	**Mike Kellogg, M.S., G.I.T.**	**8400 S. Kyrene Rd., Suite 201**
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Jeff Despain, P.E.		

July 19, 2005

Valerie Swick
Flood Control District of Maricopa County
2801 W. Durango St.
Phoenix, AZ 85009

RE: Sun Valley ADMP- Additional Data Request

Dear Valerie:

Thank you for promptly responding to our previous data requests. We have reviewed the data and information received thus far and would like to request additional data. The following data are needed for the Sun Valley ADMP:

GIS DATA within the Sun Valley ADMP boundary

- 1949 and 1953 digital aerial photography. These data may not be rectified into a GIS database already but scanned versions of these aerial photos can be rectified by JEF.

- Digital floodplain delineations for the Sun Valley ADMP area, as follows:
  1) FPXFCD and FPXFCDTXT
  2) FPBLN and FPBLNTXT
  3) FPSRFFCD and FPSRFFCDTXT

REPORTS

- A copy of the White Tanks Wash hydraulics TDN. A copy of the White Tanks Wash hydrology TDN was already received.

WORK MAPS

- Full scale work maps for White Tanks Wash FIS and Wagner Wash FIS.

Thank you for assisting us in this matter. Please feel free to contact me or Cory Helton with any questions or concerns regarding the above requested data.

Sincerely,

JE Fuller/Hydrology & Geomorphology, Inc.

Pat Quinn, P.E., R.L.S.
Project Manager

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: July 25, 2005

TO: Pat Quinn, P.E.

FROM: Ted Lehman, P.E.

RE: review of Wagner Wash and Area 3 hydrologic models

CC: File

Pat:

This memorandum summarizes the findings of my review of the Wagner Wash (FCDMC, 1989) and Buckeye Sun Valley ADMS Area 3 hydrology (PBSJ/MBJ, 2005).

The review focused on technical correctness, reasonableness of results, and applicability to the SVADMP.

Wagner Wash

The hydrology for Wagner Wash was developed by Sandy Story of the Flood Control District in 1991. The purpose of the modeling was to compute 100-year discharges along Wagner Wash for use in a floodplain delineation study (later conducted by HDR).

Overview of Methods

An HEC-1 model was developed for this study using the methods outlined in the 1989 version of the Hydrology Manual (for Maricopa County). The 100-year 6-hour storm was used as the storm event with a point rainfall depth of 3.28 inches. JD records were used to compute the critical storm for each concentration point with Hydro-40 aerial reduction factors and the 6-hour temporal patterns defined in the Hydrology Manual.

Subbasins and flow paths were delineated and measured from USGS 7.5 minute quadrangles.

The method used to compute rainfall excess was the initial and uniform loss method. Parameters were estimated from SCS soil mapping of the area focusing on interpretation of hydrologic soil groups B and D. Specific initial loss and uniform loss rates were estimated from tables in the Manual.

A mix of Clark and S-Graph methods were used for the subbasin unit hydrographs – with S-Graphs applied to the larger subbasins and Clark to the smaller basins.

Channel routing used normal-depth approach with RL records to include transmission losses along channel reaches. Level pool storage routings were also included in the

model at locations on the CAP Canal and along Sun Valley Parkway. Geometric data for the routings was obtained from design plans and supplemented by field survey as needed.

The results of the modeling predict about 16,000 cfs in Wagner Wash at its confluence with the Hassayampa River from a drainage area of about 42 square miles. Computed peak discharges at culverts along Sun Valley Parkway are noted to be about 50% greater than the design discharges Collar Williams & White in 1987. However, the design flow rates were apparently computed using a 100-year, 1-hour storm analysis.

Evaluation

The methods used in the modeling are consistent with the Drainage Design Manual. Average velocities back computed from lag times seem a little low (range from about 2 to 2.5 ft/s). Also, the use of 5 cfs per wetted acre for transmission losses may be a little high and probably not applicable to all reaches. However, application of transmission losses within the larger portions of Wagner Wash itself are probably appropriate. Nevertheless, the results fall within one standard error of the USGS Region 12 regression equation for the area (16,000 cfs vs. 20,500 cfs +/- 39% standard error). As such, they are considered reasonable for application to delineation of the 100-year floodplain along Wagner Wash.

One item to note for the SVADMP: though no significant changes have occurred in the watershed since 1991, new modeling of Area 4 (essentially all of the Wagner Wash watershed) will undoubtedly produce different results than the 1991 study due to new interpretations, higher resolution data sets, and application of different methodologies (e.g. Green-Ampt). The comparison of new model results and evaluation of impacts with new models for the alternatives analyses may not be entirely consistent with the 1991 study (and effective FDS).

Buckeye-Sun Valley ADMS - Area 3 Hydrology

Overview

PBSJ performed HEC-1 modeling of Area 3 (the area contributing to the Buckeye FRSs) as part of the Buckeye Sun Valley ADMS. The modeling had several purposes. First, the new models were developed to evaluate the performance of the FRSs during the PMF and the 100-year event as well as the impact of future development on the safe performance of the dams. In addition, the model(s) were intended to update the 1996 Alpha study and provide a base for modeling of the alternatives for the ADMP which could include floodplain delineations as part of Stage 3 (to follow Stage 1 and 2 performed by Ayers for the ADMS).

The HEC-1 models were developed for the 10-year, 100-year and PMF events. Of concern to this review are only the 100-year models.

The Watershed Modeling System (WMS) software was used to assist in the development of the HEC-1 models. The methods used were those in the Drainage Design Manual, Volume I as implemented in WMS.

Existing and future conditions models for the 100-year 6- and 24-hour durations were to be developed.

JD records were used to model rainfall over the watershed. Green-Ampt loss method was used to compute rainfall excess. Unit hydrographs were developed using FCDMC S-Graphs (Phoenix Mountain and Desert/Rangeland were selected). Normal-depth channel routings were used to route hydrographs down the piedmont to the FRSs.

PBSJ reports that the model results were comparable to the previous analyses by Alpha Engineering for the 24-hour storm.

Evaluation

No diversions were modeled in the watershed whatsoever. The rationale for this decision is not explained nor entirely clear. It seems that it had something to do with the future application to the master planned communities currently working in the area. However, no written explanation is provided in the PBSJ report. Given the objective of evaluating the performance of the dam, excluding split flows from the models may not significantly altered that evaluation. However, for evaluation of drainage problems and solutions internal to the piedmont, estimation of the split flows will be required – at least for the purpose of downstream impacts assessment. That is, a baseline existing condition needs to be established from which to compare the efficacy of various flood control alternatives internal to the piedmont environment.

In numerous locations throughout the area, subbasin and flow path delineations do not correspond well with the data visible in the high resolution aerial photographs. Namely, boundaries cross washes and misrepresent the true watershed area (Figures 4, 6, & 7) . Similarly, flow paths cross ridges and do not always follow the primary wash paths from one concentration point to another or through the subbasin to its (model) outlet (Figures 2, 6 & 7) . These discrepancies are common throughout the model. The degree of impact on results in uncertain, although many of the discrepancies are relatively minor. The cause of these discrepancies likely resulted from over-reliance on the 10-foot DTM (& WMS). At one location (Figures 3 & 4), the result of the difference between the 10-foot contours and the aerial photo information could result in a much larger watershed discrepancy.

In general the delineation of watersheds leading to the identified hydrographic apecies is adequate. However, in a few instances subbasin delineations to apecies were slightly in error (Figure 1) or absent altogether (Figure 5).

Culverts are not modeled at all. Subbasin boundaries along Sun Valley Parkway are long and include multiple culverts at each subbasin "outlet". Evaluation of the performance of each crossing will require creation of many new subbasins.

While the report suggests that future conditions models were analyzed, (and a map is included showing future peak Qs for Areas E-R) the reports, HEC-1 files, and WMS files do not include any of the future conditions information.

The model output provided in the (draft) report and disks indicate that the HEC-1 version 4.0.1 E 1990 was used. The current version is 4.1. While it is my understanding that these two versions are essentially identical, submission to FEMA would probably require them to be rerun in the most current version.

Overall, the discharges seem somewhat low. The apex discharges are comparable to other modeling in the area and not so incongruent with other estimates of the 100-year peak discharge. However, for larger drainage areas the discharges seem somewhat too low. For example, at concentration point E5R, the predicted peak is 4827 cfs from a drainage area of 16.98 square miles. That represents 284 cfs / sq.mi.. By comparison, Wagner Wash next door, reports 381 cfs / sq.mi. from its 42 sq. mi. watershed at the Hassayampa. PBSJ note that the results fall below the regional regression curve for the area (though they processed it incorrectly). Nevertheless, for E5R the computed result is more than 2 standard errors below the Region 12 estimate (4,827 cfs vs. 14,000 cfs +/- 39 %).

Finally, CMX has previously pointed out that the watershed lengths, L, reported in the ADMS may be biased toward longer values due to the use of WMS. They show a couple of different mechanisms for this bias. One is the more jagged or rasterized looking flow lines (i.e. not smoothed) due to the DTM resolution. Another is the computation of the overland flow distance from the end of the main stream channel. My examination of the WMS data provided, measurements from the aerials, and comparison with the HEC-1 input do not resolve. That is, for a number of the subbasins, I cannot easily reconstruct the values reported in the HEC-1 model and they do not match with the WMS either. CMX suggests resolution by delineating subbasin lag time paths to the watershed boundary to avoid the overland flow path calculation issue. However, such data were not provided in the PBSJ WMS or GIS files. Regardless, some level of discrepancy in watershed L statistics remains.

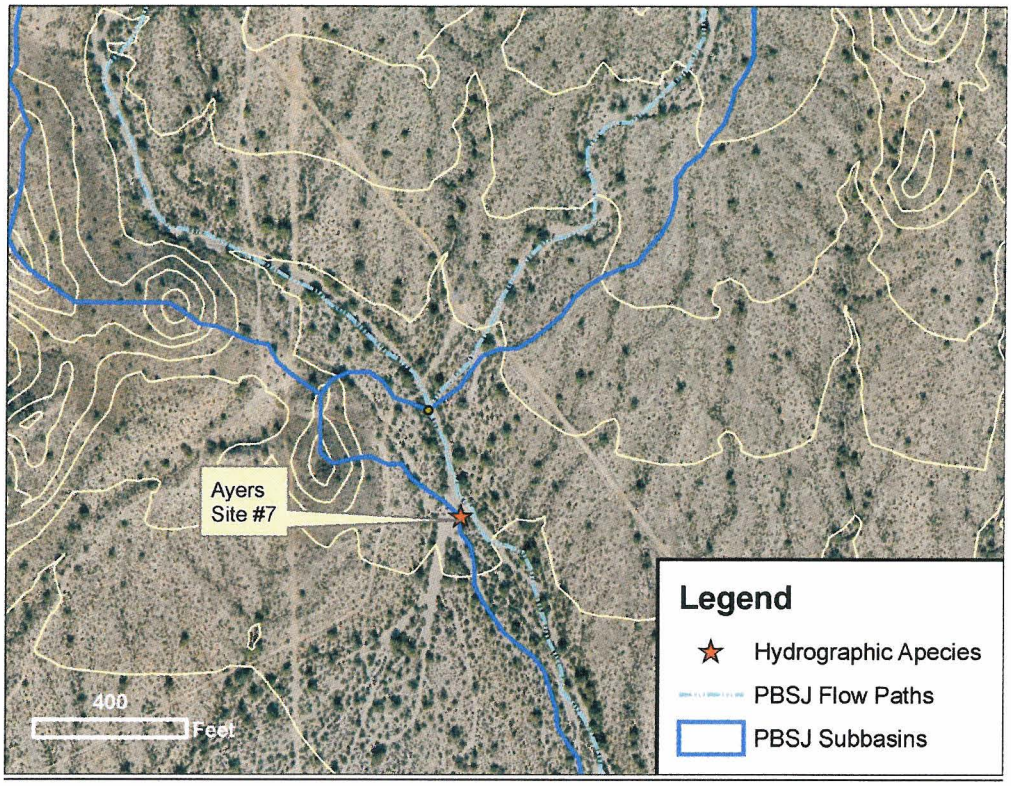

Figure 1. Example of poor subbasin delineation to hydrographic apex

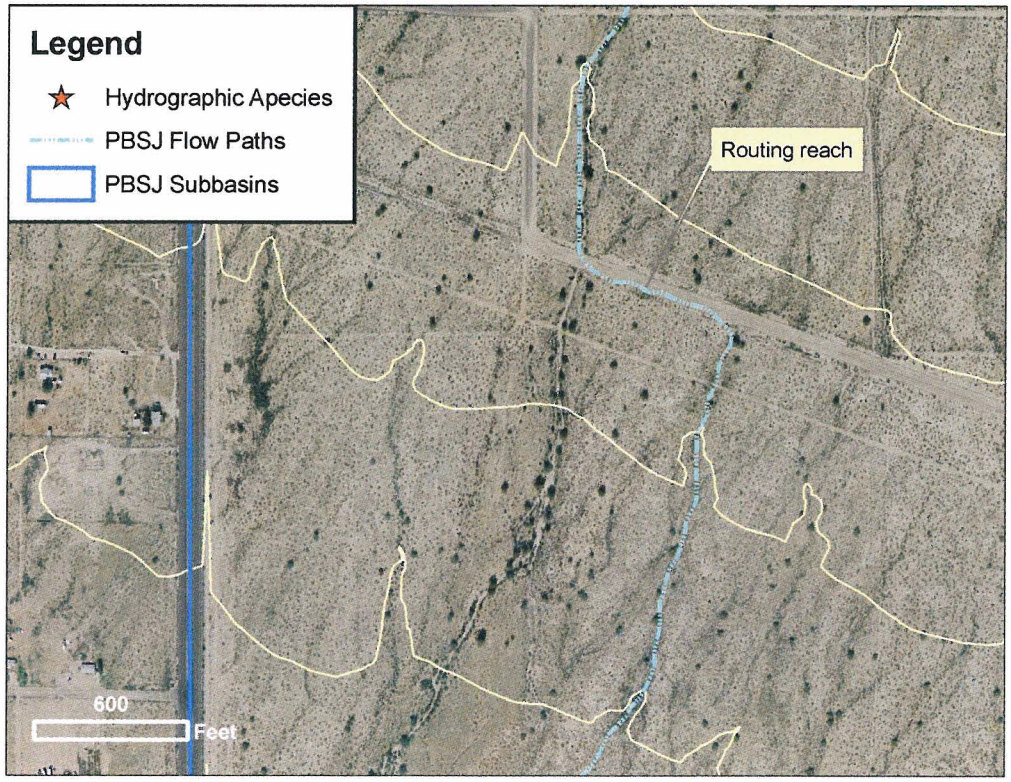

Figure 2. Example of not following data reflected in aerial photo

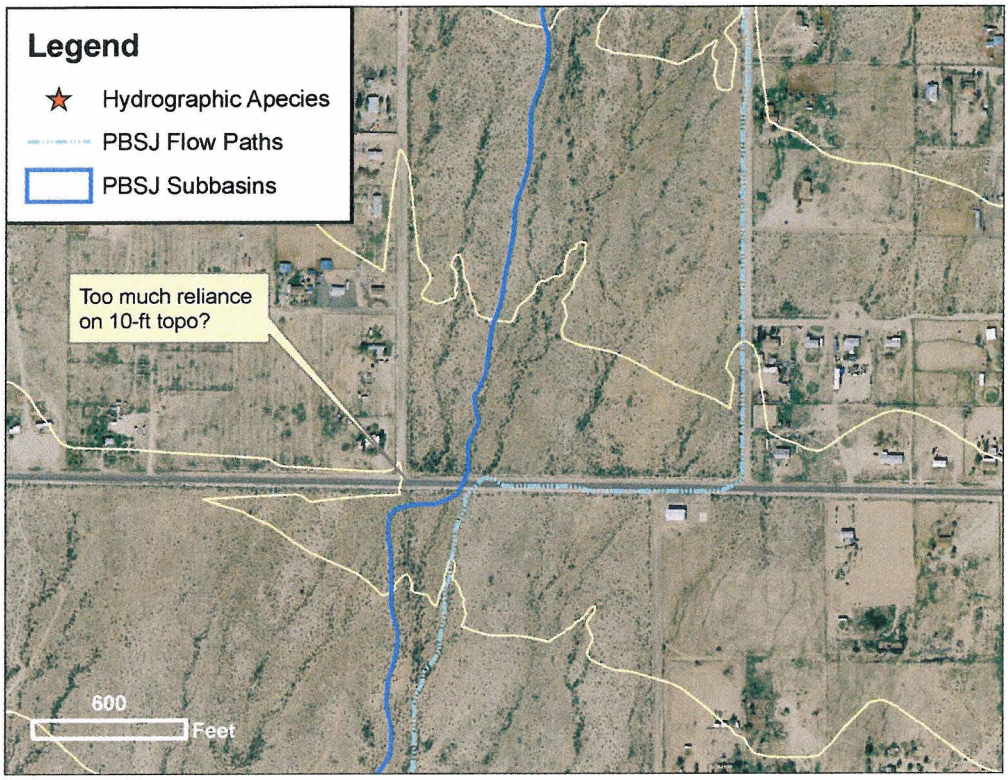

Figure 3. Another example of reliance on topography without regard for the aerial photo evidence

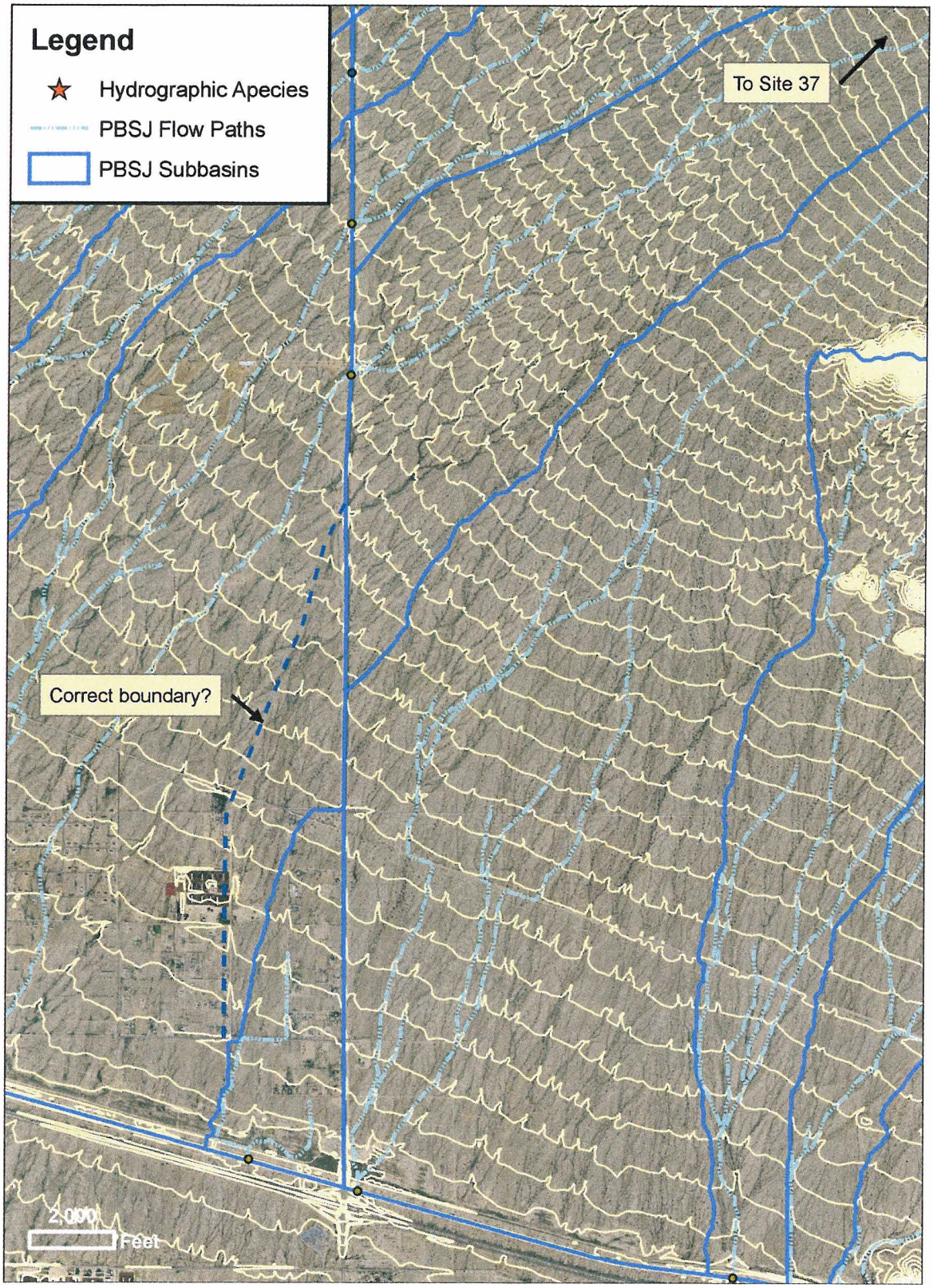

Figure 4. Possible upstream influence of incorrect delineation shown in Figure 3.

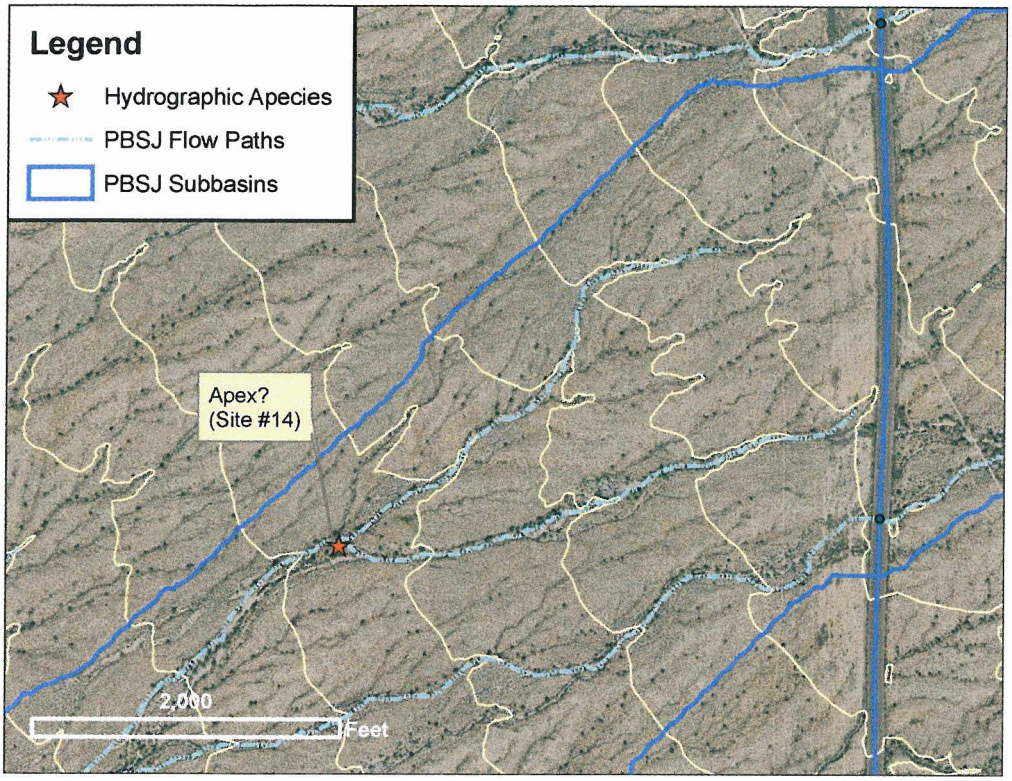

Figure 5. Site 14 apex location west of Sun Valley Parkway

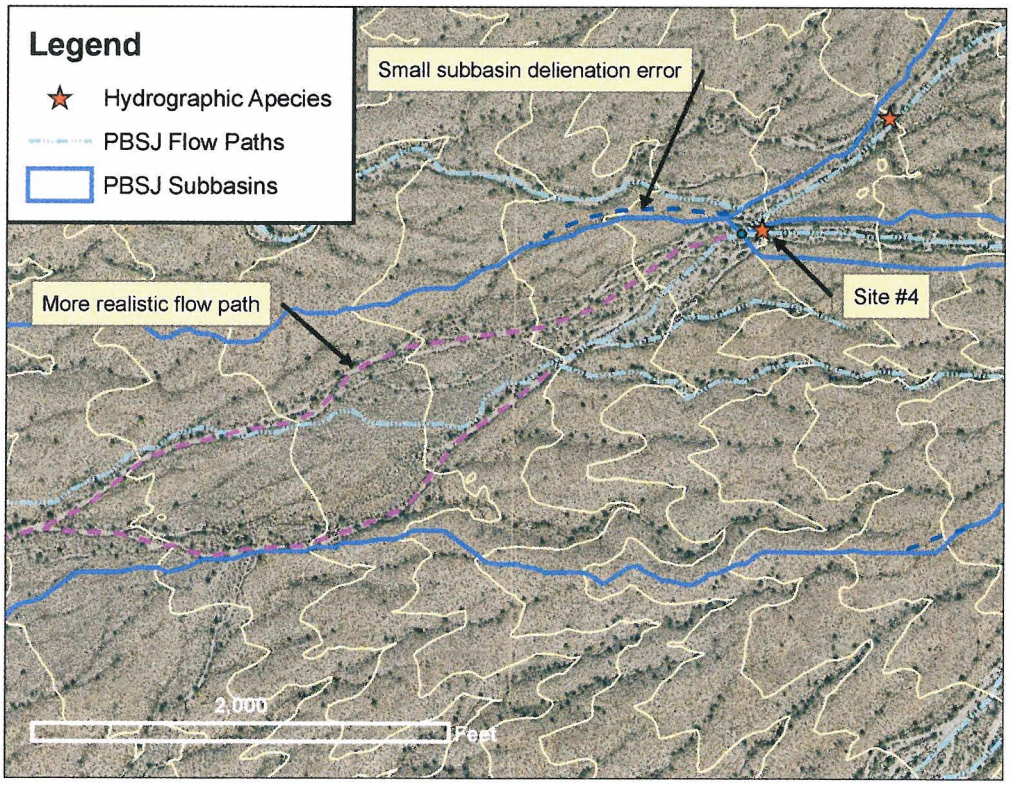

Figure 6. Example of poor flow path location selection at Site 4

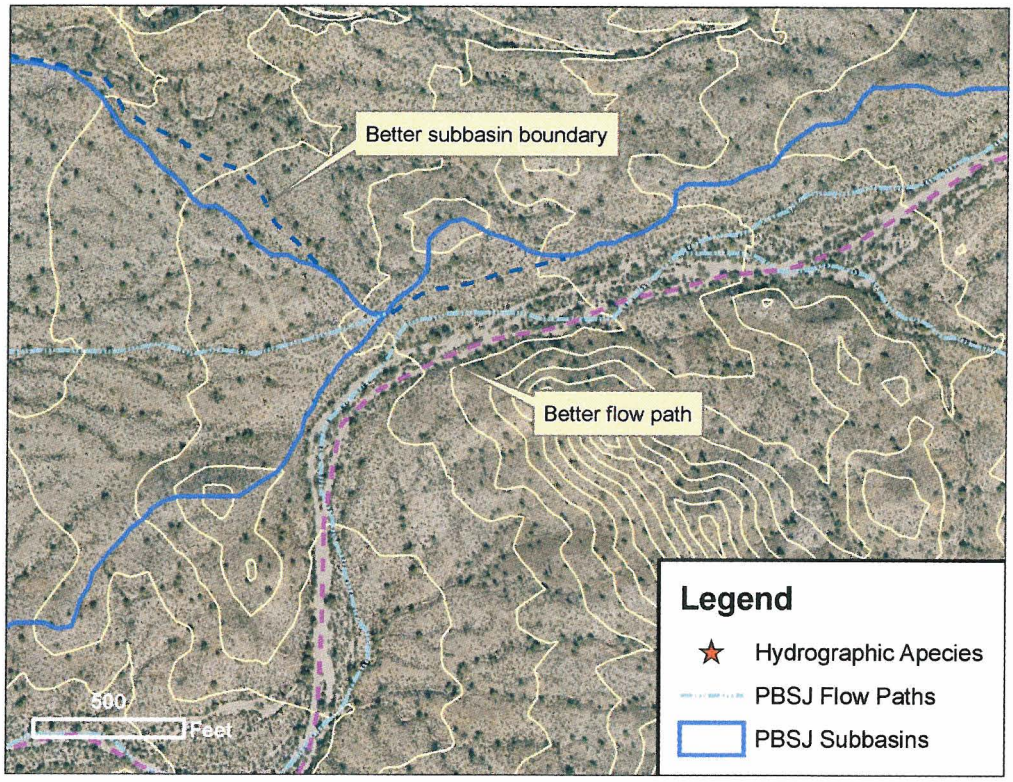

Figure 7. Another example of poor subbasin and flow path delineations compared to aerial photo

Conclusion

Area 3: Some significant level of verification and modification of the PBSJ model(s) will be required for application to the ADMP. In particular, the subbasin and flow path delineations should be thoroughly revised. In addition, watershed areas to the culvert crossings of Sun Valley Parkway will be needed. Finally, split flows need to be determined and new routing reaches constructed to establish realistic existing conditions discharge estimates internal to the piedmont, especially along Sun Valley Parkway. According to recent e-mail correspondence, some of this may be almost completed by the master planned community engineering firms. However, the specific nature of those analyses and the exact timing of their completion is uncertain and therefore likely to have an impact on the ADMP project schedule if we need to wait for their completion (and approval).

Wagner Wash: We should be able to move forward on Area 4 without issue. However, it needs to be pointed out to the District (and other stakeholders?) that the new analyses will likely result in some discrepancies when compared to the 1991 FDS hydrology.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: July 27, 2005

TO: Pat Quinn, PE, LS

FROM: Jon Fuller, PE, RG, PH, CFM

RE: Sun Valley ADMP Task 11.1.1.1
Initial Approximate Method Floodplain Delineation Technical Memorandum

CC: Ted Lehman, PE

Per Task 11.1.1.1 of the Sun Valley Area Drainage Master Plan (SVADMP) scope of services, I note the following concerns regarding the Stage 1 and 2 findings completed for the Buckeye Sun Valley Area Drainage Master Study (BSVADMS). My review of the Stage 1 and 2 findings is based on information provided in the *Final Report: Geomorphic Evaluation and Landform Stability Assessment Buckeye/Sun Valley Area Drainage Master Study* (Ayres & Associates, 2005; hereafter "the Ayres Report"), as well as the GIS that accompanied the Ayres Report. My review focused on assessing the feasibility of using the information prepared for the Stage 1 and 2 delineation as the basis of a Stage 3 approximate method floodplain delineation and Technical Documentation Notebook (TDN) to be submitted to FEMA.

1. **Documentation**. There is significantly less documentation provided in the Ayres Report than is provided in, for example, the TDN for White Tanks Fan 36 prepared by JE Fuller/Hydrology & Geomorphology, Inc.(JEF) on behalf of Wood/Patel & Associates for the District.[1] The Ayres Report included a brief discussion of the three-stage approach, the general characteristics of piedmont landforms summarized from the District's Piedmont Flood Hazard Assessment Manual (PFHAM), and description of verifications made at eight locations within the 184 mi2 study area. The limited detail and discussion provided in the Ayres Report may fall short of the intent of Chapter 2 of the PFHAM (e.g., Table 2.1 - landform characteristics, Table 2.2 - identification steps). In the White Tanks Fan 36 TDN, the Stage 1 discussion included the following:
    a. Site specific descriptions of the each landform identified.
    b. Description of lateral and distal boundaries of each of the landforms identified in the Stage 1 process.
    c. Discussion of NRCS soils units and AZGS map units relation to landform, focusing on discrepancies and commonalities with the Stage 1 landform identifications.
    d. NRCS and AZGS soils and surficial geology mapping overlain on the landform boundaries.

    In the White Tanks Fan 36 TDN, the Stage 2 discussion included more detailed discussion, such as the following:

[1] Note that Ayres was not under contract to provide FEMA-level documentation.

a. Site specific descriptions of the stability/instability for the alluvial fan landforms identified.
b. Specific discussion of the PFHAM Table 3.1 indicators and Table 3.2 & Table 3.3 characteristics for each unstable area identified.
c. Discussion of the sediment source for each unstable (active) alluvial fan identified.
d. Discussion of field observations of the location and extent of sediment deposition and/or erosion, vegetation, and flow path movement with respect to each unstable landform.
e. Comparison of historical and recent aerial photographs to help support stability determinations.

Summary: Additional effort will be required by JEF to meet the standard of FEMA TDN documentation requirements set in previous alluvial fan submittals and of that suggested by the example applications provided in the PFHAM. Alternatively, the District should dictate that more detailed documentation, beyond that provided in the Ayres Report, is not required unless required by FEMA during their review of the TDN. Note that the latter approach could lead to significant time delays during the FEMA approval process of the floodplain delineation.

2. **Technical Accuracy**. I have the following concerns regarding the Stage 1 & 2 delineations presented in the Ayres Report:
   a. Stage 1: Relict Fan vs. Inactive Alluvial Fan. I believe there is far less relict fan area than shown on the Ayres Stage 1 delineation, particularly in the region south of Site 13 and north of Fan 36. Some areas mapped as relict fans include distributary flow pattern, radial contour patterns, a fan shape, and widely spaced drainage paths, all of which indicate inactive alluvial fans. Inactive alluvial fans are mapped in Stage 1 as alluvial fan landforms.
   b. Stage 1: Alluvial Plain. Distal portions of alluvial fan (and some areas mapped as relict fans) are more likely to be alluvial plains. Most of the alluvial plain areas mapped by Ayres are riverine floodplains, rather than piedmont landforms. By definition, relict fans are stable landforms, whereas alluvial plains can be unstable and carry a higher flood hazard.
   c. Stage 1: Piedmont Toe. The toe of the White Tank Piedmont is defined by Wagner Wash, White Tanks Wash, and the riverine terrace escarpment along the Hassayampa River. Therefore the landform delineation should be truncated at the boundary of those riverine (i.e., non-piedmont) features.
   d. Stage 1: Piedmont vs. Riverine Landforms. Alluvial fan designations for the riverine deltas at the Hassayampa geologic floodplain and braided streams incised into the Hassayampa terrace escarpment should be removed from the Stage 1 delineation.
   e. Stage 1: Unmapped Alluvial Fans. There are a half-dozen or so unmapped alluvial fans, most of which are probably inactive alluvial fans, but which are incorrectly identified as relict fans.

f. Stage 2: Description Level of Detail. It is not possible to assess the accuracy of the Stage 2 delineations of unstable areas without detailed field work due to the limited detail provided in the Ayres Report. This omission is signficant because the Stage 1 discrepancies may be moot if the Stage 2 delineations are correct. However, I assume that FEMA reviewers would struggle with the same lack of detailed descriptions, particularly with respect to lateral and distal boundaries of unstable areas.

g. Stage 2: Unstable Area Boundaries. No adequate descriptions of most of the boundaries of the unstable areas was provided in the Ayres Report. Boundary descriptions are one of the key elements of the TDN.

h. Stage 2: Conditional Unstable Areas. It is unclear how areas designated as "conditionally unstable" fit into the framework outlined in the PFHAM. Areas should be designated as either stable or unstable. In addition, there are many unexplained gaps (of stable reaches) along flow corridors designated as conditionally unstable.

i. Stage 2: Unmapped Flow Splits. There are numerous flow bifurcations that are visible even at low resolution that are neither mapped nor discussed in the Ayres Report (except in general). I believe that many of the flow splits to be inset active alluvial fans that should be mapped as such for the TDN submittal.

j. Stage 2: Active Alluvial Fans. Many of the unstable areas located west of Sun Valley Parkway appear to be part of larger alluvial fan landforms which head upstream and east of Sun Valley Parkway. Therefore, it is probably beneficial to map the hydraulically and geomorphically related alluvial fans as single sites, in the same manner as was done for the Fan 36 delineation.

Summary: *While much of the information prepared by Ayres can be incorporated into the Stage 3 delineation and TDN, there are significant areas where substantial changes are recommended. Additional effort by JEF will be required to initiate the Stage 3 delineation and prepare the TDN beyond that which would have been required to complete Stage 3 alone. Because JEF and Ayres differ in our interpretations of the piedmont landforms and areas of instability, it will be problematic for JEF to prepare the additional FEMA-required documentation using the Ayres Stage 1/Stage 2 delineation.*

3. **Discussion Items**.

a. Impact on Project Schedule. Schedule impacts can be determined after coordination with District staff. The project team can continue to work in areas of agreement between Ayres & JEF mapping.

b. Labor Estimate to Provide Documentation & Boundary Modifications. The labor required exceeds the scoped labor in the optional task.

c. Impacts on Developer Fan Delineations. After a course of action is approved by the District, a coordination meeting should be held with the developer's engineers.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: August 2, 2005

TO: Valerie Swick

FROM: Pat Quinn

RE: Sun Valley ADMP Optional Tasks 9.4.2 and 11.1.1.2 Authorization Request

CC: Julie Cox, Mike Duncan, Kathryn Gross, Greg Jones, Doug Williams, Ted Lehman, Jon Fuller, Brian Iserman

Pursuant to our August 1, 2005 meeting, I request that you authorize Optional Task 9.4.2 Hydrology Model Adjustments and Optional Task 11.1.1.2 Approximate Alluvial Fan Floodplain Delineations Stage 1 and Stage 2 Adjustments of the Sun Valley ADMP Scope of Work. The following is a brief summary of our meeting discussion and outline of the intended work plan for the optional tasks.

Optional Task 9.4.2 Hydrology Model Adjustments – Ted Lehman reviewed the Buckeye Sun Valley ADMS Area 3 (PBS&J/MBJ, 2005) and Wagner Wash (FCDMC, 1989) hydrology. His findings are fully described in his July 25, 2005 memorandum previously provided to you. At yesterday's review meeting, Ted identified the following key discrepancies:

Area 3 Apex Hydrology Model

- No divisions or split flows are modeled.
- Discharges appear low when compared to regional regression equations and unit discharges from similar watersheds.
- Lengths used for lag time calculations cannot be replicated.
- Some basins modeled in the Area 3 hydrology model (A-C) do not contribute to the Buckeye FRS, hence are actually Area 4 basins by definition.

Wagner Wash

- Results appear reasonable.
- Methodology is dated, but properly applied.

The conclusion reached at yesterday's meeting was to trigger the Optional Task 9.4.2 immediately so that work could progress on resolution of the discrepancies in the Area 3 hydrology model. The consensus was that the 40 manhours currently provided for Optional Task 9.4.2 was inadequate to address all identified issues. JEF will further investigate the status and availability of hydrologic data from the master planned community developers' engineers. JEF will submit a request for change order to Task 9.4.2 to address key requirements for use of the Area 3 hydrology model and the developers' available hydrologic data in the SVADMP alternatives formulation process.

The initial proposed work plan for Optional Task 9.4.2 includes the subtasks listed below. Refined subtask descriptions and manhour estimates will be provided in the change order request once it is clear what hydrologic data will be provided by the developers' engineers. We propose to begin utilizing the 40 manhours currently provided for Task 9.4.2 in completing the first bulleted task below.

1. Prepare hydrology for Fans 5, 10, and 11 to include in the Apex HEC-RAS TDN for submittal to FEMA.
2. Modify that portion of the current Area 3 hydrology model (A-C) that actually is in Area 4 (outfalls to the Hassayampa River) to include flow splits and refine routing and subbasin divisions.
3. Assess applicability of existing condition hydrology as provided by developers' engineers for use in the ADMP alternatives formulation process.
4. Modify hydrologic data provided by others as needed to facilitate alternatives design. For example, modifications might include subbasin boundaries, routing reaches, and/or changes to hydrology model(s) logic as needed to develop discharge data at discrete locations as driven by alternatives design needs.

Optional Task 11.1.1.2 Approximate Alluvial Fan Floodplain Delineations Stage 1 and Stage 2 Adjustments – Jon Fuller reviewed the Buckeye Sun Valley ADMS Stage 1 and 2 alluvial fan delineations and reports (Ayres & Associates, 2005). His findings are fully described in his July 27, 2005 memorandum previously provided to you. At yesterday's review meeting, Jon identified the following key discrepancies:

Stage 1 Piedmont Landform Delineations

- Landform delineations should be cut-off at the Hassayampa River and Wagner Wash floodplains to define the contact between the pediment and riverine landforms.
- Report documentation is considered inadequate for TDN submittal to FEMA.
- JEF interprets landform delineations differently in certain areas. This requires content and documentation revisions to the final TDN work product.

Stage 2 Piedmont Landform Stability Assessment

- Report documentation is considered inadequate for TDN submittal to FEMA.
- JEF interprets landform stability differently in certain areas. This requires content and documentation revisions to final TDN work product.

The conclusion reached at yesterday's meeting was to trigger the Optional Task 11.1.1.2 immediately so that work could progress on resolution of the discrepancies in the Stage 1 and 2 delineations. The consensus was that the 40 manhours currently provided for Optional Task 11.1.1.2 was inadequate to address all identified issues. JEF will further coordinate with the developers' engineers to determine the status and findings of their separate Stage 3 delineations on several of the alluvial fans in the study area. JEF will submit a request for change order to Task 11.1.1.2 to address key requirements for use of the Stage 1 and 2 findings in the Stage 3 delineations (Task 11.1.1.5). Refined subtask descriptions and manhour estimates will be provided in the change order request. Mike Duncan will serve at the District's reviewer throughout the Stage 3 delineation process and for the final TDN report.

A combined change order request will be submitted for both Optional Task 9.4.2 Hydrology Model Adjustments and Optional Task 11.1.1.2 Approximate Alluvial Fan Floodplain Delineations Stage 1 and Stage 2 Adjustments to expedite processing. The anticipated timeline for submittal is 2-3 weeks after the August 16, 2005 Stakeholder Working Group meetings.

Task 11.1.2 Approximate Riverine Floodplain Delineations – Brian Iserman and Jon Fuller identified those alluvial fan apices requiring HEC-RAS modeling for the purpose of proof of flow containment. The location where the flow is no longer contained in the channel defines the contact between the riverine-based and landform-based floodplain delineations. Brian previously provided a spatial and tabular summary of the proposed reaches for HEC-RAS modeling in his July 27, 2005 memorandum. The District approved the recommended reaches at yesterday's meeting. JEF will proceed with HEC-RAS model development for the apices as documented in the July 27, 2005 memorandum.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: August 4, 2005

TO: Pat Quinn, PE, LS

FROM: Brian, Iserman, PE

RE: Sun Valley ADMP Task 10.2.3
Review of Effective White Tank Wash and Tributaries FIS,
FCD 90-64 by Harding Lawson Associates, Inc. Alpha
Engineering Group
Technical Memorandum

CC: File

Per Task 10.2.3 of the Sun Valley Area Drainage Master Plan (SVADMP) scope of services, I have performed a review of the referenced floodplain delineation study and a comparison between the recently updated hydrology model developed by PBSJ with the effective hydrology used in the referenced study.

The HEC-2 for this study was developed by Harding Lawson Associates, Inc. Alpha Engineering Group (HLA-Alpha) of Phoenix. The Technical Data Notebook associated with this study is dated January 30, 1996.

Cross Sections:

I performed detailed checks to 8 cross sections in the model to determine general accuracy. Cross section data came from 1"=400', 4' CI topographic mapping developed by AMC based on an October, 1991 flight. Cross section geometry was provided by AMC directly from the aerials photogrametrically, and supplemental cross section data were read directly from the contour maps. Spot checks on the 8 cross sections revealed that the model geometry matches up reasonably well with the topography. Bank station locations, reach lengths, Mannings "n" values and use of ineffective flow parameters (using very high Mannings "n" values) appear to be reasonable, however, I observed several cross sections that could have been aligned much better.

Floodplain Delineation:

The 100-year floodplain and floodway delineation is depicted on 7 map sheets. In my review of the map sheets, I found the following flaws to be quite prevalent throughout all sheets:

1. The HEC-2 cross section locations do not accurately depict the actual total length of the HEC-2 model cross sections. Of those checked, the average difference in drawn length to model length is 95 feet, however, this is not a fatal flaw since the floodplain widths are based on the location of the hydraulic base line and not the ends of the cross sections.

2. The HEC-2 water surface start and end stations reported in the summary output were not accurately drawn on the workmaps; resulting in topwidths that were measured to be off by an average of 17 feet for the 8 check cross sections.
3. Most Base Flood Elevation (BFE) lines did not intersect the ground at the correct elevation. This is usually an indication of poor interpolation of the floodplain boundary between cross sections.
4. There are 6 areas that are likely breakouts that are not reflected as such on the work maps at the following approximate river miles: White Tanks Wash 3.0 (left), 6.5 (left), 8.0 (left), Tributary 1 1.3 (left), 1.8 (left) and 2.6 (right). These breakout areas would likely result in shallow sheet flooding in areas adjacent to the floodplain in those areas.

Hydrology

The draft hydrology developed recently by PBSJ was compared to the hydrology used in the Flood Insurance Study for White Tanks Wash and Tributaries. The following table presents the results of this comparison.

River Reach	Effective Q (cfs)	Revised Q (cfs)	Percent Change
White Tanks Wash Main Stem (Zone AE)			
0.00 - 0.86	7209	5888	-18%
0.95 – 3.42	6256	4827	-23%
3.51 – 5.73	6208	5291*	-15%
5.82 – 6.06	3728	2205	-41%
6.17 – 6.45	3442	1236*	-64%
6.56 – 6.84	3140	1236*	-61%
6.94 – 7.57	2751	1236*	-55%
7.68 – 8.31	2125	1175	-45%
8.41	1246	958	-23%
8.50 – 9.19	894	958	+7%
9.29 – 9.52	871	958	+10%
Tributary 1 (Zone AE)			
0.00 – 2.11	818	314	-62%
2.21 – 2.78	816	314	-62%
2.87 – 3.14	767	314	-59%
3.25 – 3.81	603	314	-48%
Tributary 2 (Zone A)			
1.0 – 3.0	2000	1184	-41%
4.0	1392	1212	-13%
5.0 – 9.0	700	1212	+73%

* Estimate based on direct addition of hydrographs

A sensitivity analysis was performed to determine the effect the draft revised PBSJ discharges would have on the effective HEC-2. The attached table shows the resulting changes in computed water surface elevations as a result of using the updated hydrology. In general, the computed water surfaces decrease significantly (most more than 0.5 foot). The exception is the upper reaches of the main stem (river station 8.5 to 9.61) and the upper reaches of the Tributary 2 Zone A (cross sections 5-9). Both these reaches

experience modest increases in the computed water surface elevation as a result of discharge increases.

Summary:

In general, the HEC-2 model geometry was assembled accurately with respect to the topographic mapping. Subjective parameters such as Manning's roughness coefficients, bank station locations and ineffective flow area definitions were reasonable and consistently applied such that the resulting computed water surface elevations would be conservative. Noted problems associated with the floodplain delineation depicted on the work maps were the result of sloppy drafting rather than modeling problems, and are not fatal in my opinion. Based on my comparison with the PBSJ revised hydrology, the effective hydrology used is significantly greater in most reaches and the resulting flood profiles of the effective study are conservative with respect to the test profiles run in the sensitivity analysis.

Conclusion:

Although the effective study and attendant floodplain delineation study would not meet the current standards of the Flood Control District of Maricopa County for a detailed study (due mostly to the mapping contour interval, scale and line work inaccuracies) I do not think that the improved results of re-studying the lower 4 miles of this reach are worth the effort that it will take to do the restudy. Additionally, as we discussed with the District on 8/1/05, there is a question regarding assumptions made in the PBSJ study that may need to be revisited before the new hydrology is incorporated into a new study.

There is also the question of tying a proposed shortened 4 mile study into other possible concurrent or near-future studies being performed by others for various developments that cover the upper parts of White Tank Wash, including the area of the large split that is in question at this time. At the time of this writing, FCDMC did not have knowledge of any LOMR efforts underway by developers in this area. It is my opinion that the optional task to restudy the lower 4 miles should not be undertaken at this time.

Memorandum JE Fuller/ Hydrology & Geomorphology, Inc.

DATE: August 5, 2005

TO: Valerie Swick

FROM: Pat Quinn

RE: Sun Valley ADMP Optional Tasks 9.4.2, 11.1.1.2, and 12.9 Authorization Request

CC: Julie Cox, Mike Duncan, Kathryn Gross, Greg Jones, Doug Williams, Ted Lehman, Jon Fuller, Brian Iserman, Chuck Williams

Pursuant to our August 1, 2005 meeting and subsequent telephone and e-mail communications, I request that you authorize Optional Task 9.4.2 Hydrology Model Adjustments, Optional Task 11.1.1.2 Approximate Alluvial Fan Floodplain Delineations Stage 1 and Stage 2 Adjustments, and Optional Task 12.9 Implementation Plan of the Sun Valley ADMP Scope of Work. The following is a brief summary of our meeting and subsequent discussions. An outline of the intended work plan for the optional tasks is provided in Table 1.

Optional Task 9.4.2 Hydrology Model Adjustments – Ted Lehman reviewed the Buckeye Sun Valley ADMS Area 3 (PBS&J/MBJ, 2005) and Wagner Wash (FCDMC, 1989) hydrology. His findings are fully described in his July 25, 2005 memorandum previously provided to you. Key discrepancies and associated action items are listed in the proposed work plan for Optional Task 9.4.2 as shown in Table 1.

The conclusion reached at the August 1 meeting was to trigger the Optional Task 9.4.2 immediately so that work could progress on resolution of the discrepancies in the Area 3 hydrology model. We propose to utilize the 40 manhours currently provided for Optional Task 9.4.2 in completing Tasks #1-4 as shown in Table 1.

The consensus was that the 40 manhours currently provided for Optional Task 9.4.2 was inadequate to address all identified issues. JEF will further investigate the status and availability of hydrologic data from the master planned community developers' engineers. JEF will submit a request for change order to Task 9.4.2 to address key requirements for use of the Area 3 hydrology model and the developers' available hydrologic data in the SVADMP alternatives formulation process. Refined subtask descriptions and associated manhour estimates will be provided in the change order request once it is clear what hydrologic data will be provided by the developers' engineers.

Optional Task 11.1.1.2 Approximate Alluvial Fan Floodplain Delineations Stage 1 and Stage 2 Adjustments – Jon Fuller reviewed the Buckeye Sun Valley ADMS Stage 1 and 2 alluvial fan delineations and reports (Ayres & Associates, 2005). His findings are fully described in his July 27, 2005 memorandum previously provided to you. Key discrepancies and associated action items are listed in the proposed work plan for Optional Task 11.1.1.2 as shown in Table 1.

The conclusion reached at the August 1 meeting was to trigger the Optional Task 11.1.1.2 immediately so that work could progress on resolution of the discrepancies in the Stage 1 and 2 delineations. The consensus was that the 40 manhours currently provided for Optional Task 11.1.1.2 was inadequate to address all identified issues. We propose to utilize the 40 manhours currently provided for Task 11.1.1.2 in completing Tasks #8 and partially completing Task #9 as shown in Table 1.

JEF will further coordinate with the developers' engineers to determine the status and findings of their separate Stage 3 delineations on several of the alluvial fans in the study area. JEF will submit a request for change order to Task 11.1.1.2 to address required modifications for use of the Stage 1 and 2 findings in the new Stage 3 delineations (Task 11.1.1.5). Refined subtask descriptions and manhour estimates will be provided in the change order request. Mike Duncan will serve at the District's reviewer throughout the Stage 3 delineation process and for the final TDN report.

A combined change order request will be submitted for both Optional Task 9.4.2 Hydrology Model Adjustments and Optional Task 11.1.1.2 Approximate Alluvial Fan Floodplain Delineations Stage 1 and Stage 2 Adjustments to expedite processing. The anticipated timeline for submittal is 2-3 weeks.

Task 11.1.2 Approximate Riverine Floodplain Delineations – Brian Iserman and Jon Fuller identified those alluvial fan apices requiring HEC-RAS modeling for the purpose of proof of flow containment. The location where the flow is no longer contained in the channel defines the contact between the riverine-based and landform-based floodplain delineations. Brian previously provided a spatial and tabular summary of the proposed reaches for HEC-RAS modeling in his July 27, 2005 memorandum. The District approved the recommended reaches at the August 1 meeting. JEF will proceed with HEC-RAS model development for the apices as documented in the July 27, 2005 memorandum.

Optional Task 11.2 Detailed Floodplain Delineations – Per Task 10.2.3 of the SVADMP Scope of Work, Brian Iserman reviewed the effective White Tank Wash and Tributaries FIS (FCD 90-64 Harding Lawson Associates, Inc. Alpha Engineering Group). His findings are fully described in his August 4, 2005 memorandum previously provided to you. His conclusion is that authorization of Optional Task 11.2 is not recommended at this time.

Optional Task 12.9 Implementation Plan – Successful implementation of the SVADMP Recommended Alternative will require a comprehensive Implementation Plan. The key to the preparation of the plan is to engage stakeholders early in and throughout the alternatives formulation process in the discussion of potential sources of capital improvement and maintenance costs, application procedures, potential cost share, and funding constraints. JEF proposes to commence discussion of project implementation strategies with stakeholders at the first Stakeholder Working Group meeting on August 16, 2005 and continue throughout the stakeholder involvement program. It is my understanding that the District concurs in the recommended authorization of Optional Task 12.9 at this time so that the Implementation Plan development can parallel track with the alternatives formulation.

SUN VALLEY AREA DRAINAGE MASTER PLAN TABLE 1 - OPTIONAL TASKS WORK PLAN			
Identified Discrepancies/ Needs	**Proposed Action**	**Manhour Estimate**	**Fee Estimate**
Optional Task 9.4.2 Hydrology Model Adjustments			
Area 3 Hydrology Model			
1. No divisions or split flows are modeled.	Modify Area 3 hydrology (A-C) to estimate discharges at specific Sun Valley Parkway culvert locations as follows: a. Explicitly model eight (8) flow splits, refine routing reaches, and delineate five (5) additional subbasin boundaries. New subareas and routing lengths will be developed for the additional basins. No adjustments to hydrologic parameters used in the PBSJ Area 3 model will be made. b. Apply area-weighted adjustments to twenty-three (23) small subbasins where no split flow analysis is required. Work product will be the analysis, summary table, methodology write-up, and map.	16 4	$4,039.26
2. Some basins modeled in the Area 3 hydrology model (A-C) do not contribute to the Buckeye FRS, hence are actually Area 4 basins by definition.	Incorporate modified Area 3 hydrology (A-C) into new Area 4 hydrologic model. Develop future condition discharge data for A-C basins by evaluating and applying adjustment factor to index existing condition discharges to future condition.	4	
3. Discharges are needed at three (3) apices located at Fans 5, 10, and 11 to be used in HEC-RAS model for proof of flow containment.	Prepare separate hydrology for the apices of Fans 5, 10, and 11. Include work product in the Task 11.1.2 Apex HEC-RAS TDN (Section 4, Appendix D SS197) for submittal to FEMA.	12	
4. Discharges appear low when compared to regional regression equations and unit discharges from similar watersheds.	Review XKSAT values used for White Tank FRS #3 hydrology for relative consistency with Area 3 model. Work product will be a written summary of findings.	4	
5. Discharges are needed at locations where currently no concentration point is provided for purposes of alternatives assessment.	Assess applicability of existing condition hydrology as provided by developers' engineers for use in the ADMP alternatives formulation process. Modify hydrologic data provided by others as needed to facilitate alternatives design. For example, modifications might include subbasin boundaries, routing reaches, and/or changes to hydrology model(s) logic as needed to develop discharge data at discrete locations as driven by alternatives design needs.	TBD Change Order	TBD
6. Lengths used for lag time calculations cannot be replicated.	No Action. Appears to be a result of automated reach selection and summation of pixilated sublengths by WMS.	N/A	N/A

SUN VALLEY AREA DRAINAGE MASTER PLAN TABLE 1 - OPTIONAL TASKS WORK PLAN			
Identified Discrepancies/ Needs	**Proposed Action**	**Manhour Estimate**	**Fee Estimate**
Wagner Wash			
7. Results appear reasonable. Methodology is dated, but properly applied.	No Action. Wagner Wash hydrology will be incorporated in new Area 4 hydrologic model.	N/A	N/A
Optional Task 11.1.1.2 Approximate Alluvial Fan Floodplain Delineations Stage 1 and Stage 2 Adjustments			
Stage 1 Piedmont Landform Delineations			
8. Landform delineations should be truncated at the Hassayampa River and Wagner Wash floodplains to define the contact between the pediment and riverine landforms.	Stage 1 and 2 delineations will be truncated as recommended.	4	$4,008.89
9. Report documentation is considered inadequate for TDN submittal to FEMA.	Prepare documentation of Stage 1 boundaries per Piedmont Flood Hazard Assessment Manual (PFHAM) and FEMA requirements.	36 (partial)	
10. JEF interprets landform delineations differently in certain areas.	Prepare content revisions and document in the Stage 1 TDN work product.	TBD Change Order	TBD
Stage 2 Piedmont Landform Stability Assessment			
11. Report documentation is considered inadequate for TDN submittal to FEMA.	Prepare documentation of Stage 2 boundaries per Piedmont Flood Hazard Assessment Manual (PFHAM) and FEMA requirements.	TBD Change Order	TBD
12. JEF interprets landform stability differently in certain areas.	Prepare content revisions and document in the Stage 2 TDN work product. JEF will add up to three (3) new active areas.	TBD Change Order	TBD
Optional Task 11.1.2 Approximate Riverine Floodplain Delineations			
13. Effective study and FDS does not meet current FCDMC standards for a detailed study.	No Action. Not considered fatal flaw.	N/A	N/A
14. Suspected split flow in upper White Tank Wash tributary (portion of Fan 39).	No Action. Area likely to be subject to future LOMR by developers.	N/A	N/A
Optional Task 12.9 Implementation Plan			
15. Commence discussion of project implementation with stakeholders at initial contact and continue throughout stakeholder involvement program.	Initiate SVADMP Task 12.9 per Scope of Work.	188	$21,498.17

JE Fuller/ Hydrology & Geomorphology, Inc.

Jon Fuller, PE, RG, PH, MS, CFM	Mike Kellogg, M.S., G.I.T.	8400 S. Kyrene Rd., Suite 201
Brian Iserman, P.E.	Cory Helton, EIT, M.S.	Tempe, Arizona 85284
John Wallace, P.E.	Rob Lyons, P.E.	1-877-752-2124 (toll free)
Ted Lehman, P.E.	Brooks Dillard, E.I.T.	480-752-2124 (voice)
W. Scott Ogden, P.E.	Jolene Robertson, Hydrologist	480-839-2193 (fax)
Pat Deschamps, P.E., R.L.S.	Annette Griffin, A.A.S.	www.jefuller.com
Jeff Despain, P.E.		

August 19, 2005

Valerie Swick
Flood Control District of Maricopa County
2801 W. Durango St.
Phoenix, AZ 85009

RE: Sun Valley ADMP- GIS data request for Fan #2 Area

Dear Valerie:

To further enable JE Fuller/Hydrology & Geomorphology, Inc. to perform tasks outlined in the scope for Sun Valley ADMP, the following GIS data is being requested:

- Most recent & 1953 digital aerial photography
- FCD topographic 10' contours and DTM data (i.e. point files and breaklines).
- Index map of spatial distribution of 2' contours available for the area
- Existing and Planned Land Uses (MAG Coverage) Landscape character types, subtypes and units, FCDMC
- Various MAG coverage's including the Desert Spaces Plan, bikeways, cultural and sports attractions, outdoor recreation opportunities, municipal and supervisory district boundaries
- Maricopa County Regional Trail System in digital and hard formats
- Existing DISTRICT Facilities
- Floodplain (fpzfcd and fpzfema) polygons.
- Floodplain cross sections and baselines.
- Drainage Basin Boundaries (large and small areas)
- Soils & Nat Veg
- Surficial geology (AZGS)
- Land form & stability
- Streets
- Municipal boundaries
- CAP Alignment
- Parcels
- Sun Valley ADMP Study Limits
- Dam Locations
- Dam watersheds
- FRS flood pool limits
- Alert gauge locations

- Culvert locations
- Utility lines locations
- Alluvial Fan Apexes
- Master Planned Communities Boundaries
- State Land vs. Private Land (lndgvt)
- Township Range Section data
- Park boundaries

JE Fuller/Hydrology & Geomorphology, Inc. has included a shape file (in NAD83_ArizonaCentral_InternationFeet) of the area of interest. Please provide the vector data in .shp format and the raster images as Mr.SID.

Thanks for assisting us in this matter and please feel free to contact us with any questions/concerns regarding the above requested data.

Sincerely,

JE Fuller/Hydrology & Geomorphology, Inc.

Pat Quinn, P.E., R.L.S.
Project Manager

«Sir_Title» «First_Name» «Last_Name»
«CompanyAgency»
«Business_Address»
«City», «State» «Postal_Code»

August 26, 2005

RE: Sun Valley Area Drainage Master Plan (ADMP) - Digital Data Request

The Flood Control District of Maricopa County (District) is currently in the process of formulating preliminary alternatives to addresses identified drainage and flooding problems in the Sun Valley ADMP study area. You have been identified as a point of contact for the collection of hydrologic and hydraulic information for the master planned community developers in the study area. Information regarding the developers' existing and/or planned flow corridors and drainage design will help to ensure that the regional solutions advanced in the Sun Valley ADMP fully incorporate current and planned development. We request that you provide to the District any available digital data that may be useful for the purpose of incorporating planned drainage improvements within the footprints of the developments into the ADMP alternatives formulation. The following list identifies some of the digital data that might be useful:

- Master planned communities boundaries
- Planned/existing land use, parcel locations, and street alignments
- Drainage basin boundaries
- Planned/existing watercourse corridors
- Planned/existing drainage facilities, design data and/or models
- Planned/existing utility locations
- Planned/existing landscape, multi-use corridors, and outdoor recreation opportunities.

Please provide any of the above information, as available, to the District at your earliest convenience. Thank you for timely assistance in this matter.

Sincerely,

Valerie Swick, E.I.T., CFM, P.H.
Project Manager

JE Fuller/ Hydrology & Geomorphology, Inc.

Jon Fuller, PE, RG, PH, MS, CFM	**Mike Kellogg, M.S., G.I.T.**	**8400 S. Kyrene Rd., Suite 201**
Brian Iserman, P.E.	**Cory Helton, EIT, M.S.**	**Tempe, Arizona 85284**
John Wallace, P.E.	**Rob Lyons, P.E.**	**1-877-752-2124 (toll free)**
Ted Lehman, P.E.	**Brooks Dillard, E.I.T.**	**480-752-2124 (voice)**
W. Scott Ogden, P.E.	**Jolene Robertson, Hydrologist**	**480-839-2193 (fax)**
Pat Deschamps, P.E., R.L.S.	**Annette Griffin, A.A.S.**	**www.jefuller.com**
Jeff Despain, P.E.		

August, 29 2005

Valerie Swick
Flood Control District of Maricopa County
2801 W. Durango St.
Phoenix, AZ 85009

RE: Sun Valley ADMP – HEC-2 request for Wagner Wash

Dear Valerie:

JE Fuller/ Hydrology & Geomorphology, Inc. requests that you provide the HEC-2 models for Wagner Wash for our use in the Sun Valley ADMP. We have already received the following reports pertaining to Wagner Wash:

- Hydrologic Analysis of Wagner Wash Watershed
- Manning's "n" Value Selection Report for Wagner Wash Flood Plain Delineation Study (FCD Project 90-03)
- Wagner Wash Flood Insurance Study Final Hydraulic Report

Thank you for assisting us in this matter. Please feel free to contact me with any questions/concerns regarding the above requested data.

Sincerely,

JE Fuller/ Hydrology & Geomorphology, Inc.

Pat Quinn, P.E., R.L.S.
Project Manager

JE Fuller/ Hydrology & Geomorphology, Inc.

Jon Fuller, PE, RG, PH, MS, CFM	**Mike Kellogg, GIT, MS, CFM**	**8400 S. Kyrene Rd., Suite 201**
Brian Iserman, PE	**Hari Sundararaghavan, PhD, PE CFM**	**Tempe, Arizona 85284**
John Wallace, PE	**Jolene Tallsalt Robertson, BS**	**1-877-752-2124 (toll free)**
Ted Lehman, PE	**Cory Helton, EIT, MS**	**480-752-2124 (voice)**
W. Scott Ogden, PE	**Rob Lyons, EIT**	**480-839-2193 (fax)**
Pat Quinn, PE, RLS	**Brooks Dillard, EIT**	**www.jefuller.com**
Jeff Despain, PE	**Annette Griffin, AAS**	

September 14, 2005

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

RE: Sun Valley ADMP – Request for Optional Tasks Authorization

Dear Valerie:

This letter is written request for authorization of optional tasks and expenses as per the Sun Valley ADMP Scope of Work as follows:

Optional Task 16.0 Maintenance Plan – At the August 31, 2005 meeting with Town of Buckeye representatives, it was evident that the District's ADMP coordination with the Town's impact fee analysis project would benefit if the ADMP Optional Task 16.0 Maintenance Plan work plan was authorized. Per our conversation following this meeting, I request that you authorize this task. The lump sum fee for this task is $13,587.32.

Richard H. French, P.E., Ph.D. Optional Expenses – Per our discussion following the August 23, 2005 Step 1 Preliminary Alternatives brainstorm session, I request that you authorize the travel-related optional expenses for Dr. French to attend the upcoming December 14, 2005 Step 2 Proposed Alternatives Meeting. The optional expense amount is $525.00.

Please contact me if you have questions or need further information.

Sincerely,
JE Fuller/Hydrology & Geomorphology, Inc.

Pat Quinn, PE, RLS
Project Manager

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: October 31, 2005

TO: Pat Quinn, P.E., JE Fuller/ Hydrology & Geomorphology, Inc.

FROM: Ted Lehman, P.E., JE Fuller/ Hydrology & Geomorphology, Inc.

RE: Area 4 Hydrology and WMS

CC: Valerie Swick, FCDMC

Pat,

Valerie asked me to write an explanation memo regarding our decision to abandon WMS as the modeling interface for development of the Area 4 hydrology for the Sun Valley ADMP.

The scope of work specifies WMS as the modeling tool for the development of the hydrology for Area 4. In my review of the PBSJ work for Area 3, I noticed that the subbasin delineations and the lag time flow paths showed frequent discrepancies compared to evidence visible in the high resolution digital aerial photographs. For example, subbasin boundaries were observed to cross visible washes. Similarly, lag time flow paths were observed crossing ridges into adjacent drainages or diverging from the primary channel in numerous locations. In addition, the lines created by the WMS program for the flow paths showed a highly stair-stepped shape resulting in artificially long flow path lengths. At least some of the inconsistencies between the aerial photos and the WMS linework are likely related to the relatively coarse 10-foot topography as compared to the 0.8-foot pixel color orthophotography.

As a result, I decided it was important for us to manually delineate subbasin boundaries and lag time flow paths external of the WMS program.

Secondly, upon attempts to bring the externally generated lines into the WMS program numerous problems were encountered. Specifically:

- Control of the naming conventions for concentration points, drainage basins, and flow paths was not easily controlled despite guidance within the program help for importing these objects from ArcView. The result was that each component required manual overriding to rename or could not be renamed as desired.
- The FCD lag time equation does not exist as a pre-programmed option in WMS. WMS does allow the user to enter a user-defined equation. However, repeated attempts to implement the District's equation, the program proved cumbersome and unpredictable. Namely, the default length variable used by WMS is something it refers to as the Maximum Flow Distance. This length does not correspond to the flow path length I imported from my own delineation. Attempts to apply my flow path into

the user-defined lag equation led to frustrations that were never resolved. In particular, the length was stored in the WMS database in feet while the FCD lag equation uses the length in miles. When a conversion factor was applied to the user-defined lag equation, the result was that the length value in the database appeared to be zeroed out. That is, the length in feet became zero and the lag was computed as zero. This problem was never resolved.

- In addition, the user-defined equation could not be saved as an option to apply universally to the entire project. Each subbasin had to be opened and the equation reentered and the lag time (attempted to be) calculated.

After more than a week of frustrations and continued reminders about the tight project schedule, the decision was made to use the District's newest DDMSW pre-processor for development of the HEC-1 models. The program was designed specifically for the District and their methods. The program proved quick and efficient at importing and processing data from GIS and creating the HEC-1 models. The program also provided much more control by the hydrologist.

In summary, the combination of data resolution, model flexibility, and project schedule compelled me to recommend a decision to abandon WMS in favor of DDMSW to complete the hydrology fro Area 4 for the Sun Valley ADMP. Therefore, the Area 4 hydrology documents submitted on October 6, 2005 contain DDMSW files, GIS files, and HEC-1 files generated without the use of WMS.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: November 3, 2005

TO: Jessica White

FROM: Pat Quinn

RE: Sun Valley ADMP Project Update

CC: Valerie Swick

The following draft text is provided for your use in preparing the postcard announcement of the December 6, 2005 public meeting. The postcard is to be distributed to land owners and residents in the study area. The postcard is intended as follow-up information to that contained in the initial fact sheet mailed in September 2005.

PROJECT UPDATE

Project work by the Flood Control District of Maricopa County (District) on the Sun Valley Area Drainage Master Plan (ADMP) is currently in progress and is about one-third completed at this time. Following an early emphasis on collecting and assessing updated information about drainage and flooding problems in the study area, Preliminary Alternatives were developed to address those identified problems.

The Preliminary Alternatives include structural measures (i.e., retention/detention basins and/or drainage channels), nonstructural measures (i.e., development guidelines and/or new floodplain delineations), and no action measures (i.e., enforcement of current drainage and floodplain regulations).

The District's objectives for the project are to develop regional, whole-system alternatives to address identified drainage and flooding problems and also to ensure that future land development does not worsen flooding problems as compared to existing conditions today. To achieve those objectives, the Preliminary Alternative measures described above are currently being joined in various combinations into whole-system, flood control solutions called Proposed Alternatives. Work tasks currently focus on the technical, environmental, and regulatory analyses of these regional Proposed Alternatives.

The purpose of the December 6, 2005 public meeting is to present the Proposed Alternatives to land owners and residents in the project study area. The desired outcome is to receive the public's feedback about the Proposed Alternatives before the District proceeds with the selection, refinement, and conceptual design of the Recommended Alternative for the Sun Valley ADMP.

JE Fuller/ Hydrology & Geomorphology, Inc.

Jon Fuller, PE, RG, PH, MS, CFM
Brian Iserman, PE
Ted Lehman, PE
W. Scott Ogden, PE
Mike Kellogg, RG, MS, CFM
Hari Sundararaghavan, PhD, PE, CFM
Pat Quinn, PE, RLS
Jeff Despain, PE
Robert Lyons, PE
Emili Kolevski, PE
Cory Helton, EIT, MS
John Wallace, PE
Thomas Patterson, PE
Robert Shand, PE
Jolene Tallsalt Robertson, BS
Annette Griffin, AAS

January 18, 2006

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

RE: Sun Valley ADMP – Request for Optional Tasks Authorization

Dear Valerie:

This letter is written request for authorization of optional tasks as per the Sun Valley ADMP Scope of Work as follows:

Optional Tasks 2.4.6.3 and 2.4.6.6 Value Engineering Meetings – The formulation of the structural alternatives for the Sun Valley ADMP comprises two parallel, but highly interrelated tracks. The two tracks are:

- *Form* concerning landscape aesthetics, multi-use opportunities, and environmental impacts; and
- *Function* addressing the engineering feasibility of the various alternatives.

The approach to alternatives development and review leading up to the December 14, 2005 Integrated Alternatives Meeting was to hold similar, but separate, small group meetings with the project team members of related expertise to discuss form and function aspects of the alternatives in detail. This approach allowed the team to work together more effectively at the Integrated Alternatives Meeting to formulate the alternatives in such a way as to maximize opportunities for incorporation of recreational amenities and aesthetic improvements while still maintaining basic flood control functionality of the whole-fan systems. In combination, the results were value-engineered structural alternatives which offer recreational opportunities and can be aesthetic enhancements to the communities in which they are located. The previous form and function alternative meetings were not scoped, but proved to be key to the successful outcome of the Step 2 Proposed Alternatives formulation.

I suggest we leverage the success of this dual-track alternatives development approach into the next steps the project team undertakes in selecting the Step 3 Recommended Alternative. That is, I request that the value engineering meetings comprising Optional Tasks 2.4.6.3 and 2.4.6.6. are authorized so that we can hold separate small group meetings to review form and function considerations separately and in detail prior to the Step 2 Proposed Alternatives Evaluation Meetings. The form and function meetings are not scoped; however, they do meet the intent of Optional Tasks 2.4.6.3 and 2.4.6.6 in the identification of fatal flaws and to value engineer the Recommended Alternative. Table 1 is a summary of the previous and planned alternatives

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evaluation meetings. Scoped meetings and those not scoped are identified. Per our conversation at our January 12, 2006 project manager coordination meeting, I request that you authorize these tasks. The associated lump sum fee is $14,875.72.

Optional Task 5.4.7 Additional Stakeholder Meetings – Stakeholder involvement is a key element of the Sun Valley ADMP. The Scope of Work provides for three milestone stakeholder working group meetings, plus 20 individual meetings to address specific issues with particular stakeholders. Table 2 summarizes the individual meetings held to date with stakeholders; it does not include the stakeholder working group meetings. Future meetings that are planned and/or scheduled with key stakeholders are also identified.

In anticipation of the need for continued individual contact with several key stakeholders, I request that you authorize Optional Task 5.4.7 for ten (10) additional individual meetings to facilitate continued interaction with the stakeholders regarding the Recommended Alternative and related implementation issues. The associated lump sum fee is $10,496.76.

Thank you for your consideration. Please contact me if you have questions or need further information.

Sincerely,
JE Fuller/Hydrology & Geomorphology, Inc.

Pat Quinn, PE, RLS
Project Manager

JE Fuller/ Hydrology & Geomorphology, Inc.

Jon Fuller, PE, RG, PH, MS, CFM
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Robert Lyons, PE
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Cory Helton, EIT, MS
Annette Griffin, AAS
John Wallace, PE
Thomas Patterson, PE
Robert Shand, PE
Ian Sharp, PE

May 16, 2006

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

RE: Sun Valley Area Drainage Master Plan (FCD 2004C049)
Request for Change Order No. 1

Dear Valerie:

This letter is to request that you favorably consider Change Order No. 1 for the referenced contract. The intent is to delete Optional Task 12.7.7 Risk Analysis of Proposed Alternatives and to utilize the project budget associated with that task to provide additional funds for Optional Task 5.4.7 Additional Stakeholder Meetings. You previously authorized Optional Task 5.4.7 on April 1, 2006; however, we have already utilized those additional ten stakeholder meetings. Therefore, we propose to use the project budget allocated for Optional Task 12.7.7 to fund Attached is that portion of the Scope of Work that requiring modification with the recommended changes shown in red. Also provided is a itemization of the re-allocation of the Optional Task 12.7.7 budget to fund Task 5.4.7 stakeholder meetings.

Please contact me if you have questions or need further information. Thank you in advance for your timely processing of this request.

Sincerely,

JE Fuller/Hydrology & Geomorphology, Inc.

Patricia K. Quinn, P.E., R.L.S.
Project Manager

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JE Fuller/ Hydrology & Geomorphology, Inc.

Jon Fuller, PE, RG, PH, MS, CFM	**Jeff Despain, PE**	**John Wallace, PE**
Brian Iserman, PE	**Robert Lyons, PE**	**Robert Shand, PE**
Ted Lehman, PE	**Emili Kolevski, PE**	**Ian Sharp, PE**
W. Scott Ogden, PE	**Brian Schalk, PE**	**Chris Rod, PE**
Mike Kellogg, RG, MS, CFM	**Cory Helton, EIT, MS**	**Dave Meyer, BS**
Hari Sundararaghavan, PhD, PE, CFM	**Dwight Nield, BS**	**Annette Griffin, AAS**

October 16, 2006

Valerie Swick, Project Manager
Flood Control District of Maricopa County
2801 W. Durango Rd
Phoenix, AZ 85009

RE: Sun Valley ADMP FCD 2004C049
Authorization of Optional Task 5.2.n

Dear Valerie:

Per our telephone conversation this morning and previous email, this letter documents the need for authorization of the above-referenced optional task to support the upcoming public meeting. The District requested that JE Fuller/Hydrology & Geomorphology, Inc. produce additional 36"x48" oversized exhibits showing the recommended alternative for each of the six subareas, plus exhibits showing the subarea locations. The District's request will require labor (exhibit production, coordination with District staff) of approximately 24 hrs @ $103.08/hr and expenses of $25.00/exhibit for reproduction for a total of $2,673.92.

Thank you for your consideration of this matter.

Sincerely,

JE Fuller/Hydrology & Geomorphology, Inc.

Jonathan Fuller, PE
Principal

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Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: June 23, 2006

TO: Valerie Swick, PE/FCDMC

FROM: Jon Fuller, PE

RE: SVADMP Value Engineering Meeting Response

CC: Ted Lehman, PE

The following summarize the SVADMP team's responses to design suggestions made by the Value Engineering (VE) team:

FRS #1 Subarea

F-1. Reconsider B41 Channel Alignment: **Reject**

- The B41 channel alignment crosses watershed divides, resulting in substantial excavation costs, inability to integrate the channel into the natural environment, and interbasin transfers of stormwater.
- District staff and project participants preferred a non-excavated channel. The B41 channel alternative requires substantial cuts through divides.
- The B41 alternative is less compatible with developer corridor plans.
- The B41 alternative does not provide for a regional drainage system for areas downstream of the corridor alignment. Providing a regional drainage system has been identified by District staff as a critical success criteria.

F-2. Basin Only, No Channels (Entire Study Area): **Reject**

- The basin only concept addresses only the alluvial fan aspect of a regional drainage solution. Providing a more comprehensive regional drainage system has been identified by District staff as a critical success criteria.
- Leaving channel construction to downstream developers may result inconsistent, incompatible designs, gaps in conveyance system, and phasing issues.
- Non-regional drainage systems to be maintained by homeowners associations are a likely problem.

F-6. Consider Moving Downstream Portion of Channel 36 900 Feet East Off Sun Valley Parkway: **Review**.

- Final recommended channel alignments will be evaluated as part of Step 3 of the ADMP process. The landowners of this parcel are included in the stakeholder involvement process and will be consulted for their alignment preferences. Discussions thus far with these landowners suggests that

realignment in this area is not likely acceptable given their land use objectives.

F-7. Reconsider Off-Line Basins: **Reject**

- ADMP team members expressed significant concerns regarding the ability off-line basins to function adequately to remove alluvial fan flooding hazards over the long-term.

White Tank Wash Subarea

WT-1. Basin Only, No Channels: **Reject**

- See F-2 above.

WT-2. Do Nothing At Sun Valley South: **Reject**

- The do-nothing alternative is evaluated as part of the ADMP process.
- The do-nothing alternative does not provide a comprehensive regional drainage system, which has been identified by District staff as a critical success criteria for an ADMP.
- See G-9

Hassayampa Subarea

H-1. Consider Managed Approach for Fans 4 & 5: **Review**

- Idea will be reviewed and evaluated as part of Step 3 of the ADMP.
- If apex basin is removed, a basin will be required at Sun Valley Parkway in order to meet team objective of not disturbing Sun Valley Parkway.
- The management alternative does not provide a comprehensive regional drainage system, which has been identified by District staff as a critical success criteria for an ADMP.
- Incorporation of the existing channel capacities (see H-2) will likely result in significant reaches of non-structural solutions in this sub-area.
- See G-9

H-2. Reduce Amount of Structured Channel by Using Existing Channels: **Accept**

- This idea is already part of Step 3 and was already being implemented by the ADMP team.

Wagner Wash Subarea

WW-1. Consider Floodplain Management Approach for Fans 17-19: **Reject**

- The management alternative does not provide a comprehensive regional drainage system, which has been identified by District staff as a critical success criteria for an ADMP.
- See H-1.

WW-2. Basin Only, No Channels: **Reject**

- See F-2

Landscape Compatibility Assessment

L-1. Developers Pay for Buffer Construction: **Review**

- This idea is an implementation issue, not a design issue. Implementation issues are addressed in Step 3, which is currently underway.

L-2. Delete One Foot Vertical Undulation for Levee Walls: **Accept**

- District LA has suggested that aesthetic treatment objectives can be met without this additional height variation.
- Was already under consideration as part of Step 3 refinement.

L-3. Use Wall Cross Section in Lieu of Levee: **Accept**

- Was already selected as part of Step 3 refinement.

L-4. Use Corridor Section for Trails/Multi-Use in Lieu of Buffers: **Review**

- Subject to District LA approval. However, discussions thus far indicate that the purpose of the buffers is primarily an aesthetic treatment approach (as opposed to a multiple use objective).
- Step 3 refinement will consider trails on alternate sides (inside vs. outside).

L-5. Establish Corridor Width Criteria Based on Functions Required: **Review**

- Requires coordination with District LA during Step 3 refinement.
- Already incorporated into Step 3 refinement process.

General (Entire Study Area)

G-1. Confirm Need for Environmental Document – Regional Permit. **Accept**

- ADMP team concurs on need, but is not authorized for such activity in the project scope of work.
- Currently, this task is a District function, not a consultant team function.
- Use of environmental permit as implementation tool may be explored.

G-3. Coordinate Planning of State Trust Parcel with Sun Valley ADMP: **Accept**

- ADMP team is already coordinating with ASLD

G-4. Reduce Number of Drop Structures & Monitor Erosion: **Partially Accept**

- District has indicated that monitoring is not an acceptable erosion mitigation measure.
- Refinement of the number, spacing and design of grade control structures is normal part of the Step 3 design process.

G-5. Fund Improvements Through Community Facilities District: **Review**

- ADMP team will consider as part of the scoped implementation plan.

G-9/F-3. Non-Structural Floodplain Management Approach: **Reject**

- Does not meet District objectives for an ADMP.

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING AGENDA

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Wednesday, August 10, 2005

TIME: 1:00 – 3:00 pm

AGENDA:

A. DATA COLLECTION

1. Data collection substantially complete.
2. ADMS work products availability status update.

B. HYDROLOGY

1. Area 3
   - Work pending District authorization of Optional Task 9.4.2 includes Area 3 A-C model modifications and Fans 5, 10, & 11 apex hydrology for Apex HEC-RAS TDN.
   - Assessment pending of hydrology available from developers' engineers for use in ADMP alternatives formulation. Potential change order.
2. Area 4
   - New WMS model development underway.
   - Incorporation of Wagner Wash hydrology into WMS model underway.

C. FLOODPLAIN DELINEATION STUDIES

1. Stage 1 and 2 alluvial fan floodplain delineations
   - Work pending District authorization of Task 11.1.1.2 includes additional documentation of Stage 1 delineations per PFHAM and FEMA requirements.
   - Revisions to landform and landform stability delineations and associated documentation pending resolution. Potential change order.
2. Apex modeling – HEC-RAS modeling of selected alluvial fan apices underway.
3. White Tank Wash and Tributaries FIS – Review completed. Re-study not recommended. District concurrence pending.

D. GEOTECHNICAL INVESTIGATION

1. Geological Characterization – Review of aerial photography and mapping underway.

E. ENVIRONMENTAL EVALUATION

1. Archeological Assessment – Coordination meeting with Jim Rodgers. Deliverables due August 31, 2005.
2. Biological Assessment – Review of Ecoplan report underway.

F. LANDSCAPE PLANNING/ RECEATION MULTI-USE

1. Work plan – District approval pending.
2. July 25, 2005 Site visit.

G. STEP 1 PRELIMINARY ALTERNATIVES

1. August 23, 2005 Brainstorm Session – Presentation and handout materials preparation underway.
2. Existing constraints map preparation underway.
3. Coordination with developers' engineers underway.

H. PUBLIC INVOLVEMENT

1. Update regarding internal District meeting to discuss need for supplemental support of PIO by consultant in implementing public involvement program.
2. Initial public notice of ADMP project start.
3. Web site.

I. STAKEHOLDER INVOLVEMENT

1. Stakeholder Involvement Plan and database matrix update.
2. August 16, 2005 Stakeholder Working Group meeting – Presentation and handout materials preparation underway.
3. Planned individual stakeholder meetings –ASLD, Town of Buckeye, MCDOT.

J. PROJECT ADMINISTRATION

1. Schedule/ Deliverables – Kick-off Site Visit September 20, 2005
2. Optional Tasks 9.4.2, 11.1.1.2, and 12.9 authorization status

K. NEXT MEETING

1:00-3:00pm, Wednesday, September 14, 2005
FCDMC Adobe Conference Room

STEP 1 PRELIMARY ALTERNATIVE BRAINSTORM MEETING

LOCATION: JE Fuller/ Hydrology & Geomorphology, Inc.

DATE: Thursday, August 11, 2005

TIME: 9:00am – 2:00 pm

AGENDA:

A. MEETING PURPOSE 9:00-9:15 am

1. Review alternative development framework (flowchart, matrices, tools, products)
2. Identify problems, opportunities and constraints for study area (existing constraints map)
3. Develop seed alternative ideas for August 23 alternative brainstorm session
4. Identify strengths and weaknesses regarding seed ideas for alternatives

B. ALTERNATIVE PROCESS OVERVIEW 9:15-9:45 am

1. Process Flowchart (Stkhldr ppt)
   a) ADMS
   b) Step 1 – Measures by fan (cards)
   c) Step 2 – Alternative whole fan solution by fan (hand)
   d) Step 3 – Recommended alternative by fan or fan family (winning hand)
2. Tools
   a) Maps – Physical and human systems
   b) Fan Prototype Template
   c) Matrices (Steps 1& 2)
   d) Concept Design Prototype (Step 3)

C. APPLICATION (Steps 1 & 2) 9:45 am -1:00 pm

1. Area 3 Families of Fans (categorized by outfall)
   a) Buckeye FRS 1, 2, & 3
      - Skyline, 11, 10, 9, 12
      - 8, 7, 36
   b) White Tank Wash
      - 37, 38, 39
   c) B R E A K
   d) Hassayampa River
      - 4, 5, 6
   e) Wagner Wash
      - 3, 13 E & W
   f) CAP
      a) 1, 2
2. Area 4

D. OUTCOME (Step 3) **1:00 – 1:30pm**

No more than 4 alternatives:

1. Structural Alternative(s)
   - Conveyance Alternative – all channel-routed flows
   - Detention Alternative – all basin-captured flows
2. Non-structural Alternative – Open space corridors, f/p & ehz delineations, development guidelines)
3. Combination Alternative - detention/ conveyance strategies (vary by fan or fan family)
4. No Action Alternative – future condition flows

E. NEXT STEPS SUMMARY **1:30 – 1:45 pm**

1. Identify action items
2. August 23, 2005 Step 1 Brainstorm Session

SUN VALLEY AREA DRAINAGE MASTER PLAN

STEP 1 PRELIMARY ALTERNATIVES BRAINSTORM MEETING

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Tuesday, August 23, 2005

TIME: 9:30am – 3.30 pm

AGENDA:

A. MEETING PURPOSE **9:30-9:40 am**

B. ALTERNATIVES DEVELOPMENT PROCESS OVERVIEW **9:40-10:10 am**

1. Phase I ADMS
2. Phase II ADMP Step 1 Preliminary Alternatives
3. Phase II ADMP Step 2 Proposed Alternatives
4. Phase II ADMP Step 3 Recommended Alternative

C. EXISTING CONDITIONS REVIEW **10:10-10:20 am**

1. Results of Data Collection Effort
2. Existing Constraints Map
3. Existing Flooding Problem Areas
4. Existing Studies in the Project Area

D. B R E A K **10:20-10:30 am**

E. STEP 1A BRAINSTORM COMPONENT MEASURES **10:30am-12:00 pm**

Step 1A – Measures for Alluvial Fan Components
(30 minutes each)

- 1 – Apex
- 2 – Up-Fan
- 3 – Parkway

F. L U N C H **12:00-1:30 pm**

G. STEP 1A BRAINSTORM (CONT'D.) **1:30-2:30 pm**

Step 1A – Measures for Alluvial Fan Components
(30 minutes each)

- 4 – Down-Fan
- 5 – Outfall

H. B R E A K **2:30-2:40 pm**

I. STEP 1B WHOLE FAN ALTERNATIVES BY SUBAREA **2:40-3:15 pm**

1. CAP (example)

J. SUMMARY/ NEXT STEPS **3:15 – 3:30 pm**

1. Progress Meeting – September 14, 2005 (1:00-3:00pm)

2. Step 1B Brainstorm Session – September 14, 2005 (3:00-5:00pm)

   Whole fan alternatives by subarea

   - FRS # 1
   - White Tank Wash
   - Wagner Wash
   - Hassayampa River
   - FRS #2 & 3

3. Final Step 1 Brainstorm Session – Schedule Date

   - Area 4
     - Sun Valley Parkway
     - CAP
     - Patton Road
   - ADMP Area Wide

K. ADJOURN **3:30 pm**

BUCKEYE COORDINATION MEETING AGENDA

LOCATION: Town of Buckeye
100 N. Apache Road, Suite A
Buckeye, AZ 85326

DATE: Thursday, August 31st, 2005

TIME: 10:00m - 12:00 pm

1. 10:00 - Introductions
    - FCDMC Team
    - Buckeye Team
2. 10:05 - Meeting Purpose
    - How best to exchange information and coordinate between Buckeye and the FCDMC SVADMP
3. 10:10 - Project Overview and Status
    - Buckeye MPC's (status, drainage reports, master plans, plats, etc)
    - Buckeye Public Works Projects
    - FCDMC Sun Valley ADMP
    - Other
4. 11:00 - Implementation Opportunities
    - SVADMP Scope and Schedule
    - Buckeye Impact Fee Study Scope and Schedule
    - Capital Improvements
    - Maintenance
5. 11:30 - Private Sector Coordination Strategies
    - Information Exchange
    - Other
6. 11:50 - Summary and Adjourn

SUN VALLEY AREA DRAINAGE MASTER PLAN

STEP 1B PRELIMARY ALTERNATIVES MEETING

LOCATION: McMicken Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Thursday, September 8, 2005

TIME: 1:00 – 5:00 pm

AGENDA:

A. MEETING PURPOSE **1:00-1:15 pm**

B. ALTERNATIVE PROCESS OVERVIEW **1:15-1:30 pm**

C. STEP 1B WHOLE FAN ALTERNATIVES BY SUBAREA **1:30-3:00 pm**

1. CAP (1:30-2:30 pm)
2. Wagner Wash (2:30-3:00 pm)

D. B R E A K **3:00-3:15 pm**

E. STEP 1B WHOLE FAN ALTERNATIVES BY SUBAREA **3:15-4:45 pm**

1. Wagner Wash (3:15-3:45 pm)
2. Hassayampa River (3:45-4:45 pm)

F. SUMMARY/ NEXT STEPS **4:45 – 5:00 pm**

1. September 14, 2005 Progress Meeting **Cancelled**

2. Step 1B Whole Fan Alternatives by Subarea

   a) 1 – 5pm, Wednesday, September 14, 2005, Adobe Conference Room
   - White Tank Wash
   - FRS # 1
   - FRS #2 & 3

   b) 8 am – 12pm, Tuesday, September 27, 2005, ALERT Conference Room
   - Area 4
     - Sun Valley Parkway
     - CAP
     - Patton Road
   - ADMP Area Wide

3. Step 1 Preliminary Alternatives Evaluation Meeting
   8 am – 12 pm, Thursday, October 6, 2005, Adobe Conference Room

4. October 12, 2005 Progress Meeting – To be rescheduled

G. ADJOURN **5:00 pm**

SUN VALLEY AREA DRAINAGE MASTER PLAN

STEP 1B PRELIMARY ALTERNATIVES MEETING

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Wednesday, September 14, 2005

TIME: 1:00 – 5:00 pm

AGENDA:

A. MEETING PURPOSE **1:00-1:15 pm**

B. ALTERNATIVE PROCESS OVERVIEW **1:15-1:30 pm**

C. STEP 1B WHOLE FAN ALTERNATIVES BY SUBAREA **1:30-3:00 pm**

1. Area 4 North of CAP (1:30-2:30 pm)
2. ADMP Area-Wide (2:30-3:00 pm)

D. B R E A K **3:00-3:15 pm**

E. STEP 1B WHOLE FAN ALTERNATIVES BY SUBAREA **3:15-4:45 pm**

1. ADMP Area-Wide (3:15-3:45 pm)
2. FRS #2 & #3 (3:45-4:45 pm)

F. SUMMARY/ NEXT STEPS **4:45 – 5:00 pm**

1. Step 1B Whole Fan Alternatives by Subarea

   a) 8 am – 12pm, Tuesday, September 27, 2005, ALERT Conference Room
      - White Tank Wash
      - FRS # 1

2. Step 1 Preliminary Alternatives Evaluation Meeting
   8 am – 12 pm, Thursday, October 6, 2005, Adobe Conference Room

3. 1:30-3:30 pm, Wednesday, October 19, 2005 Progress Meeting

G. ADJOURN **5:00 pm**

SUN VALLEY AREA DRAINAGE MASTER PLAN

STEP 1B PRELIMARY ALTERNATIVES MEETING

LOCATION: ALERT Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Tuesday, September 27, 2005

TIME: 8:30 – 11:30 am

AGENDA:

A. MEETING PURPOSE	**8:30-8:45 am**
B. ALTERNATIVE PROCESS OVERVIEW	**8:45-9:00 am**
C. STEP 1B WHOLE FAN ALTERNATIVES BY SUBAREA White Tank Wash	**9:00-10:00 am**
D. B R E A K	**10:00-10:15 am**
E. STEP 1B WHOLE FAN ALTERNATIVES BY SUBAREA FRS #1	**10:15-11:15 am**
F. SUMMARY/ NEXT STEPS	**11:15 – 11:30 am**

1. Step 1 Preliminary Alternatives Evaluation Meeting
   8 am – 12 pm, Thursday, October 6, 2005, Adobe Conference Room

2. 1:30-3:30 pm, Wednesday, October 19, 2005 Progress Meeting

G. ADJOURN **11:30 am**

CAP COORDINATION MEETING AGENDA

LOCATION: Central Arizona Project
23636 N. 7th Street
Phoenix, AZ

DATE: Wednesday, September 28th, 2005

TIME: 10:00 pm - 11:30 pm

1. 10:00 - Introductions
    - FCDMC
    - CAP
2. 10:05 - Meeting Purpose
    - How best to exchange information and coordinate with the CAP (including projects, facilities, lands etc.) and the FCDMC SVADMP
3. 10:15 - Project Overview and Status
    - Sun Valley ADMP
        a. Scope
        b. Schedule
    - CAP
    - Other
4. 11:00 - Implementation Opportunities
    - Schedule/ Timing
    - Capital Improvements
    - Maintenance
5. 11:15 -Coordination Strategies
    - Information Exchange
    - Other
6. 11:30 - Summary /Adjourn

SUN VALLEY AREA DRAINAGE MASTER PLAN

Site Visit #1 Itinerary

STARTING LOCATION: Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Thursday, September 29, 2005

TIME: 8:00 am – 5:00 pm

AGENDA: (Note: Depending upon time, additional stops may occur)

OVERVIEW OF DAY	**8:00-8:15 am**
DEPART FROM FCD	**8:30 am**
TRAVEL—FCD TO STOP #1	**8:30-9:30am**
STOP #1: FAN 1	**9:30-10:30am**
TRAVEL—STOP #1 TO STOP #2	**10:30-10:45**
STOP #2: CAP	**10:45-11:45am**
TRAVEL—STOP #2 TO STOP #3	**11:45-12:00**
LUNCH AT WAGNER WASH	**12:00-12:30pm**
STOP #3: WAGNER WASH	**12:30-1:30pm**
TRAVEL—STOP #3 TO STOP #4	**1:30-2:00pm**
STOP #4: FRS #1 & Privately Owned Fractured Parcels	**2:00-3:00 pm**
TRAVEL—SALOME-TONOPAH HIGHWAY TO I-10	**3:00-3:30 pm**
TRAVEL—RETURN TO FCD	**3:30-4:30 pm**

SUB AREA 4 NORTH OF CAP COORDINATION MEETING AGENDA

LOCATION: Buckhorn-Mesa Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ
DATE: Monday, October 3rd, 2005
TIME: 1:30 pm - 3:00 pm

1. **1:30 - Introductions and Opening Comments**

2. **1:40 - Meeting Purpose-Coordination on:**

   - **Schedule of Developments & SVADMP**
   - **Drainage System Alternatives by Sub Area**
   - **Data Sharing between Development & SVADMP**
   - **Implementation Opportunities**

3. **1:50 – SVADMP Status**

   - **Sub Area Development**
   - **Schedule**

4. **2:10 – Open discussion by Development**

   - **Development Schedule & Status**
   - **Drainage System Approach/Status**
   - **Data Sharing Protocol/ Continued Coordination Methods**

5. **2:40 – Implementation Opportunities**

6. **3:00- Adjourn**

SUN VALLEY AREA DRAINAGE MASTER PLAN

STEP 1 PRELIMARY ALTERNATIVES EVALUATION MEETING

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Thursday, October 6, 2005

TIME: 8:00 am – 12:00 pm

AGENDA:

A. **MEETING PURPOSE** 8:00-8:10 am

B. **ALTERNATIVES DEVELOPMENT PROCESS REVIEW** 8:10-8:30 am

C. **EVALUATION CRITERIA REVIEW/ APPLICATION** 8:30-9:00 am

D. **PRELIMINARY ALTERNATIVES EVALUATION** 9:00-10:30 am

- **Alternative B** – Apex Storage Strategy (45 min.)
- **Alternative C** – Apex Conveyance Strategy (45 min.)

E. **B R E A K** 10:30-10:45 am

F. **PRELIMINARY ALTERNATIVES EVALUATION** 10:45-11:45 am

- **Alternative A** – Apex No Measure Strategy (30 min.)
- **Alternative D** – Whole Fan No Measure Strategy (30 min.)

G. **STEP 2 PROPOSED ALTERNATIVES SELECTION** 11:45-11:55 am

H. **SUMMARY/ NEXT MEETING** 11:55 am-12:00 pm

1. 1:30-3:30 pm, Wednesday, October 19, 2005 Monthly Progress Meeting

I. **ADJOURN** 12:00 pm

HASSAYAMPA SUBAREA COORDINATION MEETING AGENDA

LOCATION: Buckhorn-Mesa Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ

DATE: Tuesday, October 18th, 2005

TIME: 1:30 pm - 3:00 pm

1. **1:30 - Introductions and Opening Comments**

2. **1:40 - Meeting Purpose-Coordination on:**

   - **Schedule of Developments & SVADMP**
   - **Drainage System Alternatives by Sub Area**
   - **Data Sharing between Development & SVADMP**
   - **Implementation Opportunities**

3. **1:50 – SVADMP Status**

   - **Sub Area Development**
   - **Schedule**

4. **2:10 – Open discussion by Development**

   - **Development Schedule & Status**
   - **Drainage System Approach/Status**
   - **Data Sharing Protocol/ Continued Coordination Methods**

5. **2:40 – Implementation Opportunities**

6. **3:00- Adjourn**

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING AGENDA

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Wednesday, October 19, 2005

TIME: 1:30 – 3:30 pm

AGENDA:

A. DATA COLLECTION

1. Status update regarding data collection from master planned community developers' engineers.
2. ADMS work products availability status update.

B. HYDROLOGY

1. Area 3 – Completed models and documentation for apex hydrology for Fans 5, 10, & 11 for use in apex HEC-RAS models to prove flow containment.
2. Area 4 – Completed existing and future condition models. Submitted Area 4 hydrology report on October 6, 2005. District review pending.

C. FLOODPLAIN DELINEATION STUDIES

1. Approximate Alluvial Fan Floodplain Delineations
   - Revised Stage 1 and 2 delineations. Work underway on documentation.
   - Stage 3 delineations underway. Field work partially completed. Coordinating with Pulte/ CMX regarding Fans 38 & 39 delineations.
2. Approximate Riverine Floodplain Delineations
   - Apex HEC-RAS modeling of selected alluvial fan apices underway. Submitted cross section locations, preliminary delineations, 'n' value report, and model output on October 4, 2005. District review pending.
3. Detailed Floodplain Delineations (Optional Task 11.2)
   - White Tank Wash and Tributaries FIS review completed. Re-study not recommended. District concurrence pending.

D. GEOTECHNICAL INVESTIGATION

1. Geological Characterization – Review of aerial photography and mapping underway.

E. ENVIRONMENTAL EVALUATION

1. Archeological Assessment – Work underway incorporating cultural resources maps into historic character report.
2. Biological Evaluation – Work to commence hyperlinking ground photos into GIS database.

F. LANDSCAPE PLANNING/ RECEATION MULTI-USE

1. Completed work plan.
2. Completed draft base mapping.
3. Completed visual quality field work for existing character assessment.
4. Completed regional multi-use inventory.
5. Work underway on landscape character report.
6. Work underway on multi-use data collection report.
7. Coordination meeting with District held October 12, 2005.

G. STEP 1 PRELIMINARY ALTERNATIVES

1. Final updates to Step 1 Preliminary Alternatives matrices pending.
2. Work underway on Task 9.6 Step 1 Hydrologic Analysis submittal.
3. Work underway on Task 10.9 Step 1 Hydraulic Analysis submittal.
4. Work to commence on draft outline for Task 12.12 Step 1 Preliminary Alternatives Report.

H. PUBLIC INVOLVEMENT

1. District PIO distributed the initial fact sheet/ notice of project start to landowners and residents in the project area.
2. Fact sheet posted to project web site.

I. STAKEHOLDER INVOLVEMENT

1. Stakeholder Involvement Plan and database matrix update. Reformatted stakeholder database to list stakeholder groups by subareas.
2. Met with MCDOT, Town of Buckeye, AZ Game & Fish, CAP, FRS #1 Subarea land developers/ engineers, Area 4 North of CAP Subarea land developers/ engineers, and Hassayampa River Subarea land developers/ engineers to discuss project coordination, implementation, and maintenance issues.
3. Planned individual stakeholder meetings –ASLD and White Tank Wash Subarea land developers/ engineers.
4. September 9, 2005 Western Area Region Meeting update

J. PROJECT ADMINISTRATION

1. Optional Tasks status update – Submitted request to District for authorization of Optional Task 16.0 Maintenance Plan and travel-related optional expenses for Richard French, PhD, PE to attend Step 2 Proposed Alternatives Meeting.
2. Posted report templates and binder covers to JEF ftp site for download and use by subconsultants in preparing deliverables.

K. NEXT MEETING

1:30-3:30pm, Wednesday, November 9, 2005
FCDMC Adobe Conference Room

ASLD COORDINATION MEETING AGENDA

LOCATION: Arizona State Land Department
1616 West Adams
Room325
Phoenix, AZ 85007

DATE: Monday, October 24th, 2005

TIME: 3:00 pm - 4:30 pm

1. **3:00 - Introductions**

   - FCDMC Team
   - ASLD Team

2. **3:05 - Meeting Purpose**

   - How best to exchange information and coordinate with current and future ASLD efforts and the Sun Valley ADMP.

3. **3:10 - Project Overviews and Status**

   - Sun Valley ADMP by FCDMC
   - Disposition Plans by ASLD
   - Infrastructure Studies by ASLD
   - Other

4. **4:10 - Future Coordination Strategies**

   - Agency Information Exchange
   - Private Sector Information Exchange

5. **4:20 - Summary/Action Items**

6. **4:30 - Adjourn**

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING AGENDA

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Wednesday, November 19, 2005

TIME: 1:30 – 3:30 pm

AGENDA:

A. STEP 2 PROPOSED ALTERNATIVES FORMULATION UPDATE

B. STAKEHOLDER INVOLVEMENT

1. Review action items related to preparation for November 29, 2005 Stakeholder Working Group Meeting No. 2.
2. Met with ASLD and consultant on October 24, 2005 to discuss project coordination, implementation, and maintenance issues.
3. October 20, 2005 Western Area Region Meeting update

C. PUBLIC INVOLVEMENT

1. Review action items related to critical path calendar for preparation for December 6, 2005 public meeting.
2. Preparation and distribution of public meeting announcement postcard.
3. Preparation of public meeting exhibit boards.

D. HYDROLOGY

1. Area 3 – Completed models and documentation for apex hydrology for Fans 5, 10, & 11 for use in apex HEC-RAS models to prove flow containment.
2. Area 4 – Completed existing and future condition models. Submitted Area 4 hydrology report on October 6, 2005. District review pending.

E. FLOODPLAIN DELINEATION STUDIES

1. Approximate Alluvial Fan Floodplain Delineations
   - Revised Stage 1 and 2 delineations. Work underway on documentation.
   - Stage 3 delineations underway. Field work partially completed.
2. Approximate Riverine Floodplain Delineations
   - Apex HEC-RAS modeling of selected alluvial fan apices underway. Submitted cross section locations, preliminary delineations, 'n' value report, and model output on October 4, 2005. Received District review comments October 19, 2005. Finalize and submit TDN to District.
3. Detailed Floodplain Delineations (Optional Task 11.2)
   - White Tank Wash and Tributaries FIS review completed. Re-study not recommended. District concurrence pending.

F. ENVIRONMENTAL EVALUATION

1. Archeological Assessment – Work underway incorporating cultural resources maps into historic character report.
2. Biological Evaluation – Work to commence hyperlinking ground photos into GIS database.

G. LANDSCAPE PLANNING/ RECEATION MULTI-USE

1. Update regarding coordination meeting with District LA.
2. December 1, 2005 Sun Valley ADMP Multi-Use Workshop

H. PROJECT ADMINISTRATION

1. Optional Tasks status update – Submitted request to District for authorization of Optional Task 16.0 Maintenance Plan and travel-related optional expenses for Richard French, PhD, PE to attend Step 2 Proposed Alternatives Meeting.

I. OTHER

J. NEXT MEETING

Step 2 Proposed Alternatives Evaluation Meeting
9:30-3:30pm, Wednesday, December 14, 2005
FCDMC Adobe Conference Room

STAKEHOLDER WORKING GROUP MEETING AGENDA

Private Sector

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ

DATE: Tuesday, November 29th, 2005

TIME: 1:00 pm - 4:00 pm

1. 1:00 - Introductions and Opening Comments — Valerie Swick, District PM

2. 1:10 - Meeting Purpose — Chuck Williams, Facilitator
   - Inform SWG of Proposed Alternatives
   - Receive input from SWG on Proposed Alternatives
   - Discuss issues

3. 1:20 - Project Status and Update — Pat Quinn, Consultant PM
   - Progress to Date
   - Schedule

4. 1:30- Proposed Alternatives Review — Pat Quinn

5. 2:40- Stakeholder Working Group Involvement — Chuck Williams
   - SWG Individual Reaction and Comments
   - SWG Individual and Group Issues Discussion

6. 3:40 - Summary/Next Meeting — Chuck Williams

7. 4:00 - Adjourn — Valerie Swick

SUN VALLEY AREA DRAINAGE MASTER PLAN

STEP 2 ALTERNATIVES TECHNICAL REVIEW MEETING AGENDA

LOCATION: JE Fuller/ Hydrology & Geomorphology, Inc.
8400 S. Kyrene Rd., Ste. 201
Tempe, AZ 85284

DATE: Tuesday, December 6, 2005

TIME: 2:00 – 4:00 pm

AGENDA:

A. STEP 2 ALTERNATIVES FORMULATION UPDATE (2:00-2:10pm)

1. Component Structures
   - On-line retention basins
   - Open channels
   - Off-line detention basins
   - Drop structures

2. Alternatives Formulation
   - Size variations – big/small, on-line/off-line basins; leveed/excavated channels
   - Alignment variations – conveyance corridors
   - Longitudinal variations – channel sections can vary with longitudinal distance along conveyance corridor

3. Alternatives Overview (handout)
   - A – No Measure at Apex
   - B1 – Big on-line basin at Apex,
   - B2 – Small on-line basin at Apex
   - B3 – Earthen Excavated Channel
   - B4 – Alignment Variation
   - B5 – Off-line basin at Apex
   - C – Concrete Excavated Channel
   - D – Developer Infrastructure

B. MAJOR DESIGN CONCEPTS (2:10-2:20pm)

1. ADMP whole-fan alternatives comprise regional trunk system sized to accept apex and local inflow to channels and basins (Q & sediment).
2. Use existing condition hydrology for design.
3. Range of flows are analyzed to evaluate impacts on design of structures.
4. Test basin/channel size variations on CAP and WTW subareas alternatives. Extrapolate findings to other subareas alternatives.
5. Existing natural channel corridor with levees used for flow containment in conveyance corridors.
6. Excavated channel section faces significant regulatory challenges. Consideration of excavated channels limited to alignments parallel to existing riparian corridors with possible habitat-enhancing side drainage.
7. Sun Valley Parkway culverts will be not be upsized nor will new culverts be installed. Off-line basin upstream of parkway will scalp discharge to match existing culvert capacity.

8. Alternatives design concept similar in downfan areas and at outfalls.
9. Limit flow at outfall to existing 100-year floodplain.

C. DESIGN CONSIDERATIONS BY STRUCTURE (handout) **(2:20-3:40pm)**

1. Open Channel
2. On-line Retention Basin
3. Off-line Detention Basin
4. Drop Structure

D. REVIEW DESIGN CONCEPTS/ CONSENSUS **(3:40-3:55pm)**

E. 12/14/05 ALTERNATIVES MEETING **(3:55-4:00pm)**

1. Agenda discussion
2. Function/ form
3. Review B1-B5 findings for CAP and WTW subareas
4. Consensus on alternatives selection

F. NEXT MEETING

Step 2 Proposed Alternatives Evaluation Meeting
10:00am-4:00pm, Wednesday, December 14, 2005
FCDMC Adobe Conference Room

SUN VALLEY AREA DRAINAGE MASTER PLAN

INTEGRATED ALTERNATIVES MEETING AGENDA

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Wednesday, December 14, 2005

TIME: 10:00 am – 4:00 pm

AGENDA:

A. Introduction	**10:00-10:15am**
INFORMATION	
B. Landscape Character Overview	**10:15-10:45am**
C. Scenic / Visual Overview	**10:45-11:00am**
D. Recreation / Multiple-Use Overview	**11:00-11:15am**
E. Technical Overview	**11:15-11:45am**
F. Integration Session Orientation / Break into Design Groups	**11:45am-12:00pm**
G. L U N C H (provided)	**12:00-12:30pm**
INTEGRATION	
H. Basins	**12:30-1:10pm**
1. Integrated Design Session	12:30-12:50pm
2. Groups Report Out	12:50-1:10pm
I. Channels	**1:10-1:50pm**
1. Integrated Design Session	1:10-1:30pm
2. Groups Report Out	1:30-1:50pm
J. B R E A K	**1:50-2:05pm**
K. Drop Structures	**2:05-2:45pm**
1. Integrated Design Session	2:05-2:25pm
2. Groups Report Out	2:25-2:45pm

L. Combine Measures into Whole-Fan Alternatives **2:45-3:45pm**

1. Integrated Design Session 2:45-3:15pm
2. Groups Report Out 3:15-3:45pm

M. Wrap / Next Steps **3:45-4:00pm**

IPR	Jan 5, 2006
Alternatives Evaluation	Jan 9, 2006
PAAC	week of Jan 23, 2006
Public Meeting	week of Feb 6, 2006

SUN VALLEY ADMP
PM Coordination Meeting
1/12/06

Discussion Items

1. Meeting Schedule

2. Alternative Analysis Decision Process

3. Work Product – CAP Subarea example

4. Preliminary Findings/Synthesis

5. Alternative Evaluation Meeting
   - Agenda
   - Evaluation Criteria

6. Sediment Sampling Program
   - Meeting
   - ROE
   - Schedule

7. Optional Meetings Tasks
   - Alternatives Meetings
   - Stakeholder Individual Meetings

8. Stardust

9. Dick French

10. AZ G&F Mule Deer Movement Proposal

11. Town of Buckeye – Impact Fee contract award, contact with USACOE

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING AGENDA

LOCATION: Operations Building Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Thursday, January 19, 2006

TIME: 10:00 am – 12:00 pm

AGENDA:

PROJECT UPDATES — 10:00-10:30 am

A. STEP 2 PROPOSED ALTERNATIVES FORMULATION

1. Alternatives overview update
2. Alternatives analysis decision process and work status
3. Work product preview – CAP Subarea example

B. MEETING SCHEDULE

ALTERNATIVES – FORM — 10:30-11:00 am

C. LANDSCAPE PLANNING AND DESIGN

1. Work task updates
2. Confirm February 15, 2006 PAAC meeting date
3. Discuss PAAC meeting agenda and format
4. Review action items related to critical path calendar for preparation for PAAC meeting

D. RECEATION MULTI-USE ASSESSMENTS

1. Work task updates

E. ENVIRONMENTAL OVERVIEW

1. Work task updates

ALTERNATIVES – FUNCTION — 11:00-11:15 am

F. GEOTECHNICAL INVESTIGATION

1. Sediment sampling program
2. Right-of-entry status update

G. HYDROLOGY

1. Area 4 – District review status update

H. FLOODPLAIN DELINEATION STUDIES

1. Approximate Alluvial Fan Floodplain Delineations – Stage 3
2. Approximate Riverine Floodplain Delineations – Alluvial fan apices

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROJECT COORDINATION 11:15-11:55 am

I. PUBLIC INVOLVEMENT

1. Confirm tentative March 1, 2006 public meeting date
2. Discuss public meeting agenda and format
3. Review action items related to critical path calendar for preparation for public meeting

J. STAKEHOLDER INVOLVEMENT

1. Recap November 29, 2005 Stakeholder Working Group Meeting 2

K. PLANNING/ REGULATORY COORDINATION

L. DATA COLLECTION

1. Buckeye Sun Valley ADMS work products status update

PROJECT ADMINISTRATION 11:55 am -12:00 pm

M. OPTIONAL TASK AUTHORIZATION REQUESTS

1. Optional Task 2.4.6 – Alternatives Meetings
2. Optional Task 5.4.7 – Stakeholder Meetings

N. NEXT PROGRESS MEETING

Monthly Progress Meeting (regularly scheduled)
1:30-3:30pm, Wednesday, February 8, 2006
FCDMC Adobe Conference Room

O. ADJOURN

STEP 2 ALTERNATIVES TECHNICAL REVIEW MEETING AGENDA

LOCATION: JE Fuller/ Hydrology & Geomorphology, Inc.
8400 S. Kyrene Rd., Ste. 201
Tempe, AZ 85284

DATE: Wednesday, January 25, 2006

TIME: 1:00 – 4:00 pm

AGENDA:

A. MEETING PURPOSE **(1:00-1:10pm)**

B. ALTERNATIVES FORMULATION **(1:10-1:30pm)**

1. Component Structures
   - On-line detention basins
   - Off-line detention basins
   - Open channels
   - Drop structures

2. Alternatives Formulation
   - Size variations – big/small, on-line/off-line basins; leveed/excavated channels
   - Alignment variations – conveyance corridors
   - Longitudinal variations – channel sections can vary with longitudinal distance along conveyance corridor

3. Alternatives Overview (handout)

C. ALTERNATIVES DESIGN CONCEPTS **(1:30-2:30pm)**

1. Alternative Design Process (handout)

2. Alternatives Design Criteria by Structure Type (handout)

3. Alternatives Design Methodologies (handout)

D. ALTERNATIVES DESIGN RESULTS **(2:30-3:30pm)**

1. CAP Subarea
2. Hassayampa
3. White Tank Wash
4. FRS #2 & #3

E. COST ESTIMATES **(3:30-3:50pm)**

1. Land costs
2. Construction costs
3. Landscape costs
4. Maintenance costs

F. ALTERNATIVES EVALUATION CRITERIA **(3:50-4:00pm)**

1. Form/ Function criteria
2. Qualitative ranking

G. NEXT MEETING

Step 2 Proposed Alternatives Evaluation Meeting 1
1:00-4:00pm, Monday, February 13, 2006
FCDMC Adobe Conference Room

Step 2 Proposed Alternatives Evaluation Meeting 2
10:00am-4:00pm, Tuesday, February 14, 2006
FCDMC Operations Building Conference Room

H. ADJOURN

SUN VALLEY ADMP STEP 2 PROPOSED ALTERNATIVES EVALUATION CRITERIA

Alternative Evaluation Criteria (Followed by Guidelines)	
Public Safety Criteria (Function)	
1) Public Safety Enhancement • Improve Public Infrastructure • Reduce Flood Level • Number of People Impacted	**2) Level of Damage Reduction** • Dollar Costs Saved/Reduced • Flood Frequency Impacted
3) Transportation Impacts • Collector or Arterial Roadway • Only Access • Number of People Impacted	**4) Upstream/Downstream Impacts** • Stand Alone • Systematic Solution
5) Relative Risk of Failure • Lower than average • Average • Greater than average	**6) Eliminates Flood Problem** • Partial Solution • Whole Solution
7) Design Certainty • Captures apex flow •	**8) Constructability** • Excavation excess •
Economic Criteria (Common)	
9) Comparative Benefit Cost • Dollars • Number of People • Regional Solution • Recoverable Flood Plain	**10) ROW Acquisition Necessary** • Existing ROW Available • Amount Needed • Private or Public Land
11) Condemnation Required • Yes • No	**12) Cost of Implementation (in $1,000)** • < than $50,000 • < than $500,000 • < than $1,000,000
13) Maintenance Cost • Lessened • Increased • Neutral • Comparative to Other Measure	**14) Potential Cost Sharing Partner** • Already Contacted • Already Willing • Possibly

Alternative Evaluation Criteria (Followed by Guidelines)	
Social/ Environmental/ Aesthetic/ Multi-Use Criteria (Form)	
15) Public Support • Known • Anticipated • Unknown	**16) Public Acceptance** • Known • Anticipated • Applicable • Unknown
17) Addresses Public Complaint/Concern • Response From Public • Unknown	**18) Private Acceptance** • Known • Anticipated • Applicable • Unknown
19) Environmental Impacts • Habitat • Hazmat • Cultural • 404	**20) Complexity of Environmental Permitting** • Minimal • Average • Significant
21) Visual Resource Impacts/ Aesthetic Compatibility • Incompatible • Partially Compatible • Fully Compatible	**22) Multi-Use Opportunities** • Minimal • Average • Significant
23) F.C. Method Consistency with Buckeye Recreation Master Plan • Incompatible • Partially Compatible • Fully Compatible	

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING AGENDA

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Wednesday, February 8, 2006

TIME: 1:30 – 3:30 pm

AGENDA:

A. STEP 2 PROPOSED ALTERNATIVES FORMULATION UPDATE

1. **Tasks Status Overview**
   a) Sediment sampling program
      - Right-of-entry request status
      - 2/21-2/23/06 – Test pits
      - Week of 2/27/06 – surface samples
   b) Evaluation criteria/ Summary sheets

2. **Meetings Overview**
   a) 1/25/06 Function Review Meeting
   b) 2/6/06 Function Work Product Review Meeting
   c) 2/1/06 Form Deliverables Review Meeting
   d) Step 2 Alternatives Evaluation Meetings
      - Monday, 2/13/06, 1-4pm
      - Tuesday, 2/14/06, 10am-4pm

B. PUBLIC INVOLVEMENT

1. Review action items related to critical path calendar for preparation for 3/8/06 public meeting.

C. STAKEHOLDER INVOLVEMENT

1. 1/26/06 Developers Meeting
2. 1/26/06 and 2/8/06 Buckeye Meetings
3. 2/9/06 ASLD Meeting

D. ENVIRONMENTAL EVALUATION

E. GEOTECHNICAL EVALUATION

F. HYDROLOGY

1. Status of District review of Area 4 hydrology

G. FLOODPLAIN DELINEATION STUDIES

1. Approximate Alluvial Fan Floodplain Delineations
2. Approximate Riverine Floodplain Delineations

H. PLANNING/ REGULATORY COORDINATION

I. LANDSCAPE PLANNING/ RECEATION MULTI-USE

1. Preparation for 2/15/06 PAAC Meeting

J. PROJECT ADMINISTRATION

1. Status of District response to Optional Tasks authorization request

K. OTHER

L. NEXT MEETING

SVADMP Monthly Progress Meeting
1:30-3:30pm, Wednesday, March 8, 2006
FCDMC Adobe Conference Room

STEP 2 PROPOSED ALTERNATIVES EVALUATION MEETING AGENDA

LOCATION: Operations Building Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Tuesday, February 14, 2006

TIME: 10:00am – 4:00 pm

AGENDA:

A. Recap/ Introduction	**Pat Quinn**	**10:00-10:15am**
B. Alternatives Evaluation		**10:15am –12:00pm**
Function Group Facilitator	**Chuck Williams**	
Form Group Facilitator	**Diane Simpson-Colebank**	
- CAP		
- White Tanks Wash		
C. L U N C H (provided)		**12:00-12:45pm**
D. Alternatives Evaluation (cont'd.)		**12:45-3:45pm**
Function Group Facilitator	**Chuck Williams**	
Form Group Facilitator	**Diane Simpson-Colebank**	
- Wagner Wash		
- Hassayampa		
- B R E A K		
- FRS #1		
- FRS #2 & #3		
E. Wrap/ Next Steps	**Pat Quinn**	**3:45-4:00pm**
F. Adjourn		**4:00pm**

SUN VALLEY ADMP STEP 2 PROPOSED ALTERNATIVES EVALUATION CRITERIA

Alternative Evaluation Criteria (Followed by Guidelines)	
Public Safety Criteria (Function)	
1) Public Safety Enhancement • Improve Public Infrastructure • Reduce Flood Level • Number of People Impacted	**2) Level of Damage Reduction** • Dollar Costs Saved/Reduced • Flood Frequency Impacted
3) Transportation Impacts • Collector or Arterial Roadway • Only Access • Number of People Impacted	**4) Upstream/Downstream Impacts** • Stand Alone • Systematic Solution
5) Relative Risk of Failure • Lower than average • Average • Greater than average	**6) Eliminates Flood Problem** • Partial Solution • Whole Solution
7) Design Certainty • Captures apex flow •	**8) Constructability** • Excavation excess •
Economic Criteria (Common)	
9) Comparative Benefit Cost • Dollars • Number of People • Regional Solution • Recoverable Flood Plain	**10) ROW Acquisition Necessary** • Existing ROW Available • Amount Needed • Private or Public Land
11) Condemnation Required • Yes • No	**12) Cost of Implementation (in $1,000)** • < than $50,000 • < than $500,000 • < than $1,000,000
13) Maintenance Cost • Lessened • Increased • Neutral • Comparative to Other Measure	**14) Potential Cost Sharing Partner** • Already Contacted • Already Willing • Possibly

Alternative Evaluation Criteria (Followed by Guidelines)	
Social/ Environmental/ Aesthetic/ Multi-Use Criteria (Form)	
15) Public Support • Known • Anticipated • Unknown	**16) Public Acceptance** • Known • Anticipated • Applicable • Unknown
17) Addresses Public Complaint/Concern • Response From Public • Unknown	**18) Private Acceptance** • Known • Anticipated • Applicable • Unknown
19) Environmental Impacts • Habitat • Hazmat • Cultural • 404	**20) Complexity of Environmental Permitting** • Minimal • Average • Significant
21) Visual Resource Impacts/ Aesthetic Compatibility • Incompatible • Partially Compatible • Fully Compatible	**22) Multi-Use Opportunities** • Minimal • Average • Significant
23) F.C. Method Consistency with Buckeye Recreation Master Plan • Incompatible • Partially Compatible • Fully Compatible	

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING AGENDA

LOCATION: New River / Harquahala Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Thursday, March 9, 2006

TIME: 1:30 – 3:30 pm

AGENDA:

A. PUBLIC INVOLVEMENT
1. 3/8/06 public meeting debrief

B. ALTERNATIVES FORMULATION UPDATE
1. Tasks Status Overview
   a) Draft Step 1 Preliminary Alternatives report
   b) Draft Step 2 Proposed Alternatives report
2. Meetings Overview
   a) 3/13/06 Recommended Alternative resolution meeting
   b) VE Meeting

C. STAKEHOLDER INVOLVEMENT
1. Reschedule 4/4/06 Stakeholder Working Group Meeting 3 to 5/2/06
2. Individual meetings with developers' engineers
3. 4/12/06 Town of Buckeye meeting

D. ENVIRONMENTAL EVALUATION

E. GEOTECHNICAL EVALUATION
1. Sediment sampling program

F. HYDROLOGY
1. Status of District review of Area 4 hydrology

G. FLOODPLAIN DELINEATION STUDIES
1. FDS TDN production

H. PLANNING/ REGULATORY COORDINATION

I. LANDSCAPE PLANNING/ RECEATION MULTI-USE
1. 3/10/06 PAAC Meeting

J. PROJECT ADMINISTRATION
1. Status of District response to Optional Tasks authorization request

K. NEXT MONTHLY PROGRESS MEETING
1:30-3:30pm, Wednesday, April 12, 2006
FCDMC Adobe Conference Room

RECOMMENDED ALTERNATIVE RESOLUTION MEETING

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Monday, March 13, 2006

TIME: 1:00am – 4:30 pm

AGENDA:

1. **Review outcome of Step 2 Proposed Alternatives Evaluation Meeting**

2. **Select Draft Recommended Alternative**

3. **Identify Step 3 refinements – Form & Function**

    - Incorporate "for sure" developer elements
    - Balance earthwork between basin excavation and levee placement on a corridor basis
    - Hydraulic refinements
        - Assess existing channel conveyance to identify need for levee/ wall confinement
        - Identify reaches with sufficient existing capacity (non-structural subreaches
    - Refine alignments and number of corridors
    - Refine longitudinal variation
    - Discretize design and costs on a corridor (fan) basis
    - Assess non-structural alternatives
    - Evaluate levee vs. wall corridors

4. **Next Steps**

    - Individual stakeholder meetings with developers/ engineers
    - Value Engineering meeting
    - Next level of design – Function & Form
    - Final Draft Recommended Alternative

5. **Adjourn**

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING AGENDA

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Wednesday, April 12, 2006

TIME: 1:30 – 3:30 pm

AGENDA:

A. ALTERNATIVES FORMULATION UPDATE

1. Tasks Status Overview
   a) Draft Step 1 Preliminary Alternatives report
   b) Draft Step 2 Proposed Alternatives report
   c) Step 3 Recommended Alternative tasks
2. Meetings Overview
   a) 3/13/06 Recommended Alternative resolution meeting
   b) VE Meeting update

B. PUBLIC INVOLVEMENT

C. STAKEHOLDER INVOLVEMENT

1. Reschedule 4/4/06 Stakeholder Working Group Meeting 3 to 5/17/06
2. Individual meetings held with developers and engineers for the following master planned communities
   a) 3/23/06 Sun Valley
   b) 3/23/06 Elianto/ Elianto West
   c) 3/28/06 Tartesso
   d) 3/30/06 Sun Valley Anthem
   e) 4/05/06 Mirielle
3. 4/12/06 Town of Buckeye coordination meeting
4. 4/20/06 MCDOT coordination meeting
5. ASLD coordination meeting schedule pending

D. ENVIRONMENTAL EVALUATION

E. GEOTECHNICAL EVALUATION

1. Sediment sampling program
   a) Test Pits – Logs completed for 2/3 of sites, remaining 1/3 pending ROE permission to access State Trust land
   b) Surface samples – Sampling substantially completed, laboratory results received by JEF
   c) Seismic – Selected locations, awaiting ROE clearance from ASLD
2. Archaeological inventory project
   a) Fieldwork completed with no sites found
   b) Received all requested archival research data from ASM
   c) Preliminary inventory report underway

F. HYDROLOGY

1. Received District review comments regarding Area 4 hydrology. Final report update pending.

G. FLOODPLAIN DELINEATION STUDIES

1. FDS TDN production in progress

H. PLANNING/ REGULATORY COORDINATION

1. Substantially complete. Final check pending to see if any additional information has been submitted to Town of Buckeye

I. LANDSCAPE PLANNING/ RECEATION MULTI-USE

1. Submitted draft multi-use data collection report
2. Prepared landscape compatibility maps
3. Developed landscape themes, prepared sketches
4. 3/10/06 PAAC Meeting
5. Alternatives evaluation report in progress

J. PROJECT ADMINISTRATION

1. Status of District response to Optional Tasks authorization request
2. Submitted summary assessment of task and fee impacts due to pending time extension

K. NEXT MONTHLY PROGRESS MEETING

1:30-3:30pm, Wednesday, May 10, 2006
FCDMC Adobe Conference Room

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING AGENDA

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Wednesday, May 10, 2006

TIME: 1:30 – 3:30 pm

AGENDA:

A. ALTERNATIVES FORMULATION UPDATE

1. Tasks Status Overview
   a) Draft Step 1 Preliminary Alternatives report
   b) Draft Step 2 Proposed Alternatives report and subarea reports
   c) Step 3 Recommended Alternative tasks
2. Meetings Overview
   a) VE Meeting update

B. PUBLIC INVOLVEMENT

C. STAKEHOLDER INVOLVEMENT

1. Reschedule 5/17/06 Stakeholder Working Group Meeting 3 until after VE Meeting
2. Individual meetings held with the following agencies, developers and engineers:
   a) 4/05/06 Mirielle
   b) 4/12/06 Town of Buckeye
   c) 4/20/06 MCDOT
   d) 4/20/06 ASLD

D. ENVIRONMENTAL EVALUATION

E. GEOTECHNICAL EVALUATION

1. Sediment sampling program
   a) Test Pits – Received ROE from ASLD for remaining 1/3 of test sites, currently scheduled in field 5/16-17/06
   b) Surface samples – Sampling completed, laboratory results received by JEF
   c) Seismic – Collecting seismic data 5/9-10/06
2. Archaeological inventory project
   a) Inventory report completed

F. HYDROLOGY

1. Final Area 4 hydrology report update underway incorporating District review comments.

G. FLOODPLAIN DELINEATION STUDIES

1. FDS TDN production underway

H. PLANNING/ REGULATORY COORDINATION

1. Substantially complete. Final check pending to see if any additional information has been submitted to Town of Buckeye

I. LANDSCAPE PLANNING/ RECEATION MULTI-USE

1. Alternatives evaluation report in progress

J. PROJECT ADMINISTRATION

1. Submitted summary assessment of task and fee impacts due to pending time extension

K. NEXT MONTHLY PROGRESS MEETING

1:30-3:30pm, Tuesday, June 6, 2006
FCDMC Conference Room TBD

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING AGENDA

LOCATION: Operations Building Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Tuesday, June 6, 2006

TIME: 1:30 – 3:30 pm

AGENDA:

A. ALTERNATIVES FORMULATION UPDATE

1. Tasks Status Overview
   a) Draft Step 1 Preliminary Alternatives report
   b) Draft Step 2 Proposed Alternatives report and subarea reports
   c) Step 3 Recommended Alternative tasks
2. Meetings Overview
   a) VE Meeting briefing

B. PUBLIC INVOLVEMENT

1. Public Meeting 2 - Critical path calendar

C. STAKEHOLDER INVOLVEMENT

1. Stakeholder concerns regarding alluvial fan delineations
2. Stakeholder Working Group Meeting 3

D. GEOTECHNICAL EVALUATION

1. Sampling program completion
2. Geotechnical report – draft submittal end of June

E. HYDROLOGY

1. Final Area 4 hydrology report
2. Step 3 hydrology model refinement

F. HYDRAULICS

1. Step 3 conveyance corridor refinement

G. FLOODPLAIN DELINEATION STUDIES

1. Overview of TDN organization by fan system
2. Fan 10 & 11 TDN submitted
3. Fan 6 TDN status

H. PLANNING/ REGULATORY COORDINATION

1. Planning/ Regulatory compilation report – draft submittal mid-June

I. LANDSCAPE PLANNING/ RECREATION MULTI-USE

1. Alternatives evaluation report progress

J. PROJECT ADMINISTRATION

1. Pending time extension/ change order
2. Project management changes

K. NEXT MONTHLY PROGRESS MEETING

1:30-3:30pm, Wednesday, July 12, 2006
FCDMC Adobe Conference Room

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING AGENDA

LOCATION: Flood Control District of Maricopa County

DATE: Wednesday, July 12, 2006

TIME: 1:30 – 3:30 pm

A. ALTERNATIVES FORMULATION UPDATE

1. Tasks Status Overview
   a) Draft Step 2 Proposed Alternatives Report – Review Comments?
   b) Step 3 Recommended Alternative – Delivery Schedule
2. Meetings Overview
   a) VE Meeting summary report

B. PUBLIC INVOLVEMENT

1. Public Meeting 2 - Critical path calendar

C. STAKEHOLDER INVOLVEMENT

1. Stakeholder concerns regarding alluvial fan delineations
2. Stakeholder Working Group Meeting 3

D. GEOTECHNICAL EVALUATION

1. Sampling program completion
2. Geotechnical report – draft submittal

E. HYDROLOGY

1. Final Area 4 hydrology report
2. Step 3 hydrology model refinement

F. HYDRAULICS

1. Step 3 conveyance corridor refinement

G. FLOODPLAIN DELINEATION STUDIES

1. Fan 6 TDN status (review)
2. Fan 4-5 TDN (submittal)

H. PLANNING/ REGULATORY COORDINATION

1. Planning/ Regulatory compilation report – draft submittal mid-June

I. LANDSCAPE PLANNING/ RECREATION MULTI-USE

1. Alternatives evaluation report progress

J. PROJECT ADMINISTRATION

1. Pending time extension/ change order

K. NEXT MONTHLY PROGRESS MEETING

1:30-3:30pm, Wednesday, August 9, 2006

SUN VALLEY AREA DRAINAGE MASTER PLAN

STAKEHOLDER WORKING GROUP MEETING AGENDA

Private Sector

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ

DATE: Tuesday, August 1st, 2006

TIME: 1:30 pm - 4:00 pm

1. 1:30 - Introductions and Opening Comments — Valerie Swick, District PM

2. 1:40 - Meeting Purpose — Chuck Williams, Facilitator
   - Update on Project Status
   - Inform SWG of Draft Recommended Alternative
   - Input from SWG on Draft Recommended Alternative
   - Discussion on Floodplain Delineations
   - Discussion on Other Pertinent Issues

3. 1:50 - Project Status and Update — Jon Fuller, Consultant PM
   - Progress to Date
   - Draft Recommended Alternative Overview
   - Floodplain Delineations
   - FEMA Levee Freeboard
   - Schedule

4. 2:50 - Stakeholder Working Group Involvement — Chuck Williams
   - SWG Individual Reaction and Comments
   - SWG Individual and Group Issues Discussion

5. 3:50 - Summary/Next Steps — Chuck Williams

6. 4:00 - Adjourn — Valerie Swick

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING AGENDA

LOCATION: Flood Control District of Maricopa County

DATE: Wednesday, August 9, 2006

TIME: 1:30 – 3:30 pm

A. ALTERNATIVES FORMULATION UPDATE

1. Tasks Status Overview
   a) Step 1 Revised Report
   b) Step 2 Comment Response
   c) Step 3 Recommended Alternative – Delivery Schedule
   d) Step 3 Draft Format
   e) Step 3 Subconsultant Elements

B. PUBLIC INVOLVEMENT

1. Public Meeting 2 - Critical path calendar

C. STAKEHOLDER INVOLVEMENT

1. Stakeholder Working Group Meeting 3 Summary
2. Implementation Plan

D. GEOTECHNICAL EVALUATION

1. Geotechnical report – draft submittal

E. HYDROLOGY

1. JEF response to review comments

F. HYDRAULICS

1. Step 3 conveyance corridor refinement

G. FLOODPLAIN DELINEATION STUDIES

1. Fan 17-19 TDN status

H. PLANNING/ REGULATORY COORDINATION

1. Planning/ Regulatory compilation report – draft submittal?

I. LANDSCAPE PLANNING/ RECREATION MULTI-USE

1. Alternatives evaluation report progress

J. PROJECT ADMINISTRATION

1. Time extension/ change order approved

K. NEXT MONTHLY PROGRESS MEETING

1:30-3:30pm, Wednesday, September 13, 2006

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING AGENDA

LOCATION: Flood Control District of Maricopa County

DATE: Wednesday, September 13, 2006

TIME: 1:30 – 3:30 pm

A. ALTERNATIVES FORMULATION UPDATE
1. Tasks Status Overview
   a) Step 2 Final Document Submitted 8/28
   b) Step 3 Initial documents submitted 8/14 (Wagner Wash Area)

B. PUBLIC INVOLVEMENT
1. Public Meeting 2

C. STAKEHOLDER INVOLVEMENT
1. Implementation Plan

D. GEOTECHNICAL EVALUATION
1. Geotechnical report – review comments

E. HYDROLOGY
1. Area 4 hydrology report submitted 8/31

F. HYDRAULICS
1. Step 3 conveyance corridor refinement

G. FLOODPLAIN DELINEATION STUDIES
1. Final submittal 9/30 on schedule

H. PLANNING/ REGULATORY COORDINATION
1. Planning/ Regulatory compilation report – draft submitted 8/18

I. LANDSCAPE PLANNING/ RECREATION MULTI-USE
1. Alternatives evaluation report progress – Chap 4, 5 submitted 8/18

J. PROJECT ADMINISTRATION
1. Schedule for completion

K. NEXT MONTHLY PROGRESS MEETING
1:30-3:30pm, Wednesday, October 11, 2006

SUN VALLEY AREA DRAINAGE MASTER PLAN

KICK OFF MEETING MINUTES

LOCATION: Buckhorn Mesa Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Thursday, July 7, 2005

TIME: 1:00 – 3:00 pm

ATTENDEES:

Julie Cox	FCDMC	Mike Book	LSD
Mike Duncan	FCDMC	Jon Fuller	JE Fuller
Brett Howey	FCDMC	Mark Meyer	LSD
Jen Pokorski	FCDMC	Pat Quinn	JE Fuller
Bob Stevens	FCDMC	Diane Simpson-Colebank	LSD
Diana Stuart	FCDMC	Chuck Williams	CL Williams
Valerie Swick	FCDMC		
Lynn Thomas	FCDMC	Woody Scoutten	Town of Buckeye
Jessica White	FCDMC		
Doug Williams	FCDMC		

INTRODUCTIONS/ PROJECT COORDINATION

Doug Williams opened the Sun Valley Area Drainage Master Plan (SVADMP) Kick-off Meeting by welcoming the project team. He commented that the SVADMP project would require significant coordination with the Town of Buckeye and key stakeholders. Doug indicated that the whole-fan alternatives developed to address alluvial fan flooding for the SVADMP would be used as a template for future alluvial fan development. He stated that the landscape character was not as important as sound technical analyses of the hydrology and the fans. Doug said the District would not impose landscape concepts on the Town or the developers.

The project team introduced themselves and stated their project role. Valerie Swick indicated that Mike Duncan would be filling in for Kathryn Gross during her maternity leave. Mike is the interim point of contact for the sediment engineering and geomorphic tasks until Kathryn returns in October. Carroll Reynolds is the key contact for the Town of Buckeye as the Public Works Director and Planning Director positions are vacant. Woody Scoutten serves as the Town Engineer. Valerie requested that she and Pat Quinn be copied on all project-related communication. All submittals will go to Valerie and she will distribute materials to District project team members as appropriate.

PROJECT SCHEDULE/ DELIVERABLES OUTLINE

Pat Quinn distributed the project schedule and deliverables outline. She commented that the schedule was aggressive and that it was important to complete the project within the 12-month performance time as master planned community developments were already under construction in the study area. Pat noted that she did not complete the schedule for Task 20 Landscape Planning and Design and Task 21 Recreation Multiple-Use Assessments for Planning Studies and requested that Mark Meyer and Diane Simpson-Colebank provide that information. Pat asked the project team to provide any concerns or comments about the schedule to her by July 11, 2005. The SVADMP monthly progress meetings will be held 1:00-3:00 pm on the second Wednesday of the month in the Adobe conference room at the District. The next progress meeting will be held on August 10, 2005.

The Kick-off Site Visit will be scheduled during the 3rd week of September after the team has substantially completed the data collection task. Most of the team is already familiar with the area; however, Valerie is going to arrange a site visit before September for those members of the District project team who have not been to the study area previously. Jon Fuller will coordinate with Mike Duncan so that Mike can participate in the geomorphic field work.

CRITICAL PATH TASKS DISCUSSION

Data Collection – JEF submitted data collection request letters last week to the District. The District's GIS section is working on compiling the requested digital files. Jen Pokorski is working on reproduction of the requested hardcopy reports. Pat indicated that the team needed several of the Buckeye Sun Valley ADMS (BSVADMS) work products in order to get started with the ADMP. Valerie provided status updates regarding the following items:

- Area 3 Apex Hydrology Model – PBS&J submitted the model to the District July 7 for review.
- Ayres Stage 1 & 2 Reports – Completed. Mike Duncan provided a DVD containing the reports to JEF following the meeting.
- ADMS Report(s?) – District comments to be provided to PBS&J by July 11; revised report to be re-submitted to the District July 22.

Public Involvement – Jessica White will serve as the PIO for the SVADMP. Brett Howey is the District's Project Manager for the Buckeye FRS #1 Rehabilitation Project (B1RP). Brett suggested that the public involvement efforts for the SVADMP, B1RP, and the Lower Hassayampa Watercourse Master Study (LHWCMS) be coordinated since the targeted public impacted by these three on-going District projects is the same. Brett said he would e-mail the B1RP Public Involvement Plan to Valerie and Pat. He suggested that the initial notice to the public regarding the start of the SVAMP project could be inserted into the B1RP newsletter that is scheduled to be mailed in September. Additional discussion followed regarding coordination of the public meetings for the three projects. A separate internal meeting will be held at the District to decide whether or not to trigger the optional tasks in the SVADMP scope that would enable LSD to support the public involvement efforts for the project.

Stakeholder Involvement – Chuck Williams will review the BSVADMS Stakeholder Involvement Plan and modify/ update it for use it a baseline for the SVADMP Stakeholder Involvement Plan. Brett will e-mail to Chuck the B1RP Stakeholder Involvement Plan for his review as well. Chuck will submit the draft SVADMP Stakeholder Involvement Plan to Valerie the week of July 18. Chuck and Valerie will review the current stakeholder database to categorize the project stakeholders into three Stakeholder Working Groups (SWG) including Area 3 & 4 Public Agencies, Area 3 Private Agencies, and Area 4 Private Agencies. Chuck indicated that the three SWGs will meet separately three times during the course of the project. The initial set of SWG meetings will be held August 16 at the District. Individual meetings will be held with key stakeholders throughout the project to solicit input during the alternatives formulation process. Brett suggested coordination of the stakeholder meetings for the SVADMP and B1RP.

Environmental Evaluation – Diana Stuart and Bob Stevens will lead environmental evaluation review for the District. A meeting is scheduled July 25 with Jim Rodgers to discuss the findings of the cultural resources assessment for the study area. His report will be submitted to the District by August 31. Ecoplan will submit the Environmental Overview to District by August 31. LSD needs both as input to the landscape character assessment tasks. There is nothing new to report about the status of pending CWA 404 permit applications by the developers in the study area.

Hydrology – Julies Cox is the District lead for hydrology review. JEF will proceed immediately upon receipt of requested materials to review the Area 3 Apex and Wagner Wash hydrology models. A summary memorandum of findings will be submitted to the District.

Floodplain Delineation Studies – Mike Duncan is the District lead for floodplain delineation review. JEF will proceed immediately upon receipt of requested materials to review the Ayres Stage 1 and Stage 2 delineations and reports. A summary memorandum of findings will be submitted to the District. JEF will also review the White Tanks Wash floodplain delineation study and make a recommendation to the District as to whether or not a re-delineation is warranted. JEF will evaluate the alluvial fan apices to determine those requiring HEC-RAS modeling for proof of flow containment. A recommendation will be made to the District as to which will be modeled to identify the contact between the hydraulic model-based and the geomorphic landform-based floodplain delineations of the alluvial fans. The HEC-RAS modeling of the apices will commence pending District concurrence.

Step 1 Preliminary Alternatives – The Step 1 Preliminary Brainstorm Session is scheduled 9:30am – 3:30pm, Tuesday, August 23 in the Adobe conference room at the District. The meeting schedule is impacted by the delay in the delivery of the ADMS cultural resources and environmental overview reports. These provide input to the landscape character assessment which in turn is input to the preliminary alternatives brainstorming. The team will begin preparing data for the existing constraints map for the brainstorm session.

Landscape Planning and Design/ Recreation Multi-Use Assessments – Dennis Holcomb is the District lead for landscape and recreation multi-use review. LSD will prepare a work plan and meet with Dennis for his review comments. Work will commence immediately upon his concurrence and upon receipt of requested materials. LSD is planning to do initial site work for the landscape character assessment in late July.

OTHER

Lynn Thomas will provide to Valerie a list of pending LOMR/ CLOMRs in the study area.

NEXT MEETING

1:00-3:00pm, Tuesday, August 10, 2005 , FCDMC Adobe Conference Room

ACTION ITEMS

See attached table.

ACTION ITEM LIST

ACTION ITEM	RESPONSIBLE	DATE	STATUS
Distribute final SOW to District and consultant project team.	V. Swick, P.Quinn		Completed
Update schedule and distribute to team	M. Meyer/ P. Quinn	07/29/05	Completed
Provide B1RP Public Involvement and Stakeholder Involvement Plans to team	B. Howey	07/07/05	Completed
Initial public notification of start of SVADMP (Sept B1RP newsletter)	J. White	09/05	Pending
Internal District meeting to decide if consultant support of public involvement tasks is needed	J. White, V. Swick, B. Howey, D. Williams, J. Munoz	?	?
Submit draft Stakeholder Involvement Plan for District review	C. Williams	07/21/05	Completed
District review of draft Stakeholder Involvement Plan	V. Swick, J. White		Pending
Review/ update stakeholder database, Categorize into SWGs	V. Swick, C. Williams	07/27/05	Final database pending
District decision regarding Implementation Plan optional task	V. Swick, D. Williams		Pending
Prepare presentation and handout materials for SWG meetings	C. Williams, P. Quinn, J. Despain		08/16/05 SWG meeting
Review Area 3 Apex and Wagner Wash hydrology models, prepare summary memorandum of findings	T. Lehman	07/26/05	Completed
District review of hydrology model review memorandum of findings, discrepancies resolution	J. Cox, V. Swick		08/01/05 review meeting
Review Stage 1 & 2 delineations, prepare summary memorandum of findings	J. Fuller	07/27/05	Completed
District review of Stage 1 &2 delineations review memorandum of findings, discrepancies resolution	M. Duncan, V. Swick		08/01/05 review meeting
Review of White Tanks Wash floodplain delineation, prepare summary memorandum of findings	B. Iserman		Pending
Recommendation of apex HEC-RAS model reaches, prepare summary memorandum of findings	B. Iserman		Completed
District review and approval of apex HEC-RAS model reaches	M. Duncan, V. Swick		Pending
Prepare presentation and handout materials for Step 1 Preliminary Alternatives meeting	J. Despain, P.Quinn		08/23/05 brainstorm mtg
Prepare landscape and recreation multi-use work plan	M. Meyer, D. Simpson-Colebank	07/21/05	Completed
District review and approval of landscape and recreation multi-use work plan	D. Holcomb	07/22/05	Completed
Initial landscape character site visit	M. Meyer, D. Simpson-Colebank	07/25/05	Completed
Provide list of pending LOMR/ CLOMRs to team	L. Thomas		Pending
Provide data/ reports to team	J. Pokorski		On-going

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING MINUTES

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Wednesday, August 10, 2005

TIME: 1:00 – 3:00 pm

ATTENDEES:

Julie Cox	FCDMC	Seema Anthony	EDAW
Greg Jones	FCDMC	Jeff Despain	JE Fuller
Jen Pokorski	FCDMC	Mark Meyer	LSD
Valerie Swick	FCDMC	Pat Quinn	JE Fuller
Lynn Thomas	FCDMC	Diane Simpson-Colebank	LSD
Doug Williams	FCDMC	Chuck Williams	CL Williams

AGENDA:

A. DATA COLLECTION

1. Data collection substantially complete. Pat Quinn will distribute the database of resources collected to date to the project team members. Pat thanked Jen Pokorski for her timely assistance in providing requested materials to JE Fuller. Items still outstanding include Sun Valley Parkway as-built drawings requested from MCDOT.
2. Valerie Swick provided a status update regarding ADMS work products availability.
   - The final geomorphology report was delivered last week.
   - The District provided final comments to PBS&J regarding Area 3 hydrology. Final approval pending.
   - The alluvial fan methodologies report will be delivered at the end of this week.
   - Summary report and review still outstanding.
   - Preliminary development guidelines report was delivered. Currently under District review. Review comments should be available next week.

B. HYDROLOGY

1. Area 3
   - Work pending District authorization of Optional Task 9.4.2. That task includes Area 3 A-C model modifications and Fans 5, 10, & 11 apex hydrology for HEC-RAS for proof of flow containment at apices.
   - Assessment pending of hydrology available from developers' engineers for use in ADMP alternatives formulation. Potential change order.
2. Area 4
   - New hydrology model development underway.
   - Incorporation of Wagner Wash hydrology into model underway.

C. FLOODPLAIN DELINEATION STUDIES

Approximate Alluvial Fan Floodplain Delineations

1. Stage 1 and 2
   - Work pending District authorization of Task 11.1.1.2 includes additional documentation of Stage 1 delineations per PFHAM and FEMA requirements.
   - Revisions to landform and landform stability delineations and associated documentation pending resolution. Potential change order.
   - A meeting is scheduled for August 12, 2005 with developers' engineers to exchange status updates.
2. Stage 3
   - Field work to commence in September 2005.
   - Fan 2 is included in our SOW. The fan extends into the Wittmann ADMP study area.

Approximate Riverine Floodplain Delineations

3. Apex modeling – HEC-RAS modeling of selected alluvial fan apices underway.

Detailed Floodplain Delineations (Optional Task 11.2)

4. White Tank Wash and Tributaries FIS – Review completed. Re-study not recommended. District concurrence pending.

D. GEOTECHNICAL INVESTIGATION

1. Geological Characterization – Review of aerial photography and mapping underway.

E. ENVIRONMENTAL EVALUATION

1. Archeological Assessment – Coordination meeting with Jim Rodgers held July 25, 2005. Jim provided an overview of his findings. Deliverables due August 31, 2005. Jim will attend the August 23, 2005 Step 1 Preliminary Alternatives Brainstorm Session and the initial site visit.
2. Biological Assessment – Review of Ecoplan report underway. Jen Pokorski is working on identifying locations of ground photos.
3. Hazardous Materials Assessment – Work to commence on this task.

F. LANDSCAPE PLANNING/ RECEATION MULTI-USE

1. Work plan – District approval pending.
2. July 25, 2005 and August 9, 2005 site visits conducted for field review of landscape character units.
3. Recreation assessment underway. Review of community general plans underway. Compiling inventory of existing facilities and proposed multiple-use components. These will be included in GIS database.
4. Buckeye Recreation Plan is available. Point of contact is Kevin Kugler, RBF.

G. STEP 1 PRELIMINARY ALTERNATIVES

1. August 17, 2005 Alternatives brainstorm preparation meeting planned.

2. August 23, 2005 Brainstorm Session – Presentation and handout materials preparation underway.
3. Existing constraints map preparation underway.
4. Coordination with developers' engineers underway.

H. PUBLIC INVOLVEMENT

1. An internal District meeting was held to discuss need for supplemental support of PIO by consultant in implementing public involvement program. Decision on hold.
2. Initial public notice of SVADMP project start. – The SVADMP initial public notice was originally to have been included in the Buckeye FRS #1 Rehabilitation Project (B1RP) September 2005 newsletter. The B1RP will likely be delayed 6 months. Alternate plan is to re-format the SVADMP fact sheet into a brochure to be mailed to study area landowners and residents.
3. Web site – A project web page exists for the SVADMP. Valerie will look at the web page to see if any changes are needed. The fact sheet will be the first item to be posted on the project web site. Jessica White can modify the fact sheet, but cannot upload it to the web site. District webmaster assistance required.

I. STAKEHOLDER INVOLVEMENT

1. Stakeholder Involvement Plan and database matrix submitted to District. Valerie Swick provided official approval at the progress meeting.
2. August 16, 2005 Stakeholder Working Group meeting – Presentation and handout materials preparation underway.
3. Planned individual stakeholder meetings –ASLD, Town of Buckeye, MCDOT.
4. West Area Region Meeting – Greg Jones provided background information regarding a regional effort that has been undertaken in the west valley to coordinate the planning projects currently underway west of the White Tank Mountains and extending to Tonopah. The coordinating agencies include FCDMC, MCDOT, MCP&D, and Town of Buckeye, among others. Coordination meetings are planned for August 16 and September 9, 2005. Valerie Swick will be attending these meetings and will provide updates to the SVADMP team.

J. PROJECT ADMINISTRATION

1. Kick-off site visit is scheduled for September 29, 2005.
2. The monthly progress meetings will be held the second Wednesday of the month. The meetings times have been pushed back a half-hour. The meetings will be scheduled 1:30-3:30pm in the future.
3. Optional Tasks 9.4.2, 11.1.1.2, and 12.9 authorization received from District.
4. SVADMP Escrow Account is established.

K. NEXT MEETING

1:30-3:30pm, Wednesday, September 14, 2005
FCDMC Adobe Conference Room

L. ADJOURN – The meeting adjourned at 2:20pm.

SUN VALLEY AREA DRAINAGE MASTER PLAN

STAKEHOLDER WORKING GROUP MEETING SUMMARY

Area 4 Private Sector

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ

DATE: Tuesday, August 16th, 2005

TIME: 3:00 pm – 4:30 pm

The meeting was called to order by Valerie Swick, FCDMC PM at 3:10 pm and the attached agenda was followed throughout the meeting. An updated copy of the contact database and record of the attendees is also attached. A Stakeholder Workbook containing copies of handouts and the power point was also distributed to attendees. The workbook should be used to store updated information as it is provided to the stakeholders. The following represents a summary of the key items discussed at the meeting.

1) **Cindy Paddock/ Trillium**
   - The engineering firm for Trillium is now DEA. DEA drainage engineer is Michael Weinberg. Phase I preliminary plat and drainage report are under review by Buckeye. The Phase II- Preliminary plat being prepared at this time. The 404 permit application is under review by the Corps since July 2005, the 401 is completed.
   - A preliminary drainage analysis has been performed except for Wagner Wash. Differences in their discharge values were found for the Sun Valley Parkway culverts when compared to the original design discharge values.
   - They have designed four crossings for Wagner Wash. Wagner Wash was not encroached by the development plans; strategy is to stay out of wash.

2) **Sherrick Campbell/ WRG Design**
   - WRG is working on the Lyle Anderson portion of Festival Ranch. They are beginning the preliminary stage of development planning.
   - Also getting started on Master Drainage Plan.
   - Festival Ranch 2000 Master Plan is still valid and no new submittals are anticipated.

3) **Spurlock Ranch**
   - Reportedly has an approved Drainage Plan.

4) **Sun Valley**
   - Reportedly has an approved Area Plan.

The meeting was adjourned at 4pm.

STAKEHOLDER WORKING GROUP MEETING SUMMARY

Public Sector

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ

DATE: Tuesday, August 16th, 2005

TIME: 9:30 am – 11:30 am

The meeting was called to order by Valerie Swick, FCDMC PM at 9:40 and the attached agenda was followed throughout the meeting. An updated copy of the contact database and record of the attendees is also attached. A Stakeholder Workbook containing copies of handouts and the power point was also distributed to attendees. The workbook should be used to store updated information as it is provided to the stakeholders. The following represents a summary of the key items discussed at the meeting.

1) **MCDOT**
   - Is interested in obtaining a copy of the Area 4 Hydrology Report and data when it is available. Estimated to be the end of August for a submittal by JEF to FCDMC for review.
   - Patton Road Bridge crossing at Hassayampa River is being evaluated by MCDOT now. FCD contacts are John Hathaway (LHWCMP) and Valerie Swick (SVADMP). Coordination is needed and individual meetings will be scheduled.
   - Sun Valley Parkway Corridor Study (SVP) – The draft report is due to MCDOT January 2006, which will describe North/South road corridors in the SVADMP area. Coordination will also be needed. Doug LaMont, PBQD, is interested in drainage data from SVADMP impacting SVP corridor. TAC meeting scheduled for 8/30 to develop evaluation criteria and FCDMC representatives will be invited.
   - MCDOT is interested in a high level of involvement in SVADMP SWG.

2) **ASLD**
   - Currently starting due diligence work in preparation for disposition of 18,000 acres of trust land in the SVADMP study area. An individual meeting will be scheduled in the near future for coordination
   - ASLD interested in a high level of involvement in SVADMP SWG.

3) **NRCS**
   - Primary concern is the loss of farmland in the Buckeye area.
   - NRCS interested in a low/medium level of involvement in SVADMP SWG.

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4) **AZGF**
   - Primary concern is to maintain wildlife habitat corridors from the White Tank Mountains to the Hassayampa River. They will have a draft report with maps of corridors available in January 2006.
   - The purpose of the statewide wildlife maps is to identify wildlife linkages and habitat connectivity.
   - The new map will not be static; rather it will be updated as new corridors are identified.
   - Would like to coordinate with developers and FCD regarding possible habitat corridors implementation. FCDMC has an interest in multi-use corridors. Coordination is needed and individual meetings will be scheduled.
   - AZGFD is interested in a high level of involvement in SVADMP SWG.

5) **Buckeye**
   - Planning Dept. has an interest in working with AZGF and the master planned community developers on wildlife corridors and open space.
   - Buckeye would like to be involved in regional solutions and multi-use. A September 9, 2005 meeting is planned regarding regional coordination efforts. The meeting will involve several agencies, including MCDOT, ADOT, FCDMC, and Buckeye, among others.
   - There needs to be a high level of support from master planned community developers.
   - Buckeye is interested in a high level of involvement in SVADMP SWG.

6) **Luke Air Force Base**
   - Would like to remain informed as SVADMP progresses.

7) **Maricopa County Planning & Development**
   - Would like to remain informed as SVADMP progresses.

8) **Maricopa County Parks & Recreation**
   - Primary interest is in keeping the Hassayampa River corridor open.

The meeting was adjourned at 11:30 am.

SUN VALLEY AREA DRAINAGE MASTER PLAN

STAKEHOLDER WORKING GROUP MEETING SUMMARY

Area 3 Private Sector

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ

DATE: Tuesday, August 16th, 2005

TIME: 1:00 pm – 2:30 pm

The meeting was called to order by Valerie Swick, FCDMC PM at 1:10 pm and the attached agenda was followed throughout the meeting. An updated copy of the contact database and record of the attendees is also attached. A Stakeholder Workbook containing copies of handouts and the power point was also distributed to attendees. The workbook should be used to store updated information as it is provided tostakeholders. The following represents a summary of the key items discussed at the meeting.

1) **Josh Hartmann/ Pulte**
   - Status is that Sun Valley South on the east side of SVP is preparing their land plan. Submitting 404 permit for SV South.
   - Interested in knowing what is the ADMP interaction with 404 issues? The answer per VAS at FCDMC is that FCDMC intention is not to intervene or de-rail the developers' 404 process.

2) **Terri George/ DEA**
   - Question: If the Recommended Alternative includes retention basins, will FCD be getting 404 permits for area of impact? Answer: FCD response was that it would need to be discussed. Josh Hartmann raised possibility of a regional permit or Nationwide Permit 12. Is it Feasible? Will it be a part of Recommended Alternative? Answer from VAS is that it is unknown at this time what the Corps will require.

3) **Bob Spears/ Stardust**
   - They are West of SVP and have 3,075 lots.
   - To the East of SVP, is Amendment #1 – adding to Tartesso.
   - Also has ownership in SV South, which is presently in preliminary stages.
   - They have done and will continue to do their own 404. They will participate in a regional drainage solution but don't want a regional 404 permit. Better to deal with EPA and Corps on a one-to-one basis.
   - Regional plan may be good for drainage, but advocates 404 on individual project-by-project basis.

- There is a need for an implementation plan that accounts for timing of construction of various elements. The time for it is now when there are less owners to do deal with. Believes all developers will participate if proposals are fair.

4) **Bob Stevens/ FCDMC**
   - EPA prefers EIS with regional plans but may not always require one.

5) **Shawn Waters/ SunBelt**
   - Presently updating SV South drainage.

6) **Jack Moody/ WRG**
   - SV South west of SVP is presently in preliminary planning stages.
   - No 404 permit applications at this time.

7) **Brian Rosenbaum/ Lennar**
   - Elianto has their preliminary plat approved. It is 1,450 lots.
   - They have applied for their 404 permit.

8) **General Discussion**
   - Most of the Developers present agree that it is good to have a regional drainage master plan as a road map, but prefer to process projects on an individual basis.
   - There is a high amount of collaboration already between developers regarding drainage, sewer, water, etc.

9) **Dianne Thornburg/ Westpac/**
   - Johnson/ Montieve property has just completed 404 JD and it has not been submitted.

10) **Darrell Williams/ Fisher Property**
   - Skyline Wash - There is presently no engineering underway.

11) **Gil Gillenwater/ SDI**
   - They have property between Pulte to east and SV to west.
   - It is approximately 700 Ac. along SVP.

12) **Ian Dowdy/ Buckeye**
   - Joint coordination with Maricopa County on regional issues, including SVADMP. Buckeye has an interest in involving developers. Meeting scheduled September 9, 2005 with all parties.

13) **Bob Spears/ Stardust**
   - The Town is performing Impact Fee Study addressing area water/ sewer north of I-10 within Buckeye jurisdiction. SOQ is out now. W. Scoutten reported that it is on a 4-6 month schedule.
   - Stardust wants to propose drainage component be included in the impact fee analysis.

  - Culvert enlargements along SVP
  - Structural improvements
- Determine reasonable impact fee $ amount for drainage. Whoever develops first, builds improvement, and then gets paid back with impact fee credits.
- Structural improvements – He likes containment walls (more surgical), doesn't like channels and berms. They are harder to permit. Maintaining natural corridors with structural enhancements is better.
- They would like to have impact fees credits implemented. Credits may be able to be established from SVADMP cost estimates. C. Williams reported that the SVADMP is preliminary planning level work, not detailed engineer's cost estimates.
- Maintenance costs need to be accounted for **now,** not down the road. Possibly coordinate with FCD (Tim/Russ). The developer is willing to support maintenance impact fees, but needs to know the fees up front to calculate per unit $ basis. The earlier it is figured out, the more equitable it is.
- Options discussed: Apply as a closing mechanism a taxing district; BOD implements a regional assessment over Buckeye properties.
- Get funding mechanism in place now, then can focus on regional solution. Easier to solve technical issues once funding issues are solved.

14) General

- Cannot slow down ADMP, or it won't mesh schedule wise with Impact Fee Study. Explore how impact fees become part of the funding for the Implementation Plan.
- Implementation Plan needs to address county islands as well (Skyline Wash), not just Buckeye.
- The SVADMP needs to coordinate with towns, county, developers, public agencies, etc. JEF requests existing shape files that the developers have already planned/ constructed so that JEF can account for drainage plans in the SVADMP alternatives.
- Plans that have already been approved within the SVADMP area will need to be revisited by the FCD for possible opportunities/constraints as well as to make sure there are no fatal flaws within them

The meeting was adjourned at 11:30 am.

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING MINUTES

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Wednesday, October 19, 2005

TIME: 1:30 – 3:30 pm

ATTENDEES:

Julie Cox	FCDMC	Seema Anthony	EDAW
Dave Degerness	FCDMC	Jeff Despain	JE Fuller
Bob Stevens	FCDMC	Mark Meyer	LSD
Valerie Swick	FCDMC	Pat Quinn	JE Fuller
Jessica White	FCDMC	Jim Rodgers	SAS
Bing Zhao	FCDMC	Diane Simpson-Colebank	LSD
		Chuck Williams	CL Williams
Ian Dowdy	Town of Buckeye		
Woody Scoutten	Town of Buckeye		

AGENDA:

A. DATA COLLECTION

1. Data collection from master planned community developers' engineers. – JEF has requested drainage master plans and land use plans. Partial response received from land developers' engineers. JEF is incorporating the most up-to-date information in the GIS database.
2. ADMS work products availability status update. – Valerie Swick reported that the Volume 1 Summary Report and Alluvial Fan Report are not yet submitted; Development Guidelines are under review by the District. Pat Quinn said she was unable to access PBS&J's BSVADMS project web site. Valerie will investigate the reason why the web site is not active.

B. HYDROLOGY

1. Area 3 – Completed models and documentation for apex hydrology for Fans 5, 10, & 11 for use in apex HEC-RAS models to prove flow containment.
2. Area 4 – Completed existing and future condition models. Submitted Area 4 hydrology report on October 6, 2005. District review pending.

C. FLOODPLAIN DELINEATION STUDIES

1. Approximate Alluvial Fan Floodplain Delineations
   - Revised Stage 1 and 2 delineations. Work underway on documentation. Anticipate November delivery.
   - Stage 3 delineations underway. Field work partially completed. Coordinating with Pulte/ CMX regarding Fans 38 & 39 delineations.
2. Approximate Riverine Floodplain Delineations
   - Apex HEC-RAS modeling of selected alluvial fan apices underway. Submitted cross section locations, preliminary delineations, 'n' value report, and model output on October 4, 2005. District comments received October 19, 2005.

3. Detailed Floodplain Delineations (Optional Task 11.2)
   - White Tank Wash and Tributaries FIS review completed. Re-study not recommended. District concurrence pending.

D. GEOTECHNICAL INVESTIGATION

1. Geological Characterization – Review of aerial photography and mapping underway.

E. ENVIRONMENTAL EVALUATION

1. Archeological Assessment – Work underway incorporating cultural resources maps into historic character report. Jim Rodgers discussed the cultural resources report indicating that the work was based on archival evidence. Once specific sites are identified for structural alternatives, cultural significance should be determined for each individual site. Test pits for soil sampling for geotechnical purposes should be carefully selected to avoid identified significant cultural sites. Woody Scoutten asked if the cultural resources report would be made available to the Town of Buckeye. There was some discussion about the sensitivity of the information contained in the report. Valerie will check into making the report available.
2. Biological Evaluation – Jen Pokorski completed identification of the location of ground photographs in the biological report. LSD to begin work on hyperlinking ground photos within GIS database.

F. LANDSCAPE PLANNING/ RECEATION MULTI-USE

1. Completed work plan.
2. Completed draft base mapping.
3. Completed visual quality field work for existing character assessment.
4. Completed regional multi-use inventory.
5. Work underway on landscape character report.
6. Work underway on multi-use data collection report.
7. Coordination meeting with District held October 12, 2005.
8. Work on off-site recreation multi-use assessment pending receipt of RBF report. Valerie will contact Kevin Kugler to obtain a copy of the report.
9. LSD met with Dennis Holcomb last week for in-progress review. They reached consensus regarding LSD's approach to streamlining the landscape character units. They will meet again next week.
10. Next milestone is the Preliminary Recreation Multi-Use Concepts Workshop (Task 21.3.9). The workshop purpose is to evaluate preliminary concept plans to identify ways of linking and connecting existing and potential flood protection facilities in the study area with recreation opportunities in the local and regional context. The workshop will likely be held in a mid-November timeframe.

G. STEP 1 PRELIMINARY ALTERNATIVES

1. Final updates to Step 1 Preliminary Alternatives matrices pending.
2. Work underway on Task 9.6 Step 1 Hydrologic Analysis submittal.
3. Work underway on Task 10.9 Step 1 Hydraulic Analysis submittal.
4. Work to commence on draft outline for Task 12.12 Step 1 Preliminary Alternatives Report.

5. The Step 2 Proposed Alternatives Evaluation Meeting is scheduled for December 14, 2005. Pat Quinn will send a message to the project team with dates, times, and locations for upcoming milestone meetings.

H. PUBLIC INVOLVEMENT

1. District PIO distributed the initial fact sheet/ notice of project start to landowners and residents in the project area.
2. Fact sheet posted to project web site.
3. Jessica White has prepared a critical path calendar for preparation for the December 6, 2005 public meeting. She will provide the calendar to Pat.
4. Jessica is in the process of verifying the Buckeye location of the December public meeting. Tentatively, it will be held at the Buckeye Valley Chamber of Commerce subject to availability of that facility.
5. A presentation/ open house format for the public meeting was discussed.

I. STAKEHOLDER INVOLVEMENT

1. Chuck Williams reported that he updated the stakeholder database and reformatted the database to list stakeholder groups by subareas.
2. Met with MCDOT, Town of Buckeye, AZ Game & Fish, CAP, FRS #1 Subarea land developers/ engineers, Area 4 North of CAP Subarea land developers/ engineers, and Hassayampa River Subarea land developers/ engineers to discuss project coordination, implementation, and maintenance issues.
3. An individual stakeholder meeting is planned with ASLD on October 24, 2005. A meeting with the White Tank Wash Subarea land developers/ engineers will not be held. These stakeholders previously attended the meeting for the FRS#1 group. Meetings with Area 4 developers/ engineers for the Lyle Anderson and Spurlock parcels are postponed.
4. Valerie provided an update regarding the September 9, 2005 Western Area Region Meeting. There are currently approximately 12 studies concurrently underway in the Buckeye area addressing various issues. This group coordinates these various planning projects. The group meets again October 20, 2005 and will include developers in the area to discuss cost share for funding studies. Valerie is attending tomorrow's meeting. Greg Jones will present information on behalf of the District.
5. Tartesso and Sun City Festival have individual 404 permits. Elianto's 404 permit application is pending. The developers are working with the Corps as the primary reviewing agency. It is unclear if the EPA remains involved in the 404 review process in the Sun Valley area. The No Action alternative (Alternative D) is no action on the part of the District, but does include any structural drainage improvements or nonstructural open space/ setbacks planned by the developers. If necessary, the developers might be asked to provide 404 permit application information to the SVADMP project team.

J. PROJECT ADMINISTRATION

1. Optional Tasks status update – Submitted request to District for authorization of Optional Task 16.0 Maintenance Plan and travel-related optional expenses for Richard French, PhD, PE to attend Step 2 Proposed Alternatives Meeting. Valerie provided verbal authorization to proceed with this optional task and expense.

2. Posted report templates and binder covers to JEF ftp site for download and use by subconsultants in preparing deliverables.

K. NEXT MEETING

1:30-3:30pm, Wednesday, November 9, 2005
FCDMC Adobe Conference Room

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING MINUTES

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Wednesday, October 19, 2005

TIME: 1:30 – 3:30 pm

AGENDA:

A. STEP 2 PROPOSED ALTERNATIVES FORMULATION UPDATE

B. STAKEHOLDER INVOLVEMENT

1. Review action items related to preparation for November 29, 2005 Stakeholder Working Group Meeting No. 2.
2. Met with ASLD and consultant on October 24, 2005 to discuss project coordination, implementation, and maintenance issues.
3. October 20, 2005 Western Area Region Meeting update

C. PUBLIC INVOLVEMENT

1. Review action items related to critical path calendar for preparation for December 6, 2005 public meeting.
2. Preparation and distribution of public meeting announcement postcard.
3. Preparation of public meeting exhibit boards.

D. HYDROLOGY

1. Area 3 – Completed models and documentation for apex hydrology for Fans 5, 10, & 11 for use in apex HEC-RAS models to prove flow containment.
2. Area 4 – Completed existing and future condition models. Submitted Area 4 hydrology report on October 6, 2005. District review pending.

E. FLOODPLAIN DELINEATION STUDIES

1. Approximate Alluvial Fan Floodplain Delineations
   - Revised Stage 1 and 2 delineations. Work underway on documentation.
   - Stage 3 delineations underway. Field work partially completed.
2. Approximate Riverine Floodplain Delineations
   - Apex HEC-RAS modeling of selected alluvial fan apices underway. Submitted cross section locations, preliminary delineations, 'n' value report, and model output on October 4, 2005. Received District review comments October 19, 2005. Finalize and submit TDN to District.
3. Detailed Floodplain Delineations (Optional Task 11.2)
   - White Tank Wash and Tributaries FIS review completed. Re-study not recommended. District concurrence pending.

F. ENVIRONMENTAL EVALUATION

1. Archeological Assessment – Work underway incorporating cultural resources maps into historic character report.
2. Biological Evaluation – Work to commence hyperlinking ground photos into GIS database.

G. LANDSCAPE PLANNING/ RECEATION MULTI-USE

1. Update regarding coordination meeting with District LA.
2. December 1, 2005 Sun Valley ADMP Multi-Use Workshop

H. PROJECT ADMINISTRATION

1. Optional Tasks status update – Submitted request to District for authorization of Optional Task 16.0 Maintenance Plan and travel-related optional expenses for Richard French, PhD, PE to attend Step 2 Proposed Alternatives Meeting.

I. OTHER

J. NEXT MEETING

Step 2 Proposed Alternatives Evaluation Meeting
9:30-3:30pm, Wednesday, December 14, 2005
FCDMC Adobe Conference Room

STAKEHOLDER WORKING GROUP MEETING SUMMARY

Public Sector

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ

DATE: Tuesday, November 29th, 2005

TIME: 9:30 am – 11:30 am

The meeting was called to order by Valerie Swick, FCDMC Project Manager, at 9:35am. The meeting agenda and an updated copy of the stakeholder contact database are attached. The meeting handouts distributed to attendees included SVADMP Step 2 Proposed Alternatives general overview descriptions, maps, and hardcopies of the PowerPoint presentation. The following is a summary of the key items discussed at the meeting:

1) **ASLD**
   - Interested in obtaining the HEC-RAS results for the riverine areas upstream of the apices.
   - Requested clarification as to whether 'whole fan' solutions would be applied by sub area or by the entire area.
   - Interested in the size and locations of planned detention basins when that information becomes available.

2) **AZGF**
   - Primary concern is to maintain wildlife habitat corridors from the White Tank Mountains to the Hassayampa River.
   - Would like to see the SVADMP plan having coordination with the developers to ensure 'whole fan' connectivity.
   - Would like to be involved if design modifications take place on the Sun Valley Parkway.
   - Would like to be apart of the landscape aesthetics advisory (PAAC) committee being created as part of the SVADMP.
   - Concerned about fencing, pipes, etc. that might cross stream sections, therefore inhibiting wildlife habitat corridors.
   - JEF requested feedback as to how 3-foot drop structures in conveyance channels would affect wildlife habitat corridors.

3) **Woody Scoutten/ Town of Buckeye Engineer**
   - Would like to ensure the SVADMP plan will protect the Sun Valley Parkway up to the 100-year storm event.
   - Concerned that existing subdivisions such as Skyline, the area below Fan 36, and the area just North of FRS #1 are accounted for in the alternatives.

4) **Ian Dowdy/ Town of Buckeye Planner**
   - The SVADMP plan looks good from a planning perspective.
   - Interested in adopting the SVADMP for planning purposes.

5) **CAP**
   - Wanted to verify that the Flood Control District was aware that two multi-span bridges are being planned over the CAP canal. The two bridges are located at 291st Avenue and the CAP siphon at the Hassayampa River.
   - Discussed the planned trail system along the CAP canal. The trail generally follows the north canal embankment; however, trail alignment changes are possible in the SVADMP study area such that the trail follows the south embankment.

6) **Maricopa Planning Department**
   - Would like to see the coordination with the developers continue to more detailed specifics as the SVADMP progresses.

7) **Nature Conservancy**
   - Question: What are the set backs associated with channels? Answer by Valerie Swick: Set backs are established by the master planed communities' developers ,but typical channels that previously had set backs of 50 feet now have set backs of 100-200 feet.
   - Question: What do typical cross sections look like? Answer from the Town of Buckeye: The recently completed Recreation Plan will be adopted by the Town of Buckeye. It has information about channels and landscaping.

8) **White Tanks Mountain Conservancy Group**
   - Would like to see as much of the White Tanks Mountain preserved in its natural state as possible.
   - Was not informed about the first Stakeholder Working Group meeting in August 2005.

9) **General Discussion**
   - All additional comments/ feedback from stakeholders should be provided to the SVADMP project team within the next two weeks.

The meeting was adjourned at 11:15 am.

SUN VALLEY AREA DRAINAGE MASTER PLAN

STAKEHOLDER WORKING GROUP MEETING SUMMARY

Private Sector

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ

DATE: Tuesday, November 29th, 2005

TIME: 1:00 pm – 4:00 pm

The meeting was called to order by Valerie Swick, FCDMC Project Manager, at 1:10pm. The meeting agenda and an updated copy of the contact database are attached. The meeting handouts distributed to attendees included SVADMP Step 2 Proposed Alternatives general overview descriptions, maps, and hardcopies of the PowerPoint presentation. The following is a summary of the key items discussed at the meeting:

1) **Bob Spears/ Stardust**
   - Regional drainage impact fees ought to fund drainage improvements.
   - Impact fees cannot cover maintenance expenses, therefore a maintenance plan needs to be implemented. Advocated for the immediate establishment of a maintenance district.
   - Believes that options presented in Alternative B will not be allowed per 404 permit regulations. He states that present washes will need to be avoided. Advocates small/mid-size basins strategically located to allow for adequate conveyance within natural watercourse corridors confined by constructed walls.
   - Advocates larger corridors which are not "engineered" but rather contained by walls.
   - Question: How large is the large basin? Answer from Ted Lehman: 40 acres, 12-15 feet deep.
   - There is a need for an implementation plan that accounts for timing of construction of various elements. The time for it is now when there are less landowners to do deal with. Believes all developers will participate if proposals are fair.
   - Question: Is it possible to leave a floodplain alone? Answer from Ted Lehman: Alternative B2 is the closest with some bank protection. Answer from Valerie Swick: All channels will be blended to the natural surrounding.
   - Would like to see more definitions and design specifications associated with each alternative.
   - Get funding mechanism in place now, then developers can focus on regional solution. It is easier to solve technical issues once funding issues are resolved.
   - Keep basins away from arterials and commercial roads as much as possible.
   - Make sure that the SVADMP is one with which the developers can build.

2) **Jackie Meck/ Town of Buckeye**
   - Prefers not to contribute funds for building regional infrastructure.

3) **Dianne Thornburg/ Westpac Development**
   - Prefers not to contribute funds for building regional infrastructure.

4) **Charlie Potter/ Capital Pacific Homes**
   - Question: Will the basins along the Sun Valley Parkway be large? Answer from Ted Lehman: The basins near Sun Valley Parkway will be used primarily for in-line sediment control and off-line peak scalping to match culvert capacities. The basins will probably be about 3 feet deep. Answer from Valerie Swick: There is an ongoing effort to coordinate form and function.
   - Question: Are the flow corridors set in stone? Answer from Pat Quinn: Changes can still be made but soon the final flow corridors must be set so that the SVADMP concept design can proceed.
   - Question: What sort of time frame is associated to the SVADMP project? Answer from Valerie Swick: Buckeye has requested a 12-month timeline ending July 2006. Funding of design costs in CIP track is 3-5 years out.
   - Timing of existing developers with 404 permits may prove to be critical for future applications.

5) **Terri George/ DEA**
   - Question: Why are there two basins in White Tanks Wash? Answer from Ted Lehman: To keep the discharge to existing floodplain delineation levels. A yellow line denoted on the general overview maps for the alternatives does not necessarily denote an engineered constructed channel.
   - DEA has designed wide corridors contained by view walls which have 2 feet of grouted masonry above the ground and 4-6 feet of toe down.

6) **Woody Soutten/ Town of Buckeye Engineer**
   - Questioned whether the regional plan should be presented as a flood control measure to the US Army Corps of Engineers.

7) **Jack Moody/ WRG**
   - Question: What effect will the developments have on sediment yield and design specifications? Answer from Ted Lehman: The clear water introduced from developments will require some grade control structures for vertical alignment control of the conveyance corridors.

8) **Brian Rosenbaum/ Lennar**
   - Alternative A drainage plan does not fit with the plans presently in place for Ellianto.
   - Alternative D requires precise timing from all developers involved.

9) **Nasir Raza/ URS**
   - Question: Will existing or future conditions discharge rates be used? Answer from Ted Lehman: With respect to peak discharge, existing condition is higher and more conservative than future condition and will most likely be used for design purposes. 100-year, 2-hour retention will be provided.

10) **Kevin Kammerzell/ CMX**
   - Locate basins as close to corridors as possible so as to maximize developer footprints.

11) **Rafael Velasquez/ ASLD**
   - Would like to obtain design and 404 permit information from the developers. Terri George noted that all 404 permit information could be obtained from the US Army Corps of Engineers.
   - Noted that many of the basins are on ASLD land.

12) **General Discussion**
   - The recommend alternative will likely be a combination of elements from all the Step 2 alternatives.
   - Valerie Swick requested a representative from the developers stakeholder group to be a participant of the landscape aesthetics advisory committee (PAAC) to be formed in January 2006.
   - All additional comments/ feedback from the stakeholders should be provided to the SVADMP project team within the next two weeks.

The meeting was adjourned at 3:00 pm.

STEP 2- BRAINSTORMING SESSION

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ

DATE: Wednesday, December 14th, 2005

TIME: 10:00 am – 4:00 pm

The meeting was called to order by Pat Quinn, JEF PM at 10:05am and the attached agenda was followed throughout the meeting. The purpose of the meeting was to discuss possible solutions for the SVADMP that would address the visual, technical, and regulatory concerns raised in past meetings. There were four key design features discussed:

1) Basins
2) Levee Channels
3) 'Companion' Channel
4) Drop Structures

The following represents a summary of the points discussed at the meeting for each of the items listed above.

1) Basins

- Terrace the basins
- Have the basin follow the contours of the landscape.
- Consider head cuts at the upstream end.
- To minimize maintenance- keep sediment moving as much as possible.
- Have a variable side slope between 8:1 to 4:1.
- Consider an undulating embankment lip at the downstream end of the basin.
- Keep basin depth to a maximum of 8-10 ft as volume area allows.
- For online basins, create a low flow channel in the basin that outlets at downstream side but can be closed as needed.
- For offline basins, there may be a benefit of sediment transport by using a bypass channel.
- Put water back in to the natural system to maintain a distributary network.
- Bedrock may drive having shallower basins.
- Maintenance cost for sediment and vegetation removal will be high.
- Dam regulations are provided by ADWR and should be considered when designing embankments on the downstream side of basins.
- Minimize earth moving to keep construction costs lower.
- Have a variable vegetated buffer (30-50ft.) around the basin.

2) **Levee Channels**
   - Terrace the levees.
   - Allow for vegetation and/or trails on terraced levees.
   - Undulate levee to blend with landscape
   - Concept may provide more recreation opportunity, although open space credits are not an option per current regulations.
   - Side slope channels of 8:1 preferred over 3:1 slopes.

3) **'Companion' Channel**
   - By placing a detention basin upstream of a road, flows to the natural channel and the companion channel can be controlled.
   - The space between the two channels may have evacuation issues.
   - Concept may provide more recreation opportunity.
   - The current regulations do not account for open space credits.
   - Water lines from the constructed channel could be used to water the natural channels
   - Create a designed distributary system.

4) **Drop Structures**
   - Bury grade control structures.
   - Create paths by installing earthen ramps at the drop structures.
   - Blend structures to landscape.
   - Aesthetic treatment is important.
   - Increase drop height to create waterfall feature.
   - Gabions can be covered up/vegetated.
   - Keep structures regularly spaced but design such that they appear natural in form.
   - Allow for community involvement. Two ideas are art opportunities and/or a kinetic energy (water wheels) education center.
   - Are the grade control structures allowable per 404 permit regulations?

5) **Combining all options**
   - Create a designed distributary system.
   - Define multi-use opportunities and landscape character compatibility.
   - Compare facilities with archeological and biological resources.
   - Categorize washes in flow, volume, and upstream watershed area to determine any commonality of design.
   - Determine what developers plan.

The meeting was adjourned at 4:20 pm.

SUN VALLEY ADMP STEP 2 PROPOSED ALTERNATIVES

DESIGN CRITERIA BY STRUCTURE TYPE

Channels

- Velocity ~ 4-5 fps (unlined)
- Width < 400 ft
- Depth ~ 1 ft (overbank)
- Levee Height ~ 4 ft
- Channel Slope – Subcritical flow, Froude number ≤ 0.85
- Side slopes ~ 3:1 to 4:1

Basins

- Width narrower || to flow
- Depth ~ 10-15 ft max
- Freeboard ~ 1 ft
- No Embankment
- Side slopes ~ 3:1
- Upstream slope height ~ 30-35 ft max

Drop Structures

- Width = channel width
- Height ~ 3 ft max
- Spacing based on difference between existing and design slope

SUN VALLEY ADMP STEP 2 PROPOSED ALTERNATIVES

EVALUATION CRITERIA

Alternative Evaluation Criteria

Criteria (Followed by Guidelines)	
1) Public Safety Enhancement • Improve Public Infrastructure • Reduce Flood Level • Number of People Impacted	2) Level of Damage Reduction • Dollar Costs Saved/Reduced • Flood Frequency Impacted
3) Access Critical Location • Collector or Arterial Roadway • Only Access • Number of People Impacted	4) Upstream/Downstream Impacts • Stand Alone • Systematic Solution
5) Comparative Size of Watercourse • Greater than 50 CFS • Greater than 500 CFS • Greater than 5,000 CFS	6) Eliminates Flood Problem • Partial Solution • Whole Solution
7) Eliminates Erosion Problem • Partial Solution • Whole Solution	8) Cost of Implementation • < than $50,000 • < than $500,000 • < than $1,000,000
9) ROW Acquisition Necessary • Existing ROW Available • Amount Needed • Private or Public Land	10) Condemnation Required • Private or Public
11) Maintenance Cost • Lessened • Increased • Neutral • Comparative to Other Measure	12) Potential Cost Sharing Partner • Already Contacted • Already Willing • Possibly
13) Comparative Benefit Cost • Dollars • Number of People • Regional Solution	14) Addresses Public Complaint/Concern • Response From Public
15) Public Support • Known • Anticipated • Unknown	16) Agency Acceptance • Known • Anticipated • Applicable • Unknown

Alternative Evaluation Criteria

Criteria (Followed by Guidelines)	
17) Environmental Impacts • Decrease Habitat • Increase Habitat • Hazmat • Cultural • 404	18) Multi-Use Opportunities • Known Compatibility • Possible Compatibility
19) F.C. Method Compatible with Setting • Land Use Plan • Visual Impacts • Material/Form	

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Feb. 6, 2006

TO: Pat Quinn, PE

FROM: Ted Lehman, PE; Hari Sundararaghavan, PhD, PE

RE: preliminary review meeting with FCD technical staff on 2/6/06

CC: Valerie Swick, E.I.T., P.H., CFM

This memo is to summarize the discussions held regarding preliminary review comments received from District staff dated 2/2/06. A meeting was held with Dr. Bing Zhao, Dave Degerness, Richard Waskowsky, Kathryn Gross, Julie Cox, and Valerie Swick at the FCDMC offices on the morning of Feb. 6. Comments were discussed with staff. The following summarizes our response to comments and other discussions related to the Step 2 alternatives development. Our responses follow the numbering of the comments received from the District.

1. Any changes noted for design structure types, or alternatives that applies to other structures or alternatives will be addressed for all affected elements.
2. Hari will provide a brief description of macros used in the spreadsheet design to assist in the District staff understanding and review of the design spreadsheets and the methods used. He will supply this information by tomorrow afternoon.
3. We will supply the formulas in the report text. Also, clarification will be added to the spreadsheet labels to more clearly identify which volume is what (i.e. basin flood control volume, freeboard volume, and excavation volume).
4. The spreadsheet logic will be changed and clarified in the basin worksheets to show the 6-hr, 24-hr and selected design values separately. Changes will be made to the spreadsheet to display the 6-hr and 24 hr values in the storage/detention sheets.
5. Comments will be added to the text regarding need for small outlets to drain offline basin and the fact that specific design elements for such outlets are not included as part of the Step 2 analysis. Additional outlet discussion and cost evaluation will be included as part of Step 3.
6. Much discussion of the equilibrium slope, clear vs. sediment laden flows, inflowing sediment rates, etc. was held. It was agreed to work with the District to identify specific recommended equations for used for each condition in Step 3. The SOW (Task 10.7.3.4) specifically mentions use of the BOR and ADWR manuals for clear water and sediment laden flows, respectively. The reach-average and other averaging approaches used in the spreadsheets as presented are considered adequate for the Step 2 evaluation.
7. Related to item 6. Also, sediment delivery handled in Step 2 via sediment yield. Spreadsheet will be changed to display "N/A" for "Trend" Column in the sediment capacity table when the inflowing sediment load is zero.

8. The specific channel reach, E2C-E3_E4RB30 appears to be in error. It will be corrected. Similarly, per item 1, slope used in other sheets will be verified as well.
9. Additional language will be added to the text providing background as to the source of data, info, experience upon which the assumed sediment yield rates were derived.
10. Three (3) years was used based on an assumed maintenance schedule as suggested by consultant team member, CL Williams.
11. Spreadsheet formula found to be in error (a decimal place was shifted). The formula will be corrected in all spreadsheets.
12. Local scour at culverts is not considered an element of Step 2.
13. Again, site specific bend scour is not considered an element of the Step 2 analysis.
14. See the formula for total scour in Column 13, Rows 61-64. You'll find the safety factor within the formula there.
15. We agree this is a good idea. We will be investigating existing capacity along the selected alignments as the 10-ft DTM allows. Valerie suggested we may also be able to perform some site specific topographic survey if it makes sense. If it's not in the current scope and it makes sense, District would be willing to get the survey done for the ADMP team somehow.
16. District = FHWA. Will add a comment in the sheet to this effect.
17. Comments will be added to the text regarding the validation of the regime results used based on field observations of low flow channel depth.
18. An extended discussion of the scour depth and toe down led to an understanding that JEF is providing a conservative estimate of toe down requirements. Additional refinement may be warranted in Step 3.
19. The use of a fixed drop height vs. long-term scour and the equilibrium slope was clarified. JEF is assuming a fixed drop height of 3 feet. Drop structure spacing is then set based on the calculated average long-term slope.

Additional items noted during the meeting

- It was reported by the District that some channels are not listed in the Hydraulics Summary Table for Alternative A. JEF will verify and fix if needed.
- It was reported by the District that incorrect slope may be used in the calculations for the channels in B3 alternative. JEF will ensure that the correct slope is used.

It is also noted that the FRS No.1 and Wagner subarea documents were delivered at this meeting. Additional, helpful information within the new submittal was anticipated to provide additional clarification regarding the design approaches and methods applied in the Step 2 analyses.

URS

Land Use and Infrastructure Master Planning of ASLD White Tanks Planning Area (Draft)

Date and Time: 8.30 a.m. - 10:30 a.m., Monday, Feb 09, 2009

Location: Conference Room, Flood Control District of Maricopa County, Phoenix, Arizona

Attendees:

Valerie Swick	FCDMC	602-506-2929	2801 West Durango Street Phoenix, AZ 85009	vas@mail.maricopa.gov
Ottozawa Chatupron	ASLD	602-542-2683	1616 W. Adams Phoenix, AZ 85007	ochatupron@land.az.gov
Mike Naber	ASLD	602-542-0448	1616 W. Adams Phoenix, AZ 85007	mnaber@land.az.gov
Patricia Quinn	JE Fuller	480-752-2124 (212)	8400 S.Kyrene Rd, #201 Tempe, AZ-85284	pat@jefuller.com
Chuck Williams Principal	CL Williams Consulting, Inc	928-368-2248	4720 W Maverick Ln, #103 Lakeside, AZ –85929	chuck@clwilliams.net
Thirumurugan Bose	URS	602-861-7445	7720 N. 16th Street, Suite 100, Phoenix, AZ 85020	thirumurugan_bose@urscorp.com
Marc McIntosh	URS	602-648-2437	7720 N. 16th Street, Suite 100, Phoenix, AZ 85020	marc_mcintosh@urscorp.com
Nasir Raza	URS	602-648-2352	7720 N. 16th Street, Suite 100, Phoenix, AZ 85020	nasir_raza@urscorp.com

C: Craig Mershon (ASLD)

Bob Lagomarsino, Simon Pratt, Aaron Iverson, Debra Duerr, Kim Bidle, Gene Rogge (URS)

Meeting Notes:

The purpose of the meeting was to ascertain the status of Sun Valley Area Drainage Master plan as it pertains to ASLD's White Tanks property.

Significant Items of Discussion:

Pat stated that the primary wash corridors for Area 4 have been identified and submitted to the FCDMC. She further stated that the primary wash corridors for Area 3 wash corridor are also identified and under review by FCDMC. J.E Fuller has come-up with 2 concepts:

1. Trunk Line Single Conveyance - This concept identifies single wash corridors from detention basins located at the fan apices to the outfalls.
2. Multiple Wash Concept - This concept identifies multiple wash corridors extending downstream of the proposed detention/sedimentation basins to fan outfalls.

Both concepts are under review by FCDMC. One of the concepts will be finalized and ready for public review/comments by March 8. FCDMC has considered both functional and aesthetic criteria in evaluating these

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proposed drainage improvements. After refinements the preferred drainage concept will be presented at the stakeholders meeting on April 4.

Pat stated that the primary wash corridors are the same for both the concepts.

The existing condition discharges were used for the hydraulic analyses. Ottozawa-Chatupron of ASLD stated that detention basins could adversely affect the riparian habitat. Riparian habitat wash corridors are preferred.

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Nasir enquired about the status and completion dates of hydrology for areas 4 and 3. Valerie stated that area 4 hydrology (HEC –1) is under review with FCDMC and will be ready by next week. Valerie added that only HEC-1 model was used for hydrology and Excel-Macro was used to convert GIS database file to input data for HEC-1. Valerie suggested contacting Bing Zhao of the Flood Control District for details on converting flows from GIS database file to HEC-1. She further stated that Ted Lehman of JEF has sent her a letter that provides reasons for not using WMS.

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Ottozawa-Chatupron suggested that URS overlay the hydrology that FCDMC provides and proceed with identifying the 404 washes within the next couple of weeks. Also, he suggested obtaining the 404 Jurisdictional Delineations from the Corp for adjacent areas.

Valerie Swick stated that the criteria for identification of primary wash corridors was that they (washes) start from the fan apex. Aerial photogrammetry was also used to identify the primary washes. Floodplain delineation has been prepared upstream of the apex to prove that the flows are contained (up to the apex). Pat stated that the wash corridors identified by the adjacent developers tend to change as a result of refinement of their plans. FCDMC stated that the color aerial photographs (in electronic form) could be provided to ASLD upon request.

Pat Quinn stated that the sediment calculations were based on the continuity equation, stable channel and equilibrium slope concepts and have been submitted to the FCDMC for review. They are available in spreadsheets and dynamically linked with HEC-1. The wash corridors were identified and a velocity of 4-5 ft/sec was maintained in the channel. Also drop structures were provided to reduce the slope to ½ % from 1 % at required locations. She concluded that the corridors were left untouched (except for the drop structures) with 4ft high embankments/levees built on the sides. The maximum channel widths are 400ft; 200ft wide corridors have been used on the average. Concept 2 multiple corridors have widths within the range of 150 ft-175 ft. Grade control structures have been provided at a spacing of 300-400 ft on the average. Valerie stated that the levee/embankment is more expensive than the drop structures. There are fewer basins in the multiple wash corridor concept.

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HEC-RAS modeling will be limited to key portions of the wash. These HEC-RAS models will be prepared by the end of May. Valerie added that sediment sample tests will be conducted at 25 locations and 45 sediment samples will be tested.

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Towards the end of the meeting, URS requested a list of items from the FCDMC (see attached agenda and other items) including:

a) FCDMC will provide aerial photographs to ASLD/URS at the earliest.

b) The wash corridors for areas 3 and 4 along with their hydraulic analyses will be provided to URS within a couple of weeks after the review of hydrology for area 3 is completed.

c) The HEC-1 model for area 3 and 4 will be provided soon. Bing Zhao can assist URS in converting HEC-1 to GIS and vice versa.

d) The sediment calculation will also be provided to URS by March 8.

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Sun Valley ADMP Step 2 Proposed Alternatives Evaluation Meeting – 02/14/2006
Notes for the Form Meeting:

- Reason for dividing the Sun Valley ADMP area into sub-areas – dependent on hydrology and the location of outfall for the apices.

- 3 Maps were briefly explained by LSD Group:
  - Existing landscape character Map – more or less undisturbed sonoran desert landscape character – area evaluation based on visual sensitivity, scenic variety, and scenic integrity - to explain the derivation of compatibility (predominantly Class 3) maps for the area.
  - Buckeye regional recreation plan – displaying and identifying existing and proposed trial corridors to connect the local and regional parks - to assist in the evaluation of multi-use opportunities in the sub-area.
  - Multi-use recreation plan (with possible trail connectivity, possible location of trailheads, etc) – composite of Buckeye and Sun Valley ADMP areas – also includes information gained from the earlier brainstorming public meeting conducted by the FDC for the Sun Valley ADMP area – expected to assist in the evaluation of multi-use opportunities for each sub-area.

- Evaluation of the alternatives and the treatment in order to achieve the class compatibility is to be determined by overlaying the 6 sub-areas on the composite compatibility map.

- Compatibility Classes - non-structural, soft-structural, semi-soft structural, semi-hard with aesthetic treatment, semi-hard structural and hard structural.

- All the alternatives are compatible only to adopt a non-structural, soft-structural, or a semi-soft structural flood protection method.

- Criteria 15-18 – were not included in the evaluation since an assumption would have to be made – input from the public after the meeting can be incorporated at a later stage

- Criteria 22 and 23 were combined – since they were duplicating information, recreation would be evaluated twice otherwise.

- Final Matrix Evaluation Table:

A	B	C	D	E	F	G	H	I	J	K
		Modified Functional Alternative Section								
		Environmental Impacts					Complexity of Environmental Permitting	Aesthetic Compatibility	Multi-use opportunities	Total Score
Sub-Area	Alternative	Habitat	Hazmat	Cultural	404	Average				
						(c+d+e+f)/4				g+h+i+j

- CAP Sub-Area –
  - Option B4 – 3 is preferred to others
  - Possibility of/challenge in maintaining the existing earthen channel which is not aesthetically very pleasing
  - Discussed the idea of rehabilitating the existing channel, however, impact to rehabilitate the same is that financial cost may be very high
  - All the alternatives are environmentally conducive since there is minimal impact on the natural surroundings (especially, if the existing channel is retained).
  - Alternative 'D', since not much is known about the development in that area, it is assumed that more of the existing wash area will be preserved.
  - All the alternatives, except for alternative 'D' achieve context sensitivity

- Wagner Sub-Area –
  - Option B4 – 3 is preferred to other alternatives
  - Since there exists two options- to drain the water in the upstream or downstream, the upstream is preferred since it appears more natural.
  - Additional Basins at the top will increase recreation opportunities with possible connectivity to regional trails

- Hassayampa Sub-Area –
  - Option B4 – 3 is preferred to other alternatives
  - Again, more option for recreation opportunities
  - Also, this option preserves a fairly nice wash on the southern route.

- FRS 2 & 3 Sub-Area –
  - Inclination towards the alternatives that preserve the wash on the eastern side as compared to the western side
  - As for 10-11, option to buy the land and design it as a natural basin/bank or an option tending more towards option 'A' was discussed.

- Educated guess and based on the evaluation for the above 4 sub-areas (in the interest of time) will be made for White Tank Wash and FRS 1 sub-area.

- In general, the consensus of the group was that:
  - Larger basins and more/multiple paths are preferred to alternatives that drain the water into single channels – this provides or at least generates more opportunity for multi-use recreation opportunities along the corridors; pedestrian trails, hiking trails, equestrian trails, etc), etc.
  - Larger basins are preferred since there is more scope for open spaces, habitat preservation and immediate development can be avoided. However, they should have diversity in plant species and aesthetic appearance.
  - For an approach to adopt a levee or a wall throughout channel section, the decision will be made based upon economic and aesthetic feasibility of the section

    - Opportunities for excavated channels in small areas where feasible will also be evaluated

- As a next immediate step, landscape themes (based on historic significance, landscape character, etc.) and alternatives for each sub-area are to be generated and discussed with respect to adaptability of functional channel/basin alternatives

- A meeting to decide upon a recommended solution will be scheduled sometime in mid March. Discussion to include aesthetic and economic analysis and feasibilities of the alternatives to fit the respective compatibility classes to minimize the disruption of the existing environment.

- The public meeting for 02/15/2006 will be scheduled at a later date.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: February 20, 2006

TO: Valerie Swick

FROM: Pat Quinn

RE: **Sun Valley ADMP - March 8, 2006 Public Meeting**

CC: Jessica White
Nicole Kelley
Dennis Holcomb
Mark Meyer

The following is a synopsis of the planning elements we discussed at our February 17, 2006 meeting regarding preparation for the upcoming March 8, 2006 public meeting for the Sun Valley ADMP. Please review this information and contact me if you have any questions or need further information.

Public Meeting Time/Date: 6-8 pm, Wednesday, March 8, 2006

Location: Buckeye Community Center
201 E. Centre Avenue
Buckeye, AZ

Agenda/Format:

6:00-6:30 pm	Open House
6:30-7:00 pm	Presentation
7:00-7:15 pm	General Q&A
7:15-8:00 pm	Open House – Individual Q&A

Open House: No centers planned. Meeting staff will be stationed at exhibit boards.

Presentation:

Who	Intro to FCDMC/ Intro Project Team	Nicole	5 min
What	ADMP - What is an ADMP/ Objectives Statement	Valerie	5 min
Where	Study Area Orientation	Valerie	
Why	Flood Hazard Delineation Map of Unstable Areas	Pat	10 min
How	Alternatives A-D	Pat	
	Landscape/ Multi-Use/ Recreation	Mark	5 min
When	Schedule/ Next Steps	Valerie	5 min
General Q&A		Nicole	15 min

The presentation will be made using the exhibit boards and/or a PowerPoint slide show. Pat will review and update previous slide shows for use at the meeting. Pat will bring a laptop, projector, and extension cord. The District will provide a screen.

Exhibit Boards:

1. Study Area map with Ayres Stage 2 unstable areas delineation over aerial photo
2. Alternative A
3. Alternative B
4. Alternative C
5. Alternative D
6. Natural Channel - Levee and Wall typical cross sections
7. Excavated Companion Channel – Earthen and Concrete typical cross sections
8. Basin – Oblique view
9. PAAC boards?

The typical cross sections will show flood control structures with various landscape themes for comparison.

Meeting Handout:

A public feedback form will be distributed to solicit input regarding the flood control alternatives presented and the landscape themes.

Meeting Participants:

District	Consultant
Valerie Swick	Pat Quinn
Nicole Kelley	Mark Meyer
Dennis Holcomb	Larry Hansen
Kathryn Gross	Diane Simpson-Colebank
Julie Cox	Ted Lehman
	Jon Fuller
	Chuck Williams

Preparation Timeline/ Work Plan:

2/17	Planning Meeting 1
2/22	JEF to LSD Study Area and Alternatives A-D exhibit boards (pdf format)
2/23	Planning Meeting 2 – review 11x17 mock-up examples of exhibit boards; Review presentation slide show
2/28	LSD distributes revised 11x17 mock-ups of exhibit boards
3/1	Comments due to LSD regarding exhibit boards
3/2	LSD plots exhibit boards
3/3	LSD to District Mount-ready exhibit boards
	District mounts boards to be ready by 3/7

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING MINUTES

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Wednesday, July 12, 2006

TIME: 1:30 – 3:00 pm

ATTENDEES:

Julie Cox	FCDMC	Jon Fuller	JEF
Valerie Swick	FCDMC	Ted Lehman	JEF
Nicole Kelly	FCDMC	Jim Rodgers	SAS
		Chuck Williams	CL Williams
Alan Como	Town of Buckeye		

AGENDA:

A. Alternatives Formulation Update

1. a. Step 1 & Step 2 draft reports
   - 3 copies delivered to VAS on 6/23 for her review
   - VAS to try to get comments back to JEF by end of next week
   - VAS to also supply to Julie C. for her review
   - TWL to provide memo of response to Julie's comments on Step 2 asap

   B. Step 3 process underway
2. VE meeting summary info from Jon forwarded to John P. for incorporation to final VE report

B. Public Involvement

1. Nicole handed out critical path calendar for Public Meeting. Oct. 18 selected for meeting in Buckeye at the community center. See handout from Nicole.

C. Stakeholder Involvement

1. Alluvial fan delineations - extensive discussion held in pre-meeting
2. Workgroup meeting 3 - powerpoint uploaded to JEF ftp site for VAS use/review

D. Geotech evaluation

AMEC not present. Last word, draft report under internal review. Due for delivery to JEF and FCD anytime.

E. Hydrology

1. Area 4 final report still in progress.

2. Step 3 refinements in progress. Area 4 + Skyline complete, Area 3 still to do.

F. Hydraulics

1. Step 3 refinement in progress. Preliminary designs complete for Area 4 & Skyline using CAT. Thus far corridors narrower due to slightly lower Q and use of existing capacity. For example, Fan 5 middle corridor has extensive continuous reaches of sufficient existing capacity to contain flow. This also helps incorporate VE suggestions.

G. Floodplain delineation

1. Fan 6 - in review. Fan 10/11 and 1&2 comments received. VAS requests JEF inform her if KAG fails to keep up with review commitments.
2. Fan 4-5 to be delivered to VAS at tomorrow's tech meeting at JEF.

H. Planning Regulatory

EDAW not present. Waiting on general plan meeting to finalize draft report.

I. Landscape Planning/ Rec. Multi Use

LSD not present. Dennis also not present. Some status update needed and coordination of Dennis' feedback and status on LSD progress to date. Also, need Mark's meeting minutes from earlier meeting in June with Dennis.

I.2. Jim - Archeological

2 Final reports delivered to VAS. VAS to provide one copy to JEF.

J. Project Admin

Pending time extension/change order - FCD still mulling 4 vs. 6 mo. Extension. Need to get executed by 7/18 or 7/23 (depending on interpretation of original NTP and contract duration). VAS to get it done.

K. Next Meeting
1:30 p - 8/9 at FCD

Stakeholder Meeting Notes
8-1-06

Public Sector

API – park property boundary

Who maintains the basins?

Any basins along the corridors?

Can the basins be drained?

Will the basins at Apex be unfenced?

Will basins in 1 & 2 be open for wildlife?

CAP has a dedicated park on the south side. Trail from south to north. Parallels the canal outside the security fence. Waiting for the cities to take over control of the trail.
Tom Fitsgerald 623-869-2209

Keep basins as natural as possible.

What's the plan for area around 38? Per Valerie keep it open and a waste water plant.

How do you do the set aside?

Clarify building in floodplain/floodway – no structures that could block the flow.

Set aside for area 20? Not develop in that area per Valerie

ASLD's position to commit the land to basins. Per Pat need to talk with the town.

Sun City Festival Plan – Per Valerie surveying the channel – not a fan. Looking towards what the geomorphic looks like.

Development south of Sun City Festival. Valerie hasn't seen that info yet. No detail analysis done yet.

Area 38 – Pulte putting in a waste water treatment plant? Who controls that? How do you build in a floodway?

Area 17, 18, & 19 - view the delineation of the fan. Moving ahead without a 404 permit and using bridges over the washes.

Can the fan change due to the prolong drought? Is the drought a factor?

100 yr - no more than 6" on a roadway surface. Concerned about it being more than 6 inches.

Corridors & wildlife compatible

Private Sector

Freeboard – Floor above 100 yr. level, is it a levee?

Who maintains everything – Buckeye or the district?

What is the status with the state for the basins on their property?

Will the channels be natural or engineered?

Who will sign the CLOMAR application?

Who will sign the operation/maintenance agreement?

How set is the corridor size? Can they be adjusted?

Maintenance of levees, walls and sediment?

Will you propose how they are installed in the implementation plan?

How does court decision impact your process?

Alternatives on each fan - #38?

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING MINUTES

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Wednesday, August 9, 2006

TIME: 1:30 – 2:30 pm

ATTENDEES:

Valerie Swick	FCDMC	Jon Fuller	JEF
Kathryn Gross	FCDMC	Chuck Williams	CL Williams
Nicole Kelly	FCDMC	Jim Rodgers	SAS
Dennis Holcomb	FCDMC	Mark Meyer	LSD
Pedro Melo-Rodriquez	FCDMC	Jay Hicks	EDAW
Bob Stevens	FCDMC	Seema Anthony	EDAW
Bing Zhao	FCDMC	Ralph Weeks	AMEC

AGENDA:

A. Alternatives Formulation Update

1. Step 1 Final Report
   - Was delivered to VAS last week
2. Step 2 Draft Report
   - District comments were received and will be addressed
   - The Volume 1 Report will be in 8.5"x11 format, and the rest in 11x17 format
   - JEF will revise the Step 2 reports after progress on the Step 3 reports is made
3. Step 3 Draft Report
   - The initial Step 3 report for Fan 3 will be submitted by August 14
   - Subsequent reports will be submitted by Fan as they are completed
   - The District will review reports concurrently and provide comments to JEF
   - Step 3 reports will be grouped by subarea, with each fan addressed in its own section

B. Public Involvement

1. Nicole handed out a revised critical path calendar for Public Meeting.
   - Oct. 18 selected for meeting in Buckeye at the community center.
   - See handout from Nicole.
   - A coordination & planning meetings will be held on September 27th 10:30 am
   - The dry run meeting will be help after the October team meeting 3:30 pm
   - Kathryn is checking on what FDS public notice was published at the start of the ADMP
   - Kathryn will check on the FDS public notice format
   - Nicole will prepare a letter inviting stakeholders to the public meeting

C. Stakeholder Involvement

1. Buckeye
   - Valerie and Greg Jones are attending Buckeye DRT meetings to improve coordination

- Chuck met with Grant Anderson/Willdan to coordinate on the impact fee study
- Impact fees will include drainage
- The impact fee study was just initiated and is unlikely to have concrete results by 12/31

2. Stakeholder Meeting #3
   - Chuck reported on last week's meetings.
   - Key issues were implementation, maintenance and ownership of facilities.
3. Upcoming Meetings
   - Meeting with ASLD regarding their infrastructure planning study will be held
   - Meeting date will be set with the ASLD consultant responds to review comments
   - Meeting with Vistoso will held after the ASLD meeting

D. Geotechnical Evaluation

1. AMEC submitted the draft report for review.
   - Bing will review the report, as will Jeff Weidel's group
   - Ralph cautioned that soils are highly variable in study area
   - Variability may have cost and design impacts
   - AMEC needs 2-3 weeks to respond to District comments

E. Hydrology

1. Area 4 final report will be completed, but is lower priority than Step 3 reports
2. JEF has revised hydrologic modeling in response to District comments.

F. Hydraulics

1. Bing stated that the proposed 3 year maintenance cycle is acceptable for planning purposes
2. Bing has provided several documents to JEF promised at the last coordination meeting
3. Kathryn is investigating if FEMA requires levee freeboard at gaps in flood walls.
   - JEF is proceeding assuming that short gaps will require freeboard

G. Floodplain delineation

1. Fan 17-19 will be submitted on schedule on 8/18.
2. All other TDNs have been submitted.
3. JEF will schedule a comment resolution meeting when Fan 17-19 comments are received
4. Revised TDNs will be submitted in September

H. Planning Regulatory

1. EDAW will submit their draft report by 8/18
2. Buckeye's new planning effort is starting too late to provide much information for the ADMP

I. Landscape Planning/ Rec. Multi Use

1. PAAC Meeting will be held during the last week of September

2. Dennis told Mark to submit Sections 4 & 5 of his report with the previous report
3. Mark indicated that the revised report would be submitted by 8/18 to Valerie

J. Archeology

1. Jim will coordinate with Ted on his deliverable format
2. Jon provide a copy of the recommended plan map to Jim

K. Project Administration

1. The time extension/change order was approved with a copy provided to Jon

L. Next Meeting

1. Next meeting will be in Buckeye at 1:30 pm on 9/13
2. Valerie will notify as to exact location

M. Other Business

1. The District has completed the Sun Valley Parkway channel survey. The HEC-RAS should be completed within several weeks. District will coordinate with JEF on Fan 1-2 delineation impacts.

SUN VALLEY AREA DRAINAGE MASTER PLAN

PROGRESS MEETING MINUTES

LOCATION: Buckhorn Mesa Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

DATE: Wednesday, November 8, 2006

TIME: 2:30 – 4:00 pm

ATTENDEES:

Valerie Swick	FCDMC	Jon Fuller	JEF
Kathryn Gross	FCDMC	Chuck Williams	CL Williams
Nicole Kelly	FCDMC		
Bob Stevens	FCDMC		
Bing Zhao	FCDMC		
Julie Cox	FCDMC	Dennis Holcomb	FCDMC
Greg Jones	FCDMC	Jon Loxley	FCDMC

AGENDA:

A. Alternatives Formulation Update

1. Step 3 Draft Reports
   - All draft Step 3 Subarea reports have been submitted and reviewed
   - Written responses to all reviewer comments have be or will be submitted and approved
   - District review of revised Step 3 Subarea Report has begun
   - No new comments are expected since responses will be approved prior to submittal
   - The Revised Step 3 Wagner Wash Subarea Report was submitted and reviewed
   - The remaining revised Step 3 Subarea Reports will be submitted by November 30
   - The Step 3 Summary Report was submitted November 1
   - The Step 3 Summary Report will be reviewed by November 15
   - JEF will provide PDF versions of the Step 3 Reports on DVD
   - Four copies of the Revised reports will be submitted for review.
   - Page swaps and the additional required copies will be submitted upon approval
   - The target date for final approvals is December 13

B. Public Involvement – Task Completed

C. Stakeholder Involvement

1. Chuck also reported on the progress of the implementation plan due for submittal on Nov 20.
2. Chuck met with Stakeholders to discussion implementation strategies

D. Geotechnical Evaluation – Task Completed

E. Hydrology – Task Completed

F. Hydraulics – Task Completed

G. Floodplain Delineation

1. All final TDNs have been submitted.
2. Valerie & Greg will take the FEMA forms to Buckeye for signature by Scott Lowe this week
3. Kathryn will bring the forms to Tim Phillips for signature by Monday
4. TDNs will be submitted to FEMA by the District by December 1
5. Fans 1-2 will be completed with additional technical analyses under separate contract
6. Jon & Valerie will investigate whether we need to make scope/fee adjustments since FEMA review will occur after the contract is completed.

H. Planning Regulatory

1. The District will complete review of this document by November 17.

I. Landscape Planning/ Rec. Multi Use

1. Dennis will complete review of the LSD report by November 15
2. Dennis will meet with Valerie to discuss comments prior to sending comments to LSD
3. Dennis indicated that his comments were text-related. No new mapping is needed.
4. Dennis will meet with Mark Meyer to discuss comments on November 16

J. Archeology – Task Completed

K. Project Administration

1. Valerie noted a billing discrepancy that needs resolution.

L. Next Meeting

Next meeting will be 12:00-4:00 pm on December 13 and will be the Lessons Learned Meeting. The meeting location is to be determined. The meeting will include lunch. Jon & Valerie will meet to determine the agenda and a facilitator.

M. Other Business

1. CVL's operation and maintenance plan for Elianto was discussed with Chuck and Dave (Buckeye)

Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: March 16, 2006

To: Valerie Swick, Project Manager
Planning & Project Management Division

From: Julie Cox, Senior Hydrologist
Engineering Division

Subject: Sun Valley ADMP – Area 4 Hydrology Comments

I have reviewed the HEC-1 models, DDMSW data, spreadsheets, and the report. My comments are listed below. I would be glad to meet with you and/or the consultants to discuss my recommendations.

Models

1. Please recheck the point rainfall values. I checked the NOAA Atlas 2 isopluvials and assigned the following point rainfall values.

    a. 100-yr 2-hr precipitation: 2.7"

    b. 100-yr 6-hr precipitation: 3.4"

    c. 100-yr 24-hr precipitation: 4.2"

2. Please recheck parameters for sub-basins S195, S500, and S720. The 100-yr 24-hr existing condition unit discharges for these sub-basins range from 567 to 592 cfs/sq mi. These unit discharges seem low. Please explain or revise models as necessary.

3. Please recheck parameters for sub-basins S110, S125, S130, S140, S165, S170, S415, S430, S435, S740, and S910. The 100-yr 24-hr existing condition unit discharges for these sub-basins range from 1234 to 1789 cfs/sq mi. These unit discharges seem high. Please explain or revise models as necessary.

4. Please ensure that sub-basins are broken down in order to determine the discharge at each alluvial fan apex.

5. Route 435-450 – the value in the last column on the RC record should be 105 ft.

6. Why were sub-basins 800 and 810 modeled? They are not located in Area 4.

7. Why was 30% vegetative cover assigned to all land uses for both existing and future conditions? This is an overly general assumption and should certainly be refined by field observations and review of aerial photos.

8. Report Page 15, Paragraph 1. Rather than assuming medium density residential (MDR) parameters for all "Planned Development" land uses, the consultant should use the best available data, including data from developers and the Town of Buckeye. Revise models as necessary to reflect the specific land use types for future development.

9. Report Page 15, Table 2. For the MDR land use, use RTIMP = 30%, not 45% as shown. Revise models as necessary.

10. Add ID records that include the following:

    a. Project Name and FCD Contract Number

    b. Consultant and Modeler's Name(s)

    c. File Name

    d. Storm Frequency and Duration

    e. Existing or Future Conditions

    f. Total Watershed Area (in sq mi)

    g. Rainfall Loss Method

    h. Unit Hydrograph Method

    i. Channel Routing Method

    j. Source and Date for Land Use Data (mo/yr)

    k. Source and Date for Soils Data (mo/yr)

Report

11. Include discussion of the alluvial fans and alluvial fan apexes located in Area 4. Reference the work done by Ayres and Associates under the Buckeye/Sun Valley ADMS.

12. Add hard copy isopluvials for the 100-yr 2-hr, 100-yr 6-hr, and 100-yr 24-hr rainfall events. Show the Area 4 project area (not Areas 3 and 4 combined) on these figures. It is not clear why Figure 4.2.1 on Page 12 shows the 2-yr 6-hr and 2-yr 24-hr isopluvials. The 2-yr frequency events are not part of this study. In addition, the 100-yr 6-hr isohyet is shown incorrectly as 3.2" (should be 3.4").

13. Include table with unit discharges.

14. Add titles to tables in Appendix D.1
    a. Existing Conditions Summary of Results
    b. Existing Conditions Sub-basin Data
15. Add titles to tables in Appendix D.2
    a. Future Conditions Summary of Results
    b. Future Conditions Sub-basin Data
    c. Future Conditions Soils Data
    d. Future Conditions Retention Volumes
16. Add column for % slope to the Existing Conditions Summary of Results spreadsheet.
17. Add column to soils data that identifies each soil ID by name.
18. Show subtotals (sq mi) for each soil type and sub-basin in the DDMSW soils and land use data.
19. Provide regional equation envelope curves with the results plotted to verify all of the analyses. Use DDMSW's Hydrology Graphing Feature for Unit Discharge. Graphs should include USGS, Boughton, and Malvick envelope curves. Include in the TDN and discuss results, particularly any outliers. Typically, 100-yr results should plot below Boughton, slightly below USGS, and at or higher than Malvick.
20. Since sub-basins U1 through U4 are not modeled, they should not be shown on the maps. If the Area 4 boundary is incorrect, the correct boundary should be shown on the maps.
21. Page 10, Section 4.2.1. Change "Waterhsed" to "Watershed".
22. Page 15, Paragraph 1. Specify the month and year of the MAG land use data used for this project.
23. Page 15, Paragraph 1. Rather than assuming MDR parameters for all "Planned Development" land uses, the consultant should use the best available data, including data from developers and the Town of Buckeye. Revise models as necessary.
24. Page 15, Table 2. For the MDR land use, use RTIMP = 30%, not 45% as shown. Revise models as necessary.
25. Page 15, Table 2. Five future condition land uses are specified in DDMSW and in the legend on Figure 3. There are only three future condition land uses specified in Table 2. Revise Table 2 to include the additional land uses.
26. Page 15, Table 2. Spell out NMT and NDR.

27. Page 16, Paragraph 3, Sentence 1. Change sentence to "Surface roughness values were assigned and are shown in Tables 1 and 2 above." Add another sentence describing how the Kn values were assigned. It is unclear whether a weighted average methodology was used.

28. Page 16, paragraph 3. Change "section D.2 Section 2" to "Appendix D, Section 2".

29. Page 18 (Retention Volumes Calculation). What is the relationship of the "Estate Residential" and "Rural Residential" land uses to the Maricopa County "Very Low Density Residential" and "Low Density Residential" land uses? The C coefficient for these land uses is significantly less than the 0.71 used to calculate the future retention volumes. Recalculate the future retention volumes for sub-basins S910, S920, and S700 using an average C coefficient for the land uses other than MDR.

30. Include documentation for selection of "n" values.

Maps and Figures

31. Figure 1-1. Show only Area 4, not Area 3.

32. Please submit the following maps: (1) watershed boundary map, (2) existing land use map, (3) future land use map, (4) soils map, (5) drainage flow path map, (6) lag path map with L, Lca, and the centroids shown, and (7) HEC-1 schematic map. The final version of the HEC-1 schematic map should include both the 6-hr and 24-hr peak discharges at the concentration points. The watershed boundary map should include elevation contours with a light aerial image background.

33. All Figures. The figures do not copy well at all. Please change to black and white and experiment with line thickness to make readable maps.

34. All Figures. The location map does not need to show the entire states of Arizona and Utah. Please limit the location map to either Maricopa County or just the West Valley.

35. All Figures. Add symbol for and label each alluvial fan apex in Area 4. There are 8 apexes in Area 4.

36. All Figures. Add title block.

37. All Figures. Change scale to 1" = 1000'. Remove insets.

38. All Figures. Add SCALE 1" = 1000' below the scale bar.

39. All Figures. The symbols for the 50-ft index contours are not clear on the legend. Perhaps darkening the contour line symbol will help.

40. All Figures. The concentration point symbols are not clear. Perhaps enlarging the concentration point symbol or making it a larger diameter circle will help.

41. All Figures. The sections are shown, but not the townships and ranges. Please add the townships and ranges to the figures.

42. All Figures. Add JE Fuller logo.

2801 West Durango Street Phoenix, Arizona 85009 Phone: 602-506-1501 Fax: 602-506-4601

Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: April 10, 2006

To: Valerie Swick, E.I.T., Project Manager
Planning & Project Management Division

From: Julie Cox, Senior Hydrologist
Engineering Division

Subject: Sun Valley ADMP – Step 2: Proposed Alternatives Reports dated February 8, 2006

I have reviewed the hydraulics for the Step 2 Proposed Alternatives Reports prepared by JE Fuller Hydrology & Geomorphology, Inc., as well as the associated 100-yr 6-hr and 100-yr 24-hr HEC-1 models.

There is one report for each of six subareas: (1) CAP, (2) Wagner Wash, (3) Hassayampa River, (4) White Tanks Wash, (5) FRS #1, and (6) FRS #2 and #3. My comments are organized by subarea and alternative and are listed below. If not specified, the comment applies to both the 100-yr 6-hr and 100-yr 24-hr models. I would be glad to meet with you and/or the consultants to discuss my recommendations.

General

1. Please rename the FRS No 1 HEC-1 files to begin with F1 and rename the White Tanks Wash files to begin with WTW. The file names for the other four sub-areas are good examples.

2. The scale bars on all maps appear to be 5-10% off. Please revise as necessary.

3. The macro for the volume in the rating curves rounds 0.5 down rather than up. See CAP Alternative B2, Basin RR110 for examples, i.e. 6.85, 9.75, 12.85 ac-ft

4. Some of the report tables labeled Stage-Storage-Discharge should be labeled "DI/DQ records" as appropriate.

FRS No. 1 Subarea Report & HEC-1 Models

1. Alternative A – Why is there data for channels L2B-A-R, L2B-A-L, L20, M2-A-10, and N125A in the report when these channels are not in the models or the summary table on Page 5?

2. Alternatives B2, B3, B41, and C – Why is there data for channels L30, L40, and RRP1A10 in the report when these channels are not in the models or the summary tables on Pages 57, 113, 169, and 337?

3. Alternatives B42 and B43 – Why is there data for channels L20 and RRP1A10 in the report when these channels are not in the models or the summary tables on Pages 225 and 283?

4. Alternative B3, Page 130 – The volume check indicates not enough volume is provided for Basin RRCN1. Shouldn't the macro run iterations until adequate volume is provided? Please explain or revise as necessary.

5. Alternative B41, Page 173 – The velocities calculated for the long-term channel hydraulics appear reasonable. The velocities calculated for the initial channel hydraulics are lower than those that I calculated, i.e. at a depth of 2.5 ft; I calculated 5.6 fps vs the 3.5 fps as shown. Please explain or revise as necessary.

Wagner Wash Subarea Report & HEC-1 Models

1. Alternative B3, Page 146 – The volume check indicates not enough volume is provided for Basin RR165. Shouldn't the macro run iterations until adequate volume is provided? Please explain or revise as necessary.

2. Alternative B41, Page 192 – The volume check indicates not enough volume is provided for Basin RR130. Shouldn't the macro run iterations until adequate volume is provided? Please explain or revise as necessary.

White Tank Wash Subarea Report & HEC-1 Models

1. All Alternatives - There are stage-storage-discharge graphs in the report for some basins but not others, i.e. the graph is included on Page 152 for Basin RRE3RB. Please be consistent and include graphs for all basins.

2. All Alternatives - The report tables for Basin DE2C and DJ1 have multiple issues, i.e. same elevation used twice, last 2 columns of DI/DQ records switched, missing elevations. The macros do not appear to be working correctly. Please explain or revise as necessary.

3. Alternatives B1 (Page 76) and B3 (Page 216) - Basin DE2C: The last two columns of DI/DQ records are switched in both the report and the 100-yr 24-hr and 100-yr 6-hr models. Please explain or revise as necessary.

4. Alternatives B1 (Page 106) and B3 (Page 246) – Basin DJ1: The last two columns of DI/DQ records are switched in both the report and the 100-yr 24-hr and 100-yr 6-hr models. Please explain or revise as necessary.

FRS #2 & #3 Subarea Report & HEC-1 Models

1. Alternative B41, Page 132 - For the proposed basin RRX1, the value in the first column of the SV record should be zero or a small number and the value in the first column of the SQ

record should be zero. A non-zero flow in the first column can cause the volume to be significantly overestimated. Please explain or revise as necessary.

2. Alternative B42, Page 154 - For the proposed basins RRW1 and RR810, the value in the first column of the SV record should be zero or a small number and the value in the first column of the SQ record should be zero. A non-zero flow in the first column can cause the volume to be significantly overestimated. Please explain or revise as necessary.

Hassayampa Subarea Report & HEC-1 Models

1. Alternative A (Page 18), B2 (Page 70), B3 (Page 118), B41 (Page 166), B42 (Page 200), B43 (Page 266), C (Page 338) – Basin D415: The last column of DI/DQ records is out of order in both the report and the 100-yr 24-hr and 100-yr 6-hr models. Please explain or revise as necessary.

2. Alternative B42 (Page 232), B43 (Page 298) – Basin D510: The last column of DI/DQ records is out of order in both the 100-yr 24-hr and 100-yr 6-hr models. Please explain or revise as necessary.

CAP Subarea Report & HEC-1 Models

1. Alternative B5 (Pages 205 and 226) – Basin D120: Why is the peak inflow negative? Please explain or revise as necessary.

Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: June 22, 2006

To: Valerie Swick, E.I.T., CFM, Planning Branch, PPM Division

From: Kathryn Gross, CFM, Floodplain Delineation Branch, PPM Division

Subject: Sun Valley ADMP – Approximate Floodplain Delineations for White Tank Fan 10 and 11, May 2006 submittal

I have reviewed the above submittal and have the following comments. Overall the delineations appear reasonable; however, the below comments need to be addressed prior to approval.

Technical Summary

1. Hydrology – Make sure all supporting documentation is provided including necessary maps for flow paths soils and land use beyond those presented in figures.

2. Hydraulics – Upstream modeling appears reasonable. Please run checkras on the upstream delineation. Upstream of the apex the delineation should be an administrative floodway. If the consultant prefers the water surface elevations for each cross-section location can be determined using FlowMaster or a similar product. If left in RAS the consultant needs to be prepared to answer any FEMA questions as they will review it as a RAS product.

3. Geomorphology – TDN appendix G supporting documentation needs to be provided. A master Appendix G for all fan delineations could be a solution. There is some confusion between active and inactive areas in several text discussions. This is further discussed later in the comments.

4. Floodplain Delineations. Some modifications to the naming of the zones on the workmap and annotated FIRM panel are required. This is discussed further later in the comments.

Report Comments

1. Page 2-1, Abstract section 2.1.3. Craig Kennedy is no longer the official contact at Baker. If a new contact is identified prior to FEMA submittal the name should be updated.

2801 West Durango Street Phoenix, Arizona 85009 Phone: 602-506-1501 Fax: 602-506-4601

2. FEMA OC Form

    - Part C – We may need to include a fee but for now leave as No.

    - Part D – The form should be updated to reflect my name.

3. FEMA RH&H Form

    - Part B – The yes box should be checked here instead of no if the use of RAS is continued.

4. FEMA Fan Form – Please submit one fan per form.

5. Section 4 – Please make sure that all applicable supporting documentation is supplied for the new hydrology for this area.

6. Page 4-9, section 4.5.3. Could an excerpt of the Alpha sub basin map be provided as well so the new basins and the old basins can be compared? This could be included in the appendix.

7. Section 5, the upstream floodplain should be delineated as an administrative floodway and its designation should be discussed in this section.

8. Section 6. Figure Concerns

    - Figure 6.1 not all the soil units are included. Scale of exhibit makes it hard to really verify the units necessary to fan 10 and 11

    - Figure 6.2 not all the geology units are included. Scale of exhibit makes it hard to really verify the units necessary to fan 10 and 11.

    - For Figures 6.1-6.10 should fan 10 and 11's apices be located on the figures?

    - For Figure 6.7, please consider adding a note to the figure explaining why there are no channels identified in the middle of the study area.

    - For Figure 6.9 is it possible to screen the colors on the map to more clearly see the topography underneath?

9. Page 6-24, section 6B4.6 conclusions. Consider adding an additional figure that shows a close up of stage 1 at fan 10 and 11.

10. Page 6-31, Figure 6.13, is this a photo for an active fan channel? Would it be more applicable to place a photo more representative of the bed under a piedmont channel? If possible update the photo otherwise existing photo is fine.

11. Figure 6.19. If Figure 6.19 is the result of the analysis why is it placed at the beginning of the stage 2 discussion and analysis? It appears to show the result prior to the analysis.

12. Figure 6.20. Please correct the legend and map label. The FRS is labeled as a levee instead of a dam.

13. Page 6-55, Table 6B.7. Upstream of the apex should be delineated as administrative floodway. Consider adding the category to the table?

14. Page 6-59, text states large-scale maps are to be supplied. No large-scale maps were included in this submittal. Please make sure they are included in the next submittal.

15. Page 7-1, section 7.1, in the summary of discharges please list the fans as White Tank Fan 10 and White Tank Fan 11.

16. Page 7-2, section 7.3 Annotated Panel. Please make the following corrections

    - Designations need to be modified:

        a. Upstream of Apex: Zone A Administrative Floodway – Inactive Fan Flooding

        b. Downstream of Apex: Zone A Administrative Floodway – Active Fan Flooding

    - Add a note stating administrative floodways are regulated by the local regulatory authority.

    - Add floodway shading of the corridors.

    - Consider naming the corridors.

17. Floodplain Work Map

    - Floodway symbology is needed on the delineations shown.

    - Zone AFUFD was not included. Please add.

    - Add the existing delineation at the FRS to the map.

    - Consider adding a legend of the FCD fan delineation categories.

    - Consider revising the title to "Approximate Zone A Floodplain Delineation Study of White Tank Fans 10 and 11.

Appendix Contents

1. Appendix A – no comments. Update references as needed.

2. Appendix B – Include pertinent correspondence prior to FEMA submittal.

3. Appendix C – no comments. Consider adding District contract number for mapping project.

4. Appendix D - need to provide hydrology maps in support of the delineation and parameters chosen: Sub basin map with topography and flow path, Sub basin map and soil units, Sub basin map and land use. Consider placing a separate copy of the Rainfall figure in the appendix as well.

5. Appendix E – no comments.

6. Appendix G – no supporting documentation of the geomorphic analysis was provided. Perhaps a master Appendix G could be developed for use with all the Fan reports.

7. Appendix H- no digital information was provided in this submittal. Please make sure to include a cd with the next submittal.

8. Concerned about the confusion between sections between active and inactive, total fan, AFHH and AFUFD. Language appears to shift between sections. In most instances it appears some of the confusion could be cleared up with modifications to Figure 6.19 and adding the topographic apexes to the exhibit and addressing them in the text as the top of the Fan 10 and 11 alluvial fan landform. The following are areas where it was noted:

    - Figure 6.19 and connected sections:

        - Page 6-33, section 6B.5.3, text discusses aggradation/active on a limited portion of the "total fan site". Define the total fan site (white tank piedmont or 10 and 11 specifically). Figure 6.19 appears to outline all of the fan area as active. Consider revising language in the text or on the figure.

        - Page 6-52, section 6B.5.5, is Figure 6.19 an appropriate figure to be looking at? Figure 6.19 is titled active areas but the text here states that inactive areas are shown. Are we supposed to be looking at "inactivity" within or outside of the drawn limits?

    - Page 6-51, section 6B.5.4, there appears to be some discrepancy between the stage III delineation and the text. Please verify and make corrections as necessary.

    - Page 6-52, section 6B.5.6.3, the text specifically discusses unstable flow path flooding specifically below the apices but 6B.5.5 mentions inactive portions which are stable flow paths is an additional section regarding stable flow path flooding downstream of the apex needed here as well?

    - Page 6-53, section 6B.6, bullet 2 and 3. This discussion states all of stage 2 as active unstable flow paths that contradicts text in the Stage 2 discussion where inactive areas are discussed.

Text Comments

1. Page 3-1, is "epoch" correct in the second sentence: "1992 epoch Central Zone of Arizona State Plane…"

2. Page 4-7, Unit Hydrograph second paragraph second sentence. Please reword the sentence it is not clear.

3. Page 4-8, section 4.5.2 second paragraph third sentence. Please correct the typo: "watershed will average elevation.."

4. Page 5-5, section 5.5.5, should the word "fan" be between "natural channels"?

5. Page 6-24, section 6B.4.4, last sentence. The text states there were four new fans identified beyond the Ayers study. Based on discussions with Jon are we now up to five? If so please update the text.

6. Page 6-32, No photo was included in Figure 6.18 please include in next submittal.

7. Page 6-48, 6B.5.3.6. Please correct the typo in the second to last sentence: "There is little or relief".

8. Table of Contents notes:

    - Table 5.9 has a title typo.

    - Table of Contents lists Plates, text refers to exhibits please refine either the text or table of contents.

    - Table of Contents lists Appendix F for both Sediment and Geomorphology. The actual appendices are separated into Appendix F for Sediment and Appendix G for Geomorphology. Appendix letters will need to be shifted by a letter for the rest of the appendices listed in the table of contents.

    - Plate 1 states its Area 4 hydrology. That is not applicable to Fan 10 and 11. No plate is present in the report.

    - Plates 2 through 5 were not submitted.

I have no more comments at this time.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: July 6, 2006

To: Valerie Swick, E.I.T., CFM, Planning Branch, PPM Division

From: Kathryn Gross, CFM, Floodplain Delineation Branch, PPM Division

Subject: Sun Valley ADMP – Approximate Floodplain Delineations for White Tank Fan 1 and 2, June 2006 submittal

I have reviewed the above submittal and have the following comments. Overall the delineation limits appear reasonable; however, there are some designation concerns and modifications that are needed prior to approval.

This delineation poses some challenges north of Sun Valley Parkway. Development is occurring in the area north of Sun Valley Parkway. The scope called for delineation of the alluvial fan floodplains based on geomorphic methods. This limited the amount of analysis that could be performed; the analysis does not assess the impact of Sun Valley Parkway on floodplains north of the Parkway as that would require detailed information beyond the scope. The majority of the area north of the Parkway within the ADMP study limits will be delineated as an Alluvial Fan Zone A or Zone AO1. Developments already approved by Buckeye will now be in the floodplain. The only other option the District could take at this point would be to determine Sun Valley Parkway's influence on the flows coming across the middle portion of the fan and revise the delineation based on the additional detailed analysis at the Parkway. This would require a change order on the contract.

The comments below should be addressed by the Consultant.

Technical Summary

1. Hydrology – Make sure all supporting documentation is provided.

2. Hydraulics – Upstream modeling appears reasonable. Please run checkras on the upstream delineation. Upstream of the apex the delineation should be an administrative floodway. If the Consultant prefers the water surface elevations for each cross-section location can be determined using FlowMaster or a similar product. If left in RAS the Consultant needs to provide a baseline in the delineation and be prepared to answer any FEMA questions as they will review it as a RAS product.

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3. Geomorphology – TDN appendix G supporting documentation needs to be provided. A master Appendix G for all fan delineations is recommended.

4. Floodplain Delineations - Some modifications to the study limits and designations are necessary. This will require updates on the workmaps and annotated FIRM panels as well. This is discussed later in the comments.

5. Delineations should be called out as White Tank Fan 1 and White Tank Fan 2.

Delineation

1. Locations where there are concerns regarding the delineation have been identified in the shape file fan1and2quest.shp. This file will be included with this comment submittal.

2. AFUFD Zones need to be re-evaluated. Recommended locations of the boundaries of this zone are included in the shape file. The PFHAM falls short in classifying the type of surface identified; therefore it is recommended that the designation recommended by the PFHAM not be used and instead it is recommended that north of the Parkway the AFUFD zone be reclassified or reanalyzed based on one of the following:

    - AFZA
    - AO1 Zone. AO1 is recommended by the District; however, the Consultant should evaluate which designation is a more reasonable approach for the area.
    - Further analysis is undertaken to the determine impact of Sun Valley Parkway.

3. Extending out of a portion of the AFUFD zones there are a collection of AAFF zones. This location is called out in the shape file. The Consultant should re-visit the need for these AAFF zones and determine if they should remain or be incorporated into the revised designation for the area north of Sun Valley Parkway.

4. Along the east side of the AFHH zone for Fan 2, consider adding additional area to the delineation. These areas are identified in the shape file. One portion of the requested additional delineation most likely extends beyond the ADMP study limits. One delineated wash extends out of the main portion of the delineation and stops at what may be the study limits. If the delineation continued along this wash it would connect back into the fan delineation at the Parkway. This would aid individuals by providing information that uncertain flow quantity exists for the wash since it is connected to the active fan. If at all possible it is recommended to continue the delineation along that wash.

5. Shaded Zone X delineations. It is recommended to dissolve the smaller Shaded X zones into the surrounding flood zones.

Report Comments

1. Page 2-1, Abstract section 2.1.3. Craig Kennedy is no longer the official contact at Baker. If a new contact is identified prior to FEMA submittal the name should be updated.

2. FEMA OC Form

    - Part D – The form should be updated to reflect my name.

3. FEMA RH&H Form

    - This form states that only one flooding source should be listed here. Recommend discussing the need for two sets of RH&H forms for Fans 1 and 2 with the Consultant.

    - Part A – checking the "no existing analysis" box is fine as long as all the Area 4 Fan hydrologies are being submitted in their respective reports instead of a full Area 4 hydrology TDN.

    - Part B – The yes box should be checked here instead of no if the use of RAS is continued.

4. FEMA Fan Form – Please submit one fan per form.

5. Section 4 – Review comments were not available at this time. Those comments will come as an addendum shortly.

6. Section 5, the upstream floodplain should be delineated as an administrative floodway and its designation should be discussed in this section.

7. Section 5, the alluvial fan delineation overwrites some existing delineations from the Sun Valley Parkway North delineation study. This should be discussed in the text in either this section or section 6.

8. Page 5-1. Text contains a statement that RAS was used to perform a backwater analysis. Since cross-sections are too far apart to produce a real step-backwater analysis should this sentence remain in the text?

9. Page 5-7. Make sure to include the RAS summary table in the final report.

10. Section 6. Figure Concerns

    - For Figures 6.1-6.10 should fan 1 and 2's apices be located on the figures?

    - For Figure 6.7, please consider adding a note to the figure explaining why there are no channels identified in the middle of the study area.

    - For Figure 6.9 is it possible to screen the colors on the map to more clearly see the topography underneath?

    - For Figure 6.19 please label which apex is for Fan 1 and which is for Fan 2.

11. Page 6-15. Text states that Table 6B.4 summarizes distinguishing characteristics of surficial geology. Only geologic age is listed in the table. Please look into.

12. Page 6-61, Table 6B.7. Upstream of the apex should be delineated as administrative floodway. Consider adding the category to the table?

13. Page 6-64, text states large-scale maps are to be supplied. No large-scale maps were included in this submittal. Please make sure they are included in the next submittal.

14. Page 7-1, section 7.1. Consider listing only White Tank Fan 1 and White Tank Fan 2's discharge in the table.

Appendix Comments

1. Appendix A – no comments. Update references as needed.

2. Appendix B – Include pertinent correspondence prior to FEMA submittal. Special Problem discussion should be removed or at least revised to state only the AAFF zones. Consider shifting this discussion into the main report text.

3. Appendix C – no comments. Consider adding District contract number for mapping project.

4. Appendix D - Consider placing a separate copy of the Rainfall figure in the appendix. Organize data following State Standard

5. Appendix E – no comments.

6. Appendix G – no supporting documentation of the geomorphic analysis was provided. Perhaps a master Appendix G could be developed for use with all the Fan reports.

7. Appendix H- no digital information was provided in this submittal. Please make sure to include a cd with the next submittal including digital line work for hydrology as well as floodplain delineation.

8. A-Maps Hydrology. Scale appears to be missing on Plates as well as elevation information on the contours. Concerned that the Plates may not reproduce well in black and white. Please evaluate.

9. B-Maps Geomorphology. No maps provided. Please include in next submittal.

10. C-Maps Hydraulics/Floodplain.

    - Please print all sheets at same scale.
    - Floodway symbology is needed on the delineations shown.
    - Consider adding a legend of the FCD fan delineation categories.
    - Consider revising the title to "Approximate Zone A Floodplain Delineation Study of White Tank Fans 1 and 2."

11. Annotated Panels. Please consider the following:

    - Somewhat hard to read the red line work and text.

    - On the annotated maps, it is recommended to use the inactive fan note for the portions of the delineation that will be updated to either AFZA or AO1. This should be discussed between the Consultant and the District. The reason for this request is that typically the designation of active or inactive provides an additional flag for regulators that active is floodway and inactive is Zone A.

    - Designations need to be modified. Please use FEMA designations on panels:

        a. Upstream of Apex: Zone A Administrative Floodway – Inactive Fan Flooding
        b. Downstream of Apex: Zone A Administrative Floodway – Active Fan Flooding and Zone A Inactive Fan Flooding.

    - Add a note stating administrative floodways are regulated by the local regulatory authority.

    - Add floodway shading of the corridors.

    - Consider naming the corridors.

Text Comments

1. Page 3-1, is "epoch" correct in the second sentence: "1992 epoch Central Zone of Arizona State Plane…"

2. Page 4-8, section 4.5.2, top of page. Please correct the typo: "watershed will average elevation.."

3. Page 5-6, section 5.5.5, should the word "fan" be between "natural channels"?

4. Page 6-33. Please correct the typo in the footnote "as if Fan 1 **where** tributary to Fan 2."

5. Page 6-37, third paragraph. Please update the fan ids in this paragraph to read Fans 1 and 2.

6. Page 6-39 and 6-40. Table 6B.4's title lists Fans 10 and 11. Please update with Fan 1 and 2.

7. Page 6-52, first paragraph. Please correct the typo: "**Unstable** portions of the piedmont have well defined tributary drainage pattern."

8. Page 6-56, second paragraph. Please correct the typo "Guidlelines".

9. Page 7-1. Section 7.1 is shown as 3.1.

I have no more comments at this time.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: July 14, 2006

To: Valerie Swick, E.I.T., CFM, Planning Branch, PPM Division

From: Kathryn Gross, CFM, Floodplain Delineation Branch, PPM Division

Subject: Sun Valley ADMP – Approximate Floodplain Delineations for White Tank Fan 6, June 2006 submittal

I have reviewed the above submittal and have the following comments. Overall the delineation limits appear reasonable; however, there are some designation concerns and modifications that are needed prior to approval.

The Consultant should address the comments below.

Technical Summary

1. Hydrology – Make sure all supporting documentation is provided. Full comments forthcoming from Julie Cox.

2. Hydraulics – Upstream modeling appears reasonable. Please run checkras on the upstream delineation. Upstream of the apex the delineation should be an administrative floodway. If the Consultant prefers the water surface elevations for each cross-section location can be determined using FlowMaster or a similar product. If left in RAS the Consultant needs to provide a baseline in the delineation and be prepared to answer any FEMA questions, as they will review it as a RAS product.

3. Geomorphology – TDN appendix G supporting documentation needs to be provided. A master Appendix G for all fan delineations is recommended.

4. Floodplain Delineations - Some minor modifications to the delineation limits are recommended. This will require updates on the workmaps and annotated FIRM panels as well. This is discussed later in the comments.

5. Delineation should be called out as White Tank Fan 6.

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Delineation

1. Locations where there are concerns regarding the delineation have been identified in the shape file fan6quest.shp. This file will be included with this comment submittal.

2. It is recommended that along the northern wash the AAFF zone be removed and the effective FIS delineation remain for this area. The discharges between the two studies only differ by about 100 cfs. If White Tank Fan 39 is going to supercede a portion of the effective delineation downstream of White Tank Fan 6 then this modification may not be necessary.

3. In two locations along the proposed delineation, there appears to be a chance for break out flows. Please determine if these are potential break out locations.

    - One occurs up at the apex where there appears to be a surficial change alongside the proposed delineation that is different than the surface appearance a little further away from the channel.
    - The other is where the uppermost portion of a local tributary is approaching the fan channels and there appears to only be about 1 foot difference between the water surface elevation in the channel and surface of concern.

4. The digital line work submitted does not match the line work submitted on the hard copy maps. There are minor variations in some AAFF zones and in the digital line work the southern-most shaded X zone is located in the effective floodplain. On the hard copy maps it appears that line had been trimmed back. Please look into.

5. Shaded Zone X delineations. It is recommended to remove the smaller Shaded X zones.

Report Comments

1. Page 1-4 section 1.4.1, this section states that the hydrology may be submitted separately. Please correct the text to reflect what is going to be the official hydrology submittal: per fan or full Area 4 Hydrology TDN. This will also determine what needs to be reflected in each separate fan TDN package. The District and the Consultant should discuss this and arrive at a final answer.

2. Page 2-1, Abstract section 2.1.3. Craig Kennedy is no longer the official contact at Baker. If a new contact is identified prior to FEMA submittal the name should be updated.

3. Page 2-1 section 2.1.7 Reach Description. Should we list only the fan associated with this report?

4. Page 2-1 section 2.1.10 Coordination of Peak Discharges. Since the hydrology is not finalized yet, this date will need to be updated.

5. FEMA OC Form

    - Part B number 2 Flooding Source. Update to read Fan 6 instead of Fans 1 and 2.
    - Part D – The form should be updated to reflect my name.

6. FEMA RH&H Form

    - Flooding Source. Please update to state only White Tank Fan 6.
    - Part A – checking the "no existing analysis" box is fine as long as all the Area 4 Fan hydrologies are being submitted in their respective reports instead of a full Area 4 hydrology TDN.
    - Part B
        i. Number 3 - The yes box should be checked here instead of no if the use of RAS is continued.
        ii. Number 4 – The model name should be updated to ZoneA6.

7. FEMA Fan Form – Please update to state Fan 6 not Fans 1 and 2.

8. Section 4 – Review comments were not available at this time. Those comments will come as an addendum shortly.

9. Section 5, the upstream floodplain should be delineated as an administrative floodway and its designation should be discussed in this section.

10. Section 5, the alluvial fan delineation will supercede some existing delineations from the White Tank Wash delineation study. This should be discussed in the text in either this section or section 6.

11. Page 5-1. Text contains a statement that RAS was used to perform a backwater analysis. Since cross-sections are too far apart to produce a real step-backwater analysis should this sentence remain in the text?

12. Page 5-2 and 5-3. Figure 5.1 Make sure to include the reduced maps in the final report.

13. Page 5-6. Make sure to include the RAS summary table in the final report.

14. Section 6. Terminology variation. The use of flow-through channel and through-flow channel alternates in the text. Please update if you feel necessary.

    - Pages 6-50 and 6-53 – through-flow corridors
    - Pages 6-33 and 6-41 – flow-through channels

15. Section 6. Figure Concerns

    - For Figures 6.1-6.10 should fan 6's apex be located on the figures?
    - For Figure 6.7, please consider adding a note to the figure explaining why there are no channels identified in the middle of the study area.
    - For Figure 6.9 is it possible to screen the colors on the map to more clearly see the topography underneath?
    - For Figure 6.20, Please revisit the figure. The colors on the map do not appear to match the colors in the legend. Or do the soils units not correlate well here. It is most apparent with Fan 39 showing up as an inactive fan color.

16. Page 6-55, Table 6B.7. Upstream of the apex should be delineated as administrative floodway. Consider adding the category to the table?

17. Page 6-56, 6B.6.2 consider rewording second paragraph. My interpretation of the text is that there was a difference in flood hazard between the delineation and the AZGS flood hazard classification, L2. In my opinion it looks like a reasonable match. L2 states that flows are confined in channels. The AAFF zones are essentially occurring in the channels as described by the AZGS report.

18. Page 7-1, section 7.1. Consider listing only White Tank Fan 6's discharge in the table.

Appendix Comments

1. Appendix A – no comments. Update references as needed.

2. Appendix B – Include pertinent correspondence prior to FEMA submittal. Special Problem discussion should be removed or presented in the main report text as a discussion regarding tying the proposed study to the existing study. Regarding showing both delineations on the FIRM, information from only one delineation can be presented for any given location on a FIRM panel. Recommended tie-in locations are presented above.

3. Appendix C – no comments.

4. Appendix D - Consider placing a separate copy of the Rainfall figure in the appendix. Organize data following State Standard.

5. Appendix E – no comments.

6. Appendix F – consider providing information from the sediment yield analysis here.

7. Appendix G – no supporting documentation of the geomorphic analysis was provided. Perhaps a master Appendix G could be developed for use with all the Fan reports.

8. Appendix H- no digital information was provided in this submittal. Please make sure to include a cd with the next submittal including digital line work for hydrology as well as floodplain delineation.

9. A-Maps Hydrology. On Plate 1, Elevation information appears to be missing on the contours. Concerned that the Plates may not reproduce well in black and white. Please evaluate.

10. B-Maps Geomorphology. For Stage 2 map consider including this map as Figure 6.19, not critical however.

11. C-Maps Hydraulics/Floodplain.

- Consider removing the smaller Shaded X zones.
- Floodway symbology is needed on the delineations shown.
- Consider adding a legend of the FCD fan delineation categories.
- Consider revising the title to "Approximate Zone A Floodplain Delineation Study of White Tank Fan 6."
- Consider adding labels identifying where the White Tank Fan 6 delineation will tie into the proposed White Tank Fan 39 delineation.

12. Annotated Panels. Please consider the following:

- Somewhat hard to read the red line work and text.
- Designations need to be modified. Please use FEMA designations on panels:
    a. Upstream of Apex: Zone A Administrative Floodway – Inactive Fan Flooding
    b. Downstream of Apex: Zone A Administrative Floodway – Active Fan Flooding and Zone A Inactive Fan Flooding.
- Add a note stating administrative floodways are regulated by the local regulatory authority.
- Add floodway shading of the corridors.
- Consider naming the corridor.
- FEMA will only allow one designation for any given location. If the proposed delineation is going to overlap the effective delineation a note with a leader line showing where we want to remove the effective delineation from the FIRM panel should be added.
- On Panel 1545, the label font size should be increased.

Text Comments

1. Page 3-1, is "epoch" correct in the second sentence: "1992 epoch Central Zone of Arizona State Plane…"

2. Page 4-8, section 4.5.2, top of page. Please correct the typo: "watershed will average elevation.."

3. Page 5-6, section 5.5.5, should the word "fan" be between "natural channels"?

4. Page 6-33 6B5.2 third paragraph. Please correct the typo "Fan 6 is significantly smaller **that** most other fans.."

5. Page 6-34 6B5.3.1 second paragraph. Please correct the typo "alluvial fans **w e** soil profile development.."

I have no more comments at this time.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: July 19, 2006

To: Valerie Swick, Project Manager
Planning and Project Management Division

From: Julie Cox, Senior Hydrologist
Engineering Division

Subject: Approximate Floodplain Delineations for White Tank Fans 1 and 2

I have reviewed the hydrology provided in the Approximate Floodplain Delineation Study of the White Tank Mountain Piedmont Fan Sites 1 & 2. My comments are listed below and are referenced to the maps, models, and report.

1. Electronic files were not submitted. Please submit CD for comparison purposes.

2. I compared the input parameters and the output from the Fan 1 & 2 models to the Area 4 models for both the 100-yr 24-hr and 100-yr 6-hr events. The sub-basin data and the output in this Fan 1 &2 study are consistent with the same sub-basins in the Area 4 models.

3. Based on the isopluvials in the Hydrology Manual, change the 100-yr 6-hr rainfall to 3.4 inches.

4. Add copies of the 100-yr 24-hr and 100-yr 6-hr isopluvials from the Hydrology Manual to Appendix D.

5. Land Use. The RTIMP used in the HEC-1 models differs from that in DDMSW. Please change to be consistent.

6. Plate 1 – Add title Watershed Map, add intermittent elevations to contours, recommend changing to black and white map due to reproduction issues.

7. Plate 2 – Add title Soils Map, add intermittent elevations to contours, recommend changing to black and white map due to reproduction issues. Cannot distinguish soil types 48 & 49 from each other. Cannot distinguish soil types 100 & 115 from each other. Please use more contrast for the differences in soil types.

8. Plate 3 – Add title Land Use Map, add intermittent elevations to contours, recommend changing to black and white map due to reproduction issues.

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9. Report, Page 1-2, Figure 1-1. Remove fans in Area 3 from location map. They are not related to this report.

10. Report, Page 4-1, Section 4.2.1. Change watershed area from 5.8 sq mi to 1.47 sq mi. Change "0.64 sq mi to 3.64 sq mi" to "0.43 sq mi to 1.035 sq mi".

11. Report, Page 4-3, Figure 4.1. Remove the 2-yr 6-hr and 2-yr 24-hr isopluvials. They are not related to this report.

12. Report, Page 4-6, paragraph 1. Change "Table 1" to "Table 4.1".

13. Report, Page 4-8, Section 4.5.3. Change "Fan 4 or Fan 5" to "Fan 1 or Fan 2".

14. Report, Page 4-8 to 4-10. If used, please add references from the Buckeye/Sun Valley ADMS and/or Sun Valley ADMP.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: July 19, 2006

To: Valerie Swick, Project Manager
Planning and Project Management Division

From: Julie Cox, Senior Hydrologist
Engineering Division

Subject: Approximate Floodplain Delineation for White Tank Fan 6

I have reviewed the hydrology provided in the Approximate Floodplain Delineation Study of the White Tank Mountain Piedmont Fan Site 6, JE Fuller, dated June 2006. My comments are listed below and are referenced to the maps, models, and report.

1. Electronic files were not submitted. Please submit CD for comparison purposes.

2. Based on the isopluvials in the Hydrology Manual, change the 100-yr 6-hr rainfall to 3.4 inches.

3. Add copies of the 100-yr 24-hr and 100-yr 6-hr isopluvials from the Hydrology Manual to Appendix D.

4. Plate 1 – Add title Watershed Map, add intermittent elevations to contours, add the ft symbol to the top and bottom elevations of the sub-basin, recommend changing to black and white map due to reproduction issues.

5. Plate 2 – Add title Soils Map, add intermittent elevations to contours, add the ft symbol to the top and bottom elevations of the sub-basin, recommend changing to black and white map due to reproduction issues. Please use more contrast for the differences in soil types.

6. Plate 3 – Add title Land Use Map, add intermittent elevations to contours, add the ft symbol to the top and bottom elevations of the sub-basin, recommend changing to black and white map due to reproduction issues.

7. Report, Page 1-1, Section 1.1. Change "Site 6 n the White Tank Piedmont" to "Site 6 on the White Tank Piedmont".

8. Report, Page 4-1, Section 4.2.1 Change "One individual subbasins" to "One individual sub-basin" and change "Waterhsed" to "Watershed".

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9. Report, Page 4-2, Paragraph 2. Change "The SCS (1963) indicate" to "The SCS (1963) indicates".

10. Report, Page 4-3, last sentence. Change "PI records" to "PC records".

11. Report, Page 4-4, Figure 4.1. Remove the 2-yr 6-hr and 2-yr 24-hr isopluvials. They are not related to this report.

12. Report, Page 4-7, 2 locations. Change "Table 1" to "Table 4.1".

13. Report references. Please add references from the Buckeye/Sun Valley ADMS, Sun Valley ADMP, Piedmont Manual, Hydrology Manual, Hydraulics Manual, SCS Soil Surveys, etc. as appropriate.

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July 26, 2006

MEMO TO: Jon Fuller, Project Manager
JE Fuller/Hydrology & Geomorphology, Inc.

Cc: Ted Lehman, Project Engineering and Asst. Project Manager

FROM: Valerie A. Swick

SUBJECT: **Review Comments for Sun Valley ADMP Step 1 and Step 2 Reports.**

Dear Jon,

I have reviewed the Step 1 and Step 2 reports for the Sun Valley ADMP. The following are my comments:

General Comments:

1. FCD logo in the header (right-side of the page) should be larger and the JE Fuller logo smaller.
2. In the 11" x 17" format, the page numbers should be toward the edge of the page and the Fuller logo should be toward the binding.
3. I don't like the 11" x 17" format for the summary documents. I understand the need to that format for the technical documents, but I would like to talk about the format for the summary documents. I am also undecided about having the same summary in every volume. I would like to talk about this format.

Step 1: Alternative Formulation and Preliminary Analysis

Overall, the document looks pretty good. I only have a few comments:

4. Page 1:
    - One of the major objectives should be "Plan regional flood hazard mitigation." As the second bullet.
    - The last objective "Submittal of all contract deliverables …" should not be included in this section.
5. Page 3:
    - Location of Study Area: Third line – should read the Trilby Wash Watershed. There needs to be further explanation of why we are included Fan 2 in our study since it is stated that it is a tributary of Trilby Wash.

6. Page 15:
    - Table 6 should be completed, we should not have unknowns and '?'s in the table.

Step 2: Proposed Alternative Report

General Comments:

7. The Summary document should have all the backup material with each Volume for the Sub-Areas only having the information that pertains to that Sub-Area.

Volume 1:

8. Since this will be a stand alone document, it would be nice if this volume were in a regular 8" x 11" format.
9. The subtitle for this volume should read Analysis Summary and North of CAP Sub-Area.
10. The section on North of CAP Sub-Area should come after the general information in Chapter 8 for North of CAP Sub-Area Specific Design Considerations.
11. Chapter 5 should be exactly what the section is in the other volumes with:

    5 Step 2 Approach

    5.1 Data Collection with all the sub-sections.

    5.9 All the Open Channel Analyses equations should be in the summary volume.

12. The other chapters should be as follows:

    Chapter 6: **DESIGN PROCEDURES.**
    Chapter 7: **LANDSCAPE COMPATIBILITY ENHANCEMENTS.**
    Chapter 8: **COST ESTIMATES.**
    Chapter 9: **ALTERNATIVES EVALUATION.**
    Chapter 10: **RECOMMENDATIONS FOR STEP 3.**
    Chapter 11: **NORTH OF CAP SUB-AREA SPECIFIC DESIGN CONSIDERATIONS AND SUMMARY.**
    Chapter 12: **SUMMARY.**
    Chapter 14: **REFERENCES.**

13. Page 1: The right-hand side of the page should be full justified to conform with the other pages.
14. Page 5: Figure 8 should have some descriptive text on the picture. The number 3 should be on the second line in second column and not dangling on the first line.

Volume 2

15. The Chapters should be as follows:

    Chapter 1: **ABSTRACT/EXECUTIVE SUMMARY.**
    Chapter 2: **INTRODUCTION AND LOCATION OF THE SUB-AREA.**
    Chapter 3: **SPECIFIC DESIGN CONSIDERATIONS**
    Chapter 4: **DESIGN SUMMARY**
    Chapter 5: **ALTERNATIVE EVALUATION**
    Chapter 6: **RECOMMENDATIONS FOR STEP 3 FOR THE CAP SUB-AREA**
    Chapter 7: **SUMMARY**
    Chapter 8: **REFERENCES**

16. There are many areas that should be the same at in Volume 1 but some words have been changed. For example: page 7, second paragraph after 4 Description of Alternatives. In Volume 1 it reads "The study area was divided geographically *into sub-areas* to focus attention on appropriate structural or non-structural flood control alternatives for each sub-area. The area north of the Central Arizona Project (CAP) Canal is not impacted by large,…" Volume 2 reads "The study area was divided geographically to focus attention on appropriate structural or non-structural flood control alternatives for each sub-area. The area north of the *CAP* Canal is not impacted by large,…"

The Layout for the information specifically for each sub-area looks good.

Give me a call to talk about the format.

Sincerely,

Valerie A. Swick, E.I.T., P.H., CFM
Project Manager

Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: August 11, 2006

To: Valerie Swick, E.I.T., CFM, Planning Branch, PPM Division

From: Kathryn Gross, CFM, Floodplain Delineation Branch, PPM Division

Subject: Sun Valley ADMP – Approximate Floodplain Delineations for White Tank Fans 4 and 5, July 2006 submittal

I have reviewed the above submittal and have the following comments. Overall the delineation limits appear reasonable; however, there are some designation concerns and modifications that are needed prior to approval.

The Consultant should address the comments below.

Technical Summary

1. Hydrology – Make sure all supporting documentation is provided. Full comments forthcoming from Julie Cox.

2. Hydraulics – Upstream modeling appears reasonable. Please run checkras on the upstream delineation. Upstream of the apex the delineation should be an administrative floodway. If the Consultant prefers the water surface elevations for each cross-section location can be determined using FlowMaster or a similar product. If left in RAS the Consultant needs to provide a baseline in the delineation and be prepared to answer any FEMA questions, as they will review it as a RAS product.

3. Geomorphology – TDN appendix G supporting documentation needs to be provided. A master Appendix G for all fan delineations is recommended.

4. Floodplain Delineations - Some potential modifications to the delineation limits are recommended. This will require updates on the workmaps and annotated FIRM panels as well. This is discussed later in the comments.

5. Delineation should be called out as White Tank Fans 4 and 5.

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Delineation

1. Locations where there are concerns regarding the delineation have been identified in the shape file fan45quest.shp. This file will be included with this comment submittal. Some points require no action, as they are just field visit points for myself.

2. At present the delineation appears reasonable. However, there are two locations where modifications may be discussed further.

    - The first location is the AFHH zone that contains points 3 and 10. The surface does not appear to support the active fan condition.

    - The second location possibly needed designation modification would be the Hassayampa Fans. If management is concerned about the floodway designation further discussions may be necessary.

Report Comments

1. Page 2-1, Abstract section 2.1.3. Craig Kennedy is no longer the official contact at Baker. If a new contact is identified prior to FEMA submittal the name should be updated.

2. Page 2-1 section 2.1.7 Reach Description. Should we list only the fan associated with this report?

3. Page 2-1 section 2.1.10 Coordination of Peak Discharges. Since the hydrology is not finalized yet, this date will need to be updated.

4. FEMA O&C Form

    - Part D – The form should be updated to reflect my name.

5. FEMA RH&H Form

    - Two sets of RH&H forms were submitted. For each set all the fans are listed under Flooding Source. Was one set to be for Fan 4 and one set to be Fan 5?
    - Part B
        i. Number 3 - The yes box should be checked here instead of no if the use of RAS is continued.
        ii. Number 4 – Could the model name reflect a Fan 4 and 5 identifier?

6. Section 4 – Review comments will be provided by Julie Cox.

7. Section 5, the upstream floodplain should be delineated as an administrative floodway and its designation should be discussed in this section.

8. Section 5, the alluvial fan delineation will supercede portions of the existing Hassayampa River delineation. This should be discussed in the text in either this section or section 6.

9. Page 5-8. Make sure to include the RAS summary table in the final report.

10. Page 6-60, 6B.6.2 consider rewording third paragraph. My interpretation of the text is that there was a difference in flood hazard between the delineation and the AZGS flood hazard classification, L2. In my opinion it looks like a reasonable match. L2 states that flows are confined in channels. The AAFF zones are essentially occurring in the channels as described by the AZGS report.

Appendix Comments

1. For Appendix A, B, C, and E - no comments. Update references as needed.

2. Appendix D - Consider placing a separate copy of the Rainfall figure in the appendix. Organize data following State Standard.

3. Appendix F – consider providing information from the sediment yield analysis here.

4. Appendix G – no supporting documentation of the geomorphic analysis was provided. Perhaps a master Appendix G could be developed for use with all the Fan reports.

5. Appendix H- no digital information was provided in this submittal. Please make sure to include a cd with the next submittal including digital line work for hydrology as well as floodplain delineation.

6. A-Maps Hydrology. No concerns.

7. B-Maps Geomorphology. No concerns.

8. C-Maps Hydraulics/Floodplain.

    - Consider removing the smaller Shaded X zones.
    - Floodway symbology is needed on the delineations shown.
    - Consider adding a legend of the FCD fan delineation categories.
    - Consider revising the title to "Approximate Zone A Floodplain Delineation Study of White Tank Fans 4 and 5."
    - Consider labeling the Fans as White Tank Fan 4 and White Tank Fan 5 on the workmaps.
    - Consider adding labels identifying where the White Tank Fan 4 and 5 delineation will tie into the existing Hassayampa River delineation.

9. Annotated Panels. Please consider the following:

    - Somewhat hard to read the red line work and text.
    - Designations need to be modified. Please use FEMA designations on panels:

i. Upstream of Apex: Zone A Administrative Floodway – Inactive Fan Flooding
ii. Downstream of Apex: Zone A Administrative Floodway – Active Fan Flooding and Zone A Inactive Fan Flooding.

- Add a note stating administrative floodways are regulated by the local regulatory authority.
- Add floodway shading of the corridors.
- Consider naming the corridor.
- FEMA will only allow one designation for any given location. If the proposed delineation is going to overlap the effective delineation a note with a leader line showing where we want to remove the effective delineation from the FIRM panel should be added.

Text Comments

1. Page 5-1 section 5.1. Please correct "apeces" with either "apexes" or "apices".

2. Page 6-4. Update the study list so that 16 is added to 3-13

3. Page 6-9. Update the text in the 2nd paragraph. It states Fan 6 instead of Fans 4 and 5.

4. Page 6-26, 6B.4.4 last sentence. Please update the text to reflect that there were 5 new fans identified (16-20).

5. Page 6-42 second paragraph second to last sentence. Please replace "excel" with "excess."

6. Page 6-54 section 6B.5.6.3. Please add "and" before Sun Valley Parkway in the first sentence and replace "of" with "on" in the second sentence.

7. Section 6B.5.6 Please revisit numbering of subsections.

I have no more comments at this time.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: August 24, 2006

To: Valerie Swick, Project Manager
Planning and Project Management Division

From: Julie Cox, Senior Hydrologist
Engineering Division

Subject: Approximate Floodplain Delineations for White Tank Fans 4 and 5

I have reviewed the hydrology provided in the Approximate Floodplain Delineation Study of the White Tank Mountain Piedmont Fan Sites 4 & 5. My comments are listed below and are referenced to the maps, models, and report.

1. Electronic files were not submitted. Please submit CD for comparison purposes.

2. I compared the input parameters and the output from the Fan 4 & 5 models to the Area 4 models for both the 100-yr 24-hr and 100-yr 6-hr events. The sub-basin data and the output in this Fan 4 & 5 study are consistent with the same sub-basins in the Area 4 models.

3. Based on the isopluvials in the Hydrology Manual, change the 100-yr 6-hr rainfall to 3.4 inches.

4. Add copies of the 100-yr 24-hr and 100-yr 6-hr isopluvials from the Hydrology Manual to Appendix D.

5. The Summary of Results page is missing from Appendix D.1. Please include in the next submittal.

6. Land Use. The RTIMP used in the HEC-1 models differs from that in DDMSW. Please change to be consistent.

7. Plate 1 – Add title Watershed Map, add intermittent elevations to contours, add the ft symbol to the top and bottom elevations, recommend changing to black and white map due to reproduction issues.

8. Plate 2 – Add title Soils Map, add intermittent elevations to contours, add the ft symbol to the top and bottom elevations, recommend changing to black and white map due to reproduction issues. Cannot distinguish soil types from each other. Please use more contrast for the different soil types.

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9. Plate 3 – Add title Land Use Map, add intermittent elevations to contours, add the ft symbol to the top and bottom elevations, recommend changing to black and white map due to reproduction issues. Cannot distinguish land use types from each other. Please use more contrast for the different land use types.

10. Plate 3 – To be consistent with the other Fan TDNs, please show only the existing land use types modeled, i.e. Hillslopes and Mountain Terrain. Remove Desert Rangeland (NDR) < 5% slopes from the legend since this land use type was not used.

11. Report, Page 1-1, Section 1.1. Change "Sites 4 and 5 n the White Tank Piedmont" to "Sites 4 and 5 on the White Tank Piedmont".

12. Report, Page 4-3, last sentence. Change "PI records" to "PC records".

13. Report, Page 4-4, Figure 4.1. Remove the 2-yr 6-hr and 2-yr 24-hr isopluvials. They are not related to this report.

14. Report, Page 4-5, Land Use, last sentence. Insert "Natural" before "Mountain Terrain".

15. Report, Page 4-5, Land Use, last sentence. Change "Fan 10 and 11" to "Fan 4 and 5".

16. Report, Page 4-7, 2 locations. Change "Table 1" to "Table 4.1".

17. Report, Page 4-7, Unit Hydrograph. Change "Fan 10 and 11" to "Fan 4 and 5".

18. Report, Page 4-12, Table 4.3. Show units, i.e. cfs and cfs/sq mi.

19. I did not find where the report spells out the names of the soil types. Please include a table that identifies the name for each soil type (645100, 645123, etc.).

20. Report references. Please add references from the Buckeye/Sun Valley ADMS, Sun Valley ADMP, Piedmont Manual, Hydrology Manual, Hydraulics Manual, SCS Soil Surveys, etc. as appropriate.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: August 25, 2006

To: Valerie Swick, E.I.T., CFM, Planning Branch, PPM Division

From: Kathryn Gross, CFM, Floodplain Delineation Branch, PPM Division

Subject: Sun Valley ADMP – Approximate Floodplain Delineations for White Tank Fans 3, 13, 16, August 2006 submittal

I have reviewed the above submittal and have the following comments. Overall the delineation limits appear reasonable; however, there are some designation concerns and modifications that are needed prior to approval.

The Consultant should address the comments below.

Technical Summary

1. Hydrology – Make sure all supporting documentation is provided. Full comments forthcoming from Julie Cox.

2. Hydraulics – Upstream modeling appears reasonable. Please run checkras on the upstream delineation. Upstream of the apex the delineation should be an administrative floodway. If the Consultant prefers the water surface elevations for each cross-section location can be determined using FlowMaster or a similar product. If left in RAS the Consultant needs to provide a baseline in the delineation and be prepared to answer any FEMA questions, as they will review it as a RAS product.

3. Geomorphology – TDN appendix G supporting documentation needs to be provided. Anticipate a master Appendix G for all fan delineations with next submittal.

4. Floodplain Delineations - Some minor modifications to the delineation limits are recommended. This will require updates on the workmaps and annotated FIRM panels as well. This is discussed later in the comments.

5. Delineations should be called out as White Tank Fan 3, White Tank Fan 13, and White Tank Fan 16 on workmaps where possible.

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Delineation

1. Locations where there are concerns regarding the delineation have been identified in the shape file 31316quest.shp. This file will be included with this comment submittal.

2. Where the delineations tie into Wagner Wash please draw the limits to the floodplain limits.

3. Further discussion is needed regarding the extent and placement of certain AFUFD zones prior to accepting those designations and limits. Specific concerns are use of AFUFD to delineate overbank areas adjacent to AAFF corridors and in inselberg shadows; as well as concerns that the AFUFD zones appear large in relation to the potential discharges across their surfaces.

4. Recommendations have been made to remove or extend certain AAFF zones to more closely match the definition in the PFHAM.

Report Comments

1. Page 2-1, Abstract section 2.1.3. Craig Kennedy is no longer the official contact at Baker. If a new contact is identified prior to FEMA submittal the name should be updated.

2. Page 2-1 section 2.1.10 Coordination of Peak Discharges. Since the hydrology is not finalized yet, this date will need to be updated. The Study title should also be Sun Valley Area Drainage Master Plan instead of Study.

3. FEMA OC Form

    - Part B number 1 – Communities. Only Maricopa is listed for each of the panels. Buckeye needs to be listed as well.
    - Part D – Community Signature - Tim Phillip's title should be changed. He is no longer "acting".
    - Part D – Community Signature – Buckeye- District will provide you with the information for the new person at Buckeye who will be signing the forms.
    -

4. FEMA RH&H Form

    - Part B
        i. Number 4 – Could the model name reflect the location?

5. Page 3-1, section 3.2. Please remove aerial photography from first sentence.

6. Section 4 – Review comments will be provided by Julie Cox.

7. Section 5, the alluvial fan delineation will tie in to Wagner Wash. This should be discussed in the text in either this section or section 6.

8. Section 5.6. Please rephrase the discussion regarding the administrative floodways. If possible remove the statements "The District would like…"

9. For Figure 6.7, please consider adding a note to the figure explaining why there are no channels identified in the middle of the study area.

10. Page 6-47, Figure 6.24. Could this figure be presented as an 11x17?

11. Page 6-63. Is this specific discussion regarding the development of AAFFs pertinent to the actual delineation of the AAFFs for Fans 3, 13, and 16? Was the method discussed actually applied to portions of these delineations?

12. Page 6-64 section 6B.6.2. Was a hydraulic check performed for this fan analysis? If so include its discussion. Should any statements be made as to why one wasn't performed? The concern would be for FEMA's aid as to why they appear in the other reports but not this one. District is fine including no hydraulic check.

Appendix Comments

1. Appendix A – no comments. Update references as needed.

2. Appendix B – no comments. Update as needed.

3. Appendix C – no comments.

4. Appendix D – No comments.

5. Appendix E – no comments.

6. Appendix F –no comments.

7. Appendix G – Provide Master Appendix G with next submittal.

8. Appendix H- Please make sure to include a cd with the next submittal including digital line work for hydrology as well as floodplain delineation.

9. A-Maps Hydrology – No comments.

10. B-Maps Geomorphology – No comments.

11. C-Maps Hydraulics/Floodplain – Please draw the limits of the fan delineations to the Wagner Wash floodplain limits. This can be discussed further.

12. Annotated Panels. Please consider the following:

    - Somewhat hard to read the red line work and text.
    - Designations need to be modified. Please use FEMA designations on panels:

a. Upstream of Apex: Zone A Administrative Floodway – Inactive Fan Flooding
b. Downstream of Apex: Zone A Administrative Floodway – Active Fan Flooding and Zone A Inactive Fan Flooding.

- Add a note stating administrative floodways are regulated by the local regulatory authority.
- Add floodway shading of the corridors.
- Consider naming the corridor.
- FEMA will only allow one designation for any given location. If the proposed delineation is going to overlap the effective delineation a note with a leader line showing where we want to remove the effective delineation from the FIRM panel should be added.

Text Comments

1. page 6-35, second paragraph, first sentence. Please correct "and are thus were delineated".

2. Page 6-36, second paragraph, 2nd sentence. In this sentence should the second fan reference be to Fan 3 instead of Fan 13?

3. Page 6-57. Table 6B.7.Please correct the decimals for the 100 year average deposition depth for Fan 3.

4. Section 6B.5.6 Please revisit the numbering of subsections. There are two 6B.5.6.3s.

I have no more comments at this time.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: August 28, 2006

To: Valerie Swick, Project Manager
Planning and Project Management Division

From: Julie Cox, Senior Hydrologist
Engineering Division

Subject: Approximate Floodplain Delineations for White Tank Fans 3, 13, and 16

I have reviewed the hydrology provided in the Approximate Floodplain Delineation Study of the White Tank Mountain Piedmont Fan Sites 3, 13, and 16; JE Fuller, August 2006. My comments are listed below and are referenced to the maps, models, and report.

1. Electronic files were not submitted. Please submit CD for comparison purposes.

2. I compared the input parameters and the output from the Fan 3, 13, and 16 models to the Area 4 models for both the 100-yr 24-hr and 100-yr 6-hr events. The sub-basin data and the output in this Fan 3, 13, and 16 study are consistent with the same sub-basins in the Area 4 models.

3. Based on the isopluvials in the Hydrology Manual, change the 100-yr 6-hr rainfall to 3.4 inches.

4. Add copies of the 100-yr 24-hr and 100-yr 6-hr isopluvials from the Hydrology Manual to Appendix D.

5. Land Use. The RTIMP used in the HEC-1 models differs from that in DDMSW. Please change to be consistent.

6. Plate 1 – Add title Watershed Map, add the ft symbol to the top and bottom elevations, add ranges (in addition to townships and sections), recommend changing to black and white map due to reproduction issues.

7. Plate 2 – Add title Soils Map, add the ft symbol to the top and bottom elevations, add ranges (in addition to townships and sections), recommend changing to black and white map due to reproduction issues. For sub-basin 165, show soil type 64529, and it's area, on the map.

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8. Plate 3 – Add title Land Use Map, add the ft symbol to the top and bottom elevations, add ranges (in addition to townships and sections), recommend changing to black and white map due to reproduction issues.

9. Report, Page 1-1, Section 1.1, Sentence 2. Change "report to distinguish it" to "report to distinguish them".

10. Report, Page 1-2, Figure 1.1. Remove fans in Area 3 from location map. They are not related to this report.

11. Report, Page 1-3, Figure 1.2. Add S165 and it's area 0.62 sq mi, to Figure 1.2.

12. Report, Page 4-4, Figure 4.1. Remove the 2-yr 6-hr and 2-yr 24-hr isopluvials. They are not related to this report.

13. Report, Page 4-6, paragraph 4. Change "Table 1" to "Table 4.1".

14. Report, Page 4-6, paragraph 4. Change "section D.2" to "Appendix D".

15. Report, Page 4-12, Table 4.3. Show units, i.e. cfs.

16. I did not find where the report spells out the names of the soil types. Please include a table that identifies the name for each soil type (645100, 645123, etc.).

17. Report references. Please add references from the Buckeye/Sun Valley ADMS, Sun Valley ADMP, Piedmont Manual, Hydrology Manual, Hydraulics Manual, SCS Soil Surveys, etc. as appropriate.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: September 6, 2006

To: Valerie Swick, Project Manager
Planning and Project Management Division

From: Julie Cox, Senior Hydrologist
Engineering Division

Subject: Approximate Floodplain Delineations for White Tank Fans 17, 18, and 19

I have reviewed the hydrology provided in the Approximate Floodplain Delineation Study of the White Tank Mountain Piedmont Fans 17, 18, and 19; JE Fuller, August 2006. My comments are listed below and are referenced to the maps, models, and report.

1. Electronic files were not submitted. Please submit CD for comparison purposes.

2. I compared the input parameters and the output from the Fan 17, 18, and 19 models (for sub-basin S185) to the Area 4 models for both the 100-yr 24-hr and 100-yr 6-hr events. The sub-basin data and the output for sub-basin S185 are consistent with the Area 4 models.

3. Based on the isopluvials in the Hydrology Manual, change the 100-yr 6-hr rainfall to 3.4 inches.

4. Add copies of the 100-yr 24-hr and 100-yr 6-hr isopluvials from the Hydrology Manual to Appendix D.

5. Land Use. The RTIMP used in the HEC-1 models differs from that in DDMSW. Please change to be consistent.

6. Plate 1 – Add title Watershed Map, add the ft symbol to the top and bottom elevations, recommend changing to black and white map due to reproduction issues.

7. Plate 2 – Add title Soils Map, add the ft symbol to the top and bottom elevations, recommend changing to black and white map due to reproduction issues.

8. Plate 3 – Add title Land Use Map, add the ft symbol to the top and bottom elevations, recommend changing to black and white map due to reproduction issues.

9. Report, Appendix D, Sub-basin Data Table. The Lca and Lengths listed in this table differ from those shown on Plates 1, 2, and 3. For example, for sub-basin 185, the maps show

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10,439 ft for the Lca but the table shows 10,507 ft. The Lca and Lengths listed in the maps and tables should be identical to each other.

10. Report, Page 1-2, Figure 1.1. Remove fans in Area 3 from location map. They are not related to this report.

11. Report, Page 4-3, Figure 4.1. Remove the 2-yr 6-hr and 2-yr 24-hr isopluvials. They are not related to this report.

12. Report, Page 4-5, Figure 4.2. Consider adding boundaries between the different land use types. It is difficult to see that the FAN18 sub-basin contains a small area of desert rangeland.

13. Report, Page 4-6, paragraph 4. Change "Table 1" to "Table 4.1".

14. Report, Page 4-6, paragraph 4. Change "section D.2" to "Appendix D".

15. Report, Page 4-10, Table 4.3. Show units, i.e. cfs.

16. I did not find where the report spells out the names of the soil types. Please include a table that identifies the name for each soil type (645100, 645123, etc.).

17. Report references. Please add references from the Buckeye/Sun Valley ADMS, Sun Valley ADMP, Piedmont Manual, Hydrology Manual, Hydraulics Manual, SCS Soil Surveys, etc. as appropriate.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: September 11, 2006

To: Valerie Swick, E.I.T., CFM, Planning Branch, PPM Division

From: Kathryn Gross, CFM, Floodplain Delineation Branch, PPM Division

Subject: Sun Valley ADMP – Approximate Floodplain Delineations for White Tank Fans 17, 18, and 19, August 2006 submittal

I have reviewed the above submittal and have the following comments. Overall the delineation limits appear reasonable; however, there are some designation concerns that need to be addressed prior to approval.

The Consultant should address the comments below.

Technical Summary

1. Hydrology – Make sure all supporting documentation is provided.

2. Hydraulics – Upstream modeling appears reasonable. Please run checkras on the upstream delineation. Upstream of the apex the delineation should be an administrative floodway. If the Consultant prefers the water surface elevations for each cross-section location can be determined using FlowMaster or a similar product. If left in RAS the Consultant needs to provide a baseline in the delineation and be prepared to answer any FEMA questions, as they will review it as a RAS product.

3. Hydraulics – On Fan 19 the Upstream Zone A is located within a proposed AAFF. Do we want to extend the Zone A hydraulics or use the AAFF? Consider extending the upstream Zone A delineation to Sun Valley Parkway. Would it need to extend down to the apex in order to satisfy containment concerns for FEMA?

4. Geomorphology – TDN appendix G supporting documentation needs to be provided. A master Appendix G for all fan delineations is recommended.

5. Floodplain Delineations - Some minor modifications to the delineation limits are recommended. This will require updates on the workmaps and annotated FIRM panels as well. This is discussed later in the comments.

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6. Delineation should be called out as White Tank Fan 17, 18, and 19.

Delineation

1. Locations where there are concerns regarding the delineation have been identified in the shape file fan171819quest.shp. This file will be included with this comment submittal.

2. Concerned that breakout flows from above Fan 18's apex are not being mapped as floodplain. Please discuss.

3. In 3 locations along White Tank Fan 18's UFD zone, there appears to be a chance for break out flows. Please determine if these are potential break out locations. Locations are shown in the shape file.

4. Need to discuss the AFUFD zone at Wagner Wash. Seems strict. Could this be designated as AFZA?

5. Need to discuss the AFHH designations at Wagner Wash for a few of the delineations. May not be supported by management.

Report Comments

1. Figure 1.1 - update delineation for Fan 19 if changes are made.

2. Page 2-1, Abstract section 2.1.3. Craig Kennedy is no longer the official contact at Baker. If a new contact is identified prior to FEMA submittal the name should be updated.

3. Page 2-1 section 2.1.10 Coordination of Peak Discharges. Since the hydrology is not finalized yet, this date will need to be updated.

4. FEMA OC Form

    - Part B number 1 Buckeye needs to be listed as an affected community in these tables as well
    - Part B number 3. Should there be a different project name other than Approximate Riverine floodplain delineation upstream of alluvial fan apexes?
    - Part D – Signatures. Update Tim Phillips signature block. He is no longer acting Chief Engineer (remove acting).
    - Part D – Signatures. Update Woody Scouten. He will not be signing for Buckeye. District will provide you with updated information.

5. FEMA RH&H Form

    - Part B, number 4 – Could the model name be updated to reflect the study area (17,18,19) instead of "zonea". This would need to be corrected on all three forms.

6. Section 4 – Review comments will come from Julie Cox.

7. Section 5, the upstream floodplain should be delineated as an administrative floodway and its designation should be discussed in this section.

8. Section 5.5.4, a break out from the delineation is discussed in the text and the discussion states that it was not delineated. Why is it not delineated and will FEMA allow a breakout upstream of the apex to not be delineated? Consider adding to the delineation.

9. Section 6, Figure 6.7, please consider adding a note to the figure explaining why there are no channels identified in the middle of the study area.

10. Page 7-1, section 7.1. Please add "White Tank Fan" in front of each fan number in the summary of discharges table.

Appendix Comments

1. Appendix A – no comments. Update references as needed.

2. Appendix B – Include pertinent correspondence prior to FEMA submittal

3. Appendix C – no comments.

4. Appendix D – no comments.

5. Appendix E – no comments.

6. Appendix F –no comments.

7. Appendix G – Include Master Appendix G with next submittal.

8. Appendix H- no digital information was provided in this submittal. Please make sure to include a cd with the next submittal including digital line work for hydrology as well as floodplain delineation.

9. A-Maps Hydrology. No comments.

10. B-Maps Geomorphology. No comments.

11. C-Maps Hydraulics/Floodplain.

- Consider Labeling the Fans on the map sheets as "White Tank Fan 17", "White Tank Fan 18", "White Tank Fan 19".

12. Annotated Panels. Please consider the following:

- Somewhat hard to read the red line work and text.
- Designations need to be modified. Please use FEMA designations on panels:
    a. Upstream of Apex: Zone A Administrative Floodway – Inactive Fan Flooding
    b. Downstream of Apex: Zone A Administrative Floodway – Active Fan Flooding and Zone A Inactive Fan Flooding.
- Add a note stating administrative floodways are regulated by the local regulatory authority.
- Add floodway shading of the corridors.
- Consider naming the corridor.
- FEMA will only allow one designation for any given location. If the proposed delineation is going to overlap the effective delineation a note with a leader line showing where we want to remove the effective delineation from the FIRM panel should be added.

Text Comments

1. Page 3-1, is "epoch" correct in the second sentence: "1992 epoch Central Zone of Arizona State Plane…"

2. Page 6-20 6B4.4 second paragraph. Please correct "hydrologic" apexes with "hydrographic".

3. Page 6-35. Please correct the following text concerns.

- First paragraph last sentence. "…and net sediment (fine grained) sediment deposition."
- First paragraph sentence 4. Consider adding the word "active" to "secondary alluvial fans."

4. Page 6-36. Please correct the following text concerns.

- First paragraph third sentence. "exist on land geologic landform."
- Second paragraph "Fan Site 19is"

5. Page 6-41, Figure 6.21, Red outline and TDN text are commingling.

6. Page 6-53, 6B5.5, "fan areas at Site xx".

7. Page 6-53, 6.B.5.6 "fan areas at Site xx".

I have no more comments at this time.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: September 26, 2006

To: Valerie Swick, E.I.T., CFM, Planning Branch, PPM Division

From: Kathryn Gross, CFM, Floodplain Delineation Branch, PPM Division

Subject: Sun Valley ADMP – Approximate Floodplain Delineations for White Tank Fans
September Digital Delineation Submittals

I have reviewed the digital submittals of the approximate fan floodplain delineations for White Tank Fans 3, 4, 5, 6, 10, 11, 13, 16, 17, 18, 19, and 20. The delineation limits and designations are approved.

White Tank Fans 1 and 2 delineations remain on hold per management and therefore no review comments are provided herein.

The Consultant is encouraged to submit the digital delineations (following the HIS specification) for inclusion in our GIS database as soon as possible.

I have no more comments at this time.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: October 2, 2006

To: Valerie Swick, Project Manager
Planning and Project Management Division

From: Julie Cox, Senior Hydrologist
Engineering Division

Subject: Step 3 Recommended Alternative Report for Wagner Wash Subarea

I have reviewed the hydrology provided for the Wagner Wash Subarea Report (Volume 3); J.E. Fuller Hydrology & Geomorphology, Inc., August 2006. My comments are listed below and are referenced to the maps, models, and report.

1. Report. The figures in the Wagner Wash Subarea Report should pertain to the Wagner Wash Subarea. There are several figures that are not located in the Wagner Wash Subarea. I recommend removing Skyline Fan (Figure 2), Fan 36 (Figure 6), and Fans 36 and 37 (Figure 8) and replacing them with photos in the Wagner Wash Subarea. Figures 2, 6, and 8 are not referenced in the report anyway.

2. Report, Page 4. The report should refer to Figure 1.

3. Report, Page 8, 2nd to last paragraph. The report states that the refinements and designs of the other subareas are presented in Volumes 2 and 4-7. My understanding is that there will be one volume for each of the six subareas.

4. Report, Page 10. Change "White Tanks Wash" to "White Tank Wash".

5. Report, Page 11. Change "corridors provides a path" to "corridors provide a path".

6. Report, Page 11. Change "serves as a trunk system" to "serve as a trunk system".

7. Report, Page 11. Change "includes a small containment dikes" to "includes small containment dikes" or " includes a small containment dike".

8. Report, Page 12. Change "the maximum of the values obtained from the 24-hour and 6-hour results were used" to "the maximum of the values obtained from the 24-hour and 6-hour results was used"

9. Report, Page 13. Change "AMDP" to "ADMP".

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10. Report, Page 13, Paragraph 4. There is something missing in the sentence "A brief discussion of the design approach for is included in the discussion of each structural component." Review and change as necessary.

11. Report, Page 17, Section 5.7.2.4. Change "mayraise" to "may raise".

12. Report, Page 17, Section 5.7.2.5. Change "Figure 4" to "Figure 17".

13. Report, Page 19, Section 5.7.5. Change "Table 1" to "Table 2".

14. Report, Page 19, Table 2. What is the source of the 820 cfs listed as the 100-year discharge?

15. Report, Page 19, Section 5.7.6. Change "reinforce" to "reinforced".

16. Report, Pages 20-29. Figures 20-21, 23-25, and 27-29. I did not find references to these figures in the report. Please reference the figures in the report or remove them. Please label Figure 21 if it is to remain in the report.

17. Report, Page 21, Section 5.8.2. Change "scour protection on inside of the basin" to "scour protection on the inside of the basin".

18. Report, Page 21, Section 5.8.3. Change "reinforce" to "reinforced".

19. Report, Page 21, Section 5.9. Change "basins located to reduce its visibility" to "basin was located to reduce its visibility".

20. Report, Page 25, Section 5.12.5. Change "over turning" to "overturning". Change "back fill" to "backfill".

21. Report, Page 27, Section 5.13.2. Change "moderate control" to either "moderate" or "control".

22. Report, Page 29, Section 6, 1st sentence at top of page. Change "Runoff from the remainder of the sub-area, including Fans 16-19, flow to Wagner Wash" to "Runoff from the remainder of the sub-area, including Fans 16-19, flows to Wagner Wash".

23. Appendix A, Land Use Map. Change view port to be consistent with other map view ports.

24. Appendix B, Land Use Map. Change view port to be consistent with other map view ports.

Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: October 2, 2006

To: Valerie Swick, Project Manager
Planning and Project Management Division

From: Julie Cox, Senior Hydrologist
Engineering Division

Subject: Step 3 Recommended Alternative Report for Wagner Wash Subarea

I have reviewed the hydrology provided for the Wagner Wash Subarea Report (Volume 3); J.E. Fuller Hydrology & Geomorphology, Inc., August 2006. My comments are listed below and are referenced to the maps, models, and report.

1. Report. The figures in the Wagner Wash Subarea Report should pertain to the Wagner Wash Subarea. There are several figures that are not located in the Wagner Wash Subarea. I recommend removing Skyline Fan (Figure 2), Fan 36 (Figure 6), and Fans 36 and 37 (Figure 8) and replacing them with photos in the Wagner Wash Subarea. Figures 2, 6, and 8 are not referenced in the report anyway.

2. Report, Page 4. The report should refer to Figure 1.

3. Report, Page 8, 2nd to last paragraph. The report states that the refinements and designs of the other subareas are presented in Volumes 2 and 4-7. My understanding is that there will be one volume for each of the six subareas.

4. Report, Page 10. Change "White Tanks Wash" to "White Tank Wash".

5. Report, Page 11. Change "corridors provides a path" to "corridors provide a path".

6. Report, Page 11. Change "serves as a trunk system" to "serve as a trunk system".

7. Report, Page 11. Change "includes a small containment dikes" to "includes small containment dikes" or " includes a small containment dike".

8. Report, Page 12. Change "the maximum of the values obtained from the 24-hour and 6-hour results were used" to "the maximum of the values obtained from the 24-hour and 6-hour results was used"

9. Report, Page 13. Change "AMDP" to "ADMP".

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10. Report, Page 13, Paragraph 4. There is something missing in the sentence "A brief discussion of the design approach for is included in the discussion of each structural component." Review and change as necessary.

11. Report, Page 17, Section 5.7.2.4. Change "mayraise" to "may raise".

12. Report, Page 17, Section 5.7.2.5. Change "Figure 4" to "Figure 17".

13. Report, Page 19, Section 5.7.5. Change "Table 1" to "Table 2".

14. Report, Page 19, Table 2. What is the source of the 820 cfs listed as the 100-year discharge?

15. Report, Page 19, Section 5.7.6. Change "reinforce" to "reinforced".

16. Report, Pages 20-29. Figures 20-21, 23-25, and 27-29. I did not find references to these figures in the report. Please reference the figures in the report or remove them. Please label Figure 21 if it is to remain in the report.

17. Report, Page 21, Section 5.8.2. Change "scour protection on inside of the basin" to "scour protection on the inside of the basin".

18. Report, Page 21, Section 5.8.3. Change "reinforce" to "reinforced".

19. Report, Page 21, Section 5.9. Change "basins located to reduce its visibility" to "basin was located to reduce its visibility".

20. Report, Page 25, Section 5.12.5. Change "over turning" to "overturning". Change "back fill" to "backfill".

21. Report, Page 27, Section 5.13.2. Change "moderate control" to either "moderate" or "control".

22. Report, Page 29, Section 6, 1st sentence at top of page. Change "Runoff from the remainder of the sub-area, including Fans 16-19, flow to Wagner Wash" to "Runoff from the remainder of the sub-area, including Fans 16-19, flows to Wagner Wash".

23. Appendix A, Land Use Map. Change view port to be consistent with other map view ports.

24. Appendix B, Land Use Map. Change view port to be consistent with other map view ports.

Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: October 4, 2006

To: Valerie Swick, Project Manager, P&PM Division

From: Kathryn Gross, Senior Hydrologist, P&PM Division

Subject: White Tank Fan #6 TDN September 2006 Submittal and Appendix G Submittal 2006

The TDN has been reviewed and is considered approved once the minor corrections listed below are addressed. The Hydrology section is still under review so additional comments may be forthcoming.

Appendix G is approved.

1. Section 2.
    - Section 2.1 – In the abstract under Coordination of Peak Discharges, could the reference for Sun Valley be updated to read Sun Valley ADMP instead of ADMS?
    - Section 2.2 FEMA forms
        - Form 1 – Section B, add the Town of Buckeye Community Number (040039) for each panel listed in the table.
        - Form 1 – Section B, Panel 1545. Please update to read Panel 1545H instead of 1545F.
2. Section 4. Julie Cox will provide comments for this section.
3. Section 6. Section number updates. Please update the section numbers listed below.
    - Page 6-17 – Summary should be 6B.4.1.3 (sorry for oversight in last review)
    - Page 6-51 – Summary should be 6B.5.3.9 (sorry for oversight in last review)
4. Section 6. Left over references to RAS hydraulic check. Please remove the language from the following portions of the report.
    - Page 6-53, 3rd bullet

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- Page 6-56, 6B.6.2 first sentence

5. Appendix B – Please make sure District provides a copy of the public meeting brochure and mailing list for inclusion prior to FEMA submittal.

6. Appendix D – Noticed that in the hard copy 6-hour model the ID comments call the model out as F624.dat and other ID comments state 100-year 24-hour model as well. These comments should be corrected and an updated 6-hour model be provided. Updated digital files should be included on the cd as well.

7. Appendix G – Please include a placeholder in the TDN for appendix G that directs individuals to the stand-alone binder.

8. B Maps. For the Stage 3 map, the delineation differs from the delineation and designations presented on the work maps. Is there a reason for the difference or does the Stage 3 map just need to be updated?

9. C Maps.

    - On Sheets 2 and 3, at the jurisdiction limits, please change the "City of Buckeye" to "Town of Buckeye". (Sorry for the oversight in the last review)

    - On Sheets 2 and 3, in the legend please change "Effective 100-year Administrative Floodway" to "Effective 100-year Floodway". (Sorry for the oversight in the last review)

    - On Sheet 2, the baseline for the delineation upstream of the apex is not shown. Please include.

10. Annotated Panels. For all panels, consider updating the Administrative Floodway note. Replace "Administrative Flooding" with "Administrative Floodway."

11. Digital CAD delineation. When the DWG is brought into ArcMap the letter "P" appears in front of most of the floodplain designation annotation; however, it does not appear when the DWG is opened in CAD. Any ideas as to what might be going on? No action is necessary since it is working in the CAD environment.

I have no more comments at this time.

Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: October 4, 2006

To: Valerie Swick, Project Manager
Planning and Project Management Division

From: Julie Cox, Senior Hydrologist
Engineering Division

Subject: Step 3 Recommended Alternative Report for Wagner Wash Subarea

I have reviewed the hydrology provided for the Wagner Wash Subarea Report (Volume 3); J.E. Fuller Hydrology & Geomorphology, Inc., August 2006. My comments are listed below and are referenced to the maps, models, and report.

Note that this is the second and final memo with my comments for the Wagner Wash Subarea.

1. Report, Appendix A, Pages 2 and 3. Replace the times to peak shown in the tables with the actual times to peak from the HEC-1 results.

2. Run all models with the IO record = 3 and include in the report appendices.

3. Change the L and Lca shown on the maps from miles to feet.

4. I compared the sub-basin parameters for this model to those developed for Area 4 Hydrology. The S125 basin area in this model is 0.113 sq mi vs. 0.093 sq mi for Area 4. The L and Lca also differ from Area 4. On the LG record, IA and RTIMP differ from Area 4. Shouldn't these be consistent? And of course the unit hydrograph differs from that used for Area 4. Please check and revise as necessary.

5. The ID records state the modeled area is 1.3 sq mi. This is only the case if the combined areas for S135A, S135B, S135C, and S135D add up to the 0.879 sq mi used for Area 4. Please check and revise as necessary.

6. For RR13, add a KM record that says "outlet based on assumed 2 ft pipe".

7. For route 35A35B, I calculated the slope as 0.021 ft/ft not 0.025 ft/ft as modeled. Please check and revise as necessary.

8. Report, Appendix B, Pages 2 and 3. Replace the times to peak shown in the tables with the actual times to peak from the HEC-1 results.

9. Include any Culvertmaster, Flowmaster, and/or HY8 output in appendices.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: October 6, 2006

To: Valerie Swick, Project Manager
Planning and Project Management Division

From: Julie Cox, Senior Hydrologist
Engineering Division

Subject: Step 3 Recommended Alternative Report for Hassayampa Subarea

I have reviewed the hydrology provided for the Hassayampa Subarea Report (Volume 4); J.E. Fuller Hydrology & Geomorphology, Inc., September 2006. My comments are listed below and are referenced to the maps, models, and report.

1. Report. The figures in the Hassayampa Subarea Report should pertain to the Hassayampa Subarea. There are several figures that are not located in the Hassayampa Subarea. I recommend removing Skyline Fan (Figure 2), Fan 36 (Figure 6), and Fans 36 and 37 (Figure 8) and replacing them with photos in the Hassayampa Subarea. Figures 2, 6, and 8 are not referenced in the report anyway.

2. Report, Appendix A, Pages 2 and 3. Replace the times to peak shown in the tables with the actual times to peak from the HEC-1 results.

3. Run all models with the IO record = 3 and include in the report appendices.

4. The top elevation for route F415A in the models differs from that shown on the Fan 4 sub-basin map. Please check and revise as necessary.

5. For the KK block C520AB, check the KM record and revise as necessary.

6. Change the L and Lca shown on the maps from miles to feet.

7. Fan 4 and Fan 5 Sub-basin maps. Label detention basins, concentration points, and routes.

8. Fan 4 and Fan 5 Sub-basin, Soil, and Land Use maps. Label detention basins. Label the Sun Valley Parkway. Add "Fan Apices" and the symbol to the Legends.

9. Fan 4 and Fan 5 Soil maps. Can't read. Please darken or thicken the contours.

10. Fan 5 Sub-basin map. Label elevations 1245 and 1341 ft.

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11. Fan 5 Soil map. Show and label Apex 5.

12. Fan 5 Land Use map. Enlarge the apex symbol and the number "5".

13. Report. Please number the pages in Appendix A.

14. Report, Appendix B, Pages 2 and 3. Replace the times to peak shown in the tables with the actual times to peak from the HEC-1 results.

15. Include any Culvertmaster, Flowmaster, and/or HY8 output in appendices.

16. Report, Page 3, Paragraph 3. Specify the number of miles, acres, and millions of dollars.

17. Report, Page 11. Change "the maximum of the values obtained from the 24-hour and 6-hour results were used" to "the maximum of the values obtained from the 24-hour and 6-hr results was used".

18. Report, Page 12. Change "Wagner sub-area" to "Hassayampa sub-area".

19. Report, Page 12. Change "AMDP" to "ADMP".

20. Report, Page 13, Paragraph 2. Change 2nd sentence to read "Ten percent of the 100-yr peak flow approximates the 2-year flow."

21. Report, Page 16. Change "Figure 4" to "Figure 17".

22. Report, Page 17, paragraph 1. Change the 2nd use of "Figure 18" to "Figure 19".

23. Report, Page 17. Change "Table 1" to "Table 2".

24. Report, Page 17. What is the source of the 820 cfs listed as the 100-yr discharge?

25. Report, Page 18. Change "Terrace 2 and 3" to "Terraces 2 and 3".

26. Report, Page 18. Change "Reinforce" to "Reinforced".

27. Report, Page 19. Change "basins located to reduce its visibility" to "basin located to reduce its visibility".

28. Report, Pages 19-26. Figures 20-22 and 25. I did not find references to these figures in the report. Please reference the figures in the report or remove them.

29. Report, Page 23. Change "over turning" to "overturning". Change "back fill" to "backfill".

30. Report, Page 23. Change "scoured to it maximum potential" to "scoured to its maximum potential".

31. Report, Page 23. Change "scenario's" to "scenarios".

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32. Report, Page 24. Change "grade control structure be places" to "grade control structure be placed"

33. Report, Page 24. Change "Wagner Wash" to "the Hassayampa River".

34. Report, Page 25. Change "moderate control" to either "moderate" or "control".

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: October 6, 2006

To: Valerie Swick, Project Manager, P&PM Division

From: Kathryn Gross, Senior Hydrologist, P&PM Division

Subject: White Tank Fan #4 and #5 TDN September 2006 Submittal

The TDN has been reviewed and is considered approved once the minor corrections listed below are addressed.

1. Section 6. On pages 6-33, 6-35, and 6-36, please update the sections numbers. Subsections under 6B5.2 are all listed as 6B.5.3.1.

2. Appendix B – Please make sure District provides a copy of the public meeting brochure and mailing list for inclusion prior to FEMA submittal.

3. Appendix E. For Fan 19 the discharges listed in the model notes does not match the discharge used in the model (hard copy and digital). Consider correcting the note and re-running the model.

4. Appendix G – Please include a placeholder in the TDN for appendix G that directs individuals to the stand-alone binder.

5. C Maps.

    - On Sheet 2, White Tank Fan #19's discharge is listed as 1655 cfs instead of 1660 cfs. Please update.

    - On Sheets 3 and 4, the old Wagner Wash location floodplain is using the floodway line symbol instead of the floodplain line symbol.

    - For all Sheets, in the legend it appears there is no line symbol for proposed floodplain, only proposed administrative floodway. Please consider adding the additional symbol to the legend.

    - For all Sheets, in the legend please change "Effective 100-year Administrative Floodway" to "Effective 100-year Floodway".

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- For all Sheets, in the legend, please re-verify the datum conversion values.

6. Annotated Panels.

    - On panel 1535H – Local zone designations are shown as well on this panel. Please remove.

    - On panel 1530J – Floodplain delineation along the old Wagner Wash alignment is shown as floodway. Please remove shading from this Zone A.

I have no more comments at this time.

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Flood Control District
of Maricopa County

MEMORANDUM

Date: October 16, 2006

To: Valerie Swick, EIT, Project Manager; Ted Lehman; Hari Sundararaghavan

From: Richard Waskowsky, Hydrologist, Engineering Application Development and River Mechanics Branch

Subject: Sun Valley ADMP, Buckeye FRS #2 & #3 Sub-Area (report and a CD), JE Fuller Hydrololgy/Geomorphology, dated September 2006; Report with CD was received by Engr. Application Development and River Mechanics Branch on 10/4/2006

The Engineering Application Development and River Mechanics Branch has finished its review and has the following comments. The consultant should submit written responses to these comments to the FCD.

The previous comments that still apply from the Wagner sub-area are shown with J E Fuller's responses. The Wagner comments that have been resolved are not shown in this memorandum. The FCD comments are shown in bold.

Sun Valley ADMP, Buckeye FRS #2 & #3 Draft Step 3 Report

1. FCD Comment (9/27/2006) - In the Allowable Velocity worksheet, the FHWA Minimum Velocity should actually be the FHWA Maximum Permissible Velocity. Also, how were the FHWA values for soil cement, riprap, gabions, and concrete developed?

   JEF Response (9/28/2006) - The label for FHWA Velocity will be changed to read as suggested. The values were arbitrarily set high in Step 2 to reflect "non-erodible" conditions. These material types are no longer being used in Step 3. However, we will modify the lookup table in the spreadsheet to contain the values shown in Table 6.3, pg. 6-15 of the 1996 FCD Hydraulics Manual.

   FCD Response (10/16/2006) – The Allowable Velocity worksheet has not been corrected.

2. FCD Comment (9/27/2006) - Table 6.1 in the FCD Hydrology Manual does not give a value for the 25 year and 50 year storm ratios, but the spreadsheet uses 0.55 and 0.75, respectively. How were these ratios developed?

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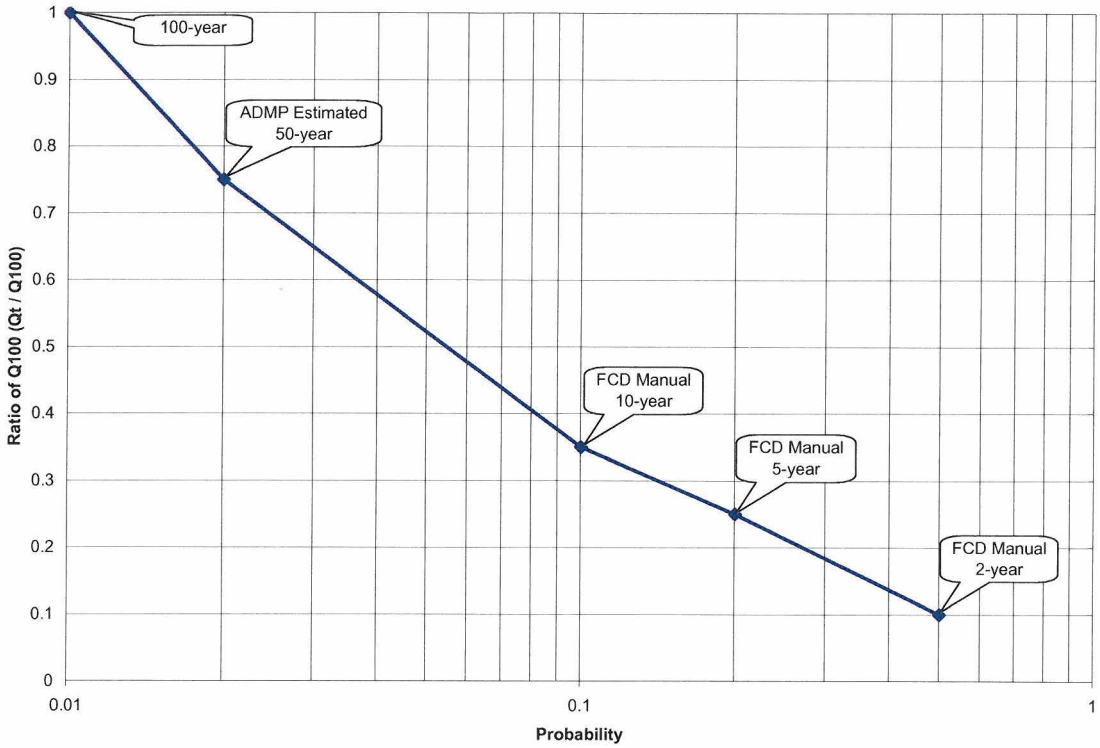
JEF Response (9/28/2006) - The following graph shows how the ADMP 50-year ratio was derived based on adding a point to a curve on a semi-log plot of the Q ratios vs. probability. The 25-year was not explicitly used in the ADMP.



FCD Response (10/16/2006) – The 25 year storm is used in the sediment yield analysis and still needs to be shown in the report and on the graph.

3. FCD Comment (9/27/2006) - In the spreadsheet, when the number of drop structures is not an integer number, the number designed for should be based on the next largest integer value (e.g. 1.27 would be 2).

JEF Response (9/28/2006) - The fractional number of drop structures is used only to estimate costs. The reach length at each cross-section is close to 1000 ft and the drop structure distances are also of the same order. We wanted not to lose partial grade controls over the entire length of the corridor. Rounding-off to integers at each cross-section will result in the use of more drop structures than needed for the purpose of cost estimation. The fractional numbers reflect the estimated spacing using a 3 foot drop height restriction. The placement of the actual drop structures are shown on the design maps based approximately on the spacing computed rather than strictly on the total number.

FCD Response (10/16/2006) – It would be clearer if in the cost estimate section of the report, there was a discussion explaining that the fractional portion of the drop structure calculations were only used for the cost estimate and are not put in the design. Basically, can you document your response in the report?

4. **FCD Comment (10/16/2006) – There are minor text errors in the report. For example on page 3, the cost estimate does not show a number, and on page 26 in (c) on the bottom of the left side there is a repeated comma. Please check the text for errors.**

5. **In the hydrology maps on pages 42 and 43, the symbol for the apices is not shown in the legend.**

6. **On page 10 section 5.1.1, if the report is to stand-alone, is there a way to explain the survey data without having to refer to another source (the District)?**

7. **On Figure 10 of the report, the symbol for the "10-ft topo" did not print in the legend.**

8. **For the inlet drop structures of section 5.7 of the report, please make a note that the structures will need to have scour protection, in accordance with the equations from the USBR manual (Pemberton and Lara, 1984). For example in Figure 19, no cutoff walls or erosion protection is shown downstream of the structures. This might give the impression that no erosion protection is necessary. Please make a note of the need for adequately sized erosion protection.**

9. **On page 10 of the report in the first full paragraph of the page, when the 4:1 slope is mentioned, is this slope only used in the cost estimate or will it affect the rating curve in the spreadsheet?**

10. **On page 20 in the on-line basin design procedure, please list the design criteria and tell how the "volume and depth are adequate". For all the design procedures, please list the characteristics that were being designed to and what constitutes the "optimum" configuration.**

Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: October 17, 2006

To: Valerie Swick, EIT, Project Manager, Planning and Project Management Branch

From: David Degerness, P.E. Senior Civil Engineer, Engineering Application and River Mechanics Branch

Subject: Sun Valley ADMP, Step 3 Recommended Alternative Report, Volume 2: CAP Sub Area, September 2006

I have finished my review of the above referenced document and I have the following comments.

The following comments are carried over from the Wagner Sub-Area Review:

1. In the Allowable Velocity worksheet, the FHWA Minimum Velocity should actually be the FHWA Maximum Permissible Velocity.

2. In the spreadsheet, in the Soil Erodibility worksheet, there are some errors. Some of the percentages and K factors do not match the percentages in the FCD Hydrology Manual and the K factors given in the Aguila-Carefree soil survey.

3. On page 12, section 5.5 of the report, the reference is for the ADWR (1985) design manual, but the equation for annual sediment yield is from the AMAFCA (1994) manual. Please also reference the AMAFCA manual.

4. In worksheet "RR900", the printed equation for "LS" should have 0.065 rather than the listed 0.65. Also, the same equation is listed as "Equation 8.4" rather; it is "Equation B.4". The heading for the "RR150 worksheet should be listed as "Design Sediment Yield (MUSLE)" not "Design Sediment Yield (MUSCLE)".

The following comments are new for this review.

5. The "Main" worksheet has more buttons than existed for previous worksheets or sub areas. Please explain why

6. Page 16 of the report, the reference to figure 4 showing the stilling basins should be provided as figure 17.

7. Page 18 of the report, the reference to table 1 should be referenced to table 2.

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8. Page 19 of the report, the figure showing the off line detention basin should be labeled as figure 21.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: October 18, 2006

To: Valerie Swick, Project Manager, P&PM Division

From: Kathryn Gross, Senior Hydrologist, P&PM Division

Subject: White Tank Fans #3, #13 and #16 TDN October 2006 Submittal

The TDN has been reviewed and is considered approved once the minor corrections listed below are addressed.

1. Section 2, Fan Forms. For Fans 3, 13, and 16, Section B, number 4, the model name still reads zone_a instead of the updated name zone_a31316.

2. Section 6. On pages 6-33, 6-35, and 6-36, please update the sections numbers. Subsections under 6B5.2 are all listed as 6B.5.3.1.

3. Section 6. Figure 6.8. Fan 20's apex is not included.

4. Appendix B – Please make sure District provides a copy of the public meeting brochure and mailing list for inclusion prior to FEMA submittal.

5. Appendix G – Please include a placeholder in the TDN for appendix G that directs individuals to the stand-alone binder.

6. C Maps.

    - On Sheet 2, baselines for upstream delineations are not included. Please add.
    - On Sheets 2, and 3, at the jurisdiction limits, please change the "City of Buckeye" to "Town of Buckeye". (Sorry for the oversight in the last review)
    - For all Sheets, in the legend please change "Effective 100-year Administrative Floodway" to "Effective 100-year Floodway". (Sorry for the oversight in the last review)

7. Annotated Panels. For panel 1095H, the Administrative Floodway note is missing from this panel. Please add.

I have no more comments at this time.

2801 West Durango Street Phoenix, Arizona 85009 Phone: 602-506-1501 Fax: 602-506-4601

Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: October 18, 2006

To: Valerie Swick, Project Manager, P&PM Division

From: Kathryn Gross, Senior Hydrologist, P&PM Division

Subject: White Tank Fan #17, 18, and 19 TDN October 2006 Submittal

The TDN has been reviewed and is considered approved once the minor corrections listed below are addressed.

1. Section 6. On pages 6-33, 6-35, and 6-36, please update the sections numbers. Subsections under 6B5.2 are all listed as 6B.5.3.1.

2. Appendix B – Please make sure District provides a copy of the public meeting brochure and mailing list for inclusion prior to FEMA submittal.

3. Appendix E. For Fan 19 the discharges listed in the model notes does not match the discharge used in the model (hard copy and digital). Consider correcting the note and re-running the model.

4. Appendix G – Please include a placeholder in the TDN for appendix G that directs individuals to the stand-alone binder.

5. C Maps.

    - On Sheet 2, White Tank Fan #19's discharge is listed as 1655 cfs instead of 1660 cfs. Please update.

    - On Sheets 3 and 4, the old Wagner Wash location floodplain is using the floodway line symbol instead of the floodplain line symbol.

    - For all Sheets, in the legend it appears there is no line symbol for proposed floodplain, only proposed administrative floodway. Please consider adding the additional symbol to the legend.

    - For all Sheets, in the legend please change "Effective 100-year Administrative Floodway" to "Effective 100-year Floodway".

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- For all Sheets, in the legend, please re-verify the datum conversion values.

6. Annotated Panels.

   - On panel 1535H – Local zone designations are shown as well on this panel. Please remove.

   - On panel 1530J – Floodplain delineation along the old Wagner Wash alignment is shown as floodway. Please remove shading from this Zone A.

I have no more comments at this time.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: October 20, 2006

To: Valerie Swick, Project Manager, P&PM Division

From: Kathryn Gross, Senior Hydrologist, P&PM Division

Subject: White Tank Fan #10, 11, and 20 TDN October 2006 Submittal

The TDN has been reviewed and is considered approved once the minor corrections listed below are addressed.

1. Section 2. FEMA forms. H&H forms, Section 4, B. For each fan the model name still reads zonea instead of the updated name zonea101120.

2. Section 6. Figure 6.8. Fan 20's apex is not included.

3. Appendix B – Please make sure District provides a copy of the public meeting brochure and mailing list for inclusion prior to FEMA submittal.

4. Appendix E. For Fan 20 no discharge is listed in the model note (hard copy and digital). Consider correcting the note and re-running the model.

5. Appendix G – Please include a placeholder in the TDN for appendix G that directs individuals to the stand-alone binder.

6. C Maps. (Sheet 2)

    - In the legend it appears there is no line symbol for proposed floodplain, only proposed administrative floodway. Please consider adding the additional symbol to the legend.

    - In the legend please change "Effective 100-year Administrative Floodway" to "Effective 100-year Floodway".

    - In the legend, please re-verify the datum conversion values.

I have no more comments at this time.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: October 23, 2006

To: Valerie Swick, Project Manager
Planning and Project Management Division

From: Julie Cox, Senior Hydrologist
Engineering Division

Subject: Step 3 Recommended Alternative Report for CAP Subarea

I have reviewed the hydrology provided for the CAP Subarea Report (Volume 2); J.E. Fuller Hydrology & Geomorphology, Inc., September 2006. My comments are listed below and are referenced to the maps, models, and report.

1. Report, Appendix A, Pages 2 and 3. Replace the times to peak shown in the tables with the actual times to peak from the HEC-1 results.

2. Report, Appendix A, Pages 2 and 3. The tables do not include the results for "TOFAN1" and 2 instances of "DOUT". Please check and revise as necessary.

3. Run all models with the IO record = 3 and include in the report appendices.

4. Change the L and Lca shown on the maps from miles to feet.

5. Fans 1 & 2 Sub-basin Maps. Label detention basins, concentration points, and routes.

6. Report. Please number the pages in Appendix A.

7. Report, Footnotes. Change references to "Wagner Wash Sub-area" and "Hassayampa Sub-area" to "CAP Sub-area".

8. Include any Culvertmaster, Flowmaster, and/or HY8 output in appendices.

9. Report, Page 12. Change "the maximum of the values obtained from the 24-hour and 6-hour results were used" to "the maximum of the values obtained from the 24-hour and 6-hr results was used".

10. Report, Page 12. Change "Wagner sub-area" to "CAP sub-area".

11. Report, Page 12. Change "AMDP" to "ADMP".

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12. Report, Page 13, Paragraph 2. There is something missing in the sentence "A brief discussion of the design approach for is included in the discussion of each structural component." Please review and revise as necessary.

13. Report, Page 13. Change "The on-line detention basin for each fan system are ideally located" to "The on-line detention basin for each fan system is ideally located".

14. Report, Page 14, Paragraph 1. Change 2nd sentence to read "Ten percent of the 100-yr peak flow approximates the 2-year flow."

15. Report, Page 16. Change "Figure 4" to "Figure 17".

16. Report, Page 17, paragraph 1. Change the 2nd use of "Figure 18" to "Figure 19".

17. Report, Page 18. Change "Table 1" to "Table 2".

18. Report, Page 18. Change "Terrace 2 and 3" to "Terraces 2 and 3".

19. Report, Page 18. Change "Reinforce" to "Reinforced".

20. Report, Page 19. Change "Figure21shows" to "Figure 21 shows".

21. Report, Page 20. Change "basins located to reduce its visibility" to "basin located to reduce its visibility".

22. Report, Page 24. Change "over turning" to "overturning". Change "back fill" to "backfill".

23. Report, Page 25. Change "scoured to it maximum potential" to "scoured to its maximum potential".

24. Report, Page 25. Change "scenario's" to "scenarios".

25. Report, Page 26. Change "grade control structure be places" to "grade control structure be placed"

26. Report, Page 26. Change "moderate control" to either "moderate" or "control".

27. Report, Pages 3-28. Figures 1-2, 6, 8, 13, 20-21, 23-25, and 27-28. I did not find references to these figures in the report. Please reference the figures in the report or remove them. Please label Figure 21 if it is to remain in the report.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: October 23, 2006

To: Valerie Swick, Project Manager
Planning and Project Management Division

From: Julie Cox, Senior Hydrologist
Engineering Division

Subject: Step 3 Recommended Alternative Report for CAP Subarea

I have reviewed the hydrology provided for the CAP Subarea Report (Volume 2); J.E. Fuller Hydrology & Geomorphology, Inc., September 2006. My comments are listed below and are referenced to the maps, models, and report.

1. Report, Appendix A, Pages 2 and 3. Replace the times to peak shown in the tables with the actual times to peak from the HEC-1 results.

2. Report, Appendix A, Pages 2 and 3. The tables do not include the results for "TOFAN1" and 2 instances of "DOUT". Please check and revise as necessary.

3. Run all models with the IO record = 3 and include in the report appendices.

4. Change the L and Lca shown on the maps from miles to feet.

5. Fans 1 & 2 Sub-basin Maps. Label detention basins, concentration points, and routes.

6. For the KK block "TOFAN2" please add more DI/DQ records to define what flows are diverted between inflows of 0 and 10,000 cfs.

7. Report, Basins Summary. For D115B, change 1050 (cfs) to 147 ac-ft. For D120A, change 950 (cfs) to 76 ac-ft.

8. For route 15B15C, I calculated the slope as 0.011 ft/ft not 0.002 ft/ft as modeled. Please check and revise as necessary.

9. For route 115120, I calculated the slope as 0.009 ft/ft not 0.002 ft/ft as modeled. Please check and revise as necessary.

10. Report. Please number the pages in Appendix A.

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11. Report, Footnotes. Change references to "Wagner Wash Sub-area" and "Hassayampa Sub-area" to "CAP Sub-area".

12. Include any Culvertmaster, Flowmaster, and/or HY8 output in appendices.

13. Report, Page 12. Change "the maximum of the values obtained from the 24-hour and 6-hour results were used" to "the maximum of the values obtained from the 24-hour and 6-hr results was used".

14. Report, Page 12. Change "Wagner sub-area" to "CAP sub-area".

15. Report, Page 12. Change "AMDP" to "ADMP".

16. Report, Page 13, Paragraph 2. There is something missing in the sentence "A brief discussion of the design approach for is included in the discussion of each structural component." Please review and revise as necessary.

17. Report, Page 13. Change "The on-line detention basin for each fan system are ideally located" to "The on-line detention basin for each fan system is ideally located".

18. Report, Page 14, Paragraph 1. Change 2nd sentence to read "Ten percent of the 100-yr peak flow approximates the 2-year flow."

19. Report, Page 16. Change "Figure 4" to "Figure 17".

20. Report, Page 17, paragraph 1. Change the 2nd use of "Figure 18" to "Figure 19".

21. Report, Page 18. Change "Table 1" to "Table 2".

22. Report, Page 18. Change "Terrace 2 and 3" to "Terraces 2 and 3".

23. Report, Page 18. Change "Reinforce" to "Reinforced".

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25. Report, Page 20. Change "basins located to reduce its visibility" to "basin located to reduce its visibility".

26. Report, Page 24. Change "over turning" to "overturning". Change "back fill" to "backfill".

27. Report, Page 25. Change "scoured to it maximum potential" to "scoured to its maximum potential".

28. Report, Page 25. Change "scenario's" to "scenarios".

29. Report, Page 26. Change "grade control structure be places" to "grade control structure be placed"

30. Report, Page 26. Change "moderate control" to either "moderate" or "control".

31. Report, Pages 3-28. Figures 1-2, 6, 8, 13, 20-21, 23-25, and 27-28. I did not find references to these figures in the report. Please reference the figures in the report or remove them. Please label Figure 21 if it is to remain in the report.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: October 23, 2006

To: Valerie Swick, EIT, Project Manager, Planning and Project Management Branch

From: David Degerness, P.E., Senior Civil Engineer, Engineering Application and River Mechanics Branch

Subject: Sun Valley ADMP, White Tanks Wash Sub Area, Step 3 Recommended Alternative

I have finished my review of the above reference document and I have the following comments.

1. Page 20, Section 5.7.5, last paragraph. The paragraph describes the terraced inlet as having 5 drops of 5 feet as shown in Figure 19. However, Figure 19 shows 4 drops of 5 feet and two of 4 feet. Please redraw the figure or change the wording in the paragraph.

2. Page 34, Section 9. The third sentence states that the off-line detention basin for fan system 38 were not estimated. The report should briefly describe why the cost was not estimated for the off-line detention basin.

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Flood Control District
of Maricopa County

MEMORANDUM

Date: October 26, 2006

To: Valerie Swick, EIT, Project Manager; Ted Lehman; Hari Sundararaghavan

From: Richard Waskowsky, Hydrologist, Engineering Application Development and River Mechanics Branch

Subject: Sun Valley ADMP, Buckeye FRS #1 Sub-Area (report and a DVD), JE Fuller Hydrololgy/Geomorphology, dated October 2006; Report with DVD was received by Engr. Application Development and River Mechanics Branch on 10/18/2006

The Engineering Application Development and River Mechanics Branch has finished its review and has the following comments. The consultant should submit written responses to these comments to the FCD.

The previous comments that still apply from the Wagner sub-area are shown with J E Fuller's responses. The Wagner comments that have been resolved are not shown in this memorandum. The FCD comments are shown in bold.

Sun Valley ADMP, Buckeye FRS #1 Draft Step 3 Report

1. FCD Comment (9/27/2006) - In the Allowable Velocity worksheet, the FHWA Minimum Velocity should actually be the FHWA Maximum Permissible Velocity. Also, how were the FHWA values for soil cement, riprap, gabions, and concrete developed?

   JEF Response (9/28/2006) - The label for FHWA Velocity will be changed to read as suggested. The values were arbitrarily set high in Step 2 to reflect "non-erodible" conditions. These material types are no longer being used in Step 3. However, we will modify the lookup table in the spreadsheet to contain the values shown in Table 6.3, pg. 6-15 of the 1996 FCD Hydraulics Manual.

   FCD Response (10/16/2006) – The Allowable Velocity worksheet has not been corrected.

2. FCD Comment (9/27/2006) - In the spreadsheet, when the number of drop structures is not an integer number, the number designed for should be based on the next largest integer value (e.g. 1.27 would be 2).

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JEF Response (9/28/2006) - The fractional number of drop structures is used only to estimate costs. The reach length at each cross-section is close to 1000 ft and the drop structure distances are also of the same order. We wanted not to lose partial grade controls over the entire length of the corridor. Rounding-off to integers at each cross-section will result in the use of more drop structures than needed for the purpose of cost estimation. The fractional numbers reflect the estimated spacing using a 3 foot drop height restriction. The placement of the actual drop structures are shown on the design maps based approximately on the spacing computed rather than strictly on the total number.

FCD Response (10/16/2006) – It would be clearer if in the cost estimate section of the report, there was a discussion explaining that the fractional portion of the drop structure calculations were only used for the cost estimate and are not put in the design. Basically, can you document your response in the report?

4. **On page 13 section 5.1.1, if the report is to stand-alone, is there a way to explain the survey data without having to refer to another source (the District)?**

5. **On Figure 10 of the report, the symbol for the "10-ft topo" did not print in the legend.**

6. **For all drop structures of the report, please make a note that the structures will need to have scour protection, in accordance with the equations from the USBR manual (Pemberton and Lara, 1984). For example in Figure 19, no cutoff walls or erosion protection is shown downstream of the structures. This might give the impression that no erosion protection is necessary. Please make a note of the need for adequately sized erosion protection.**

7. **On page 22 of the report in the first full paragraph of the page, when the 4:1 slope is mentioned, is this slope only used in the cost estimate or will it affect the rating curve in the spreadsheet?**

8. **On page 22 in the on-line basin design procedure, please list the design criteria and tell how the "volume and depth are adequate". For all the design procedures, please list the characteristics that were being designed to and what constitutes the "optimum" configuration.**

9. **In the final report, please mention that the enclosed data is on a DVD, rather than a CD or put it on multiple CDs in a flap at the end of the report.**

10. **On page 12 of the report, the first sentence has an error. It should read "Within the FRS No. 1..." not "Within the FRS No. 1 3...".**

11. **On page 19 in section 5.7.4 and 5.7.5, the report talks about fan systems 13 and 3, but the report would be clearer if the fan systems that were analyzed in the report were from the same sub-area as the report. Would it be possible to use fans from the current sub-area in this section for each report?**

12. **On pages 32, 34, and 35, the last paragraph on each page has incorrect spacing.**

13. On page 5 of Appendix A, there is an example of the printed equations in the spreadsheet having incorrect spacing. The K and LS equations have portions of the equation cut off when the page is printed. Please check the size limits to ensure that the whole equation prints.

14. On page 9 of Appendix A, there is an erroneous "click-down" box in the sediment data section. From the Excel file, this box appears in every corridor sheet.

15. On page 11 of Appendix A and in the Excel corridor worksheets, the graph shows the water surface extending into the channel cross-section. Would it be possible to have a note which clarifies that the water surface does not actually extend into the cross-section?

16. In the scour calculation portion of the engineered corridor, long-term scour is listed as a component, but in the report long-term scour was not included in the scour calculations due to the presence of grade control structures. Is this actually local scour, and if so, what causes the local scour?

17. For readability, in the scour calculation portion of the engineered corridor worksheets, please remove the label "general scour equations", change the "Scour Calculations" title to "Total Scour Calculations" along with a printed form of the total scour equation (given in the ADWR Manual), and place the components of scour next to each other at the end of the table.

18. In the "Design Summary" worksheet for FAN37, all calculated cells give a reference error. What are the correct references?

19. For the cross-section H1F37L2b1_10, the velocity given in the GIS shapefile is given as 10 ft/s, but in the spreadsheet for the H1F37L2b1_10 worksheet, the maximum initial velocity is only 2.9 ft/s. What is the reason for difference?

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: October 26, 2006

To: Valerie Swick, EIT, Project Manager, Planning and Project Management Branch

From: David Degerness, P.E., Senior Civil Engineer, Engineering Application and River Mechanics Branch

Subject: Sun Valley ADMP, White Tanks Wash Sub Area, Step 3 Recommended Alternative

I have finished my review of the above reference document and I have the following comments.

The following comments were provided on October 23, 2006:

1. Page 20, Section 5.7.5, last paragraph. The paragraph describes the terraced inlet as having 5 drops of 5 feet as shown in Figure 19. However, Figure 19 shows 4 drops of 5 feet and two of 4 feet. Please redraw the figure or change the wording in the paragraph.

2. Page 34, Section 9. The third sentence states that the off-line detention basin for fan system 38 were not estimated. The report should briefly describe why the cost was not estimated for the off-line detention basin.

The comments provided below are from this review dated October 26, 2006.

3. Page 21 of the report showing the elevation and plan view of the trash rack over the outlet for the basins should be labeled as figure 20.

4. In the Allowable Velocity worksheet, the FHWA Minimum Velocity should actually be the FHWA Maximum Permissible Velocity. Also, how were the FHWA values for soil cement, riprap, gabions, and concrete developed?

5. In the spreadsheet, in the Soil Erodibility worksheet, there are some errors. Some of the percentages and K factors do not match the percentages in the FCD Hydrology Manual and the K factors given in the Aguila-Carefree soil survey.

6. For readability, in the scour calculation portion of the engineered corridor worksheets, please remove the label "general scour equations", change the "Scour Calculations" title to "Total Scour Calculations" along with a printed form of the total scour equation (given in the ADWR Manual), and place the components of scour next to each other at the end of the table.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: November 3, 2006

To: Valerie Swick, Project Manager
Planning and Project Management Division

From: Julie Cox, Senior Hydrologist
Engineering Division

Subject: Step 3 Recommended Alternative Report for White Tank Wash Subarea

I have reviewed the hydrology provided for the White Tank Wash Subarea Report (Volume 5); J.E. Fuller Hydrology & Geomorphology, Inc., October 2006. My comments are listed below and are referenced to the maps, models, and report.

1. Several reaches of the walled levee corridors have velocities exceeding 6 ft/sec. These reaches are listed below. All are unlined channels. Please look at the design parameters and change as necessary to decrease these erosive velocities. This comment applies to all six of the Step 3 subarea reports.

SUBAREA AND REACH	VELOCITY (ft/sec)
CAP: H191A91B_4 & B_3 & B_2, H191B915_3, H191592A_2 & A_1	6.0 – 8.0
Buckeye FRS #1: H1F37L2B1_7 & 1 _5 & 1_4 & 1_3 & 1_2 & 1_1, H1L2B1L2B2_8 & 2_7 & 2_6 & 2_5, H1L2B2L3B_6 & B_5 & B_4, H1L3BL3C_4, H1L3BL3C_1, H1L3CE6A_4 & A_3 & A_2 & A_1	6.0 – 7.2
White Tank Wash: H1F1F2_2, H1F6E2B_3, and H1E2BE3C_7	6.0 – 6.5
Hassayampa: H110A10C_3 & C_2, H110C10D_2, H110D30A_5 & A_3 & A_2 & A_1, H130A30B_4 & B_2	6.0 – 6.2

2. Please review previous editorial comments for the Wagner, Hassayampa, and CAP subareas. Please ensure the same items have been addressed in the White Tank Wash Report.

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3. The Fan 38 maps show a basin but the HEC-1 models do not include a basin. Please check and revise as necessary.

4. Please add the symbol for 50-ft contours to the legend of the Fan 38 land use and soil maps.

5. Please check the modeled area included in the ID records. For the Fans 6 & 39 models, the area should be 11.4 sq mi vs. the 10.5 sq mi shown.

6. Please check the modeled area included in the ID records. For the Fan 38 models, the area should be 13.4 sq mi vs. the 12.0 sq mi shown.

7. Report, Table of Contents, Section 4. Change "FRS No. 1 Subarea" to "White Tank Wash Subarea".

8. Report, Page 4 of 121, Channels Summary. The drop structure difference shown for H1F3E3A_3 is 33,333 ft. Please check and change as necessary.

9. Report, Page 4 of 121, Basins Summary. For RRE1, change peak storage from 68.5 to 69.3 ac-ft and change peak flow d/s of basin from145 to 139 ac-ft.

10. Report, Appendix A, Pages 2 and 3. Replace the times to peak shown in the tables with the actual times to peak from the HEC-1 results.

11. Report, Appendix B, Pages 2 and 3. The tables do not include the results for "38OUT". Please check and revise as necessary.

12. Report, Appendix B, Pages 2 and 3. Replace the times to peak shown in the tables with the actual times to peak from the HEC-1 results.

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Flood Control District
of Maricopa County

INTEROFFICE MEMORANDUM

Date: November 3, 2006

To: Valerie Swick, Project Manager
Planning and Project Management Division

From: Julie Cox, Senior Hydrologist
Engineering Division

Subject: Step 3 Recommended Alternative Report for Buckeye FRS #1 Subarea

I have reviewed the hydrology provided for the Buckeye FRS #1 Subarea Report (Volume 6); J.E. Fuller Hydrology & Geomorphology, Inc., October 2006. My comments are listed below and are referenced to the maps, models, and report.

1. Please review previous editorial comments for the Wagner, Hassayampa, and CAP subareas. Please ensure the same items have been addressed in the Buckeye FRS #1 Report.

2. Please check the modeled area included in the ID records. For the Fan 37 models, the area should be 13.1 sq mi vs. the 3.3 sq mi shown.

3. Please add "Fan Apices" to the legends of the Appendix A, B, and C maps.

4. For Appendix B and C maps, please change the symbols for sub-basin centroids and elevation points to be consistent with other subarea maps.

5. For Appendix B and C maps, please add north arrow.

6. Appendix A, Sub-basin Map. Change view port to be consistent with other map view ports.

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Flood Control District
of Maricopa County

MEMORANDUM

Date: November 7, 2006

To: Valerie Swick, EIT, Project Manager; Ted Lehman; Hari Sundararaghavan

From: Richard Waskowsky, Hydrologist, Engineering Application Development and River Mechanics Branch

Subject: Sun Valley ADMP, Wagner Sub-Area (Step 3, report and CD), JE Fuller Hydrology/Geomorphology, dated October 2006; Report with CD was received by Engr. Application Development and River Mechanics Branch on 10/31/2006

The Engineering Application Development and River Mechanics Branch has finished its review and has the following comments. The consultant should submit written responses to these comments to the FCD.

Sun Valley ADMP, Wagner Sub-Area Step 3 Report

1. In the report, section 5.10.4 Scour and Toe Protection, the antidune equation on page 28 is in the wrong format if the ½ term is included in the total scour equation on page 27. If the total scour equation has the ½ term, the antidune equation should read $0.027V^2$.

2. In the report, section 5.10.4 Scour and Toe Protection, please list all six terms of total scour in the total scour equation (in the format of equation 5.28 in the ADWR manual) and in the following paragraphs provide a discussion for each term. For example, the long-term degradation should be listed and a discussion should be provided which clarifies that the 1.5 is an average and scour will be more or less depending on the distance from the drop structure. Therefore, when the project goes to construction, more detailed analyses would be needed for construction.

3. For the cross-section H1F1335A_2, the velocity given in the GIS shapefile is given as 5.3 ft/s, but in the spreadsheet for the H1F1335A_2 worksheet, the maximum initial velocity is only 4.8 ft/s. Which velocities and other attributes from the spreadsheet are the attributed in the shapefiles based on? Are they supposed to match exactly?

4. In the shapefiles for fans 17 and 18, the corridor buffer area for fan 16 is shown in the buffer area shapefile.

5. On page 4 of the report, Figure 1 is not referenced in the text.

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6. On page 12 of the report in the first sentence of the first paragraph there are erroneous parentheses.

7. On page 25 of the report, the second bullet point under section 5.9, what exactly does the sentence "The total sediment for the 3-year maintenance period was removed from the lower portion of the computed stage-volume relationship." mean? Does it mean the sediment volume is included in the total basin volume estimate or that it is removed in the basin volume? This sentence could be made clearer.

8. On page 32 of the report the last bullet point on the left side, there is an erroneous section reference.

9. In the report in the Fan System Design Summaries, the second sentence "The alternative includes both non-structural and environmentally friendly and aesthetically compatible structural flood control measures." could be made clearer. One recommendation is "This alternative includes non-structural and structural flood control measures, with the structural measures designed to be both environmentally friendly and aesthetically compatible.".

10. In the module "modChnlXS", there are comments that read, "The data starting in column 1 gives the channel cross-section for the channel as designed. The data starting in column 9 gives the channel cross-section for the channel without aesthetic treatment.", however, there is no data in column 9 for the cross-section in the spreadsheet. Is this a remnant from the previous version of the macro?

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Flood Control District
of Maricopa County

MEMORANDUM

Date: November 15, 2006

To: Valerie Swick, EIT, Project Manager; Ted Lehman; Hari Sundararaghavan

From: David Degerness, P.E., Senior Civil Engineer, Engineering Application Development and River Mechanics Branch; Richard Waskowsky, Hydrologist, Engineering Application Development and River Mechanics Branch

Subject: Sun Valley ADMP, Step 3 Recommended Alternative Report, Volume 1, Executive Summary and Overview (draft), November, 2006, JE Fuller Hydrology and Geomorphology, received by Engineering Application Development and River Mechanics Branch on November 8, 2006.

1. The following comments are for this draft summary report. Since the summary report is a summary of other reports, which are still being finalized, this summary report needs to be revised and submitted for review after other reports are finalized based on the District comments.

2. Page 12, third paragraph. The word "truck" should be replaced with the word trunk.

3. Page 14, Table 1. The totals for the White Tanks Wash and Hassayampa Sub-areas do not match the costs provided in the draft reports dated October and September 2006 respectively. To make a true comparison the FCD needs the final copy for each sub-area.

4. Page 24, figure 11. A narrative describing figure 11 should be added somewhere in the report. It appears to be a stand-alone figure with no reference.

5. Page 27, table 2. "AWDR" in the agencies column should be changed to ADWR.

6. Page 27, table 2. The FCD should also be among the list of stakeholder agencies. ?????

7. Page 32, third paragraph. The word "twenty" should be capitalized in the sentence talking about stock tanks.

8. Page 33, section 4.2. I think it would be helpful if a figure were provided showing the extent of the North of CAP Sub-area. It is not shown on figure 5, but it is shown in figure 18. An early reference to figure 18 may be helpful in this portion of the report.

9. Page 54, section 4.3.5., second paragraph. "Within the FRS No. 1 3 sub-area," may contain a typographical error.

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10. Page 56, section 4.3.5.3., last sentence in the first paragraph. There are two periods in the sentence.

11. Page 57, top of the page. There are two periods in the second to last sentence of the paragraph.

12. Page 58, bottom of the page. There are two periods at the end of the first sentence.

13. Page 62, table 4. The table is missing its headings for the design criteria.

14. Page 90, Figure 42 appears to be the same as figure 37 for the walled levee corridor. They both seem to show a floodwall at the top of the rendering.

15. Page 99, table 6. This table is missing a cost item that appears in the Wagner Wash Sub-area final report on page 37. The cost item is called outlet cost.

16. On page 7, the second sentence could be combined with the third for readability. For example, it could read "... and the Hassayampa River, with the majority of the area located within the Town of Buckeye.". The same correction can also occur on page 20, section 2.4

17. On page 7, could another figure, similar to Figure 3 in the Step 3 Wagner Report, be added and referenced in the first sentence.

18. On page 9, second paragraph, the third sentence should read "... was conducted...".

19. Figure 5 is referenced before Figure 3, therefore, Figure 5 should be labeled as Figure 3 and placed nearer to page 10 and Figures 3 and 4 should become Figures 4 and 5, respectively.

20. On page 29, should the last sentence in the last paragraph read "Step 2" instead of "Step 3"?

21. On page 32 in the last paragraph in the second sentence, please change "... as they..." to "... as the guidelines...".

22. On page 32 in the last paragraph, the last sentence on the page should read "... of large master planned communities, with many of these communities impacted...".

23. On page 40 in section 4.2.5, please reference Figure 18 and have a brief discussion of what the figure is showing.

24. On page 46 in the last paragraph, the fifth sentence would be clearer if a "the" was placed before floodwall. This correction also occurs in the other fan system discussions.

25. On page 47 in section 4.3.2.2, the second sentence should have an "on" placed before "the uphill...".

26. On page 61 in the Sediment Gradation section, the value for D16 does not match what is shown in the Wagner Step 3 spreadsheet. In the report it is listed as 0.16 mm, while in the

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spreadsheet it is 0.17 mm. This error also occurs in the Wagner Step 3 report. Please make sure a consistent value is listed.

27. In section 5.7.2 Inlet Design Concepts, the number of concepts is reduced from 5 in the Wagner Step 3 report to 2 in the Summary report. Why are they reduced, and shouldn't the number be consistent for all reports?

28. In the report, section 5.9.4 Scour and Toe Protection, please list all six terms of total scour in the total scour equation (in the format of equation 5.28 in the ADWR manual).

29. On page 85 in Table 5, the heading has an erroneous "^".

30. On page 92 in the fourth sentence, "Flood Control" should not be capitalized.

31. Page numbers 98 and 99 are duplicated.

32. On the second page 99, there are duplicate periods at the end of paragraphs 3 and 4.

33. On page 100, there is a duplicate period at the end of the last paragraph.

34. On page 104 in the second paragraph, "Figures 35 – 41" should read "Figures 44 – 49".

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12/28/06

MEMO TO: Jon Fuller, JE Fuller Hydrology/Geomorphology, Inc.

FROM: Valerie Swick

SUBJECT: Comments on Step 3, Volume 1, Executive Summary & Overview

Page 12, 6th line down: Instead of saying "detention basin depths limited to a maximum of 12 feet" say "detention basin **storage** depths limited to a maximum of 12 feet."

Page 15: The table needs to indicate that the costs are in millions of dollars.

Page 21, Section 2.3: A contract does not authorize a study to occur; only a statute can authorized. Instead of saying authorized say conducted or some other similar word.

Page 21, Section 3.1, last line of second paragraph: What constitutes a large flood? Do we have any frequency to this event? Can we say that in other parts of the Valley we had a 100-year event or something like that?

Page 22, Photo: Need to show direction of flow, north arrow, photo source. Where on Fan 36 is this area?

Page 24, 1st full paragraph: The Alternatives B1 and B4-3 are referenced, we need to reference the Step 2 process and the Volume in which someone could find more details.

Page 25, Section 3.2, fourth line: Delete the word "directly".

Page 26, Section 3.4: There is no reference to the public meetings. We should at least mention the dates of the public meetings.

Page 27, Section 3.5.1, fifth line: Starting with the full sentence it should read: "The Sun Valley ADMP area is outside the historic range and required survey area of the Pygmy owl." Delete the rest of the sentence.

Page 28, First paragraph: If we are out of the historic range of the Pygmy owl, why do we still recommend performing a detailed study? Maybe we can add to the sentence "if indications are present". We don't want to do a detailed survey if it's not needed.

Page 28, Section 3.5.2, fourth line: Don't we have an estimated amount of disturbance?

Page 29, first paragraph: Reference the map in Appendix C for locations of hazardous areas.

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Page 36, Photo: Photo needs date, location (which you already have), photo source.

Page 41, first partial paragraph: Why are we recommending removing all the stock tanks?

Page 43, Section 4.3.1.1: Instead of giving an average depth give a max and min.
The second paragraph references the required volume of storage to be 115 acre-feet but in the last paragraph 712 ac-ft of total excavation required. The excavation and backfill dirt volumes should be in cubic yards. Therefore there will not be confusion of comparing the 115 ac-ft of storage to 712 ac-ft excavated volume.

Page 45, last paragraph: Again backfill and total excavation volume should be in cubic yards. And also include the max and min depth instead of average.

Page 46, Section 4.3.2.2, first paragraph: Use the number 10 instead of spelling it out. Backfill and total excavation volume should be in cubic yards. And also include the max and min depth instead of average.

Page 46, Section 4.3.2.3, first paragraph: Use the number 8 instead of spelling it out. Backfill and total excavation volume should be in cubic yards. And also include the max and min depth instead of average.

Page 47, Sections 4.3.2.4 and 4.3.2.5: Backfill and total excavation volume should be in cubic yards.

Page 48, first paragraph: Question from Greg 'Does the first sentence indicate that sheet flow is allowed over the road?'

Page 50, Section 4.3.3.2, last paragraph: Use the number 11 instead of spelling it out. Backfill and total excavation volume should be in cubic yards. And also include the max and min depth instead of average.

Page 52, Section 4.3.4.2, first line: Why is 286 acres of active fan set-aside area? We may want to include that this is the developer's design.

Page 57, First paragraph: Delete first two sentences and just start with the third sentence.

Page 58, First paragraph: Greg does not agree that there is no cost to a non-structural solution. Maybe a line indicating that there is actually some cost due to devaluation of the property.

Page 59: Indicate depth of basin as max/min instead of average. Backfill and total excavation volume should be in cubic yards.

Page 60, Section 5.1.1: Make recommendation that more detailed mapping is needed for pre and final design.

Page 61, Section 5.6: Instead of saying that the structures are compatible state that they 'can be'. In stead of stating that the structural design is required in the last sentence say 'was done'.

Page 75, Section 5.7.2.1: How is riprap-lined spillways contact sensitive?

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Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: June 23, 2006

TO: Kathryn Gross, CFM/FCDMC

FROM: Jon Fuller, PE

RE: SVADMP Fan 10-11 Review Comment Responnse

CC: Mike Kellogg, RG

Response to District review comments are provided below. JEF comments are bolded and indented below each District comment.

Technical Summary

1. Hydrology – Make sure all supporting documentation is provided including necessary maps for flow paths soils and land use beyond those presented in figures.

   JEF Response: Done.

2. Hydraulics – Upstream modeling appears reasonable. Please run checkras on the upstream delineation. Upstream of the apex the delineation should be an administrative floodway. If the consultant prefers the water surface elevations for each cross-section location can be determined using FlowMaster or a similar product. If left in RAS the consultant needs to be prepared to answer any FEMA questions as they will review it as a RAS product.

   JEF Response:

   - **Run CHECKRAS**
   - **Administrative floodway**
   - **RAS vs. FlowMaster (BRI)**

3. Geomorphology – TDN appendix G supporting documentation needs to be provided. A master Appendix G for all fan delineations could be a solution. There is some confusion between active and inactive areas in several text discussions. This is further discussed later in the comments.

   JEF Response: Appendix G information will be provided as a separate reference document that will be applicable to all the White Tank Piedmont alluvial fan delineations.

4. Floodplain Delineations. Some modifications to the naming of the zones on the workmap and annotated FIRM panel are required. This is discussed further later in the comments.

   JEF Response: Response addressed with later comments.

Report Comments

1. Page 2-1, Abstract section 2.1.3. Craig Kennedy is no longer the official contact at Baker. If a new contact is identified prior to FEMA submittal the name should be updated.

   JEF Response: Per discussion with Kathryn, we will leave Craig's name on the form until it becomes clear who the FEMA reviewer will be.

2. FEMA OC Form

   - Part C – We may need to include a fee but for now leave as No.
   - Part D – The form should be updated to reflect my name.

   JEF Response: Done.

3. FEMA RH&H Form

   - Part B – The yes box should be checked here instead of no if the use of RAS is continued.

   JEF Response: Done.

4. FEMA Fan Form – Please submit one fan per form.

   JEF Response: Done.

5. Section 4 – Please make sure that all applicable supporting documentation is supplied for the new hydrology for this area.

   JEF Response: Done.

6. Page 4-9, section 4.5.3. Could an excerpt of the Alpha sub basin map be provided as well so the new basins and the old basins can be compared? This could be included in the appendix.

   JEF Response: Done.

7. Section 5, the upstream floodplain should be delineated as an administrative floodway and its designation should be discussed in this section.

   JEF Response: Done.

8. Section 6. Figure Concerns

- Figure 6.1 not all the soil units are included. Scale of exhibit makes it hard to really verify the units necessary to fan 10 and 11

- Figure 6.2 not all the geology units are included. Scale of exhibit makes it hard to really verify the units necessary to fan 10 and 11.

- For Figures 6.1-6.10 should fan 10 and 11's apices be located on the figures?

- For Figure 6.7, please consider adding a note to the figure explaining why there are no channels identified in the middle of the study area.

- For Figure 6.9 is it possible to screen the colors on the map to more clearly see the topography underneath?

JEF Response: Per discussion with Kathryn, JEF will provide a DVD with the project GIS on it, including all referenced layers, provide 24x36 plots of the Stage 1, 2 and 3 delineations in the TDN attachments, and will provide original copies of the AZGS maps and reports in a separately bound copy of Appendix G.

JEF will show the apexes on the figures.

JEF will add a note to the legend of Figure 6.7 explaining that no channels were delineated in the central portion of the White Tank Piedmont because that area is being delineated by others.

JEF will explore various color combinations to minimize fading, but the color difference is an artifact of using screened colors over the hue of the aerial photographs.

9. Page 6-24, section 6B4.6 conclusions. Consider adding an additional figure that shows a close up of stage 1 at fan 10 and 11.

   JEF Response: Per discussion with Kathryn, JEF will add apex locations to the Stage 1 figures.

10. Page 6-31, Figure 6.13, is this a photo for an active fan channel? Would it be more applicable to place a photo more representative of the bed under a piedmont channel? If possible update the photo otherwise existing photo is fine.

    JEF Response: It is not a photo from the White Tanks, but illustrates the concept discussed adequately. We will search for a replacement photograph.

11. Figure 6.19. If Figure 6.19 is the result of the analysis why is it placed at the beginning of the stage 2 discussion and analysis? It appears to show the result prior to the analysis.

    JEF Response: Given a choice between damned if we do and damned if we don't, we choose the former.

12. Figure 6.20. Please correct the legend and map label. The FRS is labeled as a levee instead of a dam.

JEF Response: Done.

13. Page 6-55, Table 6B.7. Upstream of the apex should be delineated as administrative floodway. Consider adding the category to the table?

    JEF Response: Done.

14. Page 6-59, text states large-scale maps are to be supplied. No large-scale maps were included in this submittal. Please make sure they are included in the next submittal.

    JEF Response: Done.

15. Page 7-1, section 7.1, in the summary of discharges please list the fans as White Tank Fan 10 and White Tank Fan 11.

    JEF Response: Done.

16. Page 7-2, section 7.3 Annotated Panel. Please make the following corrections

    - Designations need to be modified:

        a. Upstream of Apex: Zone A Administrative Floodway – Inactive Fan Flooding

        b. Downstream of Apex: Zone A Administrative Floodway – Active Fan Flooding

    - Add a note stating administrative floodways are regulated by the local regulatory authority.

    - Add floodway shading of the corridors.

    - Consider naming the corridors.

    JEF Response: Done.

17. Floodplain Work Map

    - Floodway symbology is needed on the delineations shown.

    - Zone AFUFD was not included. Please add.

    - Add the existing delineation at the FRS to the map.

    - Consider adding a legend of the FCD fan delineation categories.

    - Consider revising the title to "Approximate Zone A Floodplain Delineation Study of White Tank Fans 10 and 11.

JEF Response: Done.

Appendix Contents

1. Appendix A – no comments. Update references as needed.

2. Appendix B – Include pertinent correspondence prior to FEMA submittal.

   JEF Response: Done.

3. Appendix C – no comments. Consider adding District contract number for mapping project.

   JEF Response: Done.

4. Appendix D - need to provide hydrology maps in support of the delineation and parameters chosen: Sub basin map with topography and flow path, Sub basin map and soil units, Sub basin map and land use. Consider placing a separate copy of the Rainfall figure in the appendix as well.

   JEF Response: Done.

5. Appendix E – no comments.

6. Appendix G – no supporting documentation of the geomorphic analysis was provided. Perhaps a master Appendix G could be developed for use with all the Fan reports.

   JEF Response: Done.

7. Appendix H- no digital information was provided in this submittal. Please make sure to include a cd with the next submittal.

   JEF Response: Done.

8. Concerned about the confusion between sections between active and inactive, total fan, AFHH and AFUFD. Language appears to shift between sections. In most instances it appears some of the confusion could be cleared up with modifications to Figure 6.19 and adding the topographic apexes to the exhibit and addressing them in the text as the top of the Fan 10 and 11 alluvial fan landform. The following are areas where it was noted:

   - Figure 6.19 and connected sections:

     - Page 6-33, section 6B.5.3, text discusses aggradation/active on a limited portion of the "total fan site". Define the total fan site (white tank piedmont or 10 and 11 specifically). Figure 6.19 appears to outline all of the fan area as active. Consider revising language in the text or on the figure.

- Page 6-52, section 6B.5.5, is Figure 6.19 an appropriate figure to be looking at? Figure 6.19 is titled active areas but the text here states that inactive areas are shown. Are we supposed to be looking at "inactivity" within or outside of the drawn limits?

- Page 6-51, section 6B.5.4, there appears to be some discrepancy between the stage III delineation and the text. Please verify and make corrections as necessary.

- Page 6-52, section 6B.5.6.3, the text specifically discusses unstable flow path flooding specifically below the apices but 6B.5.5 mentions inactive portions which are stable flow paths is an additional section regarding stable flow path flooding downstream of the apex needed here as well?

- Page 6-53, section 6B.6, bullet 2 and 3. This discussion states all of stage 2 as active unstable flow paths that contradicts text in the Stage 2 discussion where inactive areas are discussed.

JEF Response: The confusion results in part from bad writing on my part, and in part from differences in terminology between FEMA Guidelines and the PFHAM. I've made text revisions to each the places noted in your bullets above. Hopefully, the report is now more clear.

Text Comments

1. Page 3-1, is "epoch" correct in the second sentence: "1992 epoch Central Zone of Arizona State Plane…"

   JEF Response: Done.

2. Page 4-7, Unit Hydrograph second paragraph second sentence. Please reword the sentence it is not clear.

   JEF Response: Done.

3. Page 4-8, section 4.5.2 second paragraph third sentence. Please correct the typo: "watershed will average elevation.."

   JEF Response: Done.

4. Page 5-5, section 5.5.5, should the word "fan" be between "natural channels"?

   JEF Response: Done.

5. Page 6-24, section 6B.4.4, last sentence. The text states there were four new fans identified beyond the Ayers study. Based on discussions with Jon are we now up to five? If so please update the text.

JEF Response: Done.

6. Page 6-32, No photo was included in Figure 6.18 please include in next submittal.

   JEF Response: Done.

7. Page 6-48, 6B.5.3.6. Please correct the typo in the second to last sentence: "There is little or relief".

   JEF Response: Done.

8. Table of Contents notes:

   - Table 5.9 has a title typo.
   - Table of Contents lists Plates, text refers to exhibits please refine either the text or table of contents.
   - Table of Contents lists Appendix F for both Sediment and Geomorphology. The actual appendices are separated into Appendix F for Sediment and Appendix G for Geomorphology. Appendix letters will need to be shifted by a letter for the rest of the appendices listed in the table of contents.
   - Plate 1 states its Area 4 hydrology. That is not applicable to Fan 10 and 11. No plate is present in the report.
   - Plates 2 through 5 were not submitted.

   JEF Response: Done.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: July 13, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on Step 2 Proposed Alternatives Reports from Julie Cox dated 2/28/06, 3/1/06, & 4/10/06

CC: Jon Fuller, PE

Thank you for the comments on the Step 2 Proposed Alternatives Reports for the Sun Valley ADMP. This memo summarizes our response to the District's comments as dated above. The revised final reports will be supplied once we have received additional comments from Valerie Swick on the Step 2 text reports delivered on 6/22/06.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The models, Step 2 reports, and figures have been revised in the final versions to reflect our responses where appropriate.

++

Comments Dated Feb. 28, 2006

I have reviewed the Step 2 Proposed Alternatives Reports prepared by JE Fuller Hydrology & Geomorphology, Inc., as well as the associated 100-yr 6-hr and 100-yr 24-hr HEC-1 models.

There is one report for each of six subareas: (1) CAP, (2) Wagner Wash, (3) Hassayampa River, (4) White Tanks Wash, (5) FRS #1, and (6) FRS #2 and #3. My comments are organized by subarea and alternative and are listed below. If not specified, the comment applies to both the 100-yr 6-hr and 100-yr 24-hr models. I would be glad to meet with you and/or the consultants to discuss my recommendations.

General
Please rename the FRS No 1 HEC-1 files to begin with F1 and rename the White Tanks Wash files to begin with WTW. The file names for the other four sub-areas are good examples.

All file names for the White Tank Wash sub-area have been renamed as requested.

The scale bars on all maps appear to be 5-10% off. Please revise as necessary.

The scale bars are correct. They are automatically generated by the ArcView GIS software.

FRS 2 & 3 Subarea/Alternative B4-2
For the proposed basins RRW1 and RR810, the value in the first column of the SV record should be zero or a small number and the value in the first column of the SQ record should be zero. A non-zero flow in the first column can cause the volume to be significantly overestimated. For example, for the 100-yr 24-hr model, RR810 should be 108 acre-ft vs the 684 acre-ft as reported. And RRW1 should be 316 acre-ft vs the 1709 acre-ft as reported. Please check all SQ records in all models for this particular error and revise as necessary.

This problem has been corrected. Six sheets in all were found to be affected.

FRS 2 & 3 Subarea/Alternative A
The reach length on the KM record differs from the reach length on the RC record for channel routing X1-X1I. Please explain or revise as necessary.

This issue was corrected. The RC records were revised to match the KM record value which was correct.

FRS 2 & 3 Subarea/Alternative B4-1
For the proposed basin RRX1, the value in the first column of the SV record should be zero or a small number and the value in the first column of the SQ record should be zero. A non-zero flow in the first column can cause the volume to be significantly overestimated. Please explain or revise as necessary.

This problem has been corrected. Six sheets in all were found to be affected.

FRS 2 & 3 Subarea/Alternative B4-3
For the proposed basins RRW1 (24-hr) and RRX1 (6-hr), the value in the first column of the SV record should be zero or a small number and the value in the first column of the SQ record should be zero. A non-zero flow in the first column can cause the volume to be significantly overestimated. Please explain or revise as necessary.

This problem has been corrected. Six sheets in all were found to be affected.

CAP Subarea/Alternative A
The models do not include the Step 2 Corridors S115AL and S115AR as shown on the map. Please explain or revise as necessary.

These elements are not explicitly modeled in HEC-1. They are included only in the hydraulic design and the cost estimates.

CAP Subarea/Alternatives A, B1, B2, B3, B5, and C

The models include the proposed basin D910 but it is not shown on the map. Please explain or revise as necessary.

This was a placeholder KK block in case the incoming Q exceeded the culvert capacity. Ultimately the culvert was found to have sufficient capacity for the peaks for all of these scenarios. It has been removed from these models for the final report.

Hassayampa Subarea/Alternative B2, B3, B4-1, B4-2, B4-3, and C
The models do not include the Step 2 Corridor S51010 as shown on the map. Please explain or revise as necessary.

These elements are not explicitly modeled in HEC-1. They are included only in the hydraulic design and the cost estimates.

Hassayampa Subarea/Alternative A
The map for Alternative A is missing from the report. Please include in the next submittal.

The map will be included in the final submittal.

Hassayampa Subarea/Alternative B4-3
There are two different maps both labeled as Alternative B4-3. They are both labeled Page 251 of 356 and the cost tables are identical. The correct B4-3 map should include RR51025 and RR51030. Please explain or revise as necessary.

The correct maps will be included in the final submittal. The missing design reaches have been included in the table on the map for Alt. B4-3.

Wagner Wash Subarea/Alternative A
The models do not include the Step 2 Corridors C155L20 and C17510B-A as shown on the map. Please explain or revise as necessary.

These elements are not explicitly modeled in HEC-1. They are included only in the hydraulic design and the cost estimates.

Wagner Wash Subarea/Alternatives A, B2, B3, B4-1, B4-2, and B4-3
Remove the Step 2 Excavated Corridors ROW from the legend. It does not apply to these alternatives. Please explain or revise as necessary.

The map legends have been modified to remove the excavated corridor legend item for alternatives with no excavated channels. This applies to all sub-areas.

Wagner Wash Subarea/Alternative B2
The 100-yr 24-hr model does not include the Step 2 Basins RR125, RR130, RR150, and RR165 as shown on the map. Please explain or revise as necessary.

This error has been corrected. The missing detention basins have been added to the 24-hr model and the reach designs modified as needed for the B2 alternative.

Wagner Wash Subarea/Alternative B4-1
The models do not include the Step 2 Corridor S18010 as shown on the map. Please explain or revise as necessary.

These elements are not explicitly modeled in HEC-1. They are included only in the hydraulic design and the cost estimates.

Wagner Wash Subarea/Alternative B4-2
The 100-yr 6-hr model does not include the Step 2 Corridor RR15020 as shown on the map. Please explain or revise as necessary.

Design reach RR15020 is in the model as KK 150165.

The 100-yr 24-hr model does not include the Step 2 Corridor C155L10. The 100-yr 6-hr model includes the Step 2 Corridor C155L10. The map does not show C155L10. I believe this corridor should be in the Alternative B4-3 models but not the Alternative B4-2 models. Please explain or revise as necessary.

You are correct. The 24-hr model for has been modified to remove C155L10 from the B4-2 Alt. The B4-3 models should contain this reach instead.

FRS No. 1 Subarea/Alternative A
The models do not include any of the four Step 2 Excavated Corridors or the Step 2 Leveed Corridor L20 as shown on the map. Please explain or revise as necessary.

These elements are not explicitly modeled in HEC-1. They are included only in the hydraulic design and the cost estimates.

FRS No. 1 Subarea/Alternative B2, B3, B4-1, B4-2
Add additional KM records so that the KM records for proposed basins RRL2BR and RRCM1 refer to apices 36 and 37, not apex 3. Comment applies only to RRCM1 for Alternative B2. Please explain or revise as necessary.

The macro formatting inadvertently extended the comment records beyond the 80th column. While in the input file, the output file didn't contain them because they became truncated at 80 columns. The comment records have been shortened so they are no longer truncated when executed.

FRS No. 1 Subarea/Alternative B4-1
Add additional KM records so that the KM records for proposed basin RRP1A refer to Apex 8. Add additional KM records so that the KM records for proposed basin RRQ1A refer to Apex 12. Please explain or revise as necessary.

The macro formatting inadvertently extended the comment records beyond the 80th column. While in the input file, the output file didn't contain them because they became truncated at 80 columns. The comment records have been shortened so they are no longer truncated when executed.

FRS No. 1 Subarea/Alternatives B2, B4-1, B4-2, and B4-3
Remove the Step 2 Excavated Corridors ROW from the legend. It does not apply to these alternatives. Please explain or revise as necessary.

The map legends have been modified to remove the excavated corridor legend item for alternatives with no excavated channels. This applies to all sub-areas.

FRS No. 1 Subarea/Alternative B4-2
The models do not include the proposed channel L20 as shown on the map. Please explain or revise as necessary.

These elements are not explicitly modeled in HEC-1. They are included only in the hydraulic design and the cost estimates.

FRS No. 1 Subarea/Alternatives B2, B3, B41, and C
The models do not include the proposed channels L30 and L40 as shown on the map. Please explain or revise as necessary.

These elements are not explicitly modeled in HEC-1. They are included only in the hydraulic design and the cost estimates.

White Tank Wash Subarea/Alternative A
The report explains why basin DE2C-2 and channel H2-A-10 are not in the models. The models do not include the proposed channels E3RB-A-L, E4-A-10, CJ120, and CJ115-A as shown on the map. Please explain or revise as necessary.

These elements are not explicitly modeled in HEC-1. They are included only in the hydraulic design and the cost estimates.

White Tank Wash Subarea/Alternative B1, B3
The models include the proposed basin DJ1 but it is not shown on the map. Please explain or revise as necessary.

This was a placeholder KK block in case the incoming Q exceeded the culvert capacity. Ultimately the culvert was found to have sufficient capacity for the peaks for all of these scenarios. It has been removed from these models for the final report.

Comments Dated Mar. 1, 2006

There are some very minor typos in the report for the FRS #1 Subarea. These typos are probably in the other reports as well. Julie

throughout documents: Change "HEC1" to "HEC-1"
throughout documents: Change "Ayers & Associates" to "Ayres & Associates"
Page 3, Paragraph 4: Change "refinement to" to "refinement of"
Page 4, Section 3.2: Add "6)" before FRS #2 & #3
Page 4, Section 3.3.2: Change "combination" to "combinations"
Page 6, Section 3.3.3: Change "include" to "includes" and change "due excavation" to "due to excavation"
Page 6, Section 3.4: Change "1foot" to "1 foot" and add "is used" after "3 feet"
Page 7, Section 3.5: Add "a" before "multi-use"
Page 8, Section 3.5: Change "used estimate" to "used to estimate"
Page 8, Section 3.5: Change "topography" to "topographic"
Page 8, Section 3.5: Change "upto" to "up to"
Page 8, Section 3.5: Change "Larger side slopes" to "Steeper side slopes"
Page 9, Section 4.1: Change "only single" to "only a single"
Page 10, Section 4.4.1: Change "the channel develops" to "the main channel develops"
Page 10, Section 4.4.1: Change "excavated channel" to "excavated channels"
Page 18, Section 4.5: Change "cards" to "records"
Page 18, Section 4.6: Change "for purpose" to "for the purpose"
Page 19, Section 4.6: Complete the last sentence.
Page 23, Section 5.10: Complete the last sentence.
Page 25, Section 6: Change "Alternative A were taken" to "Alternative A were assumed"

All of the above typos have been corrected as appropriate in the final version of the text.

Comments Dated Apr. 10, 2006

I have reviewed the hydraulics for the Step 2 Proposed Alternatives Reports prepared by JE Fuller Hydrology & Geomorphology, Inc., as well as the associated 100-yr 6-hr and 100-yr 24-hr HEC-1 models.

There is one report for each of six subareas: (1) CAP, (2) Wagner Wash, (3) Hassayampa River, (4) White Tanks Wash, (5) FRS #1, and (6) FRS #2 and #3. My comments are organized by subarea and alternative and are listed below. If not specified, the comment applies to both the 100-yr 6-hr and 100-yr 24-hr models. I would be glad to meet with you and/or the consultants to discuss my recommendations.

General

1. *Please rename the FRS No 1 HEC-1 files to begin with F1 and rename the White Tanks Wash files to begin with WTW. The file names for the other four sub-areas are good examples.*

All file names for the White Tank Wash sub-area have been renamed as requested.

2. *The scale bars on all maps appear to be 5-10% off. Please revise as necessary.*

The scale bars are correct. They are automatically generated by the ArcView GIS software.

3. *The macro for the volume in the rating curves rounds 0.5 down rather than up. See CAP Alternative B2, Basin RR110 for examples, i.e. 6.85, 9.75, 12.85 ac-ft*

The macro truncates the values. Precision of a tenth of an acre-foot is considered adequate for the alternative routing analysis.

4. *Some of the report tables labeled Stage-Storage-Discharge should be labeled "DI/DQ records" as appropriate.*

The label for this section of the design spreadsheets will be modified as suggested.

FRS No. 1 Subarea Report & HEC-1 Models

1. *Alternative A – Why is there data for channels L2B-A-R, L2B-A-L, L20, M2-A-10, and N125A in the report when these channels are not in the models or the summary table on Page 5?*

These elements are not explicitly modeled in HEC-1. They are included only in the hydraulic design and the cost estimates.

2. *Alternatives B2, B3, B41, and C – Why is there data for channels L30, L40, and RRP1A10 in the report when these channels are not in the models or the summary tables on Pages 57, 113, 169, and 337?*

These elements are not explicitly modeled in HEC-1. They are included only in the hydraulic design and the cost estimates.

3. *Alternatives B42 and B43 – Why is there data for channels L20 and RRP1A10 in the report when these channels are not in the models or the summary tables on Pages 225 and 283?*

These elements are not explicitly modeled in HEC-1. They are included only in the hydraulic design and the cost estimates.

4. *Alternative B3, Page 130 – The volume check indicates not enough volume is provided for Basin RRCN1. Shouldn't the macro run iterations until adequate volume is provided? Please explain or revise as necessary.*

The basin design has been modified to provide adequate volume.

5. *Alternative B41, Page 173 – The velocities calculated for the long-term channel hydraulics appear reasonable. The velocities calculated for the initial channel hydraulics are lower than those that I calculated, i.e. at a depth of 2.5 ft; I calculated 5.6 fps vs the 3.5 fps as shown. Please explain or revise as necessary.*

The displayed hydraulic results for the initial and long-term channels are the same for the excavated channel reaches. That is, the excavated channels are assumed to be built at the

long-term slope. The initial slope is still needed in the design sheets in order to determine the excavation volume requirements.

Wagner Wash Subarea Report & HEC-1 Models

1. *Alternative B3, Page 146 – The volume check indicates not enough volume is provided for Basin RR165. Shouldn't the macro run iterations until adequate volume is provided? Please explain or revise as necessary.*

The basin design has been modified to provide adequate volume.

2. *Alternative B41, Page 192 – The volume check indicates not enough volume is provided for Basin RR130. Shouldn't the macro run iterations until adequate volume is provided? Please explain or revise as necessary.*

The basin design has been modified to provide adequate volume.

White Tank Wash Subarea Report & HEC-1 Models

1. *All Alternatives - There are stage-storage-discharge graphs in the report for some basins but not others, i.e. the graph is included on Page 152 for Basin RRE3RB. Please be consistent and include graphs for all basins.*

The charts have been removed from all basin sheets.

2. *All Alternatives - The report tables for Basin DE2C and DJ1 have multiple issues, i.e. same elevation used twice, last 2 columns of DI/DQ records switched, missing elevations. The macros do not appear to be working correctly. Please explain or revise as necessary.*

The import macro from HY8 appears to have generated these discrepancies. The design sheets have been modified to remove the offending data.

3. *Alternatives B1 (Page 76) and B3 (Page 216) - Basin DE2C: The last two columns of DI/DQ records are switched in both the report and the 100-yr 24-hr and 100-yr 6-hr models. Please explain or revise as necessary.*

The import macro from HY8 appears to have generated these discrepancies. The design sheets have been modified to remove the offending data.

4. *Alternatives B1 (Page 106) and B3 (Page 246) – Basin DJ1: The last two columns of DI/DQ records are switched in both the report and the 100-yr 24-hr and 100-yr 6-hr models. Please explain or revise as necessary.*

The import macro from HY8 appears to have generated these discrepancies. The design sheets have been modified to remove the offending data.

FRS #2 & #3 Subarea Report & HEC-1 Models

1. *Alternative B41, Page 132 - For the proposed basin RRX1, the value in the first column of the SV record should be zero or a small number and the value in the first column of the SQ record should be zero. A non-zero flow in the first column can cause the volume to be significantly overestimated. Please explain or revise as necessary.*

This problem has been corrected. Six sheets in all were found to be affected.

2. *Alternative B42, Page 154 - For the proposed basins RRW1 and RR810, the value in the first column of the SV record should be zero or a small number and the value in the first column of the SQ record should be zero. A non-zero flow in the first column can cause the volume to be significantly overestimated. Please explain or revise as necessary.*

This problem has been corrected. Six sheets in all were found to be affected.

Hassayampa Subarea Report & HEC-1 Models

1. *Alternative A (Page 18), B2 (Page 70), B3 (Page 118), B41 (Page 166), B42 (Page 200), B43 (Page 266), C (Page 338) – Basin D415: The last column of DI/DQ records is out of order in both the report and the 100-yr 24-hr and 100-yr 6-hr models. Please explain or revise as necessary.*

The import macro from HY8 appears to have generated these discrepancies. The design sheets have been modified to remove the offending data.

2. *Alternative B42 (Page 232), B43 (Page 298) – Basin D510: The last column of DI/DQ records is out of order in both the 100-yr 24-hr and 100-yr 6-hr models. Please explain or revise as necessary.*

The import macro from HY8 appears to have generated these discrepancies. The design sheets have been modified to remove the offending data.

CAP Subarea Report & HEC-1 Models

1. *Alternative B5 (Pages 205 and 226) – Basin D120: Why is the peak inflow negative? Please explain or revise as necessary.*

There was an error in the 24-hr model. The corrected model resulted in a basin slightly more than twice as large.

JE Fuller/ Hydrology & Geomorphology, Inc.

Jon Fuller, PE, RG, PH, MS, CFM
Brian Iserman, PE
Ted Lehman, PE
W. Scott Ogden, PE
Mike Kellogg, RG, MS, CFM
Hari Sundararaghavan, PhD, PE, CFM
Jeff Despain, PE
Robert Lyons, PE
Emili Kolevski, PE
Cory Helton, EIT, MS
Dwight Nield, BS
Annette Griffin, AAS
John Wallace, PE
Robert Shand, PE
Ian Sharp, PE
Chris Rod, PE

August 4, 2006

Flood Control District of Maricopa County
Attn: Valerie A. Swick, E.I.T., P.H., CFM
2801 West Durango Street
Phoenix, Arizona 85009-6399
Phone: (602) 506-1501
Fax: (602) 506-4601

RE: Review Comments for Sun Valley ADMP Step 1 Report.

Dear Valerie:

I have gone through your comments of the Sun Valley ADMP Step 1 report dated July 26, 2006. This letter is to address only those comments dealing with the Step 1 report. The Step 2 comments will be addressed in a separate letter. The following are my responses along with your original comments:

General Comments:

FCD Comment:

1. FCD logo in the header (right-side of the page) should be larger and the JE Fuller logo smaller.

JEF Response:

I have made the FCD logo larger and made the JEF logo smaller. It appears to me that the FCD logo stands out more now.

FCD Comment:

3. I don't like the 11" x 17" format for the summary documents. I understand the need to that format for the technical documents, but I would like to talk about the format for the summary documents. I am also undecided about having the same summary in every volume. I would like to talk about this format.

8400 S. Kyrene Rd., Suite 201
Tempe, Arizona 85284
480-752-2124 (voice)
480-839-2193 (fax)

2160 N. Fourth Street, Suite 202C
Flagstaff, AZ 86004
928-214-0887 (voice)

1955 W. Grant Road, Suite 148
Tucson, Arizona 85745
520-623-3112 (voice)
520-623-3130 (fax)

www.jefuller.com

JEF Response:

I have changed the format for the Step 1 report to 8 ½" x 11". We are planning on doing the same with the Step 2 summary report. The rest of this comment does not apply to the Step 1 report.

Step 1: Alternative Formulation and Preliminary Analysis

FCD Comment:

4. Page 1:
    a. One of the major objectives should be "Plan regional flood hazard mitigation." As the second bullet.
    b. The last objective "Submittal of all contract deliverables …" should not be included in this section.

JEF Response:

I added "Plan regional flood hazard mitigation." As the second bullet and then I deleted "Submittal of all contract deliverables …".

FCD Comment:

5. Page 3:
    a. Location of Study Area: Third line – should read the Trilby Wash Watershed. There needs to be further explanation of why we are included Fan 2 in our study since it is stated that it is a tributary of Trilby Wash.

JEF Response:

I added Watershed to the text and then added the following text:

"Fan 2 was added to this study because it intermingles with Fan1. This intermingling means that it needs to be addressed at the same time as Fan 1.

FCD Comment:

6. Page 15:
    a. Table 6 should be completed, we should not have unknowns and '?'s in the table.

JEF Response:

Table 6 was modified so that unknowns and "?"s were taken out. From our database, most of these were identified, but at the time of the Step 1 completion, some of the Developers and Engineering Firms were not solidified. Therefore, "None" was used to classify this situation.

Along with this letter, I have sent five copies of the Step 1 report reflecting the changes. I have sealed these final copies and provided the report CD in the back of the report.

If you have any questions, please do not hesitate giving me a call.

Sincerely,

JE Fuller/Hydrology & Geomorphology, Inc.

Jeffrey A. Despain, P.E.
Project Engineer

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: August 23, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on Area 4 Hydrology dated 3/16/06

CC: Jon Fuller, PE

Thank you for the comments on the Area 4 Hydrology Report for the Sun Valley ADMP. This memo summarizes our response to the District's comments and is supplied along with the revised reports for your reference and use.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The models, TDN, and figures have been revised in the final versions to reflect our responses where appropriate.

++

I have reviewed the HEC-1 models, DDMSW data, spreadsheets, and the report. My comments are listed below. I would be glad to meet with you and/or the consultants to discuss my recommendations.

Models

1. *Please recheck the point rainfall values. I checked the NOAA Atlas 2 isopluvials and assigned the following point rainfall values.*

    a. *100-yr 2-hr precipitation: 2.7"*
    b. *100-yr 6-hr precipitation: 3.4"*
    c. *100-yr 24-hr precipitation: 4.2"*

We have rechecked the rainfall data. The 2-hr value used was 2.63" and was taken directly from the PREFRE output rather than estimated from the map in the Hydrology Manual. Our reading of the original NOAA II maps shows the 3.2 inch contour circling the White Tank Mountains, not 3.4 inches. See also Figure A.7 in the Hydrology Manual (2003). The 1995 version of the Manual contains the 3.4" isohyet which appears to be in error.

2. *Please recheck parameters for sub-basins S195, S500, and S720. The 100-yr 24-hr existing condition unit discharges for these sub-basins range from 567 to 592 cfs/sq mi. These unit discharges seem low. Please explain or revise models as necessary.*

The input parameters for all sub-basins have been rechecked and found to be input as intended. The unit discharges plotted on the graphs from DDMSW show that overall the results from the existing conditions models fit well with the expected results relative to the USGS regression equations and the envelope curves provided in the graphing utility of

DDMSW. Some individual sub-basins have slightly higher or lower unit discharges due to the size of the basin, its slope, shape, or infiltration rates. For example, very small basins often show high unit discharges. Similarly, long skinny basin shapes often have relatively low unit discharges when compared to more teardrop-shaped basins. Examination of the sub-basins identified in items 2 and 3 indicates that they all exhibit one or more characteristics which likely explain the apparent "low" or "high" unit discharges.

3. *Please recheck parameters for sub-basins S110, S125, S130, S140, S165, S170, S415, S430, S435, S740, and S910. The 100-yr 24-hr existing condition unit discharges for these sub-basins range from 1234 to 1789 cfs/sq mi. These unit discharges seem high. Please explain or revise models as necessary.*

See the response to item 2.

4. *Please ensure that sub-basins are broken down in order to determine the discharge at each alluvial fan apex.*

A concentration point near every fan apex identified by Ayers as part of the Buckeye/SV ADMS in Area 4 has been provided. The apex locations have been added to the maps as well for reference.

5. *Route 435-450 – the value in the last column on the RC record should be 105 ft.*

We have added this number to the ELMAX field of the RC record.

6. *Why were sub-basins 800 and 810 modeled? They are not located in Area 4.*

These basins were modeled in support of the alluvial fan floodplain delineations being conducted by JEF as part of the ADMP. I have removed them from the final "Area 4" hydrology submittal, but they remain in the TDN for Fans 10 & 11 as part of the FDS for those fans.

7. *Why was 30% vegetative cover assigned to all land uses for both existing and future conditions? This is an overly general assumption and should certainly be refined by field observations and review of aerial photos.*

Given the generally large sub-basins and variable vegetation distributions throughout, an average value of 30% was selected as representative of the area as a whole based on examination of aerial photographs and field observations for the existing conditions. This approach is deemed appropriate to this planning level study. The vegetation cover for the future conditions land use has been modified to vary with land use type.

8. *Report Page 15, Paragraph 1. Rather than assuming medium density residential (MDR) parameters for all "Planned Development" land uses, the consultant should use the best available data, including data from developers and the Town of Buckeye. Revise models as necessary to reflect the specific land use types for future development.*

The land plans from all of the master planned communities collected as part of the ADMP have been digitized for their land use breakdowns. Those land uses have been categorized and parameterized as described in the revised report. Areas of private land or other potentially developable land without master plans collected for the ADMP were assigned a typical average land use of "Small Lot Residential" based on examination of the land plans from the master planned community maps.

9. *Report Page 15, Table 2. For the MDR land use, use RTIMP = 30%, not 45% as shown. Revise models as necessary.*

All of the future land use categories have been assigned RTIMP as shown in Table 2 of the revised report. The MDR category is no longer used. An equivalent of land use type "150" from the DDMSW, also called Small Lot Residential, was assigned instead. The Small Lot Residential land use was assigned a 30% RTIMP per the DDMSW and 2003 Manual guidance. The models and report have been modified to reflect the new land use assignments and distributions.

10. *Add ID records that include the following:*

    a. *Project Name and FCD Contract Number*
    b. *Consultant and Modeler's Name(s)*
    c. *File Name*
    d. *Storm Frequency and Duration*
    e. *Existing or Future Conditions*
    f. *Total Watershed Area (in sq mi)*
    g. *Rainfall Loss Method*
    h. *Unit Hydrograph Method*
    i. *Channel Routing Method*
    j. *Source and Date for Land Use Data (mo/yr)*
    k. *Source and Date for Soils Data (mo/yr)*

These records have been added to the ID records for each file.

Report

11. *Include discussion of the alluvial fans and alluvial fan apexes located in Area 4. Reference the work done by Ayres and Associates under the Buckeye/Sun Valley ADMS.*

A brief discussion of the alluvial fans and their apices have been added to section 4.2.1. In addition, the apex locations have been added to all of the Plates. Ayers and the Buckeye Sun Valley ADMS are also included in the references.

12. *Add hard copy isopluvials for the 100-yr 2-hr, 100-yr 6-hr, and 100-yr 24-hr rainfall events. Show the Area 4 project area (not Areas 3 and 4 combined) on these figures. It is not clear why Figure 4.2.1 on Page 12 shows the 2-yr 6-hr and 2-yr 24-hr isopluvials. The 2-yr frequency events*

are not part of this study. In addition, the 100-yr 6-hr isohyet is shown incorrectly as 3.2" (should be 3.4").

The isopluvials for the 100-year 6-hr and 24-hr are included in Figure 4.2.1. The 2-yr values are shown because they are required input to the PREFRE program used in DDMSW. The PREFRE/DDMSW output show the computed 100-yr 2-hr values based on the 4 input rainfall data used for the study area. The PREFE output is provided in Appendices D.1 and D.2. As noted in item 1, the correct 100-yr 6-hr value as shown on the original NOAA Atlas 2 maps and in the 2003 version of the Hydrology Manual is 3.2". Apparently the maps in the 1995 version of the manual were labeled in correctly. Hard copies of the maps from the 2003 Hydrology Manual have also been added to Appendix D.1.

13. Include table with unit discharges.

A table with unit discharges has been added to the TDN in Appendices D.1 and D.2.

14. Add titles to tables in Appendix D.1

a. Existing Conditions Summary of Results

b. Existing Conditions Sub-basin Data

These titles have been added to these tables in Appendix D.1.

15. Add titles to tables in Appendix D.2

a. Future Conditions Summary of Results

b. Future Conditions Sub-basin Data

c. Future Conditions Soils Data

d. Future Conditions Retention Volumes

These titles have been added to these tables in Appendix D.2. The soil data table has been recreated using the default DDMSW report format.

16. Add column for % slope to the Existing Conditions Summary of Results spreadsheet.

A percent slope column has been added to the Sub-basin Data table.

17. Add column to soils data that identifies each soil ID by name.

The tables provided come directly from the DDMSW.

18. Show subtotals (sq mi) for each soil type and sub-basin in the DDMSW soils and land use data.

The tables provided come directly from the DDMSW.

19. *Provide regional equation envelope curves with the results plotted to verify all of the analyses. Use DDMSW's Hydrology Graphing Feature for Unit Discharge. Graphs should include USGS, Boughton, and Malvick envelope curves. Include in the TDN and discuss results, particularly any outliers. Typically, 100-yr results should plot below Boughton, slightly below USGS, and at or higher than Malvick.*

These graphs have been added to section 4.5.2 of the text with some discussion about outliers as well. The graphs show that the results meet the typical expectations. The significant outliers are the diversion discharges which DDMSW includes in the plot of all results.

20. *Since sub-basins U1 through U4 are not modeled, they should not be shown on the maps. If the Area 4 boundary is incorrect, the correct boundary should be shown on the maps.*

The unmodeled sub-basins have been removed from the figures.

21. *Page 10, Section 4.2.1. Change "Waterhsed" to "Watershed".*

The typo has been corrected.

22. *Page 15, Paragraph 1. Specify the month and year of the MAG land use data used for this project.*

The files are dated July 8, 2005. However, the future land use data was modified based on other comments. Therefore, the MAG data is no longer being used.

23. *Page 15, Paragraph 1. Rather than assuming MDR parameters for all "Planned Development" land uses, the consultant should use the best available data, including data from developers and the Town of Buckeye. Revise models as necessary.*

As mentioned in response to item 9, the MDR category is no longer used. An equivalent of land use type "150" from the DDMSW, also called Small Lot Residential, was assigned instead. The Small Lot Residential land use was assigned to areas without master planned community data. Land uses for areas with master plans collected as part of the ADMP were digitized and categorized into equivalent land uses using the categories in Table 2 based on the dwelling unit densities reported in the master plans. The models and report have been modified to reflect the new land use assignments and distributions. Plate 4 shows the resultant land use assignments based on these data.

24. *Page 15, Table 2. For the MDR land use, use RTIMP = 30%, not 45% as shown. Revise models as necessary.*

See items 9 and 23 above.

25. *Page 15, Table 2. Five future condition land uses are specified in DDMSW and in the legend on Figure 3. There are only three future condition land uses specified in Table 2. Revise Table 2 to include the additional land uses.*

Again, the future land uses have been completely modified as shown in Table 2. The map legend has been modified to match.

26. Page 15, Table 2. Spell out NMT and NDR.

Table 2 has been modified.

27. Page 16, Paragraph 3, Sentence 1. Change sentence to "Surface roughness values were assigned and are shown in Tables 1 and 2 above." Add another sentence describing how the Kn values were assigned. It is unclear whether a weighted average methodology was used.

The text has been changed to reflect the fact that Kn values were assigned based on the land use categories based on examination of tables in the Drainage Design Manual and a weighted average value computed based on the distribution of land use types in each sub-basin.

28. Page 16, paragraph 3. Change "section D.2 Section 2" to "Appendix D, Section 2".

The text has been changed.

29. Page 18 (Retention Volumes Calculation). What is the relationship of the "Estate Residential" and "Rural Residential" land uses to the Maricopa County "Very Low Density Residential" and "Low Density Residential" land uses? The C coefficient for these land uses is significantly less than the 0.71 used to calculate the future retention volumes. Recalculate the future retention volumes for sub-basins S910, S920, and S700 using an average C coefficient for the land uses other than MDR.

All of the future land use data has been modified and the retention volume calculations recomputed as shown in Appendix D.2 for the new land use designations. A typical C value was assigned to each land use category as shown in a new table (new Table 3) in the TDN.

30. Include documentation for selection of "n" values.

Manning's n values were also estimated from examination of the aerials and limited field observations. The values selected are within the typical range used for desert washes in Maricopa County. Their application to hydrologic routing for a planning study is deemed appropriate. Therefore, no reach specific photos or other additional documentation was collected.

Maps and Figures

31. Figure 1-1. Show only Area 4, not Area 3.

Figure 1-1 has been changed to remove Area 3..

32. Please submit the following maps: (1) watershed boundary map, (2) existing land use map, (3) future land use map, (4) soils map, (5) drainage flow path map, (6) lag path map with L, Lca, and the centroids shown, and (7) HEC-1 schematic map. The final version of the HEC-1

schematic map should include both the 6-hr and 24-hr peak discharges at the concentration points. The watershed boundary map should include elevation contours with a light aerial image background.

The maps have all been modified into 6 Plates. Plates 1 – 5 are composed of three sheets at a constant scale of 1:24000 per discussion with Ms. Cox. Plate 1 is the Watershed Boundary Map and also shows the flow and lag paths and concentration points shown on a light aerial background and 50-ft contours. Plate 2 is the Soils Map shown on a light aerial background with topography. Coloring for the XKSAT values are shown as a color ramp from low to high infiltration rates to provide a visual aid as to which areas of the watershed produce more runoff based on soil infiltration rates. Labels are provided for each polygon showing the map unit number and the XKSAT value. Plate 3 is the Existing Conditions Land Use Map also on a light aerial background. Plate 4 is the Future Conditions Land Use Map. The coloring for this map has also been modified to help with differentiation. To ensure clear understanding of the land uses, a label has been added to each polygon based on the land use category. Plate 5 is the Flow & Lag Path Map shown with the 50-foot contours for reference. Plate 6 is a schematic diagram laid out over a screened back layer of the subbasin boundaries for easier geographic orientation. Plate 6 also has tables showing the results for various concentration points throughout the area for the 100-yr 6-hr and 24-hr models for both the existing and future conditions.

33. *All Figures. The figures do not copy well at all. Please change to black and white and experiment with line thickness to make readable maps.*

Modifications to all of the maps were made to help with photocopying. However, not all layers on all maps will reproduce perfectly. Electronic (PDF) versions of all the Plates are provided with the report on CD for easy reference. In addition, the GIS data for all of the line work associated with the Plates is provided on the CD as well or readily available within the District's GIS database.

34. *All Figures. The location map does not need to show the entire states of Arizona and Utah. Please limit the location map to either Maricopa County or just the West Valley.*

The index maps have been modified to show just the County or the study area as the largest extent.

35. *All Figures. Add symbol for and label each alluvial fan apex in Area 4. There are 8 apexes in Area 4.*

The alluvial fan apices have been added to all Plates.

36. *All Figures. Add title block.*

All maps have been modified to include a title block.

37. *All Figures. Change scale to 1" = 1000'. Remove insets.*

As discussed with Ms. Cox, a compromise of 1:24000 scale was chosen for the revised maps. Insets were removed.

38. All Figures. Add SCALE 1" = 1000' below the scale bar.

A text scale was also added to the Plates.

39. All Figures. The symbols for the 50-ft index contours are not clear on the legend. Perhaps darkening the contour line symbol will help.

The legend has been modified to make the contour symbol easier to read.

40. All Figures. The concentration point symbols are not clear. Perhaps enlarging the concentration point symbol or making it a larger diameter circle will help.

The concentration point symbology has been modified to enhance legibility.

41. All Figures. The sections are shown, but not the townships and ranges. Please add the townships and ranges to the figures.

The township and range boundaries have been added and labeled.

42. All Figures. Add JE Fuller logo.

The JEF logo has been added to all large format maps. Smaller figures within the text do not include the logos because of space limitations.

JE Fuller/ Hydrology & Geomorphology, Inc.

Jon Fuller, PE, RG, PH, MS, CFM
Brian Iserman, PE
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Robert Shand, PE
Ian Sharp, PE
Chris Rod, PE

August 23, 2006

Flood Control District of Maricopa County
Attn: Valerie A. Swick, E.I.T., P.H., CFM
2801 West Durango Street
Phoenix, Arizona 85009-6399
Phone: (602) 506-1501
FAX: (602) 506-4601

RE: Response to Review Comments for Sun Valley ADMP Step 2 Reports.

Dear Valerie:

This letter is in response of the Step 2 comments in your letter dated July 26, 2006. The response to the Step 1 comments was sent on August 4, 2006. Therefore, comments 4, 5, and 6 are not addressed in this letter.

This response is organized such that the comment will be given first and the response will follow.

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JEF Response:	We have made the changes in all of the reports.
FCD Comment 2.	In the 11" x 17" format, the page numbers should be toward the edge of the page and the Fuller logo should be toward the binding.
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JEF Response: We have made both the Step 1 and Step 2 Summary documents 8 ½"x 11". We have left the Volumes 2 through 7 documents in the 11"x17" format because of the technical data associated with them. The issue of having the same summary in every volume is addressed later in the comments.

Step 2: Proposed Alternative Report

General Comments:

FCD Comment 7. The Summary document should have all the backup material with each Volume for the Sub-Areas only having the information that pertains to that Sub-Area.

JEF Response: JEF interprets this to mean that you want all of the backup Appendix material for each of the sub-areas included in the Summary document. If this is the case, two problems arise: 1) Since we are making the Summary Volume 8 ½"x11", this would mean that all of this 11"x17" appendix material would have to be Z-folded and that would be approximately three (or more) 4" binders of Z-folds. 2) All of this backup material in the Summary Volume would be excessively redundant. Because of these two reasons we feel that it is better to leave the Summary Volume as a pure summary with all backup material being included in each of the corresponding sub-area Volumes where the design considerations are actually placed.

If you meant with this comment that you want each Volume to only include the information pertaining to that particular sub-area in the text, then the responses to comments 9, 10, 11, 12, and 15 address this issue.

Volume 1:

FCD Comment 8. Since this will be a stand alone document, it would be nice if this volume were in a regular 8 ½"x11" format.

JEF Response: JEF has changed this Volume to 8 ½"x11" format.

FCD Comment 9. The subtitle for this volume should read Analysis Summary and North of CAP Sub-Area.

JEF Response: The predominant nature of the Summary Volume is to act as a summary for the Step 2 report. In place of changing the name of the Summary Volume, text was added in the front of every Volume that explains to the reader exactly how this report is organized. This was done not only to address this comment, but also to address other concerns that have arisen based on our internal review as well as your comments. To address this particular comment, the following text is the first paragraph of that new text (Section 2.1 Report Organization):

> *The Step 2 Proposed Alternative Analysis Report is presented in seven (7) volumes. Volume 1 provides an overview of the ADMP, explains the ADMP process and the*

alternatives analysis, summarizes the Step 2 evaluation and results, and provides recommendations for the Step 3 refinements to the recommended alternative. Volume 1 also provides a discussion of general area-wide flood control issues and potential solutions as well as specific issues and potential solutions for the area north of the Central Arizona Project Canal. The so-called North of CAP sub-area is included in Volume 1 for two reasons: first, the sub-area is not dominated by large alluvial fans like the piedmont sub-areas in the remainder of the study area; second, the recommendations for the North of CAP sub-area are predominantly non-structural in nature.

FCD Comment 10. The section on North of CAP Sub-area should come after the general information in Chapter 8 for North of CAP Sub-area Specific Design Considerations.

JEF Response: JEF decided not to change the layout of the Summary report as described in this comment. This is based on the fact that there really are no specific design considerations for this area. It made more sense in the text to leave it within the context of describing the areawide issues and the additional piedmont sub-areas. This is also addressed in the text that was added in section 2.1 Report Organization. The following is an excerpt of that text that we believe will help.

The alternatives presented in Volumes 2 though 7 are primarily structural in nature. Therefore, the discussion of design methods, calculations, and results are more involved, and require additional information in their presentation. Volumes 2 through 7 also include site specific data, hydraulic analyses, and cost estimates for each of the proposed alternatives.

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- 5.1 Data Collection with all the sub-sections.
- 5.9 All the Open Channel Analyses equations should be in the summary volume.

JEF Response: Section 5.1 and all of the sub-sections was added, however, we feel that Section 5.9 does not need to be altered based on the fact that this is a long and technical section. The need for all of the hydraulic calculations in the summary document is not needed, however the summary description of what was used is more appropriate for this Summary Volume.

FCD Comment 12. The other chapters should be as follows:

Chapter 6:	**Design Procedures**
Chapter 7:	**Landscape Compatibility Enhancements**
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Chapter 9:	**Alternatives Evaluation**
Chapter 10:	**Recommendations for Step 3**
Chapter 11:	**North of CAP Sub-Area Specific Design Considerations and Summary**
Chapter 12:	**Summary**
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JEF Response: This issue encompasses several of the previous issues touched on in the other comments. The following is the complete added text in Section 2.1 that addresses why the approach that was taken in the Summary Volume was used and we feel should not be altered significantly:

2.1 Report Organization

The Step 2 Proposed Alternative Analysis Report is presented in seven (7) volumes. Volume 1 provides an overview of the ADMP, explains the ADMP process and the alternatives analysis, summarizes the Step 2 evaluation and results, and provides recommendations for the Step 3 refinements to the recommended alternative. Volume 1 also provides a discussion of general area-wide flood control issues and potential solutions as well as specific issues and potential solutions for the area north of the Central Arizona Project Canal. The so-called North of CAP sub-area is included in Volume 1 for two reasons: first, the sub-area is not dominated by large alluvial fans like the piedmont sub-areas in the remainder of the study area; second, the recommendations for the North of CAP sub-area are predominantly non-structural in nature. Volumes 2 through 7 present the proposed alternatives for the piedmont sub-areas as follows:

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August 28, 2006

Flood Control District of Maricopa County
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2801 West Durango Street
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Thanks,

Sincerely,

JE Fuller/Hydrology & Geomorphology, Inc.

Jeffrey A. Despain, P.E.
Project Engineer

CC: Jon Fuller
Ted Lehman

Memorandum JE Fuller/ Hydrology & Geomorphology, Inc.

DATE: September 15, 2006

TO: Valerie Swick/FCDMC

FROM: Jon Fuller, PE, RG, CFM

RE: Sun Valley ADMP
Alluvial Fan Floodplain Delineations: Fan 17-18-19
Response to TDN Review Comments

CC: Kathryn Gross/FCDMC
Julie Cox/FCDMC
Mike Kellogg/JEF
Rob Lyons/JEF

This memorandum summarizes JE Fuller/Hydrology & Geomorphology, Inc. (JEF) responses to District review comments. District review comments are enumerated below, using the number from the District review comment letter. JEF responses are shown in 10-point bold italic font immediately below each comment. We appreciate the thoughtful and timely review by the District staff.

Hydrology Comments (Julie Cox, Letter of September 6, 2006)

1. Electronic files were not submitted. Please submit CD for comparison purposes.
   JEF Response: Done. DDMSW, HEC-1, GIS, PDF, and all other file types used to develop the TDN are included on the CD.

2. I compared the input parameters and the output from the Fan 17, 18, and 19 models (for sub-basin S185) to the Area 4 models for both the 100-yr 24-hr and 100-yr 6-hr events. The sub-basin data and the output for sub-basin S185 are consistent with the Area 4 models.
   JEF Response: No response needed.

3. Based on the isopluvials in the Hydrology Manual, change the 100-yr 6-hr rainfall to 3.4 inches.
   JEF Response: Per meeting with Julie Cox on 9-18-06, and follow email correspondence, JEF will leave the 100-yr, 6-hr point rainfall depth at 3.2 inches based on the following findings:
   - ***NOAA 2 has the isopluvial value at 3.2 inches, as does the most current draft of the District's Manual***
   - ***The effective District Manual has the isopluvial value at 3.4 inches, but there is no explanation of why it was changed from the NOAA 2 value. We can make an educated guess as to what the isopluvial value might be, but the fact is that we cannot say with certainty that NOAA didn't intend to use 3.2 inches.***
   - ***Regardless of which isopluvial value we choose, we can be criticized (didn't use NOAA 2, the official source of rainfall data vs. didn't use effective FCD Manual)***
   - ***PBSJ (ADMS) and Alpha (White Tank Wash FDS) both used the 3.2 inch value. There is continuity in using the 3.2 in value***
   - ***The District is moving towards adopting the NOAA 14 rainfall. NOAA 14 has a 6hr, 100yr value of 3.16 inches***

- ***Using 3.4 in instead of 3.2 in results in about a 10% increase in Q100 peak discharge for about half the apexes. The other half are controlled by the 24 hr storm. Accuracy of hydrology is probably no better than +/- 25% anyway***
- ***For the TDN, the discharge does not affect the floodplain delineation. On the fan surface, geomorphic methods were used (Q is not a factor). For the upstream riverine delineations (approx. methods), there are no BFE's and the washes are in well defined canyons, so the difference in Q results in no observable difference in floodplain extent***
- ***For the ADMP, recommended capital improvement basin design is controlled by the 24 hr (volume) and once the piedmont drainage area kicks in, the 24 hr controls anyway***

4. Add copies of the 100-yr 24-hr and 100-yr 6-hr isopluvials from the Hydrology Manual to Appendix D.
   JEF Response: Done.

5. Land Use. The RTIMP used in the HEC-1 models differs from that in DDMSW. Please change to be consistent.
   JEF Response: The RTIMP in the HEC-1 model is a result of the % rock outcrops in the soil map units. Therefore, the RTIMP values for input land use categories may not reflect final values used in the HEC-1 models depending on whether any rock outcrops are found in soil units within the watershed.

6. Plate 1 – Add title Watershed Map, add the ft symbol to the top and bottom elevations, recommend changing to black and white map due to reproduction issues.
   JEF Response: Done. The symbology has been revised so all features will be discernable when reproduced in black and white.

7. Plate 2 – Add title Soils Map, add the ft symbol to the top and bottom elevations, recommend changing to black and white map due to reproduction issues.
   JEF Response: Done. The symbology has been revised so all features will be discernable when reproduced in black and white.

8. Plate 3 – Add title Land Use Map, add the ft symbol to the top and bottom elevations, recommend changing to black and white map due to reproduction issues.
   JEF Response: Done. The symbology has been revised so all features will be discernable when reproduced in black and white.

9. Report, Appendix D, Sub-basin Data Table. The Lca and Lengths listed in this table differ from those shown on Plates 1, 2, and 3. For example, for sub-basin 185, the maps show 10,439 ft for the Lca but the table shows 10,507 ft. The Lca and Lengths listed in the maps and tables should be identical to each other.
   JEF Response: The map is correct and the correct length of 10,439 ft was re-entered into DDMSW, the HEC-1 model was re-run,HEC-RAS was re-run, and all resulting revisions were made to the TDN text and appendix material. The other Lca and lengths were check and found to be correct.

10. Report, Page 1-2, Figure 1.1. Remove fans in Area 3 from location map. They are not related to this report.
    JEF Response: The Stage 1 delineation addresses the entire flank of the White Tank Mountain Piedmont, which includes Area 3 and Area 4. Figure 1-1 is also a location map which shows regional features.

11. Report, Page 4-3, Figure 4.1. Remove the 2-yr 6-hr and 2-yr 24-hr isopluvials. They are not related to this report.
JEF Response: Both the 2-year and 100-year point rainfall is input into the PREFRE programs to develop the rainfall statistics for the HEC-1 model.

12. Report, Page 4-5, Figure 4.2. Consider adding boundaries between the different land use types. It is difficult to see that the FAN18 sub-basin contains a small area of desert rangeland.
JEF Response: Done

13. Report, Page 4-6, paragraph 4. Change "Table 1" to "Table 4.1".
JEF Response: Done

14. Report, Page 4-6, paragraph 4. Change "section D.2" to "Appendix D".
JEF Response: Done

15. Report, Page 4-10, Table 4.3. Show units, i.e. cfs.
JEF Response: Done

16. I did not find where the report spells out the names of the soil types. Please include a table that identifies the name for each soil type (645100, 645123, etc.).
JEF Response: Done

17. Report references. Please add references from the Buckeye/Sun Valley ADMS, Sun Valley ADMP, Piedmont Manual, Hydrology Manual, Hydraulics Manual, SCS Soil Surveys, etc. as appropriate.
JEF Response: No citations to the Sun Valley ADMS or ADMP reports were made in Section 4. References to appropriate ADMS and ADMP documents are provided in other sections of the TDN where ADMS or ADMP documents were cited. A reference to the District's Hydrology Manual was added to the citations list.

Geomorphology Comments (Kathryn Gross, Letter dated xx, 2006)

Technical Summary

1. Hydrology – Make sure all supporting documentation is provided.
JEF Response: Done.

2. Hydraulics – Upstream modeling appears reasonable. Please run checkras on the upstream delineation. Upstream of the apex the delineation should be an administrative floodway. If the Consultant prefers the water surface elevations for each cross-section location can be determined using FlowMaster or a similar product. If left in RAS the Consultant needs to provide a baseline in the delineation and be prepared to answer any FEMA questions, as they will review it as a RAS product.
JEF Response: Done. Check-RAS was run, output is included in Appendix E, a baseline has been included on the workmaps.

3. Hydraulics – On Fan 19 the Upstream Zone A is located within a proposed AAFF. Do we want to extend the Zone A hydraulics or use the AAFF? Consider extending

the upstream Zone A delineation to Sun Valley Parkway. Would it need to extend down to the apex in order to satisfy containment concerns for FEMA?
JEF Response: The upstream end of the Fan 19 delineation was moved downstream so there is no overlap with the riverine delineation. The riverine delineation begins downstream of Sun Valley Parkway to avoid culvert modeling issues.

4. Geomorphology – TDN appendix G supporting documentation needs to be provided. A master Appendix G for all fan delineations is recommended.
JEF Response: An Appendix G has been created.

5. Floodplain Delineations - Some minor modifications to the delineation limits are recommended. This will require updates on the workmaps and annotated FIRM panels as well. This is discussed later in the comments.
JEF Response: Acknowledged. See specific responses below.

6. Delineation should be called out as White Tank Fan 17, 18, and 19.
JEF Response: Done.

Delineation

1. Locations where there are concerns regarding the delineation have been identified in the shape file fan171819quest.shp. This file will be included with this comment submittal.
JEF Response: File was received and considered. See specific responses below.

2. Concerned that breakout flows from above Fan 18's apex are not being mapped as floodplain. Please discuss.
JEF Response: The "breakouts" above the Fan 18 apex were modeled using RAS and were estimated to be less than 50 cfs, which is below the County's normal threshold for floodplain mapping. The breakout flow path leads to a channel which is tributary to the Fan 19 apex. If the breakout flow path were mapped using approximate methods it would create the situation of having an approximate method geomorphic floodplain transition into a riverine approximate method (HEC-RAS) floodplain then back to a geomorphic floodplain. Finally, the reach above the apex is clearly a riverine reach, with none of the characteristics of alluvial fan flooding. Therefore, JEF recommends treating it as a normal small riverine breakout flow, and mapping it with a LODS.

3. In 3 locations along White Tank Fan 18's UFD zone, there appears to be a chance for break out flows. Please determine if these are potential break out locations. Locations are shown in the shape file.
JEF Response: Geomorphic evidence indicates breakout flows have not occurred.

4. Need to discuss the AFUFD zone at Wagner Wash. Seems strict. Could this be designated as AFZA?
JEF Response: It is our professional opinion that there are small, but active alluvial fans at the toe of the piedmont where the fans confluence with Wagner Wash. The active fans are delineated as such. In some places, slight modifications to the fan limits were made based on further consideration.

5. Need to discuss the AFHH designations at Wagner Wash for a few of the delineations. May not be supported by management.
JEF Response: See response to #4 above.

Report Comments

1. Figure 1.1 - update delineation for Fan 19 if changes are made.
   JEF Response: Done

2. Page 2-1, Abstract section 2.1.3. Craig Kennedy is no longer the official contact at Baker. If a new contact is identified prior to FEMA submittal the name should be updated.
   JEF Response: Done

3. Page 2-1 section 2.1.10 Coordination of Peak Discharges. Since the hydrology is not finalized yet, this date will need to be updated.
   JEF Response: Done

4. FEMA OC Form
   - Part B number 1 Buckeye needs to be listed as an affected community in these tables as well
     JEF Response: JEF Response: The form is referencing the FIRM panel name. The Town of Buckeye is not listed on effective FIRM panel title block, although the town limits are shown. The Town of Buckeye is listed elsewhere on the FEMA forms. Nevertheless, the Town of Buckeye was added to the form block.

   - Part B number 3. Should there be a different project name other than Approximate Riverine floodplain delineation upstream of alluvial fan apexes?
     JEF Response: Yes, this field has been updated to read, " Approximate Zone A Floodplain Delineations Study of White Tank Fans 17, 18, and 19".

   - Part D – Signatures. Update Tim Phillips signature block. He is no longer acting Chief Engineer (remove acting).
     JEF Response: Done

   - Part D – Signatures. Update Woody Scouten. He will not be signing for Buckeye. District will provide you with updated information.
     JEF Response: Done

5. FEMA RH&H Form
   - Part B, number 4 – Could the model name be updated to reflect the study area (17,18,19) instead of "zonea". This would need to be corrected on all three forms.
     JEF Response: Done

6. Section 4 – Review comments will come from Julie Cox.
   JEF Response: Julie's comments were received and are addressed above.

7. Section 5, the upstream floodplain should be delineated as an administrative floodway and its designation should be discussed in this section.
   JEF Response: Done

8. Section 5.5.4, a break out from the delineation is discussed in the text and the discussion states that it was not delineated. Why is it not delineated and will FEMA allow a breakout upstream of the apex to not be delineated? Consider adding to the delineation.
   JEF Response: It was not delineated because it was estimated to be less than 50 cfs, the threshold of District & County regulatory authority. This practice is acceptable to FEMA, even in detailed studies. Refer to the Rio Verde South delineations for numerous examples.

9. Section 6, Figure 6.7, please consider adding a note to the figure explaining why there are no channels identified in the middle of the study area.
   JEF Response: Done

10. Page 7-1, section 7.1. Please add "White Tank Fan" in front of each fan number in the summary of discharges table.
    JEF Response: Done

Appendix Comments

1. Appendix A – no comments. Update references as needed.
   JEF Response: No response needed.

2. Appendix B – Include pertinent correspondence prior to FEMA submittal
   JEF Response: Done.

3. Appendix C – no comments.
   JEF Response: No response needed.

4. Appendix D – no comments.
   JEF Response: No response needed.

5. Appendix E – no comments.
   JEF Response: No response needed.

6. Appendix F –no comments.
   JEF Response: No response needed.

7. Appendix G – Include Master Appendix G with next submittal.
   JEF Response: Appendix G has been created.

8. Appendix H- no digital information was provided in this submittal. Please make sure to include a cd with the next submittal including digital line work for hydrology as well as floodplain delineation.
   JEF Response: Done. DDMSW, HEC-1, GIS, PDF, and all other file types used to develop the TDN are included on the CD.

9. A-Maps Hydrology. No comments.
   JEF Response: No response needed.

10. B-Maps Geomorphology. No comments.
    JEF Response: No response needed.

11. C-Maps Hydraulics/Floodplain.
    - Consider Labeling the Fans on the map sheets as "White Tank Fan 17", "White Tank Fan 18", "White Tank Fan 19".
      JEF Response: Done.

12. Annotated Panels. Please consider the following:
    - Somewhat hard to read the red line work and text.
      JEF Response:
    - Designations need to be modified. Please use FEMA designations on panels:
      JEF Response:
    - Upstream of Apex: Zone A Administrative Floodway – Inactive Fan Flooding
      JEF Response:
    - Downstream of Apex: Zone A Administrative Floodway – Active Fan Flooding and Zone A Inactive Fan Flooding.
      JEF Response:
    - Add a note stating administrative floodways are regulated by the local regulatory authority.
      JEF Response:
    - Add floodway shading of the corridors.
      JEF Response:
    - Consider naming the corridor.
      JEF Response:
    - FEMA will only allow one designation for any given location. If the proposed delineation is going to overlap the effective delineation a note with a leader line showing where we want to remove the effective delineation from the FIRM panel should be added.
      JEF Response:

Text Comments

1. Page 3-1, is "epoch" correct in the second sentence: "1992 epoch Central Zone of Arizona State Plane…"
   JEF Response: Done

2. Page 6-20 6B4.4 second paragraph. Please correct "hydrologic" apexes with "hydrographic".
   JEF Response: Done

3. Page 6-35. Please correct the following text concerns.
    - First paragraph last sentence. "…and net sediment (fine grained) sediment deposition."
      JEF Response: Done

- First paragraph sentence 4. Consider adding the word "active" to "secondary alluvial fans."
  JEF Response: Done

4. Page 6-36. Please correct the following text concerns.
   - First paragraph third sentence. "exist on land geologic landform."
     JEF Response: Done

   - Second paragraph "Fan Site 19is"
     JEF Response: Done

5. Page 6-41, Figure 6.21, Red outline and TDN text are commingling.
   JEF Response: Figure has been revised.

6. Page 6-53, 6B5.5, "fan areas at Site xx".
   JEF Response: Done

7. Page 6-53, 6.B.5.6 "fan areas at Site xx".
   JEF Response: Done

Memorandum JE Fuller/ Hydrology & Geomorphology, Inc.

DATE: September 15, 2006

TO: Valerie Swick/FCDMC

FROM: Jon Fuller, PE, RG, CFM

RE: Sun Valley ADMP
Alluvial Fan Floodplain Delineations: Fan 3-13-16
Response to TDN Review Comments

CC: Kathryn Gross/FCDMC
Julie Cox/FCDMC
Mike Kellogg/JEF
Rob Lyons/JEF

This memorandum summarizes JE Fuller/Hydrology & Geomorphology, Inc. (JEF) responses to District review comments. District review comments are enumerated below, using the number from the District review comment letter. JEF responses are shown in 10-point bold italic font immediately below each comment. We appreciate the thoughtful and timely review by the District staff.

Hydrology Comments (Julie Cox, Letter of August 28, 2006)

1. Electronic files were not submitted. Please submit CD for comparison purposes.
   JEF Response: Done. DDMSW, HEC-1, GIS, PDF, and all other file types used to develop the TDN are included on the CD.

2. I compared the input parameters and the output from the Fan 3, 13, and 16 models to the Area 4 models for both the 100-yr 24-hr and 100-yr 6-hr events. The sub-basin data and the output in this Fan 3, 13, and 16 study are consistent with the same sub-basins in the Area 4 models.
   JEF Response: No response needed.

3. Based on the isopluvials in the Hydrology Manual, change the 100-yr 6-hr rainfall to 3.4 inches.
   JEF Response: Per meeting with Julie Cox on 9-18-06, and follow email correspondence, JEF will leave the 100-yr, 6-hr point rainfall depth at 3.2 inches based on the following findings:
   - ***NOAA 2 has the isopluvial value at 3.2 inches, as does the most current draft of the District's Manual***
   - ***The effective District Manual has the isopluvial value at 3.4 inches, but there is no explanation of why it was changed from the NOAA 2 value. We can make an educated guess as to what the isopluvial value might be, but the fact is that we cannot say with certainty that NOAA didn't intend to use 3.2 inches.***
   - ***Regardless of which isopluvial value we choose, we can be criticized (didn't use NOAA 2, the official source of rainfall data vs. didn't use effective FCD Manual)***
   - ***PBSJ (ADMS) and Alpha (White Tank Wash FDS) both used the 3.2 inch value. There is continuity in using the 3.2 in value***
   - ***The District is moving towards adopting the NOAA 14 rainfall. NOAA 14 has a 6hr, 100yr value of 3.16 inches***

- ***Using 3.4 in instead of 3.2 in results in about a 10% increase in Q100 peak discharge for about half the apexes. The other half are controlled by the 24 hr storm. Accuracy of hydrology is probably no better than +/- 25% anyway***
- ***For the TDN, the discharge does not affect the floodplain delineation. On the fan surface, geomorphic methods were used (Q is not a factor). For the upstream riverine delineations (approx. methods), there are no BFE's and the washes are in well defined canyons, so the difference in Q results in no observable difference in floodplain extent***
- ***For the ADMP, recommended capital improvement basin design is controlled by the 24 hr (volume) and once the piedmont drainage area kicks in, the 24 hr controls anyway***

4. Add copies of the 100-yr 24-hr and 100-yr 6-hr isopluvials from the Hydrology Manual to Appendix D.
   JEF Response: Done.

5. Land Use. The RTIMP used in the HEC-1 models differs from that in DDMSW. Please change to be consistent.
   JEF Response: The RTIMP in the HEC-1 model is a result of the % rock outcrops in the soil map units. Therefore, the RTIMP values for input land use categories may not reflect final values used in the HEC-1 models depending on whether any rock outcrops are found in soil units within the watershed.

6. Plate 1 – Add title Watershed Map, add the ft symbol to the top and bottom elevations, add ranges (in addition to townships and sections), recommend changing to black and white map due to reproduction issues.
   JEF Response: Done. The symbology has been revised so all features will be discernable when reproduced in black and white.

7. Plate 2 – Add title Soils Map, add the ft symbol to the top and bottom elevations, add ranges (in addition to townships and sections), recommend changing to black and white map due to reproduction issues. For sub-basin 165, show soil type 64529, and it's area, on the map.
   JEF Response: Done. The symbology has been revised so all features will be discernable when reproduced in black and white.

8. Plate 3 – Add title Land Use Map, add the ft symbol to the top and bottom elevations, add ranges (in addition to townships and sections), recommend changing to black and white map due to reproduction issues.
   JEF Response: Done. The symbology has been revised so all features will be discernable when reproduced in black and white.

9. Report, Page 1-1, Section 1.1, Sentence 2. Change "report to distinguish it" to "report to distinguish them".
   JEF Response: Done

10. Report, Page 1-2, Figure 1.1. Remove fans in Area 3 from location map. They are not related to this report.
    JEF Response: The Stage 1 delineation addresses the entire flank of the White Tank Mountain Piedmont, which includes Area 3 and Area 4. Figure 1-1 is also a location map which shows regional features.

11. Report, Page 1-3, Figure 1.2. Add S165 and it's area 0.62 sq mi, to Figure 1.2.

JEF Response:

12. Report, Page 4-4, Figure 4.1. Remove the 2-yr 6-hr and 2-yr 24-hr isopluvials. They are not related to this report.
JEF Response: Both the 2-year and 100-year point rainfall is input into the PREFRE programs to develop the rainfall statistics for the HEC-1 model.

13. Report, Page 4-6, paragraph 4. Change "Table 1" to "Table 4.1".
JEF Response: Done

14. Report, Page 4-6, paragraph 4. Change "section D.2" to "Appendix D".
JEF Response: Done

15. Report, Page 4-12, Table 4.3. Show units, i.e. cfs.
JEF Response: Done

16. I did not find where the report spells out the names of the soil types. Please include a table that identifies the name for each soil type (645100, 645123, etc.).
JEF Response: Done

17. Report references. Please add references from the Buckeye/Sun Valley ADMS, Sun Valley ADMP, Piedmont Manual, Hydrology Manual, Hydraulics Manual, SCS Soil Surveys, etc. as appropriate.
JEF Response: No citations to the Sun Valley ADMS or ADMP reports were made in Section 4. References to appropriate ADMS and ADMP documents are provided in other sections of the TDN where ADMS or ADMP documents were cited. A reference to the District's Hydrology Manual was added to the citations list.

Geomorphology Comments (Kathryn Gross, Letter dated August 25, 2006)

I have reviewed the above submittal and have the following comments. Overall the delineation limits appear reasonable; however, there are some designation concerns and modifications that are needed prior to approval.
JEF Response: See responses to specific comments below.

Technical Summary

1. Hydrology – Make sure all supporting documentation is provided. Full comments forthcoming from Julie Cox.
JEF Response: Comments were received from Julie and are listed above.

2. Hydraulics – Upstream modeling appears reasonable. Please run checkras on the upstream delineation. Upstream of the apex the delineation should be an administrative floodway. If the Consultant prefers the water surface elevations for each cross-section location can be determined using FlowMaster or a similar product. If left in RAS the Consultant needs to provide a baseline in the delineation and be prepared to answer any FEMA questions, as they will review it as a RAS product.
JEF Response: Done. Check-RAS was run, output is included in Appendix E, a baseline has been included on the workmaps.

3. Geomorphology – TDN appendix G supporting documentation needs to be provided. Anticipate a master Appendix G for all fan delineations with next submittal.
   JEF Response: An Appendix G has been created.

4. Floodplain Delineations - Some minor modifications to the delineation limits are recommended. This will require updates on the workmaps and annotated FIRM panels as well. This is discussed later in the comments.
   JEF Response: Specific responses are provided below.

5. Delineations should be called out as White Tank Fan 3, White Tank Fan 13, and White Tank Fan 16 on workmaps where possible.
   JEF Response: Done

Delineation

1. Locations where there are concerns regarding the delineation have been identified in the shape file 31316quest.shp. This file will be included with this comment submittal.
   JEF Response: File was received and considered. See specific responses below.

2. Where the delineations tie into Wagner Wash please draw the limits to the floodplain limits.
   JEF Response: This comment was discussed with the District reviewer. Because the alluvial fan floodplain delineation includes administrative floodways, the limits were drawn to the floodway limit, rather than the floodway fringe. The latter would leave a gap between floodways that potentially could be developed.

3. Further discussion is needed regarding the extent and placement of certain AFUFD zones prior to accepting those designations and limits. Specific concerns are use of AFUFD to delineate overbank areas adjacent to AAFF corridors and in inselberg shadows; as well as concerns that the AFUFD zones appear large in relation to the potential discharges across their surfaces.
   JEF Response: JEF and the District discussed AFUFD Zones further and revised the delineations accordingly.

4. Recommendations have been made to remove or extend certain AAFF zones to more closely match the definition in the PFHAM.
   JEF Response: Where appropriate, revisions to the delineations were made.

Report Comments

1. Page 2-1, Abstract section 2.1.3. Craig Kennedy is no longer the official contact at Baker. If a new contact is identified prior to FEMA submittal the name should be updated.
   JEF Response: Done

2. Page 2-1 section 2.1.10 Coordination of Peak Discharges. Since the hydrology is not finalized yet, this date will need to be updated. The Study title should also be Sun Valley Area Drainage Master Plan instead of Study.
   JEF Response: Done

3. FEMA OC Form
    a. Part B number 1 – Communities. Only Maricopa is listed for each of the panels. Buckeye needs to be listed as well.
    JEF Response: The form is referencing the FIRM panel name. The Town of Buckeye is not listed on effective FIRM panel title block, although the town limits are shown. The Town of Buckeye is listed elsewhere on the FEMA forms. Nevertheless, the Town of Buckeye was added to the form block.

    b. Part D – Community Signature - Tim Phillip's title should be changed. He is no longer "acting".
    JEF Response: Done.

    c. Part D – Community Signature – Buckeye- District will provide you with the information for the new person at Buckeye who will be signing the forms.
    JEF Response: The District has not provided updated name information.

4. FEMA RH&H Form
    a. Part B
        1. Number 4 – Could the model name reflect the location?
        JEF Response: Done

5. Page 3-1, section 3.2. Please remove aerial photography from first sentence.
JEF Response: Done

6. Section 4 – Review comments will be provided by Julie Cox.
JEF Response: Responses to Julie's comments are listed above.

7. Section 5, the alluvial fan delineation will tie in to Wagner Wash. This should be discussed in the text in either this section or section 6.
JEF Response: A discussion was added to the text in Section 5 and 6.

8. Section 5.6. Please rephrase the discussion regarding the administrative floodways. If possible remove the statements "The District would like…"
JEF Response: Done

9. For Figure 6.7, please consider adding a note to the figure explaining why there are no channels identified in the middle of the study area.
JEF Response: Done

10. Page 6-47, Figure 6.24. Could this figure be presented as an 11x17?
JEF Response: For consistency with the other TDN's, the figure was kept at 8.5x11, however, the data presented in the figure is derived from the FCDMC database.

11. Page 6-63. Is this specific discussion regarding the development of AAFFs pertinent to the actual delineation of the AAFFs for Fans 3, 13, and 16? Was the method discussed actually applied to portions of these delineations?
JEF Response: The answer to both questions is yes.

12. Page 6-64 section 6B.6.2. Was a hydraulic check performed for this fan analysis? If so include its discussion. Should any statements be made as to why one wasn't performed? The concern would be for FEMA's aid as to why they appear in the other reports but not this one. District is fine including no hydraulic check.
JEF Response: The answer to the first question is no. A hydraulic check was done for the Fan 10-11 TDN (and has since been removed), but none of the other TDNs. The information obtained from the hydraulic check was not worth the effort. Since no hydraulic check is required by FEMA, and it provides no useful information, we decided to eliminate it. In general, we prefer not to include discussions of analyses we didn't do in our reports.

Appendix Comments

1. Appendix A – no comments. Update references as needed.
JEF Response: No response needed.

2. Appendix B – no comments. Update as needed.
JEF Response: No response needed.

3. Appendix C – no comments.
JEF Response: No response needed.

4. Appendix D – No comments.
JEF Response: No response needed.

5. Appendix E – no comments.
JEF Response: No response needed.

6. Appendix F –no comments.
JEF Response: No response needed.

7. Appendix G – Provide Master Appendix G with next submittal.
JEF Response: An Appendix G has been created.

8. Appendix H- Please make sure to include a cd with the next submittal including digital line work for hydrology as well as floodplain delineation.
JEF Response: Done. DDMSW, HEC-1, GIS, PDF, and all other file types used to develop the TDN are included on the CD.

9. A-Maps Hydrology – No comments.
JEF Response: No response needed.

10. B-Maps Geomorphology – No comments.
JEF Response: No response needed.

11. C-Maps Hydraulics/Floodplain – Please draw the limits of the fan delineations to the Wagner Wash floodplain limits. This can be discussed further.
JEF Response: This comment was discussed with the District reviewer. Because the alluvial fan floodplain delineation includes administrative floodways, the limits were drawn to the floodway limit, rather than the floodway fringe. The latter would leave a gap between floodways that potentially could be developed.

12. Annotated Panels. Please consider the following:
    a. Somewhat hard to read the red line work and text.
    JEF Response: Done

    b. Designations need to be modified. Please use FEMA designations on panels:
    JEF Response: Done

        - Upstream of Apex: Zone A Administrative Floodway – Inactive Fan Flooding
        JEF Response: Done

        - Downstream of Apex: Zone A Administrative Floodway – Active Fan Flooding and Zone A Inactive Fan Flooding.
        JEF Response: Done

    c. Add a note stating administrative floodways are regulated by the local regulatory authority.
    JEF Response: Done

    d. Add floodway shading of the corridors.
    JEF Response: Done

    e. Consider naming the corridor.
    JEF Response: Done

    f. FEMA will only allow one designation for any given location. If the proposed delineation is going to overlap the effective delineation a note with a leader line showing where we want to remove the effective delineation from the FIRM panel should be added.
    JEF Response: Done

Text Comments

1. page 6-35, second paragraph, first sentence. Please correct "and are thus were delineated".
   JEF Response: Done

2. Page 6-36, second paragraph, 2nd sentence. In this sentence should the second fan reference be to Fan 3 instead of Fan 13?
   JEF Response: Done

3. Page 6-57. Table 6B.7.Please correct the decimals for the 100 year average deposition depth for Fan 3.
   JEF Response: Done

4. Section 6B.5.6 Please revisit the numbering of subsections. There are two 6B.5.6.3s.
   JEF Response: Done

Memorandum JE Fuller/ Hydrology & Geomorphology, Inc.

DATE: September 15, 2006

TO: Valerie Swick/FCDMC

FROM: Jon Fuller, PE, RG, CFM

RE: Sun Valley ADMP
Alluvial Fan Floodplain Delineations: Fans 4 & 5
Response to TDN Review Comments

CC: Kathryn Gross/FCDMC
Julie Cox/FCDMC
Mike Kellogg/JEF
Rob Lyons/JEF

This memorandum summarizes JE Fuller/Hydrology & Geomorphology, Inc. (JEF) responses to District review comments. District review comments are enumerated below, using the number from the District review comment letter. JEF responses are shown in 10-point bold italic font immediately below each comment. We appreciate the thoughtful and timely review by the District staff.

Hydrology Comments (Julie Cox, Letter of August 24, 2006)

1. Electronic files were not submitted. Please submit CD for comparison purposes.
   JEF Response: Done. DDMSW, HEC-1, GIS, PDF, and all other file types used to develop the TDN are included on the CD.

2. I compared the input parameters and the output from the Fan 4 & 5 models to the Area 4 models for both the 100-yr 24-hr and 100-yr 6-hr events. The sub-basin data and the output in this Fan 4 & 5 study are consistent with the same sub-basins in the Area 4 models.
   JEF Response: No response needed.

3. Based on the isopluvials in the Hydrology Manual, change the 100-yr 6-hr rainfall to 3.4 inches.
   JEF Response: Per meeting with Julie Cox on 9-18-06, and follow email correspondence, JEF will leave the 100-yr, 6-hr point rainfall depth at 3.2 inches based on the following findings:
   - ***NOAA 2 has the isopluvial value at 3.2 inches, as does the most current draft of the District's Manual***
   - ***The effective District Manual has the isopluvial value at 3.4 inches, but there is no explanation of why it was changed from the NOAA 2 value. We can make an educated guess as to what the isopluvial value might be, but the fact is that we cannot say with certainty that NOAA didn't intend to use 3.2 inches.***
   - ***Regardless of which isopluvial value we choose, we can be criticized (didn't use NOAA 2, the official source of rainfall data vs. didn't use effective FCD Manual)***
   - ***PBSJ (ADMS) and Alpha (White Tank Wash FDS) both used the 3.2 inch value. There is continuity in using the 3.2 in value***
   - ***The District is moving towards adopting the NOAA 14 rainfall. NOAA 14 has a 6hr, 100yr value of 3.16 inches***

- ***Using 3.4 in instead of 3.2 in results in about a 10% increase in Q100 peak discharge for about half the apexes. The other half are controlled by the 24 hr storm. Accuracy of hydrology is probably no better than +/- 25% anyway***
- ***For the TDN, the discharge does not affect the floodplain delineation. On the fan surface, geomorphic methods were used (Q is not a factor). For the upstream riverine delineations (approx. methods), there are no BFE's and the washes are in well defined canyons, so the difference in Q results in no observable difference in floodplain extent***
- ***For the ADMP, recommended capital improvement basin design is controlled by the 24 hr (volume) and once the piedmont drainage area kicks in, the 24 hr controls anyway***

4. Add copies of the 100-yr 24-hr and 100-yr 6-hr isopluvials from the Hydrology Manual to Appendix D.
   JEF Response: Done.

5. The Summary of Results page is missing from Appendix D.1. Please include in the next submittal.
   JEF Response: Done.

6. Land Use. The RTIMP used in the HEC-1 models differs from that in DDMSW. Please change to be consistent.
   JEF Response: The RTIMP in the HEC-1 model is a result of the % rock outcrops in the soil map units. Therefore, the RTIMP values for input land use categories may not reflect final values used in the HEC-1 models depending on whether any rock outcrops are found in soil units within the watershed.

7. Plate 1 – Add title Watershed Map, add intermittent elevations to contours, add the ft symbol to the top and bottom elevations, recommend changing to black and white map due to reproduction issues.
   JEF Response: Done. The symbology has been revised so all features will be discernable when reproduced in black and white.

8. Plate 2 – Add title Soils Map, add intermittent elevations to contours, add the ft symbol to the top and bottom elevations, recommend changing to black and white map due to reproduction issues. Cannot distinguish soil types from each other. Please use more contrast for the different soil types.
   JEF Response: Done. The symbology has been revised so all features will be discernable when reproduced in black and white.

9. Plate 3 – Add title Land Use Map, add intermittent elevations to contours, add the ft symbol to the top and bottom elevations, recommend changing to black and white map due to reproduction issues. Cannot distinguish land use types from each other. Please use more contrast for the different land use types.
   JEF Response: Done. The symbology has been revised so all features will be discernable when reproduced in black and white.

10. Plate 3 – To be consistent with the other Fan TDNs, please show only the existing land use types modeled, i.e. Hillslopes and Mountain Terrain. Remove Desert Rangeland (NDR) < 5% slopes from the legend since this land use type was not used.
    JEF Response: Done.

11. Report, Page 1-1, Section 1.1. Change "Sites 4 and 5 n the White Tank Piedmont" to "Sites 4 and 5 on the White Tank Piedmont".
JEF Response: Done.

12. Report, Page 4-3, last sentence. Change "PI records" to "PC records".
JEF Response: Done.

13. Report, Page 4-4, Figure 4.1. Remove the 2-yr 6-hr and 2-yr 24-hr isopluvials. They are not related to this report.
JEF Response: Both the 2-year and 100-year point rainfall is input into the PREFRE programs to develop the rainfall statistics for the HEC-1 model. Per verbal comment from Julie, the Figure will remain as is.

14. Report, Page 4-5, Land Use, last sentence. Insert "Natural" before "Mountain Terrain".
JEF Response: Done

15. Report, Page 4-5, Land Use, last sentence. Change "Fan 10 and 11" to "Fan 4 and 5".
JEF Response: Done

16. Report, Page 4-7, 2 locations. Change "Table 1" to "Table 4.1".
JEF Response: Done

17. Report, Page 4-7, Unit Hydrograph. Change "Fan 10 and 11" to "Fan 4 and 5".
JEF Response: Done

18. Report, Page 4-12, Table 4.3. Show units, i.e. cfs and cfs/sq mi.
JEF Response: Done

19. I did not find where the report spells out the names of the soil types. Please include a table that identifies the name for each soil type (645100, 645123, etc.).
JEF Response: Done.

20. Report references. Please add references from the Buckeye/Sun Valley ADMS, Sun Valley ADMP, Piedmont Manual, Hydrology Manual, Hydraulics Manual, SCS Soil Surveys, etc. as appropriate.
JEF Response: No citations to the Sun Valley ADMS or ADMP reports were made in Section 4. References to appropriate ADMS and ADMP documents are provided in other sections of the TDN where ADMS or ADMP documents were cited. A reference to the District's Hydrology Manual was added to the citations list.

    Julie Cox provided the following comment during a meeting on 9-18-06: Review the unit hydrograph for Sub-basin S500, something seems off.
    JEF Response: Due to the MCUHP2 program's limitation of 50 ordinates, the total unit hydrograph could not be captured. Therefore, the unit hydrograph was redeveloped for a 10 minute time-step. The peak flow rates were reduced slightly and all documentation and maps were updated accordingly. A paragraph was added to Section 4.3.1 that discusses this problem in more detail.

Geomorphology Comments (Kathryn Gross, Letter dated August 11, 2006)

I have reviewed the above submittal and have the following comments. Overall the delineation limits appear reasonable; however, there are some designation concerns and modifications that are needed prior to approval.

JEF Response: See responses to specific comments below.

Technical Summary

1. Hydrology – Make sure all supporting documentation is provided. Full comments forthcoming from Julie Cox.
   JEF Response: Comments were received from Julie and are listed above.

2. Hydraulics – Upstream modeling appears reasonable. Please run checkras on the upstream delineation. Upstream of the apex the delineation should be an administrative floodway. If the Consultant prefers the water surface elevations for each cross-section location can be determined using FlowMaster or a similar product. If left in RAS the Consultant needs to provide a baseline in the delineation and be prepared to answer any FEMA questions, as they will review it as a RAS product.
   JEF Response: Done. Check-RAS was run, output is included in Appendix E, a baseline has been included on the workmaps.

3. Geomorphology – TDN appendix G supporting documentation needs to be provided. A master Appendix G for all fan delineations is recommended.
   JEF Response: An Appendix G has been created.

4. Floodplain Delineations - Some potential modifications to the delineation limits are recommended. This will require updates on the workmaps and annotated FIRM panels as well. This is discussed later in the comments.
   JEF Response: Specific responses are provided below.

5. Delineation should be called out as White Tank Fans 4 and 5.
   JEF Response: Done

Delineation

1. Locations where there are concerns regarding the delineation have been identified in the shape file fan45quest.shp. This file will be included with this comment submittal. Some points require no action, as they are just field visit points for myself.
   JEF Response: File was received and considered. See specific responses below.

2. At present the delineation appears reasonable. However, there are two locations where modifications may be discussed further.
   a. The first location is the AFHH zone that contains points 3 and 10. The surface does not appear to support the active fan condition.
      JEF Response: Zone has been changed to AFUFD designation.

b. The second location possibly needed designation modification would be the Hassayampa Fans. If management is concerned about the floodway designation further discussions may be necessary.
JEF Response: It is our professional opinion that our delineation correctly identifies small, but active alluvial fans at the toe of the piedmont where the fans confluence with the Hassayampa River. The active fans are delineated as such. In some places, slight modifications to the fan limits were made based on further consideration.

Report Comments

1. Page 2-1, Abstract section 2.1.3. Craig Kennedy is no longer the official contact at Baker. If a new contact is identified prior to FEMA submittal the name should be updated.
JEF Response: Done

2. Page 2-1 section 2.1.7 Reach Description. Should we list only the fan associated with this report?
JEF Response: Done

3. Page 2-1 section 2.1.10 Coordination of Peak Discharges. Since the hydrology is not finalized yet, this date will need to be updated.
JEF Response: Done

4. FEMA O&C Form
   a. Part D – The form should be updated to reflect my name.
   JEF Response: Done

5. FEMA RH&H Form
   b. Two sets of RH&H forms were submitted. For each set all the fans are listed under Flooding Source. Was one set to be for Fan 4 and one set to be Fan 5?
   JEF Response: Changed to list only one fan per form.
   c. Part B
      i. Number 3 - The yes box should be checked here instead of no if the use of RAS is continued.
      JEF Response: Done
      ii. Number 4 – Could the model name reflect a Fan 4 and 5 identifier?
      JEF Response: Done

6. Section 4 – Review comments will be provided by Julie Cox.
JEF Response: Déjà vu. Comments were received from Julie and are listed above.

7. Section 5, the upstream floodplain should be delineated as an administrative floodway and its designation should be discussed in this section.
JEF Response: A discussion of riverine administrative floodways was added to Section 5.

8. Section 5, the alluvial fan delineation will supercede portions of the existing Hassayampa River delineation. This should be discussed in the text in either this section or section 6.
JEF Response: This comment was discussed with the District reviewer. Because the alluvial fan floodplain delineation includes administrative floodways, the limits were drawn to the floodway

limit, rather than the floodway fringe. The latter would leave a gap between floodways that potentially could be developed. A discussion of this was added to Sections 5 and 6.

9. Page 5-8. Make sure to include the RAS summary table in the final report.
   JEF Response: Done.

10. Page 6-60, 6B.6.2 consider rewording third paragraph. My interpretation of the text is that there was a difference in flood hazard between the delineation and the AZGS flood hazard classification, L2. In my opinion it looks like a reasonable match. L2 states that flows are confined in channels. The AAFF zones are essentially occurring in the channels as described by the AZGS report.
    JEF Response: The paragraph was reworded.

Appendix Comments

1. For Appendix A, B, C, and E - no comments. Update references as needed.
   JEF Response: No response needed.

2. Appendix D - Consider placing a separate copy of the Rainfall figure in the appendix. Organize data following State Standard.
   JEF Response: Done.

3. Appendix F – consider providing information from the sediment yield analysis here.
   JEF Response: The Ayres Sediment Report was added to Appendix G.

4. Appendix G – no supporting documentation of the geomorphic analysis was provided. Perhaps a master Appendix G could be developed for use with all the Fan reports.
   JEF Response: An Appendix G has been created.

5. Appendix H- no digital information was provided in this submittal. Please make sure to include a cd with the next submittal including digital line work for hydrology as well as floodplain delineation.
   JEF Response: Done. DDMSW, HEC-1, GIS, PDF, and all other file types used to develop the TDN are included on the CD.

6. A-Maps Hydrology. No concerns.
   JEF Response: No response needed.

7. B-Maps Geomorphology. No concerns.
   JEF Response: No response needed.

8. C-Maps Hydraulics/Floodplain.
   a. Consider removing the smaller Shaded X zones.
      JEF Response: Small zones less than 5 acres were not delineated.

   b. Floodway symbology is needed on the delineations shown.
      JEF Response: Done.

   c. Consider adding a legend of the FCD fan delineation categories.

JEF Response: Done.

d. Consider revising the title to "Approximate Zone A Floodplain Delineation Study of White Tank Fans 4 and 5."
JEF Response: Done.

e. Consider labeling the Fans as White Tank Fan 4 and White Tank Fan 5 on the workmaps.
JEF Response: Done.

f. Consider adding labels identifying where the White Tank Fan 4 and 5 delineation will tie into the existing Hassayampa River delineation.
JEF Response: Done.

9. Annotated Panels. Please consider the following:
   a. Somewhat hard to read the red line work and text.
   JEF Response: Increased font size, added white background behind text where necessary.

   b. Designations need to be modified. Please use FEMA designations on panels:
   JEF Response: Done.

   c. Upstream of Apex: Zone A Administrative Floodway – Inactive Fan Flooding
   JEF Response: Done.

   d. Downstream of Apex: Zone A Administrative Floodway – Active Fan Flooding and Zone A Inactive Fan Flooding.
   JEF Response: Done.

   e. Add a note stating administrative floodways are regulated by the local regulatory authority.
   JEF Response: Done.

   f. Add floodway shading of the corridors.
   JEF Response: Done.

   g. Consider naming the corridor.
   JEF Response: Done.

   h. FEMA will only allow one designation for any given location. If the proposed delineation is going to overlap the effective delineation a note with a leader line showing where we want to remove the effective delineation from the FIRM panel should be added.
   JEF Response: Done.

Text Comments

1. Page 5-1 section 5.1. Please correct "apeces" with either "apexes" or "apices".
   JEF Response: Done

2. Page 6-4. Update the study list so that 16 is added to 3-13

JEF Response: Done

3. Page 6-9. Update the text in the 2nd paragraph. It states Fan 6 instead of Fans 4 and 5.
   JEF Response: Done

4. Page 6-26, 6B.4.4 last sentence. Please update the text to reflect that there were 5 new fans identified (16-20).
   JEF Response: Done

5. Page 6-42 second paragraph second to last sentence. Please replace "excel" with "excess."
   JEF Response: Done

6. Page 6-54 section 6B.5.6.3. Please add "and" before Sun Valley Parkway in the first sentence and replace "of" with "on" in the second sentence.
   JEF Response: Done

7. Section 6B.5.6 Please revisit numbering of subsections.
   JEF Response: Done

Memorandum JE Fuller/ Hydrology & Geomorphology, Inc.

DATE: September 15, 2006

TO: Valerie Swick/FCDMC

FROM: Jon Fuller, PE, RG, CFM

RE: Sun Valley ADMP
Alluvial Fan Floodplain Delineations: Fan 6
Response to TDN Review Comments

CC: Kathryn Gross/FCDMC
Julie Cox/FCDMC
Mike Kellogg/JEF
Rob Lyons/JEF

This memorandum summarizes JE Fuller/Hydrology & Geomorphology, Inc. (JEF) responses to District review comments. District review comments are enumerated below, using the number from the District review comment letter. JEF responses are shown in 10-point bold italic font immediately below each comment. We appreciate the thoughtful and timely review by the District staff.

Hydrology Comments (Julie Cox, Letter of July 19, 2006)

1. Electronic files were not submitted. Please submit CD for comparison purposes.
   JEF Response: Done. DDMSW, HEC-1, GIS, PDF, and all other file types used to develop the TDN are included on the CD.

2. Based on the isopluvials in the Hydrology Manual, change the 100-yr 6-hr rainfall to 3.4 inches.
   JEF Response: Per meeting with Julie Cox on 9-18-06, and follow email correspondence, JEF will leave the 100-yr, 6-hr point rainfall depth at 3.2 inches based on the following findings:
   - ***NOAA 2 has the isopluvial value at 3.2 inches, as does the most current draft of the District's Manual***
   - ***The effective District Manual has the isopluvial value at 3.4 inches, but there is no explanation of why it was changed from the NOAA 2 value. We can make an educated guess as to what the isopluvial value might be, but the fact is that we cannot say with certainty that NOAA didn't intend to use 3.2 inches.***
   - ***Regardless of which isopluvial value we choose, we can be criticized (didn't use NOAA 2, the official source of rainfall data vs. didn't use effective FCD Manual)***
   - ***PBSJ (ADMS) and Alpha (White Tank Wash FDS) both used the 3.2 inch value. There is continuity in using the 3.2 in value***
   - ***The District is moving towards adopting the NOAA 14 rainfall. NOAA 14 has a 6hr, 100yr value of 3.16 inches***
   - ***Using 3.4 in instead of 3.2 in results in about a 10% increase in Q100 peak discharge for about half the apexes. The other half are controlled by the 24 hr storm. Accuracy of hydrology is probably no better than +/- 25% anyway***
   - ***For the TDN, the discharge does not affect the floodplain delineation. On the fan surface, geomorphic methods were used (Q is not a factor). For the upstream riverine delineations (approx. methods), there are no BFE's and the washes are in well defined canyons, so the difference in Q results in no observable difference in floodplain extent***

- ***For the ADMP, recommended capital improvement basin design is controlled by the 24 hr (volume) and once the piedmont drainage area kicks in, the 24 hr controls anyway***

3. Add copies of the 100-yr 24-hr and 100-yr 6-hr isopluvials from the Hydrology Manual to Appendix D.
   JEF Response: Done.

4. Plate 1 – Add title Watershed Map, add intermittent elevations to contours, add the ft symbol to the top and bottom elevations of the sub-basin, recommend changing to black and white map due to reproduction issues.
   JEF Response: Done. The symbology has been revised so all features will be discernable when reproduced in black and white.

5. Plate 2 – Add title Soils Map, add intermittent elevations to contours, add the ft symbol to the top and bottom elevations of the sub-basin, recommend changing to black and white map due to reproduction issues. Please use more contrast for the differences in soil types.
   JEF Response: Done. The symbology has been revised so all features will be discernable when reproduced in black and white.

6. Plate 3 – Add title Land Use Map, add intermittent elevations to contours, add the ft symbol to the top and bottom elevations of the sub-basin, recommend changing to black and white map due to reproduction issues.
   JEF Response: Done. The symbology has been revised so all features will be discernable when reproduced in black and white.

7. Report, Page 1-1, Section 1.1. Change "Site 6 n the White Tank Piedmont" to "Site 6 on the White Tank Piedmont".
   JEF Response: Done

8. Report, Page 4-1, Section 4.2.1 Change "One individual subbasins" to "One individual sub-basin" and change "Waterhsed" to "Watershed".
   JEF Response: Done

9. Report, Page 4-2, Paragraph 2. Change "The SCS (1963) indicate" to "The SCS (1963) indicates".
   JEF Response: Done

10. Report, Page 4-3, last sentence. Change "PI records" to "PC records".
    JEF Response: Done

11. Report, Page 4-4, Figure 4.1. Remove the 2-yr 6-hr and 2-yr 24-hr isopluvials. They are not related to this report.
    JEF Response: Both the 2-year and 100-year point rainfall is input into the PREFRE programs to develop the rainfall statistics for the HEC-1 model. Per verbal comment from Julie, the Figure will remain as is.

12. Report, Page 4-7, 2 locations. Change "Table 1" to "Table 4.1".
    JEF Response: Done

13. Report references. Please add references from the Buckeye/Sun Valley ADMS, Sun Valley ADMP, Piedmont Manual, Hydrology Manual, Hydraulics Manual, SCS Soil Surveys, etc. as appropriate.
JEF Response: No citations to the Sun Valley ADMS or ADMP reports were made in Section 4. References to appropriate ADMS and ADMP documents are provided in other sections of the TDN where ADMS or ADMP documents were cited. A reference to the District's Hydrology Manual was added to the citations list.

Geomorphology Comments (Kathryn Gross, Letter dated July 14, 2006)

I have reviewed the above submittal and have the following comments. Overall the delineation limits appear reasonable; however, there are some designation concerns and modifications that are needed prior to approval.
JEF Response: See responses to specific comments below.

Technical Summary

1. Hydrology – Make sure all supporting documentation is provided. Full comments forthcoming from Julie Cox.
JEF Response: Comments were received from Julie and are listed above.

2. Hydraulics – Upstream modeling appears reasonable. Please run checkras on the upstream delineation. Upstream of the apex the delineation should be an administrative floodway. If the Consultant prefers the water surface elevations for each cross-section location can be determined using FlowMaster or a similar product. If left in RAS the Consultant needs to provide a baseline in the delineation and be prepared to answer any FEMA questions, as they will review it as a RAS product.
JEF Response: Done. Check-RAS was run, output is included in Appendix E, a baseline has been included on the workmaps.

3. Geomorphology – TDN appendix G supporting documentation needs to be provided. A master Appendix G for all fan delineations is recommended.
JEF Response: An Appendix G has been created.

4. Floodplain Delineations - Some minor modifications to the delineation limits are recommended. This will require updates on the workmaps and annotated FIRM panels as well. This is discussed later in the comments.
JEF Response: Specific responses are provided below.

5. Delineation should be called out as White Tank Fan 6.
JEF Response: Done.

Delineation

1. Locations where there are concerns regarding the delineation have been identified in the shape file fan6quest.shp. This file will be included with this comment submittal.
JEF Response: File was received and considered. A field visit with KAG was conducted on September 15, 2006 to discuss and resolve concerns. See specific responses below.

2. It is recommended that along the northern wash the AAFF zone be removed and the effective FIS delineation remain for this area. The discharges between the two studies only differ by about 100 cfs. If White Tank Fan 39 is going to supercede a portion of the effective delineation downstream of White Tank Fan 6 then this modification may not be necessary.
   JEF Response: The TDN approximate zone delineations were done based on existing condition geomorphology. Existing FIS delineations were not considered for the geomorphic analysis. Incorporation of the FIS delineations with the geomorphic delineations was done in the FEMA Workmaps and FEMA FIRM panels.

3. In two locations along the proposed delineation, there appears to be a chance for break out flows. Please determine if these are potential break out locations.
   JEF Response: Potential breakouts areas were investigated and mapped appropriately as determined after discussion with the District reviewer..

   a. One occurs up at the apex where there appears to be a surficial change alongside the proposed delineation that is different than the surface appearance a little further away from the channel.
      JEF Response: Location was investigated in the field. Channel incision indicates breakout potential is low.

   b. The other is where the uppermost portion of a local tributary is approaching the fan channels and there appears to only be about 1 foot difference between the water surface elevation in the channel and surface of concern.
      JEF Response: Geomorphology indicates no recent breakout flows.

4. The digital line work submitted does not match the line work submitted on the hard copy maps. There are minor variations in some AAFF zones and in the digital line work the southern-most shaded X zone is located in the effective floodplain. On the hard copy maps it appears that line had been trimmed back. Please look into.
   JEF Response: Hard copy maps have been updated with final digital data.

5. Shaded Zone X delineations. It is recommended to remove the smaller Shaded X zones.
   JEF Response: Done. A 5-acre minimum island size was used, and a note to that effect was added to the text of the TDN.

Report Comments

1. Page 1-4 section 1.4.1, this section states that the hydrology may be submitted separately. Please correct the text to reflect what is going to be the official hydrology submittal: per fan or full Area 4 Hydrology TDN. This will also determine what needs to be reflected in each separate fan TDN package. The District and the Consultant should discuss this and arrive at a final answer.
   JEF Response: The fan hydrology is described in Section 4 of the TDN. Area 4 hydrology was not used.

2. Page 2-1, Abstract section 2.1.3. Craig Kennedy is no longer the official contact at Baker. If a new contact is identified prior to FEMA submittal the name should be updated.
   JEF Response: Done

3. Page 2-1 section 2.1.7 Reach Description. Should we list only the fan associated with this report?
   JEF Response: Done

4. Page 2-1 section 2.1.10 Coordination of Peak Discharges. Since the hydrology is not finalized yet, this date will need to be updated.
   JEF Response: Done

5. FEMA OC Form
   a. Part B number 2 Flooding Source. Update to read Fan 6 instead of Fans 1 & 2.
      JEF Response: Done
   b. Part D – The form should be updated to reflect my name.
      JEF Response: Done

6. FEMA RH&H Form
   a. Flooding Source. Please update to state only White Tank Fan 6.
      JEF Response: Done
   b. Part A – checking the "no existing analysis" box is fine as long as all the Area 4 Fan hydrologies are being submitted in their respective reports instead of a full Area 4 hydrology TDN.
      JEF Response: Done
   c. Part B
      i. Number 3 - The yes box should be checked here instead of no if the use of RAS is continued.
         JEF Response: Done
      ii. Number 4 – The model name should be updated to ZoneA6.
         JEF Response: Done

7. FEMA Fan Form – Please update to state Fan 6 not Fans 1 and 2.
   JEF Response: Done

8. Section 4 – Review comments were not available at this time. Those comments will come as an addendum shortly.
   JEF Response: Comments were received from Julie and are listed above.

9. Section 5, the upstream floodplain should be delineated as an administrative floodway and its designation should be discussed in this section.
   JEF Response: A discussion of riverine administrative floodways was added to Section 5.

10. Section 5, the alluvial fan delineation will supercede some existing delineations from the White Tank Wash delineation study. This should be discussed in the text in either this section or section 6.
    JEF Response: This comment was discussed with the District reviewer. Because the alluvial fan floodplain delineation includes administrative floodways, the limits were drawn to the floodway

limit, rather than the floodway fringe. The latter would leave a gap between floodways that potentially could be developed. A discussion of this was added to Sections 5 and 6.

11. Page 5-1. Text contains a statement that RAS was used to perform a backwater analysis. Since cross-sections are too far apart to produce a real step-backwater analysis should this sentence remain in the text?
JEF Response: The text was revised to remove the offending phrase.

12. Page 5-2 and 5-3. Figure 5.1 Make sure to include the reduced maps in the final report.
JEF Response: Done.

13. Page 5-6. Make sure to include the RAS summary table in the final report.
JEF Response: Done.

14. Section 6. Terminology variation. The use of flow-through channel and through-flow channel alternates in the text. Please update if you feel necessary.
    a. Pages 6-50 and 6-53 – through-flow corridors
    b. Pages 6-33 and 6-41 – flow-through channels
    JEF Response: Done

15. Section 6. Figure Concerns
    a. For Figures 6.1-6.10 should fan 6's apex be located on the figures?
    JEF Response: Done
    b. For Figure 6.7, please consider adding a note to the figure explaining why there are no channels identified in the middle of the study area.
    JEF Response: Done
    c. For Figure 6.9 is it possible to screen the colors on the map to more clearly see the topography underneath?
    JEF Response: A better color scheme was selected. However, making the colors more transparent (allowing the topography to stand-out more clearly) results in a more dramatic discrepancy between the map colors and the legend colors (see next comment).
    d. For Figure 6.20, Please revisit the figure. The colors on the map do not appear to match the colors in the legend. Or do the soils units not correlate well here. It is most apparent with Fan 39 showing up as an inactive fan color.
    JEF Response: The transparency feature results in a slight color difference between map and legend colors. The transparency feature is useful in showing the aerial photo base beneath the soils data.

16. Page 6-55, Table 6B.7. Upstream of the apex should be delineated as administrative floodway. Consider adding the category to the table?
JEF Response: Done

17. Page 6-56, 6B.6.2 consider rewording second paragraph. My interpretation of the text is that there was a difference in flood hazard between the delineation and the AZGS flood hazard classification, L2. In my opinion it looks like a reasonable match. L2 states that flows are confined in channels. The AAFF zones are essentially occurring in the channels as described by the AZGS report.
JEF Response: Done

18. Page 7-1, section 7.1. Consider listing only White Tank Fan 6's discharge in the table.
JEF Response: Done

Appendix Comments

1. Appendix A – no comments. Update references as needed.
JEF Response: No response needed.

2. Appendix B – Include pertinent correspondence prior to FEMA submittal. Special Problem discussion should be removed or presented in the main report text as a discussion regarding tying the proposed study to the existing study. Regarding showing both delineations on the FIRM, information from only one delineation can be presented for any given location on a FIRM panel. Recommended tie-in locations are presented above.
JEF Response: Done.

3. Appendix C – no comments.
JEF Response: No response needed.

4. Appendix D - Consider placing a separate copy of the Rainfall figure in the appendix. Organize data following State Standard.
JEF Response: Done.

5. Appendix E – no comments.
JEF Response: No response needed

6. Appendix F – consider providing information from the sediment yield analysis here.
JEF Response: A copy of the Ayres Sediment Report will be provided in Appendix G.

7. Appendix G – no supporting documentation of the geomorphic analysis was provided. Perhaps a master Appendix G could be developed for use with all the Fan reports.
JEF Response: An Appendix G has been created.

8. Appendix H- no digital information was provided in this submittal. Please make sure to include a cd with the next submittal including digital line work for hydrology as well as floodplain delineation.
JEF Response: Done. DDMSW, HEC-1, GIS, PDF, and all other file types used to develop the TDN are included on the CD.

9. A-Maps Hydrology. On Plate 1, Elevation information appears to be missing on the contours. Concerned that the Plates may not reproduce well in black and white. Please evaluate.
JEF Response: Done. The symbology has been revised so all features will be discernable when reproduced in black and white.

10. B-Maps Geomorphology. For Stage 2 map consider including this map as Figure 6.19, not critical however.
JEF Response: Done.

11. C-Maps Hydraulics/Floodplain.
    a. Consider removing the smaller Shaded X zones.
    JEF Response: Done.

    b. Floodway symbology is needed on the delineations shown.
    JEF Response: Done.

    c. Consider adding a legend of the FCD fan delineation categories.
    JEF Response: Done.

    d. Consider revising the title to "Approximate Zone A Floodplain Delineation Study of White Tank Fan 6."
    JEF Response: Done.

    e. Consider adding labels identifying where the White Tank Fan 6 delineation will tie into the proposed White Tank Fan 39 delineation.
    JEF Response: We would do this if the Fan 39 delineation were finalized. We do not recommend including draft delineations prepared by others. We understand the SVADMP delineations will become effective before any other delineations in the area and do not want confuse FEMA personnel if they receive future delineations that are different than draft delineations for the adjacent fans.

12. Annotated Panels. Please consider the following:
    f. Somewhat hard to read the red line work and text.
    JEF Response: Increased font size, added white background behind text where necessary.

    g. Designations need to be modified. Please use FEMA designations on panels:
    JEF Response: Done.

    h. Upstream of Apex: Zone A Administrative Floodway – Inactive Fan Flooding
    JEF Response: Done.

    i. Downstream of Apex: Zone A Administrative Floodway – Active Fan Flooding and Zone A Inactive Fan Flooding.
    JEF Response: Done.

    j. Add a note stating administrative floodways are regulated by the local regulatory authority.
    JEF Response: Done.

    k. Add floodway shading of the corridors.
    JEF Response: Done.

    l. Consider naming the corridor.
    JEF Response: Added White Tank Fan 6 to delineation upstream of apex.

    m. FEMA will only allow one designation for any given location. If the proposed delineation is going to overlap the effective delineation a note with a leader line showing where we want to remove the effective delineation from the FIRM panel should be added.
    JEF Response: Done.

n. On Panel 1545, the label font size should be increased.
JEF Response: Done.

Text Comments

1. Page 3-1, is "epoch" correct in the second sentence: "1992 epoch Central Zone of Arizona State Plane…"
JEF Response: Done

2. Page 4-8, section 4.5.2, top of page. Please correct the typo: "watershed will average elevation.."
JEF Response: Done

3. Page 5-6, section 5.5.5, should the word "fan" be between "natural channels"?
JEF Response: Done

4. Page 6-33 6B5.2 third paragraph. Please correct the typo "Fan 6 is significantly smaller that most other fans.."
JEF Response: Done

5. Page 6-34 6B5.3.1 second paragraph. Please correct the typo "alluvial fans w e soil profile development.."
JEF Response: Done

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: September 15, 2006

TO: Valerie Swick/FCDMC

FROM: Jon Fuller, PE, RG, CFM

RE: Sun Valley ADMP
Alluvial Fan Floodplain Delineations: Fan 10-11-20
Response to TDN Review Comments

CC: Kathryn Gross/FCDMC
Julie Cox/FCDMC
Mike Kellogg/JEF
Rob Lyons/JEF

This memorandum summarizes JE Fuller/Hydrology & Geomorphology, Inc. (JEF) responses to District review comments. District review comments are enumerated below, using the number from the District review comment letter. JEF responses are shown in 10-point bold italic font immediately below each comment. We appreciate the thoughtful and timely review by the District staff.

Hydrology Comments

1. No comments received
   JEF Response: N/A.

Geomorphology Comments (Kathryn Gross, Letter dated June 22, 2006)

Technical Summary

1. Hydrology – Make sure all supporting documentation is provided including necessary maps for flow paths soils and land use beyond those presented in figures.
   JEF Response: Done.

2. Hydraulics – Upstream modeling appears reasonable. Please run checkras on the upstream delineation. Upstream of the apex the delineation should be an administrative floodway. If the consultant prefers the water surface elevations for each cross-section location can be determined using FlowMaster or a similar product. If left in RAS the consultant needs to be prepared to answer any FEMA questions as they will review it as a RAS product.
   JEF Response: Done. Check-RAS was run, output is included in Appendix E, a baseline has been included on the workmaps.

3. Geomorphology – TDN appendix G supporting documentation needs to be provided. A master Appendix G for all fan delineations could be a solution. There is some confusion between active and inactive areas in several text discussions. This is further discussed later in the comments.
   JEF Response: An Appendix G has been created.

4. Floodplain Delineations. Some modifications to the naming of the zones on the workmap and annotated FIRM panel are required. This is discussed further later in the comments.
   JEF Response: Specific responses are provided below.

Report Comments

1. Page 2-1, Abstract section 2.1.3. Craig Kennedy is no longer the official contact at Baker. If a new contact is identified prior to FEMA submittal the name should be updated.
   JEF Response: Done

2. FEMA OC Form
   a. Part C – We may need to include a fee but for now leave as No.
      JEF Response: Done
   b. Part D – The form should be updated to reflect my name.
      JEF Response: Done

3. FEMA RH&H Form
   a. Part B – The yes box should be checked here instead of no if the use of RAS is continued.
      JEF Response: Done

4. FEMA Fan Form – Please submit one fan per form.
   JEF Response: Done

5. Section 4 – Please make sure that all applicable supporting documentation is supplied for the new hydrology for this area.
   JEF Response: Done

6. Page 4-9, section 4.5.3. Could an excerpt of the Alpha sub basin map be provided as well so the new basins and the old basins can be compared? This could be included in the appendix.
   JEF Response: Done, refer to Appendix D.

7. Section 5, the upstream floodplain should be delineated as an administrative floodway and its designation should be discussed in this section.
   JEF Response: A discussion of riverine administrative floodways was added to Section 5.

8. Section 6. Figure Concerns
   a. Figure 6.1 not all the soil units are included. Scale of exhibit makes it hard to really verify the units necessary to fan 10 and 11
      JEF Response: Figure 6.20 shows a higher resolution soils map for 10, 11, and 20.

   b. Figure 6.2 not all the geology units are included. Scale of exhibit makes it hard to really verify the units necessary to fan 10 and 11.
      JEF Response: Figure 6.21 shows a higher resolution geology map for 10, 11, and 20.

c. For Figures 6.1-6.10 should fan 10 and 11's apices be located on the figures?
JEF Response: Done

d. For Figure 6.7, please consider adding a note to the figure explaining why there are no channels identified in the middle of the study area.
JEF Response: Done

e. For Figure 6.9 is it possible to screen the colors on the map to more clearly see the topography underneath?
JEF Response: Making the colors more transparent (allowing the topography to stand-out more clearly) results in a more dramatic discrepancy between the map colors and the legend colors.

f. Page 6-24, section 6B4.6 conclusions. Consider adding an additional figure that shows a close up of stage 1 at fan 10 and 11.
JEF Response: An 11x17 map has been included in the B: Maps Section.

g. Page 6-31, Figure 6.13, is this a photo for an active fan channel? Would it be more applicable to place a photo more representative of the bed under a piedmont channel? If possible update the photo otherwise existing photo is fine.
JEF Response: Photo was replaced with another from an active fan channel.

h. Figure 6.19. If Figure 6.19 is the result of the analysis why is it placed at the beginning of the stage 2 discussion and analysis? It appears to show the result prior to the analysis.
JEF Response: Revised figure.

i. Figure 6.20. Please correct the legend and map label. The FRS is labeled as a levee instead of a dam.
JEF Response: The Levee designation is a part of the NRCS data set. The label was removed from the map.

9. Page 6-55, Table 6B.7. Upstream of the apex should be delineated as administrative floodway. Consider adding the category to the table?
JEF Response: Done

10. Page 6-59, text states large-scale maps are to be supplied. No large-scale maps were included in this submittal. Please make sure they are included in the next submittal.
JEF Response: Text has been modified.

11. Page 7-1, section 7.1, in the summary of discharges please list the fans as White Tank Fan 10 and White Tank Fan 11.
JEF Response: Done

12. Page 7-2, section 7.3 Annotated Panel. Please make the following corrections
    a. Designations need to be modified:
        i. Upstream of Apex: Zone A Administrative Floodway – Inactive Fan Flooding
        JEF Response: Done

ii. Downstream of Apex: Zone A Administrative Floodway – Active Fan Flooding
JEF Response: Done

b. Add a note stating administrative floodways are regulated by the local regulatory authority.
JEF Response: Done

c. Add floodway shading of the corridors.
JEF Response: Done

d. Consider naming the corridors.
JEF Response: Done

13. Floodplain Work Map
    a. Floodway symbology is needed on the delineations shown.
    JEF Response: Done

    b. Zone AFUFD was not included. Please add.
    JEF Response: Done

    c. Add the existing delineation at the FRS to the map.
    JEF Response: Done

    d. Consider adding a legend of the FCD fan delineation categories.
    JEF Response: Done

    e. Consider revising the title to "Approximate Zone A Floodplain Delineation Study of White Tank Fans 10 and 11.
    JEF Response: Done

Appendix Contents

1. Appendix A – no comments. Update references as needed.
   JEF Response: No response needed.

2. Appendix B – Include pertinent correspondence prior to FEMA submittal.
   JEF Response: Done.

3. Appendix C – no comments. Consider adding District contract number for mapping project.
   JEF Response: We do not know the contract number for the District's mapping project.

4. Appendix D – need to provide hydrology maps in support of the delineation and parameters chosen: Sub basin map with topography and flow path, Sub basin map and soil units, Sub basin map and land use. Consider placing a separate copy of the Rainfall figure in the appendix as well.
   JEF Response: Done.

5. Appendix E – no comments.
   JEF Response: No response needed.

6. Appendix G – no supporting documentation of the geomorphic analysis was provided. Perhaps a master Appendix G could be developed for use with all the Fan reports.
   JEF Response: An Appendix G has been created.

7. Appendix H- no digital information was provided in this submittal. Please make sure to include a cd with the next submittal.
   JEF Response: Done. DDMSW, HEC-1, GIS, PDF, and all other file types used to develop the TDN are included on the CD.

8. Concerned about the confusion between sections between active and inactive, total fan, AFHH and AFUFD. Language appears to shift between sections. In most instances it appears some of the confusion could be cleared up with modifications to Figure 6.19 and adding the topographic apexes to the exhibit and addressing them in the text as the top of the Fan 10 and 11 alluvial fan landform. The following are areas where it was noted:
   JEF Response: The PFHAM similarly confuses and blurs the distinction between stable-unstable and active-inactive. JEF discussed the issue with the District reviewer and came to resolution. The text was revised to clarify the original intent of the text which referred both to the alluvial fan landform and the active alluvial fan (a subset of the landform) as alluvial fans.

   a. Figure 6.19 and connected sections:
      JEF Response: See above

   b. Page 6-33, section 6B.5.3, text discusses aggradation/active on a limited portion of the "total fan site". Define the total fan site (white tank piedmont or 10 and 11 specifically). Figure 6.19 appears to outline all of the fan area as active. Consider revising language in the text or on the figure.
      JEF Response: Text was revised.

   c. Page 6-52, section 6B.5.5, is Figure 6.19 an appropriate figure to be looking at? Figure 6.19 is titled active areas but the text here states that inactive areas are shown. Are we supposed to be looking at "inactivity" within or outside of the drawn limits?
      JEF Response: Figure labeling was revised.

   d. Page 6-51, section 6B.5.4, there appears to be some discrepancy between the stage III delineation and the text. Please verify and make corrections as necessary.
      JEF Response: Done

   e. Page 6-52, section 6B.5.6.3, the text specifically discusses unstable flow path flooding specifically below the apices but 6B.5.5 mentions inactive portions which are stable flow paths is an additional section regarding stable flow path flooding downstream of the apex needed here as well?

JEF Response: There are no stable flow paths downstream of the hydrographic apexes on Fans 10 and 11. The text was revised.

f. Page 6-53, section 6B.6, bullet 2 and 3. This discussion states all of stage 2 as active unstable flow paths that contradicts text in the Stage 2 discussion where inactive areas are discussed.
JEF Response: See above

Text Comments

1. Page 3-1, is "epoch" correct in the second sentence: "1992 epoch Central Zone of Arizona State Plane…"
JEF Response: Done

2. Page 4-7, Unit Hydrograph second paragraph second sentence. Please reword the sentence it is not clear.
JEF Response: Done

3. Page 4-8, section 4.5.2 second paragraph third sentence. Please correct the typo: "watershed will average elevation.."
JEF Response: Done

4. Page 5-5, section 5.5.5, should the word "fan" be between "natural channels"?
JEF Response: Done

5. Page 6-24, section 6B.4.4, last sentence. The text states there were four new fans identified beyond the Ayers study. Based on discussions with Jon are we now up to five? If so please update the text.
JEF Response: Done

6. Page 6-32, No photo was included in Figure 6.18 please include in next submittal.
JEF Response: Done

7. Page 6-48, 6B.5.3.6. Please correct the typo in the second to last sentence: "There is little or relief".
JEF Response: Done

Table of Contents notes:

1. Table 5.9 has a title typo.
JEF Response: Done

2. Table of Contents lists Plates, text refers to exhibits please refine either the text or table of contents.
JEF Response: Done

3. Table of Contents lists Appendix F for both Sediment and Geomorphology. The actual appendices are separated into Appendix F for Sediment and Appendix G for Geomorphology. Appendix letters will need to be shifted by a letter for the rest of the appendices listed in the table of contents.

JEF Response: Done

4. Plate 1 states its Area 4 hydrology. That is not applicable to Fan 10 and 11. No plate is present in the report.
   JEF Response: Done. TOC has been updated and hydrology Plates 1-3 have been added.

5. Plates 2 through 5 were not submitted.
   JEF Response: Stage 1-3 Exhibit Maps and Hydraulics Study Maps have been included.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Sept. 21, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on Sun Valley ADMP, White Tank Wash Sub-Area, Alternative A, Excel Spreadsheet WTWA.xls dated Feb. 2, 2006 from Dave Degerness & Richard Waskowsky

CC: Jon Fuller, PE

This memo summarizes our response to the District's comments as dated above.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The models, Step 2 reports, and figures have been revised in the final versions to reflect our responses where appropriate.

Please note that these were the only written comments received that we have record of from the River Mechanics Branch. These comments were discussed with District personnel in a meeting at the District held on Feb. 6, 2006. A few follow-up comments were received by email as discussed at the end of this memo.

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Comments Dated Feb. 2, 2006

In order to accelerate the review process, the Engineering Application Development and River Mechanics Branch has performed a preliminary review of the above referenced Alternative A and its spreadsheet. Here are the preliminary comments. The consultant should provide written responses to comments as a part of the review and comment process. A meeting may be needed to clarify the issues so the next-level review can be expedited.

1. *The preliminary comments we have are only for one off-line basin and one channel (alternative A). Please apply these comments to other basins, channels, and alternatives accordingly in the study area.*

   All comments the resulted in changes to the analysis were applied to all sub-areas and alternatives as appropriate.

2. *Please provide a simple flow chart for the Sheets/VBA/Macros to explain the logic process. A flow chart is important for computer programming development and review.*

   A listing of the macros used and their purpose was provided by email dated 2/7/06. A copy of those descriptions is included at the end of this memo.

3. *In Worksheet "DE2C", please write the equations in a Word document for both Storage Volume and Total Basin Volume. Why does the formula for the Total Basin Volume have zero as a multiplier in the equation?* -

The equations were added to the text portion of the reports. The zero value is to reflect the removal of the volume in the basin within the freeboard in order to compute the total volume.

4. *In Worksheet "DE2C", under the title "HEC-1 Results", we noticed that the diverted peak is incorrect. The diverted peak should be computed by using the higher value of the 6-hour diverted flow and the 24-hour diverted flow. The 6-hour diverted flow should be simply computed by taking the difference between the 6-hour upstream flow and the 6-hour downstream flow. The 24-hour diverted flow should be simply computed by taking the difference between the 24-hour upstream flow and the 24-hour downstream flow.*

The error was corrected.

5. *In Worksheet "DE2C", under the title "HEC-1 Results", we noticed that the peak stage was computed by using simple geometric computation inside the basin_depth subroutine because there is no outlet for the off-line basin. All off-line basins should have outlets such as culverts, flapgate outlets, or drywells.*

Offline basin is assumed to have no outlets for the purpose of determining the sizing. A comment was added to the text indicating that outlets will be required to drain the offline basins.

6. *In Worksheet "E2C-E3_E4RB30", the equilibrium slope for sediment-laden flow should be based upon the iterative methodology presented in ADWR's "Design Manual for Engineering Analysis of Fluvial Systems" by Simons Li and Associates, 1985. Please change your spreadsheet based on ADWR's iterative methodology for channels where there is no upstream on-line detention basin. The limiting bed slope for clear water flow should be based upon the beginning transport for MPM (page 18 in "Computing Degradation and Local Scour", Bureau of Reclamation, 1984). The limiting bed slope should apply to channels where there is an upstream on-line detention basin.*

After much discussion in the 2/6 meeting, it was agreed to use the MPM equation for the immediate downstream reaches from the detention basins and then the AMAFCA method for livebed/sediment laden reaches. The ADWR approach has been adopted for the sediment laden reaches in Step 3.

7. *In Worksheet "E2C-E3_E4RB30", the sediment inflow should not be zero because the off-line detention basin does not capture all sediment.*

The amount of sediment accumulated in offline basins is expected to be very small and therefore not important to the proposed alternatives evaluation.

8. *In Worksheet "E2C-E3_E4RB30", how is the long term channel slope of .0045 ft/ft calculated? It does not match the computed equilibrium slope. It seems to be hard-coded number.*

The long-term channel slope is based on the equilibrium slope computed. This specific error was corrected.

9. *In Worksheet "E2C-E3_E4RB30", the annual sediment yield and 100-year sediment yield were based upon assumed values according to page 6 in 11x17 documentation. Were MUSLE and RUSLE used? In addition, the annual sediment yield and the 100-year event sediment yield should not be added together to compute the total sediment yield because the annual sediment yield already includes the 100-year event information (it is double-counting to a certain extent even though we are managing the 100-year event). We recommend to use MUSLE to compute the sediment yield for 100-year, 50-year, 25-year, 10-year, 5-year, and 2-year storm events. Then, use the incremental probability methodology to compute the annual sediment yield. Then, multiply the annual sediment yield by number of years planned in the maintenance schedule to obtain the accumulative sediment yield.*

The recommended approach listed in item 9 was applied to Step 3.

10. *In the spreadsheet, 3 years were used to compute the accumulative sediment yield. Why was 3-year selected?*

Three years was the assumed maintenance period.

11. *In Worksheet "E2C-E3_E4RB30", the antidune equation is incorrect. In the ADWR manual (1985) the crest-to-trough depth is calculated with* $Z_a = 0.027 * V_m^2$ *(formula 4.25 on page 4.24) and* $\frac{1}{2}Z_a$ *is added to the total scour. Please correct the formulas to be consistent with the ADWR -*

This error was corrected.

12. *The local scour for culvert outlets should be included in the total scour*

Local scour at culvert outlets was added to a mention in the report but is considered highly localized and comparatively insignificant to the total cost estimates for the proposed alternatives and therefore will not have an important influence on the alternatives evaluation.

13. *In Worksheet "E2C-E3_E4RB30", please compute the bend scour* ***without*** *using the "reach-averaged" concept. Please follow the procedure that starts on page 5.105 of the ADWR manual. Please use Eq. 5.27 in ADWR manual to determine the distance downstream of the curvature. When the main channel is straight, the thalweg bend angle should be used for computing the bend scour. The bend scour and local scour should be applied to specific cross-sections at each of the four reaches.*

Bend scour was included as a generalized addition to scour for all toe down to provide an approximation of the cost impacts of bend scour. Specific cross section analysis of bend and local scour is considered beyond the scope of the Step 2 analysis.

14. *In Worksheet "E2C-E3_E4RB30", a factor of safety was not used in the calculation of total scour. FCD Hydraulics Manual recommends a value of 1.3.*

The factor of safety was added.

15. In Worksheet "E2C-E3_E4RB30", the levee is not necessary for all areas (the downstream channel has a well-defined channel). Topography should be considered in the plan. The 10-feet DTM does give some valuable information about the existing cross-sections.

The existing 10-ft topography is being used in to evaluate existing channel capacity in Step3.

16. Please use FCDMC allowable velocities.

The FHWA table used is the same as FCDMC table in Hydraulics Manual.

17. The low-flow incisement scour component should be based on field visits rather than Regime Theory.

The regime estimates were used in Step 2. These depths should not necessarily compare to the existing conditions due to the hydrologic and hydraulic changes imposed by the various proposed alternatives.

18. The total toe-down should start from the lowest spot of the existing thalweg.

The toe down requirements were computed from the thalweg elevation.

19. There is a design methodology issue. The Regime Theory should not be used in the design process. Once the long-term scour is computed, the drop structure height can then computed to create an equilibrium bed slope which is the design slope for construction.

The regime theory was applied to the Step 2 long-term channel estimation. Drop structure height was fixed at 3 feet. The spacing was determined based on the estimated long-term slope.

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Other Misc. E-mail related comments and correspondence
Emails and threads area included in their entirety below separated by "+++++".

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This message revealed an error in the D65 gradation value. The error was corrected.

From: Bing Zhao - FCDX
Sent: Friday, March 03, 2006 3:54 PM
To: Valerie Swick - FCDX
Cc: Richard M. Waskowsky - FCDX; Bing Zhao - FCDX
Subject: FW: SV technical review

Valerie: You may want to forward this to JE Fuller.

Thanks!

Bing

-----Original Message-----

From: Richard M. Waskowsky - FCDX

Sent: Thursday, March 02, 2006 5:24 PM

To: Bing Zhao - FCDX

Subject: FW: SV technical review

Bing:

I checked the sediment transport formulas using Yang's FORTRAN code (seddisch), and the results seemed to be ok. Some were very close while others differed by ~80%. The error results are shown in the SedError spreadsheet. However, they made an error in the gradations. They used a D65 of .15 mm, where it should be closer to 1.5 mm. With the .15 mm value, the Einstein and the Toffaleti formulas are off, but the others do not seem to change. Although, it seems some of the other formulas use size fractions, which if they use D65, they will also be wrong. Because of the gradation error, the SedGrad spreadsheet is a curve-fit with sediment sizes minus d65. Using these results, I ran the seddisch code some more and all the results are shown in the SedimentData text file. Finally, the SedCheck spreadsheet is my results from the formulas coded into Excel from Yang's USGS report using the characteristics from the Sun Valley report. Also, they use the long-term slope for both initial and long-term sediment yield calculations.

So, basically, the main errors were the D65 value and the slope.

Thanks,

Richard W.

<<SedimentData.txt>> <<SedCheck.xls>> <<SedError.xls>> <<SedGrad.xls>>

++

Thanks Ted. For that comment I did not get a chance to go look into the details in the spreadsheets but was playing in the shape files instead. Since I was running out of time yesterday I thought I would send the note ahead before I checked the spreadsheets.

By the way, thanks for the detail in the shape file attribute tables.

Kathryn

From: Ted Lehman [mailto:ted@jefuller.com]
Sent: Fri 2/10/2006 7:33 AM
To: Kathryn Gross - FCDX; pat@jefuller.com; hari@jefuller.com
Cc: Valerie Swick - FCDX; Julie Cox - FCDX; Dave Degerness - FCDX; Bing Zhao - FCDX
Subject: RE: Alternative A on fan channels

Kathryn,

You are correct to note that most of the initial upstream A channels are basically diversionary in intent. For many of these structures, we have designed them as excavated channels with a downstream side levee too. If you look at the design spreadsheets for these elements you will see both the "Excavated" channel type and the "Fill" Levee type with one side (left or right) with

zero height, width, etc. All of these segments include sedimentation basins for the sediment yield predicted based on the total contributing drainage area.

Thanks for the continued thoughtful questions.

Ted Lehman, P.E.
JE Fuller/ Hydrology & Geomorphology, Inc.
Tempe, AZ

-----Original Message-----
From: Kathryn Gross - FCDX [mailto:kag@mail.maricopa.gov]
Sent: Thursday, February 09, 2006 4:56 PM
To: pat@jefuller.com; hari@jefuller.com; ted@jefuller.com
Cc: Valerie Swick - FCDX; Julie Cox - FCDX; Dave Degerness - FCDX; Bing Zhao - FCDX
Subject: Alternative A on fan channels

Hari/Ted,

It appears that in certain A alternatives there are channels that are diverting flows to basins below the active area. Did the design treat these as normal routing channels or was extra engineering worked in to beef them up since the majority of them cut across the active fan perpendicular to flows and may be subject to additional freeboard etc. requirements to handle superelevation, extra dynamic forces and sedimentation. It appears they may serve more as diversion structures. Just a thought.

Bing/Dave, any comments on this as well?

Thanks,

Kathryn
++
Ted: Thanks for the good work!

Bing

-----Original Message-----
From: Ted Lehman [mailto:ted@jefuller.com]
Sent: Wednesday, February 15, 2006 2:57 PM
To: Bing Zhao - FCDX
Cc: 'Pat Quinn'; Valerie Swick - FCDX
Subject: Request for calculations of cost using MPM for slope

Hi Bing,

Pat asked me to send these to you as you requested yesterday. The zip file contains the B1 (or B4-X as appropriate) (all leveed corridors with big
basins) for all subareas with the long-term slope computed based on the MPM result for the 10% flow rate (assumed approx. equal to the dominant discharge). As I mentioned yesterday, since we are proposing sedimentation basins along all of our design reaches, I have applied the MPM to all reaches for all of the subareas in these sheets. Note, I made no other adjustments in these sets. Again, the average

difference between theses overall cost estimates and those previously submitted using the averaged slope in our spreadsheets is about 1%.

For the B3 (excavated earth channel), I tested five individual reaches two in the FRS 1 subarea and 3 in the Wagner subarea. The cost results are listed below:

Subarea	Reach	Avg. Slope Cost	MPM Slope Cost	% Diff
FRS 1	L2A10	$4.107 M	$5.296 M	29%
	RRP1A10	$0.897 M	$1.022 M	14%
Wagner	RR17510	$6.088 M	$8.194 M	35%
	RR15020	$5.039 M	$7.230 M	43%
	C180R10	$9.127 M	$12.902 M	41%

I hope this helps answer your question.

Ted Lehman, P.E.
JE Fuller/ Hydrology & Geomorphology, Inc.
Tempe, AZ

Ted and Hari: As we are performing the review for the six areas, I am trying to identify major issues that need immediate attention before the alternative selection meeting next week. After reviewing our preliminary comments we gave to you last week and discussions we had on Monday, here is what I think should be done before next week's meeting.

Since the estimation of the channel equlibrium slope directly changes the cost estimate and the selection of alternatives, please change the following things in your spreadsheet to reflect the new cost estimate (it should not take much time).

1. For channels downstream of an on-line detention basins, use beginning motion MPM-based limiting bed slope as the equlibrium slope instead of using the averaaged slope. Since you already did this, you will just need to pick that slope as the channel design slope. Then, update the cost.

2. For channels without any upstream detention basins or channels with upstream off-line detention basins, use ADWR equlibrium slope method to obtain the equlibrium slope instead of the using the averaged slope. However, because of the time limit before the meeting (just one day, tomorrow), you can use the results based on the simplified AMAFCA method as an approximation. Of course, in the final design, you will use ADWR method. Since you already did the simplified AMAFCA method, you will just need to select it as the design slope instead of using the averaged slope. Then, update the cost.

Thanks!

Bing

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The following are the macro descriptions provided by email in an attachment dated 2/7/06.

Routines used in the spreadsheet

Update_hec1_files

This routine is used to update the HEC-1 files using the data in the spreadsheets. The routine is accessed by clicking the "Update HEC-1 Input Files" button in "Main" sheet. The routine updates both the 6-hr and 24-hr models.

Run_hec1

This routine is used to run HEC-1 models. The routine is accessed by clicking the "Run HEC-1" button in "Main" sheet. This runs both the 6-hour and 24-hour models in a DOS window.

Import_hec1_output

This routine is used to import the HEC-1 results back in the spreadsheet. The routine is accessed by clicking the "Import HEC-1 output" button in "Main" sheet. This routine can be used to import the 6-hour and 24-hour model results into "HEC1-6hr" and "HEC1-24hr" worksheets.

Update_upstream_contribution_links

The HEC-1 results are imported in the "HEC1-6hr" and "HEC1-24hr" sheets. There are various links to these results in the channel and basin worksheets. If the HEC-1 network changes, the results table change with KK id's moving to different rows. This routine is used to link to the results in the "HEC1-6hr" and "HEC1-24hr" from the channel and basin worksheets. This is accessed using the button "Update Upstream Contribution Links".

Update_run_and_import

This routine is accessed using the button "Update, Run and Import" in the "Main" sheet. This routine does the following steps in one single click to the button: 1) Update the HEC-1 files, 2) Run the HEC1 models, 3) Import the results and 4) Re-generate the links to the HEC-1 results in "HEC1-6hr" and "HEC1-24hr" worksheets. This routine performs all the tasks needed to complete the interactions with the HEC1 model.

setup_new_sheets_using_hec6_input_file

Please ignore this routine. This routine was used initially to set-up the worksheets from already existing HEC1 files. The macro name has "hec6" incorrectly which should have been hec1. This macro is accessed by the button "Setup New Sheets Using HEC1 Input File" in the Main sheet.

View_hec1_6hr_input_file

This routine is used to open the HEC-1 6-hr input file in wordpad. This is access used the button "View HEC1 6-hr Input File". This can be used to from the spreadsheet if you want to quickly look (or change) the HEC-1 input file.

View_hec1_6hr_output_file

This routine is used to open the HEC-1 6-hr output file in wordpad. This is access used the button "View HEC1 6-hr Output File". This can be used to from the spreadsheet if you want to quickly look the HEC-1 output file.

View_hec1_24hr_input_file

This routine is used to open the HEC-1 24-hr input file in wordpad. This is access used the button "View HEC1 24-hr Input File". This can be used to from the spreadsheet if you want to quickly look (or change) the HEC-1 input file.

View_hec1_24hr_output_file

This routine is used to open the HEC-1 24-hr output file in wordpad. This is access used the button "View HEC1 24-hr Output File". This can be used to from the spreadsheet if you want to quickly look the HEC-1 output file.

update_hydraulics_summary_tables

This routine is accessed using the button "Update Hydraulics Summary Tables"" in the "Hydraulics Summary" sheet. A click to the button updates the Hydraulics Summary Table.

Setup_cost_table

This routine is accessed using the button "Setup Cost Table"" in the "Hydraulics Summary" sheet. A click to the button updates the Hydraulics Summary Table.

Get_line

This routine is accessed using the button "Update GIS Line"" in the channels' worksheet. A click to the button updates the existing reach profile from the GIS output. This routine is used when the channel alignment is changed and the slope has to be re-evaluated. The channel alignment is changed in the GIS and profile is saved into a text file from GIS using a macro within the ArcGIS software. This routine can be ignored and changes to the existing slope can be made directly in the spreadsheet.

Generate_xs_exist

This routine is accessed using the button "Update Existing XS Table"" in the channels' worksheet. A click to the button updates the initial channel cross-section using the channel cross-section parameters such as left side slope, left bench depth etc.

Generate_xs_design

This routine is accessed using the button "Update Design XS Table"" in the channels' worksheet. A click to the button updates the long-term channel cross-section using the channel cross-section parameters such as left side slope, left bench depth etc.

Norm_depth_ws_elev

This routine is internal in the spreadsheet to calculate the water-surface elevation.

Norm_depth_area

This routine is internal in the spreadsheet to calculate the flow area.

Norm_depth_perimeter

This routine is internal in the spreadsheet to calculate the wetted perimeter.

Norm_depth_top_width

This routine is internal in the spreadsheet to calculate the top width.

ackerswhite_tons_per_day

This routine is internal in the spreadsheet to calculate sediment transport capacity using Ackers-White Method.

einstein2_tons_per_day

This routine is internal in the spreadsheet to calculate sediment transport capacity using Einstein Method.

engelundhansen_tons_per_day

This routine is internal in the spreadsheet to calculate sediment transport capacity using Engelund-Hansen Method.

Kalinske2_tons_per_day

This routine is internal in the spreadsheet to calculate sediment transport capacity using Kalinkske Method.

laursen2_tons_per_day

This routine is internal in the spreadsheet to calculate sediment transport capacity using Laursen Method.

rottner_tons_per_day

This routine is internal in the spreadsheet to calculate sediment transport capacity using Rottner Method.

Schoklitsch2_tons_per_day

This routine is internal in the spreadsheet to calculate sediment transport capacity using Schoklitsch Method.

yang_tons_per_day

This routine is internal in the spreadsheet to calculate sediment transport capacity using Yang Method.

.import_hy8_culvert

This routine is accessed using the button "Import HY8 Culvert Data" in the "Diversion" sheets. A click to the button prompts for HY8 output file and imports the HY8 data into an inflow/outflow table.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Sept. 28, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on Sun Valley ADMP, Wagner Sub-Area, Fans 3 & 13, from Richard Waskowsky dated Sept. 27, 2006

CC: Jon Fuller, PE

This memo summarizes our response to the District's comments as dated above.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The design spreadsheets, models, Step 3 reports, and figures will be revised in the upcoming sub-area submittals to reflect our responses where appropriate.

++

The Engineering Application Development and River Mechanics Branch has finished its review and has the following comments. The consultant should submit written responses to these comments to the FCD.

Sun Valley ADMP, Wagner Sub-Area (Fans 3 and 13 only), Draft Step 3 Report

1. *In the report, page 17, section 5.7.2.5, Figure 4 is referenced; rather Figure 17 should be referenced. There are other places where a reference does not show. Please check the document for these errors.*

   All figure references in the reports will be checked and corrected as necessary.

2. *The culvert data listed on page iii of the report was not provided on the cd. Was this because Fans 3 and 13 do not reach the Sun Valley Parkway?*

   Yes. However, the HY8 files will be added to future affected submittals in an appendix. Digital scans of the MCDOT asbuilts will also be supplied. These files are also provided in the final Step 2 documents.

3. *In the Costs Summary in Appendix A, page 1, the channel cost per mile seems high. It reads that each mile will cost $5,815,000. Is this correct?*

   Yes, the cost per mile is correct. It includes the land, construction, landscaping, and 50-year maintenance costs. For Fan 3, the land costs represent about 40% of the total, construction about 35%, landscaping 8%, and maintenance 17%.

4. *For the Sediment Transport Summary, how were the four corridors (Fan 13) delineated into smaller reaches? For example, corridor H1F1335A has three reaches, but it is not shown how these were developed.*

The smaller reaches for each HEC-1 routing reach were taken as the reach mid way between each of the H1NAME_# cutline cross sections shown on the design sheets in the front of the appendix for each Fan System. They were originally placed 1000 feet apart, and then modified as necessary as the corridor design was refined.

5. *In Appendix F on the Sediment Sample Map, the numbered labels do not clearly show which feature they are referencing.*

The figure will be made clearer to facilitate identification of the sample numbers and locations. A shapefile of the locations will also be provided on the CD.

6. *In the Allowable Velocity worksheet, the FHWA Minimum Velocity should actually be the FHWA Maximum Permissible Velocity. Also, how were the FHWA values for soil cement, riprap, gabions, and concrete developed?*

The label for FHWA Velocity will be changed to read as suggested. The values were arbitrarily set high in Step 2 to reflect "non-erodible" conditions. These material types are no longer being used in Step 3. However, we will modify the lookup table in the spreadsheet to contain the values shown in Table 6.3, pg. 6-15 of the 1996 FCD Hydraulics Manaul.

7. *In the spreadsheet, in the Soil Erodibility worksheet, there are some errors. Some of the percentages and K factors do not match the percentages in the FCD Hydrology Manual and the K factors given in the Aguila-Carefree soil survey.*

    a. *In the calculation for soil 19, the 0.5 K factor should actually be 0.05.*

    b. *In the calculation for soil 29, the weighted percentages do not match the percentages given in the FCD Hydraulics manual, Appendix A.*

    c. *In the calculation for soil 47, the weighted percentages do not match the percentages given in the FCD Hydraulics manual, Appendix A.*

    d. *In the calculation for soil 49, the weighted percentages do not match the percentages given in the FCD Hydraulics manual, Appendix A.*

    e. *In the calculation for soil 52, the weighted percentages do not match the percentages given in the FCD Hydraulics manual, Appendix A.*

    f. *In the calculation for soil 98, the weighted percentages do not match the percentages given in the FCD Hydraulics manual, Appendix A.*

    g. *In the calculation for soil 115, the weighted percentages do not match the percentages given in the FCD Hydraulics manual, Appendix A.*

    h. *In the calculations for the Maricopa Central Survey soils, how were the indices developed?*

All of the K factors and weighting amounts in the Soil Erodibility worksheet have been double checked and corrected as necessary. Items a-g were all corrected. The weighting percentages for all units were taken from Appendices A or B of the FCD Hydrology Manual as appropriate. K factors were double checked against Table 14 in the Aguila-Carefree Soil Survey. K factors for map units in the Central Survey were assigned based on comparison with equivalent or similar map units in the Aguila-Carefree Survey. Only the Pinal soil type was not represented directly. The Pinal soil K factor was taken to be the same as the Pinamt soil in the same unit (GWD).

8. *In the supply reach macro, the discharge is calculated with the formula for a rectangular channel. Is this an adequate assumption for the non-rectangular reaches?*

Given the resolution of the 10-foot topography, an equivalent rectangular channel was deemed adequate to the purpose of estimating tributary sediment supply. Field observations suggest that many of these smaller tributary washes have relatively steep banks. While a rectangle may not agree completely with the real wash geometry which is somewhat more trapezoidal, it was assumed that an equivalent rectangle would produce a reasonable estimate of the incoming sediment supply.

9. *In worksheet "RR150", the printed equation for "LS" should have 0.065 rather than the listed 0.65. Also, the same equation is listed as "Equation 8.4" rather; it is "Equation B.4". The heading for the "RR150 worksheet should be listed as "Design Sediment Yield (MUSLE)" not "Design Sediment Yield (MUSCLE)".*

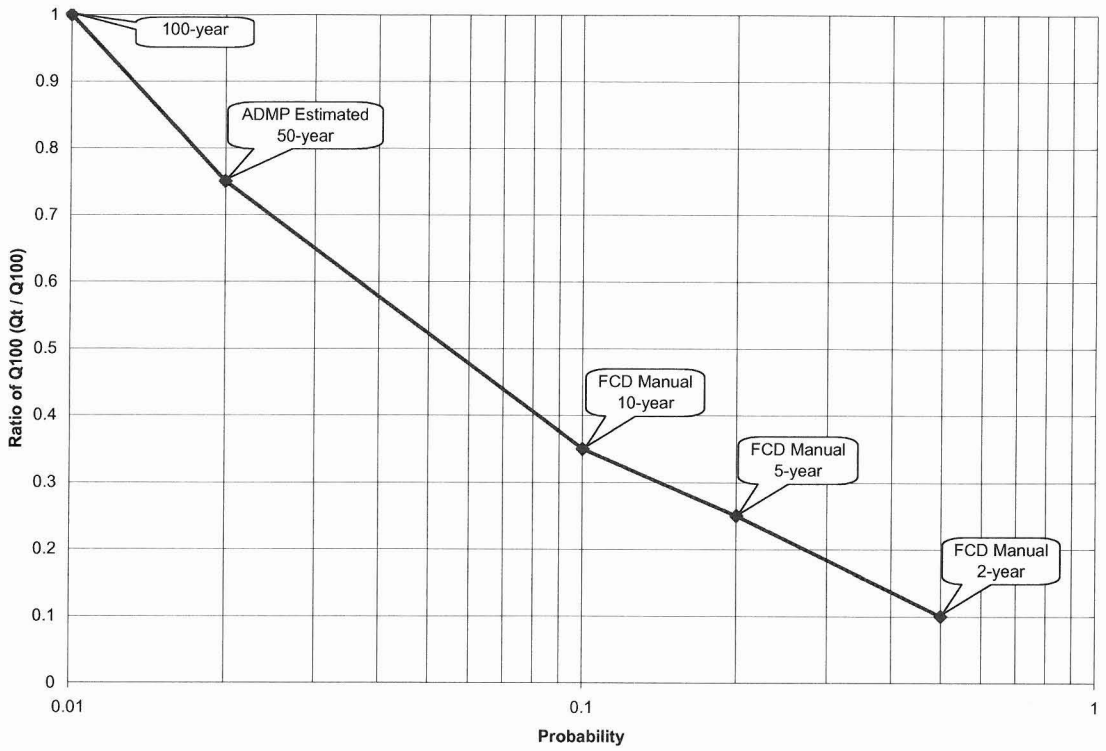
The noted corrections have been made.

10. *In worksheet "RR150", how were the values for the slope length and slope angle developed? It is annotated with "basin average", but it is not shown how these numbers were derived.*

The slope angle values were derived as the average slope statistic computed by ArcGIS from the 10-foot tin clipped to the inflowing watershed to each online detention basin. The slope lengths were estimated based on examination of the 10-foot contours, the aerial photographs, and engineering judgment.

11. *Table 6.1 in the FCD Hydrology Manual does not give a value for the 25 year and 50 year storm ratios, but the spreadsheet uses 0.55 and 0.75, respectively. How were these ratios developed?*

The following graph shows how the ADMP 50-year ratio was derived based on adding a point to a curve on a semi-log plot of the Q ratios vs. probability. The 25-year was not explicitly used in the ADMP.



12. On page 12, section 5.5 of the report, the reference is for the ADWR (1985) design manual, but the equation for annual sediment yield is from the AMAFCA (1994) manual. Please also reference the AMAFCA manual.

An additional reference to the AMAFCA manual will be added.

13. In worksheet "RR150", the inlet material volume calculation may have an error. The calculated value is correct but the formula references the entire row rather than a single value. Is this correct?

The formula, while not producing an erroneous result, is confusing and has been modified to refer to a single cell.

14. In the HEC-1 output file for the 6 hour storm, the outlet pipe is commented as a 2 ft pipe, but worksheet "RR150" says it is a 3 ft pipe. Please correct the difference.

The comment records in the HEC-1 model are erroneous. They have been removed. Other HEC-1 models will be checked to remove similar erroneous comment records.

15. In worksheet "RR150", how was the outlet coefficient for the pipe determined?

While it is recognized that the basin outlets' performance will vary with head and inlet details, a simplified assumption of a constant coefficient of discharge of 0.6 was assumed as the theoretical value for a circular orifice under sufficient head. This practice has been common in our hydrologic modeling experience.

As an alternative, in order to reflect these variations, we will use HY8 to define the outlet discharge ratings instead. The detention basins will be revised to reflect these more refined outlet discharge rating curves.

16. *In worksheet" H1F355A_7", why do the minimum channel elevation stay the same, if a low-flow channel is incising?*

In contrast to Step 2, no low flow channel incisement was directly included in the analysis per our understanding of direction from the District. The slope adjustment using the ADWR sediment transport continuity approach is however included to reflect channel adjustments to the new conditions.

17. *In the spreadsheet, when the number of drop structures is not an integer number, the number designed for should be based on the next largest integer value (e.g. 1.27 would be 2).*

The fractional number of drop structures is used only to estimate costs. The reach length at each cross-section is close to 1000 ft and the drop structure distances are also of the same order. We wanted not to lose partial grade controls over the entire length of the corridor. Rounding-off to integers at each cross-section will result in the use of more drop structures than needed for the purpose of cost estimation. The fractional numbers reflect the estimated spacing using a 3 foot drop height restriction. The placement of the actual drop structures are shown on the design maps based approximately on the spacing computed rather than strictly on the total number.

18. *For the general scour estimates, please use the initial energy slope for the calculations.*

This has been corrected to refer to the initial slope.

19. *In the worksheets for the engineered channels, the bend scour formula uses a 60 degree bend as a constraint for the bend scour equation. Why is this?*

The exceptions for angles less than 17.8 degrees and greater or equal to 60 degrees reflect recommendations in the City of Tucson Manual which we had previously been using. Although our assumed typical bend angle of 24.6 degrees (based on an average sinuosity of 1.1) uses the same equation as the ADWR Manual, we will modify the formula to remove these exceptions for low and high bend angles.

20. *(This was added by JEF to capture questions from the transmittal email) Also, I still think we have not seen the code for the levee placement tool, because the GIS file, gis_xs_info.dat, was not provided with the spreadsheet, the development of the rating curve (which appears to be developed from GIS) for the basins was not explained, and the code which developed the levee "x,y" data was not provided. If you could provide FCD, possibly at the comment meeting, with all these files, it would be greatly appreciated.*

The levee placement tool we previously demonstrated at the FCD within ArcGIS has been incorporated into Excel. The macro code has been imported into the Excel and has been included in the Excel files provided to the District. This was done to give us the ability to use the results for other calculations such as cost estimates. The

"Perform normal depth" button in each channel sheet uses the code adapted from the levee placement tool. We are using the spreadsheet to assign levee stations based on heads-up examination of the aerial photo and contours in ArcGIS. The levee stations used in the design in the spreadsheet are applied to the cross sections in GIS for the verification of the actual levee placement on ground using the aerials as the background.

The basin rating curve is determined by using the shape of the basin created by developing a tin for the basin. This is done by using a top-area polygon and ground elevations along this polygon. The side slopes of the basin tin are generated using a side slope of 6:1 going inwards from the top area polygon. The basin bottom elevation is determined by subtracting the design basin depth from the minimum elevation along the top area polygon. A basin tin is developed using 3d polylines defining the top-area, bottom-area and side slopes. This basin tin is then used to determine the rating curve.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Oct. 6, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on Sun Valley ADMP, Wagner Sub-Area, Fans 3 & 13, from Julie Cox dated Oct. 4, 2006

CC: Jon Fuller, PE

This memo summarizes our response to the District's comments as dated above.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The design Step 3 reports and figures will be revised in the upcoming sub-area submittals to reflect our responses where appropriate.

++

I have reviewed the hydrology provided for the Wagner Wash Subarea Report (Volume 3); J.E. Fuller Hydrology & Geomorphology, Inc., August 2006. My comments are listed below and are referenced to the maps, models, and report.

Note that this is the second and final memo with my comments for the Wagner Wash Subarea.

1. *Report, Appendix A, Pages 2 and 3. Replace the times to peak shown in the tables with the actual times to peak from the HEC-1 results.*

   Done. The macro was modified to correct the truncation that was occurring.

2. *Run all models with the IO record = 3 and include in the report appendices.*

   Done.

3. *Change the L and Lca shown on the maps from miles to feet.*

   The lag equation requires input in miles. Therefore, the map shows these parameters in miles on the map.

4. *I compared the sub-basin parameters for this model to those developed for Area 4 Hydrology. The S125 basin area in this model is 0.113 sq mi vs. 0.093 sq mi for Area 4. The L and Lca also differ from Area 4. On the LG record, IA and RTIMP differ from Area 4. Shouldn't these be consistent? And of course the unit hydrograph differs from that used for Area 4. Please check and revise as necessary.*

The subbasins were modified slightly to reflect the ultimate detention basin location. Therefore, drainage area, lag, and all the other subbasin specifics may have changed somewhat.

5. *The ID records state the modeled area is 1.3 sq mi. This is only the case if the combined areas for S135A, S135B, S135C, and S135D add up to the 0.879 sq mi used for Area 4. Please check and revise as necessary.*

The subbasins while named similarly to the Area 4 models, do not represent simple subdivision of the original subbasin in every instance. Only areas that were deemed reasonably able to drain to the proposed corridors were included in the hydrology and therefore in the design of the recommended alternative.

6. *For RR13, add a KM record that says "outlet based on assumed 2 ft pipe".*

Done.

7. *For route 35A35B, I calculated the slope as 0.021 ft/ft not 0.025 ft/ft as modeled. Please check and revise as necessary.*

The spreadsheets have been updated by adding a formula to calculate slope and therefore insert the proper slope into the HEC-1 models. This change will be applied to all spreadsheets.

8. *Report, Appendix B, Pages 2 and 3. Replace the times to peak shown in the tables with the actual times to peak from the HEC-1 results.*

Done.

9. *Include any Culvertmaster, Flowmaster, and/or HY8 output in appendices.*

Done.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Oct. 6, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on Sun Valley ADMP, Wagner Sub-Area, Fans 3 & 13, from Julie Cox dated Oct. 2, 2006

CC: Jon Fuller, PE

This memo summarizes our response to the District's comments as dated above.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The design Step 3 reports and figures will be revised in the upcoming sub-area submittals to reflect our responses where appropriate.

++

I have reviewed the hydrology provided for the Wagner Wash Subarea Report (Volume 3); J.E. Fuller Hydrology & Geomorphology, Inc., August 2006. My comments are listed below and are referenced to the maps, models, and report.

1. *Report. The figures in the Wagner Wash Subarea Report should pertain to the Wagner Wash Subarea. There are several figures that are not located in the Wagner Wash Subarea. I recommend removing Skyline Fan (Figure 2), Fan 36 (Figure 6), and Fans 36 and 37 (Figure 8) and replacing them with photos in the Wagner Wash Subarea. Figures 2, 6, and 8 are not referenced in the report anyway.*

   Many of the figures and other discussion in the sub-area reports are intended to serve as examples, break up the text, and provide some color. It was deemed examples from the study area at large were sufficient to serve this purpose. For example, we don't have nice low altitude oblique photographs for all areas or historic aerial evidence of significant alluvial fan avulsion episodes. Therefore, the only alternative is to remove these figures rather than replace them. We elected not to remove them. To address the reviewer's other concerns, where a logical reference could be made to each figure, references within the text have been added.

2. *Report, Page 4. The report should refer to Figure 1.*

   See response to comment 1.

3. *Report, Page 8, 2nd to last paragraph. The report states that the refinements and designs of the other subareas are presented in Volumes 2 and 4-7. My understanding is that there will be one volume for each of the six subareas.*

Yes. There will be a separate volume for each piedmont sub-area (Volumes 2 – 7). There will also be an overview report which we plan to designate as Volume 1.

4. *Report, Page 10. Change "White Tanks Wash" to "White Tank Wash".*

Done.

5. *Report, Page 11. Change "corridors provides a path" to "corridors provide a path".*

Done.

6. *Report, Page 11. Change "serves as a trunk system" to "serve as a trunk system".*

Done.

7. *Report, Page 11. Change "includes a small containment dikes" to "includes small containment dikes" or "includes a small containment dike".*

Done.

8. *Report, Page 12. Change "the maximum of the values obtained from the 24-hour and 6-hour results were used" to "the maximum of the values obtained from the 24-hour and 6-hour results was used"*

Done.

9. *Report, Page 13. Change "AMDP" to "ADMP".*

Done.

10. *Report, Page 13, Paragraph 4. There is something missing in the sentence "A brief discussion of the design approach for is included in the discussion of each structural component." Review and change as necessary.*

Done. "for" was deleted.

11. *Report, Page 17, Section 5.7.2.4. Change "mayraise" to "may raise".*

Done.

12. *Report, Page 17, Section 5.7.2.5. Change "Figure 4" to "Figure 17".*

Done.

13. *Report, Page 19, Section 5.7.5. Change "Table 1" to "Table 2".*

Done.

14. *Report, Page 19, Table 2. What is the source of the 820 cfs listed as the 100-year discharge?*

The 820 cfs is the peak discharge (rounded from 818 cfs) for the 100-year 6-hour model KK block S150 (watershed contributing to Fan 3 basin). The 6-hr is greater than the 24-hr in this particular instance (720 cfs).

15. Report, Page 19, Section 5.7.6. Change "reinforce" to "reinforced".

Done.

16. Report, Pages 20-29. Figures 20-21, 23-25, and 27-29. I did not find references to these figures in the report. Please reference the figures in the report or remove them. Please label Figure 21 if it is to remain in the report.

A reference to each figure has been added.

17. Report, Page 21, Section 5.8.2. Change "scour protection on inside of the basin" to "scour protection on the inside of the basin".

Done.

18. Report, Page 21, Section 5.8.3. Change "reinforce" to "reinforced".

Done.

19. Report, Page 21, Section 5.9. Change "basins located to reduce its visibility" to "basin was located to reduce its visibility".

Done.

20. Report, Page 25, Section 5.12.5. Change "over turning" to "overturning". Change "back fill" to "backfill".

Done.

21. Report, Page 27, Section 5.13.2. Change "moderate control" to either "moderate" or "control".

Done. "control" left, "moderate" deleted.

22. Report, Page 29, Section 6, 1st sentence at top of page. Change "Runoff from the remainder of the sub-area, including Fans 16-19, flow to Wagner Wash" to "Runoff from the remainder of the sub-area, including Fans 16-19, flows to Wagner Wash".

Done.

23. Appendix A, Land Use Map. Change view port to be consistent with other map view ports.

Done.

24. Appendix B, Land Use Map. Change view port to be consistent with other map view ports.

Done.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Oct. 16, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on Sun Valley ADMP, Hassayampa Sub-area, from Julie Cox dated Oct. 6, 2006

CC: Jon Fuller, PE

This memo summarizes our response to the District's comments as dated above.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The design Step 3 reports and figures will be revised in the upcoming sub-area submittals to reflect our responses where appropriate.

++

I have reviewed the hydrology provided for the Hassayampa Subarea Report (Volume 4); J.E. Fuller Hydrology & Geomorphology, Inc., September 2006. My comments are listed below and are referenced to the maps, models, and report.

1. *Report. The figures in the Hassayampa Subarea Report should pertain to the Hassayampa Subarea. There are several figures that are not located in the Hassayampa Subarea. I recommend removing Skyline Fan (Figure 2), Fan 36 (Figure 6), and Fans 36 and 37 (Figure 8) and replacing them with photos in the Hassayampa Subarea. Figures 2, 6, and 8 are not referenced in the report anyway.*

   Many of the figures and other discussion in the sub-area reports are intended to serve as examples, break up the text, and provide some color. It was deemed examples from the study area at large were sufficient to serve this purpose. For example, we don't have nice low altitude oblique photographs for all areas or historic aerial evidence of significant alluvial fan avulsion episodes. Therefore, the only alternative is to remove these figures rather than replace them. We elected not to remove them. To address the reviewer's other concerns, where a logical reference could be made to each figure, references within the text have been added.

2. *Report, Appendix A, Pages 2 and 3. Replace the times to peak shown in the tables with the actual times to peak from the HEC-1 results.*

   Done.

3. *Run all models with the IO record = 3 and include in the report appendices.*

   Done.

4. *The top elevation for route F415A in the models differs from that shown on the Fan 4 sub-basin map. Please check and revise as necessary.*

A missing elevation point was added to the map and labeled.

5. *For the KK block C520AB, check the KM record and revise as necessary.*

The comment record has been revised to read: "This is the total flow in the Fan 5 corridor about 1.5 mile D/S of SVP"

6. *Change the L and Lca shown on the maps from miles to feet.*

The lag equation requires input in miles. Therefore, the map shows these parameters in miles on the map.

7. *Fan 4 and Fan 5 Sub-basin maps. Label detention basins, concentration points, and routes.*

Additional labels have been added to the maps where legibility allows.

8. *Fan 4 and Fan 5 Sub-basin, Soil, and Land Use maps. Label detention basins. Label the Sun Valley Parkway. Add "Fan Apices" and the symbol to the Legends.*

Fan apices have been added along with the additional labels to the maps and legend as appropriate.

9. *Fan 4 and Fan 5 Soil maps. Can't read. Please darken or thicken the contours.*

The contours have been made thicker to enhance legibility.

10. *Fan 5 Sub-basin map. Label elevations 1245 and 1341 ft.*

Done.

11. *Fan 5 Soil map. Show and label Apex 5.*

Done.

12. *Fan 5 Land Use map. Enlarge the apex symbol and the number "5".*

Done.

13. *Report. Please number the pages in Appendix A.*

Done.

14. *Report, Appendix B, Pages 2 and 3. Replace the times to peak shown in the tables with the actual times to peak from the HEC-1 results.*

Done.

15. Include any Culvertmaster, Flowmaster, and/or HY8 output in appendices.

Done.

16. Report, Page 3, Paragraph 3. Specify the number of miles, acres, and millions of dollars.

Done.

17. Report, Page 11. Change "the maximum of the values obtained from the 24-hour and 6-hour results were used" to "the maximum of the values obtained from the 24-hour and 6-hr results was used".

Done.

18. Report, Page 12. Change "Wagner sub-area" to "Hassayampa sub-area".

I could not find a reference to the Wagner sub-area on page 12. The report was checked through for other references to the incorrect sub-area and were modified where necessary.

19. Report, Page 12. Change "AMDP" to "ADMP".

Done.

20. Report, Page 13, Paragraph 2. Change 2nd sentence to read "Ten percent of the 100-yr peak flow approximates the 2-year flow."

Done.

21. Report, Page 16. Change "Figure 4" to "Figure 17".

Done.

22. Report, Page 17, paragraph 1. Change the 2nd use of "Figure 18" to "Figure 19".

Done.

23. Report, Page 17. Change "Table 1" to "Table 2".

Done.

24. Report, Page 17. What is the source of the 820 cfs listed as the 100-yr discharge?

The 820 cfs is the peak discharge (rounded from 818 cfs) for the 100-year 6-hour model KK block S150 (watershed contributing to Fan 3 basin). The 6-hr is greater than the 24-hr in this particular instance (720 cfs).

25. Report, Page 18. Change "Terrace 2 and 3" to "Terraces 2 and 3".

Done.

26. Report, Page 18. Change "Reinforce" to "Reinforced".

Done.

27. Report, Page 19. Change "basins located to reduce its visibility" to "basin located to reduce its visibility".

Done.

28. Report, Pages 19-26. Figures 20-22 and 25. I did not find references to these figures in the report. Please reference the figures in the report or remove them.

A reference to each figure has been added.

29. Report, Page 23. Change "over turning" to "overturning". Change "back fill" to "backfill".

Done.

30. Report, Page 23. Change "scoured to it maximum potential" to "scoured to its maximum potential".

Done.

31. Report, Page 23. Change "scenario's" to "scenarios".

Done.

32. Report, Page 24. Change "grade control structure be places" to "grade control structure be placed"

Done.

33. Report, Page 24. Change "Wagner Wash" to "the Hassayampa River".

Done.

34. Report, Page 25. Change "moderate control" to either "moderate" or "control".

Done. "control" left, "moderate" deleted.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Oct. 19, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on Sun Valley ADMP, FRS 2&3 Sub-Area, from Richard Waskowsky dated Oct. 16, 2006

CC: Jon Fuller, PE

This memo summarizes our response to the District's comments as dated above.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The design spreadsheets, models, Step 3 reports, and figures will be revised in the upcoming sub-area submittals to reflect our responses where appropriate.

++

The Engineering Application Development and River Mechanics Branch has finished its review and has the following comments. The consultant should submit written responses to these comments to the FCD.

The previous comments that still apply from the Wagner sub-area are shown with J E Fuller's responses. The Wagner comments that have been resolved are not shown in this memorandum. The FCD comments are shown in bold.

Sun Valley ADMP, Buckeye FRS #2 & #3 Draft Step 3 Report

1. *FCD Comment (9/27/2006) - In the Allowable Velocity worksheet, the FHWA Minimum Velocity should actually be the FHWA Maximum Permissible Velocity. Also, how were the FHWA values for soil cement, riprap, gabions, and concrete developed?*

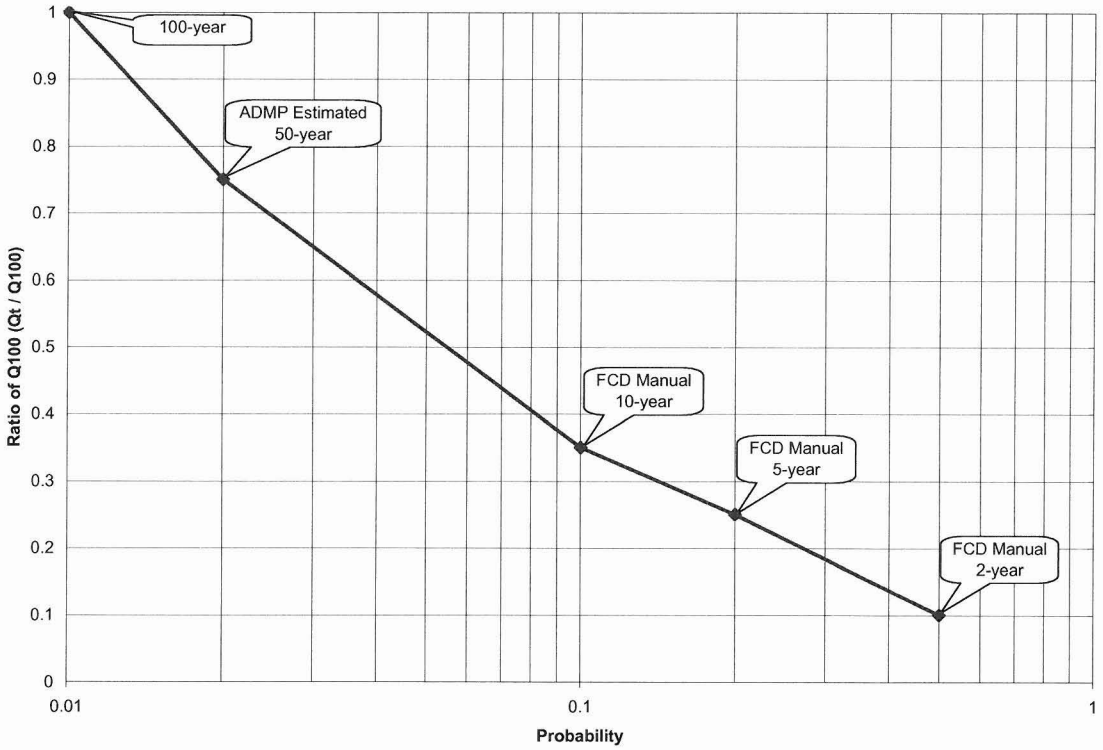
   JEF Response (9/28/2006) - The label for FHWA Velocity will be changed to read as suggested. The values were arbitrarily set high in Step 2 to reflect "non-erodible" conditions. These material types are no longer being used in Step 3. However, we will modify the lookup table in the spreadsheet to contain the values shown in Table 6.3, pg. 6-15 of the 1996 FCD Hydraulics Manual.

FCD Response (10/16/2006) – The Allowable Velocity worksheet has not been corrected.

We have responded to this comment as indicated and revised all the workbooks. The new Wagner sub-area submittal will reflect these changes.

2. *FCD Comment (9/27/2006) - Table 6.1 in the FCD Hydrology Manual does not give a value for the 25 year and 50 year storm ratios, but the spreadsheet uses 0.55 and 0.75, respectively. How were these ratios developed?*

JEF Response (9/28/2006) - The following graph shows how the ADMP 50-year ratio was derived based on adding a point to a curve on a semi-log plot of the Q ratios vs. probability. The 25-year was not explicitly used in the ADMP.



FCD Response (10/16/2006) – The 25 year storm is used in the sediment yield analysis and still needs to be shown in the report and on the graph.

The 25-year has been added back to the plot and the reports revised. The new Wagner sub-area submittal will reflect these changes.

3. *FCD Comment (9/27/2006) - In the spreadsheet, when the number of drop structures is not an integer number, the number designed for should be based on the next largest integer value (e.g. 1.27 would be 2).*

JEF Response (9/28/2006) - The fractional number of drop structures is used only to estimate costs. The reach length at each cross-section is close to 1000 ft and the drop structure distances are also of the same order. We wanted not to lose partial grade controls over the entire length of the corridor. Rounding-off to integers at each cross-section will result in the use of more drop structures than needed for the purpose of cost estimation. The fractional numbers reflect the estimated spacing using a 3 foot drop height restriction. The placement of the actual drop structures are shown on the design maps based approximately on the spacing computed rather than strictly on the total number.

FCD Response (10/16/2006) – It would be clearer if in the cost estimate section of the report, there was a discussion explaining that the fractional portion of the drop structure calculations were only used for the cost estimate and are not put in the design. Basically, can you document your response in the report?

The following text has been added to Section 5.10.6 of each sub-area report "The placement of the actual drop structures are shown on the design maps based approximately on the spacing computed rather than strictly on the total number. Therefore, the number of drop structures shown on the map do not necessarily match the number used in the cost estimates exactly."

4. ***FCD Comment (10/16/2006) – There are minor text errors in the report. For example on page 3, the cost estimate does not show a number, and on page 26 in (c) on the bottom of the left side there is a repeated comma. Please check the text for errors.***

All final versions of the text reports will be re-reviewed to remove these and other similar text errors.

5. ***In the hydrology maps on pages 42 and 43, the symbol for the apices is not shown in the legend.***

The maps will be revised to add the apices to the legends where appropriate.

6. ***On page 10 section 5.1.1, if the report is to stand-alone, is there a way to explain the survey data without having to refer to another source (the District)?***

We have no specific knowledge of the survey associated with the countywide 10-foot topography and orthophotography. Presumably this was reviewed and approved by the District in 2001.

7. ***On Figure 10 of the report, the symbol for the "10-ft topo" did not print in the legend.***

Figure 10 has been revised in all sub-area reports.

8. ***For the inlet drop structures of section 5.7 of the report, please make a note that the structures will need to have scour protection, in accordance with the equations from the USBR manual (Pemberton and Lara, 1984). For example in Figure 19, no cutoff walls or erosion protection is shown downstream of the structures. This might give the impression that no erosion protection is***

necessary. Please make a note of the need for adequately sized erosion protection.

The text in Section 5.7 has been modified to include mention of the USBR manual and additional discussion of the need and importance of scour protection measures associated with the inlet structures.

9. ***On page 10 of the report in the first full paragraph of the page, when the 4:1 slope is mentioned, is this slope only used in the cost estimate or will it affect the rating curve in the spreadsheet?***

The 4:1 slope adjustment was only considered for the purpose of the cost differential for the aesthetic treatment. It is correct to note that the stage-storage-discharge curve would be affected and hence the overall basin design. These impacts of the aesthetic treatment differences were not explicitly analyzed as the aesthetic treatment requirements were considered just that, necessary requirements, for the structural measures associated with the recommended alternative. The simplified 4:1 slope adjustment was an approach developed to estimate the cost differences only.

10. ***On page 20 in the on-line basin design procedure, please list the design criteria and tell how the "volume and depth are adequate". For all the design procedures, please list the characteristics that were being designed to and what constitutes the "optimum" configuration.***

The design criteria are listed in Table 1. The only basin criteria are Z=6 and D $\leq$ 12 feet. The volume and depth were considered "adequate" when the maximum storage from HEC-1 (which includes the required sediment volume) is less than or equal to the total basin volume. The depth was considered "adequate" when the maximum stage from HEC-1 (again which includes the sediment) plus 1 foot freeboard was less than or equal to the basin depth which should be $\leq$ 12 feet. The text in Section 5.10 has been modified.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Oct. 19, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on Sun Valley ADMP, CAP Sub-Area, from David Degerness dated Oct. 17, 2006

CC: Jon Fuller, PE

This memo summarizes our response to the District's comments as dated above.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The design spreadsheets, models, Step 3 reports, and figures will be revised in the upcoming sub-area submittals and final reports to reflect our responses where appropriate.

++

I have finished my review of the above referenced document and I have the following comments.

The following comments are carried over from the Wagner Sub-Area Review:

1. *In the Allowable Velocity worksheet, the FHWA Minimum Velocity should actually be the FHWA Maximum Permissible Velocity.*

This has been changed in all the sub-area workbooks.

2. *In the spreadsheet, in the Soil Erodibility worksheet, there are some errors. Some of the percentages and K factors do not match the percentages in the FCD Hydrology Manual and the K factors given in the Aguila-Carefree soil survey.*

This has been changed in all the sub-area workbooks.

3. *On page 12, section 5.5 of the report, the reference is for the ADWR (1985) design manual, but the equation for annual sediment yield is from the AMAFCA (1994) manual. Please also reference the AMAFCA manual.*

Done.

4. *In worksheet "RR900", the printed equation for "LS" should have 0.065 rather than the listed 0.65. Also, the same equation is listed as "Equation 8.4" rather; it is "Equation B.4". The heading for the "RR150 worksheet should be listed as "Design Sediment Yield (MUSLE)" not "Design Sediment Yield (MUSCLE)".*

This has been changed for all on-line basins in all the sub-area workbooks.

The following comments are new for this review.

5. *The "Main" worksheet has more buttons than existed for previous worksheets or sub areas. Please explain why*

The additional buttons are functions we used in our preparation and development of the original spreadsheets. We (intended) to remove them from the versions for submittal to the District. Unfortunately in this sub-area submittal the button removal was overlooked. All future submittals will contain only the two buttons fundamental to the execution of the spreadsheet similar to the worksheets you received for other sub-areas.

6. *Page 16 of the report, the reference to figure 4 showing the stilling basins should be provided as figure 17.*

The figure reference error has been corrected in this and other sub-area reports.

7. *Page 18 of the report, the reference to table 1 should be referenced to table 2.*

The table reference has been corrected in this and other sub-area reports.

8. *Page 19 of the report, the figure showing the off line detention basin should be labeled as figure 21.*

The figure reference error has been corrected.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Oct. 23, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on Sun Valley ADMP, CAP Sub-area, from Julie Cox dated Oct. 23, 2006

CC: Jon Fuller, PE

This memo summarizes our response to the District's comments as dated above.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The design Step 3 reports and figures will be revised in the final submittal to reflect our responses where appropriate. A number of these responses will be reflected in the final draft Wagner sub-area report if applicable.

++

I have reviewed the hydrology provided for the CAP Subarea Report (Volume 2); J.E. Fuller Hydrology & Geomorphology, Inc., September 2006. My comments are listed below and are referenced to the maps, models, and report.

1. *Report, Appendix A, Pages 2 and 3. Replace the times to peak shown in the tables with the actual times to peak from the HEC-1 results.*

Done.

2. *Report, Appendix A, Pages 2 and 3. The tables do not include the results for "TOFAN1" and 2 instances of "DOUT". Please check and revise as necessary.*

The macro was not reading the DR portion of the results only the KK. The macro has been modified and the summary tables updated.

3. *Run all models with the IO record = 3 and include in the report appendices.*

Done.

4. *Change the L and Lca shown on the maps from miles to feet.*

The lag equation requires input in miles. Therefore, the map shows these parameters in miles on the map.

5. *Fans 1 & 2 Sub-basin Maps. Label detention basins, concentration points, and routes.*

Additional labels have been added to the maps where legibility allows.

6. *For the KK block "TOFAN2" please add more DI/DQ records to define what flows are diverted between inflows of 0 and 10,000 cfs.*

This is strictly a percentage diversion. As stated in the comment records for this KK block, 34% is the objective to divert flows proportionally to the upstream drainage contribution. Any additional points would just be other expressions for 34 percent.

7. *Report, Basins Summary. For D115B, change 1050 (cfs) to 147 ac-ft. For D120A, change 950 (cfs) to 76 ac-ft.*

Done.

8. *For route 15B15C, I calculated the slope as 0.011 ft/ft not 0.002 ft/ft as modeled. Please check and revise as necessary.*

The 0.0015 slope (rounded to 0.002) is the constructed design slope of the existing Sun Valley Parkway channel which has numerous grade controls. Therefore, the top elevation minus the bottom elevation divided by length does not equal the constructed slope.

9. *For route 115120, I calculated the slope as 0.009 ft/ft not 0.002 ft/ft as modeled. Please check and revise as necessary.*

See item 8.

10. *Report. Please number the pages in Appendix A.*

Done.

11. *Report, Footnotes. Change references to "Wagner Wash Sub-area" and "Hassayampa Sub-area" to "CAP Sub-area".*

Done.

12. *Include any Culvertmaster, Flowmaster, and/or HY8 output in appendices.*

Done.

13. *Report, Page 12. Change "the maximum of the values obtained from the 24-hour and 6-hour results were used" to "the maximum of the values obtained from the 24-hour and 6-hr results was used".*

Done.

14. *Report, Page 12. Change "Wagner sub-area" to "CAP sub-area".*

Done.

15. Report, Page 12. Change "AMDP" to "ADMP".

Done.

16. Report, Page 13, Paragraph 2. There is something missing in the sentence "A brief discussion of the design approach for is included in the discussion of each structural component." Please review and revise as necessary.

Done. "for" was deleted.

17. Report, Page 13. Change "The on-line detention basin for each fan system are ideally located" to "The on-line detention basin for each fan system is ideally located".

Verb conjugation corrected.

18. Report, Page 14, Paragraph 1. Change 2nd sentence to read "Ten percent of the 100-yr peak flow approximates the 2-year flow."

Done.

19. Report, Page 16. Change "Figure 4" to "Figure 17".

Done.

20. Report, Page 17, paragraph 1. Change the 2nd use of "Figure 18" to "Figure 19".

Done.

21. Report, Page 18. Change "Table 1" to "Table 2".

Done.

22. Report, Page 18. Change "Terrace 2 and 3" to "Terraces 2 and 3".

Done.

23. Report, Page 18. Change "Reinforce" to "Reinforced".

Done.

24. Report, Page 19. Change "Figure21shows" to "Figure 21 shows".

Done.

25. Report, Page 20. Change "basins located to reduce its visibility" to "basin located to reduce its visibility".

Done.

26. Report, Page 24. Change "over turning" to "overturning". Change "back fill" to "backfill".

Done.

27. Report, Page 25. Change "scoured to it maximum potential" to "scoured to its maximum potential".

Done.

28. Report, Page 25. Change "scenario's" to "scenarios".

Done.

29. Report, Page 26. Change "grade control structure be places" to "grade control structure be placed"

Done.

30. Report, Page 26. Change "moderate control" to either "moderate" or "control".

Done. "control" left, "moderate" deleted.

31. Report, Pages 3-28. Figures 1-2, 6, 8, 13, 20-21, 23-25, and 27-28. I did not find references to these figures in the report. Please reference the figures in the report or remove them. Please label Figure 21 if it is to remain in the report.

Many of the figures and other discussion in the sub-area reports are intended to serve as examples, break up the text, and provide some color. It was deemed examples from the study area at large were sufficient to serve this purpose. For example, we don't have nice low altitude oblique photographs for all areas or historic aerial evidence of significant alluvial fan avulsion episodes. Therefore, the only alternative is to remove these figures rather than replace them. We elected not to remove them. To address the reviewer's other concerns, where a logical reference could be made to each figure, references within the text have been added.

32. Additional comment received by email 10/23/06 at 2:14 pm: Please check top and bottom elevations for routings 91B915, 91592A, F215A2, & 15A15B. Maps and models don't match.

An additional elevation point and label were added to the map for 91B915 which also addressed 91592A.
A label was added to elevation point 1682 at C115A which addresses F215A2 and 15A15B.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Oct. 24, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on Sun Valley ADMP, White Tank Wash Sub-Area, from David Degerness dated Oct. 23, 2006

CC: Jon Fuller, PE

This memo summarizes our response to the District's comments as dated above.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The design spreadsheets, models, Step 3 reports, and figures will be revised in the final sub-area submittals to reflect our responses where appropriate. We have endeavored to include all the applicable changes to the final draft Wagner sub-area submittal.

++

I have finished my review of the above reference document and I have the following comments.

1. *Page 20, Section 5.7.5, last paragraph. The paragraph describes the terraced inlet as having 5 drops of 5 feet as shown in Figure 19. However, Figure 19 shows 4 drops of 5 feet and two of 4 feet. Please redraw the figure or change the wording in the paragraph.*

The text has been modified to match the depiction in Figure 19.

2. *Page 34, Section 9. The third sentence states that the off-line detention basin for fan system 38 were not estimated. The report should briefly describe why the cost was not estimated for the off-line detention basin.*

The off-line basin for Fan 38 is being designed and built in conjunction with the Anthem development. In accordance with our objective to incorporate developer's schemes into the recommended alternative, this facility for Fan 38 was included. The specifics of their concept differ from some of the ADMP specific assumptions and criteria (i.e. basin fully excavated vs. partial berm detention facility). In addition, they have performed more detailed unsteady hydraulic analyses, etc. that we do not have the details for. Finally, we were concerned that our cost estimates would therefore potentially be quite different from the developer's engineer's estimates and this was felt to present potential concerns in coordination with this important stakeholder. The status of their design and its approval remains uncertain.

The report text has been modified to state specifically that the off-line basin is being designed and constructed by others. No additional elaboration was included.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Oct. 24, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on Sun Valley ADMP, FRS 1 Sub-Area, from Richard Waskowsky dated Oct. 23, 2006

CC: Jon Fuller, PE

This memo summarizes our response to the District's comments as dated above.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The design spreadsheets, models, Step 3 reports, and figures will be revised in the final sub-area submittals to reflect our responses where appropriate. We have endeavored to include all the applicable changes to the final draft Wagner sub-area submittal.

++

The Engineering Application Development and River Mechanics Branch has finished its review and has the following comments. The consultant should submit written responses to these comments to the FCD.

The previous comments that still apply from the Wagner sub-area are shown with J E Fuller's responses. The Wagner comments that have been resolved are not shown in this memorandum. The FCD comments are shown in bold.

Sun Valley ADMP, Buckeye FRS #1 Draft Step 3 Report

1. *FCD Comment (9/27/2006) - In the Allowable Velocity worksheet, the FHWA Minimum Velocity should actually be the FHWA Maximum Permissible Velocity. Also, how were the FHWA values for soil cement, riprap, gabions, and concrete developed?*

   JEF Response (9/28/2006) - The label for FHWA Velocity will be changed to read as suggested. The values were arbitrarily set high in Step 2 to reflect "non-erodible" conditions. These material types are no longer being used in Step 3. However, we will modify the lookup table in the spreadsheet to contain the values shown in Table 6.3, pg. 6-15 of the 1996 FCD Hydraulics Manual.

   FCD Response (10/16/2006) – The Allowable Velocity worksheet has not been corrected.

The omission has now been corrected in all sub-area workbooks.

2. *FCD Comment (9/27/2006) - In the spreadsheet, when the number of drop structures is not an integer number, the number designed for should be based on the next largest integer value (e.g. 1.27 would be 2).*

JEF Response (9/28/2006) - The fractional number of drop structures is used only to estimate costs. The reach length at each cross-section is close to 1000 ft and the drop structure distances are also of the same order. We wanted not to lose partial grade controls over the entire length of the corridor. Rounding-off to integers at each cross-section will result in the use of more drop structures than needed for the purpose of cost estimation. The fractional numbers reflect the estimated spacing using a 3 foot drop height restriction. The placement of the actual drop structures are shown on the design maps based approximately on the spacing computed rather than strictly on the total number.

FCD Response (10/16/2006) – It would be clearer if in the cost estimate section of the report, there was a discussion explaining that the fractional portion of the drop structure calculations were only used for the cost estimate and are not put in the design. Basically, can you document your response in the report?

The following text has been added to Section 5.10.6 of each sub-area report: "The placement of the actual drop structures are shown on the design maps based approximately on the spacing computed rather than strictly on the total number. Therefore, the number of drop structures shown on the map do not necessarily match the number used in the cost estimates exactly."

4. *On page 13 section 5.1.1, if the report is to stand-alone, is there a way to explain the survey data without having to refer to another source (the District)?*

We have no specific knowledge of the survey associated with the countywide 10-foot topography and orthophotography. Presumably this was reviewed and approved by the District in 2001.

5. *On Figure 10 of the report, the symbol for the "10-ft topo" did not print in the legend.*

Figure 10 has been revised in all sub-area reports.

6. *For all drop structures of the report, please make a note that the structures will need to have scour protection, in accordance with the equations from the USBR manual (Pemberton and Lara, 1984). For example in Figure 19, no cutoff walls or erosion protection is shown downstream of the structures. This might give the impression that no erosion protection is necessary. Please make a note of the need for adequately sized erosion protection.*

The text in Section 5.7 has been modified to include mention of the USBR manual and additional discussion of the need and importance of scour protection measures associated with the inlet structures. Section 5.10.4 presents the scour equations for estimates of scour associated with drop structures. Mention of the need to include this depth in the design of the drop structures has also been added to Section 5.10.6.

7. *On page 22 of the report in the first full paragraph of the page, when the 4:1 slope is mentioned, is this slope only used in the cost estimate or will it affect the rating curve in the spreadsheet?*

The 4:1 slope adjustment was only considered for the purpose of the cost differential for the aesthetic treatment. It is correct to note that the stage-storage-discharge curve would be affected and hence the overall basin design. These impacts of the aesthetic treatment

differences were not explicitly analyzed as the aesthetic treatment requirements were considered just that, necessary requirements, for the structural measures associated with the recommended alternative. The simplified 4:1 slope adjustment was an approach developed to estimate the cost differences only.

8. *On page 22 in the on-line basin design procedure, please list the design criteria and tell how the "volume and depth are adequate". For all the design procedures, please list the characteristics that were being designed to and what constitutes the "optimum" configuration.*

The design criteria are listed in Table 1. The only basin criteria are Z=6 and D ≤ 12 feet. The volume and depth were considered "adequate" when the maximum storage from HEC-1 (which includes the required sediment volume) is less than or equal to the total basin volume. The depth was considered "adequate" when the maximum stage from HEC-1 (again which includes the sediment) plus 1 foot freeboard was less than or equal to the basin depth which should be ≤ 12 feet. The text in Section 5.10 has been modified.

9. *In the final report, please mention that the enclosed data is on a DVD, rather than a CD or put it on multiple CDs in a flap at the end of the report.*

Reference to the specific media type has been modified. DVDs are used in preference to multiple CDs.

10. *On page 12 of the report, the first sentence has an error. It should read "Within the FRS No. 1…" not "Within the FRS No. 1 3…".*

Corrected.

11. *On page 19 in section 5.7.4 and 5.7.5, the report talks about fan systems 13 and 3, but the report would be clearer if the fan systems that were analyzed in the report were from the same sub-area as the report. Would it be possible to use fans from the current sub-area in this section for each report?*

An additional section summarizing the inlet spillway selection process and geometry has been added following the discussion of the Fan 3 and 13 designs. The Fan 3 and 13 discussion has also been more clearly identified as examples.

12. *On pages 32, 34, and 35, the last paragraph on each page has incorrect spacing.*

The justification problem has been corrected in this an other documents where it appeared similarly.

13. *On page 5 of Appendix A, there is an example of the printed equations in the spreadsheet having incorrect spacing. The K and LS equations have portions of the equation cut off when the page is printed. Please check the size limits to ensure that the whole equation prints.*

This appears to be some kind of pdf printing artifact. We will endeavor to correct this in the final version.

14. *On page 9 of Appendix A, there is an erroneous "click-down" box in the sediment data section. From the Excel file, this box appears in every corridor sheet.*

The erroneous graphic has been deleted from all sheets.

15. *On page 11 of Appendix A and in the Excel corridor worksheets, the graph shows the water surface extending into the channel cross-section. Would it be possible to have a note which clarifies that the water surface does not actually extend into the cross-section?*

The plotting macro has been modified to correct the water surface line on the cross section graphs for all workbooks.

16. *In the scour calculation portion of the engineered corridor, long-term scour is listed as a component, but in the report long-term scour was not included in the scour calculations due to the presence of grade control structures. Is this actually local scour, and if so, what causes the local scour?*

The long-term scour is a component of scour considered in the determination of scour depth for cost estimates in the engineered corridors. The long-term scour of 1.5 feet was used for all corridors with grade control structures to reflect the average potential long-term degradation given a 3 foot drop structure height. This average value allows for a representative quantity for the cost estimates of toe down protection.

17. *For readability, in the scour calculation portion of the engineered corridor worksheets, please remove the label "general scour equations", change the "Scour Calculations" title to "Total Scour Calculations" along with a printed form of the total scour equation (given in the ADWR Manual), and place the components of scour next to each other at the end of the table.*

Done.

18. *In the "Design Summary" worksheet for FAN37, all calculated cells give a reference error. What are the correct references?*

The design summary was inadvertently not updated prior to burning the workbooks to disc. The design summary tables for each fan system workbook will be updated for the final submittal.

19. *For the cross-section H1F37L2b1_10, the velocity given in the GIS shapefile is given as 10 ft/s, but in the spreadsheet for the H1F37L2b1_10 worksheet, the maximum initial velocity is only 2.9 ft/s. What is the reason for difference?*

The attributes are added following completion of the spreadsheet work. Apparently this was forgotten in the FRS 1 sub-area report production. All final shapefiles will be updated with the final attribute data before including on the discs with the final reports.

Memorandum JE Fuller/ Hydrology & Geomorphology, Inc.

DATE: November 3, 2006

TO: Valerie Swick/FCDMC

FROM: Jon Fuller, PE, RG, CFM

RE: Sun Valley ADMP
Alluvial Fan Floodplain Delineations: Fan 17-18-19
Response to TDN Review Comments

CC: Kathryn Gross/FCDMC
Julie Cox/FCDMC
Mike Kellogg/JEF
Rob Lyons/JEF

This memorandum summarizes JE Fuller/Hydrology & Geomorphology, Inc. (JEF) responses to District review comments. District review comments are enumerated below, using the number from the District review comment letter. JEF responses are shown in 10-point bold italic font immediately below each comment. We appreciate the thoughtful and timely review by the District staff.

Hydrology Comments (Julie Cox, Email on October 20, 2006)

Per above-referenced email from Julie Cox/FCDMC, all hydrology comments have been addressed.

JEF Response: No response needed.

Geomorphology Comments (Kathryn Gross, Letter dated October 18, 2006)
The TDN has been reviewed and is considered approved once the minor corrections listed below are addressed.

JEF Response: The minor corrections have been made. Therefore, the TDNs should be considered as approved.

1. Section 6. On pages 6-33, 6-35, and 6-36, please update the sections numbers. Subsections under 6B5.2 are all listed as 6B.5.3.1.

   JEF Response: Done.

2. Appendix B – Please make sure District provides a copy of the public meeting brochure and mailing list for inclusion prior to FEMA submittal.

   JEF Response: District will provide following November Submittal per phone conversation with KAG on 10-31-06.

3. Appendix E. For Fan 19 the discharges listed in the model notes does not match the discharge used in the model (hard copy and digital). Consider correcting the note and re-running the model.

   JEF Response: Done.

4. Appendix G – Please include a placeholder in the TDN for appendix G that directs individuals to the stand-alone binder.

   JEF Response: Done.

5. C Maps.
   - On Sheet 2, White Tank Fan #19's discharge is listed as 1655 cfs instead of 1660 cfs. Please update.

     JEF Response: Done.

   - On Sheets 3 and 4, the old Wagner Wash location floodplain is using the floodway line symbol instead of the floodplain line symbol.

     JEF Response: Done. Revised per discussion with KAG on 10/31/06.

   - For all Sheets, in the legend it appears there is no line symbol for proposed floodplain, only proposed administrative floodway. Please consider adding the additional symbol to the legend.

     JEF Response: Done.

   - For all Sheets, in the legend please change "Effective 100-year Administrative Floodway" to "Effective 100-year Floodway".

     JEF Response: Done.

   - For all Sheets, in the legend, please re-verify the datum conversion values.

     JEF Response: Done.

6. Annotated Panels.
   - On panel 1535H – Local zone designations are shown as well on this panel. Please remove.

     JEF Response: Done.

   - On panel 1530J – Floodplain delineation along the old Wagner Wash alignment is shown as floodway. Please remove shading from this Zone A.

     JEF Response: Done. Revised per discussion with KAG on 10/31/06.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: November 3, 2006

TO: Valerie Swick/FCDMC

FROM: Jon Fuller, PE, RG, CFM

RE: Sun Valley ADMP
Alluvial Fan Floodplain Delineations: Fan 6
Response to TDN Review Comments

CC: Kathryn Gross/FCDMC
Julie Cox/FCDMC
Mike Kellogg/JEF
Rob Lyons/JEF

This memorandum summarizes JE Fuller/Hydrology & Geomorphology, Inc. (JEF) responses to District review comments. District review comments are enumerated below, using the number from the District review comment letter. JEF responses are shown in 10-point bold italic font immediately below each comment. We appreciate the thoughtful and timely review by the District staff.

Hydrology Comments (Julie Cox, Email on October 5, 2006)

Per above-referenced email from Julie Cox/FCDMC, all hydrology comments have been addressed.

JEF Response: No response needed.

Geomorphology Comments (Kathryn Gross, Letter dated October 4, 2006)

The TDN has been reviewed and is considered approved once the minor corrections listed below are addressed. The Hydrology section is still under review so additional comments may be forthcoming.

JEF Response: The minor corrections have been made. The hydrology reviewer has approved the TDN (above). Therefore, the TDNs should be considered as approved.

Appendix G is approved.

1. Section 2.
    - Section 2.1 – In the abstract under Coordination of Peak Discharges, could the reference for Sun Valley be updated to read Sun Valley ADMP instead of ADMS?

      JEF Response: Done.

    - Section 2.2 FEMA forms

JEF Response: Done.

- Form 1 – Section B, add the Town of Buckeye Community Number (040039) for each panel listed in the table.

  JEF Response: Done.

- Form 1 – Section B, Panel 1545. Please update to read Panel 1545H instead of 1545F.

  JEF Response: Done.

2. Section 4. Julie Cox will provide comments for this section.

   JEF Response: See above.

3. Section 6. Section number updates. Please update the section numbers listed below.
   - Page 6-17 – Summary should be 6B.4.1.3 (sorry for oversight in last review)

     JEF Response: Done.

   - Page 6-51 – Summary should be 6B.5.3.9 (sorry for oversight in last review)

     JEF Response: Done.

4. Section 6. Left over references to RAS hydraulic check. Please remove the language from the following portions of the report.
   - Page 6-53, 3rd bullet

     JEF Response: Done.

   - Page 6-56, 6B.6.2 first sentence

     JEF Response: Done.

5. Appendix B – Please make sure District provides a copy of the public meeting brochure and mailing list for inclusion prior to FEMA submittal.

   JEF Response: District will provide following November Submittal per phone conversation with KAG on 10-31-06.

6. Appendix D – Noticed that in the hard copy 6-hour model the ID comments call the model out as F624.dat and other ID comments state 100-year 24-hour model as well. These comments should be corrected and an updated 6-hour model be provided. Updated digital files should be included on the cd as well.

   JEF Response: Done.

7. Appendix G – Please include a placeholder in the TDN for appendix G that directs individuals to the stand-alone binder.

   JEF Response: Done.

8. B Maps. For the Stage 3 map, the delineation differs from the delineation and designations presented on the work maps. Is there a reason for the difference or does the Stage 3 map just need to be updated?

   JEF Response: The latter. Done.

9. C Maps.
   - On Sheets 2 and 3, at the jurisdiction limits, please change the "City of Buckeye" to "Town of Buckeye". (Sorry for the oversight in the last review)

     JEF Response: Done.

   - On Sheets 2 and 3, in the legend please change "Effective 100-year Administrative Floodway" to "Effective 100-year Floodway". (Sorry for the oversight in the last review)

     JEF Response: Done.

   - On Sheet 2, the baseline for the delineation upstream of the apex is not shown. Please include.

     JEF Response: Done.

10. Annotated Panels. For all panels, consider updating the Administrative Floodway note. Replace "Administrative Flooding" with "Administrative Floodway."

    JEF Response: Done.

11. Digital CAD delineation. When the DWG is brought into ArcMap the letter "P" appears in front of most of the floodplain designation annotation; however, it does not appear when the DWG is opened in CAD. Any ideas as to what might be going on? No action is necessary since it is working in the CAD environment.

    JEF Response: Discussed and resolved with reviewer.

Memorandum JE Fuller/ Hydrology & Geomorphology, Inc.

DATE: November 3, 2006

TO: Valerie Swick/FCDMC

FROM: Jon Fuller, PE, RG, CFM

RE: Sun Valley ADMP
Alluvial Fan Floodplain Delineations: Fan 4-5
Response to TDN Review Comments

CC: Kathryn Gross/FCDMC
Julie Cox/FCDMC
Mike Kellogg/JEF
Rob Lyons/JEF

This memorandum summarizes JE Fuller/Hydrology & Geomorphology, Inc. (JEF) responses to District review comments. District review comments are enumerated below, using the number from the District review comment letter. JEF responses are shown in 10-point bold italic font immediately below each comment. We appreciate the thoughtful and timely review by the District staff.

Hydrology Comments (Julie Cox, Email on October 5, 2006)

Per above-referenced email from Julie Cox/FCDMC, all hydrology comments have been addressed.

JEF Response: No response needed.

Geomorphology Comments (Kathryn Gross, Letter dated October 6, 2006)
The TDN has been reviewed and is considered approved once the minor corrections listed below are addressed.

JEF Response: The minor corrections have been made. Therefore, the TDNs should be considered as approved.

1. Section 2.
   - Section 2.1 – In the abstract under Coordination of Peak Discharges, could the reference for Sun Valley be updated to read Sun Valley ADMP instead of ADMS?

     JEF Response: Done.

   - Section 2.2 FEMA forms
     - Form 1 – Section B, add the Town of Buckeye Community Number (040039) for each panel listed in the table.

JEF Response: Done.

- H&H Form
  1. 2 sets of H&H forms were submitted for Fan 5
     JEF Response: Done.

  2. For Fan 5, Section B, number 4, the model name still reads zone_a instead of the updated name zone_a45.

     JEF Response: Done.

2. Section 6. Section number updates. Please update the section numbers listed below.
   - Page 6-5 – Subsections under 6B.2 are listed as 6.1.1-6.1.5 instead of 6B.2.1-6B.2.5

     JEF Response: Done.

   - Page 6-19 – Summary should be 6B.4.1.3 (sorry for oversight in last review)

     JEF Response: Done.

   - Page 6-53 – Summary should be 6B.5.3.9 (sorry for oversight in last review)

     JEF Response: Done.

3. Section 6. Figure 6.8. Fan 20's apex is not included.

   JEF Response: Done.

4. Section 6. "Renegade" threes. On the top of pages 6-36 and 6-41 there are some renegade number 3s included.

   JEF Response: Done.

5. Section 6, page 6-36, first sentence. Please correct "apex for Fan 4 is location in…"

   JEF Response: Done.

6. Appendix B – Please make sure District provides a copy of the public meeting brochure and mailing list for inclusion prior to FEMA submittal.

JEF Response: District will provide following November Submittal per phone conversation with KAG on 10-31-06.

7. Appendix E. Noticed that the discharges listed in the model notes do not match the discharges used in the model (hard copy and digital). Consider correcting the notes and re-running the model. (Sorry for the oversight in the last review)

   JEF Response: Done.

8. Appendix G – Please include a placeholder in the TDN for appendix G that directs individuals to the stand-alone binder.

   JEF Response: Done.

9. CD. There is an additional 24-hour hydrology model called "test.dat" included with the digital hydrology models. Is there a reason for its inclusion? Please provide an updated cd with the file removed if it is not necessary.

   JEF Response: Done.

10. C Maps.
    - On Sheets 3, 5, and 6, at the jurisdiction limits, please change the "City of Buckeye" to "Town of Buckeye". (Sorry for the oversight in the last review)

      JEF Response: Done.

    - For all Sheets, in the legend please change "Effective 100-year Administrative Floodway" to "Effective 100-year Floodway". (Sorry for the oversight in the last review)

      JEF Response: Done.

    - On Sheet 4, there is a doubled Zone X label in Section 27.

      JEF Response: Done.

    - On Sheet 5, regarding the text "Match White Tank Fan 19 FDS". Since there is no true White Tank Fan 19 FDS, please consider revising this text.

      JEF Response: Done.

11. Annotated Panels. For all panels, consider updating the Administrative Floodway note. Replace "Administrative Flooding" with "Administrative Floodway."

    JEF Response: Done.

12. Annotated Panels. Consider creating a panel 1575 to show the rest of the delineation. This can be discussed further.

JEF Response: This is a non-printed map as stated in FEMA form 1 Section B. We looked on the FEMA website again and as of 10-31-06 there is still no printed panel for this section.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: November 3, 2006

TO: Valerie Swick/FCDMC

FROM: Jon Fuller, PE, RG, CFM

RE: Sun Valley ADMP
Alluvial Fan Floodplain Delineations: Fan 10-11-20
Response to TDN Review Comments

CC: Kathryn Gross/FCDMC
Julie Cox/FCDMC
Mike Kellogg/JEF
Rob Lyons/JEF

This memorandum summarizes JE Fuller/Hydrology & Geomorphology, Inc. (JEF) responses to District review comments. District review comments are enumerated below, using the number from the District review comment letter. JEF responses are shown in 10-point bold italic font immediately below each comment. We appreciate the thoughtful and timely review by the District staff.

Hydrology Comments (Julie Cox, Email on October 20, 2006)

Per above-referenced email from Julie Cox/FCDMC, all hydrology comments have been addressed.

JEF Response: No response needed.

Geomorphology Comments (Kathryn Gross, Letter dated October 20, 2006)

The TDN has been reviewed and is considered approved once the minor corrections listed below are addressed.

JEF Response: The minor corrections have been made. Therefore, the TDNs should be considered as approved.

1. Section 2. FEMA forms. H&H forms, Section 4, B. For each fan the model name still reads zonea instead of the updated name zonea101120.

   JEF Response: Done.

2. Section 6. Figure 6.8. Fan 20's apex is not included.

   JEF Response: Done.

3. Appendix B – Please make sure District provides a copy of the public meeting brochure and mailing list for inclusion prior to FEMA submittal.

JEF Response: District will provide following November Submittal per phone conversation with KAG on 10-31-06.

4. Appendix E. For Fan 20 no discharge is listed in the model note (hard copy and digital). Consider correcting the note and re-running the model.

   JEF Response: Done.

5. Appendix G – Please include a placeholder in the TDN for appendix G that directs individuals to the stand-alone binder.

   JEF Response: Done.

6. C Maps. (Sheet 2)

   - In the legend it appears there is no line symbol for proposed floodplain, only proposed administrative floodway. Please consider adding the additional symbol to the legend.

     JEF Response: Done.

   - In the legend please change "Effective 100-year Administrative Floodway" to "Effective 100-year Floodway".

     JEF Response: Done.

   - In the legend, please re-verify the datum conversion values.

     JEF Response: Done.

Memorandum JE Fuller/ Hydrology & Geomorphology, Inc.

DATE: November 3, 2006

TO: Valerie Swick/FCDMC

FROM: Jon Fuller, PE, RG, CFM

RE: Sun Valley ADMP
Alluvial Fan Floodplain Delineations: Fan 3-13-16
Response to TDN Review Comments

CC: Kathryn Gross/FCDMC
Julie Cox/FCDMC
Mike Kellogg/JEF
Rob Lyons/JEF

This memorandum summarizes JE Fuller/Hydrology & Geomorphology, Inc. (JEF) responses to District review comments. District review comments are enumerated below, using the number from the District review comment letter. JEF responses are shown in 10-point bold italic font immediately below each comment. We appreciate the thoughtful and timely review by the District staff.

Hydrology Comments (Julie Cox, Email on October 19, 2006)

Per above-referenced email from Julie Cox/FCDMC, all hydrology comments have been addressed.

JEF Response: No response needed.

Geomorphology Comments (Kathryn Gross, Letter dated October 18, 2006)

The TDN has been reviewed and is considered approved once the minor corrections listed below are addressed.

JEF Response: The minor corrections have been made. Therefore, the TDNs should be considered as approved.

1. Section 2, Fan Forms. For Fans 3, 13, and 16, Section B, number 4, the model name still reads zone_a instead of the updated name zone_a31316.

   JEF Response: Done.

2. Section 6. On pages 6-33, 6-35, and 6-36, please update the sections numbers. Subsections under 6B5.2 are all listed as 6B.5.3.1.

   JEF Response: Done.

3. Section 6. Figure 6.8. Fan 20's apex is not included.

JEF Response: Done

.

4. Appendix B – Please make sure District provides a copy of the public meeting brochure and mailing list for inclusion prior to FEMA submittal.

JEF Response: District will provide following November Submittal per phone conversation with KAG on 10-31-06.

5. Appendix G – Please include a placeholder in the TDN for appendix G that directs individuals to the stand-alone binder.

JEF Response: Done.

6. C Maps.
   - On Sheet 2, baselines for upstream delineations are not included. Please add.

     JEF Response: Done.

   - On Sheets 2, and 3, at the jurisdiction limits, please change the "City of Buckeye" to "Town of Buckeye". (Sorry for the oversight in the last review)

     JEF Response: Done.

   - For all Sheets, in the legend please change "Effective 100-year Administrative Floodway" to "Effective 100-year Floodway". (Sorry for the oversight in the last review)

     JEF Response: Done.

7. Annotated Panels. For panel 1095H, the Administrative Floodway note is missing from this panel. Please add.

JEF Response: Done.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Nov. 13, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on Sun Valley ADMP, FRS 1 Sub-Area, from Julie Cox dated Nov. 3, 2006

CC: Jon Fuller, PE

This memo summarizes our response to the District's comments as dated above.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The design spreadsheets, models, Step 3 reports, and figures will be revised in the final sub-area submittals to reflect our responses where appropriate.

++

I have reviewed the hydrology provided for the Buckeye FRS #1 Subarea Report (Volume 6); J.E. Fuller Hydrology & Geomorphology, Inc., October 2006. My comments are listed below and are referenced to the maps, models, and report.

1. *Please review previous editorial comments for the Wagner, Hassayampa, and CAP subareas. Please ensure the same items have been addressed in the Buckeye FRS #1 Report.*

   Comments applicable to all sub-area reports have been cross-corrected in all sub-area reports.

2. *Please check the modeled area included in the ID records. For the Fan 37 models, the area should be 13.1 sq mi vs. the 3.3 sq mi shown.*

   The comments for Fan 37 have been modified to reflect the total modeled area.

3. *Please add "Fan Apices" to the legends of the Appendix A, B, and C maps.*

   Done.

4. *For Appendix B and C maps, please change the symbols for sub-basin centroids and elevation points to be consistent with other subarea maps.*

   Done.

5. *For Appendix B and C maps, please add north arrow.*

   Done.

6. *Appendix A, Sub-basin Map. Change view port to be consistent with other map view ports.*

Done.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Nov. 14, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on Sun Valley ADMP, Final Draft Step 3 Wagner Wash Sub-Area, from Julie Cox dated Nov. 6, 2006

CC: Jon Fuller, PE

This memo summarizes our response to the District's comments as dated above.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The design spreadsheets, models, Step 3 reports, and figures will be revised in the final sub-area submittals to reflect our responses where appropriate.

++

I have reviewed the hydrology provided for the Wagner Wash Subarea Report (Volume 3); J.E. Fuller Hydrology & Geomorphology, Inc., October 2006. My comments are listed below and are referenced to the maps, models, and report.

1. Report, Page 12, Paragraph 1. Please either use or remove extra parentheses.

Parentheses removed.

2. Report, Page 21, Section 5.7.7. Please reword the first sentence.

An "of" was added to make the sentence complete. (The design concept for the outlets of the on-line detention basins are circular pipes.)

3. Report, Page 25, Paragraph 1. Please remove extra right parenthesis.

Done.

4. Report, Page 25, Figure 25. Please change "100-year" to "FCD Manual 100-year".

Done.

5. Report, Page 39, Table 10. Please change "Differnetial" to "Differential".

Done.

6. FAN166.DAT & FAN1624.DAT. Please check the top and bottom elevations for route F1670A and revise either the sub-basin map or the models.

The maps and models have been revised to provide a more correct depiction of routing block F1670A.

7. Sub-basin map for Fan System 19. Please move the elevation point 1384 so it is visible.

The labeling has been adjusted to enhance legibility.

10. *In the module "modChnlXS", there are comments that read, "The data starting in column 1 gives the channel cross-section for the channel as designed. The data starting in column 9 gives the channel cross-section for the channel without aesthetic treatment.", however, there is no data in column 9 for the cross-section in the spreadsheet. Is this a remnant from the previous version of the macro?*

Yes. The comments in the macro will be modified to remove the old reference.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Nov. 14, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on Sun Valley ADMP, Step 3 Wagner Sub-Area, Final Draft, from Richard Waskowsky dated Nov. 7, 2006

CC: Jon Fuller, PE

This memo summarizes our response to the District's comments as dated above.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The design spreadsheets, models, Step 3 reports, and figures will be revised in the final deliverables to reflect our responses where appropriate.

++

The Engineering Application Development and River Mechanics Branch has finished its review and has the following comments. The consultant should submit written responses to these comments to the FCD.

Sun Valley ADMP, Wagner Sub-Area Step 3 Report

1. *In the report, section 5.10.4 Scour and Toe Protection, the antidune equation on page 28 is in the wrong format if the ½ term is included in the total scour equation on page 27. If the total scour equation has the ½ term, the antidune equation should read* $0.027V^2$.

   The equation on page 27 should not have the ½ as written. However, given the comment 2 below, the entire section has been somewhat modified to match the ADWR Manual presentation more closely. Therefore, the discussion has been modified to refer to antidune height (h_a) (crest to trough)which is computed as 0.027 V^2 . The total scour equation therefore remains ½ (h_a).

2. *In the report, section 5.10.4 Scour and Toe Protection, please list all six terms of total scour in the total scour equation (in the format of equation 5.28 in the ADWR manual) and in the following paragraphs provide a discussion for each term. For example, the long-term degradation should be listed and a discussion should be provided which clarifies that the 1.5 is an average and scour will be more or less depending on the distance from the drop structure. Therefore, when the project goes to construction, more detailed analyses would be needed for construction.*

   See also response to comment 1. The other scour components have also been modified in the text and the spreadsheets to mirror the ADWR Manual and the Step 3 report text.

3. *For the cross-section H1F1335A_2, the velocity given in the GIS shapefile is given as 5.3 ft/s, but in the spreadsheet for the H1F1335A_2 worksheet, the maximum initial velocity is only 4.8 ft/s. Which velocities and other attributes from the spreadsheet are the attributed in the shapefiles based on? Are they supposed to match exactly?*

You are correct. The attribute table was intended to match the maximum initial velocity as shown in the hydraulic summary table and in R43C6 of each walled-corridor design sheet. The attributes need to be updated and apparently were not for Fan 13 prior to the last design tweak. We will make sure to update the attributes to match the final design results before the final submittal of the shapefiles for each fan system and sub-area.

4. *In the shapefiles for fans 17 and 18, the corridor buffer area for fan 16 is shown in the buffer area shapefile.*

The erroneous additional buffer area has been removed from the Fan 17/18 shapefile.

5. *On page 4 of the report, Figure 1 is not referenced in the text.*

The text has been modified to include a reference to Figure 1.

6. *On page 12 of the report in the first sentence of the first paragraph there are erroneous parentheses.*

These have been removed.

7. *On page 25 of the report, the second bullet point under section 5.9, what exactly does the sentence "The total sediment for the 3-year maintenance period was removed from the lower portion of the computed stage-volume relationship." mean? Does it mean the sediment volume is included in the total basin volume estimate or that it is removed in the basin volume? This sentence could be made clearer.*

The description was indented to indicate that the total design sediment volume was removed from the low end of the stage-volume rating curve before the water flow hydrograph was routed through the basin in HEC-1. The text has been modified to hopefully make this clearer by adding: "; that is, the total sediment volume was subtracted from the total excavated stage-storage curve before the curve was input into HEC-1 for the hydrograph storage routing."

8. *On page 32 of the report the last bullet point on the left side, there is an erroneous section reference.*

The cross reference has been corrected.

9. *In the report in the Fan System Design Summaries, the second sentence "The alternative includes both non-structural and environmentally friendly and aesthetically compatible structural flood control measures." could be made clearer. One recommendation is "This alternative includes non-structural and structural flood control measures, with the structural measures designed to be both environmentally friendly and aesthetically compatible.".*

The suggested rewording change has been made to the text.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Nov. 14, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on Sun Valley ADMP, White Tank Wash Sub-Area, from Julie Cox dated Nov. 3, 2006 and email also dated 11/3/06 received at 353 pm

CC: Jon Fuller, PE

This memo summarizes our response to the District's comments as dated above.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The design spreadsheets, models, Step 3 reports, and figures will be revised in the final sub-area submittals to reflect our responses where appropriate.

++

Nov. 3rd memo comments:

I have reviewed the hydrology provided for the White Tank Wash Subarea Report (Volume 5); J.E. Fuller Hydrology & Geomorphology, Inc., October 2006. My comments are listed below and are referenced to the maps, models, and report.

1. *Several reaches of the walled levee corridors have velocities exceeding 6 ft/sec. These reaches are listed below. All are unlined channels. Please look at the design parameters and change as necessary to decrease these erosive velocities. This comment applies to all six of the Step 3 subarea reports.*

SUBAREA AND REACH	***VELOCITY (ft/sec)***
CAP: H191A91B_4 & B_3 & B_2, H191B915_3, H191592A_2 & A_1	*6.0 – 8.0*
Buckeye FRS #1: H1F37L2B1_7 & 1_5 & 1_4 & 1_3 & 1_2 & 1_1, H1L2B1L2B2_8 & 2_7 & 2_6 & 2_5, H1L2B2L3B_6 & B_5 & B_4, H1L3BL3C_4, H1L3BL3C_1, H1L3CE6A_4 & A_3 & A_2 & A_1	*6.0 – 7.2*
White Tank Wash: H1F1F2_2, H1F6E2B_3, and H1E2BE3C_7	*6.0 – 6.5*
Hassayampa: H110A10C_3 & C_2, H110C10D_2, H110D30A_5 & A_3 & A_2 & A_1, H130A30B_4 & B_2	*6.0 – 6.2*

For cross sections where the normal-depth water surface is contained by natural ground (as indicated by the 10-foot topography), the 2.0 ft hydraulic depth and/or velocity criteria are not necessarily met. That is, the existing channel has higher natural velocity and/or depths for the design discharges. Adjustment of the corridor containment structures therefore does not affect the hydraulic calculation results.

2. *Please review previous editorial comments for the Wagner, Hassayampa, and CAP subareas. Please ensure the same items have been addressed in the White Tank Wash Report.*

Comments applicable to all sub-area reports have been cross-corrected in all sub-area reports.

3. *The Fan 38 maps show a basin but the HEC-1 models do not include a basin. Please check and revise as necessary.*

Originally, we left out the "design" of this basin as it was under design by others (CMX). As of a stakeholder implementation meeting in Oct., we were requested to add it back in by Pulte. Therefore, the Fan 38 system now includes the basins.

4. *Please add the symbol for 50-ft contours to the legend of the Fan 38 land use and soil maps.*

Done.

5. *Please check the modeled area included in the ID records. For the Fans 6 & 39 models, the area should be 11.4 sq mi vs. the 10.5 sq mi shown.*

The total modeled area reference has been corrected.

6. *Please check the modeled area included in the ID records. For the Fan 38 models, the area should be 13.4 sq mi vs. the 12.0 sq mi shown.*

The total modeled area reference has been corrected.

7. *Report, Table of Contents, Section 4. Change "FRS No. 1 Subarea" to "White Tank Wash Subarea".*

Done.

8. *Report, Page 4 of 121, Channels Summary. The drop structure difference shown for H1F3E3A_3 is 33,333 ft. Please check and change as necessary.*

The results have been checked and found to be correct. The reason for the long spacing is the very small difference between the existing slope (0.0119) and the estimated equilibrium slope (0.0118).

9. *Report, Page 4 of 121, Basins Summary. For RRE1, change peak storage from 68.5 to 69.3 ac-ft and change peak flow d/s of basin from145 to 139 ac-ft.*

The summary has been changed to match the HEC-1 results.

10. *Report, Appendix A, Pages 2 and 3. Replace the times to peak shown in the tables with the actual times to peak from the HEC-1 results.*

The tables have been corrected for all sub-areas.

11. *Report, Appendix B, Pages 2 and 3. The tables do not include the results for "38OUT". Please check and revise as necessary.*

Tables have been modified to include the diversion results as indicated. This was applied to all sub-areas affected.

12. *Report, Appendix B, Pages 2 and 3. Replace the times to peak shown in the tables with the actual times to peak from the HEC-1 results.*

The tables have been corrected for all sub-areas.

++

Email received 353 pm:

Please check the following and revise as necessary:

1. White Tank Wash Subarea Report - FAN3824.DAT model. The area on the JD record is 10 sq. mi. The modeled area is 13.4 sq. mi. Shouldn't there be another JD record with the area greater than 13.4 sq. mi.?

Yes. The 24-hour model should have an additional index storm. This has been added and the designs, etc. for Fan 38 adjusted as necessary.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Nov. 15, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: summary of our meeting to discuss JEF response to FCD comments on Step 3, Volumes 2 – 7 (sub-area reports)

CC: Jon Fuller, PE

Valerie:

This memo summarizes our understanding based on our meeting this afternoon where we reviewed our responses to the District comments from Richard W., Dave D., and Julie C. on Volumes 2 through 7 of Step 3 of the Sun Valley ADMP. As a summary, we reviewed all of our previous response letters with emphasis on responses where we were not necessarily affirmatively making requested changes, etc. to District review comments. Only two items remained where clarification is needed in writing:

1) Through our discussion we noted that comments in several memos regarding referencing Figures in all reports whenever they are included. Our initial responses indicated we would leave some figures without references. Based on our meeting today, we will incorporate specific reference to all figures in each report. Moreover, figure references shall be made in close proximity within the reports to the figures themselves.
2) Reference and discussion of the Sun Valley Parkway channel slope within the HEC-1 comments and text for the CAP sub-area will be added to clarify the issue of the flatter design slope versus the general ground slope in the area.

With these two clarifications, we request written confirmation from the District that our comment responses are adequate and that we may begin production of the final Step 3 deliverables for Volumes 2 – 7. Unless we hear otherwise we will provide you with six (6) hard copies and six electronic copies of each volume per the scope of work.

Thank you again for meeting with us today to discuss these time sensitive issues. We look forward to finalizing these volumes in the coming weeks, coordinating response to comments on Volume 1, and successfully wrapping up the Sun Valley ADMP in mid-December.

Sincerely,

Ted Lehman, P.E.
Project Engineer

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Nov. 15, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on **Sun Valley ADMP, Step 3 Recommended Alternative Report, Volume 1, Executive Summary and Overview (draft), November, 2006, JE Fuller Hydrology and Geomorphology, received by Engineering Application Development and River Mechanics Branch on November 8, 2006** dated Nov. 15, 2006

CC: Jon Fuller, PE

This memo summarizes our response to the District's comments as dated above.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The final reports will be revised in the final deliverables to reflect our responses where appropriate.

++

1. *The following comments are for this draft summary report. Since the summary report is a summary of other reports, which are still being finalized, this summary report needs to be revised and submitted for review after other reports are finalized based on the District comments.*

   Understood.

2. *Page 12, third paragraph. The word "truck" should be replaced with the word trunk.*

   Corrected.

3. *Page 14, Table 1. The totals for the White Tanks Wash and Hassayampa Sub-areas do not match the costs provided in the draft reports dated October and September 2006 respectively. To make a true comparison the FCD needs the final copy for each sub-area.*

   The final numbers will require finalizing all of the sub-areas first as mentioned in item 1. The exact details continued to change subtly based on our responses to comments. We will ensure that the final Volume 1 report numbers match those reported in the final Volumes 2- 7 and their accompanying appendices.

4. *Page 24, figure 11. A narrative describing figure 11 should be added somewhere in the report. It appears to be a stand-alone figure with no reference.*

   Either the text will be modified or the figure removed.

5. *Page 27, table 2. "AWDR" in the agencies column should be changed to ADWR.*

Done.

6. *Page 27, table 2. The FCD should also be among the list of stakeholder agencies. ?????*

It may seem implicit, but perhaps other internal FCD elements could be considered stakeholders (i.e. Floodplain Management, Dam Safety, etc.). FCD will be added to Table 2.

7. *Page 32, third paragraph. The word "twenty" should be capitalized in the sentence talking about stock tanks.*

Corrected.

8. *Page 33, section 4.2. I think it would be helpful if a figure were provided showing the extent of the North of CAP Sub-area. It is not shown on figure 5, but it is shown in figure 18. An early reference to figure 18 may be helpful in this portion of the report.*

All of the sub-areas are shown on Figure 12, the first reference to the sub-areas in the Overview portion of the report. A list of the individual sub-area names is also provided in reference to the discussion of near Figure 12. The text will be reexamined in this section to see if additional references to other figures, etc. will improve the presentation.

9. *Page 54, section 4.3.5., second paragraph. "Within the FRS No. 1 3 sub-area," may contain a typographical error.*

Corrected. The "3" was erroneous.

10. *Page 56, section 4.3.5.3., last sentence in the first paragraph. There are two periods in the sentence.*

Corrected.

11. *Page 57, top of the page. There are two periods in the second to last sentence of the paragraph.*

Corrected.

12. *Page 58, bottom of the page. There are two periods at the end of the first sentence.*

Corrected. The remainder of the document was also searched for the same typo. A couple more instances were also found and corrected.

13. *Page 62, table 4. The table is missing its headings for the design criteria.*

Corrected.

14. *Page 90, Figure 42 appears to be the same as figure 37 for the walled levee corridor. They both seem to show a floodwall at the top of the rendering.*

The figure has been modified to remove the wall and add some additional labeling to assist in understanding of each figure.

15. Page 99, table 6. This table is missing a cost item that appears in the Wagner Wash Sub-area final report on page 37. The cost item is called outlet cost.

The outlet costs were revised after the change to HY8 rating curves. Apparently the final draft Wagner sub-area report table on page 37 did not get updated. The Wagner report (Volume 3) will be corrected.

16. On page 7, the second sentence could be combined with the third for readability. For example, it could read "... and the Hassayampa River, with the majority of the area located within the Town of Buckeye.". The same correction can also occur on page 20, section 2.4

Page 7 has been modified to read "The area lies between the White Tank Mountains and the Hassayampa River mostly within the Town of Buckeye. " Section 2.4 was not modified as it was not constructed as redundantly as page 7.

17. On page 7, could another figure, similar to Figure 3 in the Step 3 Wagner Report, be added and referenced in the first sentence.

This is a good thought. Some kind of location map will be added to the beginning of the Executive Summary.

18. On page 9, second paragraph, the third sentence should read "... was conducted...".

Done.

19. Figure 5 is referenced before Figure 3, therefore, Figure 5 should be labeled as Figure 3 and placed nearer to page 10 and Figures 3 and 4 should become Figures 4 and 5, respectively.

Done.

20. On page 29, should the last sentence in the last paragraph read "Step 2" instead of "Step 3"?

True. The text has been changed.

21. On page 32 in the last paragraph in the second sentence, please change "... as they..." to "... as the guidelines...".

Done.

22. On page 32 in the last paragraph, the last sentence on the page should read "... of large master planned communities, with many of these communities impacted...".

Changed as suggested.

23. On page 40 in section 4.2.5, please reference Figure 18 and have a brief discussion of what the figure is showing.

Figure 18 is reference to and discussed in Section 4.2.2. Figure 18 will be moved closer to that section and the figure numbering adjusted as necessary.

24. On page 46 in the last paragraph, the fifth sentence would be clearer if a "the" was placed before floodwall. This correction also occurs in the other fan system discussions.

Done. Entire document scanned and other locations (13) corrected as well.

25. On page 47 in section 4.3.2.2, the second sentence should have an "on" placed before "the uphill…".

Done.

26. On page 61 in the Sediment Gradation section, the value for D16 does not match what is shown in the Wagner Step 3 spreadsheet. In the report it is listed as 0.16 mm, while in the spreadsheet it is 0.17 mm. This error also occurs in the Wagner Step 3 report. Please make sure a consistent value is listed.

The text in all reports has been modified to match the data used in the design sheets.

27. In section 5.7.2 Inlet Design Concepts, the number of concepts is reduced from 5 in the Wagner Step 3 report to 2 in the Summary report. Why are they reduced, and shouldn't the number be consistent for all reports?

As mentioned in the Volume 1 text, only 2 concepts "were selected" for application in the recommended alternative. The other discussion was provided in the sub-area reports because no inlet alternatives had been detailed in Step 2. We felt the need to present the possibilities and in order to better understand the selection for the recommended alternative. In Volume 1, we did not want to cloud the 'overview' with the additional discussion.

28. In the report, section 5.9.4 Scour and Toe Protection, please list all six terms of total scour in the total scour equation (in the format of equation 5.28 in the ADWR manual).

A similar comment was made to the final draft Wagner report. The modified text from the final Wagner report will be similarly incorporated into Volume 1.

29. On page 85 in Table 5, the heading has an erroneous "^".

Corrected.

30. On page 92 in the fourth sentence, "Flood Control" should not be capitalized.

Changed.

31. Page numbers 98 and 99 are duplicated.

The page numbering will be corrected.

32. On the second page 99, there are duplicate periods at the end of paragraphs 3 and 4.

Corrected.

33. On page 100, there is a duplicate period at the end of the last paragraph.

Corrected.

34. On page 104 in the second paragraph, "Figures 35 – 41" should read "Figures 44 – 49".

The figure references have been corrected.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: November 27, 2006

TO: Valerie Swick/FCDMC

FROM: Jon Fuller, PE, RG, CFM

RE: Sun Valley ADMP
Alluvial Fan Floodplain Delineations
Response to TDN Review Comments

CC: Kathryn Gross/FCDMC
Julie Cox/FCDMC
Mike Kellogg/JEF
Rob Lyons/JEF

Add a note stating administrative floodways are regulated by the local regulatory authority.

Add copies of the 100-yr 24-hr and 100-yr 6-hr isopluvials from the Hydrology Manual to Appendix D.

Add floodway shading of the corridors.

Add the existing delineation at the FRS to the map.

AFUFD Zones need to be re-evaluated. Recommended locations of the boundaries of this zone are included in the shape file. The PFHAM falls short in classifying the type of surface identified; therefore it is recommended that the designation recommended by the PFHAM not be used and instead it is recommended that north of the Parkway the AFUFD zone be reclassified or reanalyzed based on one of the following: AFZA

Along the east side of the AFHH zone for Fan 2, consider adding additional area to the delineation. These areas are identified in the shape file. One portion of the requested additional delineation most likely extends beyond the ADMP study limits. One delineated wash extends out of the main portion of the delineation and stops at what may be the study limits. If the delineation continued along this wash it would connect back into the fan delineation at the Parkway. This would aid individuals by providing information that uncertain flow quantity exists for the wash since it is connected to the active fan. If at all possible it is recommended to continue the delineation along that wash.

A-Maps Hydrology. On Plate 1, Elevation information appears to be missing on the contours. Concerned that the Plates may not reproduce well in black and white. Please evaluate.
A-Maps Hydrology. Scale appears to be missing on Plates as well as elevation information on the contours. Concerned that the Plates may not reproduce well in black and white. Please evaluate.

AO1 Zone. AO1 is recommended by the District; however, the Consultant should evaluate which designation is a more reasonable approach for the area.

Appendix A – no comments. Update references as needed.

Appendix B – Include pertinent correspondence prior to FEMA submittal. Special Problem discussion should be removed or at least revised to state only the AAFF zones. Consider shifting this discussion into the main report text.

Recommended tie-in locations are presented above.

Appendix B – Include pertinent correspondence prior to FEMA submittal.

Appendix C – no comments. Consider adding District contract number for mapping project.

Appendix D - need to provide hydrology maps in support of the delineation and parameters chosen: Sub basin map with topography and flow path, Sub basin map and soil units, Sub basin map and land use. Consider placing a separate copy of the Rainfall figure in the appendix as well.

Appendix D - Consider placing a separate copy of the Rainfall figure in the appendix. Organize data following State Standard.

Appendix F – consider providing information from the sediment yield analysis here.

Appendix G – no supporting documentation of the geomorphic analysis was provided. Perhaps a master Appendix G could be developed for use with all the Fan reports.

Appendix H- no digital information was provided in this submittal. Please make sure to include a cd with the next submittal including digital line work for hydrology as well as floodplain

At present the delineation appears reasonable. However, there are two locations where modifications may be discussed further.

Based on the isopluvials in the Hydrology Manual, change the 100-yr 6-hr rainfall to 3.4 inches.

B-Maps Geomorphology. For Stage 2 map consider including this map as Figure 6.19, not critical however.

B-Maps Geomorphology. No maps provided. Please include in next submittal.

C-Maps Hydraulics/Floodplain – Please draw the limits of the fan delineations to the Wagner Wash floodplain limits. This can be discussed further.

C-Maps Hydraulics/Floodplain.

Concerned about the confusion between sections between active and inactive, total fan, AFHH and AFUFD. Language appears to shift between sections. In most instances it appears some of the confusion could be cleared up with modifications to Figure 6.19 and adding the topographic apexes to the exhibit and addressing them in the text as the top of the Fan 10 and 11 alluvial fan landform. The following are areas where it was noted:

Consider adding a legend of the FCD fan delineation categories.

Consider adding labels identifying where the White Tank Fan 4 and 5 delineation will tie into the existing Hassayampa River delineation.

Consider labeling the Fans as White Tank Fan 4 and White Tank Fan 5 on the workmaps.

Consider naming the corridors.

Consider removing the smaller Shaded X zones.

Consider revising the title to "Approximate Zone A Floodplain Delineation Study of White Tank Fans 10 and 11.

Delineation should be called out as White Tank Fan 6 on workmaps where possible.

Designations need to be modified. Please use FEMA designations on panels:

Downstream of Apex: Zone A Administrative Floodway – Active Fan Flooding and Zone A Inactive Fan Flooding.

Electronic files were not submitted. Please submit CD for comparison purposes.

Extending out of a portion of the AFUFD zones there are a collection of AAFF zones. This location is called out in the shape file. The Consultant should re-visit the need for these AAFF zones and determine if they should remain or be incorporated into the revised designation for the area north of Sun Valley Parkway.

FEMA Fan Form – Please submit one fan per form.

FEMA will only allow one designation for any given location. If the proposed delineation is going to overlap the effective delineation a note with a leader line showing where we want to remove the effective delineation from the FIRM panel should be added.

Figure 6.1 not all the soil units are included. Scale of exhibit makes it hard to really verify the units necessary to fan 10 and 11

Figure 6.19. If Figure 6.19 is the result of the analysis why is it placed at the beginning of the stage 2 discussion and analysis? It appears to show the result prior to the analysis.

Figure 6.2 not all the geology units are included. Scale of exhibit makes it hard to really verify the units necessary to fan 10 and 11.

Figure 6.20. Please correct the legend and map label. The FRS is labeled as a levee instead of a dam.

Flooding Source. Please update to state only White Tank Fan 6.

Floodplain Delineations - Some minor modifications to the delineation limits are recommended. This will require updates on the workmaps and annotated FIRM panels as well. This is discussed later in the comments.

Floodplain Delineations - Some modifications to the study limits and designations are necessary.

Floodway symbology is needed on the delineations shown.

For Figure 6.19 please label which apex is for Fan 1 and which is for Fan 2.

For Figure 6.20, Please revisit the figure. The colors on the map do not appear to match the colors in the legend. Or do the soils units not correlate well here. It is most apparent with Fan 39 showing up as an inactive fan color.

For Figure 6.7, please consider adding a note to the figure explaining why there are no channels identified in the middle of the study area.

For Figure 6.9 is it possible to screen the colors on the map to more clearly see the topography underneath?

For Figures 6.1-6.10 should fan 1 and 2's apices be located on the figures?

Further analysis is undertaken to the determine impact of Sun Valley Parkway.

Further discussion is needed regarding the extent and placement of certain AFUFD zones prior to accepting those designations and limits. Specific concerns are use of AFUFD to delineate overbank areas adjacent to AAFF corridors and in inselberg shadows; as well as concerns that the AFUFD zones appear large in relation to the potential discharges across their surfaces.

Geomorphology – TDN appendix G supporting documentation needs to be provided. A master Appendix G for all fan delineations could be a solution. There is some confusion between active and inactive areas in several text discussions. This is further discussed later in the comments.

Hydraulics – Upstream modeling appears reasonable. Please run checkras on the upstream delineation. Upstream of the apex the delineation should be an administrative floodway. If the Consultant prefers the water surface elevations for each cross-section location can be determined using FlowMaster or a similar product. If left in RAS the Consultant needs to provide a baseline in the delineation and be prepared to answer any FEMA questions as they will review it as a RAS product.

Hydrology – Make sure all supporting documentation is provided including necessary maps for flow paths soils and land use beyond those presented in figures.

I compared the input parameters and the output from the Fan 1 & 2 models to the Area 4 models for both the 100-yr 24-hr and 100-yr 6-hr events. The sub-basin data and the output in this Fan 1 &2 study are consistent with the same sub-basins in the Area 4 models.

I did not find where the report spells out the names of the soil types. Please include a table that identifies the name for each soil type (645100, 645123, etc.).

I have reviewed the above submittal and have the following comments. Overall the delineations appear reasonable; however, the below comments need to be addressed prior to approval.

In two locations along the proposed delineation, there appears to be a chance for break out flows. Please determine if these are potential break out locations.

It is recommended that along the northern wash the AAFF zone be removed and the effective FIS delineation remain for this area. The discharges between the two studies only differ by about 100 cfs. If White Tank Fan 39 is going to supercede a portion of the effective delineation downstream of White Tank Fan 6 then this modification may not be necessary.

Land Use. The RTIMP used in the HEC-1 models differs from that in DDMSW. Please change to be consistent.

Locations where there are concerns regarding the delineation have been identified in the shape file fan1and2quest.shp. This file will be included with this comment submittal.

Number 3 - The yes box should be checked here instead of no if the use of RAS is continued.

Number 4 – Could the model name reflect a Fan 4 and 5 identifier?

Number 4 – The model name should be updated to ZoneA6.

On Panel 1545, the label font size should be increased.

On the annotated maps, it is recommended to use the inactive fan note for the portions of the delineation that will be updated to either AFZA or AO1. This should be discussed between the Consultant and the District. The reason for this request is that typically the designation of active or inactive provides an additional flag for regulators that active is floodway and inactive is Zone A.

One occurs up at the apex where there appears to be a surficial change alongside the proposed delineation that is different than the surface appearance a little further away from the channel.

Page 1-4 section 1.4.1, this section states that the hydrology may be submitted separately. Please correct the text to reflect what is going to be the official hydrology submittal: per fan or full Area 4 Hydrology TDN. This will also determine what needs to be reflected in each separate fan TDN package. The District and the Consultant should discuss this and arrive at a final answer.

Page 2-1 section 2.1.10 Coordination of Peak Discharges. Since the hydrology is not finalized yet, this date will need to be updated.

Page 2-1 section 2.1.7 Reach Description. Should we list only the fan associated with this report?

Page 2-1, Abstract section 2.1.3. Craig Kennedy is no longer the official contact at Baker. If a new contact is identified prior to FEMA submittal the name should be updated.

Page 3-1, is "epoch" correct in the second sentence: "1992 epoch Central Zone of Arizona State Plane…"

Page 3-1, section 3.2. Please remove aerial photography from first sentence.

Page 4-7, Unit Hydrograph second paragraph second sentence. Please reword the sentence it is not clear.

Page 4-8, section 4.5.2 second paragraph third sentence. Please correct the typo: "watershed will average elevation.."

Page 4-9, section 4.5.3. Could an excerpt of the Alpha sub basin map be provided as well so the new basins and the old basins can be compared? This could be included in the appendix.

Page 5-1 section 5.1. Please correct "apeces" with either "apexes" or "apices".

Page 5-1. Text contains a statement that RAS was used to perform a backwater analysis. Since cross-sections are too far apart to produce a real step-backwater analysis should this sentence remain in the text?

Page 5-1. Text contains a statement that RAS was used to perform a backwater analysis. Since cross-sections are too far apart to produce a real step-backwater analysis should this sentence remain in the text?

Page 5-2 and 5-3. Figure 5.1 Make sure to include the reduced maps in the final report.

Page 5-6, section 5.5.5, should the word "fan" be between "natural channels"?

Page 5-6. Make sure to include the RAS summary table in the final report.

Page 6-15. Text states that Table 6B.4 summarizes distinguishing characteristics of surficial geology. Only geologic age is listed in the table. Please look into.

Page 6-24, section 6B.4.4, last sentence. The text states there were four new fans identified beyond the Ayers study. Based on discussions with Jon are we now up to five? If so please update the text.

Page 6-24, section 6B4.6 conclusions. Consider adding an additional figure that shows a close up of stage 1 at fan 10 and 11.

Page 6-26, 6B.4.4 last sentence. Please update the text to reflect that there were 5 new fans identified (16-20).

Page 6-31, Figure 6.13, is this a photo for an active fan channel? Would it be more applicable to place a photo more representative of the bed under a piedmont channel? If possible update the photo otherwise existing photo is fine.

Page 6-32, No photo was included in Figure 6.18 please include in next submittal.

Page 6-33 6B5.2 third paragraph. Please correct the typo "Fan 6 is significantly smaller that most other fans.."

Page 6-33, section 6B.5.3, text discusses aggradation/active on a limited portion of the "total fan site". Define the total fan site (white tank piedmont or 10 and 11 specifically). Figure 6.19

appears to outline all of the fan area as active. Consider revising language in the text or on the figure.

Page 6-33. Please correct the typo in the footnote "as if Fan 1 where tributary to Fan 2."

Page 6-34 6B5.3.1 second paragraph. Please correct the typo "alluvial fans w e soil profile development.."

page 6-35, second paragraph, first sentence. Please correct "and are thus were delineated".

Page 6-36, second paragraph, 2nd sentence. In this sentence should the second fan reference be to Fan 3 instead of Fan 13?

Page 6-37, third paragraph. Please update the fan ids in this paragraph to read Fans 1 and 2.

Page 6-39 and 6-40. Table 6B.4's title lists Fans 10 and 11. Please update with Fan 1 and 2.

Page 6-4. Update the study list so that 16 is added to 3-13

Page 6-42 second paragraph second to last sentence. Please replace "excel" with "excess."

Page 6-47, Figure 6.24. Could this figure be presented as an 11x17?

Page 6-48, 6B.5.3.6. Please correct the typo in the second to last sentence: "There is little or relief".

Page 6-51, section 6B.5.4, there appears to be some discrepancy between the stage III delineation and the text. Please verify and make corrections as necessary.

Page 6-52, first paragraph. Please correct the typo: "Unstable portions of the piedmont have well defined tributary drainage pattern."

Page 6-52, section 6B.5.5, is Figure 6.19 an appropriate figure to be looking at? Figure 6.19 is titled active areas but the text here states that inactive areas are shown. Are we supposed to be looking at "inactivity" within or outside of the drawn limits?

Page 6-52, section 6B.5.6.3, the text specifically discusses unstable flow path flooding specifically below the apices but 6B.5.5 mentions inactive portions which are stable flow paths is an additional section regarding stable flow path flooding downstream of the apex needed here as well?

Page 6-53, section 6B.6, bullet 2 and 3. This discussion states all of stage 2 as active unstable flow paths that contradicts text in the Stage 2 discussion where inactive areas are discussed.

Page 6-54 section 6B.5.6.3. Please add "and" before Sun Valley Parkway in the first sentence and replace "of" with "on" in the second sentence.

Page 6-55, Table 6B.7. Upstream of the apex should be delineated as administrative floodway. Consider adding the category to the table?

Page 6-56, 6B.6.2 consider rewording second paragraph. My interpretation of the text is that there was a difference in flood hazard between the delineation and the AZGS flood hazard classification, L2. In my opinion it looks like a reasonable match. L2 states that flows are confined in channels. The AAFF zones are essentially occurring in the channels as described by the AZGS report.

Page 6-56, second paragraph. Please correct the typo "Guidlelines".

Page 6-57. Table 6B.7.Please correct the decimals for the 100 year average deposition depth for Fan 3.

Page 6-59, text states large-scale maps are to be supplied. No large-scale maps were included in this submittal. Please make sure they are included in the next submittal.

Page 6-60, 6B.6.2 consider rewording third paragraph. My interpretation of the text is that there was a difference in flood hazard between the delineation and the AZGS flood hazard classification, L2. In my opinion it looks like a reasonable match. L2 states that flows are confined in channels. The AAFF zones are essentially occurring in the channels as described by the AZGS report.

Page 6-61, Table 6B.7. Upstream of the apex should be delineated as administrative floodway. Consider adding the category to the table?

Page 6-63. Is this specific discussion regarding the development of AAFFs pertinent to the actual delineation of the AAFFs for Fans 3, 13, and 16? Was the method discussed actually applied to portions of these delineations?

Page 6-64 section 6B.6.2. Was a hydraulic check performed for this fan analysis? If so include its discussion. Should any statements be made as to why one wasn't performed? The concern would be for FEMA's aid as to why they appear in the other reports but not this one. District is fine including no hydraulic check.

Page 6-64, text states large-scale maps are to be supplied. No large-scale maps were included in this submittal. Please make sure they are included in the next submittal.

Page 6-9. Update the text in the 2nd paragraph. It states Fan 6 instead of Fans 4 and 5.

Page 7-1, section 7.1, in the summary of discharges please list the fans as White Tank Fan 10 and White Tank Fan 11.

Page 7-1. Section 7.1 is shown as 3.1.

Page 7-2, section 7.3 Annotated Panel. Please make the following corrections

Pages 6-33 and 6-41 – flow-through channels

Pages 6-50 and 6-53 – through-flow corridors

Part A – checking the "no existing analysis" box is fine as long as all the Area 4 Fan hydrologies are being submitted in their respective reports instead of a full Area 4 hydrology TDN.

Part B – The yes box should be checked here instead of no if the use of RAS is continued.

Part B number 1 – Communities. Only Maricopa is listed for each of the panels. Buckeye needs to be listed as well.

Part B number 2 Flooding Source. Update to read Fan 6 instead of Fans 1 and 2.

Part C – We may need to include a fee but for now leave as No.

Part D – Community Signature – Buckeye- District will provide you with the information for the new person at Buckeye who will be signing the forms.

Part D – Community Signature - Tim Phillip's title should be changed. He is no longer "acting".

Part D – The form should be updated to reflect my name.

Plate 1 – Add title Watershed Map, add intermittent elevations to contours, recommend changing to black and white map due to reproduction issues.

Plate 2 – Add title Soils Map, add intermittent elevations to contours, recommend changing to black and white map due to reproduction issues. Cannot distinguish soil types 48 & 49 from each other. Cannot distinguish soil types 100 & 115 from each other. Please use more contrast for the differences in soil types.
Plate 2 – Add title Soils Map, add the ft symbol to the top and bottom elevations, add ranges (in addition to townships and sections), recommend changing to black and white map due to reproduction issues. For sub-basin 165, show soil type 64529, and it's area, on the map.
Plate 2 – Add title Soils Map, add the ft symbol to the top and bottom elevations, recommend changing to black and white map due to reproduction issues.

Plate 3 – Add title Land Use Map, add intermittent elevations to contours, add the ft symbol to the top and bottom elevations, recommend changing to black and white map due to reproduction issues. Cannot distinguish land use types from each other. Please use more contrast for the different land use types.

Plate 3 – Add title Land Use Map, add the ft symbol to the top and bottom elevations, add ranges (in addition to townships and sections), recommend changing to black and white map due to reproduction issues.

Plate 3 – To be consistent with the other Fan TDNs, please show only the existing land use types modeled, i.e. Hillslopes and Mountain Terrain. Remove Desert Rangeland (NDR) < 5% slopes from the legend since this land use type was not used.

Plates 2 through 5 were not submitted.

Please print all sheets at same scale.

Recommendations have been made to remove or extend certain AAFF zones to more closely match the definition in the PFHAM.

Report references. Please add references from the Buckeye/Sun Valley ADMS, Sun Valley ADMP, Piedmont Manual, Hydrology Manual, Hydraulics Manual, SCS Soil Surveys, etc. as appropriate.

Report, Appendix D, Sub-basin Data Table. The Lca and Lengths listed in this table differ from those shown on Plates 1, 2, and 3. For example, for sub-basin 185, the maps show 10,439 ft for the Lca but the table shows 10,507 ft. The Lca and Lengths listed in the maps and tables should be identical to each other.

Report, Page 1-1, Section 1.1, Sentence 2. Change "report to distinguish it" to "report to distinguish them".

Report, Page 1-1, Section 1.1. Change "Site 6 n the White Tank Piedmont" to "Site 6 on the White Tank Piedmont".

Report, Page 1-1, Section 1.1. Change "Sites 4 and 5 n the White Tank Piedmont" to "Sites 4 and 5 on the White Tank Piedmont".

Report, Page 1-2, Figure 1.1. Remove fans in Area 3 from location map. They are not related to this report.

Report, Page 1-3, Figure 1.2. Add S165 and it's area 0.62 sq mi, to Figure 1.2.

Report, Page 4-1, Section 4.2.1 Change "One individual subbasins" to "One individual sub-basin" and change "Waterhsed" to "Watershed".

Report, Page 4-1, Section 4.2.1. Change watershed area from 5.8 sq mi to 1.47 sq mi. Change "0.64 sq mi to 3.64 sq mi" to "0.43 sq mi to 1.035 sq mi".

Report, Page 4-10, Table 4.3. Show units, i.e. cfs.

Report, Page 4-2, Paragraph 2. Change "The SCS (1963) indicate" to "The SCS (1963) indicates".

Report, Page 4-3, Figure 4.1. Remove the 2-yr 6-hr and 2-yr 24-hr isopluvials. They are not related to this report.

Report, Page 4-3, last sentence. Change "PI records" to "PC records".

Report, Page 4-4, Figure 4.1. Remove the 2-yr 6-hr and 2-yr 24-hr isopluvials. They are not related to this report.

Report, Page 4-5, Figure 4.2. Consider adding boundaries between the different land use types. It is difficult to see that the FAN18 sub-basin contains a small area of desert rangeland.

Report, Page 4-5, Land Use, last sentence. Change "Fan 10 and 11" to "Fan 4 and 5".

Report, Page 4-5, Land Use, last sentence. Insert "Natural" before "Mountain Terrain".

Report, Page 4-6, paragraph 1. Change "Table 1" to "Table 4.1".

Report, Page 4-6, paragraph 4. Change "section D.2" to "Appendix D".

Report, Page 4-6, paragraph 4. Change "Table 1" to "Table 4.1".

Report, Page 4-7, Unit Hydrograph. Change "Fan 10 and 11" to "Fan 4 and 5".

Report, Page 4-8 to 4-10. If used, please add references from the Buckeye/Sun Valley ADMS and/or Sun Valley ADMP.

Report, Page 4-8, Section 4.5.3. Change "Fan 4 or Fan 5" to "Fan 1 or Fan 2".
S
ection 4 – Please make sure that all applicable supporting documentation is supplied for the new hydrology for this area.

Section 5, the alluvial fan delineation overwrites some existing delineations from the Sun Valley Parkway North delineation study. This should be discussed in the text in either this section or section 6.

Section 5, the alluvial fan delineation will supercede portions of the existing Hassayampa River delineation. This should be discussed in the text in either this section or section 6.

Section 5, the alluvial fan delineation will supercede some existing delineations from the White Tank Wash delineation study. This should be discussed in the text in either this section or section 6.

Section 5, the alluvial fan delineation will tie in to Wagner Wash. This should be discussed in the text in either this section or section 6.

Section 5, the upstream floodplain should be delineated as an administrative floodway and its designation should be discussed in this section.

Section 5.6. Please rephrase the discussion regarding the administrative floodways. If possible remove the statements "The District would like…"

Section 6. Terminology variation. The use of flow-through channel and through-flow channel alternates in the text. Please update if you feel necessary.

Section 6B.5.6 Please revisit the numbering of subsections. There are two 6B.5.6.3s.

Shaded Zone X delineations. It is recommended to dissolve the smaller Shaded X zones into the surrounding flood zones.

Table 5.9 has a title typo.

Table of Contents lists Appendix F for both Sediment and Geomorphology. The actual appendices are separated into Appendix F for Sediment and Appendix G for Geomorphology.

Appendix letters will need to be shifted by a letter for the rest of the appendices listed in the table of contents.

Table of Contents lists Plates, text refers to exhibits please refine either the text or table of contents.

The digital line work submitted does not match the line work submitted on the hard copy maps. There are minor variations in some AAFF zones and in the digital line work the southern-most shaded X zone is located in the effective floodplain. On the hard copy maps it appears that line had been trimmed back. Please look into.

The first location is the AFHH zone that contains points 3 and 10. The surface does not appear to support the active fan condition.

The other is where the uppermost portion of a local tributary is approaching the fan channels and there appears to only be about 1 foot difference between the water surface elevation in the channel and surface of concern.

The second location possibly needed designation modification would be the Hassayampa Fans. If management is concerned about the floodway designation further discussions may be necessary.

The Summary of Results page is missing from Appendix D.1. Please include in the next submittal.

This delineation poses some challenges north of Sun Valley Parkway. Development is occurring in the area north of Sun Valley Parkway. The scope called for delineation of the alluvial fan floodplains based on geomorphic methods. This limited the amount of analysis that could be performed; the analysis does not assess the impact of Sun Valley Parkway on floodplains north of the Parkway as that would require detailed information beyond the scope. The majority of the area north of the Parkway within the ADMP study limits will be delineated as an Alluvial Fan Zone A or Zone AO1. Developments already approved by Buckeye will now be in the floodplain. The only other option the District could take at this point would be to determine Sun Valley Parkway's influence on the flows coming across the middle portion of the fan and revise the delineation based on the additional detailed analysis at the Parkway. This would require a change order on the contract.

This form states that only one flooding source should be listed here. Recommend discussing the need for two sets of RH&H forms for Fans 1 and 2 with the Consultant.

Two sets of RH&H forms were submitted. For each set all the fans are listed under Flooding Source. Was one set to be for Fan 4 and one set to be Fan 5?

Where the delineations tie into Wagner Wash please draw the limits to the floodplain limits.

Zone AFUFD was not included. Please add.

Memorandum JE Fuller/ Hydrology & Geomorphology, Inc.

DATE: November 27, 2006

TO: Valerie Swick/FCDMC

FROM: Jon Fuller, PE, RG, CFM

RE: Sun Valley ADMP
Alluvial Fan Floodplain Delineations: Fans 1 & 2
Response to TDN Review Comments

CC: Kathryn Gross/FCDMC
Julie Cox/FCDMC
Mike Kellogg/JEF
Rob Lyons/JEF

This memorandum summarizes JE Fuller/Hydrology & Geomorphology, Inc. (JEF) responses to District review comments. District review comments are enumerated below, using the number from the District review comment letter. JEF responses are shown in 10-point bold italic font immediately below each comment. We appreciate the thoughtful and timely review by the District staff.

Hydrology Comments (Julie Cox, Letter of July 19, 2006)

1. Electronic files were not submitted. Please submit CD for comparison purposes.
   JEF Response:

2. I compared the input parameters and the output from the Fan 1 & 2 models to the Area 4 models for both the 100-yr 24-hr and 100-yr 6-hr events. The sub-basin data and the output in this Fan 1 &2 study are consistent with the same sub-basins in the Area 4 models.
   JEF Response: No response needed.

3. Based on the isopluvials in the Hydrology Manual, change the 100-yr 6-hr rainfall to 3.4 inches.
   JEF Response: Per meeting with Julie Cox on 9-18-06, and follow email correspondence, JEF will leave the 100-yr, 6-hr point rainfall depth at 3.2 inches based on the following findings:
   - ***NOAA 2 has the isopluvial value at 3.2 inches, as does the most current draft of the District's Manual***
   - ***The effective District Manual has the isopluvial value at 3.4 inches, but there is no explanation of why it was changed from the NOAA 2 value. We can make an educated guess as to what the isopluvial value might be, but the fact is that we cannot say with certainty that NOAA didn't intend to use 3.2 inches.***
   - ***Regardless of which isopluvial value we choose, we can be criticized (didn't use NOAA 2, the official source of rainfall data vs. didn't use effective FCD Manual)***
   - ***PBSJ (ADMS) and Alpha (White Tank Wash FDS) both used the 3.2 inch value. There is continuity in using the 3.2 in value***
   - ***The District is moving towards adopting the NOAA 14 rainfall. NOAA 14 has a 6hr, 100yr value of 3.16 inches***

- ***Using 3.4 in instead of 3.2 in results in about a 10% increase in Q100 peak discharge for about half the apexes. The other half are controlled by the 24 hr storm. Accuracy of hydrology is probably no better than +/- 25% anyway***
- ***For the TDN, the discharge does not affect the floodplain delineation. On the fan surface, geomorphic methods were used (Q is not a factor). For the upstream riverine delineations (approx. methods), there are no BFE's and the washes are in well defined canyons, so the difference in Q results in no observable difference in floodplain extent***
- ***For the ADMP, recommended capital improvement basin design is controlled by the 24 hr (volume) and once the piedmont drainage area kicks in, the 24 hr controls anyway***

4. Add copies of the 100-yr 24-hr and 100-yr 6-hr isopluvials from the Hydrology Manual to Appendix D.
   JEF Response:

5. Land Use. The RTIMP used in the HEC-1 models differs from that in DDMSW. Please change to be consistent.
   JEF Response: The RTIMP in the HEC-1 model is a result of the % rock outcrops in the soil map units. Therefore, the RTIMP values for input land use categories may not reflect final values used in the HEC-1 models depending on whether any rock outcrops are found in soil units within the watershed.

6. Plate 1 – Add title Watershed Map, add intermittent elevations to contours, recommend changing to black and white map due to reproduction issues.
   JEF Response:

7. Plate 2 – Add title Soils Map, add intermittent elevations to contours, recommend changing to black and white map due to reproduction issues. Cannot distinguish soil types 48 & 49 from each other. Cannot distinguish soil types 100 & 115 from each other. Please use more contrast for the differences in soil types.
   JEF Response:

8. Plate 3 – Add title Land Use Map, add intermittent elevations to contours, recommend changing to black and white map due to reproduction issues.
   JEF Response:

9. Report, Page 1-2, Figure 1-1. Remove fans in Area 3 from location map. They are not related to this report.
   JEF Response: The Stage 1 delineation addresses the entire flank of the White Tank Mountain Piedmont, which includes Area 3 and Area 4. Figure 1-1 is also a location map which shows regional features.

10. Report, Page 4-1, Section 4.2.1. Change watershed area from 5.8 sq mi to 1.47 sq mi. Change "0.64 sq mi to 3.64 sq mi" to "0.43 sq mi to 1.035 sq mi".
    JEF Response: Done

11. Report, Page 4-3, Figure 4.1. Remove the 2-yr 6-hr and 2-yr 24-hr isopluvials. They are not related to this report.
    JEF Response: Both the 2-year and 100-year point rainfall is input into the PREFRE programs to develop the rainfall statistics for the HEC-1 model.

12. Report, Page 4-6, paragraph 1. Change "Table 1" to "Table 4.1".

JEF Response: Done

13. Report, Page 4-8, Section 4.5.3. Change "Fan 4 or Fan 5" to "Fan 1 or Fan 2".
    JEF Response: Done

14. Report, Page 4-8 to 4-10. If used, please add references from the Buckeye/Sun Valley ADMS and/or Sun Valley ADMP.
    JEF Response: No citations to the Sun Valley ADMS or ADMP reports were made in Section 4. References to appropriate ADMS and ADMP documents are provided in other sections of the TDN where ADMS or ADMP documents were cited.

Geomorphology Comments (Kathryn Gross, Letter dated July 6, 2006)

I have reviewed the above submittal and have the following comments. Overall the delineation limits appear reasonable; however, there are some designation concerns and modifications that are needed prior to approval.
JEF Response: See responses to specific comments below.

This delineation poses some challenges north of Sun Valley Parkway. Development is occurring in the area north of Sun Valley Parkway. The scope called for delineation of the alluvial fan floodplains based on geomorphic methods. This limited the amount of analysis that could be performed; the analysis does not assess the impact of Sun Valley Parkway on floodplains north of the Parkway as that would require detailed information beyond the scope. The majority of the area north of the Parkway within the ADMP study limits will be delineated as an Alluvial Fan Zone A or Zone AO1. Developments already approved by Buckeye will now be in the floodplain. The only other option the District could take at this point would be to determine Sun Valley Parkway's influence on the flows coming across the middle portion of the fan and revise the delineation based on the additional detailed analysis at the Parkway. This would require a change order on the contract.
JEF Response: Agreed. To date, the District has not provided any information on how they would like to proceed. Therefore, we have modified the delineation north of Sun Valley Parkway to include only AFZA and X (Shaded) Zones. We believe this delineation adequately identifies the hazard and meets the intent of the PFHAM methodology.

Technical Summary

1. Hydrology – Make sure all supporting documentation is provided.
   JEF Response:

2. Hydraulics – Upstream modeling appears reasonable. Please run checkras on the upstream delineation. Upstream of the apex the delineation should be an administrative floodway. If the Consultant prefers the water surface elevations for each cross-section location can be determined using FlowMaster or a similar product. If left in RAS the Consultant needs to provide a baseline in the delineation and be prepared to answer any FEMA questions as they will review it as a RAS product.
   JEF Response:

3. Geomorphology – TDN appendix G supporting documentation needs to be provided. A master Appendix G for all fan delineations is recommended.
   JEF Response: An Appendix G containing supporting reports and digital data has been created.

4. Floodplain Delineations - Some modifications to the study limits and designations are necessary. This will require updates on the workmaps and annotated FIRM panels as well. This is discussed later in the comments.
   JEF Response: Acknowledged. See specific responses below.

5. Delineations should be called out as White Tank Fan 1 and White Tank Fan 2.
   JEF Response:

Delineation

1. Locations where there are concerns regarding the delineation have been identified in the shape file fan1and2quest.shp. This file will be included with this comment submittal.
   JEF Response: File was received and considered. See specific responses below.

2. AFUFD Zones need to be re-evaluated. Recommended locations of the boundaries of this zone are included in the shape file. The PFHAM falls short in classifying the type of surface identified; therefore it is recommended that the designation recommended by the PFHAM not be used and instead it is recommended that north of the Parkway the AFUFD zone be reclassified or reanalyzed based on one of the following:
   a. AFZA
      JEF Response: We recommend using the AFZA zone. See (b) below.
   b. AO1 Zone. AO1 is recommended by the District; however, the Consultant should evaluate which designation is a more reasonable approach for the area.
      JEF Response: While I believe that an A01 Zone would one possible management tool, developing the technical data and documentation to support an A01 Zone designation required in a TDN may be problematic and probably exceeds the intended level of effort authorized by the District. Given that the landform is an alluvial fan, and the specific areas of concern are connected to an unstable, active alluvial fan, I believe the most appropriate designation is the AFZA Zone. The AFZA Zone also formally recognizes that the area is part of an alluvial fan, and therefore requires developers to address upstream alluvial fan hazards and conditions. Use of an AFZA Zone also fits better with the geomorphic delineation approach used.

   c. Further analysis is undertaken to the determine impact of Sun Valley Parkway.
      JEF Response: Further analysis by JEF has not been authorized by the District. District staff have not completed their analysis.

3. Extending out of a portion of the AFUFD zones there are a collection of AAFF zones. This location is called out in the shape file. The Consultant should re-visit the need for these AAFF zones and determine if they should remain or be incorporated into the revised designation for the area north of Sun Valley Parkway.

JEF Response: The AAFF zones north of Sun Valley Parkway have been removed and replaced with AFZA Zones. For the Fan 36 delineation, the District request that some floodway areas be

reserved through the AFZA Zones so that a corridor was reserved for the full apex discharge. In this case the ADMP proposes corridors and other flood control features that will convey the apex discharge to the toe of Fans 1 and 2.

4. Along the east side of the AFHH zone for Fan 2, consider adding additional area to the delineation. These areas are identified in the shape file. One portion of the requested additional delineation most likely extends beyond the ADMP study limits. One delineated wash extends out of the main portion of the delineation and stops at what may be the study limits. If the delineation continued along this wash it would connect back into the fan delineation at the Parkway. This would aid individuals by providing information that uncertain flow quantity exists for the wash since it is connected to the active fan. If at all possible it is recommended to continue the delineation along that wash.

   JEF Response: Much of the Fan 2 delineation already extends beyond the SVADMP study limits, and the delineation was extended without a request for a change order. The delineation was extended to the point where it joined alluvial fan landforms that are part of the Wittmann ADMP. The flow path that was requested to be extended to Sun Valley Parkway is not contained on its eastern bank and abuts a sheet flow area. Delineating a flood zone along the defined channel would give the impression that the sheet flow/overflow area was not a floodplain. Therefore, JEF recommends that the delineation be terminated at the current where it currently ends.

5. Shaded Zone X delineations. It is recommended to dissolve the smaller Shaded X zones into the surrounding flood zones.
   JEF Response: Done. A 5-acre minimum island size was used, and a note to that effect was added to the text of the TDN.

Report Comments

1. Page 2-1, Abstract section 2.1.3. Craig Kennedy is no longer the official contact at Baker. If a new contact is identified prior to FEMA submittal the name should be updated.
   JEF Response: Done

2. FEMA OC Form
   a. Part D – The form should be updated to reflect my name.
      JEF Response: Done

3. FEMA RH&H Form
   a. This form states that only one flooding source should be listed here. Recommend discussing the need for two sets of RH&H forms for Fans 1 and 2 with the Consultant.
      JEF Response: Done

   b. Part A – checking the "no existing analysis" box is fine as long as all the Area 4 Fan hydrologies are being submitted in their respective reports instead of a full Area 4 hydrology TDN.
      JEF Response: Agreed

c. Part B – The yes box should be checked here instead of no if the use of RAS is continued.
JEF Response: Done

4. FEMA Fan Form – Please submit one fan per form.
JEF Response: Done

5. Section 4 – Review comments were not available at this time. Those comments will come as an addendum shortly.
JEF Response: See hydrology comments above.

6. Section 5, the upstream floodplain should be delineated as an administrative floodway and its designation should be discussed in this section.
JEF Response:

7. Section 5, the alluvial fan delineation overwrites some existing delineations from the Sun Valley Parkway North delineation study. This should be discussed in the text in either this section or section 6.
JEF Response: A discussion was added to the text in Section 5 and 6.

8. Page 5-1. Text contains a statement that RAS was used to perform a backwater analysis. Since cross-sections are too far apart to produce a real step-backwater analysis should this sentence remain in the text?
JEF Response: The text was revised to remove the offending phrase.

9. Page 5-7. Make sure to include the RAS summary table in the final report.
JEF Response:

10. Section 6. Figure Concerns
    a. For Figures 6.1-6.10 should fan 1 and 2's apices be located on the figures?
    JEF Response: Done

    b. For Figure 6.7, please consider adding a note to the figure explaining why there are no channels identified in the middle of the study area.
    JEF Response: Done

    c. For Figure 6.9 is it possible to screen the colors on the map to more clearly see the topography underneath?
    JEF Response: Making the colors more transparent (allowing the topography to stand-out more clearly) results in a more dramatic discrepancy between the map colors and the legend colors.

    d. For Figure 6.19 please label which apex is for Fan 1 and which is for Fan 2.
    JEF Response: Done

11. Page 6-15. Text states that Table 6B.4 summarizes distinguishing characteristics of surficial geology. Only geologic age is listed in the table. Please look into.
JEF Response: The reference to Table 6B.4 was removed. Table 6B.4 describes soils mapping.

12. Page 6-61, Table 6B.7. Upstream of the apex should be delineated as administrative floodway. Consider adding the category to the table?
JEF Response: Done

13. Page 6-64, text states large-scale maps are to be supplied. No large-scale maps were included in this submittal. Please make sure they are included in the next submittal.
JEF Response: Text has been removed from the TDN.

14. Page 7-1, section 7.1. Consider listing only White Tank Fan 1 and White Tank Fan 2's discharge in the table.
JEF Response: Done

Appendix Comments

1. Appendix A – no comments. Update references as needed.
JEF Response: No response needed.

2. Appendix B – Include pertinent correspondence prior to FEMA submittal. Special Problem discussion should be removed or at least revised to state only the AAFF zones. Consider shifting this discussion into the main report text.
JEF Response: Done

3. Appendix C – no comments. Consider adding District contract number for mapping project.
JEF Response: We do not know the contract number for the District's mapping project.

4. Appendix D - Consider placing a separate copy of the Rainfall figure in the appendix. Organize data following State Standard
JEF Response:

5. Appendix E – no comments.
JEF Response: No response needed.

6. Appendix G – no supporting documentation of the geomorphic analysis was provided. Perhaps a master Appendix G could be developed for use with all the Fan reports.
JEF Response: An Appendix G has been created.

7. Appendix H- no digital information was provided in this submittal. Please make sure to include a cd with the next submittal including digital line work for hydrology as well as floodplain delineation.
JEF Response:

8. A-Maps Hydrology. Scale appears to be missing on Plates as well as elevation information on the contours. Concerned that the Plates may not reproduce well in black and white. Please evaluate.
JEF Response:

9. B-Maps Geomorphology. No maps provided. Please include in next submittal.
JEF Response: 11x17 maps are included in the TDN.

10. C-Maps Hydraulics/Floodplain.
    a. Please print all sheets at same scale.
       JEF Response:

    b. Floodway symbology is needed on the delineations shown.
       JEF Response:

    c. Consider adding a legend of the FCD fan delineation categories.
       JEF Response:

    d. Consider revising the title to "Approximate Zone A Floodplain Delineation Study of White Tank Fans 1 and 2."
       JEF Response:

11. Annotated Panels. Please consider the following:
    a. Somewhat hard to read the red line work and text.
       JEF Response:

    b. On the annotated maps, it is recommended to use the inactive fan note for the portions of the delineation that will be updated to either AFZA or AO1. This should be discussed between the Consultant and the District. The reason for this request is that typically the designation of active or inactive provides an additional flag for regulators that active is floodway and inactive is Zone A.
       JEF Response:

    c. Designations need to be modified. Please use FEMA designations on panels:
       JEF Response:

    d. Upstream of Apex: Zone A Administrative Floodway – Inactive Fan Flooding
       JEF Response:

    e. Downstream of Apex: Zone A Administrative Floodway – Active Fan Flooding and Zone A Inactive Fan Flooding.
       JEF Response:

12. Add a note stating administrative floodways are regulated by the local regulatory authority.
    JEF Response:

13. Add floodway shading of the corridors.
    JEF Response:

14. Consider naming the corridors.
    JEF Response:

Text Comments

1. Page 3-1, is "epoch" correct in the second sentence: "1992 epoch Central Zone of Arizona State Plane…"

JEF Response: Done

2. Page 4-8, section 4.5.2, top of page. Please correct the typo: "watershed will average elevation.."
   JEF Response: Done

3. Page 5-6, section 5.5.5, should the word "fan" be between "natural channels"?
   JEF Response: Done

4. Page 6-33. Please correct the typo in the footnote "as if Fan 1 where tributary to Fan 2."
   JEF Response: Done

5. Page 6-37, third paragraph. Please update the fan ids in this paragraph to read Fans 1 and 2.
   JEF Response: Done

6. Page 6-39 and 6-40. Table 6B.4's title lists Fans 10 and 11. Please update with Fan 1 and 2.
   JEF Response: Done

7. Page 6-52, first paragraph. Please correct the typo: "Unstable portions of the piedmont have well defined tributary drainage pattern."
   JEF Response: Done

8. Page 6-56, second paragraph. Please correct the typo "Guidlelines".
   JEF Response: Done

9. Page 7-1. Section 7.1 is shown as 3.1.
   JEF Response: Done

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Nov. 28, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on **Sun Valley ADMP, Step 3 Recommended Alternative Report, Volume 1, Executive Summary and Overview (draft), November, 2006, JE Fuller Hydrology and Geomorphology, by Dennis Holcomb** dated Nov. 19, 2006

CC: Jon Fuller, PE

This memo summarizes our response to the District's comments as dated above.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The final reports will be revised in the final deliverables to reflect our responses where appropriate.

++

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

8400 S. Kyrene Rd., Suite 201
Tempe, AZ 85284
1-877-752-2124 (toll free)
480-752-2124 (voice)
480-839-2193 (fax)
www.jefuller.com

July 15, 2005

TRANSMITTAL

Mark Meyer, RLA
Logan Simpson Design Inc.
51 West 3rd St., Ste. 450
Tempe, AZ 85281

Attached are the following materials provided for your use by JEFuller/ Hydrology & Geomorphology, Inc.:

Sun Valley ADMP Environmental Overview prepared by EcoPlan Associates, Inc. (July 13, 2005) – 1 digital copy

_____ _____

JE Fuller/Hydrology & Geomorphology, Inc. Date

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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July 21, 2005

TRANSMITTAL

Jay Hicks, RLA
EDAW, Inc.
455 N. 3rd Street, Suite 272
Phoenix, AZ 85004

Attached are the following materials provided by JE Fuller/ Hydrology & Geomorphology, Inc.:

Sun Valley ADMP digital GIS files – 2 DVDs

These digital files are provided for your review and use relative to the Sun Valley ADMP project. Please be advised that per the MAG Consultant Licensing Agreement for Electronic Files, these files are to be used solely for the specified project and not for other unrelated commercial purposes.

An Excel file is also included on the DVD with a catalog of other data and information collected by JEF for the project. If you wish to review or collect any additional information listed in the data catalog, or if you have any questions about the enclosed digital files, please contact Ted Lehman at 480-222-5709 or ted@jefuller.com

Thank you,

_____ _____

JE Fuller/Hydrology & Geomorphology, Inc. Date

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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July 21, 2005

TRANSMITTAL

Mark Meyer, RLA
Logan Simpson Design Inc.
51 West 3rd St., Ste. 450
Tempe, AZ 85281

Attached are the following materials provided by JE Fuller/ Hydrology & Geomorphology, Inc.:

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These digital files are provided for your review and use relative to the Sun Valley ADMP project. Please be advised that per the MAG Consultant Licensing Agreement for Electronic Files, these files are to be used solely for the specified project and not for other unrelated commercial purposes.

An Excel file is also included on the DVD with a catalog of other data and information collected by JEF for the project. If you wish to review or collect any additional information listed in the data catalog, or if you have any questions about the enclosed digital files, please contact Ted Lehman at 480-222-5709 or ted@jefuller.com

Thank you,

_____ _____

JE Fuller/Hydrology & Geomorphology, Inc. Date

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September 1, 2005

TRANSMITTAL

Mark Meyer, RLA
Sr. Environmental Planner
Logan Simpson Design
51 W. Third St., Ste. 450
Tempe, AZ 85281

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

FCDMC Sun Valley ADMP – Cultural resources map product by Jim Rodgers, Scientific Archaeological Services

For your use in digitizing into the GIS database per SOW Task 7.1.2.2.

_____ _____

JE Fuller/Hydrology & Geomorphology, Inc. Date

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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www.jefuller.com

October 4, 2005

TRANSMITTAL

Flood Control District Of Maricopa County
Att: Michael Duncan, P.E.
2801 W. Durango
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc. for the Sun Valley ADMP, FCD 2004C049:

Draft cross section location map with preliminary Zone A floodplain delineations for containment reaches. 4 sheets, 24"x36", 1"=200' scale.

Reconnaissance report for Appendix E, Part 7, Volume 4 of Approximate Zone A Floodplain Delineation Study TDN.

Draft HEC-RAS output, including summary output table, cross section plots and profile plots.

_____ _____

Brian R. Iserman, P.E. Date
JE Fuller/Hydrology & Geomorphology, Inc.

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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October 5, 2005

TRANSMITTAL

Flood Control District of Maricopa County
Att: Valerie Swick
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc. for the Sun Valley ADMP, FCD 2004C049 for your review:

- Three(3) copies of the draft Area 4 Hydrology Models Technical Data Notebook

10/5/05

Ted Lehman, P.E.
JE Fuller/Hydrology & Geomorphology, Inc.

Date

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

8400 S. Kyrene Rd., Suite 201
Tempe, AZ 85284
1-877-752-2124 (toll free)
480-752-2124 (voice)
480-839-2193 (fax)
www.jefuller.com

January 25, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

Sun Valley Area Drainage Master Plan – Part 8, Volume 2 Step 2 Proposed Alternatives Report (11x17 format) and Technical Appendices (3-ring binder) for each of the subareas listed below:

- CAP
- Hassayampa
- White Tank Wash
- FRS #2 & #3

Three (3) copies of each work product are provided for your review and comments. Please contact me if you have any questions or need further information.

_____ _____

JE Fuller/Hydrology & Geomorphology, Inc. Date

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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Tempe, AZ 85284
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February 6, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

Sun Valley Area Drainage Master Plan – Part 8, Volume 2 Step 2 Proposed Alternatives Report (11x17 format) and Technical Appendices (3-ring binder) for each of the subareas listed below:

- FRS No. 1
- Wagner

Three (3) copies of each work product are provided for your review and comments. Please contact me if you have any questions or need further information.

_____ _____

JE Fuller/Hydrology & Geomorphology, Inc. Date

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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May 18, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

Sun Valley Area Drainage Master Plan – DRAFT Technical Data Notebook: Approximate Floodplain Delineation Study for the White Tank Mountain Piedmont Fan Sites 10 & 11

Please forward this draft report to Kathryn Gross for review.

Thank you.

Nicki Kellogg

JE Fuller/Hydrology & Geomorphology, Inc.

5/18/06

Date

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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Tempe, AZ 85284
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480-839-2193 (fax)
www.jefuller.com

June 5, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

Sun Valley Area Drainage Master Plan – Three (3) copies of the Draft Step 1 Alternative Formulation and Preliminary Analysis Report.

This work product is provided for your review and comments. Please contact me if you have any questions or need further information.

_____ _____

Jeffrey A. Despain, P.E. Date

Project Engineer

JE Fuller/Hydrology & Geomorphology, Inc.

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www.jefuller.com

June 22, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

Sun Valley Area Drainage Master Plan:

- Three (3) copies of the Draft Step 2 Alternatives Formulation and Preliminary Analysis Report, Volume 1.
- Three (3) copies of the Draft Step 2 Alternatives Formulation and Preliminary Analysis Report, Volume 2 CAP Sub-Area.
- Three (3) copies of the Draft Step 2 Alternatives Formulation and Preliminary Analysis Report, Volume 3 Wagner Wash Sub-Area.
- Three (3) copies of the Draft Step 2 Alternatives Formulation and Preliminary Analysis Report, Volume 4 Hassayampa River Sub-Area.
- Three (3) copies of the Draft Step 2 Alternatives Formulation and Preliminary Analysis Report, Volume 5 White Tank Wash Sub-Area.
- Three (3) copies of the Draft Step 2 Alternatives Formulation and Preliminary Analysis Report, Volume 6 FRS #1 Sub-Area.
- Three (3) copies of the Draft Step 2 Alternatives Formulation and Preliminary Analysis Report, Volume 7 FRS #2 & #3 Sub-Area.

This work product is provided for your review and comments. Please contact me if you have any questions or need further information.

_____ _____

Jeffrey A. Despain, P.E. Date

Project Engineer JE Fuller/Hydrology & Geomorphology, Inc.

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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June 23, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

Sun Valley Area Drainage Master Plan – DRAFT Technical Data Notebook: Approximate Floodplain Delineation Study for the White Tank Mountain Piedmont Fan Site 6

Please forward this draft report to Kathryn Gross for review.

Thank you.

6/23/06

JE Fuller/Hydrology & Geomorphology, Inc. Date

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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July 13, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

Sun Valley Area Drainage Master Plan – DRAFT Technical Data Notebook: Approximate Floodplain Delineation Study for the White Tank Mountain Piedmont Fan Sites 4 & 5

Please forward this draft report to Kathryn Gross for review.

Thank you.

7/13/06

JE Fuller/Hydrology & Geomorphology, Inc. Date

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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Tempe, AZ 85284
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July 17, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc. for your review:

Sun Valley Area Drainage Master Plan:

- Three (3) copies of the Draft Preliminary Geologic/Geotechnical Investigation
- One (1) CD-ROM of geotech report files.

This work product is provided for your review and comments.

Also provided at Ms. Cox's request is:

- One (1) CD-ROM of Revised Step 2 HEC-1 files and design spreadsheets

Please contact me if you have any questions or need further information.

7/17/06

Ted Lehman, P.E. — Date

Project Engineer

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August 8, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

Sun Valley Area Drainage Master Plan – DRAFT Technical Data Notebook: Approximate Zone A Floodplain Delineation Study of White Tank Fans 3, 13, & 16

Please forward this draft report to Kathryn Gross for review.

Thank you.

8/8/06

JE Fuller/Hydrology & Geomorphology, Inc. Date

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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Tempe, AZ 85284
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August 14, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc. for your review:

Sun Valley Area Drainage Master Plan:

- Three (3) copies of the Draft Step 3 Recommended Alternative, Volume 3, Wagner Sub-Area.
- Three (3) copies of the accompanying CD-ROM for the Draft Step 3 Recommended Alternative, Volume 3, Wagner Sub-Area containing digital data associated with the report including HEC-1 files, Excel spreadsheets, pdfs, and shapefiles.

Please note, this version of Volume 3 contains the designs for only for Fan Systems 3 and 13. We would like to have you review these designs and their accompanying documentation. Once we receive your comments we will produce a Final Draft of Volume 3 with all of the fan systems in the Wagner sub-area. This will allow us to apply ourselves more efficiently to the design and production of the other Step 3 sub-area reports.

Please let us know if this approach agrees with you. Also, as you are well aware, this project has a very tight schedule. Your timely review of these materials will go far to facilitate our completion of the ADMP within our existing schedule.

Please contact me if you have any questions or need further information.

_____ _____

Ted Lehman, P.E. Date

Project Engineer JE Fuller/Hydrology & Geomorphology, Inc.

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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August 17, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

3 - Sun Valley Area Drainage Master Plan – DRAFT Technical Data Notebook: Approximate Zone A Floodplain Delineation Study of White Tank Fans 17, 18, & 19

Please forward these draft reports to Kathryn Gross for review.

Thank you.

8/17/06

JE Fuller/Hydrology & Geomorphology, Inc. Date

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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August 18, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc. for your review:

Sun Valley Area Drainage Master Plan:

- Two (2) copies of draft Sections 4 and 5 of the Scenery Multiuse Data Collection & Analysis document from Logan Simpson Design.

This work product is provided for you and Mr. Holcomb to review and comment.

Please contact me if you have any questions or need further information.

Ted Lehman, P.E.

Project Engineer

8/18/06

Date

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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August 31, 2006

TRANSMITTAL

Flood Control District of Maricopa County
Att: Valerie Swick
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc. for the Sun Valley ADMP, FCD 2004C049:

- Six (6) copies of the final Area 4 Hydrology Technical Data Notebook
- One (1) copy of our comment response memorandum addressing our responses to comments received on the draft submittal.

Ted Lehman, P.E.
JE Fuller/Hydrology & Geomorphology, Inc.

8/31/06
Date

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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Sept. 21, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc. for your review:

Sun Valley Area Drainage Master Plan:

- Four (4) copies of the Draft Step 3 Recommended Alternative, Volume 4, Hassayampa Sub-Area.
- Four (4) copies of the accompanying CD-ROM for the Draft Step 3 Recommended Alternative, Volume 4, Hassayampa Sub-Area containing digital data associated with the report including HEC-1 files, Excel spreadsheets, pdfs, and shapefiles.

Please contact me if you have any questions or need further information.

_____ _____

Ted Lehman, P.E. Date

Project Engineer JE Fuller/Hydrology & Geomorphology, Inc.

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

8400 S. Kyrene Rd., Suite 201
Tempe, AZ 85284
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www.jefuller.com

Sept. 25, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc. for your review:

Sun Valley Area Drainage Master Plan:

- Four (4) copies of the Draft Step 3 Recommended Alternative, Volume 2, CAP Sub-Area.
- Four (4) copies of the accompanying CD-ROM for the Draft Step 3 Recommended Alternative, Volume 2, CAP Sub-Area containing digital data associated with the report including HEC-1 files, Excel spreadsheets, pdfs, and shapefiles.

Please contact me if you have any questions or need further information.

_____ _____

Ted Lehman, P.E. Date

Project Engineer JE Fuller/Hydrology & Geomorphology, Inc.

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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Tempe, AZ 85284
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www.jefuller.com

Sept. 26, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc. for your review:

Sun Valley Area Drainage Master Plan:

- Four (4) UPDATED copies of the accompanying CD-ROM for the Draft Step 3 Recommended Alternative, Volume 2, CAP Sub-Area containing digital data associated with the report including HEC-1 files, Excel spreadsheets, pdfs, and shapefiles.

Please note the only updated files are the Excel design spreadsheets. The remaining data are all identical to the first set sent yesterday. Please contact me if you have any questions or need further information.

_____ _____

Ted Lehman, P.E. Date

Project Engineer JE Fuller/Hydrology & Geomorphology, Inc.

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

8400 S. Kyrene Rd., Suite 201
Tempe, AZ 85284
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480-839-2193 (fax)
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November 27, 2006

TRANSMITTAL

Flood Control District of Maricopa County
Attn: Valerie A. Swick, E.I.T., P.H., CFM
2801 West Durango Street
Phoenix, Arizona 85009-6399
Phone: (602) 506-1501
Fax: (602) 506-4601

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

Six (6) copies of the Sun Valley ADMP, Step 2, Proposed Alternatives Final Report to include:

- Volume 1 (Box 1 of 9)
- Volume 2, CAP Sub-Area (Box 2 of 9)
- Volume 2, CAP Sub-Area, Technical Appendices (Box 8 of 9)
- Volume 3, Wagner Sub-Area (Box 3 of 9)
- Volume 3, Wagner Sub-Area, Technical Appendices (Box 8 of 9)
- Volume 4, Hassayampa Sub-Area (Box 4 of 9)
- Volume 4, Hassayampa Sub-Area, Technical Appendices (Box 8 of 9)
- Volume 5, White Tank Wash Sub-Area (Box 5 of 9)
- Volume 5, White Tank Wash Sub-Area, Technical Appendices (Box 9 of 9)
- Volume 6, FRS 1 Sub-Area (Box 6 of 9)
- Volume 6, FRS 1 Sub-Area, Technical Appendices (Box 9 of 9)
- Volume 7, FRS 2 & 3 Sub-Area (Box 7 of 9)
- Volume 7, FRS 2 & 3 Sub-Area, Technical Appendices (Box 9 of 9)

One (1) copy of all review comments and response letters pertaining to Step 2. (Box 1 of 9)

September 27, 2006

Valerie,

If you have any questions, please do not hesitate to call.

_____ _____

Jeffrey A. Despain, P.E. Date

Project Engineer

JE Fuller/Hydrology & Geomorphology, Inc.

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

8400 S. Kyrene Rd., Suite 201
Tempe, AZ 85284
1-877-752-2124 (toll free)
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480-839-2193 (fax)
www.jefuller.com

September 29, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

- **Sun Valley Area Drainage Master Plan** – Technical Data Notebook: Approximate Zone A Floodplain Delineation Study of White Tank Fans 4 & 5
- **Sun Valley Area Drainage Master Plan** – Technical Data Notebook: Approximate Zone A Floodplain Delineation Study of White Tank Fan 6
- **2 - Sun Valley Area Drainage Master Plan** – Technical Data Notebook: Approximate Zone A Floodplain Delineation Study of White Tank Fans - Appendix G
- FCDMC review comments and JEF responses for Fans 4 & 5 TDN
- FCDMC review comments and JEF responses for Fan 6 TDN

Please forward these documents to Kathryn Gross for review.

Thank you.

9/29/06

JE Fuller/Hydrology & Geomorphology, Inc. Date

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

8400 S. Kyrene Rd., Suite 201
Tempe, AZ 85284
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www.jefuller.com

Oct. 2, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc. for your review:

Sun Valley Area Drainage Master Plan:

- Four (4) copies of the Draft Step 3 Recommended Alternative, Volume 7, FRS 2& 3 Sub-Area.
- Four (4) copies of the accompanying CD-ROM for the Draft Step 3 Recommended Alternative, Volume 7, FRS 2 & 3 Sub-Area containing digital data associated with the report including HEC-1 files, Excel spreadsheets, pdfs, and shapefiles.

Note that this submittal incorporates our responses to comments received from Richard Waskovsky dated 9/27/06.

Please contact me if you have any questions or need further information.

_____ _____

Ted Lehman, P.E. Date

Project Engineer JE Fuller/Hydrology & Geomorphology, Inc.

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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October 6, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

- **Sun Valley Area Drainage Master Plan** – Technical Data Notebook: Approximate Zone A Floodplain Delineation Study of White Tank Fans 3, 13, & 16
- **Sun Valley Area Drainage Master Plan** – Technical Data Notebook: Approximate Zone A Floodplain Delineation Study of White Tank Fans 10, 11, & 20
- FCDMC review comments and JEF responses for Fans 3, 13, & 16 TDN
- FCDMC review comments and JEF responses for Fans 10, 11, & 20 TDN

Please forward these documents to Kathryn Gross for review.

Thank you.

10/06/06

JE Fuller/Hydrology & Geomorphology, Inc. Date

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October. 11, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc. for your review:

Sun Valley Area Drainage Master Plan:

- Four (4) copies of the Draft Step 3 Recommended Alternative, Volume 6, Buckeye FRS #1 Sub-area report.
- Four (4) copies of the accompanying DVD-ROM for the Draft Step 3 Recommended Alternative, Volume 6, Buckeye FRS #1 Sub-Area containing digital data associated with the report including HEC-1 files, Excel spreadsheets, pdfs, and shapefiles. The DVD-ROM includes GIS macros as request by Dr. Zhao following our review meeting on 10/2/06 at FCD.
- Our response to comments from Richard Waskowsky dated 9/27/06 (and as discussed in a follow-up meeting at FCD on 10/2/06), and comments from Julie Cox dated 10/2/06 and 10/4/06. All of these comments were in regard to the Wagner sub-area submittal of 8/14/06.

Please note this submittal incorporates our responses to comments received from Richard Waskowsky dated 9/27/06, and Julie Cox dated 10/2/06 and 10/4/06. Please contact me if you have any questions or need further information.

_____ _____

Ted Lehman, P.E. Date

Project Engineer JE Fuller/Hydrology & Geomorphology, Inc.

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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October 12, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

- **Sun Valley Area Drainage Master Plan** – Technical Data Notebook: Approximate Zone A Floodplain Delineation Study of White Tank Fans 17, 18, & 19
- FCDMC review comments and JEF responses for Fans 17, 18, & 19 TDN

Please forward these documents to Kathryn Gross for review.

Thank you.

JE Fuller/Hydrology & Geomorphology, Inc.

10/12/06
Date

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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October. 17, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc. for your review:

Sun Valley Area Drainage Master Plan:

- Four (4) copies of the Draft Step 3 Recommended Alternative, Volume 5, White Tank Wash Sub-area report.
- Four (4) copies of the accompanying DVD-ROM for the Draft Step 3 Recommended Alternative, Volume 5, White Tank Wash Sub-Area containing digital data associated with the report including HEC-1 files, Excel spreadsheets, pdfs, and shapefiles.
- Our response to comments from Julie Cox dated 10/6/06.

Please note that not all of our responses have been incorporated into the White Tank Wash sub-area report yet. Some of the comments are identical to either Ms. Cox's comments dated 10/2 or 10/4. Our responses to those comments are reflected in the WTW reports. Similarly, some of our responses to comments received from Richard Waskowsky dated 10/16 are also not included. We intent to incorporate all of our responses into the complete Wagner sub-area report which we anticipate providing to you within a week.

Please contact me if you have any questions or need further information.

_____ _____

Ted Lehman, P.E. Date

Project Engineer JE Fuller/Hydrology & Geomorphology, Inc.

JE FULLER
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October 27, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc. for your review:

Sun Valley Area Drainage Master Plan:

- Four (4) copies of the Final Draft Step 3 Recommended Alternative, Volume 3, WagnerWash Sub-area report.
- Four (4) copies of the accompanying CD-ROM for the Final Draft Step 3 Recommended Alternative, Volume 3, Wagner Wash Sub-Area containing digital data associated with the report including HEC-1 files, Excel spreadsheets, pdfs, and shapefiles.
- Our response to all comments received up to yesterday (10/26/06) from Richard W., Dave D., Julie C..

Please note all of our responses thru 10/26 have been incorporated into the final draft Wagner Wash sub-area report. If you are satisfied with our responses as reflected in this final draft, we propose delivery of the final sets of the Step 3 reports for all sub-areas. Note also that Volume 1 should be forthcoming next week.

Please contact me if you have any questions or need further information.

_____ _____

Ted Lehman, P.E. Date

Project Engineer JE Fuller/Hydrology & Geomorphology, Inc.

JE FULLER
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8400 S. Kyrene Rd., Suite 201
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October 31, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

- **Final Sun Valley Area Drainage Master Plan** – Technical Data Notebook: Approximate Zone A Floodplain Delineation Study of White Tank Fans 17, 18, & 19
- 2nd Round FCDMC review comments and JEF responses for Fans 17, 18, & 19 TDN
- **Final Sun Valley Area Drainage Master Plan** – Technical Data Notebook: Approximate Zone A Floodplain Delineation Study of White Tank Fan 6
- 2nd Round FCDMC review comments and JEF responses for Fan 6 TDN

Please forward these documents to Kathryn Gross.

Thank you.

10/31/06

JE Fuller/Hydrology & Geomorphology, Inc. Date

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November 1, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc. for your review:

Sun Valley Area Drainage Master Plan:

- Four (4) copies of the Draft Step 3 Recommended Alternative, Volume 1, Executive Summary and Overview report.
- Two (2) copies of our October invoice for the SVADMP project. One copy is for you and the other for Linda Hannan.

Please note the CDs mentioned in the table of contents are not included as the GIS files, etc. were previously supplied with the sub-area reports. If you require some electronic data such as a pdf of the Volume 1 report, please do not hesitate to ask. I will be out of the office until Nov. 13th. Therefore, if you have any questions please direct them to Hari or Jon.

_____ _____

Ted Lehman, P.E. Date

Project Engineer JE Fuller/Hydrology & Geomorphology, Inc.

JE FULLER
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November 2, 2006

TRANSMITTAL

Mark Meyer, RLA
Sr. Environmental Planner
Logan Simpson Design
51 W. Third St., Ste. 450
Tempe, AZ 85281

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

Sun Valley ADMP – Step 3 Volume I Executive Summary and Overview Report

for your review. Thanks.

Please contact Hari (480)-222-5715, hari@jefuller.com if needed.

_____ _____

JE Fuller/Hydrology & Geomorphology, Inc. Date

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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480-839-2193 (fax)
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November 8, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

- **Sun Valley Area Drainage Master Plan** – Technical Data Notebook: Approximate Zone A Floodplain Delineation Study of White Tank Fans 10, 11, & 20
- **Sun Valley Area Drainage Master Plan** – Technical Data Notebook: Approximate Zone A Floodplain Delineation Study of White Tank Fans 3, 13, & 16
- **Sun Valley Area Drainage Master Plan** – Technical Data Notebook: Approximate Zone A Floodplain Delineation Study of White Tank Fans 4 & 5

The FCDMC review comments dated 11-03-06 and JEF responses for each TDN is included in Appendix B. Please forward these documents to Kathryn Gross for review.

Thank you.

11/08/06

JE Fuller/Hydrology & Geomorphology, Inc. Date

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November 27, 2006

TRANSMITTAL

Flood Control District of Maricopa County
Attn: Valerie A. Swick, E.I.T., P.H., CFM
2801 West Durango Street
Phoenix, Arizona 85009-6399
Phone: (602) 506-1501
Fax: (602) 506-4601

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc.:

Five (5) copies of the Sun Valley ADMP, Step 1, Alternatives Formulation and Preliminary Analysis Final Report

Valerie,

If you have any questions, please do not hesitate to call.

_____ _____

Jeffrey A. Despain, P.E. Date

Project Engineer

JE Fuller/Hydrology & Geomorphology, Inc.

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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December 5, 2006

TRANSMITTAL

Ms. Valerie Swick, E.I.T., P.H., CFM
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009

Attached are the following materials provided by JEFuller/ Hydrology & Geomorphology, Inc. for your review:

Sun Valley Area Drainage Master Plan:

- Three (3) copies of the Final Draft Step 3 Recommended Alternative, Volume 1, Executive Summary and Overview report incorporating comments from you, Mr. Holcomb, and the River Mechanics Branch.
- One (1) copy of our response to comments from Mr. Holcomb dated Nov. 19, 2006.
- One (1) copy of our revised response to comments from the River Mechanics Branch.
- Return of your redlined copy of the Nov. 2006 draft Volume 1 for your reference.

Please note the CDs mentioned in the table of contents are not included as the GIS files, etc. were previously supplied with the sub-area reports. If you require some electronic data such as a pdf of the revised Volume 1 report, please do not hesitate to ask. Also, Appendices A & B are intended to include Chuck Williams' Implementation and Maintenance Plan documents which he previously submitted for your review by email Nov. 20, and Nov. 26 respectively.

Also note that some of the responses indicate changes to be addressed via the sub-area report(s). We will be working on a final final draft revision of the Wagner sub-area report for your reference to those specific responses in the next couple of days.

Please let me know if you have any questions.

Ted Lehman, P.E.
Project Engineer

12/5/06
Date
JE Fuller/Hydrology & Geomorphology, Inc.

Memorandum **JE Fuller/ Hydrology & Geomorphology, Inc.**

DATE: Dec. 28, 2006

TO: Valerie Swick, FCDMC, SVADMP Project Manager

FROM: Ted Lehman, PE

RE: response to comments on **Sun Valley ADMP, Step 3 Recommended Alternative Report, Volume 1, Executive Summary and Overview** dated Dec. 28, 2006

CC: Jon Fuller, PE

This memo summarizes our response to the District's comments as dated above.

Our responses are provided along with the original comments (*in italics*) for easier reference.

The final deliverables reflect our responses where appropriate.

++

Page 12, 6th line down: *Instead of saying "detention basin depths limited to a maximum of 12 feet" say "detention basin* ***storage*** *depths limited to a maximum of 12 feet."*

Changed as suggested

Page 15: *The table needs to indicate that the costs are in millions of dollars.*

Row added to top of table indicating cost in millions.

Page 21, Section 2.3: *A contract does not authorize a study to occur; only a statute can authorized. Instead of saying authorized say conducted or some other similar word.*

Changed to read "performed for the FCDMC"

Page 21, Section 3.1, last line of second paragraph: *What constitutes a large flood? Do we have any frequency to this event? Can we say that in other parts of the Valley we had a 100-year event or something like that?*

We don't know the exact magnitude of the 1951 flood. The type of channel changes shown in the Figure referenced only occur during large floods.

Page 22, Photo: *Need to show direction of flow, north arrow, photo source. Where on Fan 36 is this area?*

Figure 9 was removed.

Page 24, 1st full paragraph: *The Alternatives B1 and B4-3 are referenced, we need to reference the Step 2 process and the Volume in which someone could find more details.*

Both the Step 1 and Step 2 reports are referenced on the previous paragraph and included in the reference list.

Page 25, Section 3.2, fourth line: *Delete the word "directly".*

Deleted

Page 26, Section 3.4: *There is no reference to the public meetings. We should at least mention the dates of the public meetings.*

Reference to the public meetings and their dates has been added to Section 3.4.

Page 27, Section 3.5.1, fifth line: *Starting with the full sentence it should read: "The Sun Valley ADMP area is outside the historic range and required survey area of the Pygmy owl." Delete the rest of the sentence.*

Changed as suggested.

Page 28, First paragraph: *If we are out of the historic range of the Pygmy owl, why do we still recommend performing a detailed study? Maybe we can add to the sentence "if indications are present". We don't want to do a detailed survey if it's not needed.*

The suggested addition has been made.

Page 28, Section 3.5.2, fourth line*: Don't we have an estimated amount of disturbance?*

Not to the 404 areas. No jurisdictional delineation has been comprehensively performed for the area (was removed by the District from the JEF contract). The text has been modified to clarify that the unknown disturbance area is the waters of the US.

Page 29, first paragraph: *Reference the map in Appendix C for locations of hazardous areas.*

Reference to the map has been added.

Page 32, Section 4.1, second paragraph: *Who are the Engineers that do not recommend a piecemeal approach?*

Most. The word 'generally' has been added. One could say good engineers.

Page 32, Section 4.1, third paragraph: *Is the recommendation of removing the stock tanks in conflict with environmental issues? Will we need to mitigate for any lost habitat?*

Environmental analysis was removed from the JEF contract and was performed by other consultants under direct contract to the District. That consultant's report does not address stock tank removal.

Page 33, second paragraph, Flood Warning: *Greg asks 'why are we suggesting a flood warning system when we have a structural solution.' I have a difference of opinion. Maybe we call it flood monitoring instead of flood warning.*

The structural measures do not address all of the potential flooding issues in the study area. Monitoring of the proposed structures should be considered a requirement of these facilities. A benefit is derived to the rest of the area in that the instrumentation can facilitate flood warning for the rest of the area. I don't believe Steve Waters or others at FCD generally make a big deal out of the distinction between monitoring and warning. Mostly it has to do with what one does with the information.

Page 36, Photo: *Photo needs date, location (which you already have), photo source.*

The photo is one of ours. We don't know the date except that it is less than two years old.

Page 41, first partial paragraph: *Why are we recommending removing all the stock tanks?*

As the text indicates, stock tanks are rarely engineered, are subject to failure, and cause problems as an area develops. The same issues occur throughout the county. The same suggestion has been made in other ADMPs because stock tanks don't belong in residential or commercial developments.

Page 43, Section 4.3.1.1: *Instead of giving an average depth give a max and min.*
The second paragraph references the required volume of storage to be 115 acre-feet but in the last paragraph 712 ac-ft of total excavation required. The excavation and backfill dirt volumes should be in cubic yards. Therefore there will not be confusion of comparing the 115 ac-ft of storage to 712 ac-ft excavated volume.

The depth reported is the effectively the minimum storage depth including freeboard. The "maximum depth" is provided by the height of the back slope provided in the description of each fan system. The depth is referred to as "average" to reflect the fact that the landscaped basin will actually undulate. The "average" depth will be changed to the "storage depth".

The excavated volume is larger than the storage volume due to the freeboard and slope of the terrain. Keeping the same units makes comparison of excavated and storage volumes easier in this table. Excavation quantities are reported in cubic yards elsewhere in the report (Table 8) and in the sub-area reports.

Page 45, last paragraph: *Again backfill and total excavation volume should be in cubic yards. And also include the max and min depth instead of average.*

See above. The max and min depth are reported.

Page 46, Section 4.3.2.2, first paragraph: *Use the number 10 instead of spelling it out. Backfill and total excavation volume should be in cubic yards. And also include the max and min depth instead of average.*

Ten changed to 10. See above.

Page 46, Section 4.3.2.3, first paragraph: *Use the number 8 instead of spelling it out. Backfill and total excavation volume should be in cubic yards. And also include the max and min depth instead of average.*

See above.

Page 47, Sections 4.3.2.4 and 4.3.2.5: *Backfill and total excavation volume should be in cubic yards.*

See above.

Page 48, first paragraph: *Question from Greg 'Does the first sentence indicate that sheet flow is allowed over the road?'*

Not necessarily. The constructed headwalls are generally 1 foot tall above the culvert soffett. Whether water sheets over the road or not will depend on the relationship of the road profile, the top of headwall, and the adjacent ground. It was assumed for all culverts that the headwall elevation would limit flow to under the roadway.

Page 50, Section 4.3.3.2, last paragraph: *Use the number 11 instead of spelling it out. Backfill and total excavation volume should be in cubic yards. And also include the max and min depth instead of average.*

Eleven changed to 11. See above.

Page 52, Section 4.3.4.2, first line: *Why is 286 acres of active fan set-aside area? We may want to include that this is the developer's design.*

You've answered your own question. The set aside area is needed with the given design. The text has been changed.

Page 57, First paragraph: *Delete first two sentences and just start with the third sentence.*

Done.

Page 58, First paragraph: *Greg does not agree that there is no cost to a non-structural solution. Maybe a line indicating that there is actually some cost due to devaluation of the property.*

We do not say there is or isn't a cost associated with a non-structural solution, only that no costs were assigned to its implementation. The hazard is there whether we do anything or not. The study only identified the hazard. "Devaluation" would be an incorrect portrayal.

Page 59: *Indicate depth of basin as max/min instead of average. Backfill and total excavation volume should be in cubic yards.*

See above.

Page 60, Section 5.1.1: *Make recommendation that more detailed mapping is needed for pre and final design.*

This section is only talking about the data used in the ADMP. Recommendations for better mapping are made in Section 10.

Page 61, Section 5.6: *Instead of saying that the structures are compatible state that they 'can be'. In stead of stating that the structural design is required in the last sentence say 'was done'.*

Changed.

Page 75, Section 5.7.2.1: *How is riprap-lined spillways contact sensitive?*

Selection of appropriate rock size, color, texture, and placement could result in context sensitive riprap, and hence lined spillways. Ultimately, stepped-boulder structures and riprap are basically the same thing.