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IA 3 – Dam Failure

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1 Purpose

- The purpose of this annex is to provide a framework of coordination among agencies to help ensure the safety of life and property during a dam failure in Klamath County.
- It defines roles, responsibilities, and organizational relationships of government and private agencies in response to dam failure.

2 Situation and Assumptions

2.1 Situation

A collapse or failure of an impoundment that causes downstream flooding is a grave concern for Klamath County. Two dams, one at Gerber Reservoir and the other at Clear Lake, California, have inundation zones that impact the most populous areas of southern Klamath County. Both dams are owned and operated by the United States Bureau of Reclamation (USBOR). A failure of either or both would put up to one third of the County's citizens at risk in Bonanza in the Langell Valley, the suburban area of Klamath County and Merrill.

Flood inundation maps are available in the office of the Klamath County Emergency Manager and the USBOR.

2.2 Assumptions

- Dam failure may occur with or without warning.
 - Dam failure could occur with some warning if problems develop such as a breach in the structure that begins small but expands due to intense water pressure. Flooding of the inundation zone would be gradual and there would be opportunities for orderly evacuation to higher ground. People would be saved and some property could be protected or salvaged.
 - Dam failure could occur suddenly and without warning during a major earthquake or as a result of a significant terrorist act. In these events, a surge of water could quickly flood the inundation zone and then slowly recede. Loss of life and property could be severe.
- Alerts and warnings issued by the USBOR will provide enough notice of a potential dam failure that actions can be taken in advance to protect property, resources, and infrastructure.
- Klamath County, the USBOR and other responding agencies could activate their Emergency Operations Centers (EOCs) and/or Incident Command Posts.

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- If there is enough time, people in the inundation zone will be alerted and an effective evacuation will be carried out.
- Responding agencies will utilize the Incident Command System (ICS) including Unified Command, if necessary.
- Communications among responding agencies will be adequate.
- Most County equipment and personnel will be available to cope with most disasters resulting from dam failure.
- Assistance through mutual aid agreements may be necessary.
- Resource assistance may be necessary through local and private contractors.
- Stabilization of emergency conditions must be met before recovery and restoration begins.

3 Organization and Roles and Responsibilities

3.1 General

The County Emergency Manager may activate the EOC and implement the ICS to support response and recovery activities, depending on the scope of the incident.

3.2 Task Assignments

3.2.1 Public Works Department/Building Maintenance Department.

- Participate in ICS structure, per the Emergency Manager's direction.
- Coordinate emergency public works activities.
- Assist other public safety agencies in search and rescue, evacuation, site area security, and other pertinent response functions as time and manpower permit.
- Initiate mutual aid agreements, if necessary.
- Identify local contractors who may provide backup support.
- Review status and location of equipment, fuel, and supplies for use during and after the dam failure.
 - Ensure that all vehicles are refueled/topped-off, and remind all County departments to do the same.
 - Verify that all emergency generators have fuel and are operational.

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- Establish the “do it yourself” sandbag site(s) if directed by the EOC or as prudent to the situation.
- Ensure that lighted barricades are operational and available, if needed.
- Identify arterial and collector roads likely to be affected.
 - Develop alternate traffic routes and determine barricade and signage needs.
 - Determine priorities for maintenance and clean-up of affected roadways.
- Maintain debris removal from storm drains, bridge viaducts, main arterial routes, etc.
- Maintain debris removal from public rights of way and in and around structures where public safety and/or health are endangered.
- Assist in essential emergency repairs to utilities.

3.2.2 Sheriff

- Participate in ICS structure.
- Keep patrol units informed of the event.
- Coordinate other public safety agencies in search and rescue, evacuation, site area security, and other pertinent response functions as time and manpower permit.
- Determine if additional resources will be needed to assist with road closures/detours, evacuations, security of evacuated areas, and search and rescue.
- Coordinate mutual aid assistance in areas pertaining to law enforcement.

3.2.3 Emergency Manager

- Organize and Participate in ICS structure at the EOC.
- Monitor weather forecasts, watches, warnings and advisories; and pass the information on to the County departments. Adverse weather can adversely affect response and recovery operations.
- Facilitate/coordinate with Commissioners, County Attorney, Sheriff, other local law enforcement agencies, Fire and Public Works development of evacuation plan, if needed, for any projected affected areas.

- Keep Oregon Emergency Response System (OERS) advised of actions being taken by the County.

3.2.4 Damage Assessment Group (Planning Section in the Incident Command Structure)

- Compile and maintain a file of reports of damage received by County Departments, the Fire Districts and the 911 Center, and other sources.
- After floodwaters recede, conduct follow-ups (calls or visits) on the reports of damage sustained to determine extent of damage and how much was not covered by insurance.
- Conduct damage assessments of County/public facilities.
- Compile damage estimates for possible emergency declaration purposes.

4 Concept of Operations

4.1 General

- Depending on the severity of a threatened or actual dam failure, response activities may require activation of the County's EOC. An Incident Command Post may be established in a safe location at the site of the emergency by the appropriate agency(s).
- Immediate actions should be centered on the preservation of life and property, as well as protection of the environment.
- Klamath County Emergency Services will be the lead coordinating agency for response and recovery. Other key agencies, such as the USBOR, Army Corps of Engineers, and the American Red Cross, should have representatives in the County EOC.

4.2 Communications

(See ESF 2 – Communications)

4.2.1 Advisories, Warnings and Alerts

- A threatened or imminent dam failure could be discovered and reported by a USBOR employee, County employee, or an individual citizen. Such reports may be received by 911 Dispatch, USBOR office, County Sheriff, County Emergency Services, or other city or County offices.
- The USBOR is the agency with primary responsibility for issuing advisory messages, warnings, and alerts associated with the threat of dam failures.

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- People in the inundation zone will be alerted to evacuate over the Emergency Alert System (EAS) on local broadcast media and by door-to-door notification by local and emergency response agencies.
- Warnings are distributed to the public by the media (radio and TV) and may also be available through computer web sites and services.
- In addition to the media, Klamath County departments will receive information about dam failure alerts through 911 and/or Emergency Services. The Sheriff's Office may also receive them over the Law Enforcement Data System (LEDS).
- Each department is responsible for passing the applicable information on to their staff.

4.3 Public Information

(see ESF 15 – External Affairs)

- In addition to the warnings and alerts issued by the USBOR, press releases may be needed to tell the public what areas of the County are expected to be impacted and to provide them with instructions regarding the appropriate actions they should take.
- Special measures may be needed to reach areas of impact that may be without power and telephone service. Local and County emergency response agencies may be required to make door-to-door warnings.
- A volunteer call center may be established. This is important during the recovery phase, to advise people on the appropriate course of action when returning to/cleaning up their flooded homes and businesses. Preferably, this will be pre-organized so the phone company has equipment and staff to do this quickly.
- County Health will be responsible for providing public information related to public health issues.
- Publications on dealing with post-disaster stress, cleaning up damaged homes, etc. are available through American Red Cross facilities around the county should be identified and publicized as distribution points for this information.

4.4 Response – EOC and USBOR**4.4.1 Dam failure Watch/Dam failure Alert Issued**

- Monitor weather advisories and forecasts.

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- Prepare necessary resources (fuel vehicles and equipment, inventory signs, and barriers, etc.).

4.4.2 Dam failure Alert Issued - Dam failure has not started but is imminent.

- Activate the EOC and establish the ICS.
- Advise the Board of County Commissioners (BOCC).
- Ensure that everyone in the inundation zone has been alerted.
- Ensure that measures are taken to keep people from entering the inundation zone.
- Notify the American Red Cross to prepare and open shelters outside the inundation zone.
- Notify the public via radio and television where American Red Cross shelters are located.
- Notify OERS.
- Arrange and coordinate transportation out of the inundation zone for people without vehicles.
- Review work assignments/shift schedules.
- If there is time and resources are available, initiate flood fight activities in areas expected to flood (sandbag threatened facilities, turn-off threatened utilities).
- Pre-position resources on higher ground above the inundation zone (Emergency Operations Center, medical services, first aid and rescue equipment, pumps, road barricades and signs, sandbags, sand piles, etc.).
- Determine areas that will need to be evacuated, and coordinate potential shelter needs with the American Red Cross.
- Monitor weather forecasts and advisories.

4.4.3 Dam Failure – Dam failure occurs without warning.

- Advise agencies to deploy all available fire, law enforcement, and EMS resources to pre-selected safe locations above the inundation zone if necessary.
- Notify the BOCC

- Notify OERS
- Activate Klamath County Sheriff's Office Search and Rescue.
- Activate the EOC/establish ICS structure.
- Notify the public via EAS over local radio and television stations.
- Notify local hospitals and clinics of the possible need to treat numerous flood victims.
- The BOCC to officially declare County a disaster area if circumstances dictate.
- Call in off-duty employees and volunteers as needed to staff the EOC.
- Erect barricades and establish detour routes around flooded areas.
- Initiate sandbagging/flood-fighting activities if feasible.
- Evacuate population at further risk and establish security for evacuated areas.
- Open evacuation assembly areas and shelters in cooperation with the American Red Cross.
- Continue search and rescue operations as needed.
- Coordinate plans and procedures with Public Health and Medical Examiner to handle the remains of flood victims and notify next of kin.
- Conduct initial damage assessment (IDA), and maintain a list of damages to private and public property.
- Call out private contractors, as needed.
- Issue press releases with public safety information.

4.5 Evacuation

(see ESF 1 – Transportation)

4.6 Sanitation and Health

- Contamination of potable water supplies and the disruption of sanitary services are major concerns during flooding from dam failure. Alternate sources for both need to be considered.

- Often, floods cause the deaths of numerous domestic animals and some wildlife. Means of disposing of the carcasses need to be developed and implemented.
- County Health will be responsible for providing the public with information related to public health issues and will also be responsible for implementing any type of public immunization program.

4.7 Recovery

- Conduct a thorough damage assessment. The BOCC makes a County “Disaster Declaration if circumstances dictate.
- Evaluate the conditions of the inundation zone and evacuated areas, and determine if/when they are safe enough for residents to return.
- Repair damages (roadways, sanitary sewers/storm drain systems, public facilities, traffic signals, street lights).
- Participate in after-action reports and critiques. Make necessary changes in plans and procedures.
- Develop a final cost analysis of all response and recovery activities.
- Request disaster assistance as appropriate.

4.8 Debris Removal

- Removal of flood-deposited debris from County roads and County facilities is the responsibility of the Public Works Department.
- Removal of debris from private property is the responsibility of the property owner.
- Temporary collection sites may need to be established, pending determination of the final disposal location.
- Debris reduction sites may be established to allow for recyclable materials to be extracted and wood and vegetation to be ground into mulch, reducing the overall amount of material needing to be transported to landfills.

5 Direction and Control

- Routine operations will be handled by individual departmental standard operating procedures.
- Depending on the severity of flooding, response activities may be handled as part of day-to-day activities or may require the activation of the County’s EOC and/or an ICS structure.

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- Activation of the EOC may require Department Heads to release staff as required to staff the ICS, EOC or other emergency functions.
- Depending upon the severity and complexity of the dam failure, Incident Command may need to be elevated to Unified Command.

6 Incident Annex Development and Maintenance

See Basic Plan.

7 Appendices

None at this time.

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