

## MEMORANDUM

**TO:** Tim O'Halloran, General Manager  
**FROM:** Fran Borcalli, P.E., Program Manager  
**DATE:** March 12, 2008  
**SUBJECT:** floodSAFE Yolo – Justification for Work Plan Tasks Implementation

It was agreed during our PAC meeting on February 13, 2008, that I should prepare a statement of justification for tasks from our Work Plan that we have discussed for early implementation. The respective tasks as identified in our Work Plan Outline are as follows:

### **C. FLOOD EMERGENCY PREPAREDNESS**

#### Cache Creek

Task 1 Update Hydrology

Task 4 Obtain Regional Topographic Mapping

#### Sloughs, Canals, and Creeks

Task 1 Develop City-County Drainage Manual

Task 2 Update the YCFCWCD Hydrologic Model for the Willow Slough Watershed

The format used for presenting the justification for early implementation of the respective tasks is the same as that presented and discussed during our PAC meeting on January 6, 2008. A description of each task follows.

## **C. FLOOD EMERGENCY PREPAREDNESS**

### **Cache Creek**

#### **Task 1 Update Hydrology**

**Result:** To have the work product and a report that documents a reevaluation of the Cache Creek hydrology complete with runoff hydrographs for storm frequencies of recurrence ranging from 10-year to 500-year events with the statistical analyses and documented approval by the USACE and DWR.

The results of this work are essential and foundational for accomplishing the following:

- Analyzing the Cache Creek and Settling Basin levees by DWR under its Urban Levees Geotechnical Investigation.
- Performing detailed floodplain mapping by DWR under its Floodplain Evaluation and Delineation Program.
- Updating analyses and floodplain mapping for FEMA's NFIP.
- Determining zones of benefit or assessment districts for project and O and M funding.
- Preparing flood emergency preparedness maps and developing emergency preparedness protocols.
- Formulating and evaluating alternatives to mitigate flood risks associated with Cache Creek.
- Performing feasibility analyses for selected alternatives.
- Preparing designs and construction plans for the preferred project.
- Receiving grant funding as part of DWR's floodSAFE California Central Valley Flood Protection Plan and Congressional appropriations for projects to provide public safety and minimize property damage.

**Measure of Success:** The success of this work will be measured by completion of the analysis, preparation of the final report, and acceptance of the work by the USACE.

## MEMORANDUM

### Work Plan Tasks Justification

March 12, 2008

Page 3 of 9

**Relative Significance:** The results and approval of the reevaluation of the Cache Creek hydrology is critical to the formulation and evaluation of solutions to flood-related problems related to Cache Creek. In essence, this work will be the basis for spending several million dollars in investigative work and constructing facilities to minimize flood risks to the community.

**Description:** The preliminary analysis of the Cache Creek hydrology performed by David Ford Associates, shows runoff characteristics significantly different than the hydrology developed previously by the USACE, in terms of the peak and total storm volume. The results of this effort will be a set of flow hydrographs at County Road 94B that will be used for purposes stated above. The completed work will include an updated calibrated rainfall-runoff model and updated unregulated (no regulation by Indian Valley Dam) flow-frequency curves at Rumsey and Indian Valley Dam. The hydrologic analysis will be completed by David Ford Associates and will include documentation to facilitate review by DWR and the USACE.

**Budget:** The budget for completing the analysis of the Cache Creek hydrology is estimated at \$100,000.

**Duration:** It is anticipated that approximately six months will be required to complete the work.

**Schedule:** This work should be initiated as soon as possible.

#### **Task 4 Obtain Regional Topographic Mapping**

**Result:** To have detailed topographic mapping that would facilitate planning, floodplain mapping, flood hazard assessment, project feasibility studies, and design of projects to minimize flood risks and enhance environmental values. DWR is planning to develop detailed topographic mapping (1-foot contour interval) as part of its Floodplain Evaluation and Delineation Program for the Central Valley under floodSAFE California. As part of this program, a large part of Yolo County will be mapped. The opportunity may be available to “piggy back” on DWR’s work to obtain topographic mapping for the balance of the valley portion of Yolo County with the same level of detail.

The detailed topographic mapping covering the entire valley portion of Yolo County would facilitate the following:

- Performing hydraulic analyses and preparing detailed floodplain maps.
- Determining areas that would be appropriate to be maintained as a flood corridor thereby preserving open space.
- Issuing building permits to minimize future flood damage to property and infrastructure.
- Delineating zones of benefit for flood hazard mitigation projects.
- Formulating and investigating flood hazard mitigation plans.
- Preparing project designs and construction plans for flood hazard mitigation projects.

**Measure of Success:** The success of this work will be measured by executing an agreement with DWR’s LiDAR mapping and surveying contractors and receiving the completed topographic maps.

**Relative Significance:** The best available topographic mapping for the majority of the county is USGS Quadrangle Maps. These have been updated from time to time merely to reflect urbanization and roads, etc.; however, they have not been updated to reflect the extensive changes in land form that has occurred in the county. The availability of detailed topographic mapping will be extremely beneficial for local, state, and federal agencies doing work in the county and will be very useful to citizens of the county as well. Project planning is handicapped today due to the lack of up-to-date and detailed topographic mapping. The work product from the task will facilitate planning and design and advance

## MEMORANDUM

### Work Plan Tasks Justification

March 12, 2008

Page 5 of 9

implementing work that is “stymied” because it lacks data and information that will be made available through this task.

**Description:** The work to be performed by DWR directly and for the county is to adhere to a very tight specification. DWR was delayed in executing contracts for capturing the LiDAR data; however, the best available techniques will be employed to rectify areas where tree leaf-out and grass may be an impediment. The specification for the mapping and surveying is available. Aerial imagery will be provided for the same area for which topographic mapping is developed. (If anyone wants copies of these documents, please let me know.)

**Budget:** The work would be performed in essentially two phases, the data acquisition and post-processing phases. The work would be performed by Photo Science for the aerial data acquisition and post-data processing and Wood Rodgers for setting targets for the aerial imagery and the ground control and base station monitoring for the LiDAR operation, and the ground surveys for the QC/QA. The estimated cost for both the data acquisition and post-data processing is \$60,000 that would be split equally for each phase. In approximate terms, the data acquisition would be approximately \$25,000 for Photo Science and \$5,000 for Wood Rodgers, and the data processing would be approximately \$20,000 for Photo Science and \$10,000 for Wood Rodgers. Accordingly, the data acquisition would be approximately \$30,000 and the post-data processing to develop the final work product would be approximately \$30,000.

**Duration:** The data capture is to be performed within a period of 30 days. The post processing may require three to four months.

**Schedule:** It is anticipated that DWR will issue a Notice-to-Proceed shortly. In order for the respective contractors to incorporate the additional work into their flight plans and survey missions a decision is needed immediately.

### **Sloughs, Canals, and Creeks**

#### **Task 1 Develop City-County Drainage Manual**

**Result:** To have a document that provides the guidelines for consistency in criteria and methodology for hydrologic and hydraulic analyses associated with storm runoff throughout the county.

The results of this work are essential to accomplish the following:

- Developing updated design rainfall (depth/duration/frequency and distribution patterns) for use throughout the county.
- Developing rainfall-runoff parameters and methodology that are consistent between rural and urban areas.
- Developing criteria for addressing storm water quality in a consistent manner between urban and urbanizing areas.
- Developing criteria for sizing hydraulic structures associated with roads and other infrastructure affecting storm runoff.
- Developing hydrologic and hydraulic design criteria and guidelines for sloughs, creeks, and other anticipated types of storm drainage facilities, including direction for conveyance (peak) and storage (volume) design considerations.

**Measure of Success:** The success of this work will be measured by the acceptance and “buy-in” of criteria and guidelines by the cities and county and other jurisdictions in the county that deal with storm drainage.

**Relative Significance:** Currently the criteria and approach of the cities and county for handling storm drainage are not consistent and in some cases the criteria in relation to design rainfall is outdated. It is critical, especially for newly planned or urbanizing areas, to develop criteria to guide the development community rather than reacting to what the development community determines is suitable. With the passage of SB 5 in 2007, the cities must amend their General Plan by July 2015, to provide for 200-year level of protection and have facilities in place to provide that protection by 2025. This is particularly relevant to storm runoff originating outside the urban areas. Having consistency in handling storm runoff in the watersheds contributing runoff to urban areas will be critical in this regard.

## MEMORANDUM

### Work Plan Tasks Justification

March 12, 2008

Page 7 of 9

**Description:** The execution of this work should be accomplished with a technical committee comprised of representatives of the PAC and other cities agencies within the county that typically deal with storm runoff, such as the Natural Resource Conservation District and Resource Conservation District. The design rainfall will be updated through 2007, with new rainfall depths/duration recurrences established. The application of rainfall within the watersheds and orographic affects, storm centering, and rainfall distribution patterns for different storm durations will be addressed for application in the watersheds in western Yolo County. Rainfall patterns for both short- and long-duration events will be developed.

**Budget:** The budget for this work is estimated at \$100,000.

**Duration:** The time to develop a draft manual is approximately five months.

**Schedule:** This work is a prerequisite for many tasks comprising the Work Plan for floodSAFE Yolo and should be initiated as early as possible.

## **Task 2 Update the YCFCWCD Hydrologic Model for the Willow Slough Watershed**

**Results:** To have an updated HEC-HMS rainfall-runoff model with documentation for the Willow Slough watershed that encompasses most of the land in the county west of the Yolo Bypass between Cache Creek and Putah Creek.

The results of this work are essential for the following

- Evaluating and designing facilities impacting storm runoff in the watershed and subwatersheds and for assessing impacts from proposed projects and formulating mitigation measures in advance of implementing projects.
- Formulating flood hazard/emergency preparedness programs.
- Performing detailed floodplain evaluation and delineation to facilitate sound land use decisions.
- Enhancing DWR's evaluation of the Willow Slough Bypass levees as part of its Urban Levees Geotechnical Investigation.
- Determining the existing levels of protection and facilitating compliance of the cities of Davis, Winters, and Woodland with the provisions of SB 5 in relation to providing a 200-year level of protection.
- Developing guidelines for channel maintenance.
- Facilitating a discussion with Caltrans regarding hydraulic impacts associated with interstate and state highways in the county.

**Measure of Success:** The success of this work will be the completion of the updated model and the documentation to facilitate its use and application.

**Relative Significance:** The District's existing HEC-1 hydrologic model for the Willow-Slough watershed, developed in 1992, has been used extensively for floodplain mapping by FEMA, the preparation of storm drainage master plans, and floodplain analyses particularly in the vicinity of Davis, Winters, the Yolo County Airport, and the communities of Esparto and Madison. This tool is even more important today to address flood management issues in this watershed area; however, the model needs to be updated consistent with the proposed City-County Drainage Manual.

**Description:** The updated hydrologic model will allow for more subwatershed-specific analyses as well as a more integrated approach to conditions that affect the entire



## MEMORANDUM

### Work Plan Tasks Justification

March 12, 2008

Page 9 of 9

watershed, particularly where overflows and interconnected floodplains are driven by storm volume and timing.

**Budget:** It is estimated that the cost to update the model and provide the documentation will be in the order of \$40,000 to \$50,000.

**Duration:** This work would require approximately three months to complete.

**Schedule:** This work should be initiated as soon as the proposed City-County Drainage Manual is adopted as the design rainfall and design parameters will be incorporated into the updated model.