

Hazard Mitigation Technical Assistance Program
Contract No. EMW-2000-CO-0247
Task Orders 276 and 279
Hurricane Isabel Rapid Response
Coastal High Water Mark (CHWM) Collection
FEMA-1492-DR-MD

Final Report
November 19, 2003

Submitted to:

Federal Emergency Management Agency



Federal Emergency Management Agency
Region III
Philadelphia, PA

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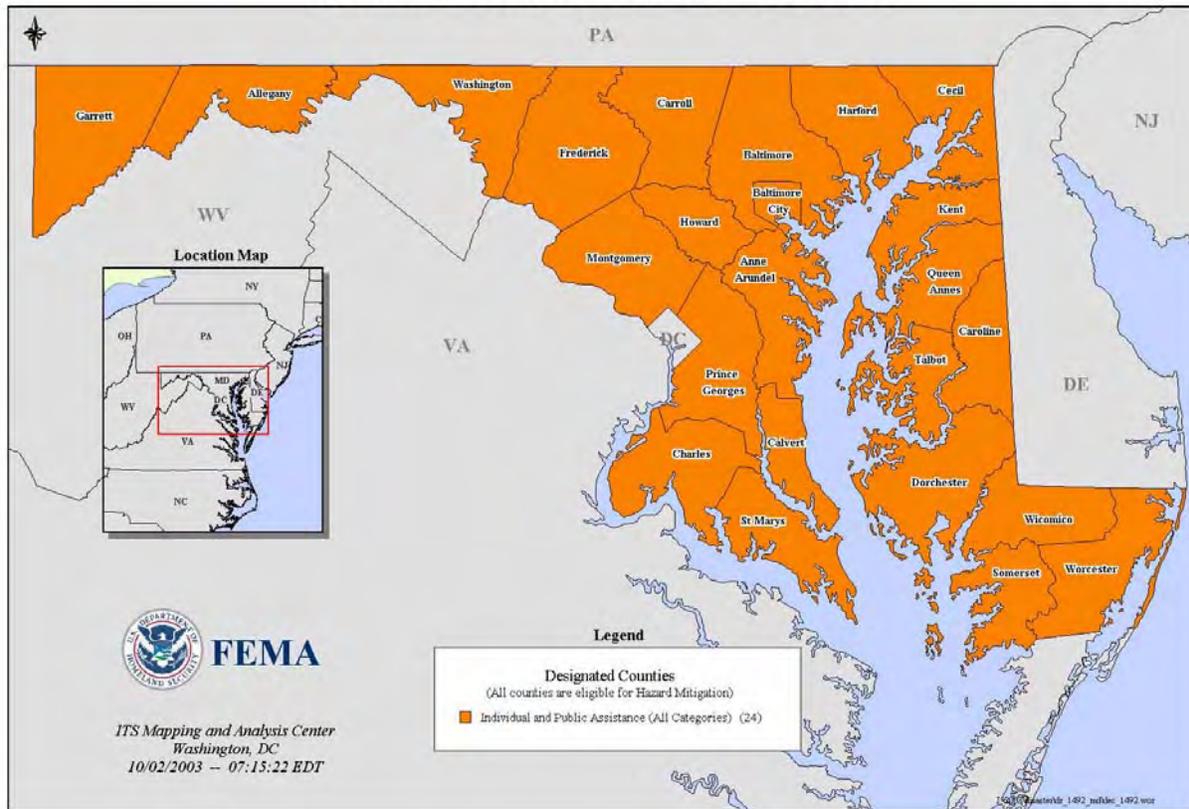
Maryland and Washington DC Coastal High Water Marks (CHWMs), Hurricane Isabel, September 19, 2003

Introduction

On September 18, 2003, Hurricane Isabel made landfall on the North Carolina coast between Wilmington, North Carolina and Norfolk, Virginia. As the hurricane moved northwest through Virginia, Maryland, and DC, wind and wave action along the Chesapeake Bay in Maryland disrupted power and communication lines and caused localized flooding. The hurricane caused significant wind and flood damages along the upper Chesapeake Bay within the State of Maryland.

A disaster declaration in response to Hurricane Isabel was authorized by the Federal Emergency Management Agency (FEMA) for Maryland on September 19, 2003. As stated by the Maryland Governor, Robert L. Ehrlich, "This sorely-needed disaster declaration will help citizens and businesses alike with damage assessment, repair, insurance, and other critical recovery measures." The declaration provides the necessary assistance to meet immediate needs and to help Maryland get back on the road to recovery as fast as possible. All counties in Maryland were designated for disaster declaration, as shown in Figure 1. The assistance will help these Counties.

Figure 1: Disaster Declaration Map
FEMA - 1492 - DR, Maryland
Disaster Declaration as of 10/01/2003



URS Group, Inc. was contracted by FEMA under the Hazard Mitigation Technical Assistance Program (HMTAP) to assist in the disaster recovery. Part of this assistance included the collection and survey of High Water Marks (HWMs). This report summarizes the methodologies used to collect the HWM

locations and elevations established during the Hurricane in Maryland and Washington, DC. This is an important step in assisting communities in establishing flood hazard areas and to prevent future loss of life and property damage.

Hurricane Isabel caused both coastal and riverine flooding. The resulting HWMs were flagged and surveyed along coastal locations. The purpose of this report is to document the flagging and surveying of Coastal High Water Marks (CHWMs), provide an estimation of the storm surge at each location, and document the orientation to the assumed storm surge and wave action.

The data collected is invaluable to federal, state, and local recovery efforts. The data assists in identifying areas of significant damage in order to target resources needed for disaster recovery. It also helps to establish the magnitude and recurrence interval of the flood and erosion events caused by the hurricane along various areas of the coast. This data collection is also beneficial in (a) accurately assessing the benefits to be expected from flood mitigation efforts and (b) prioritizing the flood mitigation efforts pursued following the hurricane.

Area of Study

The initial review of the coastal counties and cities was completed on September 25, 2003. The review began with a meeting with FEMA Disaster Field Office (DFO) officials on September 24, 2003 and followed with a definition of the scope and location of desired CHWMs.

Further analysis, utilizing field investigations, various GIS support coverages, and local media reports, was performed to determine additional CHWM collection areas. In summary, CHWMs were recommended and surveyed in 13 counties and the District of Columbia as shown in Table 1.

Table 1: Number of CHWMs Investigated by County/Area

County	Number of CHWMs Surveyed
Anne Arundel County	49
Baltimore County	34
Calvert County	12
Cecil County	3
Charles County	5
Dorchester County	5
Harford County	8
Kent County	8
Prince George's County	5
Queen Anne's County	9
Somerset County	2
St. Mary's County	12
Talbot County	6
Washington, D.C.	1

According to the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) Center for Operational Oceanographic Products and Services, the highest storm tides occurred in Baltimore. Table 2 is a summary of NOAA NWS tidal gage peak readings during Hurricane Isabel on September 19, 2003. The foldout map in the pocket of this report includes these tidal stations along with the points surveyed in the 14 counties and Washington, D.C.

Table 2: NOAA NWS Tidal Gage Stations on Chesapeake Bay and Peak Readings during Hurricane Isabel

Station ID:	Name	Longitude (West)	Latitude (North)	Hurricane Isabel Peak Elevation (ft)	
				(MSL)	(NAVD 88)
8571892	Cambridge, Choptank River	76 deg 04.1 min	38 deg 34.4 min	5.16	Not available
8594900	Washington, Potomac River	77 deg 01.3 min	38 deg 52.4 min	5.84	5.793
8635150	Colonial Beach, Potomac River Virginia	76 deg 57.6 min	38 deg 15.1 min	4.45	4.458
8635750	Lewisetta, Potomac River Virginia	76 deg 27.9 min	37 deg 59.7 min	3.01	3.033
8573927	Chesapeake City, Md	75 deg 48.6 min	39 deg 31.6 min	4.05	4.063
8573364	Tolchester Beach, Chesapeake Bay Maryland	76 deg 14.7 min	39 deg 12.8 min	7.07	
8574680	Baltimore, Fort McHenry, Patapsco River Maryland	76 deg 34.7 min	39 deg 16.0 min	7.35	7.360
8575512	U.S. Naval Academy, Severn R., Ches. Bay Maryland	76 deg 28.8 min	38 deg 59.0 min	6.48	6.496
8577330	Solomons Island, Patuxent River Maryland	76 deg 27.1 min	38 deg 19.0 min	3.7	3.729

Marking and Survey Methodology

Field and survey crews from URS, Greenhorne and O’Mara, and Dewberry were deployed to conduct resident interviews, take digital photos and survey CHWMs from Hurricane Isabel.

Based on locations developed and identified by FEMA and the State of Maryland as areas of highest priority for CHWM collection, field crews were dispatched in designated areas to perform reconnaissance of the affected areas and flagging of CHWMs using available information from preliminary damage reporting, coastal flood stage data, and interviews with flooded residents and witnesses. Field crews identified areas of concern, based on general guidelines for HWM spacing (approximately 1 CHWM per mile of affected shoreline), used hand-held GPS units to document the locations of the CHWMs, completed a Historical Flooding Survey Form (Figure 2), and flagged the CHWM. In some cases, witnesses were interviewed and they pointed out the highest water surface reached by the storm surge or coastal stillwater on an object such as a building, mailbox, or telephone pole. Additionally, the locations of debris lines along the ground were inventoried as CHWMs. Debris lines are as much an indication of high water as a mudline on a building and the Professional Licensed Surveyor (PLS) was able to certify a debris line as well as they were able to certify a mud line. The PLS certification is for a point identified by a flagger, the flagger determined the point of high water.

Figure 2: Sample Historical Flooding Survey Form

HIGH WATER MARK (HWM) REPORT	
Site ID	
Stream Name	
Unit Number	
Name of Crew	
Company	
Date of flagging	
Address of HWM	
Description of Mark	
Vertical Distance from set point	
HWM Object	
Type of Mark	
Type of HWM	
HWM Quality	
Coastal Flood Type	
City	
County	
State	Maryland
Witness Information:	Name:
	Address:
	Telephone Number:

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Photo ID	
Photo Orientation	
Photo description	
Flagger HWM latitude	
Flagger HWM Longitude	
Comments	

[Plan View](#)

[Elevation View](#)

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Field crews noted CHWMs with characteristics such as Surge, Wave Runup, and Wave Height. These designations on the survey sheets in the Appendices represent the flagger’s estimate of this characteristic based on a combination of physical flood evidence and interviews with witnesses at the time of collection.

Surge represents the rise in the normal water level, wave runup indicates the height of water rise above the still-water level due to water rush up from a breaking wave, and wave height indicates CHWM elevation due to more direct wave action. Typically, Surge CHWMs are associated with a slow rising flood that causes more water damage than structural damage. Wave Height usually results in a higher elevation. All attempts were made to flag storm surge elevations, but in areas where Surge characteristics were not obvious, Wave Runup or Wave Height were flagged. In some cases, witnesses might claim the flooding was associated with a storm surge when in fact the flooding was from wave run up or riverine flooding.

GPS survey crews followed the field crews and used static GPS methods to determine an accurate elevation for each CHWM. Since static GPS requires an area with no tree cover to return an accurate result, in some cases it was necessary perform a short level loop survey from the GPS point to the CHWM. Wherever possible, the finished floor elevation of structures adjacent to the CHWM was collected. This information may be used at a later date for possible damage assessments or Hazard Mitigation Grant Program applications. CHWM locations were surveyed horizontally in NAD 83, State Plane feet, and vertically in NAVD 88 US survey feet. CHWM locations have been surveyed to within accuracies of 0.25 feet vertically and 10 feet horizontally with a 95% confidence level.

Findings and Observations

In general, Hurricane Isabel produced more extensive flooding from storm surge and coastal stillwater flooding than from riverine flooding from heavy rains as the storm moved inland. Excessive damage was witnessed in many communities located along the Chesapeake Bay and coastlines on inland waterways. Many structures were destroyed as a result of the storm surge. Despite widespread power outages and lack of water in most coastal communities, field crews did not encounter any significant constraints to access. Figures 3 and 4 below are photos of 2 CHWMs collected after Hurricane Isabel.



Figure 3: CHWM in Baltimore County



Figure 4: CHWM in Harford County

Because of the level of activity following a storm of Isabel's magnitude, including the demolition of condemned structures and the cleaning of personal property, field crews had to spend more time locating CHWMs that had not been disrupted by the actions of residents or weather conditions.

In some of the communities that were identified for surveying of CHWMs, no evidence of flooding was witnessed. For these areas, field crews marked a location and noted that there was no flooding.

Some surveyed CHWM elevations are outliers to the average CHWM elevations surveyed in an area. Some of these outliers are due to the poor quality of the mark and the flaggers probable interpretation of wave action as storm surge (for an outlier higher than average) or weather or cleanup activities eliminating the upper portions of a mark causing a flag to be placed at a lower than average elevation. Still others may be due to eyewitness attempting to recall an actual HWM. When appropriate, these outliers are identified in the individual survey sheets in the Appendices.

Some of the photographs on the individual survey sheets in the Appendices is difficult to interpret due to either the cameras or the lighting conditions at the time the pictures were taken (i.e., low light situations). Attempts were made to improve those pictures but some low quality pictures remain in the report.

A quality/confidence factor was recorded by the flaggers at the time the points were flagged. This data field included on the individual survey sheets in the Appendices. In addition, "N/A" is used occasionally on the individual survey sheets in the Appendices to indicate data or information that is either not available or not applicable.

Hazardous Mitigation Grant Program (HGMP) and repetitive loss structures are identified on the map in the pocket and on the county maps within the Appendices. Where feasible, the flaggers attempted to mark the CHWM on a HGMP or repetitive loss structure so that FEMA can compare CHWM from Hurricane Isabel to previous HWMs.

Recommendations

The following recommendations discuss how FEMA can utilize the HWM information to assist in the recovery effort from Hurricane Isabel:

- Compare the Isabel HWMs to the flood elevation data on the effective or preliminary Flood Insurance Rate Maps. These comparisons can help FEMA make determinations on where the updated flood hazard data was supported by the flooding that occurred or where new detailed studies should be performed to update the maps, and can help illustrate deficiencies on the existing maps.
- Compare the Isabel HWMs to HWMs from other significant flood events. This will identify areas of repetitive flooding that can assist FEMA in determining locations that would make good buyout areas.
- Complete detail engineering analysis to determine flood elevations in the areas where deficiencies have been identified on the existing FEMA maps, or on areas where property loss occurred where no previous studies have been prepared.
- The locations and severity of the Isabel HWMs can help FEMA identify areas of concern for future mitigation projects when funding for such projects come available.
- Use these HWMs to evaluate the success of completed mitigation projects. The flood depths that occurred during Isabel can be used to estimate potential damage that could have occurred to structures that have been bought out and removed as part of mitigation projects already completed. Documentation of the “damages avoided” can be used as success stories to further support the mitigation efforts.
- The HWMs can be used to create inundation mapping for Hurricane Isabel. The inundation maps would provide a plan view look at the extent of flooding from Hurricane Isabel and can assist in determining the accuracy of existing FEMA flood maps. The inundation mapping would be a spatially correct GIS coverage that can be provided to community officials to assist in disaster recovery.
- Provide this report on the Internet to aid public officials and the community in general in the recovery effort.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240009
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-1
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_1 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Spa Creek/Severn River **Quality of Mark:** Fair
Flood Elevation: **6.5 FT** **Location:** outside building window
Flooding Type: Surge
Mark Address: 69 Prince George Street
Description of Mark: 6.75" above window sill to right of door. Sign on door reads "use side door"

Type of Line: Mud/debris line

Description of Physical Structure: wood building

Closest City: Annapolis **County:** Anne Arundel **State:** Maryland

Flaggers: Carroll **Company/Agency:** Dewberry

Flagging Date: 9/25/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/2/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9770 **Easting:** 1,460,175

Longitude: -76.4846 **Northing:** 475,079

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 70 FT

Comments:

point located under tree so exact positioning may be difficult. Time = 4:45 pm. Weather = Sunny + Clear.



DSCN0005.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240009
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-2
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_2 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Spa Creek/Severn River **Quality of Mark:** Good
Flood Elevation: **6.3 FT** **Location:** Inside Wall
Flooding Type: Surge
Mark Address: 122 Dock Street
Description of Mark: 21.5" above top of brick foundation

Type of Line: Debris line

Description of Physical Structure: wood building

Closest City: Annapolis **County:** Anne Arundel **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 9/25/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/2/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9778 **Easting:** 1,460,175

Longitude: -76.4863 **Northing:** 475,079

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 140 FT

Comments:

Witness was present for flooding associated with both hurricane of 1933 and Hurricane Isabel. Mark transferred to outside wall.



DSCN0006.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240009
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-3
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_3 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Spa Creek/Severn River **Quality of Mark:** Good
Flood Elevation: **6.4 FT** **Location:** Inside Wall
Flooding Type: Surge
Mark Address: 110 Compromise Street (Fawcett's Boat Supplies, Inc.)
Description of Mark: 35.25" from top of concrete slab against door

Type of Line: Mud/debris line

Description of Physical Structure: wood building

Closest City: Annapolis **County:** Anne Arundel **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 9/25/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/2/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9769 **Easting:** 1,460,175

Longitude: -76.4862 **Northing:** 475,079

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 10 FT

Comments:

Photo ID 0009 shows flooding inside the building. HWM transferred to outside door.



DSCN0007.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240009
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-4
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_4 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Spa Creek/Severn River **Quality of Mark:** Poor
Flood Elevation: **5.5 FT** **Location:** metal utilities box
Flooding Type: Surge
Mark Address: 2 Compromise Street (Annapolis Yacht Club)
Description of Mark: 13.75 inches above dock; approx. 4 ft above water level @ 6:52 pm.

Type of Line: Debris line

Description of Physical Structure: wood building

Closest City: Annapolis **County:** Anne Arundel **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 9/25/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9742 **Easting:** 1,460,175

Longitude: -76.4853 **Northing:** 475,079

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 10 FT

Comments:

debris line was very pronounced, but HWM received poor rating because it seemed to be left when surge was receding and not at peak. Eyewitness accounts at the Yacht Club estimated the water level to be much higher (approx 2 feet).



DSCN0013.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240009
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-5
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_5 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Spa Creek/Severn River **Quality of Mark:** Fair
Flood Elevation: **6.1 FT** **Location:** outside wall
Flooding Type: Surge
Mark Address: 80 Compromise Street (Annapolis Marriott Waterfront)
Description of Mark: 25.75" above access ramp surface

Type of Line: Mud line

Description of Physical Structure: concrete ramp

Closest City: Annapolis **County:** Anne Arundel **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 9/25/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/2/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9759 **Easting:** 1,460,175

Longitude: -76.4862 **Northing:** 475,079

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 210 FT

Comments:

Survey should be taken at bottom of paint line.



DSCN0014.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-6
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_6 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **7.6 FT** **Location:** ground
Flooding Type: Surge
Mark Address: 2103 Bay Drive
Description of Mark: approx 2 feet above crest of seawall

Type of Line: Debris line
Description of Physical Structure: N/A

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry
Flagging Date: 9/26/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.0305 **Easting:** 1,482,776
Longitude: -76.4043 **Northing:** 497,070

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 140 FT

Comments:

Time: 9:45 a.m. Weather: Clear and sunny.
 SURVEYOR: take elevation of ground @stake/paint line



DSCN0021.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-7
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_7 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Whitehall Creek **Quality of Mark:** Good
Flood Elevation: **6.5 FT** **Location:** inside wall*
Flooding Type: Surge
Mark Address: 824 Holly Drive East
Description of Mark: 35.125" above concrete slab inside dockhouse

Type of Line: Mud/debris line

Description of Physical Structure: wood dock

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry
Flagging Date: 9/26/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/6/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.0145 **Easting:** 1,474,300

Longitude: -76.4363 **Northing:** 489,731

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 10 FT

Comments:

Time: 12:00 p.m. **HWM transferred to outside of door. Water level was 49.5" from top of dock. Dock approx 10" above concrete slab in front of dockhouse.



DSCN0024.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-8
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_8 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **7.2 FT** **Location:** ground
Flooding Type: Surge
Mark Address: 895 Oceanic Drive (Northrop Grumman Corporation)
Description of Mark: HORIZONTAL DISTANCE: 16' 1" from edge of sidewalk (ground elevation at this point)

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.0065 **Easting:** 1,482,848

Longitude: -76.4066 **Northing:** 486,144

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 170 FT

Comments:

Survey elevation of ground at stake/paint line.



DSCN0034.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-9
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_9 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Meredith Creek **Quality of Mark:** Good
Flood Elevation: **6.2 FT** **Location:** outside wall
Flooding Type: Surge
Mark Address: 1729 River Rd
Description of Mark: 18.5" from top of garage slab inside door frame

Type of Line: Mud/debris line

Description of Physical Structure: concrete garage

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/15/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.0129 **Easting:** 1,479,983

Longitude: -76.4182 **Northing:** 489,768

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 70 FT

Comments:



DSCN0037.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-10
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_10 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Burley Creek **Quality of Mark:** Fair
Flood Elevation: **6.5 FT** **Location:** outside wall
Flooding Type: Surge
Mark Address: 1829 Hidden Point Rd
Description of Mark: 7.625" above brace in door frame on wooden shed behind residence

Type of Line: Debris line

Description of Physical Structure: wood shed

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/6/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.0015 **Easting:** 1,468,639

Longitude: -76.4513 **Northing:** 486,055

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 160 FT

Comments:

Time: 3:40 p.m. WSEL was 29.5" below crest of bulkhead. HWM approx 2' above crest of bulkhead.



DSCN0039.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-11
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_11 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Severn River **Quality of Mark:** Fair
Flood Elevation: **6.8 FT** **Location:** outside building wall
Flooding Type: Surge
Mark Address: No address
Description of Mark: 80.25" below 2x4 (top wall frame) in middle of building

Type of Line: Mud/debris line

Description of Physical Structure: wood building

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/6/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9951 **Easting:** 1,460,134

Longitude: -76.4831 **Northing:** 482,363

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 160 FT

Comments:

Building is condemned. Parking lot is littered with debris.



DSCN0055.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-12
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_12 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Severn River **Quality of Mark:** Fair
Flood Elevation: **7 FT** **Location:** post on canoe rack
Flooding Type: Surge
Mark Address: Dream's Landing condo community
Description of Mark: approx 2" above pavement surface, measured at front of post.

Type of Line: Debris line/personal account

Description of Physical Structure: wood post

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/6/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.0065 **Easting:** 1,451,587

Longitude: -76.5122 **Northing:** 485,957

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 60 FT

Comments:



DSCN0047.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-13
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_13 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Severn River **Quality of Mark:** Good
Flood Elevation: **6.4 FT** **Location:** inside wall
Flooding Type: Surge
Mark Address: 4 Beach Drive (in Sherwood Forrest)
Description of Mark: approx 27.25" above top of brick driveway, measured inside garage door frame

Type of Line: Debris line

Description of Physical Structure: wood garage

Closest City: Sherwood Forrest **County:** Anne Arundel **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/6/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.0298 **Easting:** 1,445,866

Longitude: -76.5378 **Northing:** 493,212

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 30 FT

Comments:

*HWM transferred to outside. Time: 8:00 a.m. Weather: some fog



DSCN0050.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-14
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_14 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Severn River **Quality of Mark:** Fair
Flood Elevation: **6.6 FT** **Location:** wooden post
Flooding Type: Surge
Mark Address: Beach 2, Arden on the Severn
Description of Mark: approx 7" below water side of top of post

Type of Line: Debris line

Description of Physical Structure: wood post

Closest City: Arden on the Severn **County:** Anne Arundel **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/6/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.0706 **Easting:** 1,431,577

Longitude: -76.5870 **Northing:** 511,353

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 50 FT

Comments:

HWM transferred from debris line in shrubs. Time: 9:40 a.m. Weather: mostly cloudy.



DSCN0054.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-15
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_15 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Severn River **Quality of Mark:** Fair
Flood Elevation: **See comments** **Location:** steps
Flooding Type: Surge
Mark Address: 1184 Nancy Lane
Description of Mark: approx 38" above top of metal dock frame. WSEL was 28" below metal dock frame @ 9:00 a.m.

Type of Line: Personal account/debris line

Description of Physical Structure: N/A

Closest City: Arden on the Severn **County:** Anne Arundel **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: **Company/Agency:**

Survey Date: **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.0727 **Easting:** 1,428,738

Longitude: -76.5902 **Northing:** 511,340

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 140 FT

Comments:

**No HWM tagged for surveying. Location not accessible to survey crew.



DSCN0053.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240009
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-16
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_1 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Spa Creek - Acton Cove **Quality of Mark:** Good
Flood Elevation: **6.3 FT** **Location:** Transferred from inside
Flooding Type: Surge
Mark Address: 7 Shipwright Street, Brick wall in the back of house - Just down the steps to the back yard
Description of Mark: Mark transferred from inside basement, 19" down from top brick pool apron

Type of Line: Mud line

Description of Physical Structure: brick wall

Closest City: Annapolis **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/25/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/3/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9737 **Easting:** 1,460,175

Longitude: -76.4888 **Northing:** 475,079

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 50 FT

Comments:

HWM transferred from inside. Mud line measured at approx. 40" above basement slab.



DSCN0005.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240009
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-17
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_2 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Spa Creek - Acton Cove **Quality of Mark:** Fair
Flood Elevation: **12.8 FT** **Location:** Outside
Flooding Type: Wave height
Mark Address: West wall of House #6 on Market Street (Market Quay Building)
Description of Mark: 20.4" from bottom of wall

Type of Line: Personal account

Description of Physical Structure: brick house

Closest City: Annapolis **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/25/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9745 **Easting:** 1,457,332

Longitude: -76.4915 **Northing:** 475,063

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 120 FT

Comments:

Owner of House #6 has indicated that the water level was about 4 feet above the normal WSEL (approx. at the door knob of his tool shed). Personal account may have exaggerated actual surge height.



DSCN0008.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240009

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-18

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_3 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Spa Creek - Acton Cove **Quality of Mark:** Good

Flood Elevation: **7.3 FT** **Location:** Street sign pole

Flooding Type: Surge

Mark Address: Street sign in front of House #74 on Conduit Street.

Description of Mark: 46.3" from ground

Type of Line: Mud line

Description of Physical Structure: metal pole

Closest City: Annapolis **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/25/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/3/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9747 **Easting:** 1,457,332

Longitude: -76.4927 **Northing:** 475,063

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 70 FT

Comments:

Street sign on left side (east) of Conduit Street, in front of House #74. Same side with telephone pole and fire hydrant.



DSCN0010.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240009
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-19
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_4 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Spa Creek - Acton Cove **Quality of Mark:** Good
Flood Elevation: **6.6 FT** **Location:** Outside
Flooding Type: Surge
Mark Address: Driveway between House #1 and 3 on Southgate Ave.
Description of Mark: 0.5" above bottom of wall

Type of Line: Mud line
Description of Physical Structure: concrete building
Closest City: Annapolis **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS
Flagging Date: 9/25/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/3/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 38.9734 **Easting:** 1,457,332
Longitude: -76.4945 **Northing:** 475,063

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 90 FT

Comments:

Driveway is located between House #1 and #3 on Southgate Ave.



DSCN0012.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240009
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-20
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_5 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Spa Creek - Acton Cove **Quality of Mark:** Good
Flood Elevation: **4.9 FT** **Location:** Outside wall
Flooding Type: Surge
Mark Address: Waterfront Building - Burnside Street
Description of Mark: 1' above ground

Type of Line: Mud line

Description of Physical Structure: brick house

Closest City: Annapolis **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9717 **Easting:** 1,460,175

Longitude: -76.4868 **Northing:** 475,079

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 110 FT

Comments:

Building numbers are not visible, except for unit number 301 of building east of Burnside Street. A red flag was tied at corner of wood fence for easy spotting. Mud line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DSCN0014.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240009
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-21
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_6 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Black Creek **Quality of Mark:** Good
Flood Elevation: **6.6 FT** **Location:** On grass
Flooding Type: Surge
Mark Address: Common area of Westgate Village, between buildings #680 and #700
Description of Mark: 15 feet from the edge of concrete walkway

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Annapolis **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/2/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9641 **Easting:** 1,460,196

Longitude: -76.4823 **Northing:** 471,437

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 30 FT

Comments:

Mark is also at the bottom of the 2nd concrete step down from the back of building #680



DSCN0016.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-22
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_7 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **7.2 FT** **Location:** On grass
Flooding Type: Surge
Mark Address: 114 Bay Drive (Stone House near the point - looks abandoned)
Description of Mark: 12 feet from the edge of the street asphalt pavement.

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/2/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9481 **Easting:** 1,468,770

Longitude: -76.4577 **Northing:** 464,203

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 40 FT

Comments:

House looks abandoned.



DSCN0018.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-23
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_8 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **6.5 FT** **Location:** On back wall
Flooding Type: Surge
Mark Address: 27 Sands Ave.
Description of Mark: 17" from the top of the door frame (measured from inside of frame)

Type of Line: Mud line

Description of Physical Structure: concrete block house

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/6/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9477 **Easting:** 1,465,926

Longitude: -76.4610 **Northing:** 464,186

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 160 FT

Comments:

Mudline is visible on the back wall and door to basement / crawl space



DSCN0021.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-24
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_9 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Fishing Creek and Chesapeake **Quality of Mark:** Good
Flood Elevation: **8.2 FT** **Location:** Outside
Flooding Type: Wave runoff
Mark Address: 1301 Magnolia Ave.
Description of Mark: 13" above ground

Type of Line: Mud line

Description of Physical Structure: wood house

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9151 **Easting:** 1,465,991

Longitude: -76.4642 **Northing:** 453,260

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 140 FT

Comments:

House is located on the circle at the end of Magnolia Ave. Marked tape on corner bead, because it would not stick to vinyl siding)



Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

DSCN0025.jpg



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-25
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_10 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **7.8 FT** **Location:** Outside (transferred)
Flooding Type: Surge
Mark Address: 3545 Narragansette Ave.
Description of Mark: 31" above ground

Type of Line: Mud line

Description of Physical Structure: brick garage

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9171 **Easting:** 1,465,991

Longitude: -76.4601 **Northing:** 453,260

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 150 FT

Comments:

House is located on the Southeast corner of Hollywood and Narragansett Ave.



DSCN0026.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-26
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_11 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: South River **Quality of Mark:** Good
Flood Elevation: **6.4 FT** **Location:** Outside
Flooding Type: Surge
Mark Address: 3276 Harness Creek. (middle white house down the gravel driveway)
Description of Mark: 26" above ground

Type of Line: Mud line

Description of Physical Structure: wood house

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/7/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9375 **Easting:** 1,451,724

Longitude: -76.5153 **Northing:** 460,464

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 220 FT

Comments:

Middle white house down the driveway off of Harness Creek Drive, just before entering Wimbledon Farms Subdivision. Looks like asbestos exterior siding



DSCN0030.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240008

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-27

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_12 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: South River **Quality of Mark:** Good

Flood Elevation: **6.7 FT** **Location:** on wood fence

Flooding Type: Surge

Mark Address: 400 Ferry Point Road

Description of Mark: 36" above ground

Type of Line: Mud line

Description of Physical Structure: wood fence

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/7/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9459 **Easting:** 1,446,016

Longitude: -76.5320 **Northing:** 464,076

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 30 FT

Comments:

Red flag tied on little tree in front of mark for easy spotting.
House is on the end of Ferry Point Road



DSCN0032.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-28
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_13 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: South River **Quality of Mark:** Good
Flood Elevation: **6.2 FT** **Location:** outside
Flooding Type: Surge
Mark Address: Liberty Yacht Club on South River (downstream of Route 2 bridge)
Description of Mark: 26.5" above asphalt pavement

Type of Line: Mud line

Description of Physical Structure: metal building

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/7/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9531 **Easting:** 1,440,310

Longitude: -76.5523 **Northing:** 467,689

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 160 FT

Comments:

Marina office / shop is the big blue and white building



DSCN0034.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-29
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_14 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: South River **Quality of Mark:** Good
Flood Elevation: **6.4 FT** **Location:** outside
Flooding Type: Surge
Mark Address: Oak Grove Marina (upstream of Route 2 bridge)
Description of Mark: 16" above ground

Type of Line: Mud line

Description of Physical Structure: metal cooler

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/7/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9551 **Easting:** 1,440,310

Longitude: -76.5540 **Northing:** 467,689

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 30 FT

Comments:

Staff gave a picture of the Marina taken after the storm on 9/18/03.



DSCN0036.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-30
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_15 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: South River **Quality of Mark:** Good
Flood Elevation: **6.1 FT** **Location:** on tree
Flooding Type: Surge
Mark Address: 1512 Londontown Ct.
Description of Mark: 21" from bottom of tree

Type of Line: Mud line

Description of Physical Structure: tree

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: DB CC **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9392 **Easting:** 1,443,190

Longitude: -76.5426 **Northing:** 460,419

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 200 FT

Comments:

Gazebo and tree is in the back yard between house #1510 and 1512. House #1512 is for sale. House #1510 is approx. 200' from the edge of the water.



DSCN0038.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-31
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_16 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: South River **Quality of Mark:** Good
Flood Elevation: **6.5 FT** **Location:** outside
Flooding Type: Surge
Mark Address: Selby Bay Yacht Basin off of Selby Drive
Description of Mark: 46" above ground

Type of Line: Mud line

Description of Physical Structure: wood shed

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: DB CC **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/7/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9082 **Easting:** 1,451,783

Longitude: -76.5139 **Northing:** 449,538

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 140 FT

Comments:

Shed is in the back yard, right off the entrance



DSCN0039.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240008

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-32

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_17 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: South River **Quality of Mark:** Good

Flood Elevation: **5 FT** **Location:** outside

Flooding Type: Surge

Mark Address: 3689 1st Ave. (on repetitive loss list)

Description of Mark: 30.5 " from concrete floor

Type of Line: Mud line

Description of Physical Structure: wood house

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/28/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9086 **Easting:** 1,451,783

Longitude: -76.5143 **Northing:** 449,538

Approx. First Floor Elevation (Based on Measurement from Mark): 2.5 FT

Approx. Distance to Shoreline: 190 FT

Comments:

Owner was not home - left business card. Mud line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DSCN0043.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-33
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_18 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Rhode River **Quality of Mark:** Good
Flood Elevation: **6.9 FT** **Location:** outside
Flooding Type: Surge
Mark Address: 107 Elliott Court
Description of Mark: 7.5" above wood deck floor

Type of Line: Mud line

Description of Physical Structure: wood house

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/7/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

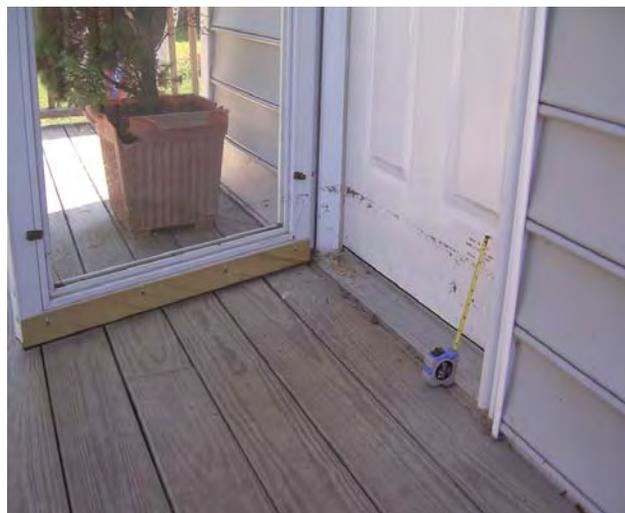
Latitude: 38.8738 **Easting:** 1,454,689

Longitude: -76.5077 **Northing:** 438,627

Approx. First Floor Elevation (Based on Measurement from Mark): 6.3 FT

Approx. Distance to Shoreline: 400 FT

Comments:



DSCN0044.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-34
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_19 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: West River **Quality of Mark:** Good
Flood Elevation: **7.03 FT** **Location:** outside
Flooding Type: Surge
Mark Address: Pirates Cove Restaurant , 4817 Riverside Drive
Description of Mark: 35.2 above ground

Type of Line: Mud line

Description of Physical Structure: stucco building

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/7/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.8434 **Easting:** 1,446,204

Longitude: -76.5389 **Northing:** 427,656

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 260 FT

Comments:

HWM in side dining room is about 4' above floor.



DSCN0045.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-35
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_20 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **5.9 FT** **Location:** outside
Flooding Type: Surge
Mark Address: 5190 Lake Ave (on the repetitive loss list)
Description of Mark: 18" above ground

Type of Line: Mud line

Description of Physical Structure: concrete house

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.8325 **Easting:** 1,454,768

Longitude: -76.5029 **Northing:** 424,060

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 1000 FT

Comments:

Masonry rambler, gray color, at the corner of Lake Ave and Spruce Ave.



DSCN0047.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-36
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_21 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Rockhold Creek **Quality of Mark:** Fair
Flood Elevation: **6.7 FT** **Location:** outside
Flooding Type: Surge
Mark Address: 611 Deale Road (downstream of Deale Road Bridge)
Description of Mark: 3" down from the edge of back brick patio

Type of Line: Personal account

Description of Physical Structure: brick patio

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS
Flagging Date: 9/27/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/7/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 38.7821 **Easting:** 1,440,615
Longitude: -76.5586 **Northing:** 405,776

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 10 FT

Comments:

2 story brick, wood, and siding house just downstream of Deale Bridge. According to witness, HWM is approximately 7' above normal water elevation.



DSCN0049.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-37
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_22 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Rockhold Creek **Quality of Mark:** Good
Flood Elevation: **5.4 FT** **Location:** on grass
Flooding Type: Surge
Mark Address: 5977 Rockhold Creek Drive (upstream of Deale Road Bridge)
Description of Mark: 2' from edge of ramp

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.7832 **Easting:** 1,440,615

Longitude: -76.5592 **Northing:** 405,776

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 50 FT

Comments:

House is the 2nd house, NW of bridge



DSCN0050.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-38
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT6_23 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **3.9 FT** **Location:** on grass
Flooding Type: Surge
Mark Address: 6603 Eleanore Ave (within Owings Cliffs / Fairhaven Subdivision)
Description of Mark: 2' east of buoy (toward water)

Type of Line: Debris line
Description of Physical Structure: N/A

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Mai **Company/Agency:** URS
Flagging Date: 9/27/2003

Surveyors: SW FP **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 38.7462 **Easting:** 1,440,687
Longitude: -76.5576 **Northing:** 391,209

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 40 FT

Comments:

Beach is widened after storm. Debris line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DSCN0052.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-39
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_11 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Poor
Flood Elevation: **6.81 FT** **Location:** Debris line
Flooding Type: Surge
Mark Address: 1000 Kembo Road
Description of Mark: debris line on Kembo Road

Type of Line: Debris line
Description of Physical Structure: N/A

Closest City: Curtis Bay **County:** Anne Arundel **State:** Maryland

Flaggers: Fike **Company/Agency:** URS
Flagging Date: 9/27/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS
Survey Date: 9/30/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.1914 **Easting:** 1,445,547
Longitude: -76.5349 **Northing:** 555,127

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 230 FT

Comments:



Balt11-28.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-40
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_12 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Stony Creek **Quality of Mark:** Fair
Flood Elevation: **7.16 FT** **Location:** Embankment
Flooding Type: Surge
Mark Address: 1210 Beach Promenade, Baltimore, MD 21226
Description of Mark: backyard on embankment, right side of steps if facing water

Type of Line: Debris line/personal account

Description of Physical Structure: N/A

Closest City: Orchard Beach **County:** Anne Arundel **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 9/29/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.1705 **Easting:** 1,448,420

Longitude: -76.5227 **Northing:** 547,858

Approx. First Floor Elevation (Based on Measurement from Mark): 7.16 FT

Approx. Distance to Shoreline: 10 FT

Comments:



Balt12-32.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-41
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_13 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Rock Creek **Quality of Mark:** Poor
Flood Elevation: **6.88 FT** **Location:** Personal account
Flooding Type: Surge
Mark Address: 7812 June Drive
Description of Mark: 1 foot off tree between tree and water

Type of Line:

Description of Physical Structure: N/A

Closest City: Pasadena **County:** Anne Arundel **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 9/29/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.1414 **Easting:** 1,451,314

Longitude: -76.5197 **Northing:** 536,946

Approx. First Floor Elevation (Based on Measurement from Mark): 6.88 FT

Approx. Distance to Shoreline: 160 FT

Comments:



Balt13-34.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-42
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_14 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **6.42 FT** **Location:** Inside wall transferred outside
Flooding Type: Surge
Mark Address: Fort Smallwood Park at intersection of East Drive and Bay Front Drive
Description of Mark: Outside storage building, transferred from inside

Type of Line: Mud line

Description of Physical Structure: N/A

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 9/30/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.1654 **Easting:** 1,462,617

Longitude: -76.4779 **Northing:** 544,294

Approx. First Floor Elevation (Based on Measurement from Mark): 4.67 FT

Approx. Distance to Shoreline: 100 FT

Comments:



Balt14-37B.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-43
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_15 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **6.71 FT** **Location:** Inside wall transferred outside
Flooding Type: Surge
Mark Address: 7804 Harbor Road
Description of Mark: Back of house right side of basement door frame

Type of Line: Mud line

Description of Physical Structure: wood house on concrete foundation

Closest City: Bay Side Beach **County:** Anne Arundel **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/4/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.1372 **Easting:** 1,471,190

Longitude: -76.4417 **Northing:** 533,418

Approx. First Floor Elevation (Based on Measurement from Mark): 6.29 FT

Approx. Distance to Shoreline: 380 FT

Comments:



Balt15-40.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-44
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_16 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Sillery Bay **Quality of Mark:** Poor
Flood Elevation: **7.85 FT** **Location:** Outside building wall
Flooding Type: Surge
Mark Address: See below
Description of Mark: To the left of the main door to the house, adjacent to frame

Type of Line: Mud line/personal account

Description of Physical Structure: brick house

Closest City: Gibson **County:** Anne Arundel **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/4/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.0955 **Easting:** 1,471,279

Longitude: -76.4448 **Northing:** 518,850

Approx. First Floor Elevation (Based on Measurement from Mark): 5.68 FT

Approx. Distance to Shoreline: 50 FT

Comments:



Balt16-42.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-45
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_17 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Magothy River **Quality of Mark:** Poor
Flood Elevation: **5.76 FT** **Location:** Debris line on Eagle Hill Road
Flooding Type: Surge
Mark Address: 381 Eagle Hill Road
Description of Mark: Debris line, with nail and flag for visual

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrismer **Company/Agency:** URS

Survey Date: 10/4/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.0810 **Easting:** 1,457,108

Longitude: -76.4917 **Northing:** 515,125

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 90 FT

Comments:



Balt17-45.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-46
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_18 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Magothy River **Quality of Mark:** Poor
Flood Elevation: **6.89 FT** **Location:** Debris line on Beach Road
Flooding Type: Surge
Mark Address: 14 Beach Road
Description of Mark: Adjacent to stairs that led to dock, right side facing bay

Type of Line: Debris line/personal account

Description of Physical Structure: N/A

Closest City: Severna Park **County:** Anne Arundel **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 9/28/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.0758 **Easting:** 1,448,611

Longitude: -76.5214 **Northing:** 511,437

Approx. First Floor Elevation (Based on Measurement from Mark): 6.56 FT

Approx. Distance to Shoreline: 10 FT

Comments:



Balt18-49.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-47
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_19 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Magothy River **Quality of Mark:** Good
Flood Elevation: **6.47 FT** **Location:** Inside wall transferred
Flooding Type: Surge
Mark Address: 998 Forest Drive
Description of Mark: Adjacent to window

Type of Line: Mud line

Description of Physical Structure: wood house

Closest City: Severna Park **County:** Anne Arundel **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/4/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.0595 **Easting:** 1,468,529

Longitude: -76.4592 **Northing:** 504,265

Approx. First Floor Elevation (Based on Measurement from Mark): 5.8 FT

Approx. Distance to Shoreline: 70 FT

Comments:



Balt19-50.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-48
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT9_10 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Patapsco River **Quality of Mark:** Fair
Flood Elevation: **7.5 FT** **Location:** black fence post
Flooding Type: Surge
Mark Address: corner of Shenandoah Ave and Gibbons Ave (Wastewater Pumping Station)
Description of Mark: 26.25" from blacktop pad on front left black metal fencepost.

Type of Line: Mud/debris line

Description of Physical Structure: metal fence post

Closest City: **County:** Anne Arundel **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 10/7/2003

Surveyors: Thigpen, Walker **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/15/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2211 **Easting:** 1,417,160

Longitude: -76.6394 **Northing:** 565,923

Approx. First Floor Elevation (Based on Measurement from Mark): 5.3 FT

Approx. Distance to Shoreline: 1000 FT

Comments:

Public Works Phone# 410-222-8400.



DSCN0090.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240008
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** A-49
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT9_11 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Patapsco River **Quality of Mark:** Fair
Flood Elevation: **7.5 FT** **Location:** outside wall
Flooding Type: Surge
Mark Address: 3 Arundel Place
Description of Mark: 26.25" above top of porch deck

Type of Line: Debris line

Description of Physical Structure: wood deck post

Closest City: Glen Burnie **County:** Anne Arundel **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 10/7/2003

Surveyors: Thigpen, Walker **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/15/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.1550 **Easting:** 1,428,607

Longitude: -76.5979 **Northing:** 540,477

Approx. First Floor Elevation (Based on Measurement from Mark): 5.3 FT

Approx. Distance to Shoreline: 320 FT

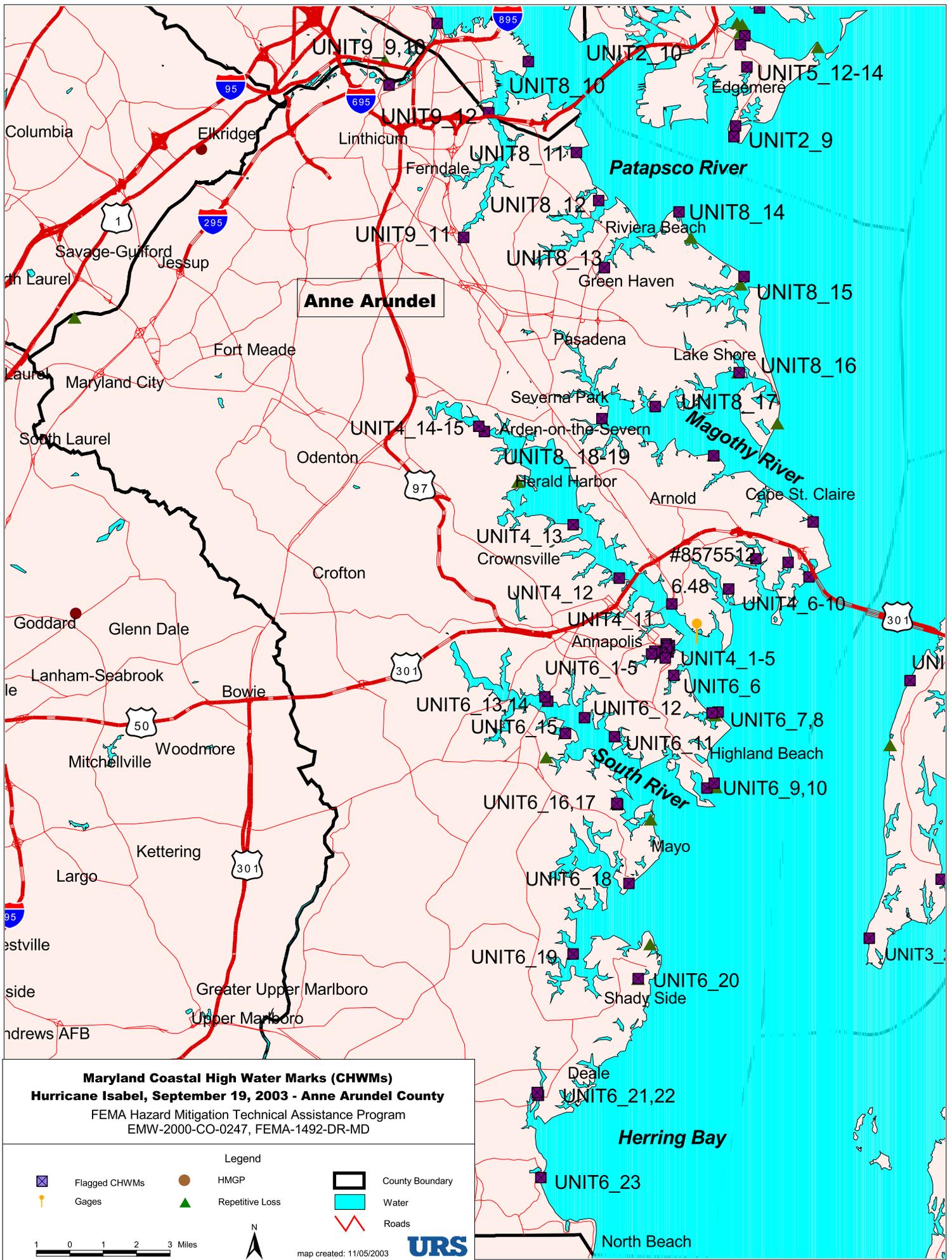
Comments:

residence sustained extensive flood damage. Family was not home at time of flagging.



DSCN0091.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



Anne Arundel

UNIT9_9,10

UNIT2_10

UNIT5_12-14

UNIT8_10

UNIT2_9

UNIT9_12

UNIT8_11

Patapsco River

UNIT8_12

UNIT8_14

UNIT9_11

UNIT8_13

UNIT8_15

Fort Meade

UNIT8_16

Lake Shore

UNIT8_17

UNIT4_14-15

UNIT8_18-19

Severna Park

UNIT8_17

UNIT4_13

UNIT4_6-10

Odenton

UNIT4_12

UNIT4_11

UNIT4_11

UNIT4_1-5

UNIT6_1-5

UNIT6_6

UNIT6_13,14

UNIT6_7,8

UNIT6_15

UNIT6_11

UNIT6_12

UNIT6_9,10

UNIT6_11

UNIT6_16,17

UNIT6_18

UNIT6_19

UNIT6_19

UNIT6_20

UNIT6_18

UNIT6_21,22

UNIT6_19

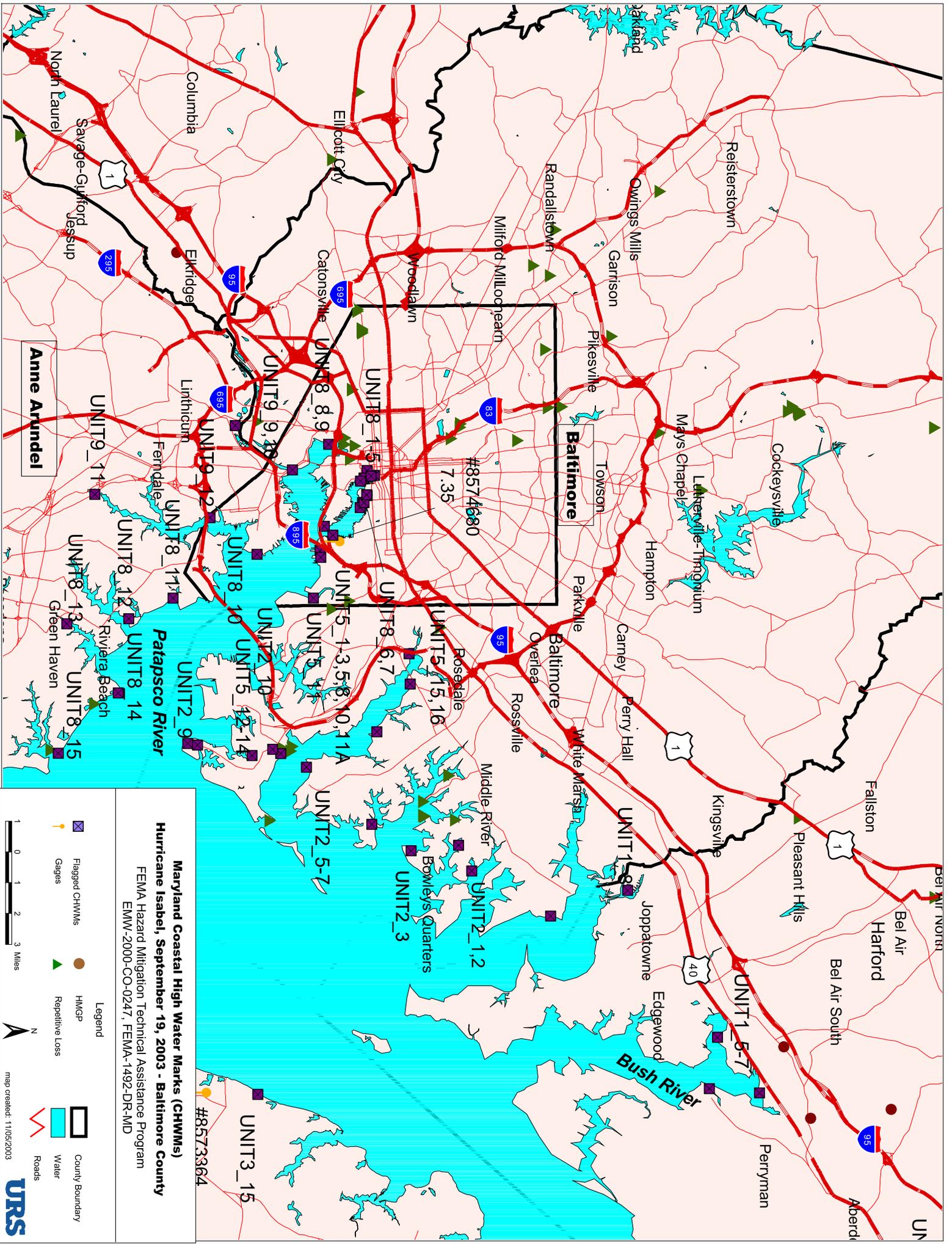
UNIT6_23

Herring Bay

North Beach

Appendices

Appendix B: Survey Sheets from Baltimore County



Maryland Coastal High Water Marks (CHWMs)
Hurricane Isabel, September 19, 2003 - Baltimore County
 FEMA Hazard Mitigation Technical Assistance Program
 EMW-2000-CO-0247, FEMA-1492-DR-MD

Legend

- Flagged CHWMs
- HMGF
- ▲ Repetitive Loss
- County Boundary
- █ Water
- Roads
- ⚡ Gages

1 0 1 2 3 Miles

map created: 11/05/2003

URS

Anne Arundel

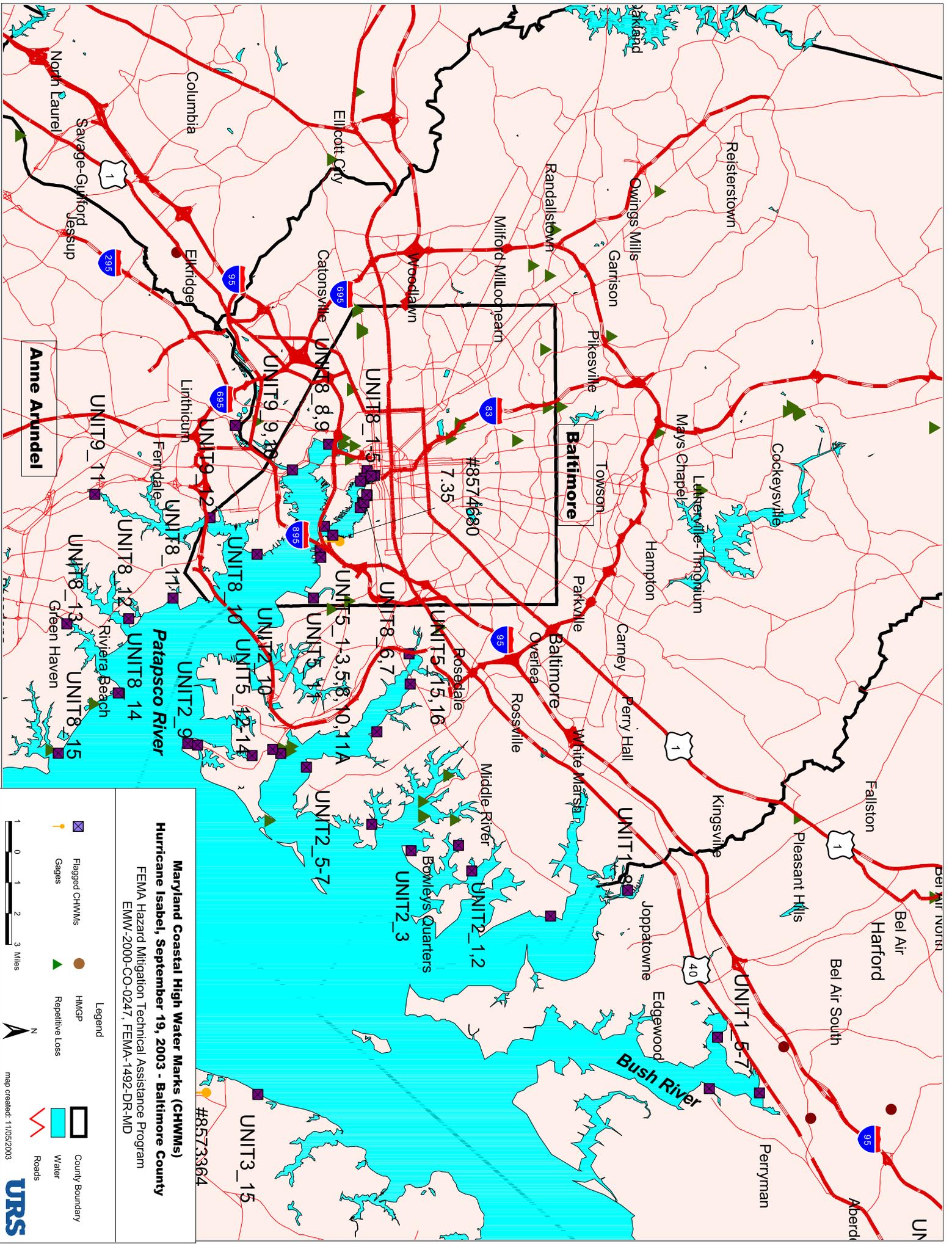
Baltimore

Bush River

Patapsco River

#8574680
7.35

#8573364





PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-1
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_1 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Saltpeper Creek **Quality of Mark:** Good
Flood Elevation: **7.61 FT** **Location:** Outside wall of Garage
Flooding Type: Surge
Mark Address: 700 Asher Road (east of intersection of Asher Road and Beach Drive). Garage facing north.
Description of Mark: 4' 8" above concrete floor of garage.

Type of Line: Mud line

Description of Physical Structure: concrete garage

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry

Flagging Date: 9/25/2003

Surveyors: Blackwell, Chrismer **Company/Agency:** URS

Survey Date: 10/3/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.3313 **Easting:** 1,493,373

Longitude: -76.3686 **Northing:** 606,411

Approx. First Floor Elevation (Based on Measurement from Mark): 2.94 FT

Approx. Distance to Shoreline: 10 FT

Comments:

Take Carroll island Drive off Eastern Avenue (Extended). Make a left on Beach Drive, and another left on Asher Road. Garage is facing the road.



DSCN0001.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-2
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_2 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Seneca Creek **Quality of Mark:** Good
Flood Elevation: **8.16 FT** **Location:** Outside building wall
Flooding Type: Wave runoff
Mark Address: 728 Nollmeyer Road
Description of Mark: 3' 8" from LAG just outside garage

Type of Line: Mud line
Description of Physical Structure: wood garage
Closest City: **County:** Baltimore **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry
Flagging Date: 9/25/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS
Survey Date: 10/3/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.3252 **Easting:** 1,487,740
Longitude: -76.3843 **Northing:** 602,730

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 100 FT

Comments:

Almost 4 foot inundation seen clearly in the inside of the garage. Mark transferred to the outside. Property owner says garage will be left open for surveyors. Prop. Owner says the FFE for his house is 10 foot, and that was flooded with ~8 inches of water



DSCN0002.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-3
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_3 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Galloway Creek **Quality of Mark:** Good
Flood Elevation: **7.46 FT** **Location:** Outside wall of white garage
Flooding Type: Surge
Mark Address: 1606 Burke Road,
Description of Mark: 2' 10" from concrete floor slab at the outside of the aforementioned white garage.

Type of Line: Mud line

Description of Physical Structure: cinderblock garage

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry

Flagging Date: 9/25/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/3/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.3027 **Easting:** 1,487,790

Longitude: -76.3812 **Northing:** 595,445

Approx. First Floor Elevation (Based on Measurement from Mark): 4.63 FT

Approx. Distance to Shoreline: 320 FT

Comments:

Water depth shows to have risen up to about 1 foot or so below the east-facing window sills of the garage (as seen in the picture)



DSCN0003.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240010

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-4

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_5 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Sue Creek **Quality of Mark:** Poor

Flood Elevation: **6.83 FT** **Location:** Electric Meter Shed

Flooding Type: Surge

Mark Address: 2426-A Holly Neck Road (off Back River Neck Road)

Description of Mark: 3' 11" from ground to the point shown.

Type of Line: Eyewitness account

Description of Physical Structure: wooden electric meter board

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrismer **Company/Agency:** URS

Survey Date: 10/2/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2843 **Easting:** 1,485,008

Longitude: -76.3972 **Northing:** 588,142

Approx. First Floor Elevation (Based on Measurement from Mark): 2.91 FT

Approx. Distance to Shoreline: 80 FT

Comments:

Location of current spot is Sue Creek- just before its confluence with Middle River. Eyewitness also submitted a photo taken by him on the 19th (Friday) showing the floodwaters receding



Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

DSCN0004.jpg



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-5
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_6 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Back River **Quality of Mark:** Good
Flood Elevation: **7.4 FT** **Location:** Red Diesel Tank
Flooding Type: Surge
Mark Address: 1311 Wildwood Beach Road
Description of Mark: 14" from ground slab

Type of Line: Mud line

Description of Physical Structure: above ground diesel tank

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/2/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2539 **Easting:** 1,473,754

Longitude: -76.4323 **Northing:** 577,142

Approx. First Floor Elevation (Based on Measurement from Mark): 6.23 FT

Approx. Distance to Shoreline: 10 FT

Comments:



DSCN0005.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240010

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-6

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_7 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Deep Creek **Quality of Mark:** Poor

Flood Elevation: **8.51 FT** **Location:** Front of house

Flooding Type: Wave runoff

Mark Address: 401 Walnut Grove Road (last house on the street)

Description of Mark: ~3 feet from the bottom of the 1st step.

Type of Line: Eyewitness account

Description of Physical Structure: wood shed

Closest City: Hyde Park **County:** Baltimore **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/2/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2871 **Easting:** 1,468,024

Longitude: -76.4534 **Northing:** 588,034

Approx. First Floor Elevation (Based on Measurement from Mark): 5.51 FT

Approx. Distance to Shoreline: 330 FT

Comments:

Neighbor (Mrs. Ritter) says occupant of 410 died in August, and house was vacant, when it got flooded . No HW marks seen on the outside, however, Mrs. Ritter says the water reached about the handle of the outside door (about 3' 2" from the front step.



DSCN0006.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-7
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_9 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Old Road Bay **Quality of Mark:** Good
Flood Elevation: **11 FT** **Location:** debris line
Flooding Type: Wave height
Mark Address: Inside Fort Howard Veterans Affairs Dept area. 200 feet east of Gettysburg Road & Washington Drive
Description of Mark: None

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Fort Howard **County:** Baltimore **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrismer **Company/Agency:** URS

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.1980 **Easting:** 1,471,056

Longitude: -76.4469 **Northing:** 555,271

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 250 FT

Comments:

Red paint on tree indicated approximate location. Debris line of poor quality, may actually be wave action.



DSCN0007.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-8
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_10 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Back River **Quality of Mark:** Good
Flood Elevation: **6.91 FT** **Location:** side wall of garage
Flooding Type: Surge
Mark Address: 7401 Chesapeake Avenue. 20 feet from junction of Chesapeake Avenue and Main Ave. White garage
Description of Mark: 17 " from outside ground

Type of Line: Mud line

Description of Physical Structure: stucco garage

Closest City: Edgemere **County:** Baltimore **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/2/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2417 **Easting:** 1,470,944

Longitude: -76.4405 **Northing:** 573,482

Approx. First Floor Elevation (Based on Measurement from Mark): 5.49 FT

Approx. Distance to Shoreline: 40 FT

Comments:



DSCN0010.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240087

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-9

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_1 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Chesapeake Bay **Quality of Mark:** Fair

Flood Elevation: **7.6 FT** **Location:** outside

Flooding Type: Surge

Mark Address: 700 S. Caroline Street

Description of Mark: 56" above garage floor

Type of Line: Discoloration

Description of Physical Structure: brick building

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/25/2003

Surveyors: Thigpen, Walker **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/15/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2830 **Easting:** 1,428,394

Longitude: -76.5967 **Northing:** 587,825

Approx. First Floor Elevation (Based on Measurement from Mark): 2.9 FT

Approx. Distance to Shoreline: 730 FT

Comments:



DSCN0001.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-10
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_2 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **7.5 FT** **Location:** Outside
Flooding Type: Surge
Mark Address: City Pier Broadway
Description of Mark: 3 feet

Type of Line: Discoloration

Description of Physical Structure: building

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/25/2003

Surveyors: Thigpen, Walker **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/15/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2808 **Easting:** 1,428,394

Longitude: -76.5925 **Northing:** 587,825

Approx. First Floor Elevation (Based on Measurement from Mark): 4.5 FT

Approx. Distance to Shoreline: 10 FT

Comments:



DSCN0003.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-11
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_3 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Poor
Flood Elevation: **7.73 FT** **Location:** outside
Flooding Type: Surge

Mark Address:

Description of Mark: 1 foot 2 inches from bottom of bench leg

Type of Line: Mud line

Description of Physical Structure: wood post

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/25/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/29/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2811 **Easting:** 1,428,394

Longitude: -76.5923 **Northing:** 587,825

Approx. First Floor Elevation (Based on Measurement from Mark): 4.73 FT

Approx. Distance to Shoreline: 40 FT

Comments:

Café bench 2nd set in from pier next to damaged deck



DSCN0008.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-12
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_5 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **7.52 FT** **Location:** outside
Flooding Type: Surge
Mark Address: 700 S Caroline Street
Description of Mark: 56" ABOVE GARAGE FLOOR

Type of Line: Eyewitness account

Description of Physical Structure: concrete garage

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/28/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

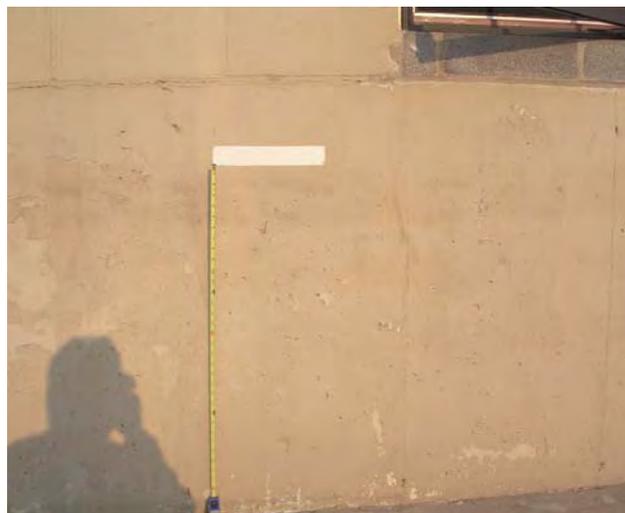
Latitude: 39.2829 **Easting:** 1,428,394

Longitude: -76.5971 **Northing:** 587,825

Approx. First Floor Elevation (Based on Measurement from Mark): 2.85 FT

Approx. Distance to Shoreline: 650 FT

Comments:



DSCN0004.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-13
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_8 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Patapsco River **Quality of Mark:** Fair
Flood Elevation: **6.4 FT** **Location:** outside
Flooding Type: Surge
Mark Address: 2021 South Clinton Street Baltimore, MD
Description of Mark: 1.5 inches above pier

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/29/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2669 **Easting:** 1,434,090

Longitude: -76.5727 **Northing:** 580,567

Approx. First Floor Elevation (Based on Measurement from Mark): 5.9 FT

Approx. Distance to Shoreline: 10 FT

Comments:



DSCN0011.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-14
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_10 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Patapsco River **Quality of Mark:** Fair
Flood Elevation: **7.38 FT** **Location:** In/Out
Flooding Type: Surge
Mark Address: 3800 New Gate Road Guard Shack
Description of Mark: 6 Inches above floor

Type of Line: Debris line
Description of Physical Structure: brick building
Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry
Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS
Survey Date: 9/30/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.2607 **Easting:** 1,436,921
Longitude: -76.5634 **Northing:** 580,580

Approx. First Floor Elevation (Based on Measurement from Mark): 6.88 FT

Approx. Distance to Shoreline: 230 FT

Comments:



DSCN0024.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-15
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_11A **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Patapsco River **Quality of Mark:** Fair
Flood Elevation: **7.56 FT** **Location:** outside
Flooding Type: Surge
Mark Address: 3800 New Gate Road Pier 11
Description of Mark: 33" from ground level

Type of Line: Discoloration

Description of Physical Structure: metal building

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/30/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2612 **Easting:** 1,439,753

Longitude: -76.5594 **Northing:** 580,594

Approx. First Floor Elevation (Based on Measurement from Mark): 4.81 FT

Approx. Distance to Shoreline: 190 FT

Comments:



DSCN0014.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-16
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_16 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Back River **Quality of Mark:** Poor
Flood Elevation: **7.59 FT** **Location:** outside
Flooding Type: Surge
Mark Address: 126 Villa Capri Circle
Description of Mark: 10' above shoreline, above bulk head

Type of Line: Debris line
Description of Physical Structure: N/A

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry
Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS
Survey Date: 10/1/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.3030 **Easting:** 1,459,491

Longitude: -76.4822 **Northing:** 595,269

Approx. First Floor Elevation (Based on Measurement from Mark): -3.59 FT

Approx. Distance to Shoreline: 40 FT

Comments:



DSCN0009.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240010

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-17

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_11 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Colgate Creek **Quality of Mark:** Fair

Flood Elevation: **14.6 FT** **Location:** Outside Bridge

Flooding Type: Wave height

Mark Address: Broewing bridge over Colgate Creek

Description of Mark: 8-10 feet above shoreline

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/30/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2576 **Easting:** 1,445,435

Longitude: -76.5346 **Northing:** 576,980

Approx. First Floor Elevation (Based on Measurement from Mark): 14.6 FT

Approx. Distance to Shoreline: 10 FT

Comments:

Dedbris line of poor quality, may actually be wave action.



DSCN0029.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240010

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-18

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_12 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Bear Creek **Quality of Mark:** Fair

Flood Elevation: **10.46 FT** **Location:** Outside

Flooding Type: Wave height

Mark Address: 695 bridge crossing bear creek

Description of Mark: 12' above shoreline

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrismer **Company/Agency:** URS

Survey Date: 10/1/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2379 **Easting:** 1,470,967

Longitude: -76.4431 **Northing:** 569,840

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 1200 FT

Comments:

Dedbris line of poor quality, may actually be wave action.



DSCN0032.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-19
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_13 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: North Point Creek **Quality of Mark:** Fair
Flood Elevation: **7.23 FT** **Location:** Outside
Flooding Type: Surge
Mark Address: 2601 Boulevard
Description of Mark: 3 ft above ground

Type of Line: Eyewitness account

Description of Physical Structure: swimming pool

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:**
Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS
Survey Date: 10/1/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.2282 **Easting:** 1,473,822
Longitude: -76.4396 **Northing:** 566,215

Approx. First Floor Elevation (Based on Measurement from Mark): 4.23 FT

Approx. Distance to Shoreline: 10 FT

Comments:



DSCN0033.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-20
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_14 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Patapsco River **Quality of Mark:** Fair
Flood Elevation: **7.14 FT** **Location:** Outside
Flooding Type: Surge
Mark Address: 9600 N. Point Rd.
Description of Mark: 3 feet from ground

Type of Line: Eyewitness account

Description of Physical Structure: concrete building

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/30/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2027 **Easting:** 1,471,034

Longitude: -76.4461 **Northing:** 558,913

Approx. First Floor Elevation (Based on Measurement from Mark): 4.14 FT

Approx. Distance to Shoreline: 470 FT

Comments:



DSCN0036.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-21
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_15 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Back River **Quality of Mark:** Poor
Flood Elevation: **7.6 FT** **Location:** Shoreline under bridge
Flooding Type: Surge
Mark Address: 695 Bridge west side
Description of Mark: 12' above shoreline

Type of Line: Debris line
Description of Physical Structure: N/A

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry
Flagging Date: 9/27/2003

Surveyors: Thigpen, Walker **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/30/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.3025 **Easting:** 1,453,831
Longitude: -76.5006 **Northing:** 595,237

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 10 FT

Comments:



DSCN0038.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-22
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_1 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Inner Harbor **Quality of Mark:** Fair
Flood Elevation: **7.62 FT** **Location:** Outside wall
Flooding Type: Surge
Mark Address: Southwest Corner of Pratt and Gay Streets
Description of Mark: next to stairs that go up to the walkway that crossed Pratt Street

Type of Line: Mud line
Description of Physical Structure: concrete building
Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS
Flagging Date: 9/25/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS
Survey Date: 9/27/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.2866 **Easting:** 1,425,563
Longitude: -76.6089 **Northing:** 587,813

Approx. First Floor Elevation (Based on Measurement from Mark): 5.87 FT

Approx. Distance to Shoreline: 220 FT

Comments:



Balt1-2.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240087

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-23

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_2 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Inner Harbor **Quality of Mark:** Fair

Flood Elevation: **7.45 FT** **Location:** Outside building wall

Flooding Type: Surge

Mark Address: Clipper City Boat Tours Light St., half way between Hooters and Science Center

Description of Mark: west side of the ticket booth for Clipper City tours

Type of Line: Mud line/personal account

Description of Physical Structure: wood shed

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/25/2003

Surveyors: Blackwell, Chrismer **Company/Agency:** URS

Survey Date: 9/27/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2832 **Easting:** 1,422,733

Longitude: -76.6117 **Northing:** 587,801

Approx. First Floor Elevation (Based on Measurement from Mark): 5.7 FT

Approx. Distance to Shoreline: 10 FT

Comments:



Balt1-3.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-24
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_3 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Inner Harbor **Quality of Mark:** Fair
Flood Elevation: **5.8 FT** **Location:** Outside building wall
Flooding Type: Surge
Mark Address: Parking lot adjacent to Rusty Scupper
Description of Mark: north side of wall at entrance to parking garage

Type of Line: Mud line

Description of Physical Structure: concrete wall

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/25/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/27/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2816 **Easting:** 1,425,563

Longitude: -76.6072 **Northing:** 587,813

Approx. First Floor Elevation (Based on Measurement from Mark): 5.47 FT

Approx. Distance to Shoreline: 110 FT

Comments:



balt3-8.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-25
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_4 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Inner Harbor **Quality of Mark:** Poor
Flood Elevation: **7.38 FT** **Location:** Fence
Flooding Type: Surge
Mark Address: 800 block of Key Highway across from American Visionary Art Museum
Description of Mark: the fence line that borders the east side of the parking lot

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/25/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/27/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2799 **Easting:** 1,425,579

Longitude: -76.6052 **Northing:** 584,171

Approx. First Floor Elevation (Based on Measurement from Mark): 3.21 FT

Approx. Distance to Shoreline: 10 FT

Comments:



Balt4-10.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-26
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_5 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Inner Harbor **Quality of Mark:** Good
Flood Elevation: **7.44 FT** **Location:** Inside wall transferred outside
Flooding Type: Surge
Mark Address: National Aquarium
Description of Mark: on the left outside wall adjacent to the Pier 3 security entrance

Type of Line: Mud line

Description of Physical Structure: concrete building

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/28/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2849 **Easting:** 1,425,563

Longitude: -76.6083 **Northing:** 587,813

Approx. First Floor Elevation (Based on Measurement from Mark): 5.27 FT

Approx. Distance to Shoreline: 70 FT

Comments:



Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

Balt5-14.jpg



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-27
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_6 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Inner Harbor **Quality of Mark:** Good
Flood Elevation: **7.88 FT** **Location:** Protected outside wall
Flooding Type: Surge
Mark Address: 1000 Fell Street
Description of Mark: at Henderson Wharf hotel main entrance, left at doors if facing hotel

Type of Line: Mud line
Description of Physical Structure: brick building
Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS
Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrismer **Company/Agency:** URS
Survey Date: 9/27/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.2798 **Easting:** 1,431,242
Longitude: -76.5892 **Northing:** 584,196

Approx. First Floor Elevation (Based on Measurement from Mark): 5.3 FT

Approx. Distance to Shoreline: 150 FT

Comments:



Balt6-17.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-28
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_7 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Inner Harbor **Quality of Mark:** Good
Flood Elevation: **7.72 FT** **Location:** Inside wall
Flooding Type: Surge
Mark Address: 1710 Thames Street/Recreation Pier City Building
Description of Mark: inside wall parking area of city building southwest side

Type of Line: Mud line

Description of Physical Structure: brick building

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/28/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2816 **Easting:** 1,428,394

Longitude: -76.5924 **Northing:** 587,825

Approx. First Floor Elevation (Based on Measurement from Mark): 5.47 FT

Approx. Distance to Shoreline: 30 FT

Comments:



Balt7-19.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-29
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_8 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Middle Branch **Quality of Mark:** Poor
Flood Elevation: **21.52 FT** **Location:** Fence
Flooding Type: Wave height
Mark Address: 2035 Kloman Street
Description of Mark: next to old railroad bridge along fence line

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 9/29/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2650 **Easting:** 1,419,932

Longitude: -76.6277 **Northing:** 580,504

Approx. First Floor Elevation (Based on Measurement from Mark): 21.19 FT

Approx. Distance to Shoreline: 120 FT

Comments:

Debris line of poor quality. Mark may be due wave action, which accounts for the exceptionally high flood elevation recorded at this location.



Balt8-20.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-30
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_9 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Inner Harbor **Quality of Mark:** Fair
Flood Elevation: **9.95 FT** **Location:** Outside wall of trash can
Flooding Type: Wave runoff
Mark Address: Fort McHenry
Description of Mark: trash can along walkway, next to seawall, just south of orange construction fence

Type of Line: Mud line

Description of Physical Structure: seawall

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 9/27/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2629 **Easting:** 1,434,090

Longitude: -76.5782 **Northing:** 580,567

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 10 FT

Comments:



Balt9-22.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-31
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_10 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: **Quality of Mark:** Good
Flood Elevation: **7.6 FT** **Location:** Inside wall transferred outside
Flooding Type: Surge
Mark Address: 2601 Cannery Avenue
Description of Mark: 27 inches above sidewalk at corner of garage door

Type of Line: Mud line

Description of Physical Structure: metal garage

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 9/27/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2311 **Easting:** 1,436,974

Longitude: -76.5614 **Northing:** 569,654

Approx. First Floor Elevation (Based on Measurement from Mark): 5.35 FT

Approx. Distance to Shoreline: 140 FT

Comments:



Balt10-22.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-32
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT9_8 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Gunpowder River **Quality of Mark:** Fair
Flood Elevation: **7.9 FT** **Location:** Road sign
Flooding Type: Surge
Mark Address: 13107 Greenbank Rd
Description of Mark: 21.5" from top point of road sign

Type of Line: Mud line
Description of Physical Structure: wood house
Closest City: Oliver Beach **County:** Baltimore **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry
Flagging Date: 10/7/2003

Surveyors: Thigpen, Walker **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/15/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.3682 **Easting:** 1,498,951
Longitude: -76.3410 **Northing:** 617,378

Approx. First Floor Elevation (Based on Measurement from Mark): 6.1 FT

Approx. Distance to Shoreline: 210 FT

Comments:

water in this neighborhood was on the order of 5-8 feet deep.



DSCN0085.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-33
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT9_9 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Patapsco River **Quality of Mark:** Poor
Flood Elevation: **7.6 FT** **Location:** bridge abutment
Flooding Type: Surge
Mark Address: Potee Street/Hanover Street Bridge over Patapsco River
Description of Mark: 14.5" from concrete foundation below abutment

Type of Line: Debris line

Description of Physical Structure: concrete bridge abutment

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 10/7/2003

Surveyors: Thigpen, Walker **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/15/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2479 **Easting:** 1,422,795

Longitude: -76.6123 **Northing:** 573,232

Approx. First Floor Elevation (Based on Measurement from Mark): 6.4 FT

Approx. Distance to Shoreline: 130 FT

Comments:

mark transferred from debris line on ground to abutment.



DSCN0089.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240087

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-34

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT9_12 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Curtis Creek/Marley Creek **Quality of Mark:** Fair

Flood Elevation: **7.4 FT** **Location:** outside wall/door

Flooding Type: Surge

Mark Address: 6211 Pennington Ave (A. Smith & Sons Shipyard)

Description of Mark: 10.25" above top of concrete slab at top of entrance steps

Type of Line: Debris line

Description of Physical Structure: concrete building

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 10/7/2003

Surveyors: Thigpen, Walker **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/15/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2090 **Easting:** 1,431,359

Longitude: -76.5837 **Northing:** 558,700

Approx. First Floor Elevation (Based on Measurement from Mark): 6.5 FT

Approx. Distance to Shoreline: 60 FT

Comments:

shipyard owner witnessed Hurricanes Connie and Hazel-said Isabel storm surge was approx 3' higher than those 2 storms.



DSCN0093.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-1
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_1 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Saltpeper Creek **Quality of Mark:** Good
Flood Elevation: **7.61 FT** **Location:** Outside wall of Garage
Flooding Type: Surge
Mark Address: 700 Asher Road (east of intersection of Asher Road and Beach Drive). Garage facing north.
Description of Mark: 4' 8" above concrete floor of garage.

Type of Line: Mud line
Description of Physical Structure: concrete garage
Closest City: **County:** Baltimore **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry
Flagging Date: 9/25/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS
Survey Date: 10/3/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.3313 **Easting:** 1,493,373
Longitude: -76.3686 **Northing:** 606,411

Approx. First Floor Elevation (Based on Measurement from Mark): 2.94 FT

Approx. Distance to Shoreline: 10 FT

Comments:

Take Carroll island Drive off Eastern Avenue (Extended). Make a left on Beach Drive, and another left on Asher Road. Garage is facing the road.



DSCN0001.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-2
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_2 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Seneca Creek **Quality of Mark:** Good
Flood Elevation: **8.16 FT** **Location:** Outside building wall
Flooding Type: Wave runoff
Mark Address: 728 Nollmeyer Road
Description of Mark: 3' 8" from LAG just outside garage

Type of Line: Mud line
Description of Physical Structure: wood garage
Closest City: **County:** Baltimore **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry
Flagging Date: 9/25/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS
Survey Date: 10/3/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.3252 **Easting:** 1,487,740
Longitude: -76.3843 **Northing:** 602,730

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 100 FT

Comments:

Almost 4 foot inundation seen clearly in the inside of the garage. Mark transferred to the outside. Property owner says garage will be left open for surveyors. Prop. Owner says the FFE for his house is 10 foot, and that was flooded with ~8 inches of water



DSCN0002.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-3
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_3 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Galloway Creek **Quality of Mark:** Good
Flood Elevation: **7.46 FT** **Location:** Outside wall of white garage
Flooding Type: Surge
Mark Address: 1606 Burke Road,
Description of Mark: 2' 10" from concrete floor slab at the outside of the aforementioned white garage.

Type of Line: Mud line

Description of Physical Structure: cinderblock garage

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry

Flagging Date: 9/25/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/3/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.3027 **Easting:** 1,487,790

Longitude: -76.3812 **Northing:** 595,445

Approx. First Floor Elevation (Based on Measurement from Mark): 4.63 FT

Approx. Distance to Shoreline: 320 FT

Comments:

Water depth shows to have risen up to about 1 foot or so below the east-facing window sills of the garage (as seen in the picture)



DSCN0003.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240010

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-4

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_5 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Sue Creek **Quality of Mark:** Poor

Flood Elevation: **6.83 FT** **Location:** Electric Meter Shed

Flooding Type: Surge

Mark Address: 2426-A Holly Neck Road (off Back River Neck Road)

Description of Mark: 3' 11" from ground to the point shown.

Type of Line: Eyewitness account

Description of Physical Structure: wooden electric meter board

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrismer **Company/Agency:** URS

Survey Date: 10/2/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2843 **Easting:** 1,485,008

Longitude: -76.3972 **Northing:** 588,142

Approx. First Floor Elevation (Based on Measurement from Mark): 2.91 FT

Approx. Distance to Shoreline: 80 FT

Comments:

Location of current spot is Sue Creek- just before its confluence with Middle River. Eyewitness also submitted a photo taken by him on the 19th (Friday) showing the floodwaters receding



Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

DSCN0004.jpg



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-5
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_6 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Back River **Quality of Mark:** Good
Flood Elevation: **7.4 FT** **Location:** Red Diesel Tank
Flooding Type: Surge
Mark Address: 1311 Wildwood Beach Road
Description of Mark: 14" from ground slab

Type of Line: Mud line

Description of Physical Structure: above ground diesel tank

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/2/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2539 **Easting:** 1,473,754

Longitude: -76.4323 **Northing:** 577,142

Approx. First Floor Elevation (Based on Measurement from Mark): 6.23 FT

Approx. Distance to Shoreline: 10 FT

Comments:



DSCN0005.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240010

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-6

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_7 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Deep Creek **Quality of Mark:** Poor

Flood Elevation: **8.51 FT** **Location:** Front of house

Flooding Type: Wave runoff

Mark Address: 401 Walnut Grove Road (last house on the street)

Description of Mark: ~3 feet from the bottom of the 1st step.

Type of Line: Eyewitness account

Description of Physical Structure: wood shed

Closest City: Hyde Park **County:** Baltimore **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/2/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2871 **Easting:** 1,468,024

Longitude: -76.4534 **Northing:** 588,034

Approx. First Floor Elevation (Based on Measurement from Mark): 5.51 FT

Approx. Distance to Shoreline: 330 FT

Comments:

Neighbor (Mrs. Ritter) says occupant of 410 died in August, and house was vacant, when it got flooded . No HW marks seen on the outside, however, Mrs. Ritter says the water reached about the handle of the outside door (about 3' 2" from the front step.



DSCN0006.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-7
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_9 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Old Road Bay **Quality of Mark:** Good
Flood Elevation: **11 FT** **Location:** debris line
Flooding Type: Wave height
Mark Address: Inside Fort Howard Veterans Affairs Dept area. 200 feet east of Gettysburg Road & Washington Drive
Description of Mark: None

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Fort Howard **County:** Baltimore **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrismer **Company/Agency:** URS

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.1980 **Easting:** 1,471,056

Longitude: -76.4469 **Northing:** 555,271

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 250 FT

Comments:

Red paint on tree indicated approximate location. Debris line of poor quality, may actually be wave action.



DSCN0007.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-8
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_10 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Back River **Quality of Mark:** Good
Flood Elevation: **6.91 FT** **Location:** side wall of garage
Flooding Type: Surge
Mark Address: 7401 Chesapeake Avenue. 20 feet from junction of Chesapeake Avenue and Main Ave. White garage
Description of Mark: 17 " from outside ground

Type of Line: Mud line

Description of Physical Structure: stucco garage

Closest City: Edgemere **County:** Baltimore **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/2/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2417 **Easting:** 1,470,944

Longitude: -76.4405 **Northing:** 573,482

Approx. First Floor Elevation (Based on Measurement from Mark): 5.49 FT

Approx. Distance to Shoreline: 40 FT

Comments:



DSCN0010.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-9
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_1 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **7.6 FT** **Location:** outside
Flooding Type: Surge
Mark Address: 700 S. Caroline Street
Description of Mark: 56" above garage floor

Type of Line: Discoloration
Description of Physical Structure: brick building
Closest City: Baltimore **County:** Baltimore **State:** Maryland
Flaggers: cannon **Company/Agency:** Dewberry
Flagging Date: 9/25/2003
Surveyors: Thigpen, Walker **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/15/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.2830 **Easting:** 1,428,394
Longitude: -76.5967 **Northing:** 587,825
Approx. First Floor Elevation (Based on Measurement from Mark): 2.9 FT
Approx. Distance to Shoreline: 730 FT

Comments:



DSCN0001.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-10
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_2 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **7.5 FT** **Location:** Outside
Flooding Type: Surge
Mark Address: City Pier Broadway
Description of Mark: 3 feet

Type of Line: Discoloration

Description of Physical Structure: building

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/25/2003

Surveyors: Thigpen, Walker **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/15/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2808 **Easting:** 1,428,394

Longitude: -76.5925 **Northing:** 587,825

Approx. First Floor Elevation (Based on Measurement from Mark): 4.5 FT

Approx. Distance to Shoreline: 10 FT

Comments:



DSCN0003.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-11
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_3 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Poor
Flood Elevation: **7.73 FT** **Location:** outside
Flooding Type: Surge

Mark Address:

Description of Mark: 1 foot 2 inches from bottom of bench leg

Type of Line: Mud line

Description of Physical Structure: wood post

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/25/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/29/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2811 **Easting:** 1,428,394

Longitude: -76.5923 **Northing:** 587,825

Approx. First Floor Elevation (Based on Measurement from Mark): 4.73 FT

Approx. Distance to Shoreline: 40 FT

Comments:

Café bench 2nd set in from pier next to damaged deck



DSCN0008.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-12
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_5 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **7.52 FT** **Location:** outside
Flooding Type: Surge
Mark Address: 700 S Caroline Street
Description of Mark: 56" ABOVE GARAGE FLOOR

Type of Line: Eyewitness account

Description of Physical Structure: concrete garage

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/28/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

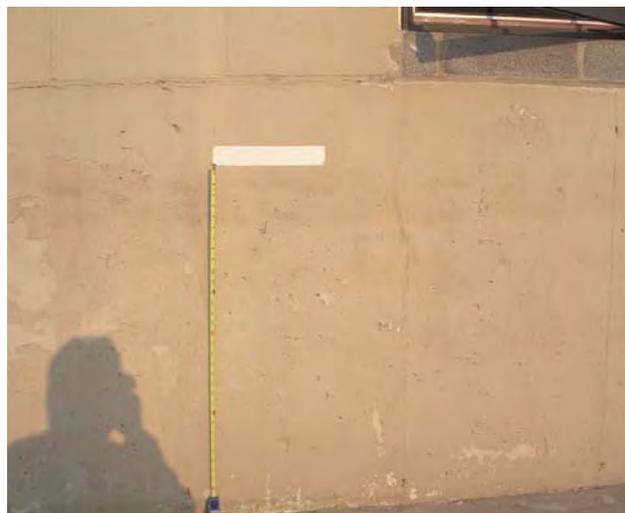
Latitude: 39.2829 **Easting:** 1,428,394

Longitude: -76.5971 **Northing:** 587,825

Approx. First Floor Elevation (Based on Measurement from Mark): 2.85 FT

Approx. Distance to Shoreline: 650 FT

Comments:



DSCN0004.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-13
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_8 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Patapsco River **Quality of Mark:** Fair
Flood Elevation: **6.4 FT** **Location:** outside
Flooding Type: Surge
Mark Address: 2021 South Clinton Street Baltimore, MD
Description of Mark: 1.5 inches above pier

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/29/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2669 **Easting:** 1,434,090

Longitude: -76.5727 **Northing:** 580,567

Approx. First Floor Elevation (Based on Measurement from Mark): 5.9 FT

Approx. Distance to Shoreline: 10 FT

Comments:



DSCN0011.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-14
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_10 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Patapsco River **Quality of Mark:** Fair
Flood Elevation: **7.38 FT** **Location:** In/Out
Flooding Type: Surge
Mark Address: 3800 New Gate Road Guard Shack
Description of Mark: 6 Inches above floor

Type of Line: Debris line
Description of Physical Structure: brick building
Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry
Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS
Survey Date: 9/30/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.2607 **Easting:** 1,436,921
Longitude: -76.5634 **Northing:** 580,580

Approx. First Floor Elevation (Based on Measurement from Mark): 6.88 FT

Approx. Distance to Shoreline: 230 FT

Comments:



DSCN0024.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-15
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_11A **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Patapsco River **Quality of Mark:** Fair
Flood Elevation: **7.56 FT** **Location:** outside
Flooding Type: Surge
Mark Address: 3800 New Gate Road Pier 11
Description of Mark: 33" from ground level

Type of Line: Discoloration

Description of Physical Structure: metal building

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/30/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2612 **Easting:** 1,439,753

Longitude: -76.5594 **Northing:** 580,594

Approx. First Floor Elevation (Based on Measurement from Mark): 4.81 FT

Approx. Distance to Shoreline: 190 FT

Comments:



DSCN0014.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-16
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_16 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Back River **Quality of Mark:** Poor
Flood Elevation: **7.59 FT** **Location:** outside
Flooding Type: Surge
Mark Address: 126 Villa Capri Circle
Description of Mark: 10' above shoreline, above bulk head

Type of Line: Debris line
Description of Physical Structure: N/A

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry
Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS
Survey Date: 10/1/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.3030 **Easting:** 1,459,491
Longitude: -76.4822 **Northing:** 595,269

Approx. First Floor Elevation (Based on Measurement from Mark): -3.59 FT

Approx. Distance to Shoreline: 40 FT

Comments:



DSCN0009.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240010

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-17

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_11 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Colgate Creek **Quality of Mark:** Fair

Flood Elevation: **14.6 FT** **Location:** Outside Bridge

Flooding Type: Wave height

Mark Address: Broewing bridge over Colgate Creek

Description of Mark: 8-10 feet above shoreline

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/30/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2576 **Easting:** 1,445,435

Longitude: -76.5346 **Northing:** 576,980

Approx. First Floor Elevation (Based on Measurement from Mark): 14.6 FT

Approx. Distance to Shoreline: 10 FT

Comments:

Dedbris line of poor quality, may actually be wave action.



DSCN0029.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240010

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-18

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_12 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Bear Creek **Quality of Mark:** Fair

Flood Elevation: **10.46 FT** **Location:** Outside

Flooding Type: Wave height

Mark Address: 695 bridge crossing bear creek

Description of Mark: 12' above shoreline

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrismer **Company/Agency:** URS

Survey Date: 10/1/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2379 **Easting:** 1,470,967

Longitude: -76.4431 **Northing:** 569,840

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 1200 FT

Comments:

Dedbris line of poor quality, may actually be wave action.



DSCN0032.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-19
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_13 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: North Point Creek **Quality of Mark:** Fair
Flood Elevation: **7.23 FT** **Location:** Outside
Flooding Type: Surge
Mark Address: 2601 Boulevard
Description of Mark: 3 ft above ground

Type of Line: Eyewitness account

Description of Physical Structure: swimming pool

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:**
Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS
Survey Date: 10/1/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.2282 **Easting:** 1,473,822
Longitude: -76.4396 **Northing:** 566,215

Approx. First Floor Elevation (Based on Measurement from Mark): 4.23 FT

Approx. Distance to Shoreline: 10 FT

Comments:



DSCN0033.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-20
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_14 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Patapsco River **Quality of Mark:** Fair
Flood Elevation: **7.14 FT** **Location:** Outside
Flooding Type: Surge
Mark Address: 9600 N. Point Rd.
Description of Mark: 3 feet from ground

Type of Line: Eyewitness account

Description of Physical Structure: concrete building

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/30/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2027 **Easting:** 1,471,034

Longitude: -76.4461 **Northing:** 558,913

Approx. First Floor Elevation (Based on Measurement from Mark): 4.14 FT

Approx. Distance to Shoreline: 470 FT

Comments:



DSCN0036.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240010

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-21

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT5_15 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Back River **Quality of Mark:** Poor

Flood Elevation: **7.6 FT** **Location:** Shoreline under bridge

Flooding Type: Surge

Mark Address: 695 Bridge west side

Description of Mark: 12' above shoreline

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: **County:** Baltimore **State:** Maryland

Flaggers: cannon **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Thigpen, Walker **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/30/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.3025 **Easting:** 1,453,831

Longitude: -76.5006 **Northing:** 595,237

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 10 FT

Comments:



DSCN0038.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-22
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_1 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Inner Harbor **Quality of Mark:** Fair
Flood Elevation: **7.62 FT** **Location:** Outside wall
Flooding Type: Surge
Mark Address: Southwest Corner of Pratt and Gay Streets
Description of Mark: next to stairs that go up to the walkway that crossed Pratt Street

Type of Line: Mud line
Description of Physical Structure: concrete building
Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS
Flagging Date: 9/25/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS
Survey Date: 9/27/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.2866 **Easting:** 1,425,563
Longitude: -76.6089 **Northing:** 587,813

Approx. First Floor Elevation (Based on Measurement from Mark): 5.87 FT

Approx. Distance to Shoreline: 220 FT

Comments:



Balt1-2.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240087

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-23

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_2 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Inner Harbor **Quality of Mark:** Fair

Flood Elevation: 7.45 FT **Location:** Outside building wall

Flooding Type: Surge

Mark Address: Clipper City Boat Tours Light St., half way between Hooters and Science Center

Description of Mark: west side of the ticket booth for Clipper City tours

Type of Line: Mud line/personal account

Description of Physical Structure: wood shed

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/25/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/27/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2832 **Easting:** 1,422,733

Longitude: -76.6117 **Northing:** 587,801

Approx. First Floor Elevation (Based on Measurement from Mark): 5.7 FT

Approx. Distance to Shoreline: 10 FT

Comments:



Balt1-3.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-24
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_3 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Inner Harbor **Quality of Mark:** Fair
Flood Elevation: **5.8 FT** **Location:** Outside building wall
Flooding Type: Surge
Mark Address: Parking lot adjacent to Rusty Scupper
Description of Mark: north side of wall at entrance to parking garage

Type of Line: Mud line
Description of Physical Structure: concrete wall
Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS
Flagging Date: 9/25/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS
Survey Date: 9/27/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.2816 **Easting:** 1,425,563
Longitude: -76.6072 **Northing:** 587,813

Approx. First Floor Elevation (Based on Measurement from Mark): 5.47 FT

Approx. Distance to Shoreline: 110 FT

Comments:



balt3-8.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-25
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_4 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Inner Harbor **Quality of Mark:** Poor
Flood Elevation: **7.38 FT** **Location:** Fence
Flooding Type: Surge
Mark Address: 800 block of Key Highway across from American Visionary Art Museum
Description of Mark: the fence line that borders the east side of the parking lot

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/25/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/27/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2799 **Easting:** 1,425,579

Longitude: -76.6052 **Northing:** 584,171

Approx. First Floor Elevation (Based on Measurement from Mark): 3.21 FT

Approx. Distance to Shoreline: 10 FT

Comments:



Balt4-10.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-26
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_5 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Inner Harbor **Quality of Mark:** Good
Flood Elevation: **7.44 FT** **Location:** Inside wall transferred outside
Flooding Type: Surge
Mark Address: National Aquarium
Description of Mark: on the left outside wall adjacent to the Pier 3 security entrance

Type of Line: Mud line

Description of Physical Structure: concrete building

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 9/28/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2849 **Easting:** 1,425,563

Longitude: -76.6083 **Northing:** 587,813

Approx. First Floor Elevation (Based on Measurement from Mark): 5.27 FT

Approx. Distance to Shoreline: 70 FT

Comments:



Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

Balt5-14.jpg



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-27
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_6 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Inner Harbor **Quality of Mark:** Good
Flood Elevation: **7.88 FT** **Location:** Protected outside wall
Flooding Type: Surge
Mark Address: 1000 Fell Street
Description of Mark: at Henderson Wharf hotel main entrance, left at doors if facing hotel

Type of Line: Mud line
Description of Physical Structure: brick building
Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS
Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrismer **Company/Agency:** URS
Survey Date: 9/27/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.2798 **Easting:** 1,431,242
Longitude: -76.5892 **Northing:** 584,196

Approx. First Floor Elevation (Based on Measurement from Mark): 5.3 FT

Approx. Distance to Shoreline: 150 FT

Comments:



Balt6-17.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-28
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_7 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Inner Harbor **Quality of Mark:** Good
Flood Elevation: **7.72 FT** **Location:** Inside wall
Flooding Type: Surge
Mark Address: 1710 Thames Street/Recreation Pier City Building
Description of Mark: inside wall parking area of city building southwest side

Type of Line: Mud line

Description of Physical Structure: brick building

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrismer **Company/Agency:** URS

Survey Date: 9/28/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2816 **Easting:** 1,428,394

Longitude: -76.5924 **Northing:** 587,825

Approx. First Floor Elevation (Based on Measurement from Mark): 5.47 FT

Approx. Distance to Shoreline: 30 FT

Comments:



Balt7-19.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-29
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_8 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Middle Branch **Quality of Mark:** Poor
Flood Elevation: **21.52 FT** **Location:** Fence
Flooding Type: Wave height
Mark Address: 2035 Kloman Street
Description of Mark: next to old railroad bridge along fence line

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 9/29/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2650 **Easting:** 1,419,932

Longitude: -76.6277 **Northing:** 580,504

Approx. First Floor Elevation (Based on Measurement from Mark): 21.19 FT

Approx. Distance to Shoreline: 120 FT

Comments:

Debris line of poor quality. Mark may be due wave action, which accounts for the exceptionally high flood elevation recorded at this location.



Balt8-20.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-30
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_9 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Inner Harbor **Quality of Mark:** Fair
Flood Elevation: **9.95 FT** **Location:** Outside wall of trash can
Flooding Type: Wave runoff
Mark Address: Fort McHenry
Description of Mark: trash can along walkway, next to seawall, just south of orange construction fence

Type of Line: Mud line

Description of Physical Structure: seawall

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 9/27/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2629 **Easting:** 1,434,090

Longitude: -76.5782 **Northing:** 580,567

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 10 FT

Comments:



Balt9-22.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-31
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT8_10 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: **Quality of Mark:** Good
Flood Elevation: **7.6 FT** **Location:** Inside wall transferred outside
Flooding Type: Surge
Mark Address: 2601 Cannery Avenue
Description of Mark: 27 inches above sidewalk at corner of garage door

Type of Line: Mud line

Description of Physical Structure: metal garage

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Fike **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 9/27/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2311 **Easting:** 1,436,974

Longitude: -76.5614 **Northing:** 569,654

Approx. First Floor Elevation (Based on Measurement from Mark): 5.35 FT

Approx. Distance to Shoreline: 140 FT

Comments:



Balt10-22.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240010
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-32
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT9_8 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Gunpowder River **Quality of Mark:** Fair
Flood Elevation: **7.9 FT** **Location:** Road sign
Flooding Type: Surge
Mark Address: 13107 Greenbank Rd
Description of Mark: 21.5" from top point of road sign

Type of Line: Mud line
Description of Physical Structure: wood house
Closest City: Oliver Beach **County:** Baltimore **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry
Flagging Date: 10/7/2003

Surveyors: Thigpen, Walker **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/15/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.3682 **Easting:** 1,498,951
Longitude: -76.3410 **Northing:** 617,378

Approx. First Floor Elevation (Based on Measurement from Mark): 6.1 FT

Approx. Distance to Shoreline: 210 FT

Comments:

water in this neighborhood was on the order of 5-8 feet deep.



DSCN0085.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-33
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT9_9 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Patapsco River **Quality of Mark:** Poor
Flood Elevation: **7.6 FT** **Location:** bridge abutment
Flooding Type: Surge
Mark Address: Potee Street/Hanover Street Bridge over Patapsco River
Description of Mark: 14.5" from concrete foundation below abutment

Type of Line: Debris line

Description of Physical Structure: concrete bridge abutment

Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 10/7/2003

Surveyors: Thigpen, Walker **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/15/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.2479 **Easting:** 1,422,795

Longitude: -76.6123 **Northing:** 573,232

Approx. First Floor Elevation (Based on Measurement from Mark): 6.4 FT

Approx. Distance to Shoreline: 130 FT

Comments:

mark transferred from debris line on ground to abutment.



DSCN0089.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240087
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** B-34
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT9_12 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Curtis Creek/Marley Creek **Quality of Mark:** Fair
Flood Elevation: **7.4 FT** **Location:** outside wall/door
Flooding Type: Surge
Mark Address: 6211 Pennington Ave (A. Smith & Sons Shipyard)
Description of Mark: 10.25" above top of concrete slab at top of entrance steps

Type of Line: Debris line
Description of Physical Structure: concrete building
Closest City: Baltimore **County:** Baltimore **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry
Flagging Date: 10/7/2003

Surveyors: Thigpen, Walker **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/15/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.2090 **Easting:** 1,431,359
Longitude: -76.5837 **Northing:** 558,700

Approx. First Floor Elevation (Based on Measurement from Mark): 6.5 FT

Approx. Distance to Shoreline: 60 FT

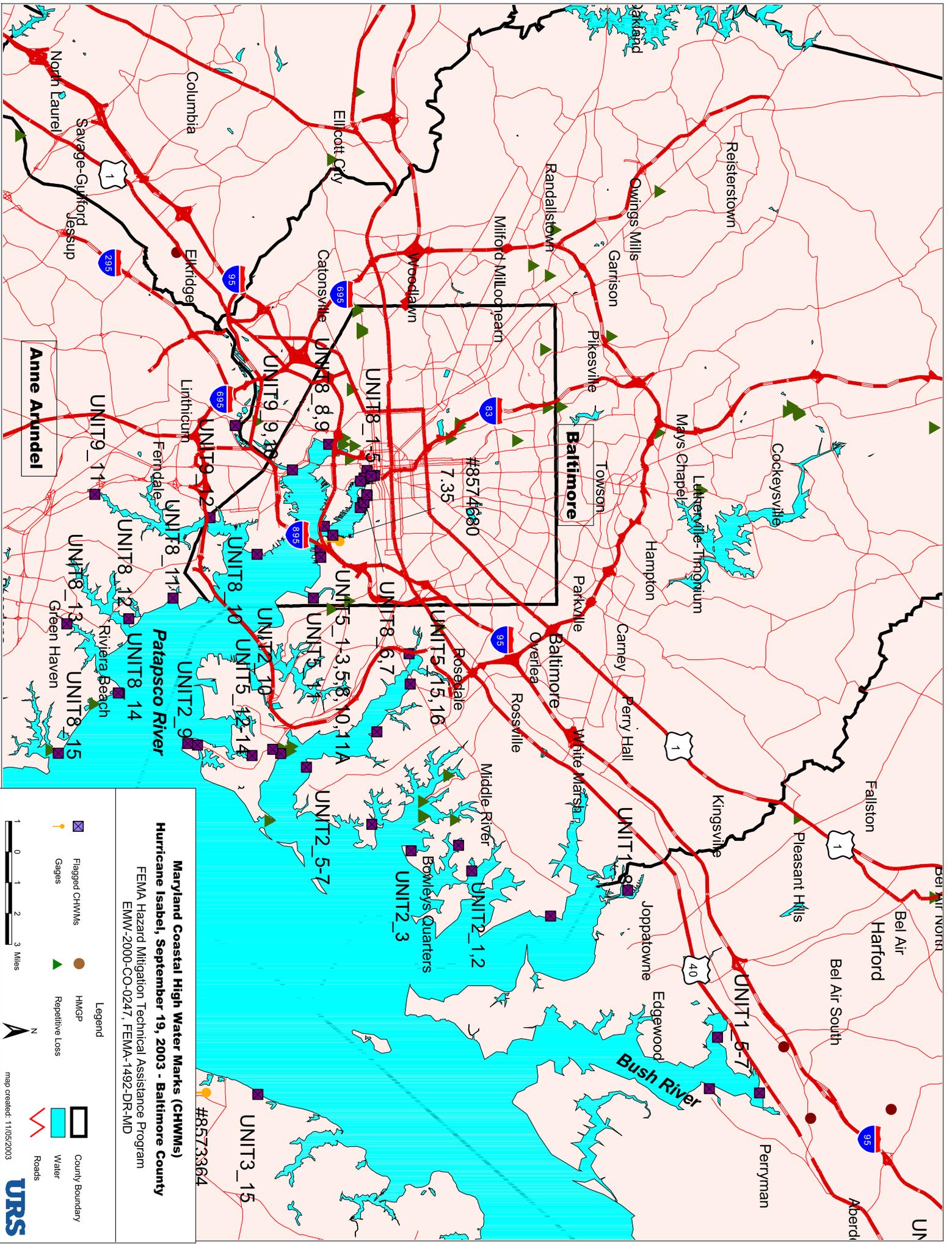
Comments:

shipyard owner witnessed Hurricanes Connie and Hazel-said Isabel storm surge was approx 3' higher than those 2 storms.



DSCN0093.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



Maryland Coastal High Water Marks (CHWMs)
Hurricane Isabel, September 19, 2003 - Baltimore County
 FEMA Hazard Mitigation Technical Assistance Program
 EMW-2000-CO-0247, FEMA-1492-DR-MD

Legend

- Flagged CHWMs
- HMGF
- ▲ Repetitive Loss
- County Boundary
- Water
- Roads
- Gages

1 0 1 2 3 Miles

N

map created: 11/05/2003

URS

Anne Arundel

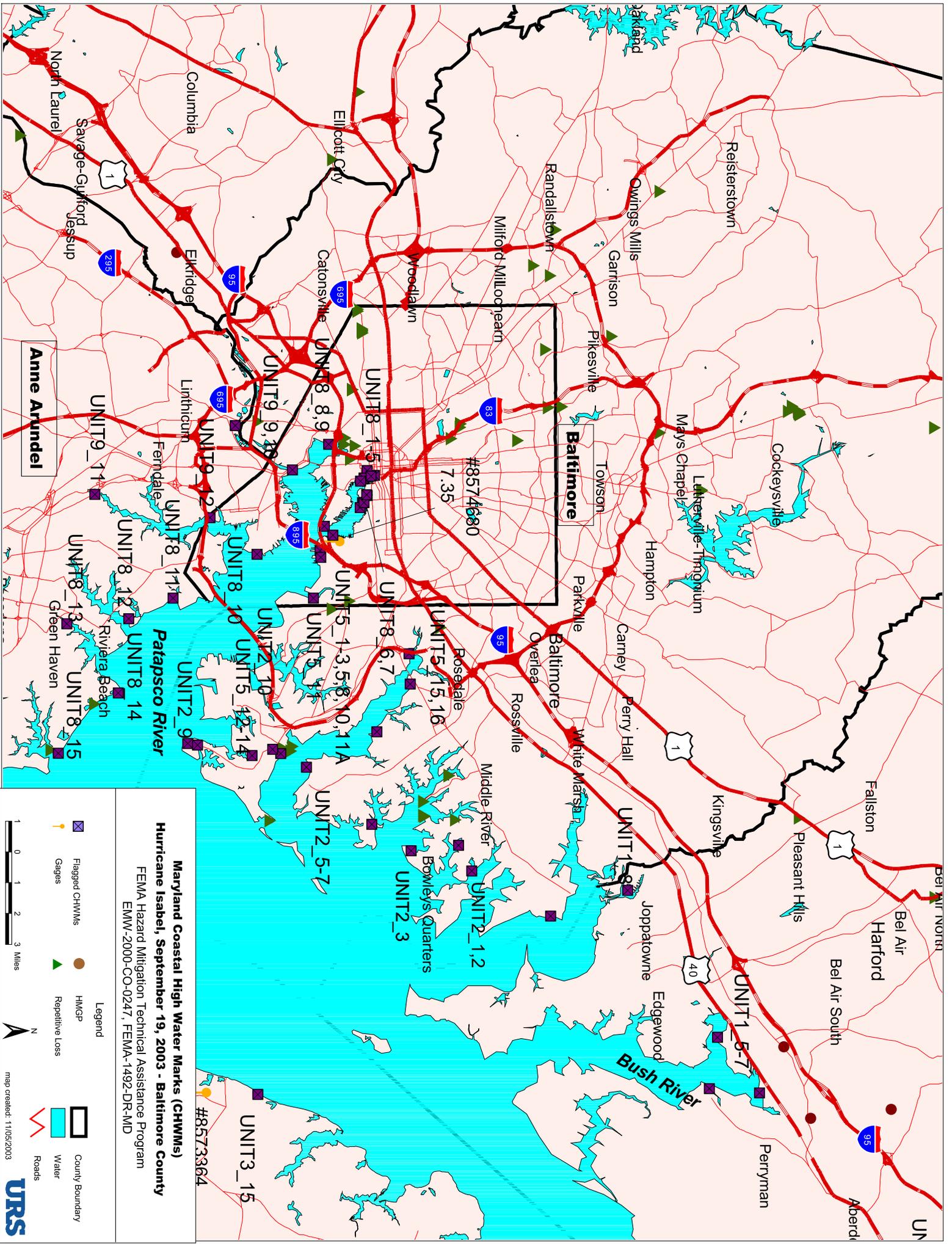
Baltimore

Bush River

Patapsco River

#8574680
7.35

#8573364





PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240011
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** C-1
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_1 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **5.7 FT** **Location:** Inside rear wall, transfer outside
Flooding Type: Surge
Mark Address: 9306 Atlantic Ave
Description of Mark: rear of home, next to rear door

Type of Line: Mud line

Description of Physical Structure: building

Closest City: North Beach **County:** Calvert **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry

Flagging Date: 9/25/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.7102 **Easting:** 1,449,301

Longitude: -76.5296 **Northing:** 380,327

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 90 FT

Comments:



DCP_3310.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240011
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** C-2
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_2 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **7 FT** **Location:** Building/restaurant
Flooding Type: Surge
Mark Address: 8617 Route 261
Description of Mark: mudline

Type of Line: Mud line

Description of Physical Structure: concrete building

Closest City: Chesapeake Beach **County:** Calvert **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry
Flagging Date: 9/25/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/9/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.7007 **Easting:** 1,446,466

Longitude: -76.5333 **Northing:** 376,670

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 250 FT

Comments:



DCP_3313.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240012
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** C-3
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_3 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **6.1 FT** **Location:** Outside building door
Flooding Type: Surge
Mark Address: 9214 Atlantic Avenue
Description of Mark: outside of building, rear door

Type of Line: Mud line
Description of Physical Structure: building
Closest City: North Beach **County:** Calvert **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry
Flagging Date: 9/25/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/9/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 38.7090 **Easting:** 1,446,466
Longitude: -76.5303 **Northing:** 376,670

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 150 FT

Comments:



DCP_3344.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240011
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** C-4
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_4 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **6.4 FT** **Location:** Brick pillar in front of home, rear to water source
Flooding Type: Surge
Mark Address: 2811 Beach Drive
Description of Mark: mudline along front and garage door

Type of Line: Mud line

Description of Physical Structure: brick garage

Closest City: Plum Point **County:** Calvert **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/9/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.6128 **Easting:** 1,452,350

Longitude: -76.5127 **Northing:** 343,924

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 220 FT

Comments:



DCP_3348.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240011
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** C-5
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_5 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Poor
Flood Elevation: **8 FT** **Location:** Coastal wall
Flooding Type: Wave runoff
Mark Address: Boat Ramp at Ent. of 402
Description of Mark: discoloration of wood at flood wall

Type of Line: Discoloration of wood

Description of Physical Structure: wood flood wall

Closest City: Dare Beach **County:** Calvert **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.5572 **Easting:** 1,452,467

Longitude: -76.5156 **Northing:** 322,073

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 120 FT

Comments:



DCP_3358.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240011
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** C-6
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_6 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **5.6 FT** **Location:** Beach bench
Flooding Type: Surge
Mark Address: Beach Shelter
Description of Mark: yellow tape identifying mudline

Type of Line: Mud/debris line

Description of Physical Structure: N/A

Closest City: Governors Run **County:** Calvert **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.5002 **Easting:** 1,455,427

Longitude: -76.5035 **Northing:** 303,880

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 20 FT

Comments:



DCP_3360.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240011
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** C-7
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_7 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **5.6 FT** **Location:** Ground
Flooding Type: Surge
Mark Address: End Governor Run Road
Description of Mark: debris line at end of road

Type of Line: Debris line
Description of Physical Structure: N/A

Closest City: Governors Run **County:** Calvert **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry
Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 38.5000 **Easting:** 1,455,447
Longitude: -76.5034 **Northing:** 300,238

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 10 FT

Comments:



DCP_3364.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240011
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** C-8
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_8 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **6.2 FT** **Location:** Stump with nail and ribbon
Flooding Type: Surge
Mark Address: Boat launch
Description of Mark: debris line at boat launch

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Calvert Beach **County:** Calvert **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/9/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.4696 **Easting:** 1,464,097

Longitude: -76.4785 **Northing:** 289,361

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 10 FT

Comments:



DCP_3367.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240011
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** C-9
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_9 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair/Good
Flood Elevation: **5 FT** **Location:** Outside building wall
Flooding Type: Surge
Mark Address: 6574 Long Beach Drive
Description of Mark: mudline on shed in rear of home

Type of Line: Mud line

Description of Physical Structure: wood shed

Closest City: Long Beach **County:** Calvert **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.4594 **Easting:** 1,466,982

Longitude: -76.4655 **Northing:** 285,736

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 140 FT

Comments:

Mud line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DCP_3370.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240011
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** C-10
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_10 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **4.6 FT** **Location:** Outside wall
Flooding Type: Surge
Mark Address: 3160 Light House Blvd.
Description of Mark: mudline/outside wall

Type of Line: Mud line

Description of Physical Structure: wood house

Closest City: Cove City **County:** Calvert **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.3841 **Easting:** 1,490,065

Longitude: -76.3867 **Northing:** 260,390

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 660 FT

Comments:

Mud line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DCP_3379.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240011
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** C-11
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_11 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **4.6 FT** **Location:** Outside wall
Flooding Type: Surge
Mark Address: 3010 Light House Blvd.
Description of Mark: mudline/outside wall

Type of Line: Mud line

Description of Physical Structure: wood house

Closest City: Lusby (20657 Zip) **County:** Calvert **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.3795 **Easting:** 1,487,223

Longitude: -76.3915 **Northing:** 256,729

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 600 FT

Comments:

Mud line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DCP_3387.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240011
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** C-12
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_12 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **5.8 FT** **Location:** Ground
Flooding Type: Surge
Mark Address: End River View Dr.
Description of Mark: ribbon and paint mark

Type of Line: Debris line
Description of Physical Structure: N/A

Closest City: Drummond Point **County:** Calvert **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry
Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 38.3245 **Easting:** 1,475,869
Longitude: -76.4323 **Northing:** 238,446

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

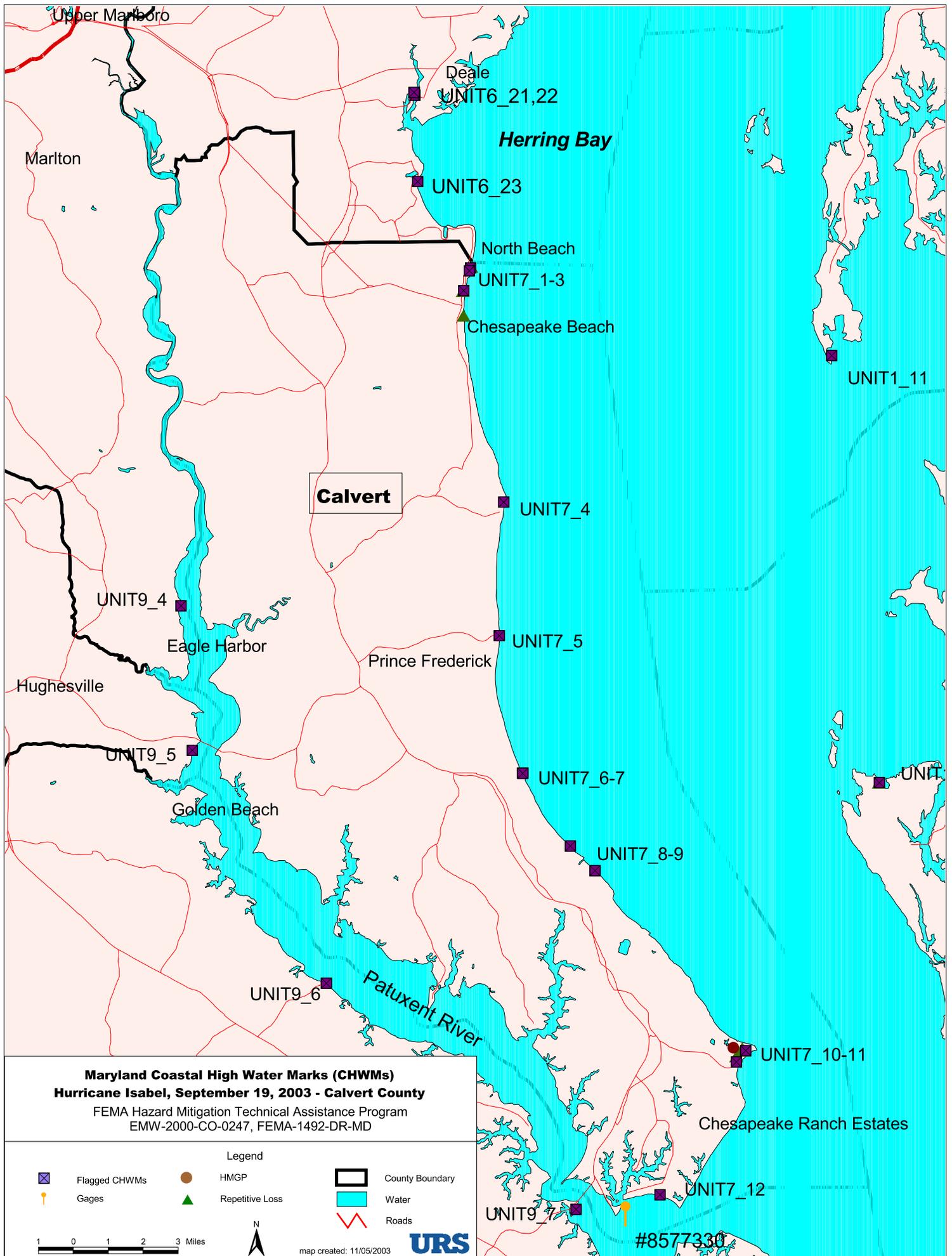
Approx. Distance to Shoreline: 130 FT

Comments:



DCP_3396.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



Upper Marlboro

Deale
 UNIT6_21,22

Herring Bay

Marlton

UNIT6_23

North Beach

UNIT7_1-3

Chesapeake Beach

UNIT1_11

Calvert

UNIT7_4

UNIT9_4

Eagle Harbor

Prince Frederick

UNIT7_5

Hughesville

UNIT9_5

Golden Beach

UNIT7_6-7

UNIT7_8-9

UNIT9_6

Patuxent River

UNIT7_10-11

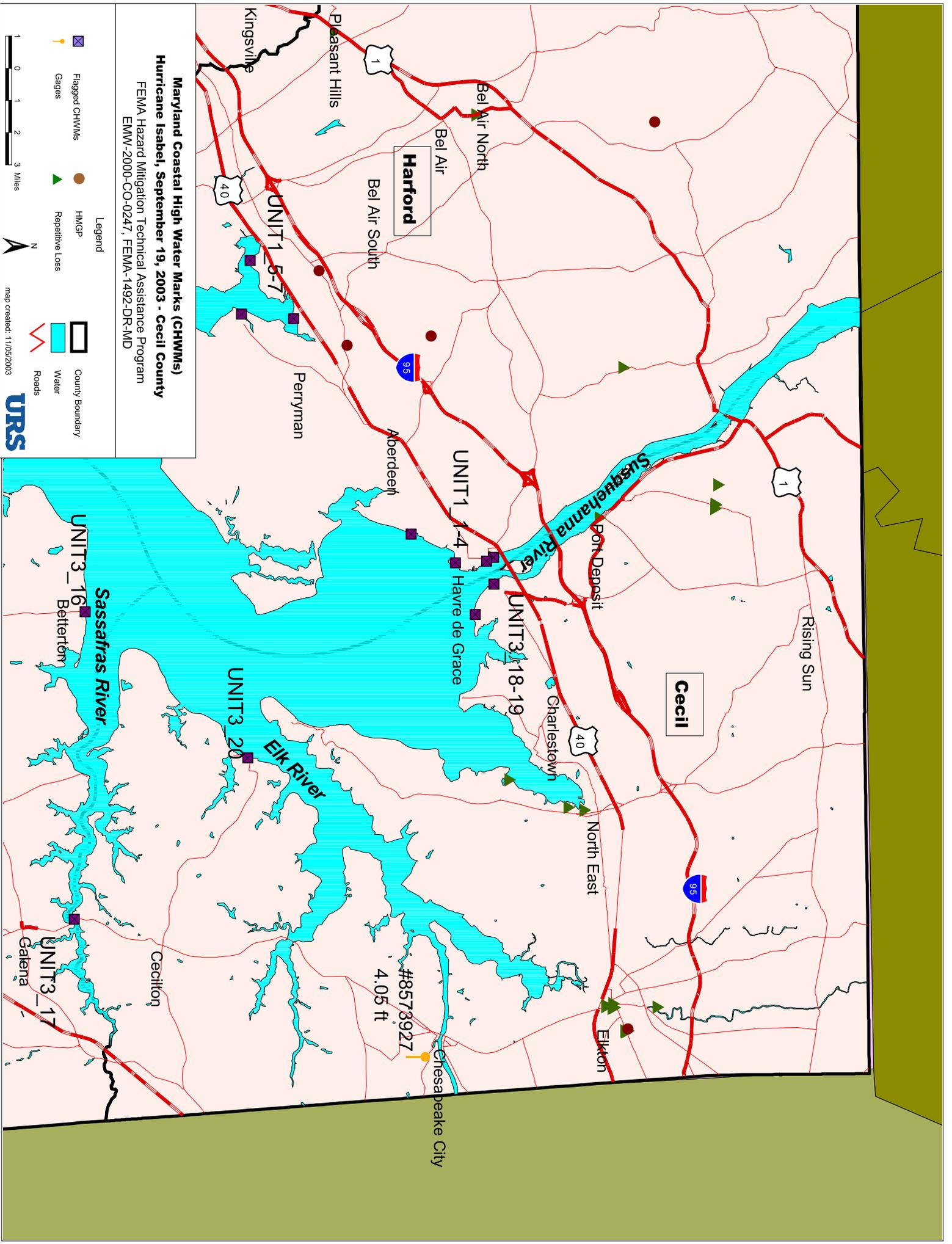
Chesapeake Ranch Estates

UNIT7_12

UNIT9_7

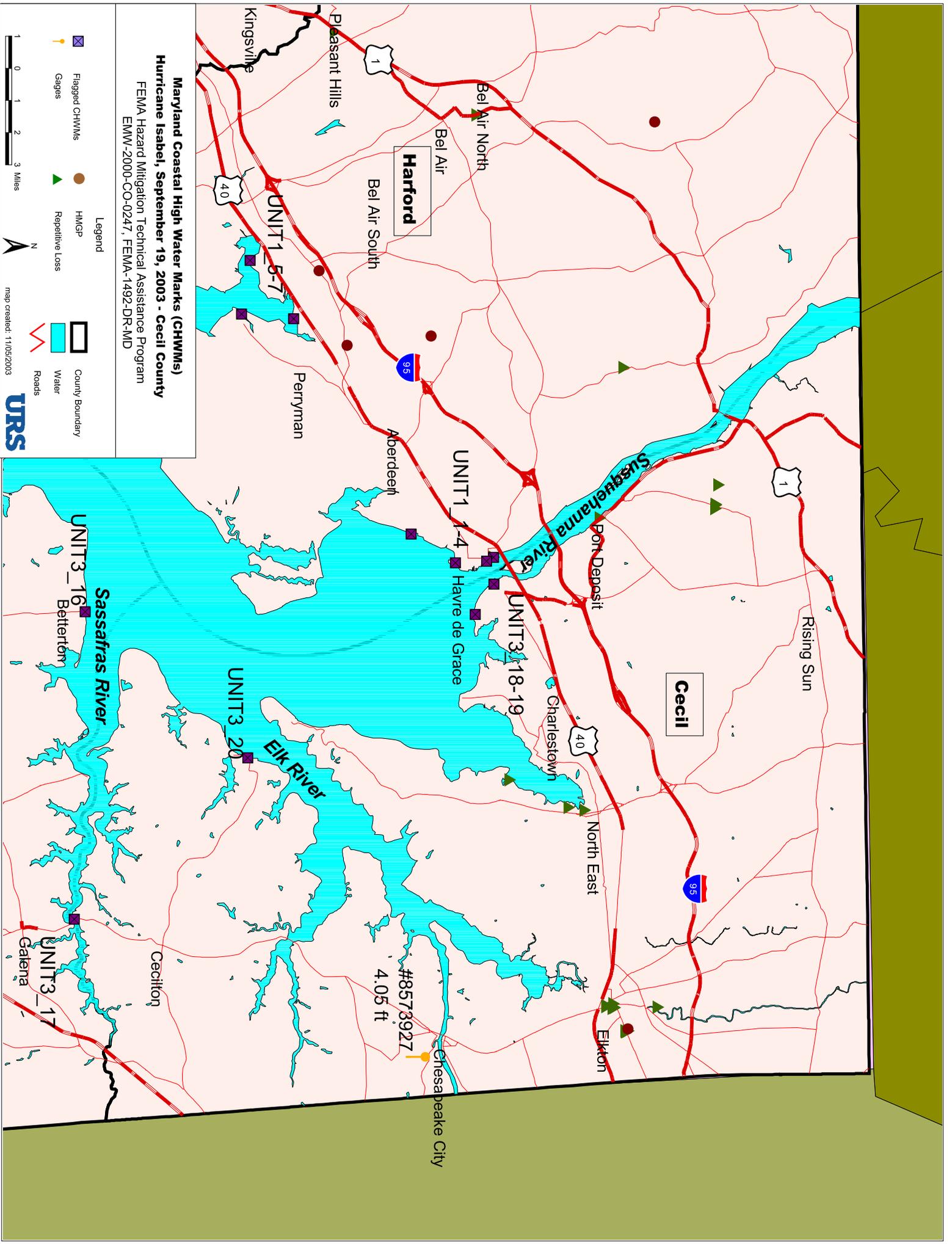
Appendices

Appendix D: Survey Sheets from Cecil County



Harford

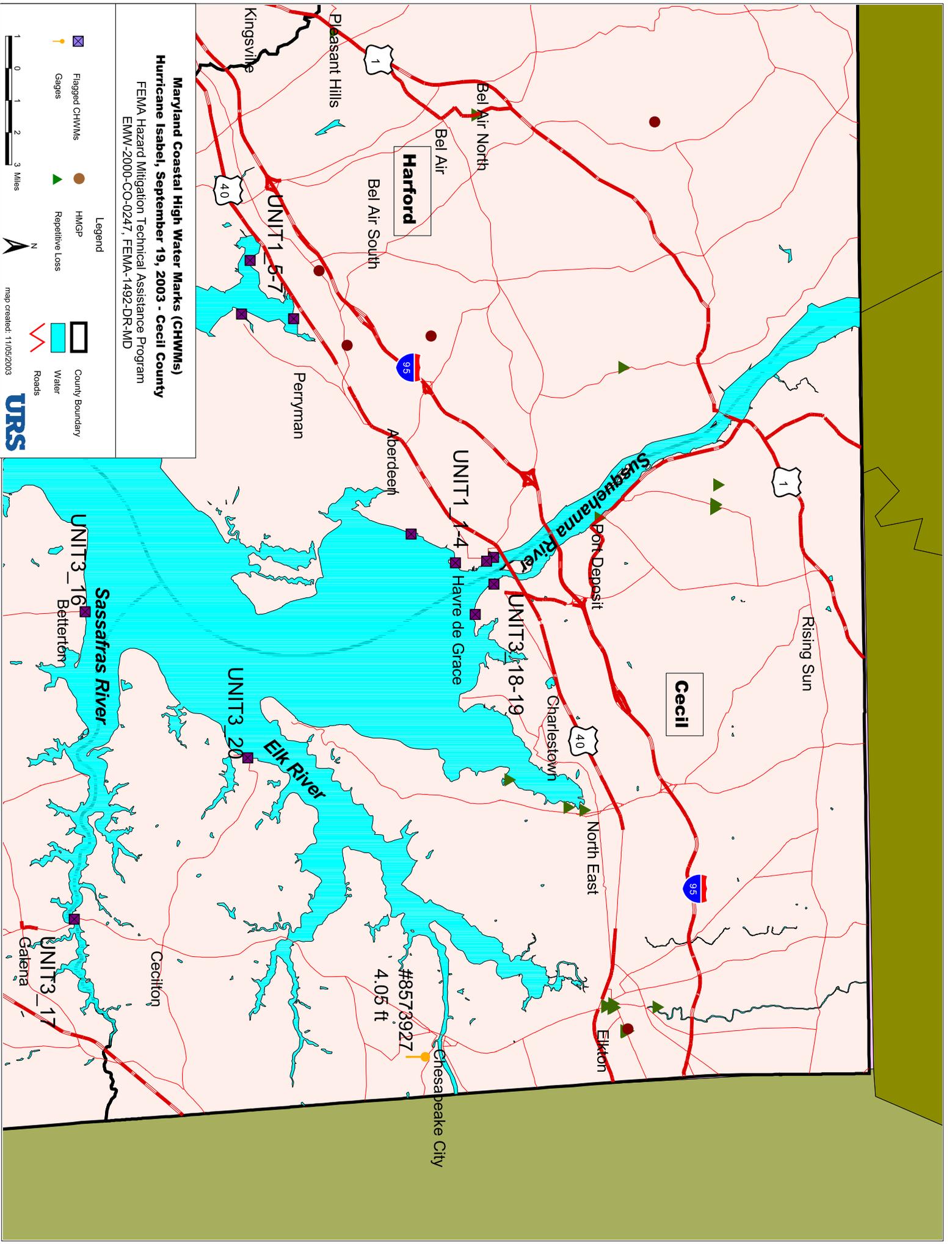
Cecil



Harford

Cecil

#8573927
4.05 ft



Harford

Cecil

#8573927
4.05 ft



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240019

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** D-1

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_18 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Chesapeake Bay **Quality of Mark:** Good

Flood Elevation: **8.39 FT** **Location:** Debris line on ground

Flooding Type: Wave runoff

Mark Address: Entrance to Perry Point VA Medical Center, Perry Point, Maryland, 21902

Description of Mark: N/A

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Perry Point **County:** Cecil **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry

Flagging Date: 9/28/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/5/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.5551 **Easting:** 1,574,588

Longitude: -76.0769 **Northing:** 687,247

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 130 FT

Comments:

To reach VA Medical Center, take Route 222 East towards Perryville. When Route 222 ends at Broad Street, take a right and follow Broad Street through town until reaching the entrance booth to the Medical Center.



DSCN0030.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240019
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** D-2
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_19 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **9.49 FT** **Location:** Debris line on ground
Flooding Type: Wave runoff
Mark Address: Near the intersection of Tenth Street and Avenue A, along the Chesapeake Bay shoreline
Description of Mark: N/A

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Perry Point **County:** Cecil **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry

Flagging Date: 9/28/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/5/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.5464 **Easting:** 1,580,265

Longitude: -76.0592 **Northing:** 683,663

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 130 FT

Comments:

To reach VA Medical Center, take Route 222 East towards Perryville. When Route 222 ends at Broad Street, take a right and follow Broad Street through town until reaching the entrance booth to the Medical Center.



DSCN0031.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240019
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** D-3
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_20 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **3.26 FT** **Location:** Debris line on ground
Flooding Type: Surge
Mark Address: Northwest of the intersection of Park Drive and Bay Boulevard, Crystal Beach, Maryland
Description of Mark: N/A

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Crystal Beach **County:** Cecil **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry

Flagging Date: 9/28/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/5/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.4432 **Easting:** 1,603,238

Longitude: -75.9771 **Northing:** 647,484

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 200 FT

Comments:

Debris line may have been affected by weather or cleanup action, resulting in lower than average elevation.

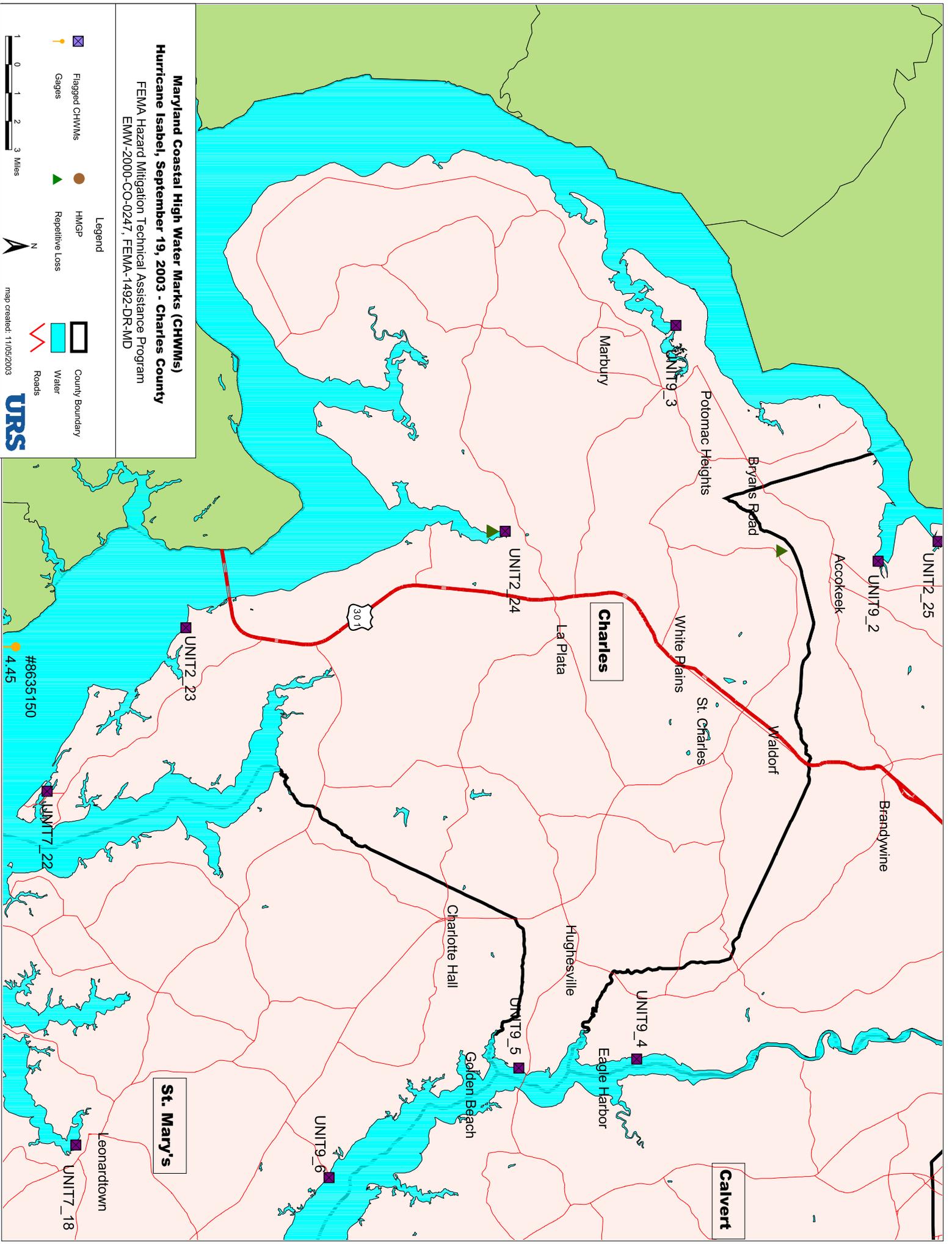


DSCN0033.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

Appendices

Appendix E: Survey Sheets from Charles County



UNIT2_25

UNIT9_2

Accokeek

Bryans Road

Potomac Heights

Marbury

White Plains

St. Charles

Waldorf

Brandywine

Charles

La Plata

30.1

UNIT2_24

UNIT2_23

#8635150

4.45

UNIT7_22

Hughesville

Eagle Harbor

Golden Beach

UNIT9_5

Charlotte Hall

UNIT9_6

St. Mary's

Leonardtown

UNIT7_18

Calvert



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240089
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** E-1
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_23 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Potomac River **Quality of Mark:** Good
Flood Elevation: 11 FT **Location:** Outside wall
Flooding Type: Wave height
Mark Address: 13531 South View Road.
Description of Mark: HWM is 20" below the bottom of window sill

Type of Line: Mud line
Description of Physical Structure: wood house
Closest City: Morgantown **County:** Charles **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry
Flagging Date: 9/27/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/15/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 38.3408 **Easting:** 1,323,806
Longitude: -76.9642 **Northing:** 245,222

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 220 FT

Comments:

Mud line of poor quality, may actually be wave action.



DSCN0016.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240089
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** E-2
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_24 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Port Tobacco River **Quality of Mark:** Good
Flood Elevation: **7.3 FT** **Location:** Outside wall
Flooding Type: Surge
Mark Address: 7478 Shirley Blvd
Description of Mark: 3" from window sill , and 3 feet from wood flooring outside. Mark transferred from the inside of the building

Type of Line: Mud line

Description of Physical Structure: wood house

Closest City: Port Tobacco **County:** Charles **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/15/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.5036 **Easting:** 1,306,610

Longitude: -77.0267 **Northing:** 303,489

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 160 FT

Comments:

The community center building has been condemned.



DSCN0013.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240064
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** E-3
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_22 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Neale Sound **Quality of Mark:** Good
Flood Elevation: **6.3 FT** **Location:** Outside building wall
Flooding Type: Surge
Mark Address: 13040 Pine Grove Road
Description of Mark: water line, outside building

Type of Line: Mud line
Description of Physical Structure: wood house
Closest City: Cobb Island **County:** Charles **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry
Flagging Date: 9/27/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/13/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 38.2700 **Easting:** 1,355,399
Longitude: -76.8583 **Northing:** 219,762

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 220 FT

Comments:



Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240089
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** E-4
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT9_3 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Mattawoman Creek **Quality of Mark:** Poor
Flood Elevation: **9.5 FT** **Location:** sign post
Flooding Type: Wave runup
Mark Address: Mattingly Street and Mattawoman Creek (Mattingly Park)
Description of Mark: 16" above ground, measured on Mattingly Park sign post closest to the water

Type of Line: Debris line

Description of Physical Structure: wood sign post

Closest City: Indian Head **County:** Charles **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 10/6/2003

Surveyors: Weaver, Payabyab **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/15/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.5906 **Easting:** 1,266,601

Longitude: -77.1609 **Northing:** 336,305

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 120 FT

Comments:

Surge left wide swath of debris, making it difficult to give anything more than a poor rating.



DSCN0068.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240089
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** E-5
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT9_5 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Patuxent River **Quality of Mark:** Good
Flood Elevation: **5.4 FT** **Location:** inside wall
Flooding Type: Surge
Mark Address: 7320 Benedict Ave (Tony's Riverhouse Restaurant)
Description of Mark: 21.75" above metal door frame

Type of Line: Mud/debris line
Description of Physical Structure: concrete building
Closest City: Benedict **County:** Charles **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry
Flagging Date: 10/6/2003

Surveyors: Weaver, Payabyab **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 38.5102 **Easting:** 1,406,762
Longitude: -76.6782 **Northing:** 307,300

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 120 FT

Comments:

Other debris lines were evident in the building, most likely left behind while the surge was receding. Inside wall mark was transferred to glass door. SURVEYOR: construction/clean-up ongoing...proceed with caution.

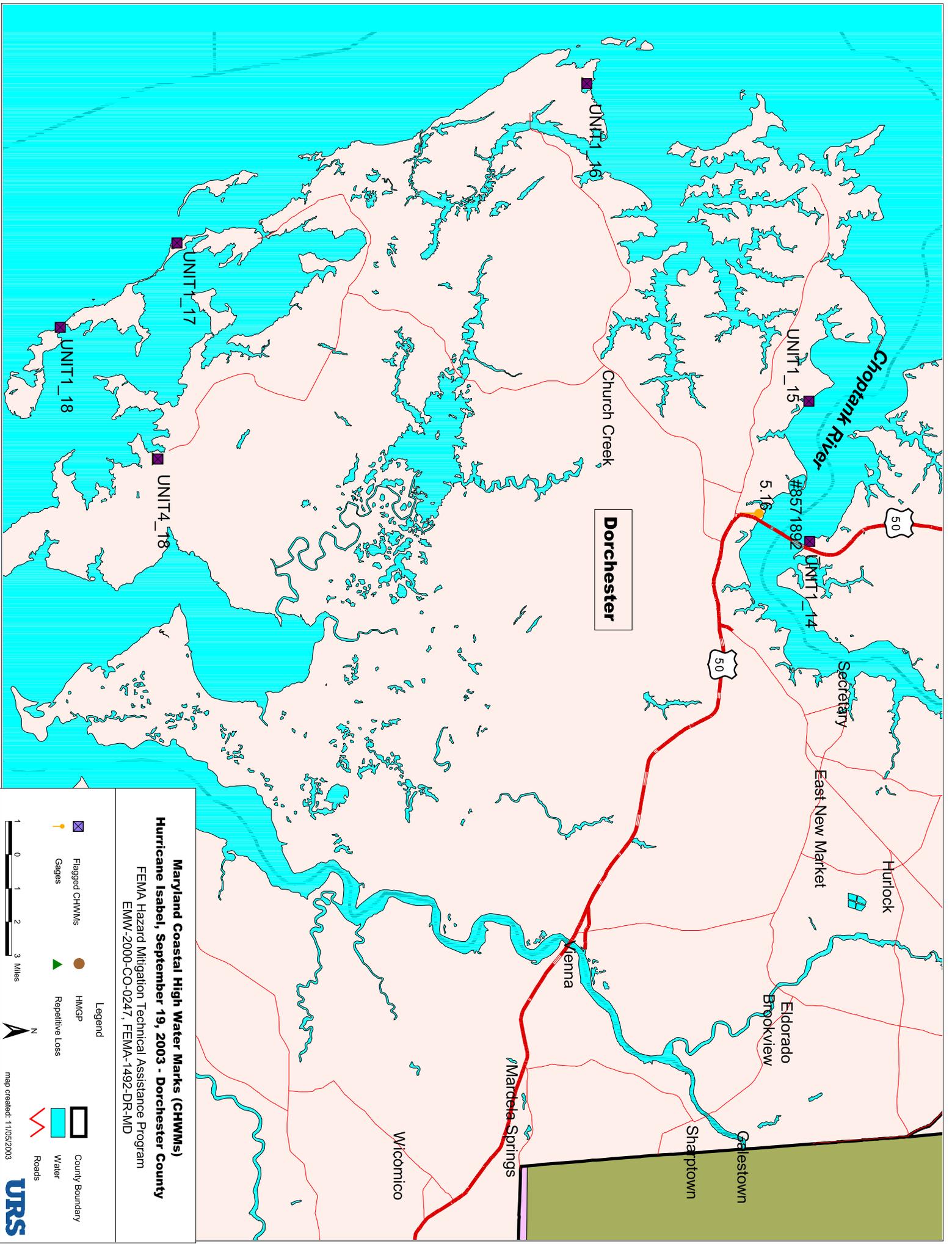


DSCN0074.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

Appendices

Appendix F: Survey Sheets from Dorchester County



Maryland Coastal High Water Marks (CHWMs)
Hurricane Isabel, September 19, 2003 - Dorchester County
 FEMA Hazard Mitigation Technical Assistance Program
 EMW-2000-CO-0247, FEMA-1492-DR-MD

Legend

- Flagged CHWMs
- Gages
- HMGP
- Repetitive Loss
- County Boundary
- Water
- Roads

1 0 1 2 3 Miles

N

map created: 11/05/2003



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240026

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** F-1

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_15 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Choptank River **Quality of Mark:** Poor

Flood Elevation: **5.34 FT** **Location:** ground

Flooding Type: Surge

Mark Address: 2010 Hornspoint Rd

Description of Mark: no vertical reference, ground debris line

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Cambridge **County:** Dorchester **State:** Maryland

Flaggers: Dudley **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/8/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.5941 **Easting:** 1,561,001

Longitude: -76.1314 **Northing:** 337,449

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 160 FT

Comments:

site name: DOCO 1-15



DSCN0025.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240026
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** F-2
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_16 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Slaughter Creek **Quality of Mark:** Good
Flood Elevation: **4.06 FT** **Location:** inside wall, transferred outside
Flooding Type: Surge
Mark Address: 324 Hooper Neck Road
Description of Mark: 10" below window sill, 31" above ground

Type of Line: Mud line

Description of Physical Structure: wood house

Closest City: Taylors Island **County:** Dorchester **State:** Maryland

Flaggers: Dudley **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/8/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.4951 **Easting:** 1,509,829

Longitude: -76.3150 **Northing:** 300,593

Approx. First Floor Elevation (Based on Measurement from Mark): 1.48 FT

Approx. Distance to Shoreline: 150 FT

Comments:

DOCO 1-16, repetitive loss property, extreme damage to building structure, floor extremely warped, driveway still had 3-5" of water. Mud line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DSCN0026.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240026
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** F-3
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_17 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Tar Bay **Quality of Mark:** Good
Flood Elevation: **4.9 FT** **Location:** inside wall, transferred out
Flooding Type: Surge
Mark Address: 1210 Horse Point Road
Description of Mark: 18 1/4" below window sill

Type of Line: Mud line
Description of Physical Structure: wood house
Closest City: Fishing Creek **County:** Dorchester **State:** Maryland

Flaggers: Dudley **Company/Agency:** URS
Flagging Date: 9/27/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS
Survey Date: 10/8/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 38.3096 **Easting:** 1,536,180
Longitude: -76.2255 **Northing:** 231,608

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 170 FT

Comments:

FISH 1-17. Mud line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DSCN0027.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240026
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** F-4
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_18 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **4.61 FT** **Location:** inside wall, transferred out
Flooding Type: Surge
Mark Address: 1728 Hoopersville Road
Description of Mark: 24.5" below window sill

Type of Line: Mud line

Description of Physical Structure: wood house

Closest City: Hoopersville **County:** Dorchester **State:** Maryland

Flaggers: Dudley **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/8/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.2567 **Easting:** 1,550,694

Longitude: -76.1778 **Northing:** 213,527

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 160 FT

Comments:

site name: HOOP 1-18. Mud line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DSCN0028.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240026
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** F-5
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_18 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Honga River **Quality of Mark:** Good
Flood Elevation: **See comments** **Location:** inside wall
Flooding Type: Surge
Mark Address: 2275 Wingate Point Rd
Description of Mark: 33.75" above top of concrete garage slab, measured from inside garage door frame on left side of door.

Type of Line: Mud/debris line, personal account

Description of Physical Structure: wood garage

Closest City: Wingate **County:** Dorchester **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: **Company/Agency:**

Survey Date: **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.3001 **Easting:** 1,570,616

Longitude: -76.1019 **Northing:** 231,925

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 1200 FT

Comments:

Shop/garage is a repetitive loss structure. There is no flood insurance policy in place for the house or the garage. Both structures were affected by storm surge. Location not accessible to survey crew.

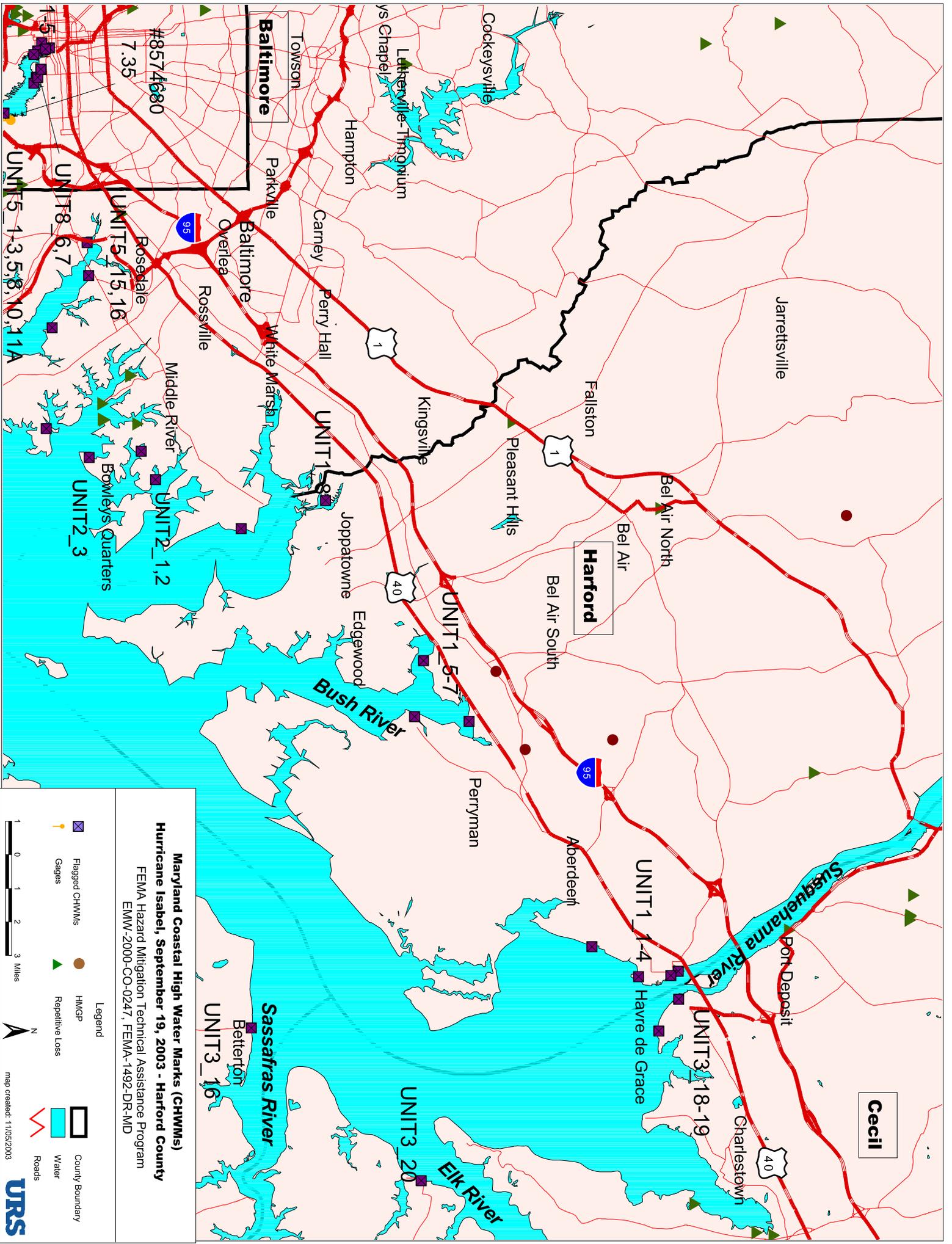


DSCN0061.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

Appendices

Appendix G: Survey Sheets from Harford County



Maryland Coastal High Water Marks (CHWMs)
Hurricane Isabel, September 19, 2003 - Harford County
 FEMA Hazard Mitigation Technical Assistance Program
 EMW-2000-CO-0247, FEMA-1492-DR-MD

Legend

- Flagged CHWMs
- Gages
- HMGF
- Repetitive Loss
- County Boundary
- Water
- Roads

1 0 1 2 3 Miles

map created: 11/05/2003



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240040
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** G-1
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_1 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **8.12 FT** **Location:** inside, transferred outside
Flooding Type: Wave runoff
Mark Address: 723 Water Street "Havre De Grace Yacht Sales"
Description of Mark: 2" above window sill

Type of Line: Mud line

Description of Physical Structure: wood building

Closest City: Havre De Grace **County:** Harford **State:** Maryland

Flaggers: Dudley **Company/Agency:** URS

Flagging Date: 9/25/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 10/2/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.5550 **Easting:** 1,568,948

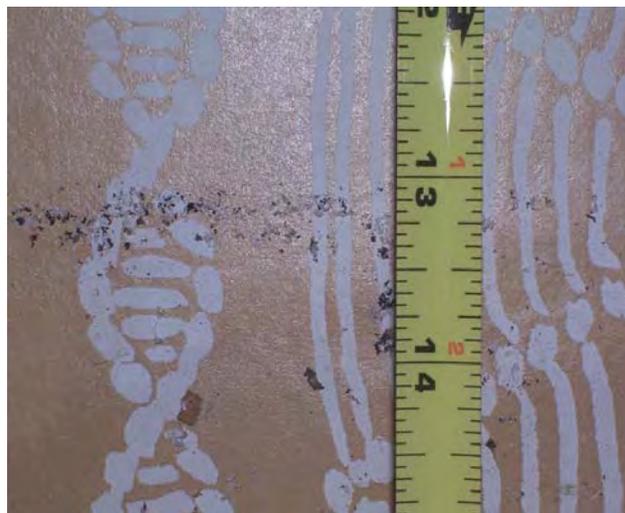
Longitude: -76.0924 **Northing:** 687,191

Approx. First Floor Elevation (Based on Measurement from Mark): 7.95 FT

Approx. Distance to Shoreline: 60 FT

Comments:

Site name: HAVR 1-01



DSCN0006.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240040
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** G-2
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_2 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **8.12 FT** **Location:** fence
Flooding Type: Wave runoff
Mark Address: Warren St, waterfront green house
Description of Mark: 21.5" above curb

Type of Line: Debris line
Description of Physical Structure: metal fence post
Closest City: Havre De Grace **County:** Harford **State:** Maryland

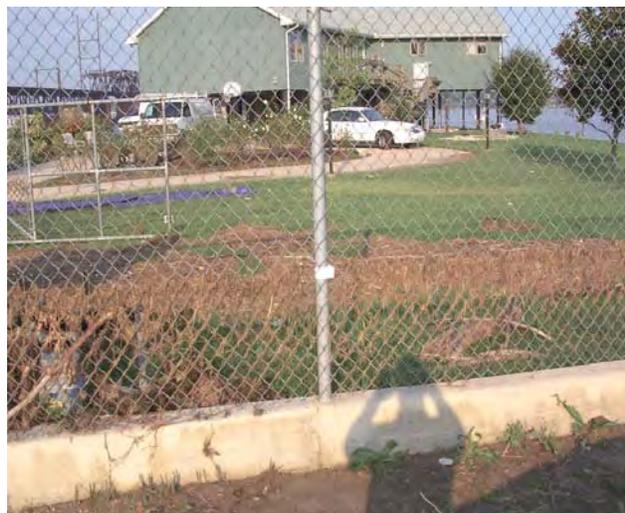
Flaggers: Dudley **Company/Agency:** URS
Flagging Date: 9/25/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS
Survey Date: 10/2/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.5518 **Easting:** 1,568,948
Longitude: -76.0902 **Northing:** 687,191

Approx. First Floor Elevation (Based on Measurement from Mark): 7.95 FT

Approx. Distance to Shoreline: 60 FT

Comments:
site name: HAVR 1-02



DSCN0011.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240040

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** G-3

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_3 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Chesapeake Bay **Quality of Mark:** Poor

Flood Elevation: **9 FT** **Location:** Dock piling

Flooding Type: Wave runoff

Mark Address: Yacht Basin Boat Dock, Off of Commerce St. on south end of town

Description of Mark: 49 1/4" from dock walkway

Type of Line: Personal account

Description of Physical Structure: boat dock pilings

Closest City: Havre De Grace **County:** Harford **State:** Maryland

Flaggers: Dudley **Company/Agency:** URS

Flagging Date: 9/25/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 10/2/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.5379 **Easting:** 1,571,841

Longitude: -76.0896 **Northing:** 679,934

Approx. First Floor Elevation (Based on Measurement from Mark): 4.9 FT

Approx. Distance to Shoreline: 10 FT

Comments:

site name: HAVR 1-03, US Geodetic Survey Benchmark on left side of gate just before entering dock, about 10' from HWM



DSCN0012.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240040
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** G-4
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_4 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Poor
Flood Elevation: **6.57 FT** **Location:** ground
Flooding Type: Surge
Mark Address: Swan Harbor Farm, off Oakington Road
Description of Mark: no vertical reference, ground debris line

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Harford unincorporated **County:** Harford **State:** Maryland

Flaggers: Dudley **Company/Agency:** URS
Flagging Date: 9/26/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS
Survey Date: 10/4/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.5179 **Easting:** 1,566,272

Longitude: -76.1065 **Northing:** 672,593

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 10 FT

Comments:

site name: HACO 1-04, office can direct you to site, stake has nail through it with red ribbon and tape on top



DSCN0013.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240040
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** G-5
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_5 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Bush River **Quality of Mark:** Good
Flood Elevation: **6.95 FT** **Location:** outside wall, transferred from inside
Flooding Type: Surge
Mark Address: 2148 Perryman Road
Description of Mark: 45" above concrete slab

Type of Line: Mud line

Description of Physical Structure: wood garage

Closest City: Harford unincorporated **County:** Harford **State:** Maryland

Flaggers: Dudley **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 10/4/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.4423 **Easting:** 1,529,808

Longitude: -76.2355 **Northing:** 646,760

Approx. First Floor Elevation (Based on Measurement from Mark): 3.2 FT

Approx. Distance to Shoreline: 100 FT

Comments:

site name: HACO 1-05, witness also stated that water was at 4' mark on gage in water by old crane, approximately 6.5' above current level



DSCN0014.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240040
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** G-6
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_6 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Bush River **Quality of Mark:** Poor
Flood Elevation: **7.02 FT** **Location:** ground
Flooding Type: Surge
Mark Address: end of Bata Boulevard in Water's Edge Apartment/Condo complex
Description of Mark: no vertical reference, ground debris line

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Harford unincorporated **County:** Harford **State:** Maryland

Flaggers: Dudley **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 10/3/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.4658 **Easting:** 1,529,746

Longitude: -76.2326 **Northing:** 654,045

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 10 FT

Comments:

site name: HACO 1-06



DSCN0015.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240040
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** G-7
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_7 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Otter Point Creek **Quality of Mark:** Good
Flood Elevation: **7.04 FT** **Location:** inside wall, transferred out
Flooding Type: Surge
Mark Address: 600 Otter Point Road
Description of Mark: 31" above brick window sill

Type of Line: Mud line
Description of Physical Structure: brick building
Closest City: Harford unincorporated **County:** Harford **State:** Maryland

Flaggers: Dudley **Company/Agency:** URS
Flagging Date: 9/26/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS
Survey Date: 10/4/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.4464 **Easting:** 1,521,335
Longitude: -76.2667 **Northing:** 646,690

Approx. First Floor Elevation (Based on Measurement from Mark): 4.46 FT

Approx. Distance to Shoreline: 80 FT

Comments:
site name: HACO 1-07



DSCN0017.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240040
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** G-8
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_8 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Gunpowder River **Quality of Mark:** Fair
Flood Elevation: **6.41 FT** **Location:** ground
Flooding Type: Surge
Mark Address: 504 Anchor Drive
Description of Mark: no vertical distance, ground debris line approx 18" downslope of gazebo concrete slab

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Harford unincorporated **County:** Harford **State:** Maryland

Flaggers: Dudley **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 10/4/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.4047 **Easting:** 1,496,020

Longitude: -76.3562 **Northing:** 631,927

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 60 FT

Comments:

site name HACO 1-08 private property, talked to owner/witness

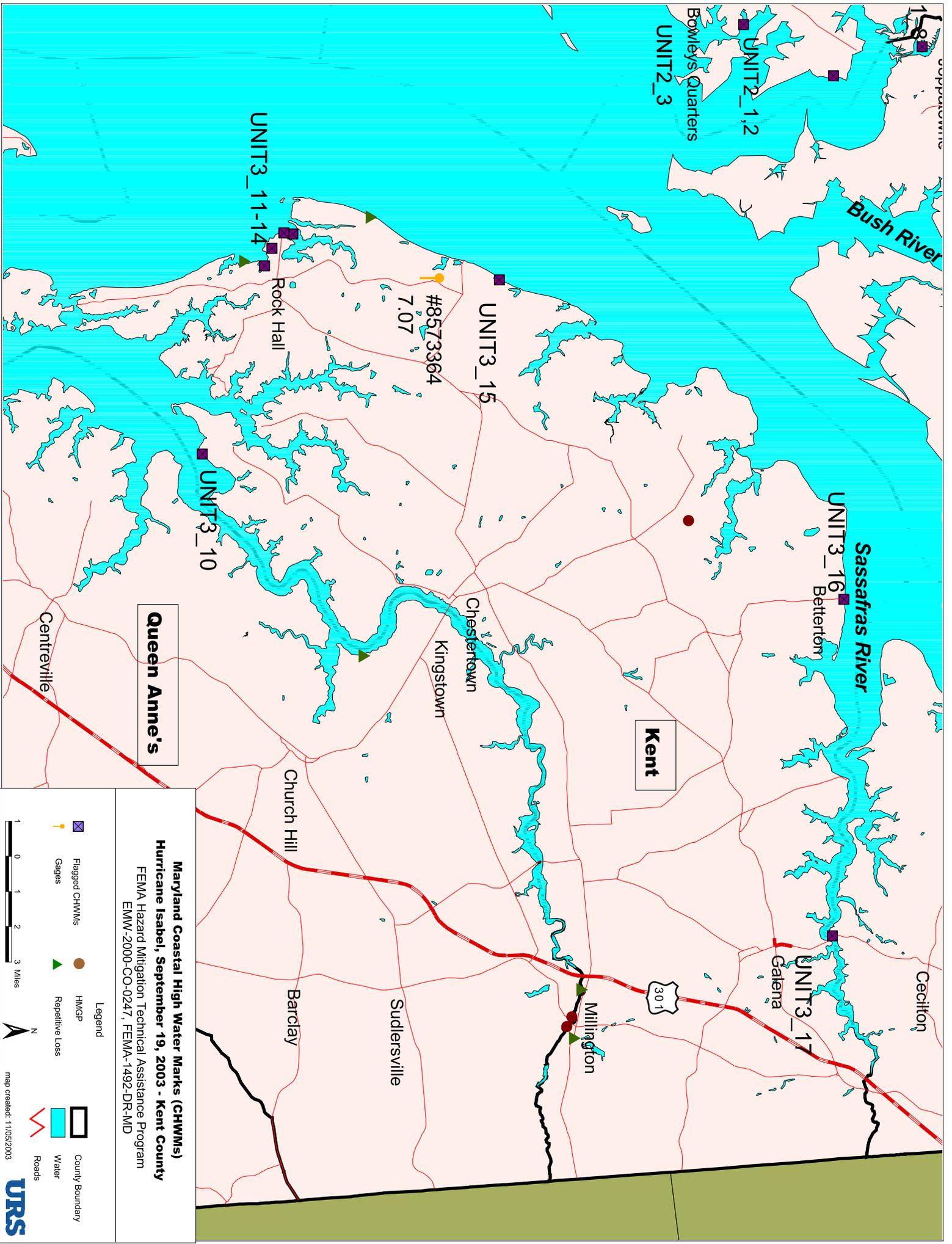


DSCN0018.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

Appendices

Appendix H: Survey Sheets from Kent County



Queen Anne's

Kent

Maryland Coastal High Water Marks (CHWMs)
Hurricane Isabel, September 19, 2003 - Kent County
 FEMA Hazard Mitigation Technical Assistance Program
 EMW-2000-CO-0247, FEMA-1492-DR-MD

Legend

- Flagged CHWMs
- ? Gages
- ▲ HMGP Repetitive Loss
- County Boundary
- Water
- Roads

1 0 1 2 3 Miles

N

map created: 11/05/2003





PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240045
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** H-1
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_10 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **7.38 FT** **Location:** Debris line on signpost
Flooding Type: Surge
Mark Address: Southern limit of Cliff's City Road, near Cliff's City Wharf (dead end).
Description of Mark: 21 inches from base of 15 MPH sign

Type of Line: Debris line

Description of Physical Structure: metal post

Closest City: Cliffs City **County:** Kent **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/6/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.1068 **Easting:** 1,556,393

Longitude: -76.1436 **Northing:** 523,154

Approx. First Floor Elevation (Based on Measurement from Mark): 5.63 FT

Approx. Distance to Shoreline: 320 FT

Comments:



DSCN0020.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240045
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** H-2
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_11 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **6.89 FT** **Location:** Outside building wall
Flooding Type: Surge
Mark Address: 6043 Lawton Avenue (east side of Lawton Avenue, northernmost structure)
Description of Mark: 7.75 inches above ground grade

Type of Line: Mud line

Description of Physical Structure: wood building

Closest City: Rock Hall **County:** Kent **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/6/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.1451 **Easting:** 1,525,057

Longitude: -76.2593 **Northing:** 537,447

Approx. First Floor Elevation (Based on Measurement from Mark): 6.24 FT

Approx. Distance to Shoreline: 10 FT

Comments:



DSCN0021.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240045
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** H-3
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_12 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **6.93 FT** **Location:** Inside wall transferred to exterior
Flooding Type: Surge
Mark Address: Gratitude Marina, 5924 Lawton Avenue, Rock Hall, Maryland, 21661
Description of Mark: 38.5 inches above floor

Type of Line: Mud line

Description of Physical Structure: wood building

Closest City: Rock Hall **County:** Kent **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/6/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.1413 **Easting:** 1,522,221

Longitude: -76.2602 **Northing:** 537,424

Approx. First Floor Elevation (Based on Measurement from Mark): 3.72 FT

Approx. Distance to Shoreline: 220 FT

Comments:



DSCN0023.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240045
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** H-4
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_13 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **6.74 FT** **Location:** Outside building wall
Flooding Type: Surge
Mark Address: 27083 Bayside Avenue, Rock Hall, Maryland
Description of Mark: 25.5 inches above crushed stone on ground

Type of Line: Mud line

Description of Physical Structure: concrete building

Closest City: Rock Hall **County:** Kent **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry

Flagging Date: 9/28/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/6/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.1363 **Easting:** 1,525,087

Longitude: -76.2519 **Northing:** 533,805

Approx. First Floor Elevation (Based on Measurement from Mark): 4.62 FT

Approx. Distance to Shoreline: 1030 FT

Comments:



DSCN0024.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240045
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** H-5
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_14 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **7.06 FT** **Location:** Outside building wall
Flooding Type: Surge
Mark Address: Waterman's Crab House, 21053 Sharp Street, Rock Hall, Maryland
Description of Mark: 40.25 inches above blacktop grade

Type of Line: Mud line

Description of Physical Structure: metal building

Closest City: Rock Hall **County:** Kent **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry

Flagging Date: 9/28/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/6/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.1332 **Easting:** 1,527,923

Longitude: -76.2427 **Northing:** 533,829

Approx. First Floor Elevation (Based on Measurement from Mark): 3.71 FT

Approx. Distance to Shoreline: 10 FT

Comments:



DSCN0025.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240045
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** H-6
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_15 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **6.41 FT** **Location:** Debris line on ground
Flooding Type: Surge
Mark Address: Due south of 9152 North Bayview Avenue, Tolchester Beach, Maryland
Description of Mark: N/A

Type of Line: Debris line
Description of Physical Structure: N/A

Closest City: Tolchester Beach **County:** Kent **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry
Flagging Date: 9/28/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS
Survey Date: 10/5/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 39.2298 **Easting:** 1,530,484
Longitude: -76.2342 **Northing:** 566,631

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 220 FT

Comments:



DSCN0027.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240045
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** H-7
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_16 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **6.44 FT** **Location:** Debris line on ground
Flooding Type: Surge
Mark Address: Betterton Beach Waterfront Park, northwest of the intersection of Ericsson Avenue and Main Street
Description of Mark: N/A

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Betterton **County:** Kent **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry

Flagging Date: 9/28/2003

Surveyors: Blackwell, Chrismer **Company/Agency:** URS

Survey Date: 10/5/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.3706 **Easting:** 1,578,083

Longitude: -76.0631 **Northing:** 621,714

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 210 FT

Comments:



DSCN0028.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240045
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** H-8
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_17 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** N/A
Flood Elevation: **See comments** **Location:** No surge evident
Flooding Type: None
Mark Address: Georgetown Yacht Basin, on Sassafras River, Route 213 South, Georgetown, Maryland
Description of Mark: N/A

Type of Line: N/A

Description of Physical Structure: N/A

Closest City: Georgetown **County:** Kent **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry

Flagging Date: 9/28/2003

Surveyors: **Company/Agency:**

Survey Date: **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 39.3642 **Easting:** 1,629,013

Longitude: -75.8845 **Northing:** 618,646

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 70 FT

Comments:

This entry serves to record a point on the Sassafras River where no appreciable storm surge associated with Hurricane Isabel was evident.

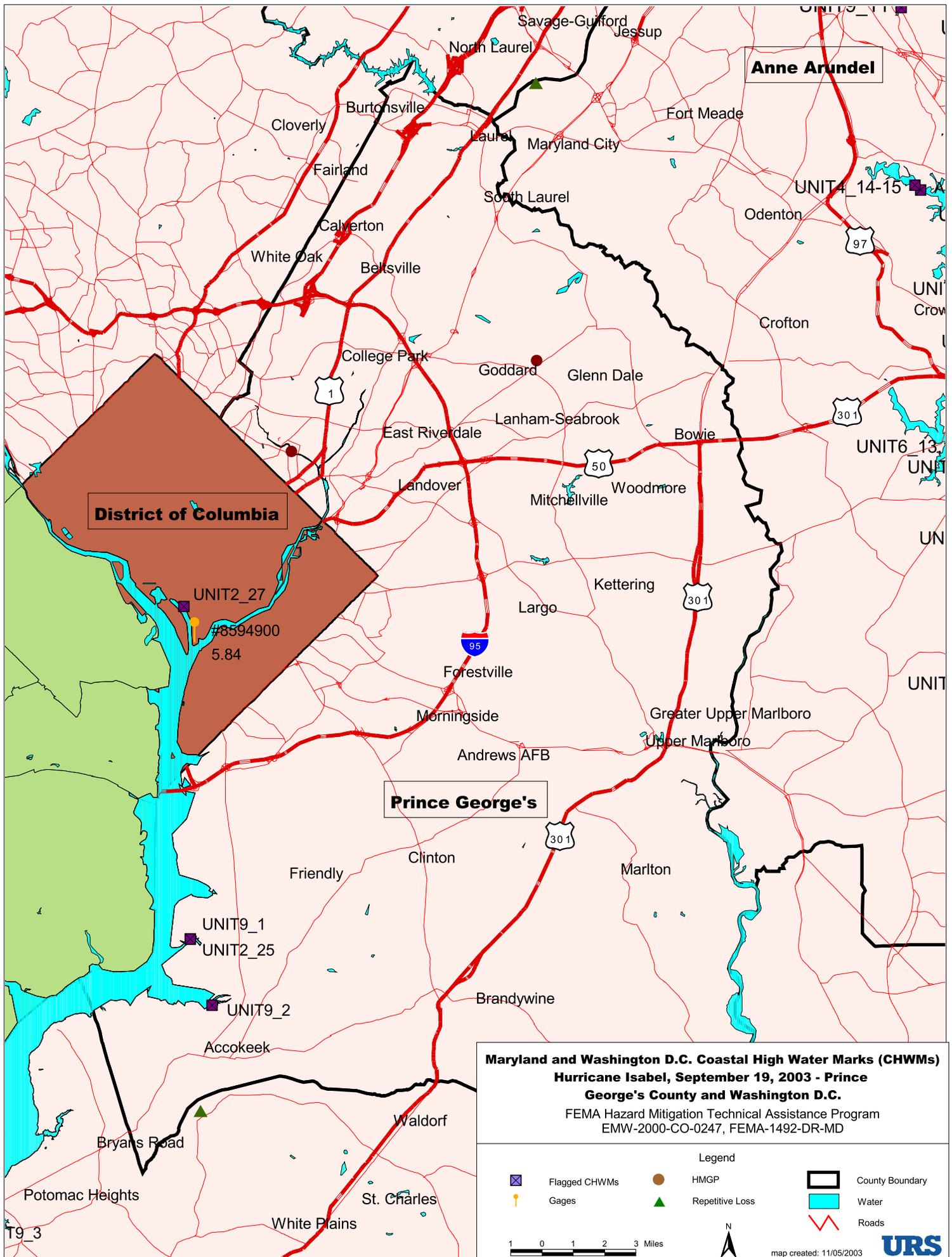


DSCN0029.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

Appendices

Appendix I: Survey Sheets from Prince George's County



Anne Arundel

District of Columbia

Prince George's

Maryland and Washington D.C. Coastal High Water Marks (CHWMs)
Hurricane Isabel, September 19, 2003 - Prince
George's County and Washington D.C.
 FEMA Hazard Mitigation Technical Assistance Program
 EMW-2000-CO-0247, FEMA-1492-DR-MD

- | | | | | | |
|--|---------------|--|-----------------|--|-----------------|
| | Flagged CHWMs | | HMGP | | County Boundary |
| | Gages | | Repetitive Loss | | Water |
| | | | | | Roads |

1 0 1 2 3 Miles



map created: 11/05/2003





PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 245208
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** I- 1
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_25 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Potomac River **Quality of Mark:** Good
Flood Elevation: **3.8 FT** **Location:** Debris line
Flooding Type: Surge
Mark Address: 900 Swans Creek Road
Description of Mark: ~60 feet from present water body limit, there is a debris line that shows the maximum extent of flooding caused by the storm.

Type of Line: Debris line
Description of Physical Structure: N/A
Closest City: Tantallon **County:** Prince George's **State:** Maryland

Flaggers: Bagha **Company/Agency:** Dewberry
Flagging Date: 9/27/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/15/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 38.7243 **Easting:** 1,306,627
Longitude: -77.0202 **Northing:** 383,609

Approx. First Floor Elevation (Based on Measurement from Mark): N/A
Approx. Distance to Shoreline: 100 FT

Comments:
 Debris line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DSCN0012.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 245208
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** I- 2
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT9_1 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Swan Creek **Quality of Mark:** Poor
Flood Elevation: **3.8 FT** **Location:** concrete abutment/bulkhead
Flooding Type: Surge
Mark Address: 900 Swan Creek Road (Tantallon Marina)
Description of Mark: 3.75" below top of concrete cap on bulkhead

Type of Line: Debris line

Description of Physical Structure: concrete bulkhead

Closest City: Fort Washington **County:** Prince George's **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 10/6/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/15/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.7243 **Easting:** 1,306,627

Longitude: -77.0202 **Northing:** 383,609

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 10 FT

Comments:

HWM is Red line painted on side of bulkhead. Red X is painted on top of bulkhead to identify location. Time: 12:45 p.m. Weather: Clear. Debris line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DSCN0065.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 245208
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** I- 3
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT9_2 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Piscataway Creek **Quality of Mark:** Poor
Flood Elevation: **4 FT** **Location:** ground
Flooding Type: Surge
Mark Address: Intersection of Father White Drive and Leonard Calvert Drive (Calvert Manor Park)
Description of Mark: measuring along the concrete boat ramp, HWM is 6' landward of rusty pole in ground.

Type of Line: Debris line

Description of Physical Structure: concrete bulk ramp

Closest City: **County:** Prince George's **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 10/6/2003

Surveyors: Weaver, Payabyab **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.6938 **Easting:** 1,312,333

Longitude: -77.0073 **Northing:** 372,683

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 50 FT

Comments:

HWM was approx 45' landward of water level at 2:00 p.m.
 Debris line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DSCN0067.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 245208
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** I- 4
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT9_4 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Patuxent River **Quality of Mark:** Poor
Flood Elevation: **5.2 FT** **Location:** metal sign post
Flooding Type: Surge
Mark Address: 18601 Trueman Point Rd
Description of Mark: 9.5" above ground, measured on metal sign post

Type of Line: Debris line
Description of Physical Structure: metal fence post
Closest City: Eagle Harbor **County:** Prince George's **State:** Maryland
Flaggers: Ryan Carroll **Company/Agency:** Dewberry
Flagging Date: 10/6/2003
Surveyors: Weaver, Payabyab **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/31/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 38.5702 **Easting:** 1,403,824
Longitude: -76.6838 **Northing:** 329,141
Approx. First Floor Elevation (Based on Measurement from Mark): N/A
Approx. Distance to Shoreline: 140 FT

Comments:
 open fetch of approx 1 mile across the Patuxent River to the southeast created some wave action as indicated by the

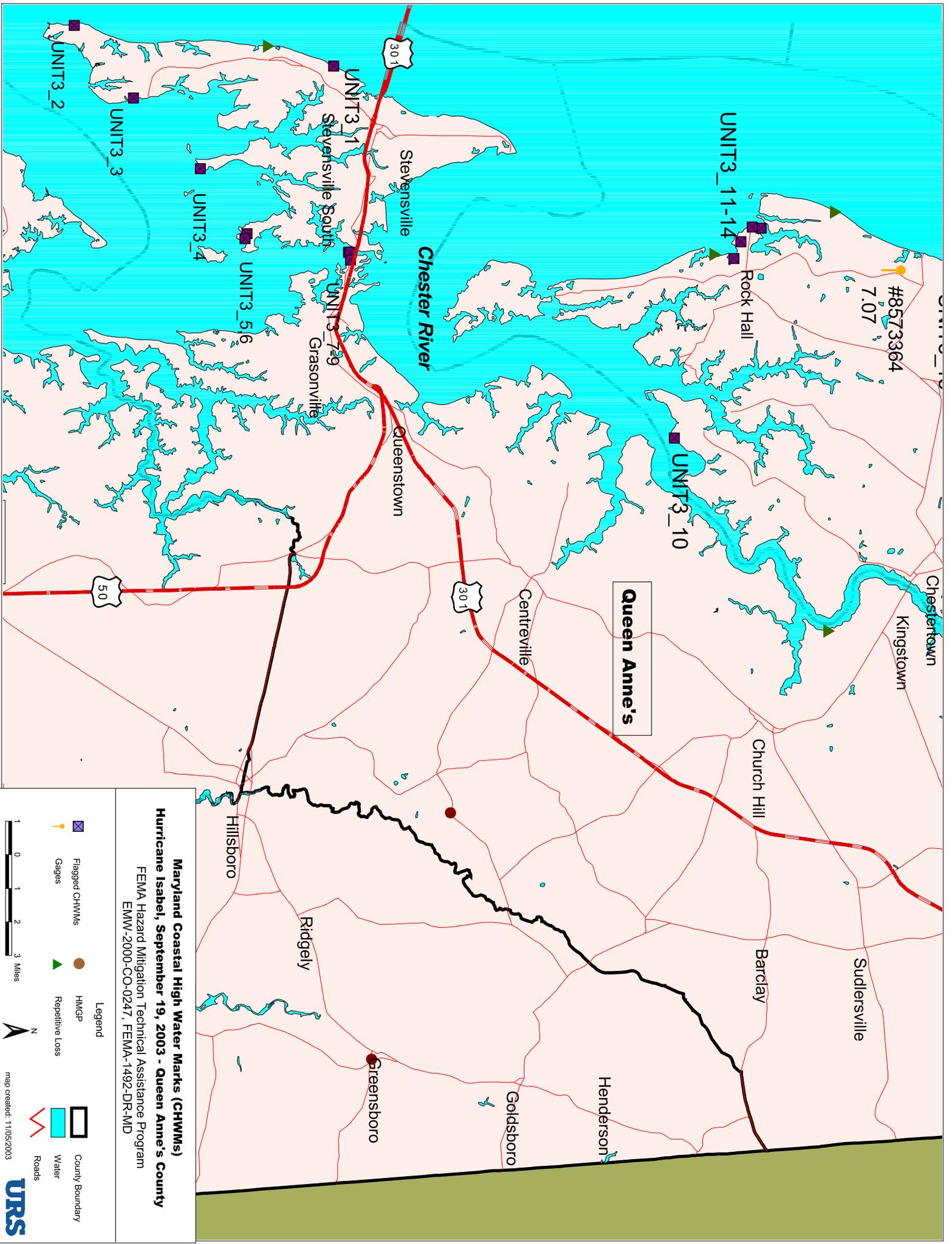


DSCN0072.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

Appendices

Appendix J: Survey Sheets from Queen Anne's County



Maryland Coastal High Water Marks (CHWMs)
Hurricane Isabel, September 19, 2003 - Queen Anne's County
 FEMA Hazard Mitigation Technical Assistance Program
 EMW-2000-CO-0247, FEMA-1492-DR-MD

Legend

- Flagged CHWMs
- Gages
- HM/GP
- Repetitive Loss
- County Boundary
- Water
- Roads

1 0 1 2 3 Miles

map created: 11/05/2003



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240054
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** J- 1
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_1 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **See comments** **Location:** Above bulkhead slope
Flooding Type: Surge
Mark Address: Intersection of Bayside Drive and Chesapeake Drive
Description of Mark: N/A

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Kent Island **County:** Queen Anne's **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry

Flagging Date: 9/25/2003

Surveyors: **Company/Agency:**

Survey Date: **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9612 **Easting:** 1,497,161

Longitude: -76.3509 **Northing:** 471,674

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 30 FT

Comments:

Location not accessible to survey crew.



DSCN0003.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240054
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** J- 2
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_2 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **10.06 FT** **Location:** Debris Line
Flooding Type: Wave height
Mark Address: Southern end of Lighthouse View Drive
Description of Mark: N/A

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Kent Island **County:** Queen Anne's **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry

Flagging Date: 9/25/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 10/5/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.8495 **Easting:** 1,491,776

Longitude: -76.3746 **Northing:** 427,931

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 220 FT

Comments:

Dedbris line of poor quality, may actually be wave action.



DSCN0008.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240054
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** J- 3
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_3 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **5.58 FT** **Location:** Hexagonal jungle gym
Flooding Type: Surge
Mark Address: Intersection of Alleghany Road and Chesapeake Avenue
Description of Mark: 36 inches from above bare earth underneath hexagonal jungle gym

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Romancoke **County:** Queen Anne's **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry

Flagging Date: 9/25/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 10/5/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.8747 **Easting:** 1,503,089

Longitude: -76.3342 **Northing:** 438,938

Approx. First Floor Elevation (Based on Measurement from Mark): 2.58 FT

Approx. Distance to Shoreline: 260 FT

Comments:

"NO PICTURE AVAILABLE FROM FLAGGER"

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

DSCN0004.jpg



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240054
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** J- 4
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_4 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **5.1 FT** **Location:** Outside building wall
Flooding Type: Surge
Mark Address: 2900 Block of Cox Neck Road (Southern limit)
Description of Mark: HWM located 9.75 inches above slate floor of gazebo

Type of Line: Mud line
Description of Physical Structure: concrete gazebo
Closest City: Kent Island **County:** Queen Anne's **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry
Flagging Date: 9/27/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS
Survey Date: 10/5/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 38.9034 **Easting:** 1,514,392
Longitude: -76.2949 **Northing:** 449,949

Approx. First Floor Elevation (Based on Measurement from Mark): 4.29 FT

Approx. Distance to Shoreline: 150 FT

Comments:



DSCN0009.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240054

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** J- 5

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_5 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Chesapeake Bay **Quality of Mark:** Fair

Flood Elevation: **1.65 FT** **Location:** debris line along edge of embayment

Flooding Type: Surge

Mark Address: 1600 block of Calvert Road, south of the intersection of Calvert Road and Chester Road

Description of Mark: N/A

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Kent Island **County:** Queen Anne's **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 10/5/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9232 **Easting:** 1,525,715

Longitude: -76.2588 **Northing:** 457,324

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 180 FT

Comments:

Debris line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DSCN0012.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240054
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** J- 6
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_6 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **5.61 FT** **Location:** debris line along edge of road
Flooding Type: Surge
Mark Address: Southern limit of Chester Road, near fishing wharf
Description of Mark: N/A

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Kent Island **County:** Queen Anne's **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 10/5/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9224 **Easting:** 1,525,715

Longitude: -76.2560 **Northing:** 457,324

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 190 FT

Comments:



Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240054
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** J- 7
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_7 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **8.19 FT** **Location:** Inside mark transferred to outside building wall
Flooding Type: Wave runup
Mark Address: South end of Wharf Drive/Kent Island Yacht Club
Description of Mark: 16.5 inches above concrete slab at base of structure

Type of Line: Mud line

Description of Physical Structure: wood building

Closest City: Chester **County:** Queen Anne's **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 10/7/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9670 **Easting:** 1,528,439

Longitude: -76.2479 **Northing:** 471,915

Approx. First Floor Elevation (Based on Measurement from Mark): 6.81 FT

Approx. Distance to Shoreline: 160 FT

Comments:

Tape mark located on northeast corner of southernmost portion of bar building, below Verizon payphone.



DSCN0014.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240054
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** J- 8
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_8 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **4.3 FT** **Location:** Inside mark transferred to outside of building
Flooding Type: Surge
Mark Address: South end of Wharf Drive/Kent Island Yacht Club
Description of Mark: 49 inches above crushed stone atop ground at base of structure

Type of Line: Mud line
Description of Physical Structure: brick building
Closest City: Chester **County:** Queen Anne's **State:** Maryland
Flaggers: Usher **Company/Agency:** Dewberry
Flagging Date: 9/27/2003
Surveyors: Pavlis, Ireton **Company/Agency:** URS
Survey Date: 10/7/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 38.9676 **Easting:** 1,528,439
Longitude: -76.2480 **Northing:** 471,915
Approx. First Floor Elevation (Based on Measurement from Mark): 0.21 FT
Approx. Distance to Shoreline: 200 FT

Comments:
 Water line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DSCN0016.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240054
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** J- 9
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT3_9 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Good
Flood Elevation: **5.83 FT** **Location:** Inside mark transferred to exterior
Flooding Type: Surge
Mark Address: Fisherman's Crab Deck, 3116 Main Street, Grasonville, Maryland 21638
Description of Mark: Just above base of sign.

Type of Line: Mud line

Description of Physical Structure: wood building

Closest City: Grasonville **County:** Queen Anne's **State:** Maryland

Flaggers: Usher **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Pavlis, Ireton **Company/Agency:** URS

Survey Date: 10/7/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.9677 **Easting:** 1,528,439

Longitude: -76.2437 **Northing:** 471,915

Approx. First Floor Elevation (Based on Measurement from Mark): 4.46 FT

Approx. Distance to Shoreline: 130 FT

Comments:

Surge slightly lower at this location than across the narrows at Kent Island Yacht Club (main building). This is likely because of lesser exposure of Crab Deck to extended southeast fetch.

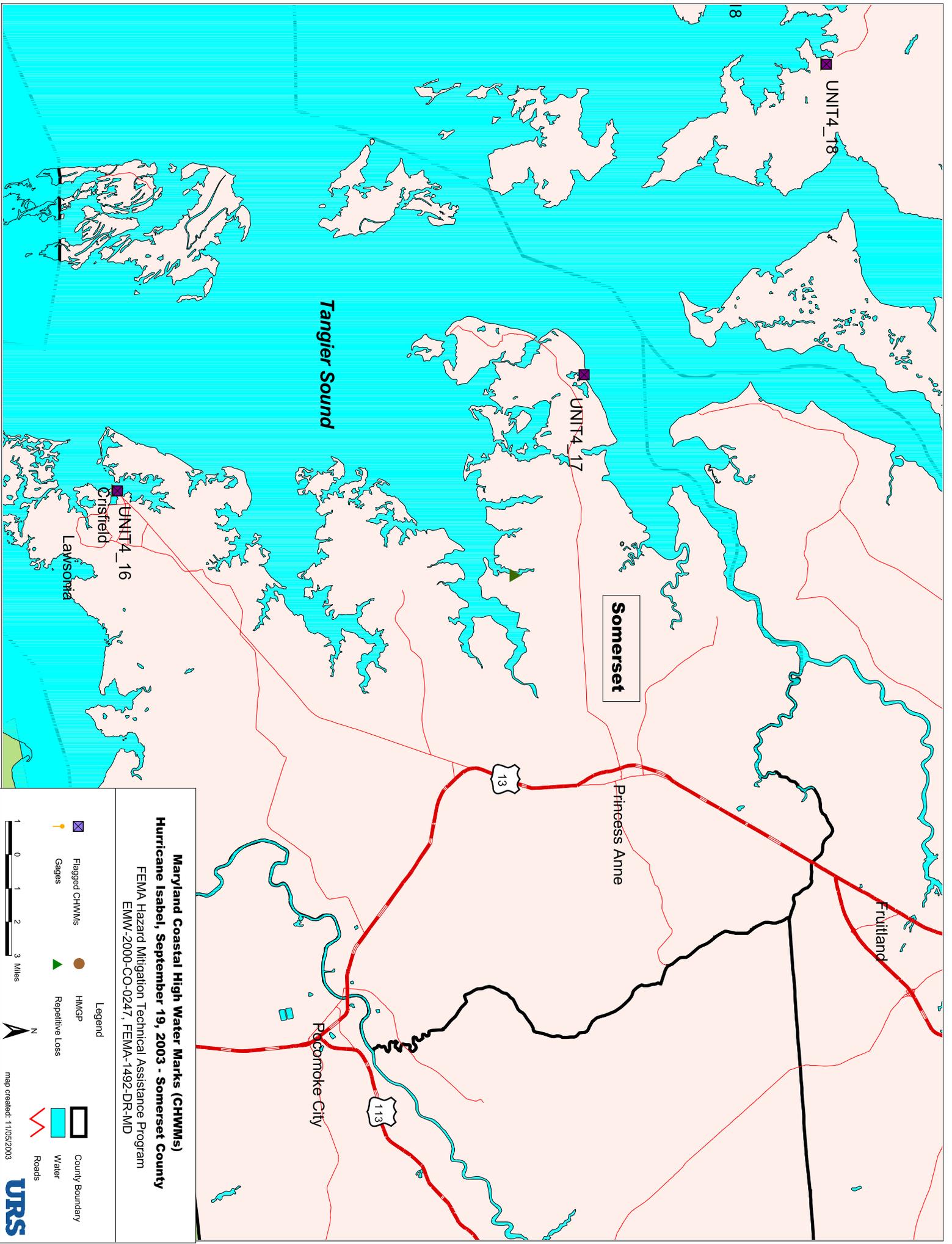


DSCN0017.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

Appendices

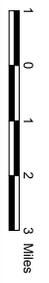
Appendix K: Survey Sheets from Somerset County



Maryland Coastal High Water Marks (CHWMs)
Hurricane Isabel, September 19, 2003 - Somerset County
 FEMA Hazard Mitigation Technical Assistance Program
 EMW-2000-CO-0247, FEMA-1492-DR-MD

Legend

-  Flagged CHWMs
-  Gages
-  HMGP
-  Repetitive Loss
-  County Boundary
-  Water
-  Roads



map created: 11/05/2003





PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240061
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** K-1
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_16 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **See comments** **Location:** inside wall
Flooding Type: Surge
Mark Address: 1021 West Main St
Description of Mark: 11.25" above top of concrete slab in front of door to Bar/Lounge

Type of Line: Debris line
Description of Physical Structure: building
Closest City: Crisfield **County:** Somerset **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry
Flagging Date: 9/27/2003

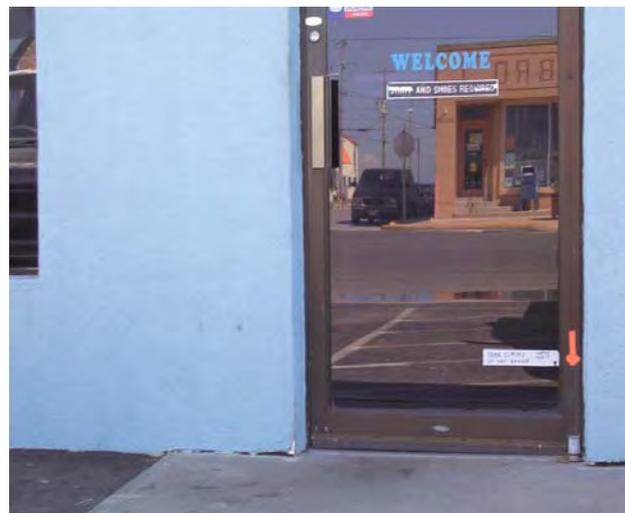
Surveyors: **Company/Agency:**
Survey Date: **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 37.9781 **Easting:** 1,640,989
Longitude: -75.8626 **Northing:** 112,524

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 200 FT

Comments:

HWM measurement inside bar was 11.5" from floor.
Personal accounts estimated water at 18" inside bar.
Location not accessible to survey crew.



DSCN0059.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240061
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** K-2
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT4_17 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Monie Bay/Tangier Sound **Quality of Mark:** Fair
Flood Elevation: **See comments** **Location:** inside wall
Flooding Type: Surge
Mark Address: End of Rolan Parks Rd
Description of Mark: approx 4" above top of concrete garage slab, measured on inside of garage door frame on right side.

Type of Line: Debris line

Description of Physical Structure: wood

Closest City: Chance **County:** Somerset **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: **Company/Agency:**

Survey Date: **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.1894 **Easting:** 1,622,788

Longitude: -75.9257 **Northing:** 188,787

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 170 FT

Comments:

Time: 4:00 p.m. Weather: mostly clear. Ron Bull described water as ankle-deep in this area. HWM transferred to outside. Location not accessible to survey crew.



DSCN0060.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240064
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** L-1
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_13 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **9.4 FT** **Location:** Debris line front yard
Flooding Type: Wave runoff
Mark Address: Route 1, Box 120, Tippet Road
Description of Mark: debris line

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Lexington Park **County:** St. Mary's **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/13/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.2224 **Easting:** 1,490,461

Longitude: -76.3875 **Northing:** 202,122

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 90 FT

Comments:



DCP_3399.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240064
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** L-2
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_14 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: St. Jerome Creek/Chesapeake **Quality of Mark:** Fair
Flood Elevation: **4.8 FT** **Location:** Ground/tree
Flooding Type: Surge
Mark Address: End of Airedele Road (in 2nd to last house yard)
Description of Mark: flagged tree and ground with paint with nail and ribbon

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Ridge **County:** St. Mary's **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.1183 **Easting:** 1,502,243

Longitude: -76.3462 **Northing:** 162,144

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 120 FT

Comments:

Debris line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DCP_3404.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240064
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** L-3
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_15 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Chesapeake Bay **Quality of Mark:** Fair
Flood Elevation: **3 FT** **Location:** Outside wall (building)
Flooding Type: Surge
Mark Address: 14685 Bay Front Drive
Description of Mark: front right corner below window on corner

Type of Line: Mud line

Description of Physical Structure: wood house

Closest City: Point Look Out **County:** St. Mary's **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/13/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.0697 **Easting:** 1,508,133

Longitude: -76.3297 **Northing:** 143,978

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 260 FT

Comments:

Mud line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DCP_3415.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240064
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** L-4
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_16 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: St. Mary's River **Quality of Mark:** Fair
Flood Elevation: **4.8 FT** **Location:** Bridge/pole
Flooding Type: Surge
Mark Address: 16956 Look Out Road
Description of Mark: a bridge next to public safety office

Type of Line: Debris line/eye witness

Description of Physical Structure: N/A

Closest City: St. Mary's **County:** St. Mary's **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry

Flagging Date: 9/26/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.1895 **Easting:** 1,476,187

Longitude: -76.4317 **Northing:** 187,462

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 150 FT

Comments:

Debris line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DCP_3422.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240064
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** L-5
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_17 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Potomac River **Quality of Mark:** Fair
Flood Elevation: **6.5 FT** **Location:** Back of breaker wall
Flooding Type: Surge
Mark Address: 16608 Piney Point Road
Description of Mark: debris line on back of breaker wall, across street from 16608

Type of Line: Debris line
Description of Physical Structure: N/A

Closest City: St. Georges Island **County:** St. Mary's **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry
Flagging Date: 9/27/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/13/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 38.1236 **Easting:** 1,461,939
Longitude: -76.4879 **Northing:** 165,526

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 120 FT

Comments:



DCP_3457.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240064
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** L-6
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_18 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Breton Bay **Quality of Mark:** Fair
Flood Elevation: **7.6 FT** **Location:** Ground/tree
Flooding Type: Surge
Mark Address: Public Park, at end of Camp Calvert Road at Boat Launch
Description of Mark: debris line, with nail in tree for visual

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: **County:** St. Mary's **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/13/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.2842 **Easting:** 1,421,418

Longitude: -76.6295 **Northing:** 223,595

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 140 FT

Comments:



DCP_3460.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240064
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** L-7
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_19 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Potomac River **Quality of Mark:** Fair
Flood Elevation: **7.3 FT** **Location:** Fence
Flooding Type: Surge
Mark Address: 38352 Point Breeze Road
Description of Mark: fence in front of home

Type of Line: Debris line
Description of Physical Structure: metal fence post
Closest City: Cottons Point **County:** St. Mary's **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry
Flagging Date: 9/27/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.
Survey Date: 10/13/2003 **Survey Type:** N/A
Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83
Latitude: 38.2242 **Easting:** 1,384,159
Longitude: -76.7512 **Northing:** 201,616

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 80 FT

Comments:



DCP_3464.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240064
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** L-8
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_20 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Potomac River **Quality of Mark:** Fair/Good
Flood Elevation: **5.8 FT** **Location:** Outside building wall
Flooding Type: Surge
Mark Address: 40540 Old Breton Beach Road
Description of Mark: front of building near air conditioning unit and electric meter

Type of Line: Mud line

Description of Physical Structure: wood house

Closest City: Breton Beach **County:** St. Mary's **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.2348 **Easting:** 1,407,131

Longitude: -76.6743 **Northing:** 205,331

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 170 FT

Comments:



DCP_3436.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240064
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** L-9
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT7_21 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Potomac River **Quality of Mark:** Excellent
Flood Elevation: **5.9 FT** **Location:** Inside wall/transfer
Flooding Type: Surge
Mark Address: 40461 Old Breton Beach Road
Description of Mark: left side of home, front window, green tape

Type of Line: Mud line

Description of Physical Structure: stucoco house

Closest City: Breton Beach **County:** St. Mary's **State:** Maryland

Flaggers: Schelling **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.2346 **Easting:** 1,407,131

Longitude: -76.6782 **Northing:** 205,331

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 180 FT

Comments:



Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

DCP_3451.jpg



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240064

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** L-10

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT9_6 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Patuxent River **Quality of Mark:** Good

Flood Elevation: 5 FT **Location:** inside wall transferred out

Flooding Type: Surge

Mark Address: 27130 South Sandgates Rd (Seabreeze Restaurant)

Description of Mark: 35" from top of concrete slab

Type of Line: Mud line

Description of Physical Structure: wood shed

Closest City: Sandgates **County:** St. Mary's **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 10/6/2003

Surveyors: Weaver, Payabyab **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.4131 **Easting:** 1,426,952

Longitude: -76.6077 **Northing:** 270,963

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 110 FT

Comments:

HWM is on left side of wooden door frame. Transferred from interior mud line. Mud line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DSCN0078.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. 240064

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** L-11

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT9_7 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Patuxent River **Quality of Mark:** Poor

Flood Elevation: 11.2 FT **Location:** ground

Flooding Type: Wave height

Mark Address: 24239 N. Patuxent Beach Rd

Description of Mark: did not determine

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Town Creek **County:** St. Mary's **State:** Maryland

Flaggers: Ryan Carroll **Company/Agency:** Dewberry

Flagging Date: 10/6/2003

Surveyors: Weaver, Payabyab **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.3186 **Easting:** 1,464,414

Longitude: -76.4767 **Northing:** 234,735

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 10 FT

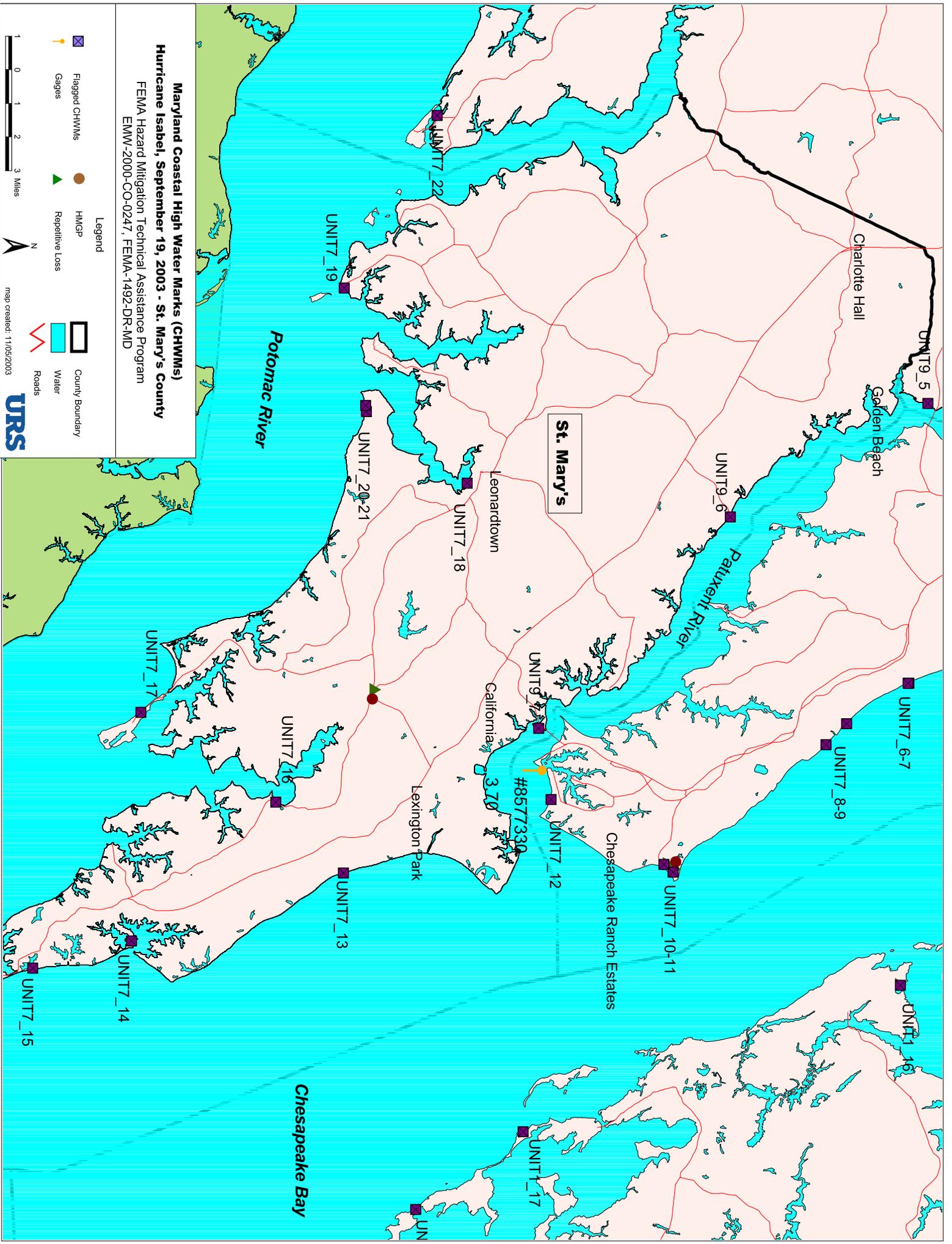
Comments:

Homeowner described the debris line as being even with the 2nd handrail post from top of staircase, visible in background of photo 0084. This was verified with a photo taken the day after the storm. Staircase is on neighbor's property. Bulkheads along this reach of shoreline did not perform well; this particular property sustained major shoreline erosion/scour behind an old wooden bulkhead that completely failed. SURVEYOR: proceed with caution as HWM is adjacent to eroded shoreline.



DSCN0084.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



Maryland Coastal High Water Marks (CHWMs)
Hurricane Isabel, September 19, 2003 - St. Mary's County
 FEMA Hazard Mitigation Technical Assistance Program
 EMMW-2000-CO-0247, FEMA-1492-DR-MD

Legend

- Flagged CHWMs
- County Boundary
- Gages
- Water
- HMGP
- Repetitive Loss
- Roads



map created: 11/05/2003



St. Mary's

Potomac River

Patuxent River

Chesapeake Bay

Charlotte Hall

Golden Beach

Leonardtown

California

Lexington Park

Chesapeake Ranch Estates

#8577330

UNIT7_22

UNIT7_19

UNIT7_20-21

UNIT7_18

UNIT9_4

UNIT9_6

UNIT9_5

UNIT7_17

UNIT7_16

UNIT7_13

UNIT7_14

UNIT7_15

UNIT7_8-9

UNIT7_6-7

UNIT7_10-11

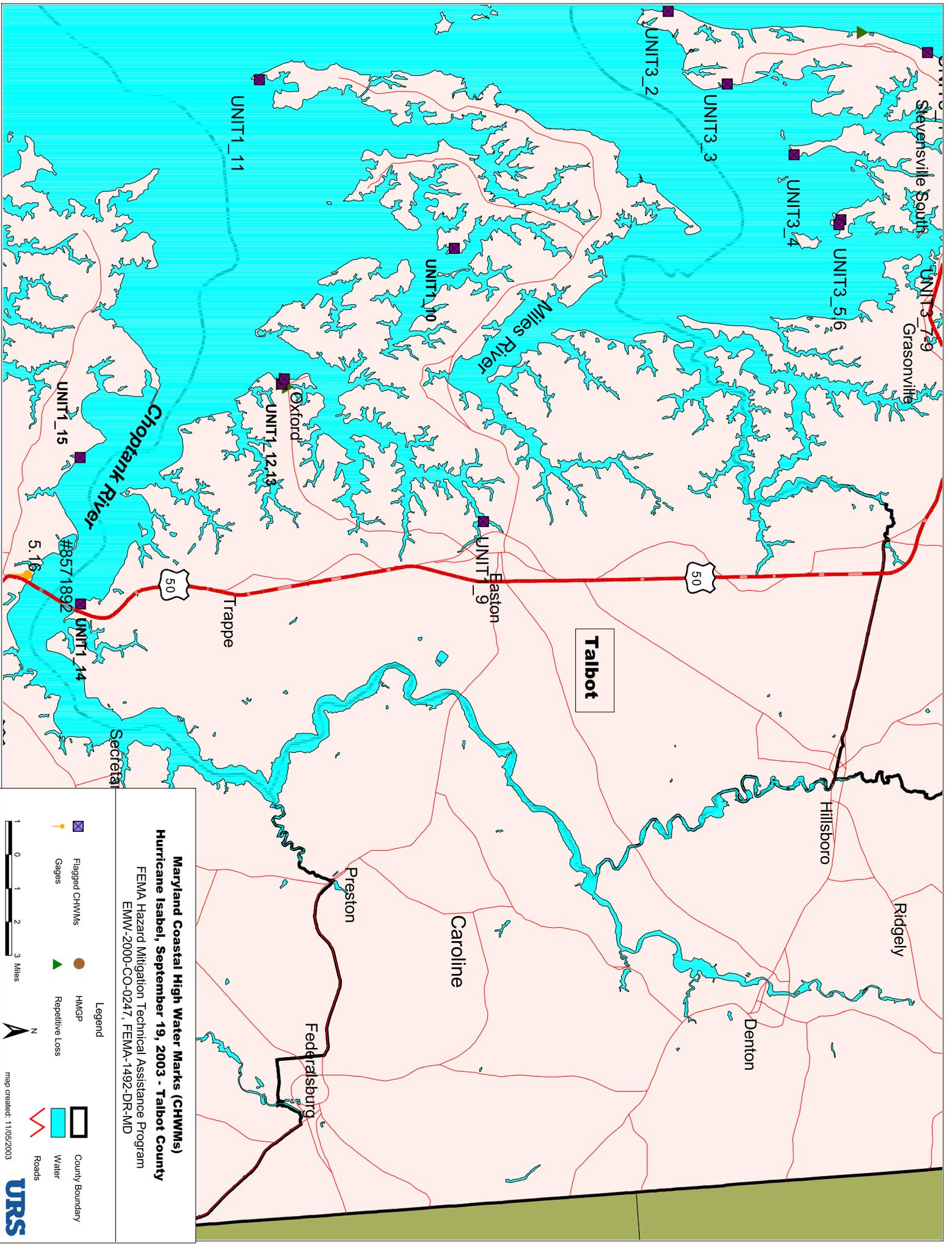
UNIT7_16

UNIT7_17

UNIT7_18

Appendices

Appendix M: Survey Sheets from Talbot County



Stevensville South

Grasonville

Ridgely

Hillsboro

Denton

Talbot

Easton

Caroline

Preston

Feddersburg

Trappe

Secreta

UNIT3_4

UNIT3_5,6

UNIT3_3

UNIT3_2

UNIT1_10

UNIT1_11

UNIT1_12,13

Oxford

UNIT1_15

#8571892

UNIT1_14

Choptank River

Miles River

50

50

UNIT3_7,9



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240066
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** M-1
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_9 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Tred Avon River **Quality of Mark:** Fair
Flood Elevation: **5.54 FT** **Location:** outside building wall
Flooding Type: Surge
Mark Address: 956 Port Street
Description of Mark: 28.5" above concrete slab (rough section of slab, distance varies) 27" above smooth section of concrete slab

Type of Line: Discoloration, water mark

Description of Physical Structure: wood building

Closest City: Talbot unincorporated **County:** Talbot **State:** Maryland

Flaggers: Dudley **Company/Agency:** URS

Flagging Date: 9/26/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/7/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.7678 **Easting:** 1,571,816

Longitude: -76.0938 **Northing:** 399,470

Approx. First Floor Elevation (Based on Measurement from Mark): 3.17 FT

Approx. Distance to Shoreline: 150 FT

Comments:

site name: TACO 1-09, talked to owner/witness



DSCN0019.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240066
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** M-2
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_10 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Broad Creek **Quality of Mark:** Poor
Flood Elevation: **5.25 FT** **Location:** ground
Flooding Type: Surge
Mark Address: 23955 Vandenburg Lane
Description of Mark: no vertical reference, ground debris line, approx 30" to left of edge of driveway

Type of Line: Debris line

Description of Physical Structure: N/A

Closest City: Talbot unincorporated **County:** Talbot **State:** Maryland

Flaggers: Dudley **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/8/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.7564 **Easting:** 1,529,076

Longitude: -76.2448 **Northing:** 395,437

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 200 FT

Comments:

Site name: TACO 1-10, spoke with owner, she was cautious about allowing a mark



DSCN0020.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240066
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** M-3
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_11 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Choptank River **Quality of Mark:** Good
Flood Elevation: **5.5 FT** **Location:** inside on old water heater, moved outside
Flooding Type: Surge
Mark Address: Black Walnut Point Bed & Breakfast, past Naval Research Lab on Black Walnut Point Road
Description of Mark: 33 5/8" below top of white window sill

Type of Line: Mud line

Description of Physical Structure: wood building

Closest City: Talbot unincorporated **County:** Talbot **State:** Maryland

Flaggers: Dudley **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/7/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.6729 **Easting:** 1,503,623

Longitude: -76.3385 **Northing:** 366,101

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 120 FT

Comments:

TACO 1-11



DSCN0021.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240068
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** M-4
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_12 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Tred Avon River **Quality of Mark:** Good
Flood Elevation: **5.26 FT** **Location:** inside wall, transferred out
Flooding Type: Surge
Mark Address: 707 South Morris St
Description of Mark: 8" below window sill

Type of Line: Mud line

Description of Physical Structure: wood structure with concrete foundation

Closest City: Oxford **County:** Talbot **State:** Maryland

Flaggers: Dudley **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/7/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.6815 **Easting:** 1,549,270

Longitude: -76.1707 **Northing:** 370,118

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 380 FT

Comments:

site name: OXFO 1-12, repetitive loss property



DSCN0022.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240068
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** M-5
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_13 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Tred Avon River **Quality of Mark:** Good
Flood Elevation: **5.21 FT** **Location:** inside wall, transferred outside
Flooding Type: Surge
Mark Address: 106 West Pier Street
Description of Mark: 17 5/8" above bottom of wood frame of garage door

Type of Line: Mud line

Description of Physical Structure: brick house

Closest City: Oxford **County:** Talbot **State:** Maryland

Flaggers: Dudley **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrismer **Company/Agency:** URS

Survey Date: 10/7/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.6825 **Easting:** 1,549,270

Longitude: -76.1735 **Northing:** 370,118

Approx. First Floor Elevation (Based on Measurement from Mark): 3.74 FT

Approx. Distance to Shoreline: 40 FT

Comments:

OXFO 1-13, repetitive loss property, owner also owns restaurant next door, 104 W. Pier St which sustained massive damage



DSCN0023.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project
COMM. NO. 240066
TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** M-6
CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT1_14 **Mark Type:** Coastal
Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003
Flooding Source: Choptank River **Quality of Mark:** Good
Flood Elevation: **5.09 FT** **Location:** inside garage door, transferred outside
Flooding Type: Surge
Mark Address: 1646 Ferrypoint Court
Description of Mark: 9 1/4" above concrete slab

Type of Line: Mud line

Description of Physical Structure: wood house

Closest City: Talbot unincorporated **County:** Talbot **State:** Maryland

Flaggers: Dudley **Company/Agency:** URS

Flagging Date: 9/27/2003

Surveyors: Blackwell, Chrimer **Company/Agency:** URS

Survey Date: 10/7/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.5938 **Easting:** 1,583,866

Longitude: -76.0507 **Northing:** 337,677

Approx. First Floor Elevation (Based on Measurement from Mark): 4.32 FT

Approx. Distance to Shoreline: 50 FT

Comments:

site name: TACO 1-14. Mud line may have been affected by weather or cleanup action, resulting in lower than average elevation.



DSCN0024.jpg

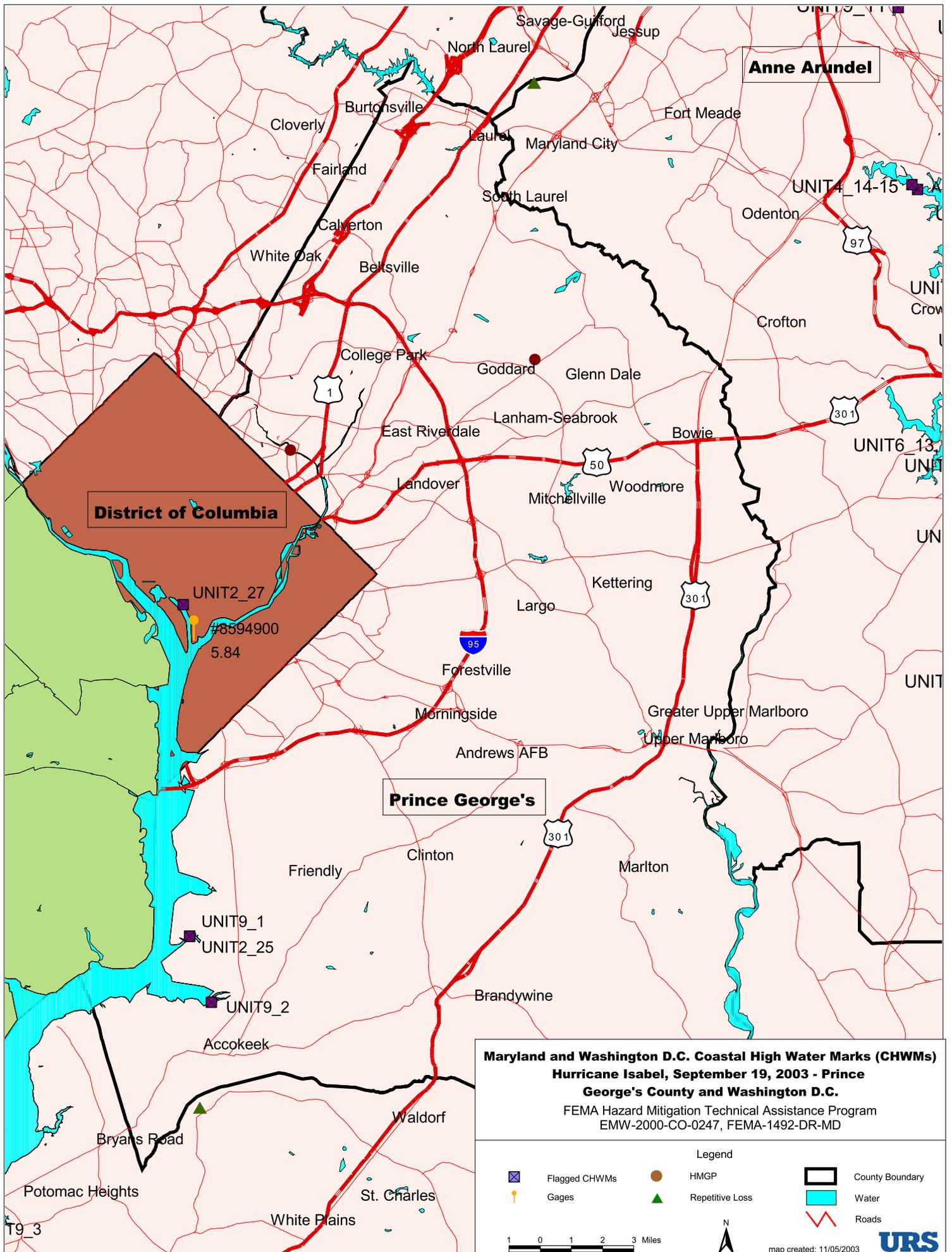
Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

Appendices

Appendix N: Survey Sheet from Washington, D.C.

Note: The individual survey sheets for Maryland Counties report elevations in NAVD, as does the following sheet for Washington, D.C. Since most of the flood insurance data for D.C. is in NGVD, a conversion of the data to NGVD is presented below:

Latitude (NAD 83)	38.8783 feet
Longitude (NAD 83)	-77.0241 feet
Elevation (NAVD 88)	9.1 feet
Elevation (NGVD 29)	9.9 feet



Anne Arundel

District of Columbia

Prince George's

Maryland and Washington D.C. Coastal High Water Marks (CHWMs)
Hurricane Isabel, September 19, 2003 - Prince
George's County and Washington D.C.
 FEMA Hazard Mitigation Technical Assistance Program
 EMW-2000-CO-0247, FEMA-1492-DR-MD

	Flagged CHWMs		HMGP		County Boundary
	Gages		Repetitive Loss		Water
					Roads

1 0 1 2 3 Miles

map created: 11/05/2003

T9_3



PROJECT FEMA-1492-DR-MD High Water Mark Survey Project

COMM. NO. _____

TYPE High Water Mark Survey **PREL.** 10/05/2003 **FINAL** 11/20/2003 **SHEET** N-1

CONTENTS Individual Historical High Water Mark Survey Report

Historical Mark: UNIT2_27 **Mark Type:** Coastal

Flood Event: Hurricane Isabel **Date of Flood:** 09/19/2003

Flooding Source: Potomac River **Quality of Mark:** Good

Flood Elevation: **9.1 FT** **Location:** outside wall

Flooding Type: Wave runoff

Mark Address: Zanzibar Restaurant- 7th St SW and Water Street (on the Washington DC waterfront)

Description of Mark: 5' 3" from the ground of the basement (at base of steps).

Type of Line: Mud line

Description of Physical Structure: concrete building

Closest City: Washington **County:** N/A **State:** DC

Flaggers: Bagha **Company/Agency:** Dewberry

Flagging Date: 9/27/2003

Surveyors: Cumberledge, Booth **Company/Agency:** Greenhorne & O'Mara, Inc.

Survey Date: 10/31/2003 **Survey Type:** N/A

Projection: Maryland **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD 83

Latitude: 38.8783 **Easting:** 1,306,639

Longitude: -77.0241 **Northing:** 438,238

Approx. First Floor Elevation (Based on Measurement from Mark): N/A

Approx. Distance to Shoreline: 120 FT

Comments:



DSCN0011.jpg

Survey Certification: Coastal High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.