

**CITY OF ALEXANDRIA**

**FLOOD OPERATIONS PLAN**

**OFFICE OF EMERGENCY MANAGEMENT**

**JUNE 2009 DRAFT**

**TITLE:** Flood / Dam Plan

**PURPOSE/SCOPE:**

This plan provides guidance in the event of Flooding within the City of Alexandria. The two types of flooding that affect Alexandria include Inland/flash flooding, and Tidal Flooding. Inland/flash flooding can be caused by heavy rain or riverine (coming from upstream). It can also be a sunny day event where a breach or failure of the Barcroft Dam occurs. Flooding can be caused by tides, wind, or excessive river flow. Impact of flooding can disrupt businesses, residents, traffic and lead to evacuation of effected areas of the City.

It is the mission of City government to develop and implement plans and procedures to minimize the adverse effects on life, health, property and business in the event of flooding.

**AUTHORITY AND REFERENCES:**

- a- The Commonwealth of Virginia Emergency Services and Disaster Law, as amended.
- b- Virginia Department of Conservation and Recreation re: "Dam Safety, Floodplain Management".
- c- City of Alexandria Emergency Operations Basic Plan, as amended.
- d- National Response Plan.

**DEFINITIONS:**

**Backwater:** occurs when stream flooding pushes water into inland streams causing increased depth and volume to the waterway.

**Barcroft Dam:** Is a private dam located North West of the City of Alexandria at 38°51'5" by 77°9'5". The Dam holds approximately 800 million gallons of water.

**Dam Emergency stages:** The following identifies action points for the dam:  
Stage 1: slowly developing conditions; five or more days to take remedial action.  
Stage 2: rapidly developing conditions; overtopping is possible. Less than five days to take action.  
Stage 3: failure has occurred, is imminent or already in flood condition; Evacuation recommended.

**Director of Emergency Management:** In accordance with state law and City ordinance, the City Manager is the director of emergency management, and thus is responsible for the mitigation of, preparedness for, operations during, and recovery from a flood situation.

**Emergency Operations Center:** (EOC) A facility with appropriate communications and information collection and analysis capability where key officials gather to set policy and make coordinated decisions in the direction and control of the incident.

**Essential Emergency Workers:** Persons required to remain in an evacuated area to perform vital services.

**Evacuation:** Moving persons a safe distance or ordering persons with the capability to move on their own from a high-risk area within the City of Alexandria to a lower risk area, usually within the City, but possibly outside the City limits.

**Flood:** Abundance of water outside normal waterways disrupting activities.

Flood Gauges: Automatic monitoring devices located in City waterways to alert City staff to rising water.

Flood Monitoring Point: (FMP) Predetermined sites along the waterways of the City where water levels will be observed and conditions reported to incident commander. Police will be initially sent to these points supported by TE&S staff.

Tier I: Primary Flood Monitoring Points where flood water observations are critical.

Tier II: Secondary Flood Monitoring Points where flood water observations are desired as staffing permits.

Flood Receding: Flood water receding with no apparent threat of further flooding

Flood Warning: When hazardous weather is occurring or imminent and poses a threat to life and property.

Flood Watch: Conditions are such that flooding could occur. Close observation should be maintained.

Flood Zone: Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.

Incident Commander: The person in operational control of the incident. This person has full and complete authority and responsibility, second only to the City Manager, for flood operations. This role is commensurate with command. It means the person in charge of tactical operations in the field. The incident commander should wear a blue vest for easy and quick recognition.

Inland/flash Flooding: Water accumulation in and around streams, creeks, parks, streets and neighborhoods not adjacent to the river.

Normal Situation: No current or predicted flooding.

On-Scene Command Post: A mobile facility with appropriate adequate functionality from which the incident will be controlled. It shall be established by the incident commander as near the flood site as feasible and will be clearly and distinctively marked for easy and quick recognition. An alternate on-scene command post may be established if required by the incident commander.

Perimeter Control Points: Specific points established around the event site where Police will limit access to the scene to authorized persons, vehicles and equipment.

Post Flood: Flood water no longer exists in Alexandria.

Probable Maximum Flooding: (PMF) equals approximately 27.5" of rain over a six hour period.

Rainy Day Event: Significant rainfall that has led earth being saturated and unable to absorb additional surface water.

Recovery: Returning to normal status for the City. Repair to property, removal of debris, etc.

Response triggers: specific events or that requires action to protect life and property. There are two categories of actions: those that are Immediate and those to consider.

Riverine Flooding: Is a function of precipitation levels and water runoff volumes within the watershed of the stream or river.

Staging Area: An area selected by the incident commander to which responding personnel and equipment will report and standby until called to the scene. This area is to be in close proximity to the event yet not close enough to cause congestion at the site.

Sunny Day Event: No significant rainfall. Earth is able to absorb additional surface water.

Supportive Role: assistance furnished to the department having operational control of the event. It may be from one or more City departments, outside agencies or volunteer organizations, etc.

Termination: The Flood event has ended and recovery has begun.

Tidal Flooding: Is a function of tides and winds. Within the City Tidal Flooding routinely occurs in the unit block of King Street, the unit block of Prince Street and the Strand. Abnormal winds and tides may cause other areas to be affected.

### **ASSUMPTIONS:**

There will be periods of heavy rain and threatening weather conditions prior to flooding. This period will serve as advance warning and will permit precautionary actions to be taken to protect life and property.

There will be tidal flooding along the banks of the Potomac River, particularly the unit block of King Street, the unit block of Prince Street and the Strand.

There will be a pass through of water from the Barcroft Dam during inclement weather to maintain a safe water level within the dam. This will result in water flows in Holmes Run and Cameron Run streams.

Sunny day catastrophic failure of the Barcroft Dam would lead to flooding throughout a large portion of the City, especially those areas adjacent to Holmes Run / Cameron Run waterways. Timely evacuation of these areas is critical.

A Probable Maximum Flood (PMF) event could inundate major areas of the City. Most notably would be areas lying west of I 395 on both sides of Holmes Run including Lynbrook at Mark Center Apartments and Woodmont Park apartments and extending in to Fairfax County.

Weather forecasts and advanced flood warnings will be received via the National weather service, WAWAS telephone network, commercial radio and television stations and the NOAA weather radio.

During flood watch conditions the Police Department and the Transportation and Environmental Services Department (TE&S) will maintain surveillance of City waterways at flood monitoring points\*.

When informed of flooding conditions, the Police will notify City officials including the Duty Emergency Manager and TE&S.

When potential flooding conditions exist, the City will notify affected business and residents of the situation.

### **CONCEPT OF OPERATIONS:**

Preventative: Respect flood plain areas and not allow development in such areas without proper protective measures. Ensure Building codes and Zoning ordinances are clear and rigidly enforced. Recreation, Parks and Cultural Activities will clean vegetation and silt from all of the runs as further preventative measure. Silt removal will be performed on a 7 to 10 year cycle by TE&S.

Preparedness: The City will develop policies and procedures to maintain waterways, coordinate response and mitigate impact of flooding in Alexandria.

Response: Appropriate response to flooding events includes maintaining awareness to conditions, evacuation of people, securing of affected area.

Recovery: Ensure cleanup efforts are rapid and effective. Debris removal, street cleaning inspections of structures (as needed) will be coordinated.

City staff will be sent to the flood monitoring points to observe and report conditions. Flood Monitoring Points include: \* *see annex at end of document*

When flood watch conditions exist, affected parks, hiking and biking trails will be closed. Affected areas will be notified to begin evacuation to Reception centers. Surveys will be completed at the reception centers to determine the need for sheltering. City staff will be sent to flood monitoring points to observe conditions.\*

**Direction and control:**

The Director of Emergency Management (City Manager), or authorized designee, exercises overall direction and control of operations and resources in the event of flood, through the Director of T&ES and such other staff members and outside agencies as desired.

The Director of T&ES, or authorized designee, exercises primary operational control in accordance with the department's internal directives and procedures.

**TASKS / RESPONSIBILITIES**

Each City department/activity is responsible for carrying out task assignments in the event of a flood in Alexandria. They following are not necessarily all inclusive but are the most urgent ones to be accomplished.

The exercise of individual judgment, initiative, common sense, awareness, urgency, cooperation and coordination is essential in accomplishing these emergency task assignments.

The emergency task assignments are written in broad, general terms. They purposely do not tell department/activity directors how to do their jobs. Those details are left up to the departments/activities to be included in their own internal plans and procedures.

Departments/activities with emergency task assignments are responsible for developing and maintaining their own internal plans and operating procedures and to assure their capability to carry out their assigned tasks. Those activities outside City government are requested to comply in the interest of mutual preparedness and protection.

**City Council**

As in all emergency situations, the ultimate responsibility to the residents of Alexandria for effective flood preparation, execution and recovery rests with the elected officials of the City.

**City Manager (Director of Emergency Management)**

1. Assume overall responsibility for flood preparedness, response, and recovery through the appropriate City government department/activity directors.

2. Recommend that City Council declare an emergency if needed, or that the City Manager declare an emergency with confirmation by Council within 14 days.
3. Provide policy decisions and exercise emergency powers as required.
4. Based on the recommendations of the Emergency Management Team, approve changes in the City's Level of Readiness to cope with the flood conditions.
5. Activate the Emergency Operations Center through the Emergency Management Coordinator and with input from the Director of T&ES.
6. Monitor the entire incident by situation reports and data coming into the EOC. Visit the various sectors of the incident as desired and deemed necessary.
7. Make a formal request for state and federal assistance.
8. Keep City Council and the general public informed of developments.
9. Approve initial damage assessment report and revisions to it.
10. After consultation with the Emergency Management Team, terminate the emergency.

Deputy City Manager

Act in the absence of the City Manager.

City Communications Director

1. Serve as the City public information officer and coordinate the information from all departments involved in flooding preparedness, response, and recovery.
2. Keep the news media up-to-date on current developments by periodic news briefings and press releases.
3. Keep the public informed via the City website, "E-News You Can Use" subscribers, and cable TV.
4. Keep City Manager and City Council informed.
5. Provide information to potential flood area via printed flyers delivered door-to- door.
6. Coordinate information with the Emergency Management Coordinator and T & ES Director.
7. Become the primary spokesperson for the City.

### Citizen Assistance

1. Open and operate the emergency operations call center (hotline) where the public may obtain current and accurate information and determine the whereabouts of individual evacuees.
2. Maintain liaison with the Emergency Operations Center, the on-scene command post, and any evacuation shelters as sources of current and accurate information.
3. Provide assistance to disaster victims who have lost credit cards, credit contracts, deeds, warranties, insurance papers and similar important documents.
4. Provide warning/advice to disaster victims against unscrupulous business and professional practices which might occur during a flood.

### City Attorney

1. Prepare emergency legislation and proclamations.
2. Provide emergency legal counsel to City officials.

### Emergency Management

1. The coordinator shall be responsible to the director and shall carry out any tasks as designated by the director.
2. Report to the Emergency Operations Center.
3. Keep the Virginia Department of Emergency Management informed with situation reports and damage assessment reports.
4. Serve as liaison with state and federal agencies, and the Red Cross.
5. Coordinate weather information and preparation of initial damage assessment report.
6. Coordinate sending a Department Head Page for flood watches and warnings issued for Alexandria.
7. Recommend changes in readiness levels.
8. Receive calls from the Lake Barcroft Water Improvement District when the Lake Barcroft Dam is opened 20% or more. Initiate both internal and external notifications regarding the potential for flooding of Cameron Run. Monitoring of Lake Barcroft Dam flow will continue until there is no longer a threat of flooding for the City. Consider closing low lying park areas.
9. Contact Lake Barcroft Watershed Dam for upstream observation report of Holmes Run and the dam opening.

## Fire

1. Respond in a supportive role and assist T&ES.
2. Make necessary notifications, including regular pages to City staff.
3. Assist Police in evacuation.
4. Continue fire suppression and emergency medical service.
5. Provide for swift water rescue teams.
6. Monitor water levels from Potomac River, Four Mile Run and Holmes Run gauges.
7. Refer inquiries from the general public regarding the flood or the whereabouts of an individual person to the emergency call center operated by the Citizen Assistance Director.
8. Contact DASH or the school buses and other transportation that may be required for evacuation.
9. Monitor WAWAS and disseminate warnings.
10. Assist in initial damage assessment report and revision to it.
11. Through the Code Enforcement division, conduct damage assessment of buildings in flooded areas, take pictures and videos of damage, and perform the necessary building and life safety inspections prior to re-occupancy following an evacuation.

## Finance

1. Provide financial statistics as may be required.
2. Expedite emergency purchases as required.
3. Coordinate with the City real estate assessor in damage assessment.
4. Delegate authority to department/activity directors to make emergency requisitions/purchases as required for the safety and comfort of evacuees and other residents and for the protection of property.
5. Furnish departments/activities with account numbers to which to charge flood emergency expenditures.
6. Maintain accurate and complete documentation and accounting of flood emergency expenditures as a basis for subsequent claims for state/federal financial assistance, should it become available.

## General Services

1. Assign a representative to the Emergency Operations Center.



2. Install flood-proofing barriers in the Torpedo Factory and other City buildings subject to flooding.
3. Provide for vehicle and equipment repair as required.
4. Conduct damage assessment of City property.
5. Remove any City vehicles in danger of flooding.

#### Health

1. Respond to the reception / evacuation shelter.
2. Coordinate and supervise medical and public health efforts.
3. Provide additional nursing support as required.
4. Conduct immunizations as may be required.
5. Assist in initial damage assessment and revisions to it in regards to health care facilities and food handling establishments.

#### Housing

1. Help flood victims obtain temporary emergency housing.
2. Arbitrate emergency related differences between landlords and tenants.

#### Human Services

1. Register evacuees in reception centers / shelters using Red Cross forms.
2. Assist the Red Cross in managing shelters.
3. Reunite families that become separated.
4. In coordination with the Red Cross, determine social/welfare needs of evacuees.
5. Provide shelter and food for displaced persons and families as may be required and within availability.
6. Refer flood victims to sources of emergency assistance.
7. Assist victims in preparing necessary forms for disaster assistance.
8. Translate for non-English speaking persons.
9. Perform follow-up assistance during the recovery stage.

#### Hospital

1. Implement hospital emergency operations plan if required.
2. Receive and treat disaster victims as required.

### Mental Health, Mental Retardation and Substance Abuse

1. Respond to an evacuation shelters and elsewhere as needed.
2. Provide psychological counseling, crisis intervention and moral support to flood victims.
3. Provide critical incident stress debriefing for emergency workers.
4. Provide care and transportation for the mentally ill, mentally retarded and persons under the influence of drugs and/or alcohol.

### Personnel

1. Recruit or transfer personnel for emergency employment.
2. Establish and operate a registration point for unassigned volunteers by skills and qualifications.
3. Inform departments and activities of availability of volunteer workers.
4. Maintain list of emergency personnel who are required to work during weather-related emergencies.

### Planning and Zoning

1. Provide geographical information system (GIS) and printed maps in the EOC and provide staff to plot data on them.
2. Assist in initial damage assessment and revision(s) to it.
3. Furnish population data, charts and development plans as needed.
4. Provide administrative personnel as needed in an emergency situation.

### Police

1. Respond in a supportive role and assist T&ES.
2. Make notifications.
3. Monitor Tier 1 Flood Monitoring Points. Monitor Tier II Flood Monitoring Point as conditions warrant. Monitor water level gauges until T&ES takes over. Report observations to TE&S and Duty Emergency Manager. (See Annex 1)
4. Warn residents and businesses by public address systems on cruisers, knocking on doors, telephone emergency notification system, etc. as necessary.
5. Conduct evacuation of flood area, upon declaration by the Director of T&ES, and with assistance from fire personnel. Limit access to flooded areas and control evacuation routes.
6. Patrol assembly points being used for loading buses.

7. Direct Animal Control Officers who are under contract, to pick up and care for stray animals and pets of evacuees through the animal shelter.
8. Continue law enforcement, traffic and crowd control, security of flood sites and shelter areas.
9. Provide police mobile command unit for on-scene command post if requested.
10. Receive notification from Lake Barcroft Dam owner/operator when spillway is 35% open so that 1901 Hawthorne Drive, 6207 Holmes Run Parkway, and any other vulnerable addresses can be notified. (flood monitoring point?)
11. Consider the current operational guidance for the Watch Commander involving flooding and weather related emergencies.
12. Monitor river gauges and waterways. Notify T&ES, Emergency Management and The City Manager through the City Communications' Director of any flooding. (See Annex 1)
13. Evacuate people and vehicles from areas subject to flooding.

**Radio Amateur Civil Emergency Services (RACES)**  
**Amateur Radio Emergency Services (ARES)**

Respond upon request to the on-scene command post, Emergency Operations Center and Inova Alexandria Hospital or other locations if requested for further assignment to provide temporary emergency radio communications augmentation where needed.

**Recreation, Parks and Cultural Activities**

1. Open recreation centers for use as reception centers or shelters as needed.
2. Provide sports and games for evacuees so as not to interfere with reception center / shelter operations. Coordinate with Alexandria Library and City schools for movies and books.
3. Close Parks, Biking and Hiking facilities affected by flooding conditions.
4. Clear parks and marinas of any debris caused by flooding. Assist T&ES in other clean-up operations.
5. City arborist will manage any tree damage on public property.

**Red Cross**

1. Respond upon request and render assistance in accordance with its Congressional mandate, internal procedures and memorandum of understanding between the Red Cross and the City of Alexandria, Commonwealth of Virginia and Federal Emergency Management Agency.

2. Make necessary arrangements to obtain, open, staff, supply and manage one or more reception / evacuation shelter(s) as the circumstance may require.
3. Coordinate relief and welfare activities during flood operations and recovery phases.
4. Provide for traditional emergency needs of evacuees; i.e., food, cots, blankets, clothing, shelter, first aid, financial assistance counseling, etc.
5. Assign representative to the EOC.

#### Schools

1. Evacuate children from schools if required.
2. Be prepared to furnish school buses and drivers for evacuation transportation as may be required.
3. Make available school facilities for reception / evacuation shelters, aid stations, or for whatever other use may be required.
4. In coordination with the Alexandria Library and the Recreation Department, be prepared to furnish movies, TVs and other types of recreational and entertainment services to evacuees in shelters as may be required.

#### Sheriff

1. Respond in a supportive role and assist the police as requested.
2. Provide food service to EOC or other locations, when requested.

#### Transportation and Environmental Services

1. Assume primary operational control of flood operations.
2. Respond to the EOC and to the on-scene command post if one has been established.
3. Observe Flood Monitoring Points and monitor and disseminate weather forecasts and condition of City waterways and gauges. Declare the following flood conditions as they develop (Annex 1):
  - a. Flood Watch. When water level reaches, or is expected to reach, 10 feet on Mount Vernon Ave. bridge, OR 3.2 feet on the marina gauge NAVD 1988.
  - b. Flood Warning. At level of 10.5 feet on Mount Vernon Ave. bridge, or 3.5 feet on the marina gauge NAVD 1988.
  - c. Evacuation. At 11 feet at Mount Vernon Ave., or at 4.5 feet on the marina gauge (estimated) NAVD 1988.

- d. Tidal flooding. During a high tide cycle, when the marina gauge is at 3.7 feet (estimated) NAVD 1988 and rising or water is observed at the foot of King Street or in King Street park.
  - e. Flood. At 11 feet at Mount Vernon Ave., or 4.5 on the marina gauge (estimated) NAVD 1988.
  - f. Termination. When water recedes below flood stage and the outlook is favorable that it will not return.
4. Open the department's 24-hour dispatch office in the operations division. Request City IT support if additional phone lines are needed for hot line activation.
  5. Request that police dispatch the mobile command post when required.
  6. Provide sandbags (in accordance with the sand bag policy), barricades and variable message signs. Park a trailer of sandbags near Old Town businesses that may use them. A supply of barricades is kept in the shed at Waterfront Park for use in Old Town. Sand bags are generally made available for flood situations or Tidal flooding if the flooding has the potential to be severe.
  7. Coordinate the turning off and restoration of service with the utility companies - gas, water, electric, telephone, and cable TV.
  8. Notify the General Services Director to relocate City vehicles that may be in danger from flooding.
  9. Administer the federal flood insurance program.
  10. Additional items for TE&S to consider:
    - Provide for emergency water supply and sewage disposal as required.
    - Coordinate with local contractors to obtain equipment and operators beyond the City's capability.
    - Determine time to deactivate the on-scene command post.
    - Accomplish clean-up, which should include sweeping, flushing, pumping, refuse collection and debris removal on public streets and sidewalks.
    - Perform damage assessment of City streets, roadways, waterways and bridges.
    - Call upon fire and police services, other City departments/activities and outside agencies for assistance as required.
    - Monitor Sanitation Authority flow when periods of rain and/or snow melt could infiltrate the system and overwhelm the capacity of the sewage treatment plant. The Sanitation Authority shall notify T&ES whenever the sewage treatment plant exceeds 70 million gallons per day or approaches the maximum capacity of 120 MGPD.

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- Monitor storm and sanitary sewer distribution system pipes at critical locations for proper operation during flood events and take corrective actions.

#### Utility Companies

1. Dispatch representatives to the EOC.
2. In the event of an outage, keep the EOC informed of the current situation and approximately when service may be restored.

### **LOGISTICS AND FISCAL ACCOUNTING**

Department/activity directors will provide their own logistical support as required to carry out their assigned responsibilities and will account for the expenditure of all resources in accordance with the procedure outlined in Section XI, Logistics and Fiscal Accounting, of the City's Emergency Operations Basic Plan.

**IMPORTANT:** All department/activity directors are charged with the responsibility to document completely all costs and expenditures in connection with a flood. This is necessary to support a claim for state/federal assistance, should it develop.

A careful record should be maintained of all regular time and overtime during which personnel and equipment are employed. Obtain detailed receipts for all local purchases, including meals. Keep a record of all parts and supplies used from City inventories.

All such records are subject to state/federal audit, so completeness and accuracy are essential.

Annex 1:

Flood Monitoring Points:

Tier I	Tier II	Location	Flood level
x		2900 blk. Holmes Run Pkwy.. Avalon Bay (rear)	
x		5500 blk. Eisenhower Ave. @ Ripley foot bridge – north side	
x		Holmes Run bike path west of RR bridge	
	x	4100 blk. Eisenhower Ave. north of Animal Shelter	
x		6207 Holmes Run Pkwy. Rear of house	
	x	Beauregard @ Holmes Run bridge (near N. Morgan)	
	x	600 blk. S. Picket St. rear of bldgs.	
	x	Mt. Vernon Ave. @ Four Mile bridge	

Flood Monitoring Gauges:

Location	Flood watch	Flood warning	
Torpedo Factory / City Marina			Duplicate w/ marina Controls in shed
Holmes Run @ Van Dorn St.			
Four Mile Run			
Cameron Run			
Mt. Vernon Ave Bridge			
Thompson's Alley			
The Dandy dock			