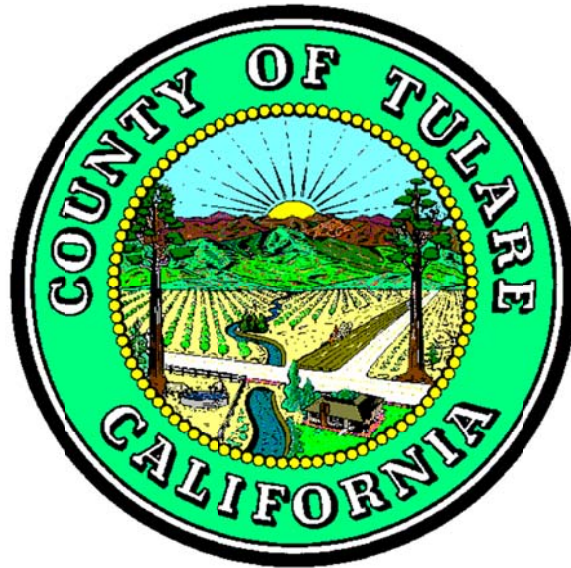


County of Tulare Flood Control District

Flood Control Action Plan 2015-2016



Flood Control Action Plan 2015/2016

INTRODUCTION

County Topography

The Topography of Tulare County can be generally divided into three regions. The Eastern region consists of High Sierra Mountains, substantially covered in forest with minimal development and improved structures. Drainage basins are typically natural and uncontrolled. Flooding is not typically an issue here, as precipitation generally falls in the form of snow during the winter months. Flows from drainage areas with origins in the Eastern region are generally controlled through either of the two major dams in Tulare County operated by the US Army Corps of Engineers – Terminus Dam on the Kaweah River and Success Dam on the Tule River.

The Central region runs along the foothill area of the County at elevations from approximately 500 feet to 2,000 feet. This region includes a few smaller communities and dispersed residential and ranching operations. The majority precipitation with potential to cause flooding falls within the Central region during storm events. Drainage basins with origins in the foothills are typically uncontrolled and subject to high intensity rain events.

The Western region of Tulare County is generally flat with substantial urban and rural development. The terrain is predominantly covered in agricultural and industrial uses. Natural water flows have been dramatically altered through the development of irrigation channels, grading operations, privately owned flood control ditches and berms, and roadway networks. Many of these facilities have been developed on a private, individual or ad-hoc basis, or without consideration for potential flood control ramifications. The southern portion of the Western region of Tulare County forms a portion of the Tulare Lake Basin. The Tulare Lake Basin is an endorheic basin with no outflow to other bodies of water. During normal rain events, storm water is typically dispersed within the drainage areas through percolation to groundwater, discharge to natural riverine systems, collection and conveyance through irrigation ditches, retention in flood control basins, and evaporation. During abnormal, high intensity rain events, these storm water dispersal methods are overcome and there is a potential for flooding events.

County Climate and Hydrology

The Western and Central Tulare County regions are the focus of this report due to their somewhat similar climate patterns and lack of direct flood influence caused by winter snowfall. Average annual rainfall in the lower elevations of Tulare County ranges from around 7-inches in the extreme southwest to around 15-inches in the northern Central region. Rain events typically occur between mid-October and April, with limited rainfall during the remaining portion of the year. Storm events are frequently moderate in intensity with over 1-inch of rain per hour. Less frequent storm events – 100 year storms – can be as high as 3-inches of rainfall per hour. Storm cells are generally localized and focused over unique drainage areas, and flooding has historically occurred in limited regions of the County during a particular storm event.

Tulare County Flood Control District

The highest potential for flooding issues in the Western region of Tulare County occur when a storm cycle has produced multiple storm events aimed at the same drainage basin. These multiple storm events will saturate topsoil and reduce the effects of percolation. As smaller drainage basins merge, and waters move westerly, the flows increase. Due to the vast size of the county, high water levels may not be seen in particular western streams, rivers, and channels until 12 to 36 hours after a rain event in the foothills.

Storm water runoff from high intensity rain events in the foothills flows down gradient and collects in streams, rivers, and ditches that cannot fully accommodate the quantity of water when the terrain flattens out as the waters move west. The reduction in slope of the terrain was historically accommodated by the rivers and streams carrying the storm waters naturally fanning out and creating multiple channels in which the floodwaters could flow. The development of agricultural activities, irrigation facilities, and urban development has disturbed these natural, multi-branched flows of water. During normal storm events, the man-made improvements are capable of handling the flows of waters. Due to the high cost, both in terms of dollars and in reductions to useable land, development has historically occurred in a manner that accommodates normal precipitation, but does not allow for unusually high intensity rain events.

The Federal Emergency Management Agency (FEMA) prepares and updates Flood Maps that show the areas likely to flood during the 100-year storm (a storm with a 1% chance of occurrence – FEMA “A” zone) and a 500-year storm (a storm with a 0.2% chance of occurrence – FEMA “B” zone). See the attached ***Exhibit – County Flood Plain Map***. The County generally prohibits construction of structures within an identified floodway (area associated with a riverine system) and regulates the construction of structures within a FEMA “A” zone. Many agricultural grading activities are not subject to regulation, and thus can have the potential to impact the flood prone areas within the County.

Tulare County Flood Control District

The Tulare County Flood Control District (District) is an independent Special District with powers established under "Tulare County Flood Control District Act." 1969 Cal. Stat. 2218; Cal. Water Code App. § 111-1 (West 1999). The County Board of Supervisors acts as the governing board of the District and appoints a seven member Commission to provide operational oversight of the District. The Resource Management Agency (RMA) is responsible for the operations and management of the District. The District boundary includes all unincorporated areas of Tulare County.

Duties of the District include:

- Planning, designing, constructing and maintaining flood control projects within the District;
- Coordinating with Federal and State flood control agencies;
- Maintaining channels, pumps, and ponding basins;
- Administering the FEMA National Flood Insurance Program in Tulare County; and
- Providing flood zone information and performing flood control investigations.

Flood Control District Budget

Revenue for the District is collected through an annual ad valorem assessment on all taxable property within the District to pay for general administrative costs and to carry out purposes of general benefit. The

current budget for FY 2016 includes a revenue of approximately \$575,000, expenditures of approximately \$188,000 with a cash amount of \$4 million as of 8/19/2015. This does not include a separate \$761,000 cash reserve for the Success Reservoir Enlargement Project.

Currently, RMA staff from Public Works Management Group III oversees the administration and management of the District. Maintenance and operations activities are performed by County Roads Crew personnel from Management Group I. Future flood control improvement projects are proposed to be contracted out for construction.

The District currently operates and maintains a network of 28 flood control pumps and nearly 70 storm water retention basins throughout the County. See the attached ***Exhibit – Flood Control Pump Map***. The District does not own or operate any notable storm water drainage ditches, channels or waterways. The majority of the storm water conveyance systems utilize natural streams and rivers located on private property or in channels that have been established for irrigation purposes and are owned/operated by Irrigation Districts, ditch companies, or private landowners. While the District does have authority to perform maintenance on natural streams and rivers (subject to landowner consent). Historically channel clearing operations performed by the District have been limited to confluence areas at bridges and culverts near roadways (within 300-feet). Flood prevention measures within the more isolated areas of streams and rivers have historically been performed by the owners of the property over which the waters flow.

Regulatory Oversight and Separate Outside Agency Authority

All aspects of water within the state of California are highly regulated by numerous Federal, State, and Local entities. All with separate mandates and interests. Some of these agencies and districts have authority to construct flood control projects, or projects that have the potential to impact flood waters throughout the County. Some of these agencies and districts are listed below:

- **Central Valley Flood Protection Board** – Established to reduce the risk of catastrophic flooding to people and property within the California central valley. The CVFPB regulates development and activities along certain waterways within Tulare County. This includes: The Kings River, Cottonwood Creek, Sand Creek, and others.
- **US Army Corps of Engineers** – The Corps owns and operates the flood control facilities of Terminus dam at Kaweah Lake, and Success dam and lake. Depending on the scope of work within a waterway determined to be under the jurisdiction of the Corps, a 404 permit may be required for the placement of fill or dredged material within the waters.
- **Kaweah Delta Water Conservation District** – Established for the purpose of conserving and storing waters of the Kaweah River and for conserving and protecting the underground waters of the Kaweah Delta.
- **Irrigation Districts** – These Districts cover a majority of the agricultural areas within the Western region of Tulare County. While they were established for the purpose of providing irrigation water, many of their conveyance facilities (channels, pipes, ditches, etc.) serve as a method to divert flood waters.
- **California Department of Fish and Wildlife** – CDFW has regulatory oversight over any river stream or lake (both perennial and episodic). A Streambed Alteration Agreement may be required for any

action that would: divert waters; change or use material from the bed, channel, or bank; or deposit debris that could pass into any river, stream, or lake.

- **US Environmental Protection Agency** – Depending on the Scope of the work within the waterway or wetland, The US EPA may require a 401 Certification (permit) in regards to water quality.

STORM SEASON PREPARATION

Preparation for upcoming storm seasons can be divided into two main categories. The first category is larger scale improvement projects that will serve as long term flood control protection facilities. The second category is considered annual maintenance that occurs every year prior to the storm season.

Flood Control Infrastructure Improvements

As part of the Tulare County Flood Control District, under the direction of the Flood Control Commission RMA staff analyzed flood prone areas throughout the County, and prepared conceptual projects at 14 locations. See the attached **Exhibit – Flood Control Projects**. Of these 14 projects the Flood Control Commission and Board directed staff to proceed with the design and implementation upon receipt of possible grant funding of the first three projects. These projects are:

Juvenile Detention Facility – Cottonwood Creek

Scope : The proposed Cottonwood Creek Realignment project will consist of realigning about 6,300 feet of the creek to near its original alignment. The reconstructed channel will have a 40-foot wide bottom with 3:1 (H:V) bank slopes. The bottom of the channel will be about 5 to 6 feet below the surrounding natural grade. Berms will be constructed above grade to produce the final south bank height of 12 feet and north bank height of 6.5 feet. The project will also include 5 to 6-foot high berms along the west, south, and east sides of the County road maintenance sand pit and the east and south sides of road-mix preparation pad. This project is developed to provide flood protection for the County's Juvenile Detention Facility and Records Storage Facility located north of Avenue 368.

Estimate and Budget: The Preliminary Cost estimate for this project is approximately \$1.5 million dollars. Based on previous direction from the Board of Supervisors, this project is not included in the current FY16 budget for the Flood Control District. RMA staff has been exploring grant opportunities as a potential source of funding for the project.

Status: The design of this project is 90% completed and can be quickly finalized for advertisement and bidding. Property acquisition is not an issue, as the entire project is located on County owned property. The environmental (CEQA) clearance and permitting with CDFW has been completed.

Schedule (proposed): Staff is prepared to complete the PS&E package by September 10, 2015. Construction could be started as soon as January 2016. However, construction during the rainy season introduces tremendous risk to washout, potential for monetary citations for permit infractions caused by discharge of sediment to the storm water, and increased construction costs due to construction during the rainy season. Therefore, it is recommended that construction take place during the summer and fall, and be completed prior to the rainy season.

Alternative: An alternative to the full JDF-Cottonwood Creek re-alignment project has been developed for short term flood protection mitigation. This alternative includes constructing a temporary berm located immediately south of the existing Cottonwood Creek channel. See attached ***Exhibit – JDF Interim Project***. This berm, in conjunction with a new berm located around the County sand pit to the northeast of the JDF and the existing berm system located immediately north of the JDF and records facility would provide adequate flood protection for reasonably anticipated floodwaters along the Cottonwood Creek. This alternative could be completed by County forces prior to October 2015, and would cost approximately \$150,000.

Seville Sontag Ditch

Scope: The proposed project will consist of constructing a new 24-inch culvert pipe with canal gate from Sontag Ditch on the north side of SR 201 to an existing junction box constructed with the Stone Corral Watershed Project by SCS in 1978. The project will also include the construction of a new 24-inch culvert pipe with a canal gate from Sontag Ditch on the south side of SR 201 to daylight into the Stone Corral Ditch on the east side of Sontag Ditch. The purpose of this project is intended to direct high flows from Sontag Ditch to the Stone Corral Ditch during heavy rain events. The diverted water will flow into Stone Corral Irrigation District's detention basin located approximately 2 miles to the south, just north of Cottonwood Creek, therefore, alleviating flooding in the Seville area.

Estimate and Budget: The Preliminary Cost estimate for this project is approximately \$78,000 dollars. Based on previous direction from the Board of Supervisors, this project is not included in the current FY16 budget for the Flood Control District. RMA staff has been exploring grant opportunities as a potential source of funding for the project.

Status: The design of this project is 98% completed and can be quickly finalized for construction. Two pipeline easements are required prior to construction. Staff is currently making efforts to secure these easements. The environmental (CEQA) clearance and permitting with CDFW has been completed.

Schedule (proposed): Staff is prepared to complete the PS&E package by September 10, 2015. It is expected that the pipeline easements will be in place by January 2016 and Construction could be started immediately thereafter to be completed by March 2016. However, construction during the rainy season introduces moderate risk to washout, and increased construction costs due to construction during the rainy season. Therefore, it is recommended that construction take place during the summer and fall, and be completed prior to the rainy season.

Yettem Button Ditch

Scope: The proposed project will consist of constructing a new culvert crossing SR 201 in Yettem for the Button Ditch (owned by Alta Irrigation District). The project will also include a roadside ditch along Road 144, three culvert road crossings and ultimately a discharge into Cottonwood Creek. The purpose of this project is intended to direct high flows from the Button Ditch away from the community of Yettem into Cottonwood Creek during heavy rain events.

Estimate and Budget: The Preliminary Cost estimate for this project is approximately \$250,000 dollars. Based on previous direction from the Board of Supervisors, this project is not included in the

current FY16 budget for the Flood Control District. RMA staff has been exploring grant opportunities as a potential source of funding for the project.

Status: The design of this project is 20% completed and can be finalized for construction by March of 2016. The environmental (CEQA) clearance and permitting with CDFW has been completed. An encroachment permit would be required from Caltrans for the culvert crossing of SR 201 and an agreement with Alta Irrigation District would be required to construct a facility within their ditch property.

Schedule (proposed): Staff is prepared to complete the PS&E package by March, 2016. It is expected that the encroachment permits will be in place by March 2016 and Construction could be started immediately thereafter to be completed by July 2016.

Annual Maintenance

RMA staff performs annual maintenance throughout the County in preparation for the storm season. This reoccurring inspection and repair procedure ensures that the County's flood control facilities are fully operational and prepared for potential rain events. The following is a description of the activities that RMA staff consisting of personnel from Public Works Management Groups I and III perform prior to the rain season.

Potential Flood Hazard Areas (Hot Spots)

Through a systematic analysis of Countywide facilities, RMA staff has identified certain locations that have historically been problem areas where flooding has, or is likely, to occur. These locations were identified as part of a County Flood Risk Assessment. See attached **Exhibit – Flood Hazard Location Map** and **Exhibit – Flood Control Risk Assessment** for more detail on the locations of the "Hot Spots" and a description of the situation and mitigation efforts. Public Works operations staff from Management Group I survey these locations prior to and during storm events to ensure that the facilities, infrastructure and equipment in these locations is fully functional. If during this pre-storm inspection, inadequacies or problems are identified (for example, if shrubs and debris are noted clogging a culvert or bridge) actions are taken to repair the facility.

Flood Basin Inspections and Maintenance

The Tulare County Flood Control District maintains nearly 70 flood control basins located throughout the County. These are typically located in the community areas and provide retention facilities for storm water runoff from the roadway and residential subdivisions. These basins require maintenance that includes weed abatement, fence repair, and drainage inlet flushing. RMA staff coordinates with the County Probation Department and Management Group I operations staff to maintain these basins throughout the year. County Encroachment Permit Inspectors are trained to visit, inspect and report basin deficiencies throughout the course of their daily inspections around the county.

Constructed Conveyance Inspections and Maintenance (Pipes, Culverts Drain Inlets, Pumps etc.)

The County maintains a network of 28 permanently located flood control pumps. These pumps are shown on **Exhibit – Flood Control Pump Map**. Prior to the storm season, County operations staff from Management Group I inspect and cycle these flood control pumps to ensure functionality. The basins and

channels within the immediate proximity of the pumps are cleared of shrubs and debris to minimize potential blockage during operation. If required, staff contracts with local pump repair contractors to service the equipment.

As part of the 3,000 plus miles of the County roadway system, numerous bridges and culverts have been constructed over and across rivers, streams, channels, ditches, and floodplains. These culverts and bridges are shown on ***Exhibit – Tulare County Structures Map***. County operations staff from Management Group I inspect these culverts and bridges in preparation for storm events. The annual inspection is typically performed by the Roads District Supervisor or delegated staff. Inspectors look for damage to the bridge or culvert, shrubs, overgrowth or debris that could potentially cause blockages, blocked culverts, and any other facilities that could be impacted by the rain event, or is not fully functional.

Channel Clearing Efforts

As shown on the Exhibit – Culvert and Bridge Map, numerous County roads cross rivers, streams, channels and ditches. The Public Works Management Group I operations staff currently inspects and clears channels that may cause flood damage to these bridges and culverts. This clearing activity within a streambed requires a permit with the CDFW. Current permits and operational policy directs staff to limit channel clearing activities to 300-feet upstream and downstream of the culvert or bridge.

The Tulare County Flood Control District has the authority through its originating documents to clear channels for flood control purposes. There are however significant barriers to performing any substantial channel clearing. These barriers include:

- **Environmental Permitting** – CDFW imposes strict regulations for any work occurring in or near a streambed. These permits can limit work allowed within the streambed and the timing of the work allowed. In general, CDFW Streambed Alteration Agreements are developed to retain and protect existing flora and fauna, which is directly in conflict with the goal of the channel clearing efforts.
- **Access to Private Properties** – Despite the authority to clear channels, the District does not have permissive rights to enter properties to perform such duties. It can be burdensome to obtain permission to enter from property owners. Many of the channels utilized for flood control are operated or maintained by Irrigation Districts. These districts typically perform their own maintenance activities, or they may have other restrictions that limit clearing activities.
- **Budgetary and Staff Resources** – The Tulare County Flood Control District currently has revenues of approximately \$500,000 per year. A typical moderately sized clearing project at one location could cost nearly that much. This does not leave any remaining budget for other flood projects or funds for staff administration costs. The Flood Control District does not own any equipment or have any full time employees dedicated to it. RMA operations personnel from Management Groups I and III provide services on an as needed basis. However, this time is limited due to resource needs from other divisions within RMA.

Contingency Planning for RMA Construction Projects (Non-Flood Control Projects)

Inclement weather can often be a hindrance to the successful completion of construction projects. The first step to avoiding weather issues is to schedule projects when there is the least chance for weather to interfere. This unfortunately is not always an option due to planning and budgeting constraints. Therefore, creating a good working relationship and constant coordination with the contractor becomes the key factor to avoiding delays caused by rain or other mitigating circumstances. Prior to the start of any project the contractors are required to submit their construction baseline schedule. Careful analysis of this schedule is a vital step in identifying stages of work that are most susceptible to damage or delay caused by rain or other inclement weather. The review process allows the opportunity to adjust weather sensitive operations to a more suitable time if possible. Examples of these operations can include but are not limited to exposing roadway subgrades during wet weather or planning paving operations during cold or rainy times of year. Bridge projects require special consideration due to work being performed within waterways and river channels. These special considerations can include work restrictions by other agencies, varying water levels, stream diversion plans and increased environmental sensitivity.

Scheduling and cooperation with the contractor are crucial in avoiding risks and delays. Planning the work so that those operations most effected by poor weather are performed during the milder months is ideal. Since this is not always practical, the process of reviewing, monitoring and implementing the contractors storm water pollution prevention plan (S.W.P.P.P.) or water pollution control program (W.P.C.P.) and best management practices (B.M.P.'s) is of great importance. The proper implementation of these plans is the first line of defense against flooding and erosion caused by heavy precipitation. Included in each contract is the ability on the part of the engineer to grant the contractor "non-working days caused by weather" this allows the contractor to suspend work on a daily basis if the weather requires, without the risk of losing time to complete the project. Ultimately it is the responsibility of the contractor to plan for and perform the work in such a manner that inclement weather has the least possible impact. However, in extraordinary situations the best way to avoid risk may be to postpone operations. In these instances a temporary suspension of the project as ordered by the engineer may be required; this is not preferable as it may incur additional compensation due to the contractor.

READINESS

In preparation for flood events, RMA Public Works staff has undertaken a number of actions to develop a team based approach to be able to understand the County areas most likely to experience flooding, have response plans in place, and know who to coordinate with in the event of emergencies.

Response Team

RMA closely coordinates flood response between Management Groups I and III. MG I is typically responsible for all on-site response to flood hazards. MG I has access to the crews, equipment and operational knowledge required for all "in the field" responses. During major storm events, MG III serves as backup to MG I and provides "in office" administration assistance for coordination of the response.

As flood control situations increase in scale, external agencies (CAO, OES, Fire, Sherriff, FEMA, Cities, etc.) are contacted and utilized for response.

Material and Equipment Preparation

As part of the annual maintenance efforts, Public Works staff checks and services the equipment that may be required during flood control emergency operations. Each road yard is equipped with at least one diesel powered mobile standby pump.

At the beginning of the rain season, The County Purchasing office is responsible for coordinating the procurement of sand and canvas sandbags. These materials are distributed to various road yards and other central County locations for use by the public during flood events.

Public Works staff will prepare two pallets of sandbags to be strategically located at County Facilities that have previous history of flooding (Juvenile Detention Facility, Records Storage Facility).

Prepare and Update Risk Assessment

A County wide Flood Control Risk Assessment has been prepared and will be updated annually. This risk assessment identifies areas throughout the County that have a history of requiring flood control response. The level of response varies from a simple road closure to significant pumping and construction of earthen berms. The results of this assessment are shown on the attached ***Exhibit – Flood Hazard Location Map*** and ***Exhibit – Flood Control Risk Assessment***. As critical as the assessment, measures to mitigate the specific risk at each location are clearly identified. This allows County staff to be prepared to quickly respond to these specific flood “hot spots”.

RESPONSE

Established Roles Utilizing Standardized Emergency Management System (SEMS)

Coordination between responders is a key aspect of successful response in any emergency situation. Numerous County Agencies and outside resources may become involved in a flood fighting situation depending upon the severity of the flooding. County responders are trained in SEMS and the associated Incident Command System (ICS) to establish roles and responsibilities during a mutual aid situation. Prior to and during flood events, RMA staff works closely with County Office of Emergency Services, Fire Department and Sheriff’s Department to coordinate a response. For smaller scale flood issues that can be handled fully by RMA staff, the ICS structure is utilized and the Operations Section Chief leads on the ground flood response as described below.

Develop Operational Response Plan

The Operations Section Chief – in this case, the Chief Engineer of Management Group I has developed a Flood Hazard Emergency Response Protocol. See attached ***Exhibit – Flood Hazard Emergency Response Protocol***. This plan identifies the roles and responsibilities of staff and outlines the steps taken during a flooding event. As the emergency event becomes larger or includes more than flooding, additional

resources are necessary and the County Emergency Operations Center may become activated. Through the ICS system, transition of authority can be exchanged seamlessly from within RMA to a higher authority.

Develop Notification Protocol

RMA is the process of developing a Flood Event notification protocol to be maintained by the Public Information Officer as directed by the Incident Commander per the ICS structure. This protocol will include the dissemination of information to both internal and external stakeholders. An outline of the Notification Protocol is shown below:

- a. Internal (County) Notification
 - i. Limited access blog for Directors, CAO, BOS, Sherriff, Fire, OES,
 - ii. Direct contact information and provide point of contact (PIO)
- b. External Agency Notification
 - i. Direct contact info for supporting agencies (FEMA, Army Corps, Cities, Irrigation Districts etc.)
- c. Public Notification
 - i. AlertTC
 - ii. Media Contacts through PIO
 - iii. Establish Flood Control Hotline as necessary