

## City of Alexandria, Virginia

## MEMORANDUM

DATE: MAY 17, 2004

TO: THE HONORABLE MAYOR AND MEMBERS OF CITY COUNCIL

FROM: PHILIP SUNDERLAND, CITY MANAGER<sup>5</sup>

SUBJECT: HURRICANE ISABEL AFTER ACTION REPORT

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**ISSUE:** Receipt of the Hurricane Isabel After Action Report.

**RECOMMENDATIONS:** The City Council receive the report.

**BACKGROUND:** The City of Alexandria felt the effects of Isabel during the afternoon of September 18. Tropical storm winds hit the City around 4:00 p.m. with the peak of the storm arriving around midnight. The winds died down by the early morning hours of September 19, 2003. During this period the City received 2.31 inches of rain and wind gusts rose to near 58 mph. During the peak of the storm the National Weather Service reports winds of over 85 mph recorded on building roofs throughout the area. Between 250 and 275 trees toppled during the storm.

Isabel's sustained winds of 40-60 mph pushed a swell of water from the Chesapeake Bay northward to its tributaries, including the Potomac River. The water levels in our area were recorded at 9.5 feet above mean sea level exceeding the previously recorded levels from the 1933 Hurricane. Flooding was significant in Old Town reaching to the top of the 100 block of King Street, and numerous businesses were flooded. Alexandria's private properties damages are estimated to be more than two million dollars, and damages to the City Marina, parking garages, and other City buildings are estimated at \$700,000. The City expended approximately \$1.1 million in operating costs before, during, and after the Hurricane.

In Virginia, over 99 counties, cities, and towns were affected by the Hurricane. The storm resulted in 33 deaths and hundreds injured. Hurricane Isabel destroyed 1186 homes and 77 businesses. An additional 9,110 homes and 333 businesses sustained major damage and 107,908 homes and 1000 businesses were affected or sustained minor damages from the storm. At the peak of the storm nearly 2 million customers were without power. Approximately 50 percent of Virginia's population was without water due to power failures. Virginia removed over 660,000 dump-truck loads of debris. The total damage impact in Virginia is approximately 1.6 billion dollars.

**DISCUSSION:** The response to the storm engaged numerous agencies, organizations, and individuals from all levels of government and the private sector. At the conclusion of the response, the City Manager assembled a broad-based team to evaluate the City's response to Hurricane Isabel.

The team members were to review all aspects of the City's preparation, response, recovery, and damage from the storm and to recommend actions for future incidents. The task force compiled information from several different sources including debriefings of response organizations, surveys, and stakeholder meetings. The two major issues that arose during and after Hurricane Isabel are listed below:

(1) The coordination with the utility companies and return of service needs improvement. City staff are working aggressively with Dominion Virginia Power, the Virginia American Water Company, and others to coordinate communications and the return of service to the customers after such a storm.

(2) City officials need to improve and enhance methods of disseminating information to citizens, businesses, and employees. Public Information Officer and Emergency Management staff are working together on a plan to ensure that citizens, businesses, and employees receive the information that they need in an emergency.

**FISCAL IMPACT:** The city expended approximately \$1,060,000 in operating costs on response. The Emergency Management Staff is working with state and federal officials to get reimbursement of eligible operating costs. Currently \$462,149.03 is pre-approved operating expenses that FEMA has agreed to reimburse. The City is working on obtaining FEMA funding for its \$700,000 in capital facilities damage.

**ATTACHMENTS:** Hurricane Isabel After Action Report

**STAFF:**

Gary Mesaris, Fire Chief

Mark Penn, Emergency Management Coordinator

Laura Pettus, Emergency Management Analyst

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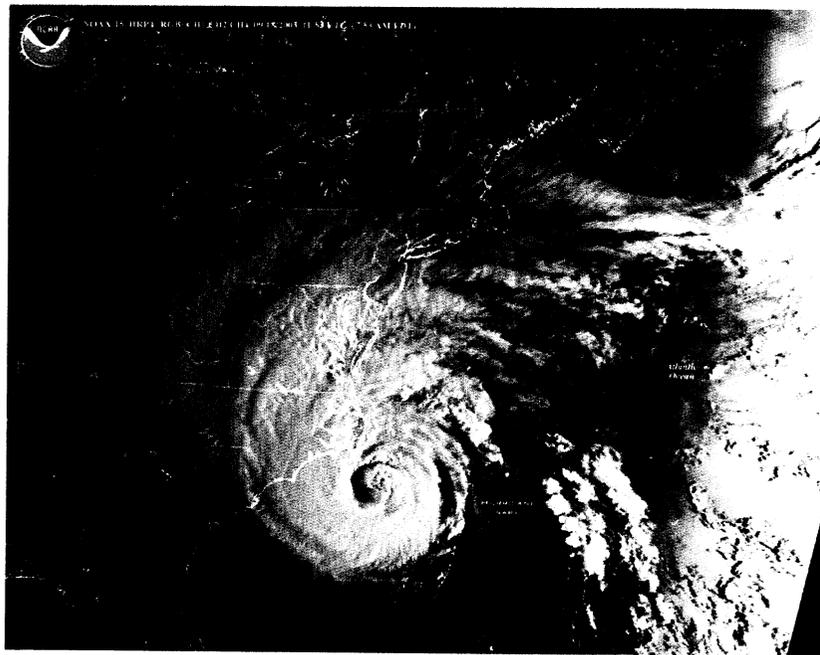
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# City of Alexandria, Virginia



## Hurricane Isabel After Action Report

May 25, 2004



*FEMA News Photos by Liz Roll*

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## **I. Introduction**

Hurricane Isabel formed off the West African Coast on September 1, 2003. Isabel reached Hurricane Category 5 status with winds of over 165 mph on September 11 and traveled on a path northwest of the Bahamas and the Caribbean. By September 16, Hurricane Isabel had weakened to a Hurricane Category 3 with winds below 110 mph. Hurricane Isabel made landfall at 5:00 P.M. on September 16, at Drum Inlet, North Carolina, as a Hurricane Category 2 with wind speeds of 100 mph. As the storm reached central Virginia, Isabel had weakened and was downgraded from a hurricane to a tropical storm. Isabel continued along a northerly path inland and damaged large portions of North Carolina, Virginia, Maryland, and areas North up to Canada.

The City's response to the storm engaged numerous agencies, organizations, and individuals from all levels of Federal, State, and local government and the private sector. At the conclusion of the response, the City Manager assembled a broad-based team to evaluate the City's response to Hurricane Isabel.

The team members were charged with reviewing all aspects of the City's preparation, response, recovery, and damage from the storm and to recommend actions for future incidents. The task force compiled information from several sources including debriefings of response organizations, surveys, and stakeholder meetings. This report conveys the views of many individuals and departments.

The Hurricane Isabel After Action Report is organized into six principle sections. **Overview of Hurricane Isabel** section includes data about the storm. **Pre-Storm Preparation** section includes the City's pre-storm planning and other activities to prepare for the storm. **Hurricane Response Activities** section includes a description of the actions taken to respond to Hurricane Isabel. **Hurricane Recovery Issues** section includes actions related to the City's recovery from Hurricane Isabel. **Hurricane Damage** section includes a description of the damage that occurred within the City caused by the storm. **Findings and Recommendations** section outlines the issues, recommendations, and actions from the task force for the City in the future.

## **II. Overview of Hurricane Isabel**

On Thursday September 18, Hurricane Isabel reached Alexandria as a tropical storm with winds near 58 mph and rainfall of 2.31 inches. Tropical storm winds hit the City around 4:00 p.m. with the peak of the storm arriving around midnight. The winds died down by the early morning of September 19. During this period, the City received 2.31 inches of rain and wind gusts rose to near 58 mph. During the peak of the storm, the National Weather Service reports winds of over 85 mph recorded on building roofs throughout the area.

The soil was already saturated because of the above average rainfall preceding the storm. Trees and other structures were therefore extremely vulnerable to the Hurricane's high wind gusts. There was extensive damage to property and unprecedented power outages throughout the region. Between 250 and 275 trees within the City were damaged or toppled.

Isabel's sustained winds of 40-60 mph pushed a swell of water from the Chesapeake Bay northward to its tributaries, including the Potomac River. The River has flooded many times in the past causing damage to businesses at the foot of King Street. During this storm, the water levels in our area were recorded at 9.5 feet above mean sea level, exceeding the previously recorded levels from the 1933 Hurricane. Flooding unprecedented in Old Town reaching within feet of the King and Lee Streets intersection. Numerous businesses were flooded, many of which had not been affected in previous floods. The City's Marina also sustained significant damage. Alexandria's damages totaled more than \$2 million. Fortunately, Alexandria experienced no deaths attributed to Isabel.

In Virginia, over 99 counties, cities, and towns were affected by the Hurricane. The storm resulted in 33 deaths and hundreds injured. Hurricane Isabel destroyed 1,186 homes and 77 businesses. An additional 9,110 homes and 333 businesses sustained major damage and 107,908 homes and 1,000 businesses were affected or sustained minor damages from the storm. At the peak of the storm nearly 2 million customers were without power. Approximately 50 percent of Virginia's population was without water due to power failures. Virginia removed over 660,000 dump-truck loads of debris.

The total damage in Virginia was approximately \$1.6 billion. Virginia's Dominion Power estimated \$128 million in storm costs. The Red Cross expended \$6 million on relief work. The military bases spent \$283 million on response and recovery efforts. The National Park Service estimated more than \$123 million in damages. The agricultural crop damage was estimated at \$59.3 million with an additional \$57.6 million in damage to farm equipment. The impact on public property is estimated at \$270 million, and private property damages are estimated to exceed \$732 million.

### **III. Pre-Storm Preparation**

The City of Alexandria and collaborative agencies had several days to prepare for the arrival of Hurricane Isabel. Below are the preparation details.

*September 8:* City staff began monitoring the track of Hurricane Isabel

*September 15:* The City's Emergency Management Team (EMT) met to discuss preparations for Isabel. The EMT includes the City Manager, Assistant City Manager, Fire Chief, Police Chief, Public Information Officer, Director of Transportation and Environmental Services, and Emergency Management. Other department heads were included to develop messages to the public, plan for a 24-hour call center, prepare sandbags, plan for opening shelters, prepare teams to remove trees and debris from the public rights-of-ways, set-up of the City's Emergency Operations Center (EOC), prepare duty rosters and twelve-hour shifts, and plan to activate the EOC. The EMT met several times during the next two days to coordinate planning for the City's response to the storm. The City's Emergency Management staff began to hold daily briefings for key City staff.

Governor Warner declared a state of emergency in Virginia. The Virginia Emergency Operation

Center (VEOC) augmented its staff with all state agencies, Dominion Virginia Power, and the Red Cross. Inmates were evacuated from corrections facilities in the Hurricane's path. Eastern State Hospital evacuated 250 patients prior to the storm's arrival.

Dominion Virginia Power inventoried storm supplies and purchased additional material such as poles, cross arms, and power lines.

*September 16:* The Red Cross continued preparing emergency shelters. The information/citizens call center was activated to respond to questions by citizens related to Hurricane Isabel. At 5 P.M. every day leading up to the hurricane, the 24-hour information center was transferred to Fire Communications. DASH and school buses were readied for evacuation services if needed. All departments checked the accuracy of their phone communication lists.

Recreation and T&ES staff began clearing debris from catch basins, roadways, and bridges. Recreation and T&ES work vehicles were fueled and stationed at strategic locations throughout the City. The City placed the EOC on full stand-by to enable response teams to act on short notice. T&ES staff assembled stop signs and barricades for use in the event and in preparation for traffic signal outages. Variable message boards were readied to relay real-time public service messages.

The Public Information Office distributed messages for the public and employees on "eNews," the City Website, and press releases. City employees exercised call lists, reviewed disaster plans, and made alternative arrangements for their family should extra work be required.

Pursuant to the Governor's declaration of a statewide emergency, purchasing made arrangements with Alexandria hotels and motels for housing City staff during the emergency. The Purchasing Division assisted Fire, Police, Recreation, and T&ES staff in the location and purchase of emergency items, such as portable generators and chain saws. The Purchase Card was used successfully for off-the-shelf purchases, and several cardholders were granted increased emergency purchase card expenditure authority. Purchasing planned shifts for EOC staffing.

The Fire Department reviewed procedures to be implemented when the hurricane hit. The minimum staffing on fire apparatus was increased from three to four people. A sixth back-up ambulance unit was to be put in service and run out of Station 204. Fire communications staff increased dispatchers from three to six per shift. The Fire Department maintenance division would increase the number of staff mechanics and placed all personnel on 12-hour shifts. Family employee hotlines were established. All apparatus and stations were prepared for heavy winds and rain. Stations were stocked with food and drinking water. Additional equipment, such as chain saws, portable generators, batteries, and rain gear were distributed to personnel and stations. The Fire Department pulled water rescue boats out of the water. Response protocols for wind speed and hazardous conditions were established for the safety of the emergency personnel.

Code Enforcement staff were divided into four designated damage assessment teams, on 12-hour shifts. The City was divided into East and West to manage team assignments. Code Enforcement

personnel were given FEMA forms and equipment to assess the storm damage.

The Police Department command staff met to begin coordinating the specific personnel mobilization plans. The command staff developed goals, which included to more than double the regular number of uniformed officers for the first 48-hours, beginning on Thursday. Sworn personnel from the Investigation Bureau and Administrative Services Bureau were directed to report at their normal times in full uniform and perform routine duties pending activation for the Field Operations. Communications and Records and Property were instructed to develop their own individual plans for activating personnel. The Police Department assessed the necessary equipment, such as stop signs, flares, and extra batteries.

General Services established a 24-hour roster for facility maintenance and management. They hired two electricians and six carpenters for stand-by duty. They purchased three heavy-duty sump pumps, 50 sheets of plywood, plastic, and other building materials. The staff topped-off all fuel levels in all City generators and removed all loose items from around and on top of City buildings.

Dominion Virginia Power assembled a statewide restoration workforce of 7,000 people. The workers traveled from Texas, Florida, Ohio, Oklahoma, and Canada and were stationed throughout the company's service area and were ready to respond once the storm had passed. Dominion set priorities to work on problems that affected the largest number of customers, with emergency facilities receiving expedited service.

*September 17:* The City Manager's Office-Public Information Officer announced the City government would be closed on September 18. The City began distributing approximately 11,000 sandbags to City residents and businesses at three locations: Pitt and Gibbon Streets, King and Fairfax Streets, and Glebe Road and Commonwealth Avenue. City officials participated in the Council of Governments pre-storm conference call and learned Metro would be closed when the wind speeds reached 40 mph.

Dominion Virginia Power issued several news releases, aired radio statements warning customers to prepare for outages, and contacted 10,000 customers with special medical needs and suggested they make alternate arrangements due to the anticipated outages from the storm.

Nextel Communications issued press releases on their preparation for the hurricane and ensured emergency backup plans were in place. Nextel cell sites and switching offices were designed to withstand hurricane force winds. Nextel's cell sites had high-powered batteries and backup generators, and the switching sites had multiple backup generators and automatic cut over switches.

FEMA sent an advance team to the Virginia State Emergency Operations Center. The Governor issued a mandatory evacuation for low lying areas, light-constructed dwellings, and other areas deemed dangerous by local officials. The Governor held a conference call with all jurisdictions to raise awareness of the potential damage. Three hundred state troopers and swift water rescue

teams were placed on stand-by for deployment.

*September 18:* Code Enforcement personnel distributed flyers in English and Spanish to residents and businesses in flood prone areas. The Public Information Officer announced the opening of two shelters, one at Francis Hammond Middle School and the other at the Mount Vernon Recreation Center, beginning at noon on Thursday September 18. Residents in low-lying areas were encouraged to stay with family or friends, but shelters were available if needed. The City announced suspension of trash pick-up for Friday September 19. Citizens were encouraged to move vehicles parked in low-lying areas. Parking restrictions were lifted effective 2:00 p.m. on Thursday September 18. Schools announced closing for Thursday September 18 and Friday September 19. The EOC was opened at 12:00 noon.

#### **IV. Hurricane Response Activities**

More than 1,000 employees kept the City operating safely on September 18 and 19 when government offices were closed, including 65 employees who worked in the Emergency Operations Center with the recovery employees working in the field (Police, Fire, Sheriff, T&ES, General Services, and Recreation.) Below are the response activities carried out by some of these employees and other collaborative agencies.

##### *Alexandria Chapter of American Red Cross*

In addition to operating the two shelters, the Red Cross distributed food to citizens at food distribution points and shelters.

##### *Alexandria City Public Schools*

School officials opened and maintained Francis Hammond Middle School and assisted the Red Cross with shelter operations.

##### *Citizen Assistance*

Citizen Assistance operates the information line for citizens. Prior to the arrival of Hurricane Isabel, Citizen Assistance staff prepared talking points and increased staffing to answer additional citizen inquiries related to preparing for Hurricane Isabel. Staff included employees fluent in multiple languages, including Spanish, Farsi, French, and others. On September 18th, the staff reported to the call center, which was collocated with the Emergency Operations Center, to field non-emergency citizen calls during the response period. The non-emergency call center received over 1,009 calls and the Fire and Police Communications handled an additional 1,767 calls before, during, and after the storm.

##### *City Manager's Officer - Public Information Office*

The Public Information Office provided information to citizens during the event via eNews, Website, and press releases. At 6:30 a.m. on September 19, 2003 the information was received that the City's water system had lost pressure, the Public Information Officer immediately sent press warning to the public to boil water.

#### *Department of General Services*

The staff inspected and responded to reports of damage to City buildings and made necessary repairs. The electricians worked to repair the generator at the EOC and additional staff maintained the fuel level of all generators.

#### *Department of Information Technology Services*

Maintained the City network and phone systems to ensure operational capability at all City facilities. The ITS staff supported the phone and computer operations in the EOC.

#### *Department of Planning/Zoning*

Provided geographical information services to the EOC for documentation and planning.

#### *Department of Recreation, Park, and Cultural Activities*

The Recreation Department field staff was primarily responsible for tree removal, including the cutting, loading, and hauling. Initially 226 calls were reported to different agencies for trees down. Of these calls, staff removed 98 trees, trimmed 49 trees, and removed 15 trees in right of way. The other 64 trees were on private property. Staff opened the Mt. Vernon Recreation Center and assisted the Red Cross in providing shelter operations.

#### *Department of Transportation & Environmental Services*

Staff was cutting, loading, and hauling away debris and trees to clear right-of-ways. Operators used pick-up trucks, self-loading dump trucks, street sweepers, utility trucks, and stake body trucks to support the operations of the clean-up phase. City crews cleared debris from flooded areas the City. Staff supplied barricades and signs to flooded areas. A street-cleaning tanker provided non-potable water to Inova Alexandria Hospital after it lost water pressure. Officials worked with the Alexandria Sanitation Authority to increase pumping capacity to help relieve sewer lines and flooded basements. T&ES staff monitored the amount of debris removal for recovery efforts.

#### *Dominion Virginia Power*

With over 96 percent of the statewide customer base without power, Dominion Virginia Power immediately increased the restoration crew from 7,000 to 12,000 workers. The crews replaced 10,700 power poles, 14,600 cross arms, and 7,900 transformers. Dominion used a year's supply of poles, cross arms, and transformers and used about 4 years' worth of secondary wire and insulators in a ten-day time period. Dominion fielded over 1.8 million customer calls during the 10-day period.

#### *Finance Department*

The Purchasing Division purchased drinking water for Alexandria Inova Hospital and the jail. Portable toilets were rented for field staff because of the water pressure problem. The purchasing of hotel and motel rooms for City employees was expanded outside of the City limits.

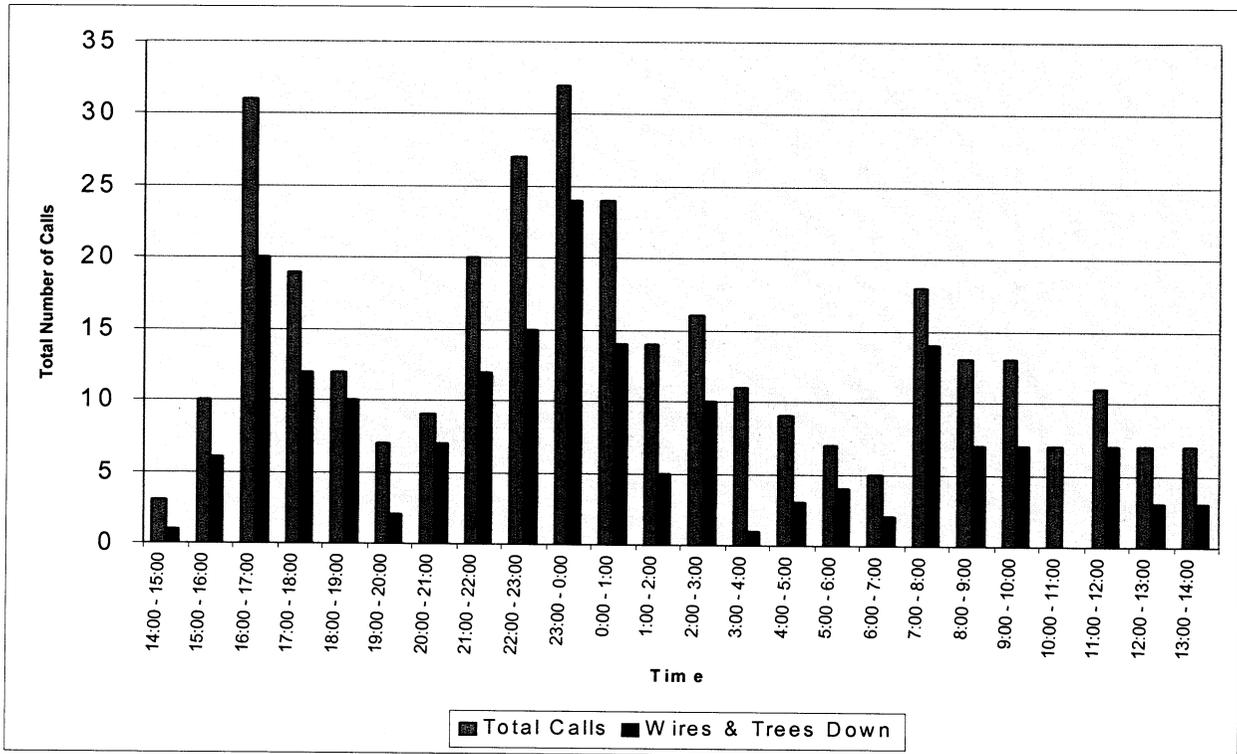
#### *Fire Department*

Fire and EMS staff responded to 332 calls in the first 24 hours. The calls are divided into the

following categories: 79 fire, 41 EMS, 189 trees and/or wires, 8 elevator rescues, and 15 other. The fire calls included vehicle, house, or building fires, as well as, fire alarms. People using candles and generators contributed to the increase in calls. Some fire alarms malfunctioned during the power failures, which also increased fire calls. The number of EMS calls was higher than normal due to the increase in support needed by citizens with special needs. These citizens in normal conditions are self-sufficient, but the power outage increases their need for assistance. For instance, there is an increase in calls for people on oxygen needing transportation to a facility with power.

Table 1 illustrates the call volume received during the 24-hour period starting at 2:00 P.M. on September 18.

**Table 1: Fire Department - Total Calls 24-hour period starting at 14:00 on September 18**



The Fire Department personnel also helped cut down and clear trees from roadways and secured downed wires.

When the City lost water pressure, the Fire Department received three large-capacity water tankers from local jurisdictions, Montgomery County, Prince William County, and Metropolitan Washington Airport Authority. Later the City used the statewide mutual aid program to obtain water from Spotsylvania and Fredrick Counties.

Code Enforcement staff was primarily responsible for property damage assessment. The staff responded to reports of trees and wires down and secured dangerous areas. The field staff was responsible for coordinating with utility companies to re-supply energy. After the hurricane passed, teams of code enforcement staff were in flooded areas evaluating building integrity and assisting businesses with re-openings.

#### *Office of the Sheriff*

The Office of the Sheriff responded to Hurricane Isabel by securing flooded property and relieving police officers at roadblocks. They were responsible for essential support for inmate services during the storm. The Sheriffs staffed the security of the sandbag trailers to ensure proper identification of Alexandria residency and to limit the number of sandbags per household.

#### *Police Department*

On September 18, the police communications center received 793 calls, an above average volume. Police provided patrols and response to emergencies. The bulk of the resources were needed to provide security in Old Town area and to respond to traffic and safety problems related to downed trees and lines, many of which resulted in traffic signal failure. The police established perimeters, positioned roadblocks, and managed pedestrians in the flooded and storm-damaged areas. In intersections with power-outages, the police provided traffic management. Resources were allocated based on location, traffic volume, and danger of a particular situation. Watch commanders from the three patrol divisions continued coverage throughout the weekend.

### **V. Hurricane Recovery Issues**

Alexandria's recovery operations included many different departments and organizations to help businesses and residents cleanup after the hurricane.

The Alexandria Health Department made 700 visits to restaurants, nursing homes, day care centers, convenience stores, and grocery stores to provide information about food safety, water issues, and flood recovery.

Code enforcement staff temporarily lifted permit requirements so businesses could begin emergency construction and repairs.

Federal Emergency Management Agency (FEMA) opened a disaster recovery center (DRC) at the Lee Center to help residents and businesses apply for disaster assistance. Approximately 215 Alexandria residents and businesses applied for disaster funding through the FEMA teleregistration process.

General Services helped cleanup the City's flooded North Union St and Thompson Alley garages. Crews also made necessary repairs around the City, such as the damaged air-conditioning unit at Beatley Library. General Services also prepared damage assessments for City buildings.

T &ES and Recreation Departments continued to take necessary action to remove trees and debris from the City.

City staff began the necessary documentation for FEMA reimbursement for emergency efforts, which occurred during the response to Hurricane Isabel.

## **VI. Hurricane Damage**

Despite all the pre-storm preparation, the City still sustained considerable damage from Hurricane Isabel.

Isabel arrived in the City as a tropical storm with the winds at recorded speeds of 58 mph. Isabel brought with it 2.31 inches of rain. During Isabel's peak, the City experienced a storm surge on the Potomac River that was estimated at over 8 feet.

The water from the storm surge entered many buildings east of Lee Street. The flooding was the worst experienced in recent memory. The storm surge also caused significant damage to the City Marina. Individual businesses and homes experienced several feet of flooding despite having utilized sandbags. Floodwaters entered underground parking structures in several areas of Old Town.

Examples of flood damage include the Starbucks, Ben & Jerry's, The Virginia Store, several stores in the Torpedo Factory, and the Backyard Boat Townhouse development. Starbucks located in the 100 block of S. Union Street had opened just prior to the storm. After months of renovation and significant investment in the business the company suffered extensive damage including the loss of all of its equipment. Townhouses in the Backyard Boat development experienced heavy damage in its underground garage and in individual units due to the flooding that occurred in that area of the City.

A combination of several years of below average rainfall followed by a year of above average rainfall, created weakened root systems for many trees in the City. With the arrival of Isabel's heavy winds, somewhere between 250 and 275 trees within the City were damaged or toppled.

Downed trees blocked many roads and created downed utility lines throughout the entire City. Power was lost to most of the City, and many residents and businesses were without power for several days. Additionally many businesses and residents lost gas service on lower King Street.

The Fairfax County Water Authority lost power to both of its pumping stations, which resulted in low water pressure in Alexandria. The low water pressure required a "boil water" alert for the entire City. Due to the loss of water pressure and the boil water restriction, all restaurants in the City suffered loss of business. Every restaurant was closed for some time until the water pressure was returned and the boil water order lifted.

The City Marina and lower King Street businesses were substantially damaged by the storm surge on the Potomac River. The City is working with its insurance agent to complete a claim and to possibly begin the FEMA application process for financial assistance for damage to City property.

Approximately 124 homes, 113 apartments, 65 businesses, and 127 vehicles suffered physical damage as a result of the storm, and several lower King Street businesses had to close for a period of time as a result of flood damage. The total damage estimates for the City is estimated to be over two million dollars.

## **VII. Findings and Recommendations**

The following section describes the major lessons learned and recommended actions the City can or has taken. City staff will revisit all the recommendation and action items in December 2004 to verify the accomplishment of targeted goals.

### **A. Utility Issues**

1. Dominion Virginia Power - Information
  - a. *Issue:* City Officials were unable to obtain timely, detailed information from Dominion Virginia Power relating to areas of power outages, numbers of residents and businesses affected, and reasonable time estimations of power restoration.
  - b. *Recommendation:* Work with Dominion Virginia Power to develop accurate and timely data coordination and evaluate potential data sharing.
  - c. *Action:* Staff continues to work aggressively with Dominion Virginia Power on these issues. Emergency Management staff and T&ES have met with Dominion Virginia Power numerous times since last September. Dominion Virginia Power has developed a data-sharing program, which is scheduled to begin May 20, 2004. The program will provide information on power outage maps in GIS format. The information will also include pre-identified critical facilities in the City without power. City staff will continue to request outage information by individual addresses and request reasonable estimation of power restoration.
2. Fairfax County Water Authority - Information
  - a. *Issue:* During the power outage, the Fairfax County Water Authority lost all the power feeds to its production facilities, which resulted in low water pressure throughout its service areas including that of the Virginia American Water Company. Virginia American Water Company was not notified immediately, and therefore, City Officials were late in being notified.
  - b. *Recommendation:* Work with the Fairfax County Water Authority to develop a better plan for cooperation, coordination, and communication.
  - c. *Action:* Emergency Management staff has discussed this issue with the Fairfax County Water Authority and they have agreed to work on a plan to coordinate, cooperate, and communicate with the City in conjunction with Virginia American Water Company. On March 9, 2004, Fairfax County Water Authority announced it would be purchasing back-up generators for its water distribution system. The back-up generator project will be completed in three years.
3. Virginia American Water Company - Information

- a. *Issue:* Virginia American Water Company initially had an adequate supply of water, but experienced a generator failure at West Braddock Road and North Van Dorn Street that resulted in a loss of water pressure in the City's distribution system. The City was not notified in a timely manner of this occurrence.
  - b. *Recommendation:* Work with the Virginia American Water Company to develop a plan to improve communications and monitoring of critical water system components during large events.
  - c. *Action:* Emergency Management staff is working with Virginia American Water and they have agreed to develop a notification protocol in conjunction with the Fairfax County Water Authority. Staff will continue to work with Virginia American Water Company on the issues related to their system.
4. Lake Barcroft Watershed Improvement District
- a. *Issue:* The Lake Barcroft Watershed Improvement District is located in Fairfax County and owns and operates the recreational watershed and dam that flows into Holmes Run in Alexandria. There are a number of homes that may need to be evacuated in the event the dam operator releases a large amount of water from the dam or if the dam fails as it did during Hurricane Agnes in 1972. Before Hurricane Isabel, the Lake Barcroft dam operator did not manually open the gates to release the water prior to the storm. There is no formal plan to lower the water levels prior to heavy rains, and there is no plan for notification in advance of the release of the water from the dam, which inputs into the Holmes Run area of the City of Alexandria.
  - b. *Recommendation:* Meet with Lake Barcroft Watershed Improvement District, Fairfax County Officials, and other relevant officials to discuss the problems experienced regarding the release of water from the dam. Recommend improvements to the dam operational plans establishing the release of water prior to an event that may challenge the capacity of the lake. Releasing water prior to an event would be a slower release, which is less likely to create flooding in the City. Establish communication guidelines for a dam release to ensure timely notification to the City.
  - c. *Action:* Emergency Management staff and the Virginia Department of Conservation and Recreation, Division of Dam Safety will hold a joint meeting with Fairfax County Officials and Lake Barcroft. A letter has been sent to the dam operator requesting a meeting.
5. Dominion Virginia Power - Downed Lines
- a. *Issue:* Dominion Virginia Power has a policy to only deploy crews to de-energized downed power lines when the lines are ready to be repaired. Dominion Virginia Power prioritizes the repair work based on the number of customers affected by the downed lines. The City prefers to initially clear downed lines from roadways and walkways to open up roads and to ensure safety of citizens regardless of whether the lines will be immediately repaired. Since the City employees are unable to verify if downed power

- lines are energized, significant delays are encountered until Dominion Virginia Power crews are able to move all the lines out of the roads and walkways.
- b. *Recommendation:* Dominion Virginia Power should use dedicated crews or allow the City to contract with a certified company to de-energize and render safe downed power lines. This would allow the City to clear road blockages.
  - c. *Action:* Emergency Management staff and T&ES are discussing solutions with Dominion Virginia Power to address both priorities.
6. Washington Gas - Return of Service
- a. *Issue:* Washington Gas has a company policy to restore gas service when they feel weather forecast predicts no additional flooding. This policy helps reduce the possibility of Washington Gas crews duplicating work. City staff felt that the flooding had receded and was no longer a threat much sooner than Washington Gas officials thought. Typically Washington Gas established restoration activities jointly with the affected municipalities. During the aftermath of Hurricane Isabel, Washington Gas established a separate restoration command post in a vehicle located near the Backyard Boat Townhouses. Information on restoration process and restoration command post was not coordinated with the City.
  - b. *Recommendation:* Emergency Management staff and T&ES have met with Washington Gas and both have agreed to a protocol, which includes Washington Gas notifying the Fire Communications Center of any major gas outage, defined as between 100-200 gas meters. Washington Gas has also agreed to abide by the City's recommendation as to when the potential flooding has passed. Washington Gas has also agreed to collocate a restoration center with the City.
  - c. *Action:* Emergency Management staff is working with Washington Gas to develop a protocol for gas service restoration and for receiving timely accurate service restoration information.
7. Alexandria Sanitation Authority
- a. *Issue:* The Alexandria Sanitation Authority has an operational policy to increase pumping capacity sparingly. The City desires a more coordinated effort to increase pumping capacity prior to significant weather conditions to mitigate backup.
  - b. *Recommendation:* Review threshold policies with Sanitation Authority and suggest increased pumping prior to and during significant weather conditions.
  - c. *Action:* Emergency Management staff and T& ES have discussed this issue with the Authority. The Authority has not agreed to pursue additional pumping capacity because of the potential to damage their equipment. City staff will continue to work on this issue. During more recent rains, T&ES placed a City employee at the Sanitation Authority to address threshold issues as they arose.

8. Power failure in critical facilities
  - a. *Issues:* Power was lost in the EOC and other City facilities, and the shelters did not have emergency power.
  - b. *Recommendation:* Provide adequate back-up power in the EOC, City Hall, and other City facilities, including shelters. Evaluate need for backup power for our City network.
  - c. *Action:* Emergency generators have been installed at the EOC and City Hall. Emergency Management staff and Information Technology Services staff will develop a proposed plan for continuity of IT services. The plan for construction of the new T.C. Williams High School includes emergency power making T.C. a primary shelter location during power outages in the future.

**B. Isabel Damage**

1. Backyard Boat Townhouse Community
  - a. *Issue:* There was significant flooding in the Backyard Boat Townhouse Community creating significant damage to the homes.
  - b. *Recommendation:* Because the buildings cannot simply be raised to avoid future flooding, work with the homeowners to develop a solution that could be implemented when necessary to mitigate potential flooding.
  - c. *Action:* City staff has been meeting with the owners, developers, and their consultants. The consultants are designing flood mitigation measures that meet the desired requirements and will be working with City staff for approvals.
2. City Marina
  - a. *Issue:* There was significant storm damage to City facilities at the Marina.
  - b. *Recommendations:* Work with the insurance company and FEMA to complete the City claim for funding to repair the marina as soon as possible.
  - c. *Action:* Outside engineers assessed the Marina and found substantial damage had occurred. FEMA disapproved the City's initial estimates and notified the City that we must complete our insurance claim prior to submitting an appeal of the FEMA ruling. General Services has provided needed documentation to the insurance company. The Risk Manager is working with the insurance company to get the final financial damage assessment. Once the insurance company has completed its assessment Emergency Management staff will file an appeal of FEMA's rulings and apply for FEMA reimbursement for the repairs if our documented damage exceeds the FEMA threshold of \$2.71 per resident. Repairs will be made as soon as funding is available.

**C. Public Water Issues**

1. Critical Care Facilities

- a. *Issue:* During the loss of water to the City, including Alexandria Inova Hospital, officials realized many critical care facilities have emergency management plans that rely totally on City Resources.
  - b. *Recommendation:* Meet with critical care facilities in Alexandria and review their emergency plans.
  - c. *Action:* Emergency Management staff is scheduled to meet with facilities in May to ensure that adequate plans are in place or that actions have been taken to plan for future emergencies of this type. City Emergency Management staff will work with the facilities, assisting them with the development of appropriate plans.
2. City's Back-up Water Plan
- a. *Issue:* The City lost water pressure as a result of power outages. The loss of water pressure affects fire protection, drinking water, and sanitary capabilities for the City's residents and businesses. Alexandria Inova Hospital was impacted particularly hard and had to postpone urgent medical care and obtain additional water supplies.
  - b. *Recommendation:* Review emergency power and water systems and backup distribution, and develop emergency action plans for water loss within the City and schools buildings. Review mutual aid agreements with other jurisdictions to provide assistance with water shortages in emergencies. Evaluate need for additional water resources.
  - c. *Action:* Fire Department staff has developed a contingency plan for requesting tankers through existing mutual aid programs to provide water for firefighting use. Emergency Management staff has met with the Virginia Department of Emergency Management who is in the process of developing a purchase agreement for drinking water. Additionally, purchasing staff has completed an emergency purchasing manual that identifies available resources. The City and Alexandria Inova Hospital purchased a large quantity of water, much of which is stored for the next emergency.

**D. Information Dissemination**

- 1. Return of Utility Service
  - a. *Issue:* The various utility companies were giving inconsistent information with regard to estimated return of utility service and other disaster information.
  - b. *Recommendation:* Coordinate with utilities to get usable information in a timely manner.
  - c. *Action:* Emergency Management staff is working with all the utility companies to get more reliable, timely information. Staff has scheduled future meetings to develop communications strategies.
- 2. Public Information
  - a. *Issue:* The City has limited capabilities to provide important emergency messages to the public during a power outage.

- b. *Recommendation:* Continue to use all current modes of communication, when appropriate: flyers door-to-door, variable message boards, the Emergency Alert System, radios, emergency vehicles public address capability, eNews You Can Use, City's website, media, cable, and TV programming. Add to our current communications capability a text and voice communication system that could be used to reach the public when power is out.
    - c. *Action:* The Urban Area Security Initiative is offering funding to the City to receive a free text messaging system for citizen notification to add to our existing methods of reaching the citizens. This text system could reach people who have pagers, cell phones, e-mail and personal digital assistants. Many of these devices work with batteries that could operate during power outages. The City has also implemented a voice system that can reach telephones, many of which operate even during power outages. Emergency Management staff, ITS, Police, and the Public Information Officer will develop a plan for using all available systems as needed.
- 3. Information to Citizens
  - a. *Issue:* Information available to citizens was not adequate.
  - b. *Recommendation:* Continue to provide information using television, radio, website, and eNews You Can Use, variable message boards, Citizen Assistance information number, and other systems for home/property owners. Add to our current communications capability a text and voice communication system that could be used to reach the public when power is out. Provide information on what the residents/businesses can expect the City to provide and what they will have to be prepared to do for themselves. Develop a plan to use Comcast in extreme emergency situations when a community wide message is necessary. Identify and publicize a main number for residents/businesses to call. Devise and disseminate "canned" messages for community (i.e., conserve water when supply is low)
  - c. *Action:* Public Information Office, with assistance from Emergency Management staff, is developing an improved plan for informing citizens during disasters.
- 4. City Employees
  - a. *Issue:* Even though information was provided prior to the event, field staff did not receive updated information to help answer questions from citizens.
  - b. *Recommendation:* Develop a communications plan for all City employees during a disaster. Increase staff support to the PIO in order to provide needed information to all parties.
  - c. *Action:* Emergency Management staff and the Public Information Officer will develop a plan to update employees during disasters. The PIO has developed a team of employees to assist in large events. The team has begun training and developing working relationships.
- 5. Businesses

- a. *Issue:* Restaurants were not familiar with requirements for reopening after floods. Requirements included structural regulations and health and utility issues.
  - b. *Recommendation:* All relevant agencies develop and disseminate a compilation of requirements for all buildings.
  - c. *Action:* A multi-agency task group is being formed to develop the information and a distribution plan for the information during an event. These will be developed in advance and be ready for distribution when needed.
6. Language Barriers
- a. *Issue:* Although we had interpreters available for callers, we did not have translators available to prepare printed material.
  - b. *Recommendation:* Obtain translators for printed material.
  - c. *Action:* The Public Information Officer has identified a translator for use during emergency situations.

**E. Emergency Supplies**

1. Sandbags
- a. *Issue:* The City had provided sandbags to businesses and residents during past flooding events. The potential magnitude of Hurricane Isabel created a demand for sandbags, which exceeded our capabilities. Security measures had to be instituted at the distribution areas to control the numbers of sandbags available to each person and to verify City residency.
  - b. *Recommendation:* Develop policy on sandbags. Provide outreach to the community regarding expectations and preparedness.
  - c. *Action:* The City will continue to distribute a limited number of sandbags to businesses and residents that routinely experience flooding. In large-scale events, additional sand distribution sites with sand, bags, and shovels will be established for citizens to assemble bags they may need. Security staff will be assigned to the distribution sites. T&ES and Emergency Management staff will include sandbag availability in their outreach efforts.
2. Ice
- a. *Issue:* During the power outage many residents requested ice for food storage. Ice was not available in retail stores. Ice distribution from FEMA never reached the City.
  - b. *Recommendation:* Develop policy on ice. Provide outreach to the community regarding expectations and preparedness.
  - c. *Action:* For extended power outages ice does not replace refrigerator or freezers. Public Health Officials worry that the use of ice may provide a false sense that food is stored properly. Ice is useful to store medication for short periods of time. Normally ice is available through retail outlets including supermarkets and convenience stores. The City should not provide ice for food storage. The Virginia Department of Emergency Management is establishing contracts with ice vendors that will be

available if needed for the storage of medical supplies. Emergency Management outreach staff will include the issues of ice in their outreach efforts throughout the City.

**F. Coordination with Virginia State Emergency Operations Center (VEOC)**

1. *Issue:* Several unsuccessful attempts were made to obtain resources from the VEOC. One example is the City requested water buffaloes with drinking water. This request was never acted upon.
2. *Recommendation:* Work with the Virginia Department of Emergency Management to develop a plan to improve coordination between the State and the City.
3. *Action:* Emergency Management staff has met with the Virginia State Officials and changes to the State resource request tracking system and local coordination have begun. The VEOC will now have a local liaison who will track all issues including resource requests through the State and FEMA processes. The VEOC is also updating the software used to track requests. Emergency Management staff will continue to work with the State to coordinate improvements to state and local coordination.

**G. Operations**

1. *Issue:* The City's EOC needed more continuity and consistency in handling callers' information, department assignments, and tracking results. Multiple units were responding to the same incident. Field staff did not have an established point of contact at the EOC.
2. *Recommendation:* Use Permit Plan, an automated computer system currently used by Code Enforcement, to track all calls for response and assistance. Develop an integrated tracking system that pulls together all actions by various departments and major agencies to display on GIS.
3. *Action:* Emergency Management staff is actively working with Code Enforcement to implement the use of permit plan as the tracking system for use during a disaster.