CHAPTER 10
EMERGENCY WORK

10.1 EMERGENCY RESPONSE

DESCRIPTION

County roads and maintenance crews must respond quickly to fix damage to roadways and structures caused by storms, floods, and other events. Typical emergency response activities include: storm damage patrol; debris removal; emergency opening or closing of a road; and repairs to roads, slopes, and drainage facilities. County roads crews need to plan for emergency response scenarios to *protect the public* and ensure that appropriate measures are employed to *protect the environment*.

Emergency is defined by our regulatory agencies as:

"A situation which would result in an unacceptable hazard to life, a significant loss of property, or an immediate, unforeseen, and significant economic hardship if corrective action requiring a permit is not undertaken within a time period less than the normal time needed to process the application under standard." (COE Regulations);

"A situation involving an act of God, disasters, casualties, national defense or security emergencies, etc., and includes response activities that must be taken to prevent imminent loss of human life or property." (ESA rules, 50 CFR 402.05); and

"A sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property or essential public services. Emergency includes such occurrences as fire, flood, earthquake, or other soil or geologic movements, as well as such occurrences as riot, accident, or sabotage." (CEQA 15359).

ENVIRONMENTAL CONCERNS

- ✓ Discharge of sediment, organic material, and other potential pollutants to streams, watercourses, or storm water drainage systems.
- ✓ Alteration of stream channels or destruction of riparian or aquatic habitat.
- ✓ Creation of a barrier to fish passage.

BMP OBJECTIVES

- ✓ Prioritize maintenance for problematic areas to keep them from becoming an emergency.
- ✓ Reduce the amount of road-related and hillslope materials entering storm drain inlets and watercourses.
- ✓ Decrease or prevent sediment delivery to storm drains inlets and watercourses.
- ✓ Prevent the entry of spills into storm drains inlets and watercourses.

BEST MANAGEMENT PRACTICES

1) Temporarily store materials (e.g. spoils) where they will not enter a stream or watercourse, and permanently store or dispose of materials according to *Chapter 7.3-Spoils Handling and Disposal*.

2) Prepare emergency action plans and provide training for crews for their role in various emergency response scenarios that include steps to:
    - inspect and assess the site for potential hazards to workers, public safety and the environment,
    - notify the appropriate public safety officials,
    - notify appropriate agencies (contact numbers are listed in the table on page 10-6), and
    - respond to emergencies in a safe manner.

DANGER: Notify the County Office of Emergency Services, or the State Office of Emergency Services (OES) at 800-852-7550, or the local fire department when a hazardous materials spill occurs.

3) When an emergency situation is significantly impacting, or could impact, a stream system (for example, if the natural flow of a watercourse is disrupted by a large flood or landslide), seek the advice of appropriate experts prior to performing permanent repair work, which may include:
    - Engineering, environmental and planning staff
    - Agency personnel (DFG, NMFS, RWQCB)
    - Hydrologists or Hydraulic Engineers
    - Geologists
    - Geomorphologists
    - Geotechnical Engineers
    - Fisheries and Wildlife Biologists

4) When an emergency involves the discharge of hazardous substances or pollutants, implement Water Management BMPs and Sediment Management BMPs to contain pollutants and prevent them from entering drainage systems, streams, or watercourses.

5) During an emergency response that involves erosion, slope failure or embankment failure, implement Sediment Control BMPs to control the discharge of sediment, and Erosion Control BMPs or Streambank Protection BMPs to prevent further damage and, if possible, restore the damaged area. In addition, Water Management BMPs should be implemented as needed to keep runoff from entering or leaving the repair area. Refer to *Chapter 7.1-Erosion Control* and *Ch. 6.4- Streambank Stabilization* for additional information. Remedial actions should include biotechnical designs where practicable.

6) Use the following guidelines for modification or removal of large woody debris under emergency conditions:

    - If in doubt as to the best way to handle large woody debris in a stream, consult with DFG personnel.

- Log jams on public property that are damaging or immediately threatening the integrity of roads, bridges, culverts and other public facilities or private developments during high flows may be modified to reduce or halt damage and direct flow toward a more desirable path.

- Consider opportunities to ***modify*** the debris jam to halt damage and direct flow toward a more desirable path.. Only remove (as opposed to modify) logs and debris from streams as a "last resort" (i.e. failure to remove them will certainly cause damage to an essential county facility).

- Take precautions to ensure that modifications of log or debris jams will not cause damage downstream to culverts and other structures.

- When modifying log jams, leave trees, logs and/or stumps in the longest lengths and diameters practicable for removal and hauling. If logs must be cut from fallen trees, leave as much as possible of the main trunk (12 feet plus is desirable) attached to the rootball and only cut branches obstructing flow.

- Limit modifications or removal to materials higher than approximately 2 feet above the streambed (i.e. above knee height) to preserve some instream habitat features, unless the log or debris jam is immediately upstream of a culvert or bridge, or if permit conditions require otherwise.

- Incorporate large woody debris removed from water bodies into streambank repairs or cribbing at a nearby location, or transport to an approved storage site for later use.

- Non-emergency debris maintenance can only be undertaken after the appropriate agency permits have been obtained. Refer to the permits section below for additional details.

7) Emergency repairs should be thoroughly inspected after the emergency is over, and final repairs should be made using the appropriate Upslope Erosion Control BMPs or Streambank Protection BMPs. Remedial actions should include biotechnical designs where practicable.

8) Photo-document emergency actions for after-the-fact consultations.

9) Document all BMPs, including use of a biological monitor, that are completed as part of emergency actions for after-the-fact consultations.

AGENCY CONTACT INFORMATION FOR EMERGENCY NOTIFICATION

Agency Contact	Sonoma	Marin	San Mateo	Santa Cruz	Monterey
Department of Fish and Game Streambed Alteration Program					
Bay Delta Headquarters Yountville, CA (707) 944-5520	X	X	X	X	
Central Region Headquarters Fresno, CA (559) 243-4005					X
U.S. Army Corps of Engineers Regulatory Branch					
San Francisco District San Francisco, CA (415) 503-6795	X	X	X	X	X
Regional Water Quality Control Board 401 Certification					
North Coast RWQCB Santa Rosa, CA (707) 576-2220	X				
San Francisco Bay RWQCB Oakland, CA (510) 622-2300		X	X		
Central Coast RWQCB San Luis Obispo, CA (805) 549-3147				X	X
NOAA Fisheries Northern CA Habitat Coordinator					
Southwest Region Santa Rosa, CA (707) 575-6050	X	X	X	X	X
U.S. Fish & Wildlife Service					
Coast-Bay Delta Branch, Sacramento Field Office Sacramento, CA (916) 414-6625	X	X	X	X	X
California Coastal Commission					
North Central Coast District San Francisco, CA (415) 904-5260	X	X	X		
Central Coast District Santa Cruz, CA (831) 427-4863				X	X

BMP TOOLBOX

Road Surface BMPs
- ✓ Rolling Dip

Culvert BMPs
- ✓ Culvert Hydraulics Diagram
- ✓ Culvert Plugging Diagram
- ✓ Energy Dissipater

Erosion Control BMPs
- ✓ Blankets/Geotextile Fabrics
- ✓ Coir Log/Straw Roll
- ✓ Mulching
- ✓ Planting
- ✓ Plastic Covering
- ✓ Rock Breast Wall
- ✓ Broadcast Seeding
- ✓ Surface Roughening and Soil Tracking
- ✓ Stepped or Terraced Slope
- ✓ Coir Log/Straw Roll

Sediment Management BMPs
- ✓ Check Dam – Rock
- ✓ Check Dam – Straw Bale
- ✓ Containment of Concrete Pours
- ✓ Concrete Washout
- ✓ Sedimentation Trap/Sump
- ✓ Silt Fence
- ✓ Silt Mat Inlet
- ✓ Siltation Pond/Settling Pond
- ✓ Storm Drain Inlet Protection
- ✓ Sweeping
- ✓ Turbidity Curtain

Streambank Protection - Bioengineering BMPs
- ✓ Brush mattress
- ✓ Fabric Reinforced Earth Fill with Brush Layering
- ✓ Large Woody Debris Revetment
- ✓ Wattles/Fascine
- ✓ Live Stakes

Streambank Protection - Hardscape BMPs
- ✓ Boulder/Riprap
- ✓ Streambed Gravel

Water Management BMPs
- ✓ Aqua Barrier

- ✓ Asphalt Berm
- ✓ Cofferdam
- ✓ Dewatering
- ✓ Diversion Berm
- ✓ Fish Exclusion
- ✓ Sandbag
- ✓ Slope Drain – Temporary
- ✓ Slope Drain – Overside
- ✓ Stream Bypass (Water Diversion)

PERMITS

10.1 EMERGENCY RESPONSE	
Activity or Condition	**Required permit or limitation**
Project proponents are not required to notify DFG or obtain a Streambed Alteration Agreement before commencing the following emergency work under the following conditions: 1. immediate emergency work necessary to protect life or property; 2. immediate emergency repairs to pubic service facilities under specified circumstances; and 3. emergency projects undertaken, carried out, or approved by a public agency to maintain, repair, or restore and existing highway, as defined, within the existing right-of-way of the highway, damaged as a results fire flood, storm, earthquake, land subsidence, gradual earth movement, or landslide, within one year of the damage._Work needed in the vicinity above and below a highway may be conducted outside of the existing right-of-way, if it is needed to stop ongoing or recurring mudslides, landslides, or erosion to their pre-damage condition and functionality. This exception does not exempt any project undertaken, carried out, or approved by a public agency to expand or widen a highway damaged by fire, flood, storm, earthquake, land subsidence, gradual earth movement, or landslide.	• DFG regulations Fish & Game Code Section 1602 (f)
• Emergency work	• CEQA (Sect. 15269) has similar conditions to DFG conditions above
• Emergency instream work •	• DFG must be given written notification of emergency work within 14 days after work begins
• Emergency work	• COE requires a post-project 404 permit. Nationwide Permit #3 authorizes the repair, rehabilitation, or replacement of those structures destroyed by storms, floods, fire or other discrete events, provided the repair is begun (or under contract to begin) within 2 years of the date of their destruction or damage.

10.1 EMERGENCY RESPONSE	
Activity or Condition	**Required permit or limitation**
• Emergency Work	• RWQCB post-project 401 permit
• Emergency Work	• Consult with NOAA Fisheries and U.S. Fish and Wildlife Service.

NOTE: Additional remedial work may be required by these agencies as a condition of post-project permits. If the work was implemented poorly, it may have to be replaced later, thus requiring more work and additional consultations.

10.2 EMERGENCY SLIDE AND WASHOUT REPAIR

DESCRIPTION

Slides and washouts or slip outs are typically caused by the impact of heavy rainfall, subsurface water, loss of support, loss of vegetation, concentrated runoff or freeze /thaw conditions on unstable or saturated soils. Slides and washouts can be caused by the events described, but those events are often only the trigger at improperly designed or constructed road features. Many of our County roads are poorly located historically and fraught with design problems . Slides and washouts can be caused by cutbank failures, ditch diversion and over the bank runoff due to improper or infrequent maintenance of ditches, culverts, and road surface (slope and grading). Slides and washouts can often be prevented with proper design and construction maintenance BMPs. For example, frequent slides and washouts along a particular stretch of road can be helped by cleaning ditches, and culverts, or eliminated by installing additional road features such as rolling dips, ditch relief culverts, or upgraded stream crossings with critical dips.

Emergency slide or washout repair activities may include: removal of slide/washout material from the road right of way; backfilling or stabilizing the slope, reestablishment of damaged roadway features; repairing and cleaning drainage system, and revegetating, and/or armoring with rock.

Slides and washouts are treated as emergencies if their impact could result in an unacceptable hazard to life, a significant loss of property, or an immediate, unforeseen, and significant economic hardship if corrective action is not immediately taken. Routine repair of minor slides under non-emergency conditions is discussed in *Chapter 7.2 -Minor Slide Repair*. Long term repair of major slides is generally a large project with an extensive planning and design component, and is not covered in this manual.

ENVIRONMENTAL CONCERNS

- ✓ Delivery of sediment, organic debris, asphalt, and other potential pollutants into the stream or storm water drainage system.
- ✓ Damage to stream or riparian habitat from the slide itself or from heavy equipment use instream or in the riparian zone.

BMP OBJECTIVES

- ✓ Reduce delivery of sediment into streams, storm drains and watercourses.
- ✓ Protect water quality and stream habitat by removing slide material and restoring streamflow.

BEST MANAGEMENT PRACTICES

1) Comply with general emergency response standards (*Chapter 10.1- Emergency Response*).

2) Set up the work area in such a way that vehicles will not track mud and debris in and out to the maximum extent practicable.

3) Protect storm drain inlets and watercourses using Water Quality Protection / Sediment Control BMPs.

4) During the emergency response, concentrate on controlling runoff flowing into and out of the repair area to the extent feasible using Water Management BMPs. Decrease sediment leaving the repair area using Water Quality Protection / Sediment Control BMPs. Stabilize the slide or washout using Upslope Erosion Control BMPs or Streambank Protection BMPs to prevent further damage and, if possible, restore the damaged area . See *Chapter 7.1- Erosion Control* or *Chapter 6.4- Streambank Stabilization,* for additional information. Remedial actions should include bioengineering designs where practicable.

5) Implement erosion and sediment control BMPs on or around stockpiles to keep materials from eroding into a stream or watercourse. Remove debris for proper long-term storage or disposal once the emergency is under control (*Chapter 7.3- Spoils Handling and Disposal).*

6) If fish-bearing streams are impacted, follow Water Management BMPs for water diversion and fish exclusion to the maximum extent practicable during the emergency slide repair. Consult a hydrologist or fish biologist with DFG or NOAA Fisheries prior to performing the work. (See *Permits* below for notification requirements.)

7) Temporarily store materials where they will not enter a stream or watercourse, and permanently store or dispose of materials according to *Chapter 7.3 - Spoils Handling and Disposal.*

8. Emergency repairs should be thoroughly inspected after the emergency is over, and final repairs should be made using the appropriate Upslope Erosion Control BMPs or Streambank Protection BMPs. Remedial actions should include biotechnical designs where practicable.

BMP TOOLBOX

Road Drainage BMPs
- ✓ Rolling Dip

Culvert BMPs
- ✓ Culvert Hydraulics Diagram
- ✓ Culvert Plugging Diagram
- ✓ Energy Dissipater

Erosion Control BMPs
- ✓ Blankets/Geotextile Fabrics
- ✓ Coir Logs/Straw Rolls
- ✓ Mulching
- ✓ Planting
- ✓ Plastic Covering
- ✓ Rock Breast Wall
- ✓ Hydroseeding
- ✓ Silt Mat Inlet
- ✓ Surface Roughening & Soil Tracking
- ✓ Stepped or Terraced Slope

Streambank Protection - Bioengineering BMPs
- ✓ Brush mattress
- ✓ Joint Planting
- ✓ Large Woody Debris Revetment
- ✓ Wattles/Fascines
- ✓ Live Stakes
- ✓ Fabric Reinforced Earth Fill with Brush Layering

Streambank Protection - Hardscape BMPs
- ✓ Boulder/Riprap
- ✓ Streambed Gravel

Water Management BMPs
- ✓ Aqua Barrier
- ✓ Cofferdam
- ✓ Dewatering
- ✓ Diversion Berm
- ✓ Sandbag
- ✓ Slope Drain – Temporary
- ✓ Slope Drain – Overside
- ✓ Stream Bypass (Water Diversion)
- ✓ Fish Exclusion

Sediment Management BMPs
- ✓ Brush Packing
- ✓ Storm Drain Inlet Protection
- ✓ Sand Bag
- ✓ Sedimentation Trap/ Sump

- ✓ Silt Fence
- ✓ Siltation Pond/Settling Pond
- ✓ Sweeping
- ✓ Turbidity Curtain

PERMITS

10.2 EMERGENCY SLIDE AND WASHOUT REPAIR	
• Emergency instream work	• DFG must be given written notification of emergency work within 14 days after work begins, according to the Fish and Game Code. • COE post-project 404 permit. • RWQCB post-project 401 permit. • Consult DFG and NOAA biologists before performing work on fish-bearing streams. • Consult with U.S. Fish and Wildlife Service for other species of concern that might be affected (i.e. tidewater gobi, California freshwater shrimp, etc.)

10.3 ACCIDENT CLEAN UP

DESCRIPTION

County road and maintenance crews may have to respond to accidents on county roads involving spills of debris or hazardous materials. The accident may be due to: a) county activity, or b) activity by a non–county entity or individual, which the county is assisting in cleaning up. Activities include: hazard assessment, traffic control, isolation, containment, identification, and proper removal and disposal of spilled substances on the road right-of-way.

ENVIRONMENTAL CONCERNS

- ✓ Discharge of spilled materials into streams or watercourses.
- ✓ Damage to aquatic habitat at the site of the spill and downstream.
- ✓ Lethal impact to fish and aquatic organisms.
- ✓ Damage to riparian areas during clean up.
- ✓ Pollutants from equipment entering the streams or watercourses.

BMP OBJECTIVES

- ✓ Prevent spilled materials from entering streams or watercourses
- ✓ Reduce sediments entering storm drain inlets and watercourses.

BEST MANAGEMENT PRACTICES

1) Response to accidents should be addressed by and comply with a local spill contingency plan and emergency operations plan. County personnel responding to accidents should be periodically trained in accident response and automotive fluid spill clean up. Work should comply with the general emergency response standards in *Chapter 10.1 - Emergency Response*.

2) Only specially trained and equipped response teams should respond to hazardous materials or hazardous waste spills. County maintenance personnel should be trained in the appropriate notification requirements if they suspect that a hazardous materials or hazardous waste spill has occurred, and they should stay clear of the area pending further instructions from responding agency personnel.

3) County maintenance crews can assist emergency response personnel (i.e., the CHP, Sheriff or fire department) with vehicle accident cleanup or traffic control, and should take direction from these agencies for their work. In the event that county personnel are the first to have knowledge of the accident, appropriate authorities must be immediately notified and consulted. (See *Permits* below.)

4) County staff should have available and be trained to use emergency spill response equipment such as absorbent spill kits, river booms, and oil skimmers ,at all maintenance yards and other strategic spill response sites. Sufficient equipment should be available to cleanup or contain at least a moderate petroleum product or non-hazardous spill (1-50 gallons).

5) Contain spilled material and prevent it from entering drain inlets and watercourses using Walter Quality Protection / Sediment Control BMPs. Containerize absorbent and spilled material for removal from the site as soon as possible.

BMP TOOLBOX

Planning and Prevention BMPs
- ✓ Small Spill Kit
- ✓ Large Spill Kit

Sediment Management BMPs
- ✓ Silt Fence
- ✓ Siltation Pond/Settling Pond
- ✓ Storm Drain Inlet Protection
- ✓ Sweeping
- ✓ Turbidity Curtain

Water Management BMPs
- ✓ Asphalt Berm
- ✓ Diversion Berm
- ✓ Sand Bag

Valuable References
- ✓ County or State Spill Contingency Plan
- ✓ County Emergency Operations Plan
- ✓ DFG Pollution Response Manual (1998), Sacramento
- ✓ Spill Responses Training Manual, DFG – Office of Spill Prevention and Response (OSPR), Sacramento
- ✓ Upper Sacramento Spill Contingency Plan (Resources Agency & DFG) – based on experience of the toxic "Cantara Spill": by Southern Pacific Railroad

PERMITS

10.3 ACCIDENT CLEAN-UP	
Activity or Condition	**Required permit or limitation**
	• Follow notification protocols established by your County Office of Emergency Services.

10.4 EMERGENCY UTILITY REPAIRS

DESCRIPTION

County maintenance crews may be called upon to repair irrigation lines, sprinklers or valves, as well as broken waterlines, sewer lines or storm drain lines that are damaged, could pollute streams or cause flooding or erosion. In some cases, significant work beyond the repair of sewer, water or storm drain lines may be needed just to stabilize the emergency – for example, a failing bank that threatens a pump station. Such emergency repairs may require significant excavation, construction of temporary access, bank stabilization, dewatering, and so on. Please refer to other sections of this manual for environmental protection BMPs associated with ancillary activities.

Note: Regular permit requirements always apply for *non*-emergency work. Please carefully distinguish bona fide emergency work according to emergency permit requirements. (See Permit sections in this chapter.)

ENVIRONMENTAL CONCERNS

- ✓ Flooding or pollution of streams from discharges associated with broken water and sanitary sewer utilities .
- ✓ Excessive erosion caused by discharges associated with broken utilities.
- ✓ Sedimentation or pollution caused by repair work during emergencies.
- ✓ Lethal impact to fish and aquatic organisms.

ENVIRONMENTAL BMP OBJECTIVES

- ✓ Prevent accidents, damage to infrastructure or harm to public health that may be caused by discharges flowing from broken utilities.
- ✓ Prevent pollution caused by discharges from broken sanitary sewer utilities.
- ✓ Prevent erosion and sediment delivery to streams caused by discharges from broken water and sanitary sewer utilities, non-functional drainage systems or soil disturbance during utility repair.
- ✓ Contain any spill associated with broken pipe.
- ✓ Restore proper drainage.

BEST MANAGEMENT PRACTICES

1) Shut off utility or drainage system to prevent further damage to roadway or structure. Contact utility company, city or local utility district to do this if necessary.

2) Notify proper authorities immediately. Effluent from sewer lines is considered a health hazard. Local fire department or Hazardous Material Response Team (HMRT) and the County Department of Environmental Health should be notified immediately to determine the proper protocol for management of sewage leaks.

3) Identify and protect drain inlets and watercourses using appropriate Water Management, Erosion Control and Sediment Management BMPs. County Engineering may be able to help you locate drain inlets or determine their drainage configuration so the spill can be stopped before it reaches a water body.

4) Set up the work area in such a way that vehicles will not track mud and debris in and out to the maximum extent practicable.

5) Implement Erosion Control and Sediment Management BMPs on or around excavation areas and stockpiles to keep materials from eroding into a stream or watercourse. Reuse soil as backfill or remove for proper long-term storage or disposal once the emergency is under control (*Chapter 7.3 - Spoils Handling and Disposal).*

6) When containing a spill associated with a broken pipe, it may be necessary to implement Large Spill Kit BMPs, which include use of absorptive materials and provisions for containment to prevent the spill from reaching nearby water bodies (e.g. use of temporary bladders in stream to limit spill dispersion"]

7) Once the utility is repaired, identify any damage caused by erosion to slopes or impacts to streams and apply appropriate Erosion Control BMPs or Streambank Protection BMPs to prevent further erosion and repair the damage. See *Chapter 7.1 -1 Erosion Control* and *Chapter 10.2 - Emergency Slide and Washout Repair* for additional guidance.

8) Monitor the repaired utility periodically until you are confident the repair was effective.

BMP TOOLBOX

Water Management BMPs
- ✓ Diversion Berm
- ✓ Sandbag
- ✓ Slope Drain – Temporary
- ✓ Slope Drain – Overside

Sediment Management BMPs
- ✓ Storm Drain Inlet Protection
- ✓ Silt Fence

Planning and Prevention
- ✓ Large Spill Kit
- ✓ Small Spill Kit

Useful Information

- ✓ Storm Drain System Maps or GIS

Valuable References

- ✓ County or State Spill Contingency Plan
- ✓ County Emergency Operations Plan
- ✓ DFG Pollution Response Manual (1998), Sacramento
- ✓ Spill Responses Training Manual, DFG – Office of Spill Prevention and Response (OSPR), Sacramento

PERMITS

10.4 EMERGENCY UTILITY REPAIRS	
Activity or Condition	**Required permit or limitation**
• Releases from sewer pipes	• Follow notification protocols established by your County Office of Emergency Services.
• Emergency instream work	• DFG must be given written notification of emergency work within 14 days after work begins. • COE post-project CWA Section 404 permit. The Corps Emergency Permit defines "emergency" consistent with the CEQA and NEPA definitions. The COE limits remediation allowed under the emergency permit to the minimum necessary to stabilize the situation. Otherwise, you *must* follow normal permit routes. • RWQCB post-project CWA Section 401 permit • Contact NOAA Fisheries and U.S. Fish and Wildlife Service if listed species will be affected.