

# POST INCIDENT ANALYSIS

**River Road Water Main Break  
Swift Water Rescue/Multiple Casualty Incident  
Tuesday, December 23, 2008  
Incident #08-0131557**

**Prepared by Battalion Chief Jim Resnick**



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## Executive Summary

On Tuesday, December 23, 2008 just before 0800, a 66" water main ruptured on the 8500 block of River Road in Bethesda. The result was a massive swift water event that required an unprecedented, coordinated rescue of nine stranded occupants from a combination of ground, boat and helicopter rescues. This was accomplished through the combined efforts of 80 MCFRS personnel who were joined by personnel from mutual aid and other Departments/agencies. The successes of the operations that day were witnessed throughout the region, the United States and the world. The acute phase of this incident lasted approximately 3 hours, and due to damage to the roadway and adjacent utilities there were ramifications that affected the County for several weeks. Although many factors made this a unique event, it is imperative that the experience of that day and the lessons learned be reviewed to improve responses to similar events in the future. The events of that morning demonstrate the value of the investment into proper staffing, training and equipment that Montgomery County has made over the years. This incident provides proof of the need for this continued investment in the MCFRS to maintain itself as a premier, all-hazards response organization. Given the aging infrastructure in the County it should be anticipated that similar events might occur in the future, and the MCFRS will be called upon to play a lead role in responding to and mitigating those disasters. With history as our teacher the MCFRS will continue to improve on its mission to "protect lives, property, and the environment with comprehensive risk reduction programs; and safe, efficient, and effective emergency response provided by skilled, motivated, and compassionate

career and volunteer service providers representing Montgomery County's diverse population".

## Introduction

Tuesday morning, December 23, 2008 was very cold with temperatures in the mid-teens. At 0756 hours, Montgomery County Emergency Communications Center (ECC) began receiving the first of several 911 calls from frantic occupants of several vehicles that had suddenly become stranded along the 8400 block of River Road, between Fenway Road and Carderock Springs Drive. A 66" water main under the roadway had just ruptured, sending as much as 150,000 gallons per minute flowing down the steep incline of River Road, and sending a three-to-four foot high torrent of icy water down the roadway. Some of the vehicles caught in the flood stalled out immediately, others continued to run but were unable to move due to debris that jammed their undercarriage. Freezing water began filling the interior of many of the cars. In turn, many of the car doors and windows quickly became frozen shut.

At about 0757, unaware of the 911 calls and the events that were occurring just west of Cabin John Fire Station #10, Engine 710 was heading westbound on River Road in order to run an errand in Potomac. Engine 710, commanded by Lieutenant William Phelps and with a crew of Firefighter III Anthony Bell and Firefighter I Ryan Bailey approached the scene. Lt. Phelps radioed ECC and advised that he was witnessing a "three-to-four foot wall of water" and as many as ten vehicles stranded on River Road. The 7-Alpha dispatcher advised him that they were receiving calls and were about to dispatch a Swift Water Rescue assignment. Lt. Phelps took command of the incident and began requesting additional resources, including additional Swift Water Rescue Teams, Helicopters, and EMS units. He also consulted with FF Bell and they came up with a strategy to use Engine 710 to drive up through the fast flowing water and attempt to rescue as many of the stranded victims as they could. Large chunks of asphalt and large rocks that had been part of the ballast for the roadway were cascading down River Road at speeds estimated at up to 15 miles per hour. The crew of E710 used their knowledge of the dangers of fast moving water and their concern that the cars' occupants might try to step into the freezing water and therefore could be swept away. Lt. Phelps implemented a plan to have FF Bell drive E710 up the hill to the first car. When they got within about 15 feet of the car and without a swift water rescue dry suit, Lt. Phelps first probed the water with a pike pole to ensure that the roadway was still there, and then he worked his way over to the car door. After forcing the door open, he aided the scared driver out of her car and into Engine 710 where she was assisted by FF Ryan and assessed for injuries. FF Bell maneuvered through the moving debris field and drove up the hill to the second car where the crew repeated the same type of rescue. As they prepared to drive farther up the hill toward the third car, FF Bell and Lt. Phelps quickly discussed the possibility that the roadway was being undermined and could be washed away, and considered that with the risks to the trapped occupants in the other cars. They made the decision to press ahead and completed a total of four rescues before they decided it was too unsafe to proceed ahead. FF Bell then backed Engine 710 down to the bottom of the hill where the patients were transferred to A710 for medical evaluation and transport to Station 10.

The Swift Water Rescue dispatch resulted in responses by Strike Team 710, commanded by Lieutenant Patrick Mitchell and staffed by Master Firefighter Henry

Kumm and Firefighter Luis Valdez, and Strike Team 730 commanded by Captain Francis Doyle and Firefighter III John Dunlavey. These crews eventually met at the top of the hill at the intersection of River Road and Clewerall Drive and developed an action plan that was implemented and coordinated by Deputy Chief Scott Emmons in order to rescue the occupants of the two vehicles that were closest to the water main break. Using a John Boat that was tethered to a rope system that the Swift Water Rescue Team set up between two large trees, Lt. Mitchell and MFF Kumm were carefully lowered into an eddy next to the uppermost car. Stepping out of the boat and into the freezing water, Lt. Mitchell gave instructions to the stranded motorist and after assuring that she had a proper water safety gear in place, he assisted her into the boat. Using MFF Kumm's directions, Capt. Doyle, FF Dunlavey, and other Swift Water Rescue Team members guided the boat farther down the hill and to the second vehicle. Again, these crews executed the rescue of that vehicle's occupant, and then the boat was pulled back upstream and over to the north side of the road, that was now an icy shoreline. Additional swift water rescue personnel aided the two drivers to waiting EMS crews who treated the two women for hypothermia and transported them to Suburban hospital where they were treated and released.

While the rescues at the top of the hill were being conducted by Strike Team 710 and Strike Team 730, three other rescues were being made by the crew from Maryland State Police Trooper 2, staffed by Pilot Sgt. Jim MacKay and Flight Paramedic Sgt. Nathan Wheelock. In an internationally viewed rescue, this crew made a very intricate rescue of a driver and her 9-year old child.

Unified Command was established with Montgomery County Police, and numerous supporting agencies and the other participating Departments. This singular event also had immediate and short-to-medium duration implications on the County's water supply, public health, transportation, and commerce that required the activation on the County's Emergency Management Group. In the end, the heads-up, innovative actions of the MCFRS personnel, supported by air and mutual aid resources were responsible for saving the lives of nine stranded motorists from a dangerous, dynamic situation. There was one lost time injury to an MCFRS member. Their efforts were supported by over 100 public safety officials from several agencies.

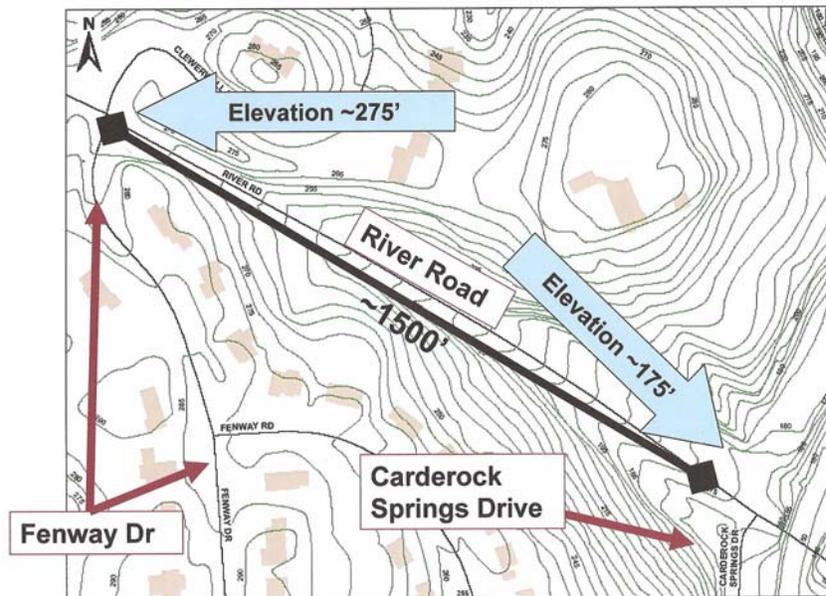
#### Unique Circumstances/Problems

There were many unique aspects to this incident.

- Date and Time: Tuesday, December 23<sup>rd</sup> was the second day of winter break for most private schools in Montgomery County, and the last day of school for Montgomery County Public Schools before the winter break. These two factors might have lead to a lighter-than-normal morning rush hour traffic flow on an otherwise busy commuter route. Although nine vehicles were known to have been directly impacted by the flooding on December 23<sup>rd</sup>, there were most likely many vehicles and passengers not on the road that day. Additionally, timing and luck seemed to have worked in our favor, as one of the first vehicles stopped before the water main break was a Metrobus with an unknown number of passengers.

- Location of the water main break: While most seasoned MCFRS personnel have some experience with flash floods and/or water main breaks, the writer is unaware of any MCFRS personnel with the experience of this type of event occurring along an occupied roadway, with the combined factors of (1) the massive volume of water and (2) the significant slope of the hill. The grade of River Road in that area drops approximately 100 feet in elevation over approximately 1500 linear feet, making that slope similar to the road in the mountainous areas of western Maryland. By comparison, Great Falls along the Potomac River consists of rapids and waterfalls, with a total a 76 foot drop in elevation over a distance of just less than a mile.

Figure 1

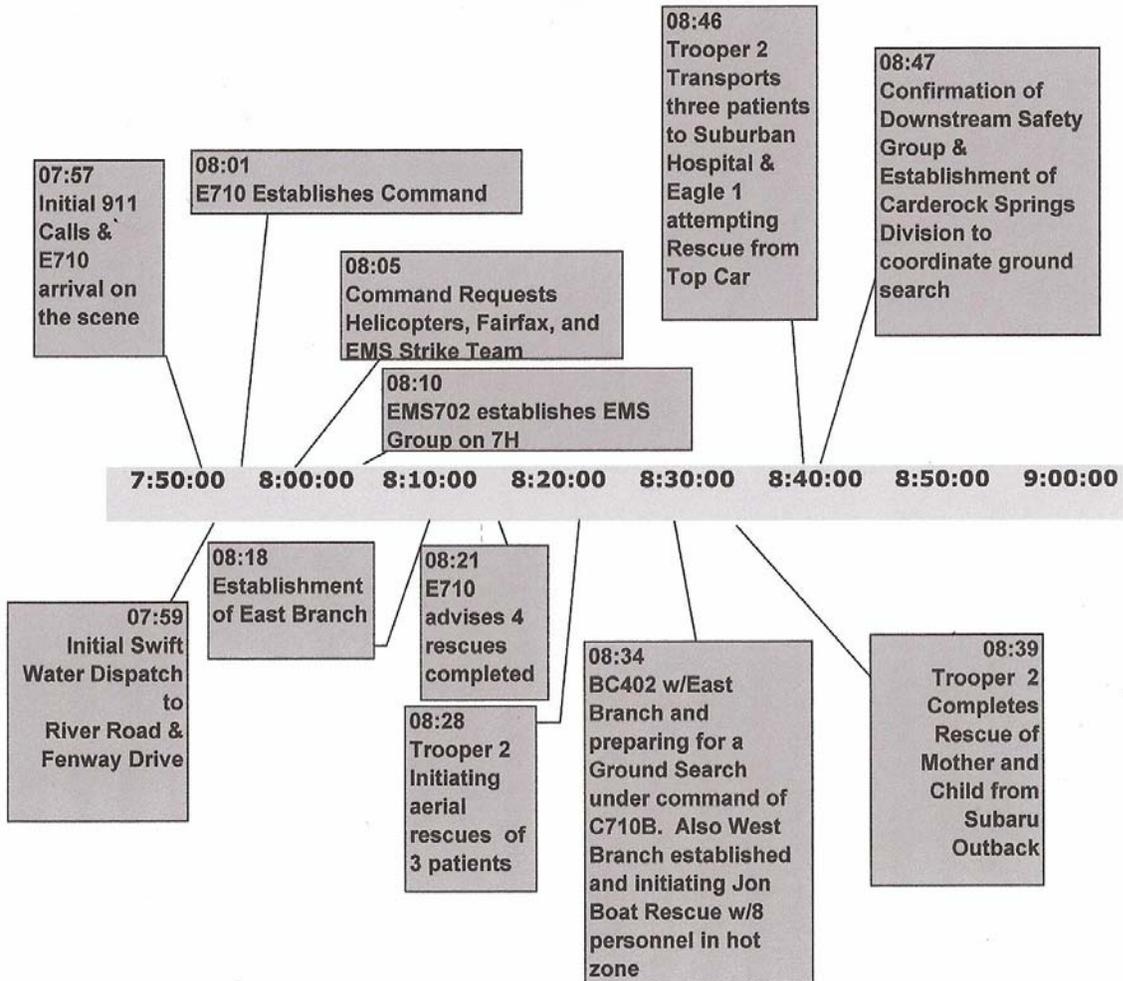


- Temperature: This factor cannot be overstated in terms of the acute nature of the rescues that had to be made. The extremely cold temperature heightened the urgency of making the rescues. Air temperatures were less than 20F degrees with winds approximately 5-10 mph, making wind chills in the single digits. If the air and water temperature had not been so cold, it is possible that other, less risky, strategy and tactics might have been employed. There was a significant risk of severe frostbite and/or hypothermia to all trapped victims.
- Distance (end to end) of the incident scene: The distance from the top of the hill where the rigging system was employed to the bridge where Seven Locks Road is carried over the Cabin John Creek is nearly one mile in length.
- Duration of the incident: The incident started just before 0800, and it wasn't until approximately 1330 that Unified Command was terminated and the scene was formally turned over to WSSC, SHA and PEPCO, with SHA being the lead agency. The duration of this incident was rather lengthy as compared to most swift water rescues, most of which are resolved in less than one hour.

Timeline of Significant Events:

Figure 2

River Road Water Main Break Timeline of Significant Events



### On-Scene Operations

Early calls for assistance: Within the first ten-to-fifteen minutes of the initial dispatch, a significant number of additional resources were requested or self-dispatched. These included:

- ST710 and ST730, A710, Cabin John Duty Officer and Battalion Chief 702 – dispatched by ECC after conferring with Command (Phelps)
- Helicopter Trooper 2 – requested from SYSCOM by ECC as part of the inland water rescue response, after being air resources were requested by Command (Phelps)
- Helicopter Eagle 1 – requested by ECC after being specifically requested by Command (Phelps)
- Fairfax Swift Water Response – specifically requested by BC702 (Resnick) after conferring with Command (Phelps)
- EMS Strike Team - requested by BC702 after conferring with Command
- MAB726 - requested by Command (Resnick)
- BC703, EMS702, C710B, DC700, C710, U131, U100, Executive Chief, Safety 700, C703D, C703, PIO – self dispatched

### Responding Units

As the incident progressed, several other requests for assistance were made, including additional fire task forces, canteens, and additional manpower units. The final tally of responding units was:

#### Figure 3

Swift Water Assets: Strike Team 710, ST730, Swift Water 439, SW421, SW418, SW412, BS725, U131, U62

Engine Companies: E706, E710, E711, E720, E726, E733, E752

Aerials: T706

Rescue Squads: RS741, RS703, RS401, RS418, RS421

EMS Units: A710, A708B, A711, A726, A741B, A741C, A418, M741, M729, MAB726

Command and Command Support: BC702, BC703, BC402, C703, C703B, C710, C710B, C741E, CS700, DC700, DC700B, EMS702, SA700, U100, PIO, CP727

Other Fire/Rescue Units: B715, CT705, CT708, CT733, FM20

Helicopters: Maryland State Police Trooper 2, U.S. Park Police Eagle 1

MCFRS Personnel: 80

Fairfax County Personnel: 23

### Incident Action Plan

Lt. Phelps established his Incident Action Plan for the parts of the incident that he was able to see from his vantage point. This included (1) initiating a vehicle-based rescue of the occupants of the cars toward the bottom of the hill, (2) advising the Swift Water Strike Teams respond to the top of the hill and evaluate the situation from that perspective, and (3) requesting helicopters for the cars that were in the middle. Once Battalion 702 (Resnick) had established a fixed Incident Command Post, he confirmed with E710 that their rescue operations were commencing and then he did a face-to-face with the Strike Team Leader from ST730 (Doyle). They determined that the IAP for the rescues from the two vehicles closest to the top of the hill would be a

rope and boat-based rescue. Command then announced over the operations talk group (7G) that the priority for the East Branch was to perform a search of the creek. Command also had C741D (Gaegler) perform a reconnaissance mission of the parts of the Carderock Springs community that were adjacent to the creek. Finally, with Eagle 1 flying as “cover” for them, Trooper 2 initiated the airborne extraction of three occupants from the middle vehicles.

After the rescues had been made, MCFRS Commanders met with MCPD Commanders and developed an action plan to have a thorough secondary search of all vehicles, including looking into the trunk, underneath the vehicle, etc. MCPD also used this opportunity to verify the make, model, license number and VIN of each vehicle before having them towed. It was during this process that two discrepancies were noted between the vehicles' registered owner and those known to have been rescued. This resulted in having the crews that were now at Station 10 doing a hotwash being readied to perform another air and ground search. However, quick work by MCPD Detectives and Patrol Units resolved these issues before the searches were initiated.

### Command Operations

#### Incident Command & Division/Group Operations:

- Initial Incident Command was established by Lt. Phelps on E710. This was essentially “attack command” with E710 first attempting to determine the scope of the event, and then engaging in rescues of the first four victims. His actions also included requesting Montgomery County Police, and aviation assets. After consulting with BC702, Command also requested additional swift water assets from Fairfax, and an EMS Task Force to stage at Station 10.
- Upon arrival at the western end of the incident, BC702 (B/C Resnick) established a fixed Incident Command Post in the BC702 vehicle, a three-seat Ford Expedition, at the corner of Clewerall Road and River Road. He was joined there by DC700 (A/C McCarty) and U131 (BC Goldstein), Executive Chief (A/C Ridgely), and BC703 (BC Cooper). As Ridgely, Goldstein and Cooper arrived, so did CP727 which was then utilized as the Incident Command Post for the remainder of the Fire/Rescue Operations and the development of Unified Command with Fire, Police, WSSC, State Highway Administration, and PEPCO.
- C710B (D/C Miller) was directed to establish the East Branch running out of Station 10, with the East Branch running out of CP727 . C710 arrived at Station 10 before C710B arrived so he assumed the role/responsibilities of East Branch Director. As the event unfolded, the East Branch also took on the role for staging most of the EMS and support apparatus, and became the focal point of most of the media attention. The East Branch also became subdivided when the Carderock Group was created; this group handled the ground search of nearly ½ mile of Cabin John Creek from Carderock Springs Drive to the Seven Locks Road overpass over the creek.
- The West Branch Director was not built out for about 20 minutes and it primarily involved the efforts of the swift water personnel and EMS response that handled the Jon Boat rescues. The West Branch also contained the Incident Command Post and served as liaison with Montgomery County Police, WSSC, PEPCO,

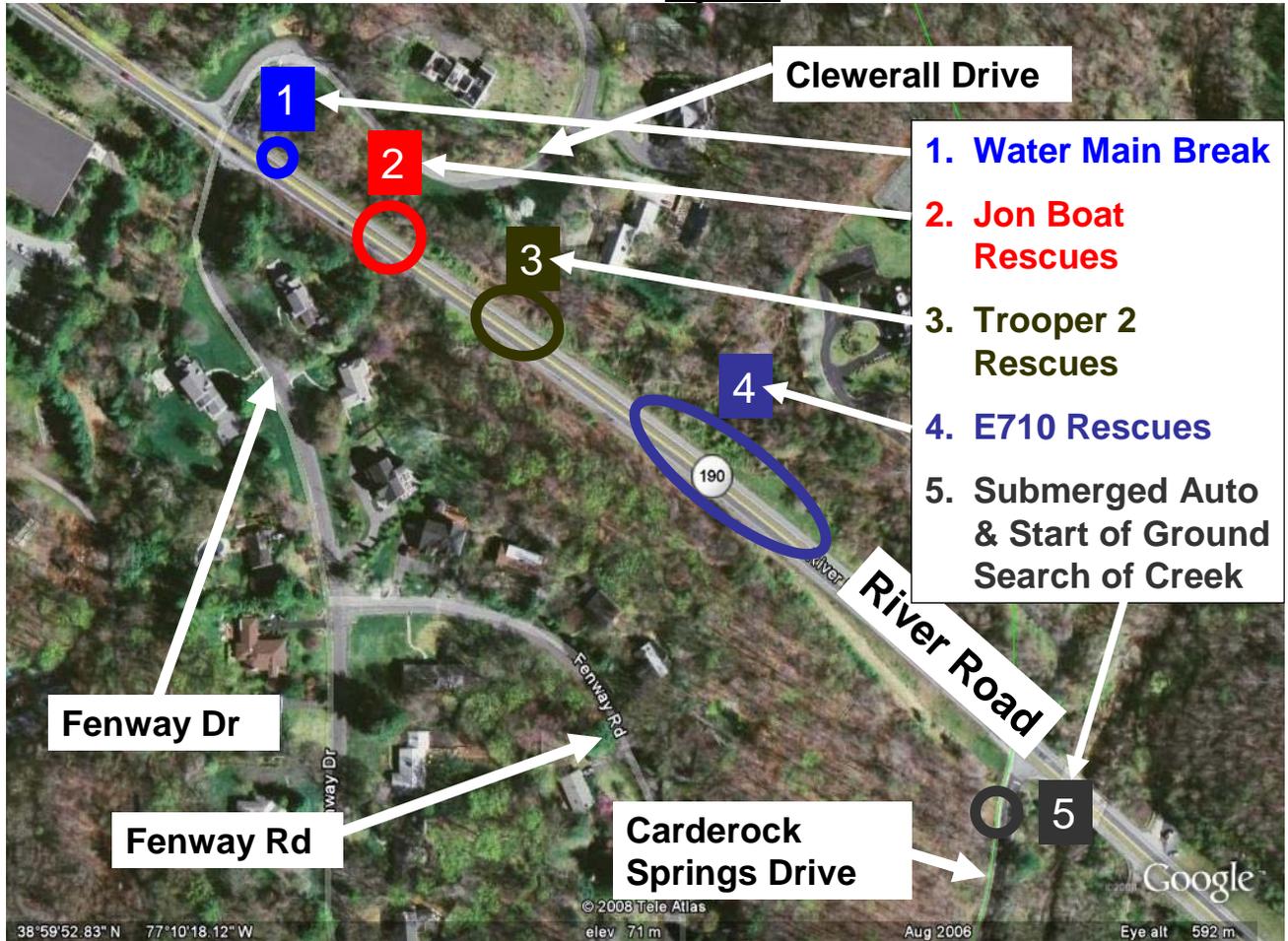
SHA and other Departments and Agencies. Late in the incident, the County Executive was briefed by MCFRS and MCPD at the Command Post.

- Command also communicated with the County's Emergency Management Group throughout the incident, starting at approximately 0835. Most of the communications between the ICP and the EOC were handled by DC700 (Prete).

Scene Arrangement/Layout

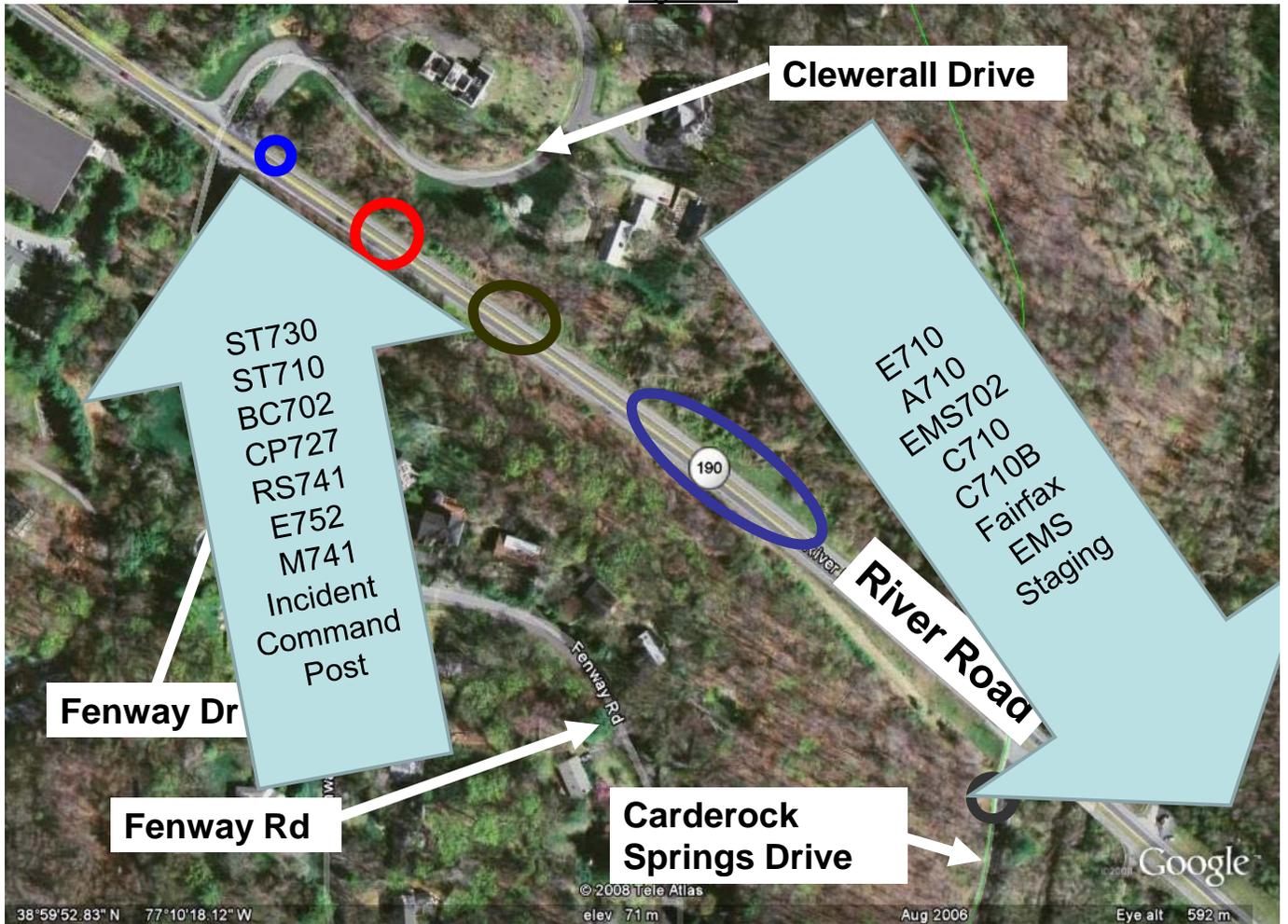
- Overview of Rescues:

Figure 4



- Apparatus Layout:

Figure 5



### Involvement/Use of Outside Agencies:

Montgomery County Police – Initially there was first responder concern regarding insufficient police resources to handle the priorities of traffic and crowd control. This was compounded by the fact that the incident occurred at the edge of the MCPD 1<sup>st</sup> District response area. MCPD resources from the 1<sup>st</sup> and 2<sup>nd</sup> Districts, as well as several other sections responded and managed many aspects of this incident, including traffic and crowd control, witness and victim interviews, dealing with personal property (vehicles), and PIO functions. MCPD was represented in the unified command post by the 1D Deputy Commander, Lt. Nancy Hudson and the 2D Commander, Capt. Russell Hamill.

Hospitals – Suburban Hospital ultimately received four patients from this incident, during which time the hospital was on mini-disaster as a result of the loss of water pressure. Three of these patients arrived via Trooper 2, with very short notice from SYSCOM. Fortunately these patients required assessment only and no medical intervention; otherwise the selection of Suburban Hospital for receiving these patients would have been a poor choice.

Helicopters – the benefits of using helicopters for this event cannot be understated. In addition to the rescues and the extraction of Lt. Mitchell, both Trooper 2 and Eagle 1 were instrumental in providing reconnaissance that proved invaluable to Command in making strategic and tactical decisions. Although the presence of several news helicopters was a significant area of concern by the Incident Commander, we have subsequently learned that there was good communication between the public safety helicopters and those from the media, and in the end the footage provided by the news helicopters was helpful for post-incident evaluation and positive public relations for MCFRS and other agencies.

Mutual Aid Companies – with multiple incident priorities that were each labor intensive, it is unlikely that the incident could have been handled as efficiently and effectively as it was without the support of Fairfax County Fire and Rescue. A total of 21 swift water and command personnel from Fairfax County responded with boats and rescue equipment, and were quickly assigned to fill out the Carderock Springs Group that handled a ½ mile long search of the Cabin John Creek. An excellent decision by the East Branch Director was to have them remain on their own tactical talk-group and have Fairfax Battalion 402 in C710's vehicle to coordinate activities.

### Other Considerations

Communications – Communications were extremely challenged throughout both the initial phases of the incident as well as further into the incident. Branch directors and unit officers both complained about their inability to get air time, and the resultant difficulties of not being able to get important strategic or tactical messages through. Early on, Command had a problem with information overload and it wasn't until the incident had been divided into East and West Branches that Command began to get a handle on the situation and the flow of messages. Some information and some

messages presented Command with confusion. For example, M729 brought crew taking UT729 but calling themselves M729

Confusion with the availability of AB730 – (BT730-B (MFF Pollard) had information that AB730 was OOS)

Command assigned HT2 and HE1 to 7 Hotel even though EMS was already on 7 Hotel

Safety – Safety 700 (Grierson) responded and checked in with the Command Post at the West Branch early in the incident. He maintained the role of Incident Scene Safety Officer at the technical rescue throughout the event. He did suffer a back strain while assisting with pulling the boat – ironically this was the only injury to MCFRS personnel. At the other end of the incident, a 4-person RRATS crew provided downstream safety in the event that any victims or rescuers were swept downhill/downstream. They operated under the East Branch.

Logistics & Equipment/Supplies – Throughout on-scene operations, there were no reported problems with equipment availability. The majority of the technical equipment needs were at the West Branch, and with both Boat Support Units (ST710 and ST730) located close by there was sufficient equipment on hand to handle the technical rescues. After the event was over, units were able to be adequately restocked and placed back in service.

Rehabilitation – The most significant aspect of Rehab was providing a warm environment for responders and support agency personnel. This function was integrated into the command structure and was handled extremely well by Canteen 705 and Canteen 708 at Station 10 and by Canteen 733 at the West Branch. In addition, the Salvation Army provided a canteen to the West Branch.

Site Access – Access was a challenge to many of the operations. E710's crew took a calculated risk by driving up River Road to make the initial rescues, and later it was moved up the hill to provide a safety and reconnaissance platform. Otherwise, there was no access for heavy apparatus from the east end. The west end of River Road was not accessible by apparatus beyond the intersection with Fenway Road/Clewerall Road. There was no apparatus access from the north and south sides and personnel access was extremely treacherous due to the steep inclines that had become ice covered and the fast flowing channels along the sides of the road.

Figure 6



### Triage/Patient Outcomes

Although this incident was technically a multiple casualty incident, formal triage was never used. Crews never used triage ribbons, established formal treatment areas, or filled out triage tags. This was due to a number of circumstances including the way that the victims were extricated from the scene in three different ways (by Engine and Ambulance from the bottom of the hill, by helicopter from the middle of the hill, and by boat from the top of the hill). The four victims who were rescued by E710 were evaluated by A710's crew and all were determined to not require treatment or transport, and were left off at Station 10 until they were reunited with family and friends and taken home. The three victims who were removed by Trooper 2 were transported to the ball fields in front of the Norwood School. They were evaluated by the flight medic and when no ground-based EMS transport unit showed up in a timely fashion (they were all at Station 10), the crew of Trooper 2 opted to fly them to Suburban Hospital. All patients were quickly evaluated and released.

### Lessons Learned:

Swift Water Rescue Training: The outstanding performance of the MCFRS and Fairfax Swift Water Rescuers is directly attributable to their continuing training. The support for this training cannot be interrupted, especially as the more experienced members of these teams approach retirement.

Swift Water Staffing: Desired staffing for RRATS is four members each Stations 10 and 30, with two of them being Boat Operators. At the time of this incident there were five RRATS members at Station 10, but only two at Station 30 (minimum staffing). Due to a longer response route and the need to evaluate Carderock Springs Drive, ST710 was delayed and ST730 provided the only RRATS qualified personnel at the top of the hill for nearly 25 minutes. This in turn delayed the implementation of the rescue attempt. Although this incident was unusual in terms of the number of rescues that had to be made, there is no doubt that the desired staffing levels would have more rapidly accomplished the incident priorities in this particular event. This concept can also be extrapolated to day-to-day RRATS operations along the Potomac River as well as flash flood-type events.

Logistics: A large quantity of technical rescue equipment (ropes, carabineers, etc.) from ST710 and ST730 was rendered unusable or damaged during the incident. This equipment was replaced from existing stock so the units were able to be placed back in service, but with no budget for the replacement CJPVFD is struggling to maintain inventory. Appropriate funding for this equipment is essential.

Use of Subject Matter Experts: For highly technical rescue scenarios such as those that occurred on River Road, there is a need for Command staff to have an understanding of specific procedures and techniques. In the absence of that knowledge and experience, it is extremely important that Command have access to subject matter experts (SME). In this event, because of the unique nature of how, where and when it unfolded, many of the SME were involved in roles that prevented them from being accessible to Command. This included C710 and C710B being in Branch Director or Group Supervisor roles. Consideration should be given to removing them from those positions and redeploying them to SME positions (e.g. Senior Advisor)

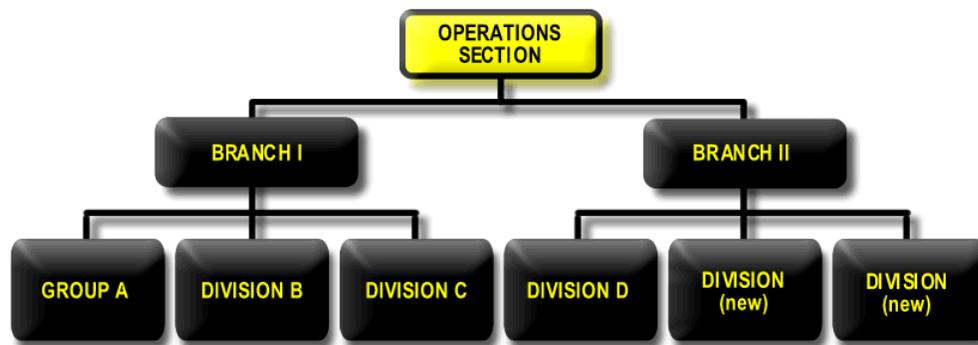
The Importance of Back-up Plans: Unit officer and command officers all indicated that they were actively developing alternative plans throughout the incident. Lt. Phelps commented that he and his crew were constantly evaluating their progress and coming up with back-up plans if they couldn't proceed up the hill. D/C Emmons indicated that he had plans in place for using the helicopters, using a winch from a Rescue Squad or a tow trucks, or waiting for the flow of water to be controlled as option if the rope/boat system didn't work. Captain Doyle used seven iterations of his plan (Plan A, Plan B, etc. through Plan G) to successfully make the two rescues and retrieve Lt. Mitchell.

Use of Command Post 727: As a Command Platform, CP727 worked fairly well but some limitations were apparent to users. Among them were (1) the need to keep all radio channel operators in one room with at least one Command level Communications Group Supervisor to monitor, coordinate and direct the communications as necessary; (2) the need to direct support staff to work the radios, providing better use of Command resources; and (3) the need to place Command and General Staff in a separate room in order to allow for better direction and coordination.

Type of Command: Although Command was established and a dedicated Incident Command Post was employed, there were certain aspects of Command that could have been managed and conducted more effectively and more efficiently. Although unified command was employed, it was never announced that unified command was in effect. Also, along this elongated scene there were four distinct operations that were under the Command of “River Road Command” which might have been better served under an “Area Command”. They were:

- The boat-based evacuation of the occupants of two vehicles toward the top of the hill. This was accomplished through the efforts of the West Branch, with the majority of the work done by Strike Teams 710 and 730, with support from other MCFRS Strike Team personnel, Fairfax Swift Water assets and other MCFRS personnel, and Helicopter Eagle 1.
- The helicopter-based evacuation of three people by Helicopter Trooper 2 from two cars in the middle of the hill.
- The vehicle-based evacuation of four occupants of three vehicles from the lower half of the hill. This was accomplished by E710.
- The ground search of the Cabin John Creek for possible cars or people that were swept into the creek. This area ran from Carderock Springs Road to the Seven Locks Road overpass over the creek. This was done by the Fairfax County personnel under the direction of C710B D/C Miller). It should also be noted that Montgomery County Police also conducted a ground search along the C & O Canal Towpath in the vicinity of the confluence of the Canal and the Cabin John Creek. This search was negative, and this information was relayed to the Fire/Rescue Incident Commander by face-to-face conversation at approximately 1030.

A two-branch ICS was implemented, with each branch handling separate but related responsibilities, and at times there were instances where the branches were competing for resources. Some command officers at the branch level indicated that they were unaware of the overall Incident Action Plan and therefore struggled with obtaining the resources to fully implement the strategy and tactics that were needed to mitigate the issues in their Branch.



**TWO-BRANCH ORGANIZATION**

An area command might have been better able to address these issues more effectively due to the level of complexity and the incident management span-of-control. In the end,

the outcome might not have changed, but the management might have been more effective.

Use of All Available Means for Reconnaissance: Incident Command struggled throughout most of the incident with dealing with the scope and layout of the entire incident scene. Initially, E710 provided information that they could not see the entire scene from the bottom of the hill. Trooper 2 gave provided good intelligence but that part of their mission was cut short when they went into rescue mode. Late in the incident, C703 was put into Eagle 1 and provided a very comprehensive description of vehicle locations, make, model, color and license plates. Using technology for a down-link of video images from one of the helicopters to the Command Post would have been extremely helpful; this technology should be available and used whenever possible. In this case a simpler and less costly option would have been to have someone in the Command Post view local news channels that had helicopters in the air and were streaming live images of the entire operation.

This will happen again: The aging WSSC infrastructure combined with the weather and temperature patterns in the Mid-Atlantic region will continue to cause water main breaks in Montgomery County. Since this event occurred, there have been several cold snaps in the Washington Metropolitan area with hundreds of water main breaks; most of them were small but a few were very large. The 66" diameter pipe that ruptured along River Road is not the largest diameter pipe in the County; there is a 96" diameter pipe that runs across the County. The WSSC has 5,300 miles of water pipe in Prince George's and Montgomery counties. About 3,300 miles of that is 30 years or older. The MCFRS must continue to prepare for similar events in the future.

#### Overall Analysis of Incident

This was a very significant incident with far-reaching implications. The training, preparation and experience of the MCFRS and their ability to work effectively with other departments and agencies resulted in a successful outcome. Rescues were made in a timely fashion in a variety of methods, all of which had positive outcomes. Risk/Benefit analysis was employed successfully throughout the incident. All civilians were accounted for in a coordinated effort with County Police. No injuries occurred to any Fire/Rescue personnel and there was no property damage to any Fire/Rescue apparatus. MCFRS took a major role in the Emergency Management Group efforts to determine the scope and severity of the water shortage issues in the lower half of the County, and MCFRS immediately took proactive steps to reduce the impact on EMS and firefighting in the affected areas. Within 12 hours of the incident, MCFRS operations returned to normal.

#### Acknowledgements

I would like to thank all of the men and women from Montgomery County Fire Rescue Service who gave of their time and effort to provide information and review sections of this report. Special thanks to Captain Frank Doyle for the use of his after-action Power Point slide program. Thanks also to Master Firefighter Donnie Simmons for the information that he supplied after the hotwash of the technical rescue aspects of this

event. I'd also like to recognize GIS Manager Sarah Lerley for the quick turnaround of outstanding products from her shop. Special thanks to Sgt. Jim MacKay from MSP Aviation, Sgt. Kevin Chittick from the United States Park Police Aviation Section and Battalion Chief Robert Zoldos II from Fairfax County Technical Rescue Operations Team for their assistance.

Other Comments from PIA Worksheets (edited):

Communications between Aviation and the West Branch Officer was poor at best. Command set-up an Evacuation Group to work in my division/branch but initially did not coordinate our efforts or even notify West Branch. I have also since learned of the difficulty MSP has with working/talking on multiple talk groups. I feel communications are critical when using aviation assets, especially when our personnel are in support roles on the ground. Need to work on that.

Larger Work Zones needed to be established to keep citizens and media away from the working point. MCPD was requested by my Branch at least three times and very little if any assistance was provided until the rescues were over. Had one USAR Volunteer enter the water without PPE and cross the caution tape numerous times putting him and others at risk.

We should have a water command program offered annually as part of our COPDI; another option would maybe even be an online type program for refresher...

EMS Group struggled early on with the overall Incident Action Plan. It took about 15 minutes into the incident, perhaps longer, to start getting a grasp of strategy on my end. Talk-group 7 Hotel was overtaken and from our POV it was difficult to tell what was happening and when. Eventually, EMS was moved to 7 India and communications among EMS units improved immediately. .

Since we don't often go beyond one talk group, we need more practice.

We needed a separate Command Talk group. When I needed to talk to Montgomery/ECC or staging I was taking air time away from the other unit tactically engaged in the East Branch on 7-Golf

When BC702 asked for a strike team of EMS units to stage at River and Bradley that happened – but then the units were redirected to FS10 and then to Holton Arms. This resulted in no EMS units being located on the West side near the Congressional Country Club and when the 2 patients were rescued by the john boat we had to get EMS units from FS10 to respond around to the West side.

It was VERY hard to get other agency reps to the Command Post. We asked several times for a PD rep and it took what seemed to be an excessive period of time for that to occur. Additionally, on an event like this Command Post 727 was too small for a representative from each needed agencies/organization to meet. We need to have an

alternate plan/location for these reps to be staged. This may be the police bus, a Ride-On bus or an outside location but the representative MUST remain there.

BC702 made an excellent call in asking Montgomery ECC for Fairfax swift water resources. Once the Fairfax units arrived the East Branch had plenty of personnel to support their mission.

At one point (approximately 0900) I realized that we had run out of resources. There were no technical rescue, swift water, or fire units available on either side of the event. I requested a task force to stage on each side. This was amended to be 2 engines and 2 rescue squads on the West side as the idea of using a rescue squad as part of the rescue plan was presented. These folks allowed for elasticity if we needed to expand

Due to the dynamics of the call, 7 Hotel was overtaken by ongoing rescue ops. Luckily I was able to do face to face with the EMS units staged at Station 10. I was unable to communicate with Command. I took this time to poll the area hospitals for bed availability. It was lost, however, the number of patients. I requested MAB726 dispatched to our location.

Chief 710 was East Branch Director and was located at Station 10. He and I sat together and coordinated efforts and information. We had EMS Operations moved to talk group 7 India. This helped greatly (as I owned the radio channel). Prior to this happening, it was hard to track the pts; three were rescued and transported directly by Trooper 3 to Suburban. We were able to pool EMS resources much better and maintain integrity. Through East River Command, I sent EMS resources to areas requested by Command. I talked with EMS703 and we both polled the area hospitals to see if they were maintaining water pressure. Holy Cross, Washington Adventist and Suburban went on Mini-Disaster. It was determined that other target hazards (nursing homes, schools, etc) would be handled by other resources.

I was the unit officer of E733. Our unit was dispatched to transfer to station 30. Prior to the transfer, we witnessed on Fox 5 News Trooper 2's rescue of 3 patients from 2 separate vehicles and saw them fly west of the scene to an open field on River Rd. Based on my knowledge of the area, I recognized the field as the Norwood School field near the intersection of River Rd. and Bradley Blvd. I saw Trooper 2 on the ground for 2 minutes without any fire/rescue personnel close to or about to approach the aircraft. Immediately after the broadcast, while on the air at Falls Road & Democracy Blvd., we were dispatched to 7303 River Rd, the Holton Arms School to handle the LZ. I questioned PSCC if they did not mean the Norwood School at Bradley and River – they replied that we were to go to Holton Arms, 7303 River Rd. It made a big difference to me because River was closed at the point of the water main break and this added several minutes to our response time to the LZ. The question I have comes from my limited crew resource management training - At what point should I have called time-out – why was the LZ not at the Norwood school where I saw Trooper 2 land with patients?

