

Flood and Erosion Control Board Meeting
September 11, 2023
Board of Education Auditorium, 129 Church Street
6:00 P.M.
Join Zoom Meeting

<https://bristolct.gov.zoom.us/j/88226500928?pwd=b0pLa0ZFVWprc3NaaGxOa3h6a0hWQT0>

Meeting ID: 882 2650 0928

Passcode: 144621

1. Flood And Erosion Previous Meeting Minutes

Documents:

[March 2022 Meeting minutes.pdf](#)

2. Review/Update Of City Wide Flooding 2023

A. DPW Flooding Memo

Documents:

[DPW Flooding Memo.pdf](#)

3. Review/Update FEMA Proposed Revisions To City Flood Insurance Rate Maps (FIRM) And Flood Insurance Study (FIS)- Dated June 29,

A. FECB FEMA Mapping

Documents:

[FECB FEMA Mapping.pdf](#)

4. CT DEEP- Climate Resilience Fund Grant Award

A. FECB Bristol Resilient Grant 2023

Documents:

[FECB Bristol Resilient Grant.pdf](#)

5. Adjournment

6. Signature

Raymond A. Rogozinski, P.E.
Director of Public Works

MARCH 29, 2022

A Special Meeting of the Flood and Erosion Control Board was held on Tuesday, March 29, 2022 at 5:03 p.m. in the City Hall Council Chambers, 111 North Main Street.

Present: Mayor Caggiano; Council Members Howe, Olsen, Thibeault, and Tyler.

The call of the meeting was presented:

*"Flood and Erosion Control Members
Bristol, Connecticut*

SPECIAL FLOOD AND EROSION CONTROL BOARD MEETING

There will be a Special Meeting of the Flood and Erosion Control Board to be held on Tuesday, March 29, 2022, at 5:00 p.m. in the City Hall Council Chambers, 111 North Main Street, Bristol, Connecticut.

AGENDA

1. *Flood and Erosion Control Board meeting minutes of the previous meeting, March 27, 2018.*
2. *City Areas of Flooding.*
3. *FEMA Flood Assistance Program.*
4. *FEMA Insurance Map update & Flood Damage Prevention Ordinance summary.*
5. *MSA Program summary.*
6. *Addendum*
7. *Adjournment*

Per Raymond Rogozinski, P.E., Director of Public Works"

1. **APPROVAL OF MINUTES OF SPECIAL FLOOD AND EROSION CONTROL BOARD MEETING ON MARCH 27, 2018.**

On motion of Council Member Howe and seconded, it was unanimously voted: To approve the minutes of the special Flood and Erosion Control Board meeting on March 27, 2018.

2. PUBLIC PARTICIPATION

Steve Donaghy, 94 Frederick St., stated the Flood & Erosion Control Board needs to meet more frequently than every two years. He expressed concern over the increased amount of pavement and building in Bristol since 1987, as well as, the frequent flooding of his home on Fredrick St.

MARCH 29, 2022

Paul D'Aprile, 126 Frederick St., questioned why a protective berm could not be installed on Frederick St. in response to frequent flooding, similar to one that had been installed on Broad St.

Mary Rydingsward, President, PRWA, spoke on behalf of the Pequabuck River Watershed Association urging the Board to prioritize collaboration with the PRWA and other stake holder organizations. Also requesting the Board utilize the PRWA's recently updated Watershed Base Plan in identifying key properties for conservation and for implementing/establishing a best practices management program for the cleaning and maintenance of the City's stormwater/sewer infrastructure.

3. PRESENTATION OF CITY AREAS OF FLOODING.

Public Works Director Rogozinski stated the City was impacted by heavy rains from multiple tropical storms in 2021 leading to the identification of 30 locations with flooding and/or drainage issues. By site, he listed corrective actions taken and proposed.

Mayor Caggiano asked that two or three locations be identified as the highest priorities.

Public Works Director Rogozinski stated the Brace Avenue and Beth Avenue/Hiltbrand Road intersections were the highest priorities.

4. FEMA FLOOD ASSISTANCE PROGRAM

Public Works Director Rogozinski provided an overview of the FEMA Flood Assistance Program in relation to 2021 Bristol flood events. Including, that damage to properties rarely meets the FEMA Flood Assistance eligibility requirement that damages must exceed 50% of the value of a structure.

David Murphy, P.E.; CFM, Resilient Land & Water, presented his report that was commissioned by the City to assess and recommend measures to better assist the City and residents in mitigating damage/loss due to flooding in the future.

5. FEMA INSURANCE MAP UPDATE & FLOOD DAMAGE PREVENTION ORDINANCE SUMMARY

Public Works Director Rogozinski summarized the City's Flood Damage Prevention ordinance, required for residents to participate in National Flood Insurance Program, and the forth coming updated FEMA Flood Insurance Rate Maps that are expected to be published summer 2022.

6. MS4 PROGRAM SUMMARY

Public Works Director Rogozinski defined and answered questions regarding the City's Municipal Separate Storm Sewer System (MS4) and management plan.

7. ADJOURNMENT.

At 5:59 p.m., on motion of Council Member Howe and seconded, it was unanimously voted: To adjourn.

MARCH 29, 2022

ATTEST: _____

DRAFT



Department of Public Works | 860.584.6125

MEMORANDUM

DATE: August 8, 2023

TO: Mayor Jeffrey Caggiano
Board of Public Works

FROM: Raymond A. Rogozinski, P.E., Director of Public Works

RE: DPW CITY FLOODING – STORM ON JULY 16, 2023

The City received 5.2 inches of rain in less than 2 hours on July 16, 2023 that caused flooding in multiple areas throughout the City. A 100-year-storm, storms that are calculated to have a 1% chance of occurring each year, consist of 7.3 inches over a 24-hour period.

The flooding that occurred on July 16, 2023 was consistent with high intensity storm. Runoff in several areas overwhelmed the inlet capacity of catch basins, resulting in runoff from City roads entering private property. The runoff onto private property occurred primarily at low point (sag) in the road where driveways are located. Runoff in these areas is a result of the depth of water gutter flow. In areas of roadway curbs, gutter flow has to exceed 4-6 inches prior to entering private property. However, in areas of driveways, the depth is 1.5 inches.

Once storm runoff entered the City's storm drainage system (designed for a 25-year-storm), there were several areas that experienced flooding due to the limited capacity of the drainage pipe (pipe was not large enough). Flooding of the City's major rivers (Pequabuck & Coppermine Brook) was limited, including East Main St and Frederick St. Although the Pequabuck River water surface levels reached approximately 70% of the historic high of 1955. Had the storm continued for longer than 2 hours, City rivers (Pequabuck & Coppermine) would have crested and extended up the Coppermine to include: Mechanic St, Louisiana, Farmington/Mix St, and Richard Court, and up the Pequabuck to include Mem Blvd and Rockwell Park.

A report summarizing the areas of flooding is attached. DPW evaluation and corrective measures are ongoing, and the City is still receiving complaints from property owners indicating damage from City storm drainage. Therefore, additional report updates will be forthcoming.

A review of some of the areas with the most severe flooding is provided below:

1. Divinity Street Culvert east of Peck Lane: The culvert overtopped, eroding the downstream property. The existing 5 ft. x 5 ft. culvert is scheduled to be replaced with a 5 ft. x 8 ft. culvert, however, the roadway section is currently within the detour of the CT DOT West

End project. The culvert replacement can proceed in 2024. DPW repaired the eroded grass area and installed large concrete blocks to mitigate future erosion.

2. Sharon Road Storm Drainage: City storm drainage from Lexington St flows to Sharon Road, and connects into the State's storm drainage system on Burlington Ave. During the storm, the area of Sharon Road received severe flooding. The flooding is a result of insufficient pipe flow in the drainage system. The City replaced its piping approximately 5 years ago, to more than double the system's capacity. DPW inspected and jetted the City's system and did not find a blockage. DPW is currently jetting the State drainage system on Burlington Ave, and installed open-grated manhole upgrades on Burlington Avenue to provide a potential outlet for water. The State system is undersized, and has less capacity than the City's system.
3. George St Culvert: The city culvert (6 ft. x 8 ft.) that receives flow from the channel, located in the back yard areas of the George Street properties, overflowed. The water flooded South St (Walgreens) and Main St. Flooding was a result of debris at the culvert inlet. DPW hired a contractor to inspect the culvert interior (900 ft.) and remove debris. In addition, DPW removed the grate that covered half of the culvert inlet.
4. Park St Flooding: Park St flooding including a portion of the West End, extending to the CT Route 69/72 intersection. Flooding was a result of a clogged private culvert (5 ft. x 5ft). The culvert was clogged with vegetation. In order to prevent additional flooding, DPW hired a contractor to remove blockage.

In addition to City flooding, CT Route 229 (Middle St), south of the Riverside Ave, flooded at the Middle St dam. The flooding caused damage to the pavement, and closed Middle St. DPW assisted CT DOT with repair.

DPW will be scheduling a City Flood Erosion Control Board Meeting in September. The Board members consist of the City Council and the Mayor. The July flooding will be an agenda item and additional updates will be provided to the BPW.

Please feel free to contact me with any questions or concerns at 860-584-6113.

Summary of Workorders Following The Flooding of July 16th 2023



Prepared By:
William R. Stango, EIT

Bristol Public Works

July 27, 2023
Updated August 9, 2023

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Overview

On July 16, 2023 The City of Bristol experienced a high intensity rain storm within a relatively short period of time (approximately 5.2 inches of rain in less than 2 hrs). The storm caused localized flooding and property damage throughout the City. This report is a summary of the current flooding and drainage issues that have been brought to the attention of the Public Works Department.

Flooding is a function of the quantity (number of inches of rain) and the intensity / rate of rainfall. For example, a storm with short-duration and high-intensity results in flooding of localized areas where The City drainage did not have sufficient capacity to receive or convey storm flows. In contrast, a storm with a long-duration results in flooding around major rivers such as the Pequabuck River and Coppermine Brook exceeding their capacity which result in direct flooding and water backing up into The City's storm drainage system.

As engineers, often speak and describe storms in terms of year's frequency of an event. We refer to storms as 100, 50, 25 and 10 year storms, which in the State of Connecticut equates to 7.98, 7.05, 6.20, and 5.05 inches of rainfall. However, it is important to understand that storm event years equates to inches of rainfall over a 24-hour period. Since intensity of rainfall matters, we understand that high-intensity storms that occur in relatively short periods of time create more flooding than a 100-year storm defined as 7.98 inches of rainfall over a 24-hour period.

It is also important to understand what a 100, 50, 25 and 10 year storm actually means. A 100-year storm does not mean that it will only occur once every 100 years, rather it means that there is a 1 percent chance that Connecticut will experience 7.98 inches of rain during a 24-hour period EACH year. Likewise, a 50-year storm equates to a 2 percent chance each year, and a 25- & 10-year storm equates to a 4 & 10 percent chance respectively EACH year.

In accordance with City Ordinance 21-119, roadway storm drainage is sized for a 25-year storm event. A number of The City's existing drainage systems predate the ordinance and are much smaller. The DOT design drainage manual requires State storm drainage systems to be designed for 10-year storms with culverts sized for a 50- & 100-year storms depending on the size of the drainage area.

Many residents incorrectly believe that the City owns all the rivers, streams and wetlands located in the city. Through the City's network of roads, drainage easements and property, we do own a portion of them. However, they are generally owned by private property owners as defined by the property description delineated in their deed. If there is a stream in the back yard of a property in Bristol, it is generally on private property and the responsibility of the property owner to maintain. In addition, work in areas of streams and wetlands require a permit from the City's Inland Wetland Commission as designated by the CT DEEP.

When the DPW receives a drainage or flooding complaint, the standard procedure is to contact the property owner to obtain additional information, perform a field inspection, and review available mapping of the area. If the problem is associated with City storm drainage, our first step is to jet and clean the storm lines to ensure that the drainage system is operating as designed. If the problem persists, we video the storm drainage system to confirm there is no blockage and if there is a problem due to lack of catch basins on a road with existing storm drainage, we typically add catch basins or storm drainage piping. Resolving storm drainage issues becomes more problematic when there is either no existing storm drainage in the area, a drain pipe is undersized for a long length of roadway, or the receiving stream or

waterbody has insufficient capacity to accept the City discharge during storm events. In these cases, formulating a capital project and obtaining BOF appropriation is required. Between procuring funding, developing a design, obtaining environmental permits and bidding, a capital project typically takes 2-3 years prior to the start of construction.

One of the most common storm drainage complaints in the City is roadway storm water entering private property from driveway aprons. The City standard is to have a 1.5-inch lip where the driveway meets the edge of the road. In order to prevent road runoff from entering the driveways, DPW often replaces driveway aprons to establish a lip.

A summary of the identified flooding areas which have occurred in the July storm is provided below. The summaries are a preliminary assessment and not listed in order of priority or severity. DPW is still receiving reports, therefore the list may not be complete and may be updated as additional information is obtained and additional engineering analysis is performed.

The City does experience periodic flooding. The last significant flooding occurred in July of 2021. This report contains components of information contained within the report associated with the July 2021 storm. When comparing these two storms we can see similarity and difference as to the streets that experienced flooding. Areas such as Frederick St, George Street, Divinity Street, and King Street flooded in both the July 2021 storm and the recent July 2023 storm. Areas such as Park Street, Blakeslee Street, and Jeffrey Road flooded in July 2023 but did not flood in July 2021. Likewise, areas such as Vine Road, Trout Brook Road, Brace Ave., Duncan Street, Carolina Road, Clark Ave., Balsam Road, Hardwick Road, Sheffield Road, Litchfield Road, Hopmeadow Road, Gregory Place, Broad Street, Middle Street, Royal Drive, Chippannee Lane, Stone Crest Drive, Glenn Street, Battle Street, Mix Street, and Jerome Ave. experienced flooding in July 2021 but not in July 2023.

Pequabuck River Stream Gage

One metric Engineers consider when analyzing the severity of a flood is the water level of streams and rivers within a given watershed. The graph below has been provided to show comparison of the Pequabuck River during the Flooding of July 2023 to average and historic levels. The levels presented in this graph were observed in Forestville, CT and are measured against an arbitrary datum. The water level relative to this arbitrary datum is referred to as the “Stage”. The current stage of the Pequabuck River measured on August 8, 2023 is 2.53’. This number can be used to approximate water levels during average conditions. The highest stage of the Pequabuck River was recorded during the flood of 1955 which measured 13.22’. On July 16, 2023 the stage of the Pequabuck River measured to be 8.99’. The water levels during this storm event are approximately 3.5 times higher than the current conditions and 0.68 times (almost 70%) as high as the Flood of 1955.

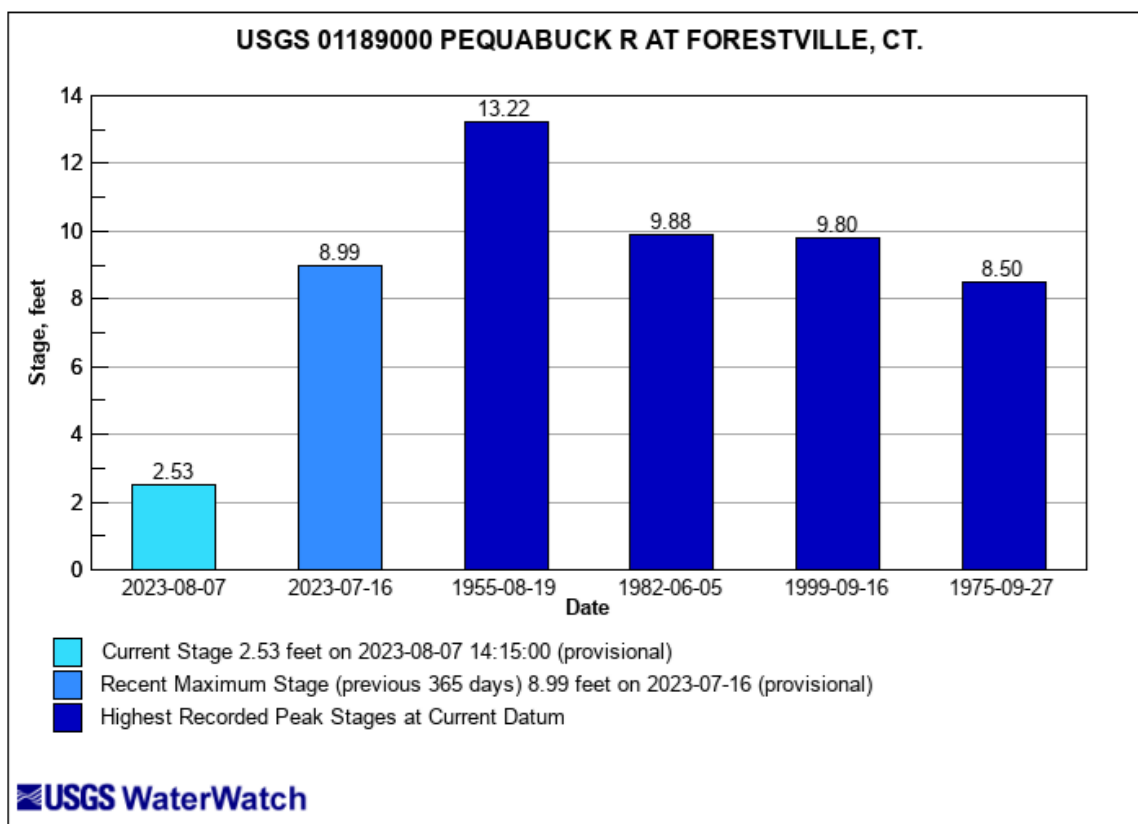


Figure 1: Stage of the Pequabuck River During Significant Storm Events

109 Marlene Street

Summary of Workorder:

High water levels and erosion of banks along Birge Pond Brook. Resident indicated that riprap along channel has washed away. While onsite the resident claimed that the slopes along the channel are hazardous and that something should be done.

Field Investigation:

The DPW investigated the claim and noted the following: An unnamed stream runs north to south along west side of 109 Marlene Street. Flows are facilitated under Marlene Street through an existing 72-inch CMP culvert. Each end of the culvert is embedded within a concrete headwall complete with flared wingwalls. The channel and culvert were both found to be located within a City owned easement. Due to thick overgrowth the Department was unable to determine the overall stability of the channel banks. The resident claims the channel armoring around the outlet had eroded away in years past.

Current Action:

The DPW crews are scheduled to clear overgrowth from the channel and perform a visual inspection of the existing channel slopes. Based on field conditions of the overall stability of the slopes DPW will install riprap and or regrade existing material to mitigate erosion (if any).

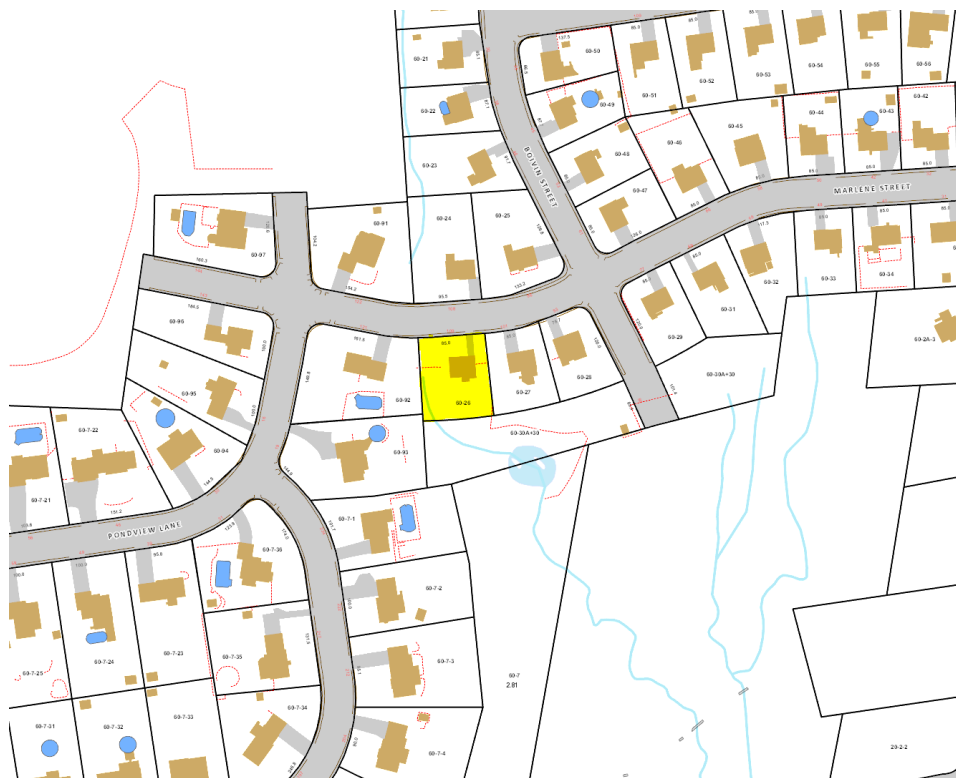


Figure 2: Location Map – 109 Marlene Street



Figure 3: Birge Pond Brook - Looking Downstream

96 Marlene Street

Summary of Workorder:

Water levels rose over the top of the channel bank causing flooding to several properties.

Field Investigation:

The DPW investigated the claim and noted the following: An unnamed stream runs north to south along west side of 96 Marlene Street. Flows are facilitated under Marlene Street though an existing 72-inch CMP culvert. Each end of the culvert is embedded within a concrete headwall complete with flared wingwalls. The channel and culvert were both found to be located within a City owned easement. During field investigation a large buildup of debris was found within the channel obstructing flows at the upstream end of the culvert. The inside of the culvert was also inspected and it appeared to be clear. While onsite the homeowner explained that due to the buildup of material headwater from the stream overtopped the channel banks and caused flooding around the property.

Current Action:

DPW crews cleared debris from the channel. The Department will continue to monitor the situation for any additional flooding.

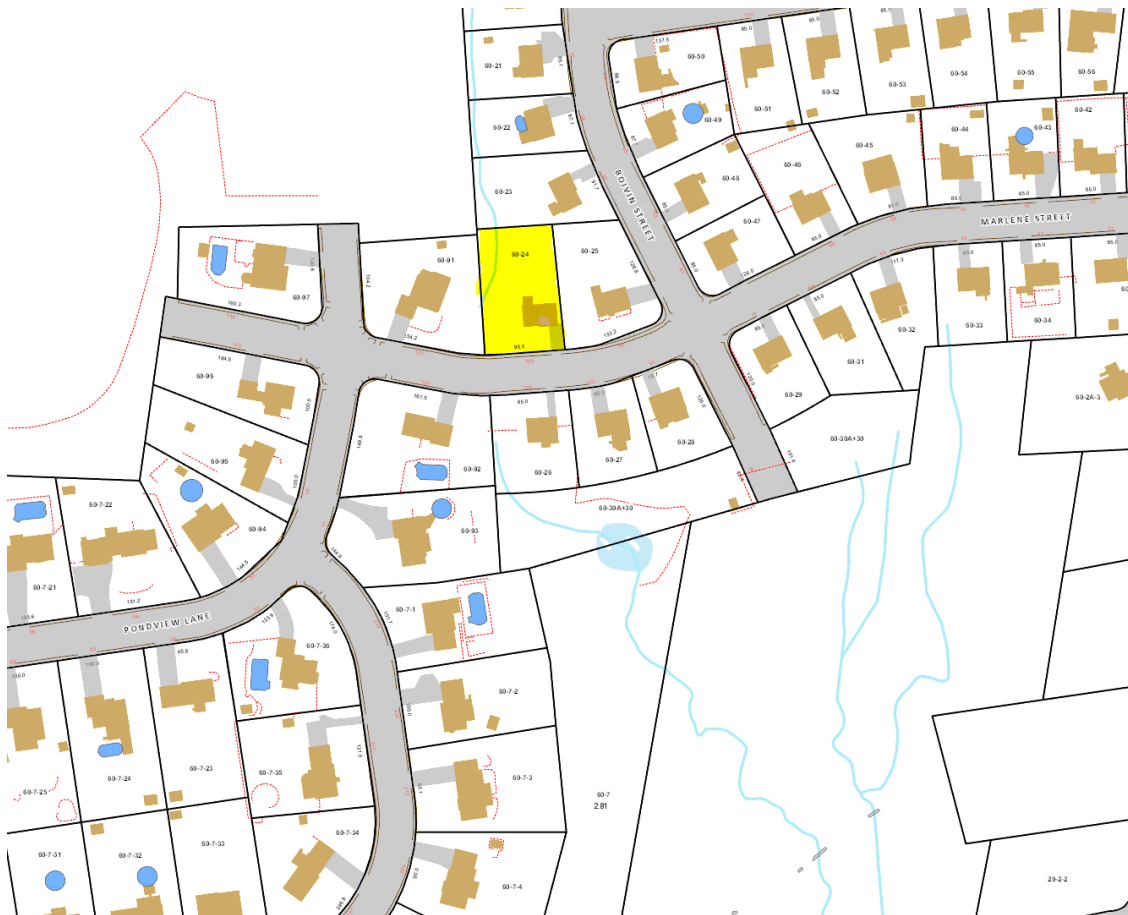


Figure 4: Location Map - 96 Marlene Street



Figure 5: Birge Pond Brook - Looking Downstream

136 Dino Road

Summary of Workorder:

The home owner of 136 Dino Road indicated that water from the roadway is coming over top of the driveway apron and causing flooding in the backyard. They believe that the basin at the top of the driveway is undersized and that it can't handle flows from the street.

Field Investigation:

The DPW investigated the claim and noted the following: The existing storm drain adjacent to the driveway of 136 Dino Road currently outlets to an unnamed stream located along the southern property line. The outfall was determined to be located entirely within a City owned easement. A manhole located within the easement was inspected and determined to be a sanitary style manhole with significant scouring along the troughs. In addition, a section of pipe at the outlet has become disconnected and is impeding flows. The property owner informed the Department that stormwater on the street backs up into the roadway and flows down the driveway into the yard. Upon inspection, the lip of the existing driveway apron appears to be less than standard height.

Current Action:

The DPW is scheduled to reconstruct the driveway apron in front of 136 Dino Road. The new apron will be constructed with a standard sized lip to help prevent stormwater from the street from overtopping the driveway. In addition, the Department will replace the existing sanitary style manhole and outfall pipe as shown in the figure below. The existing manhole will be replaced with a standard curbless catch basin to help collect flows within the yard and the outfall will be replaced with a standard flared end section.

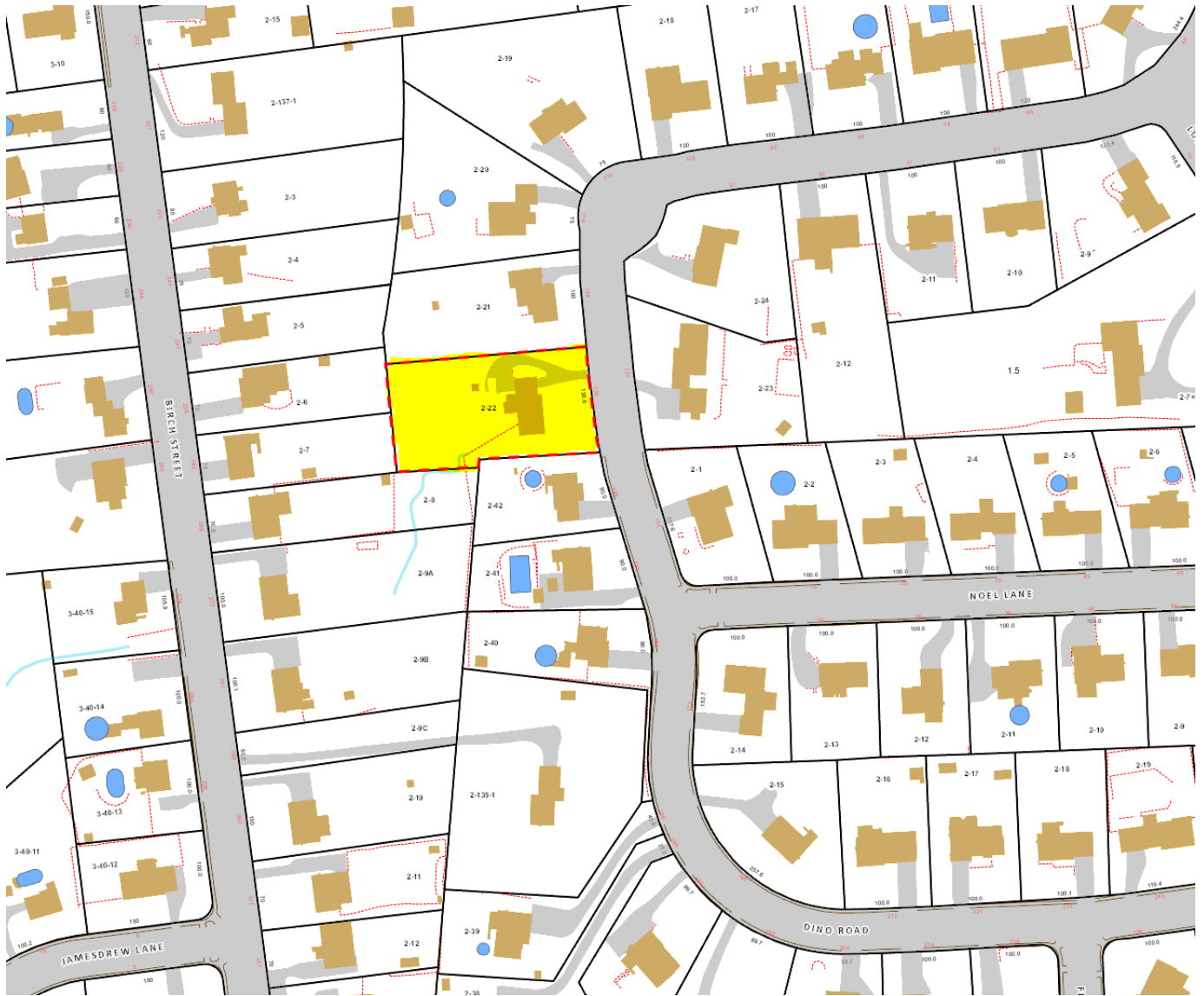


Figure 6: Location Map - 136 Dino Road



Figure 7: Proposed Drainage Improvements

114 Blakeslee Street

Summary of Workorder:

High floodwaters have caused significant property damage to the homeowner of 114 Blakeslee Street and to several adjacent property owners. The homeowner stated that recent flooding has been substantially worse than anything he has seen in the past 25 years of living at this address.

Email From Property Owner:

"I have lived at 114 Blakeslee Street for over 25 years. Over the last few years, the flooding in my backyard has increased due to the overflow from surrounding areas being diverted into the brook adjacent to my home. The flooding from the recent storm on July 16, 2023 caused roughly \$2,500 in damage to equipment stored in my backyard shed.

I understand Huntington Woods is in the process of repairing the sink hole located in their parking lot. I don't believe they truly understand the severity of the tunnel's poor condition. I took a video from the entrance of the brook all the way to the discharge into the Pequabuck River and three quarters of the galvanized tunnel is in disrepair and needs to be replaced. I noticed in some sections, due to the weight above, the tunnel has now changed to an oval shape and you can see gravel on the bottom due to missing rubber coating and completely rusted out bottoms. Also, in a couple of sections, the tunnel connections are beginning to separate.

My biggest concern is if this tunnel should collapse during a heavy rainstorm and water is unable to pass through, the flooding from it would severely impact roughly 6-12 homes in the Blakeslee Street area leaving us with no emergency plan in place.

I have attached photos to validate my concerns and am available should you need to reach out for more information."

Field Investigation:

An unnamed stream flows adjacent to 114 Blakeslee Street and into a CMP culvert located on the north side of the Huntington Woods facility. A recent sinkhole on the Huntington Woods property brought to light that the existing culvert is failing. It's likely that the failing culvert is contributing to the high headwaters shown in Figure 9. The DPW has been in contact with the property manager at Huntington Wood and they are currently in the process of receiving quotes from private contractors to have sections of the existing culvert replaced. The DPW informed the residents in adjacent properties that flooding is likely caused by the failed culvert and that Huntington Woods is in the process of making repairs.

Current Action:

The existing culvert shown in *Figure 10* is located entirely on private property and will be the responsibility of the owner to replace. The owner is currently in the process of receiving quotes from private contractors to make repairs to the culvert. The DPW is in contact with the owner (Huntington Woods) regularly to get updates on the project.



Figure: Location Map - 114 Blakeslee Street



Figure 8: Floodwaters at Blakeslee Street Culvert Located Upstream of Huntington Woods

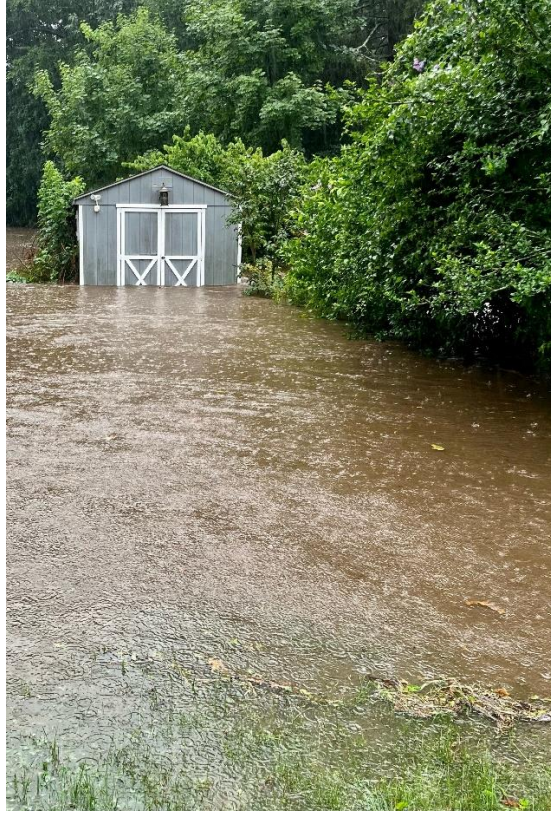


Figure 9: Floodwaters at 114 Blakeslee Street



Figure 10: Downstream Culvert on Private Property

72 South Street Extension

Summary of Workorder:

The homeowner of 72 South Street Ext. stated that insufficient drainage along the street has caused damage to the existing sidewalk, driveway, and retaining wall.

Email From Property Owner:

"I am writing in regards to improper water drainage on South St. Ext Bristol Connecticut. There is no water drainage coming down the hill of this road leading water right to the sidewalk, into my driveway, all the way down to my backyard creating several ditches as well as the cement wall and foundation of my garage to collapse. I have requested already the City to fix this problem and nothing has been done and this is now out of control. There are children and elderly living here. The City needs to fix this water system as well as the damages it caused my property. There are huge ditches in the sidewalk, there is a ditch in the side of the foundation of my house creating a stream every time it rains. This stream is coming down my driveway breaking the asphalt and causing the wall to collapse not only this but the foundation to the garage is also collapsing. This is an extreme hazard and a lawsuit on the City waiting to happen. I'm not sure if this needs to go to the news or not but something needs to be done ASAP"

Field Investigation:

The DPW has investigated the existing site conditions and claimed property damage. From visual inspection the Department believes stormwater from Melville Street and South Street Ext. is overtopping the sidewalk and flowing down the driveway at 72 South Street Extension.

Current Action:

The DPW is preparing a workorder with a private contractor to reconstruct the existing driveway apron, sidewalk, and curbing as shown in *figure 13*. The homeowner has filed a claim for the property damage.

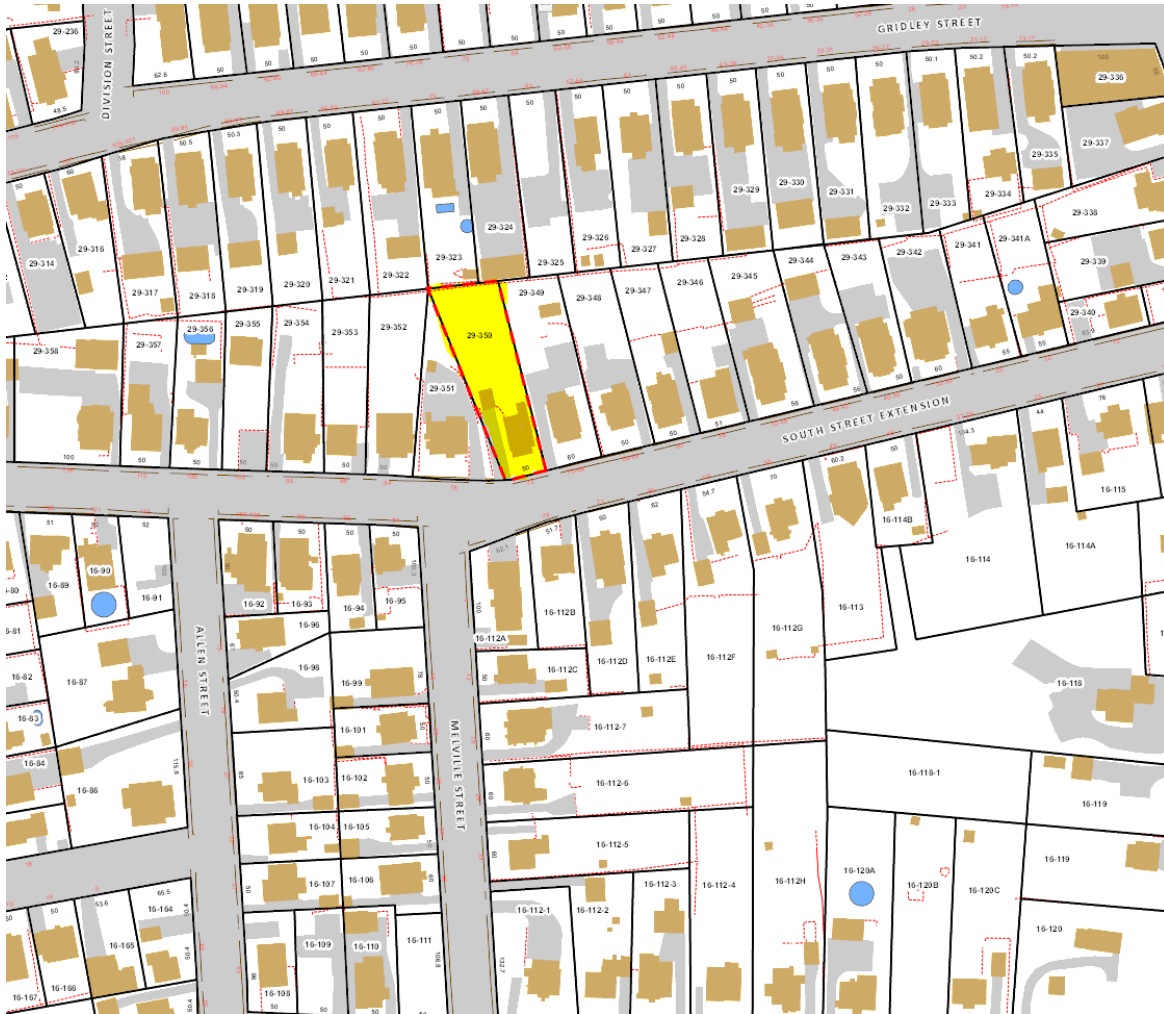


Figure 11: Location Map - South Street Extension



Figure 12: Driveway Apron Looking Toward Melville Street



Figure 13: Erosion Behind Existing Retaining Wall

465 Redstone Hill

Summary of Workorder:

The homeowner of 465 Redstone Hill believes that an adjacent construction site has caused increased amounts of stormwater runoff to flow through her property.

Email From Property Owner:

"I fully understand that the amount of rain that we have experienced Sunday and today is exceptional. However, we have owned our home for 26 years and we have NEVER experienced this. These photos were just taken. I also sent a video to Cheryl. The first photo is proof once again that water is flowing through this area and is exposing the roots of my trees and pushing my rocks! The water is rushing across my property and into my neighbors newly renovated enclosed back porch. He had 8 inches of water on his patio on Sunday. Look at the color of the water, ITS FROM THE CONSTRUCTION SITE! Isn't the pond supposed to fix this problem? The last photo is where the trench begins closest to my house. The stake shows where it begins. The water is flowing over the straw bags that border the trench. Thank God these trenches were put in because MY HOUSE WOULD BE FLOODED, but they clearly are not enough. There is even ponding in my front yard. I am beyond frustrated. My insurance agent informed me yesterday that any property damage caused by this flooding most likely will not be covered. I have been documenting this journey with you since the first disaster last May. Where's the solution."

Field Investigation:

The DPW was on site and inspected the existing sediment and erosion control measures installed around the construction site which consisted of a 2-foot-wide drainage ditch lined with haybales.

Current Action:

The contractor working at the adjacent construction site has installed additional sedimentation and erosion control measures including a new drainage swale along the back side of 465 Redstone Hill. The existing swale was upgraded from a 2-foot-wide channel to a 6-foot-wide grass lined channel. The property owner has been notified and has informed the Department the swale seems to be operating as intended.

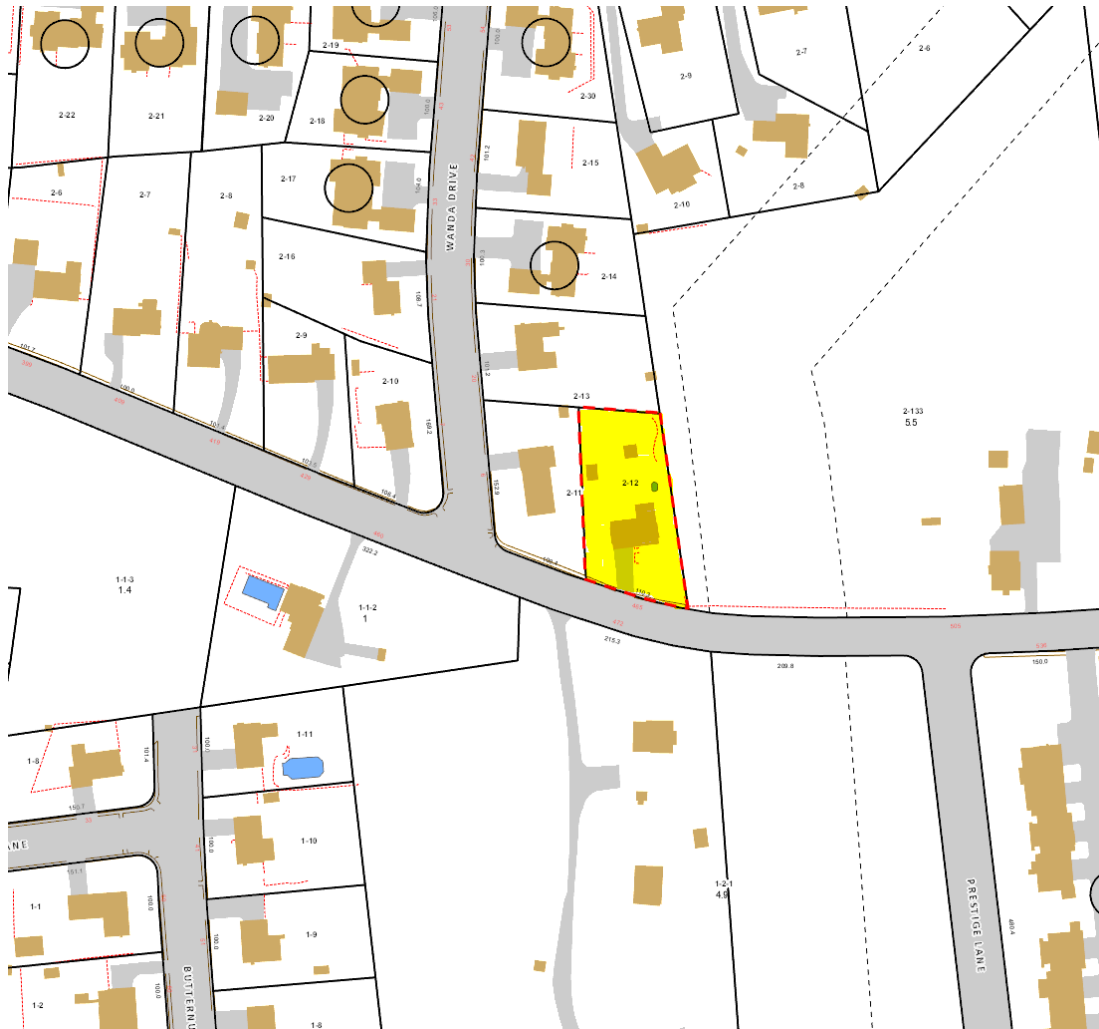


Figure 14: Location Map - 465 Redstone Hill Road

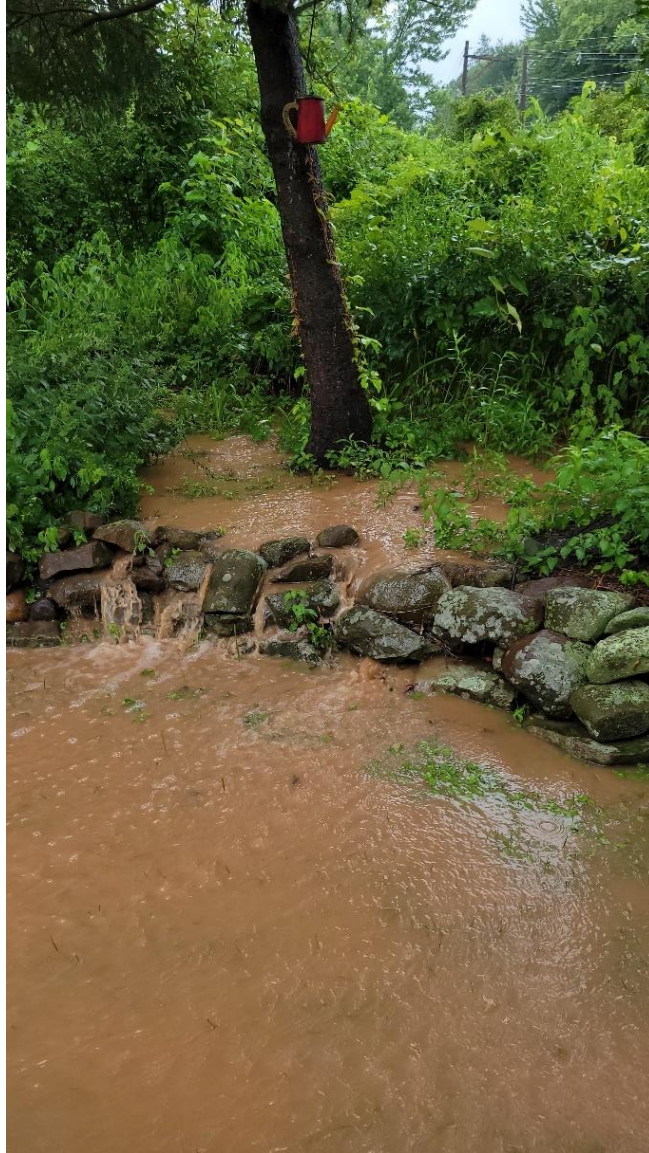


Figure 15: Stormwater Runoff

90 Field Street

Summary of Workorder:

Recent storms have caused erosion of an existing crushed stone driveway. The homeowner of 90 Field Street believes that the culvert adjacent to his property is undersized and has caused floodwaters to overtop the roadway.

Field Investigation:

An unnamed stream flows south to north along the east side of 90 Field Street. On the north side of the property the stream crosses under Field Street facilitated by an existing 6 ft x 4 ft concrete culvert. The DPW spoke with the homeowner during field investigations and the home owner claims that during a typical rain event water does not overtop the driveway apron. The homeowner also expressed to DWP his concern with the stability of the existing channel wall. Several sections of the dry stacked stone masonry wall have collapsed and it does not appear to be stable.

Current Action:

The homeowner was made aware that The City is in the process of securing funds to have the culvert adjacent to his property replaced and that construction is anticipated to begin in 2025. The proposed structure is an 11 ft x 4.5 ft precast concrete box culvert with flared concrete wingwalls. In addition, to replacing the existing culvert this project will involve realignment of the existing channel. The new channel alignment will improve the hydraulic conductivity and reduce the likelihood of water overtopping the roadway. For construction of the new culvert, temporary and permanent easements will be required for excavation but have not yet been granted by the property owners. Temporary reconstruction of the driveway and shoring of the existing wall is being considered as part of the negotiation for these easements.



Figure 16: Location Map - 90 Field Street



Figure 17: Erosion of Unpaved Driveway



Figure 18: Channel Wall Adjacent to 90 Field Street

89 Field Street

Summary of Workorder:

The recent rain storm has caused erosion of an existing crushed stone driveway.

Field Investigation:

During field investigations it was observed that 89 Field Street is set well above the gutter line of the roadway and the existing driveway is pitched downward toward the road. It does not appear that the erosion was caused by improper roadway drainage.

Current Action:

Since the damages were not caused by improper roadway drainage the City would not typically take action in repairing the driveway. However, the City is in the process of securing funds to have an existing culvert adjacent to 89 Field Street replaced. The homeowner has thus far been unresponsive to The City's request for easements and temporary reconstruction of the driveway is being considered as part of the negotiations for the easements.

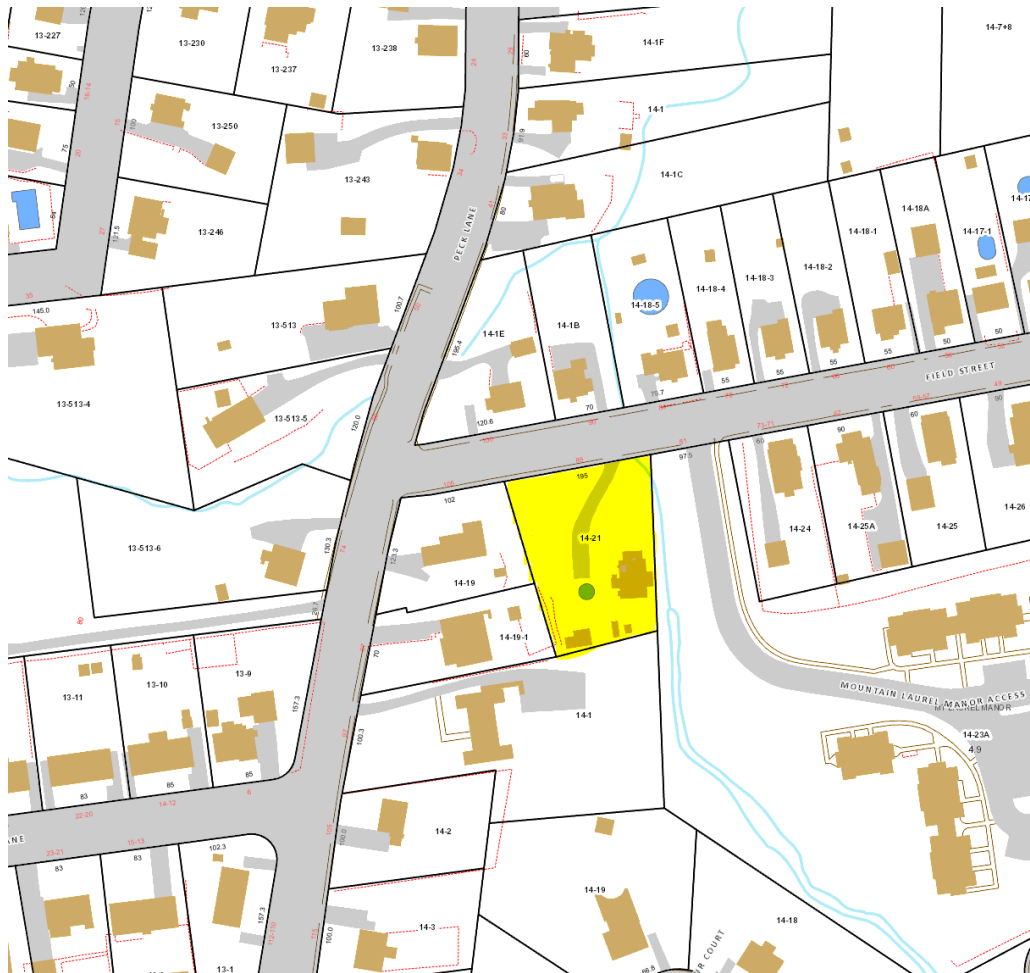


Figure 19: Location Map - 89 Field Street

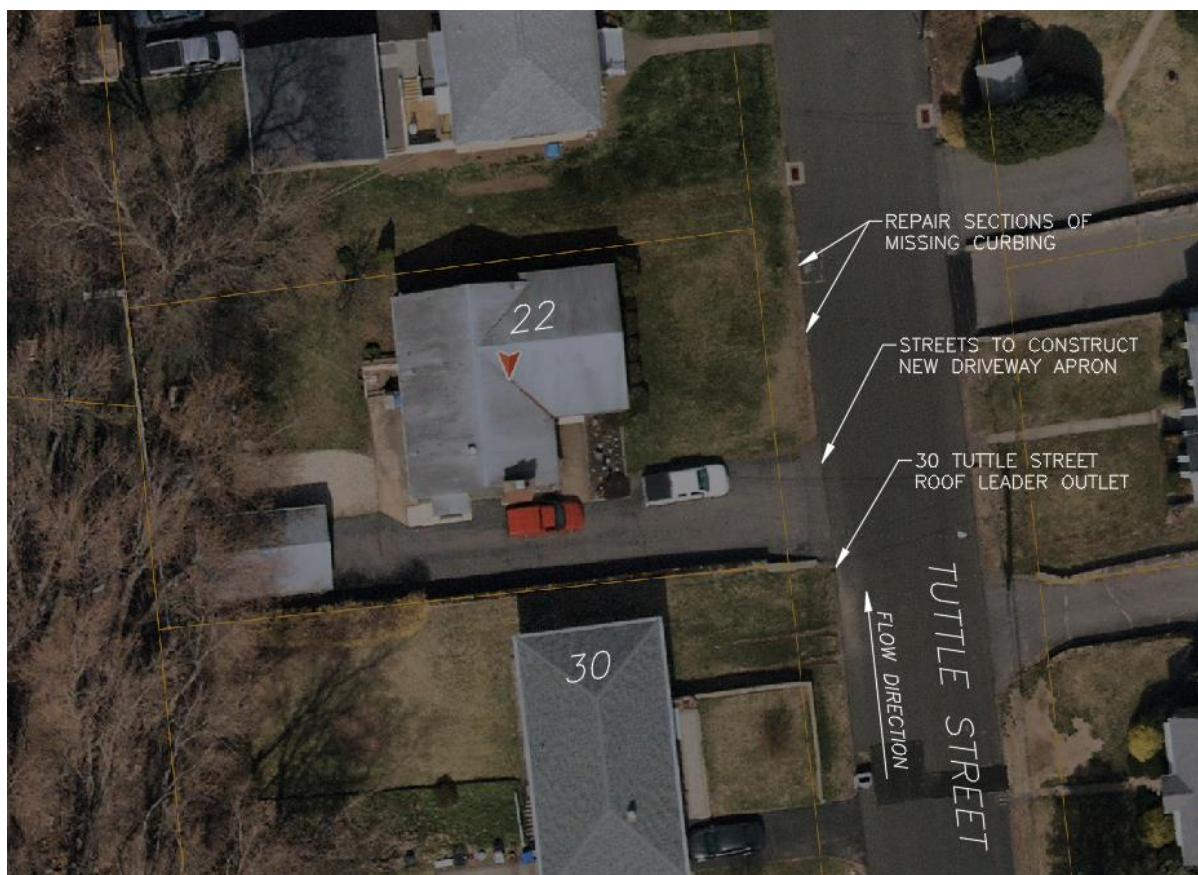


Figure 21: Proposed Improvements

220 Sonstrom Road

Summary of Workorder:

Homeowner of 220 Sonstrom Road indicated that storm water from the roadway is jumping the driveway apron and causing flooding in the garage.

Field Investigations:

The City has recently installed a new catch basin at the top of the existing driveway to catch stormwater runoff before it reaches the apron. The DPW inspected the basins and there does not appear to be any buildup of sediment or debris. Field measurements confirmed that the gutter flow in front of 220 Sonstrom is one directional and that during a typical storm event gutter flow should not be jumping the catch basin. It is likely that flooding is due to runoff from the roof leader and from the back pitched driveway.

Current Action:

A City catch basin is currently located on the high side of the driveway. No additional City action is proposed.

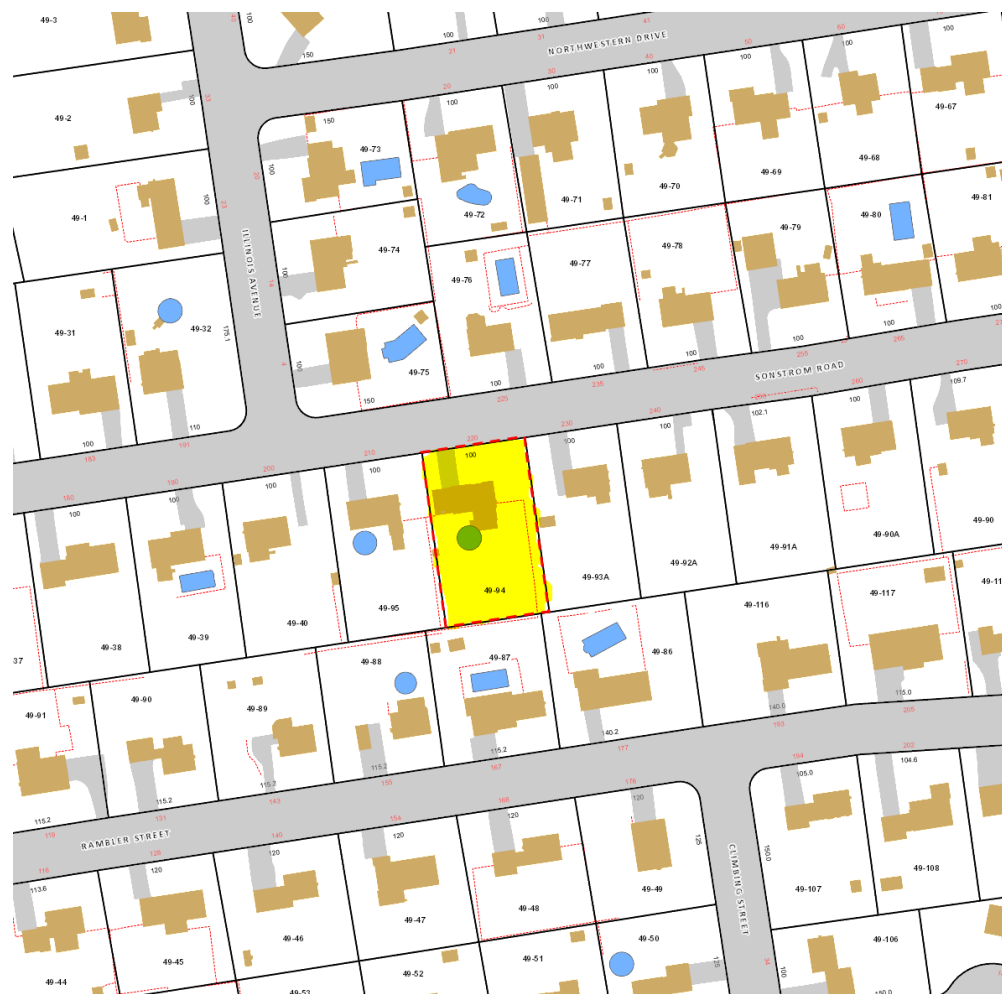


Figure 22: Location Map - 220 Sonstrom Road



Figure 23: Site Conditions at 220 Sonstrom Road

24 Jeffrey Road

Summary of Workorder:

Flooding on Jeffrey Road. Homeowner believes that the storm drains are undersized.

Email From Home Owner:

"Yesterday, I had a major flood on the side and the front of my house.

There is creek with a tunnel/easement behind the house that needs to be cleaned as well as city drains (one on the side of the property & one in front) which I have reached out to Public Works about.

My email is just to ask for assistance in getting additional drains added to the side of the house. There is one there now but I think there needs to be more.

I recently purchased this home and I love this neighborhood and did a 100k rehab on the house and water got into my basement yesterday because there aren't enough drains."

Field Investigations:

An unnamed stream runs east to west along the south side of 24 Jeffrey Road. Flows from this stream are facilitated through a 24" RCP within a City owned easement. The inlet structure was determined to be a dry stacked stone masonry catch basin. Flows from this basin are then piped to the storm sewer system along Jeffrey Road. It is likely that due to high volume flows and poor hydraulic conductivity within the basin the storm sewer was overwhelmed and overtopped. From videos it appeared that the stone basin behind the house began to overtop sending flows through the yard and into the street; at this point it appeared that stormwater began ponding along the street.

Current Action:

The DPW cleaned/cleared the basins and jetted the storm drainage lines along Jeffrey Road. In addition, the Department is currently drafting conceptual plans to improve flows from the unnamed stream. The current plan would be to remove the existing basin, several sections of pipe and realigning the channel so it flows more naturally into the storm drain.





Figure 25: Flooding at 24 Jeffrey Road



Figure 26: Proposed Drainage Improvements

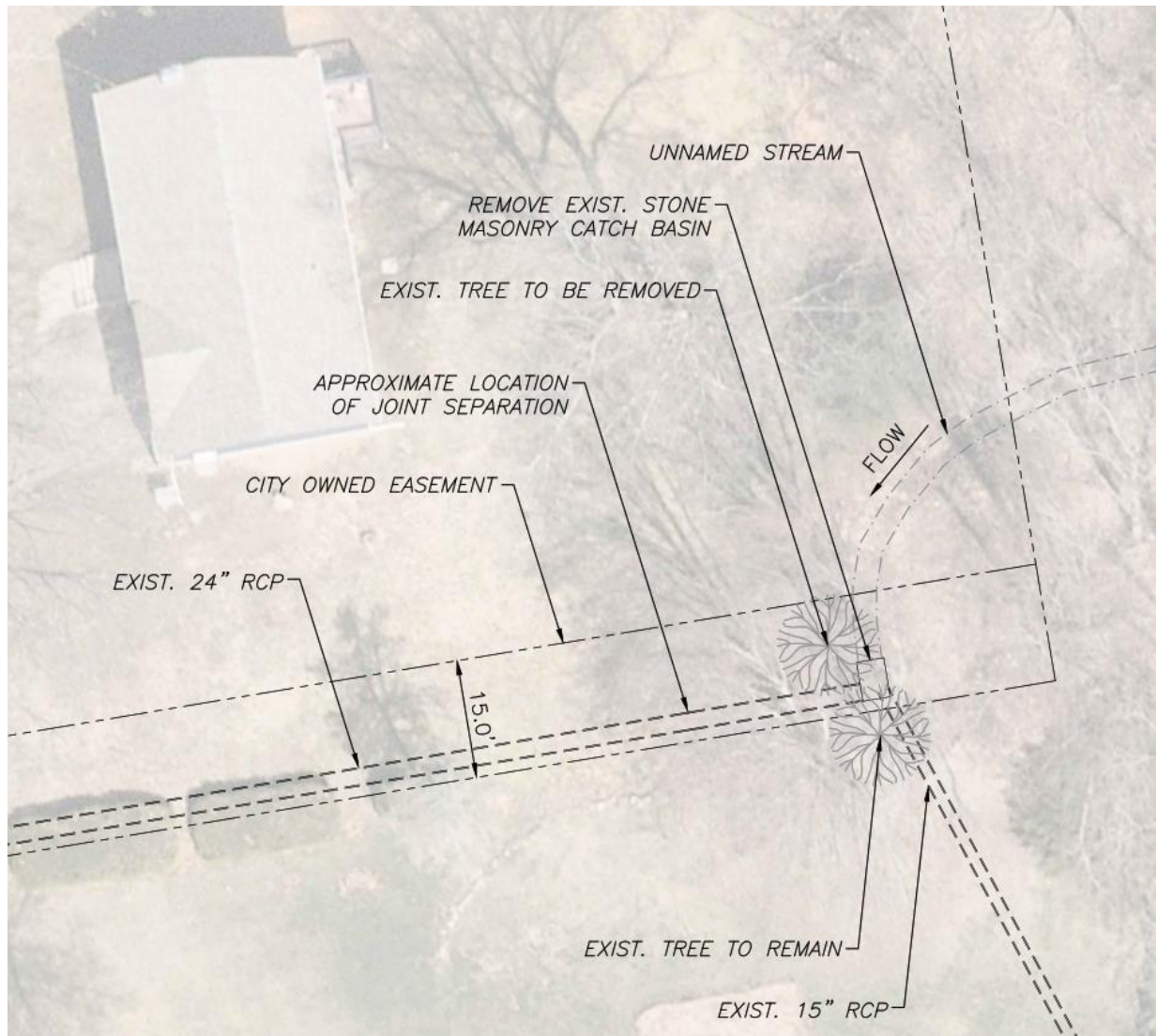


Figure 27: Existing Conditions

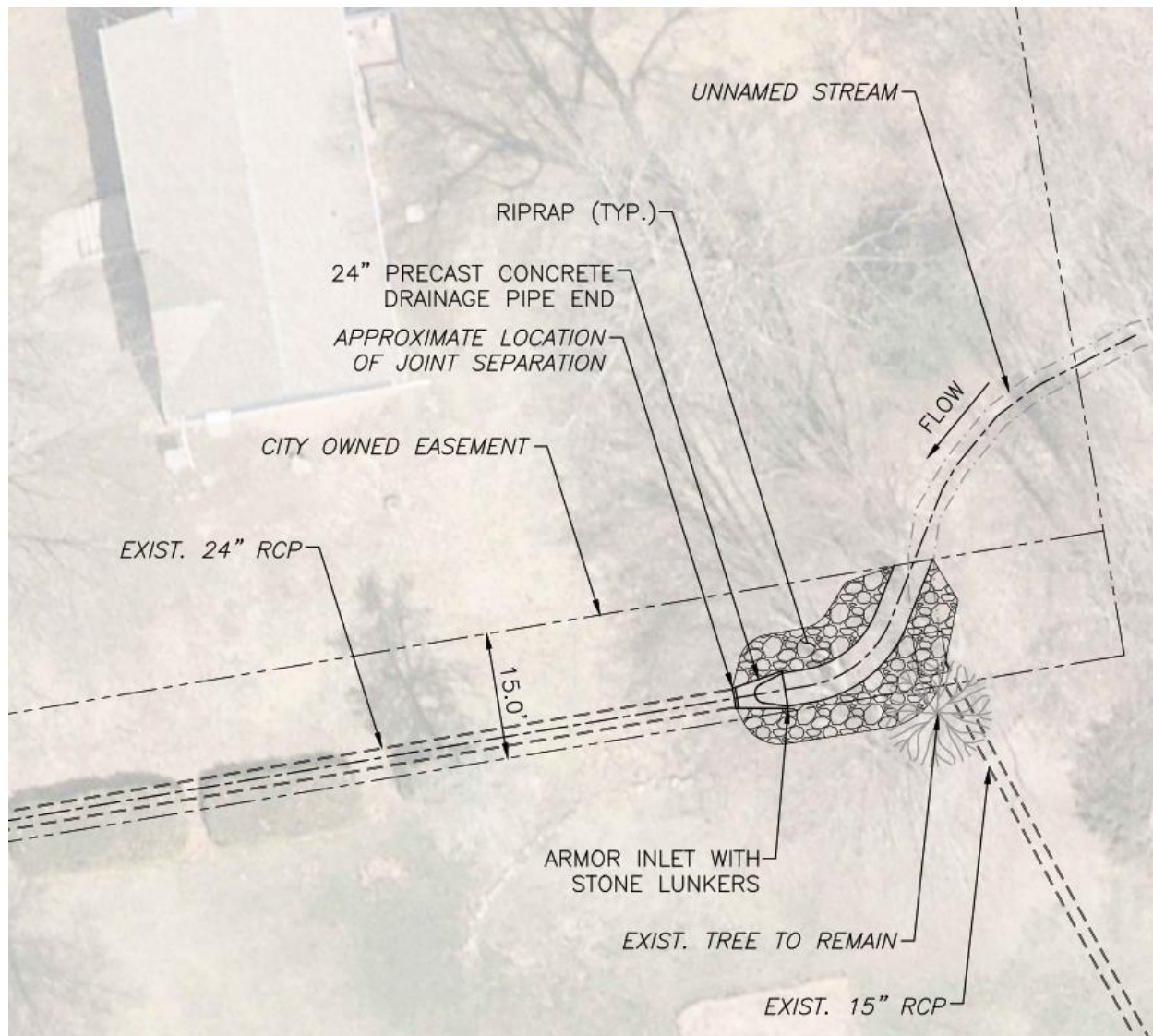


Figure 28: Proposed Improvements

35 Bently Road

Summary of Workorder:

During the storm on July 16th rainwater from the roadway ponded in the cul-de-sac and the south end of Bently Road. It appears the existing system could not handle flows and was backing up on the street. Photos from the homeowner (not shown in this report) show floodwaters 6-inches high spilling over the curb and onto private property.

Field Investigations:

DPW inspected the storm sewer from Bently Road to Candy Lane but only observed a minor buildup of sediment within the existing catch basins.

Current Action:

The DPW cleaned/cleared the catch basins and jetted the storm drainage lines. The department will continue to monitor this system during future storm events.

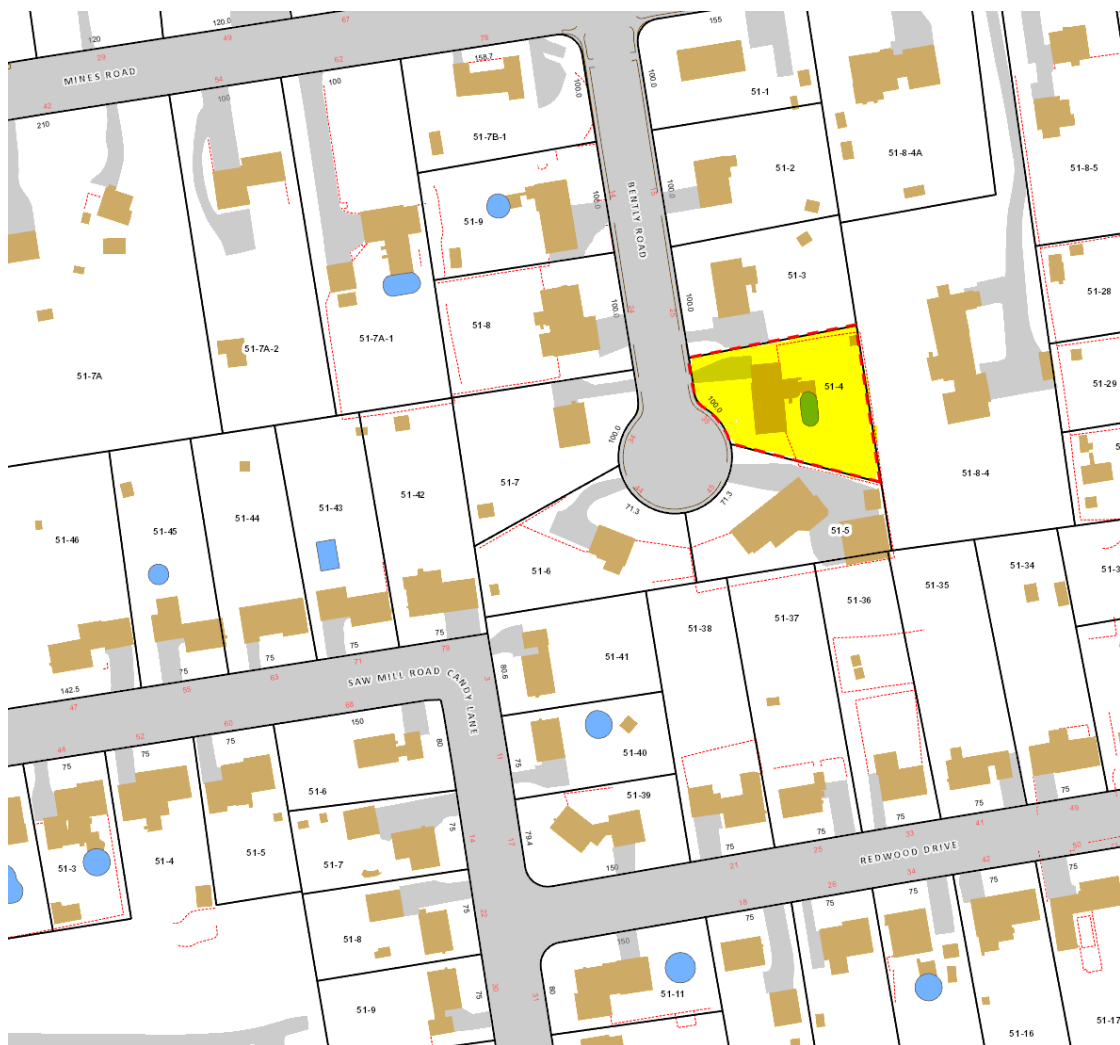


Figure 29: Location Map - 35 Bently Road



Figure 30: Maintenance of Bently Road Drainage System

48 Lawson Street

Summary of Workorder:

Homeowner believes a clogged catch basin has caused her driveway to flood.

Field Investigations:

During on site investigations the catch basin in question was determined to be a private driveway drain located at the bottom of the driveway at 48 Lawson Street (see the figure below).

Current Action:

The homeowner has been notified that the City will take no action as this is a private issue.



Figure 31: Existing Conditions

120 Perkins Street

Summary of Workorder:

The resident believes that due to increased runoff from past roadway improvements projects, the stream on his property has significantly eroded and has become a hazard.

Field Investigations:

An unnamed stream originating at a detention pond south of the Summerberry Circle flows west to east and crosses Perkins Street. Flows are facilitated under the street through a 36" RCP and are discharged along the north side of 120 Perkins Street. During field investigations the DPW inspected the channel along the property and did see sever signs of erosion along the channel invert. An approximate property line was identified with the home owner and the stream does appear to be located entirely on private property.

Current Action:

The DPW is currently in the process of producing concept plans to stabilize and armor the outfall within The City's right-of-way. Stabilization will involve cutting back slopes and installing riprap along the channel banks. In addition, a detention pond located upstream will be investigated to ensure it is functioning as designed.

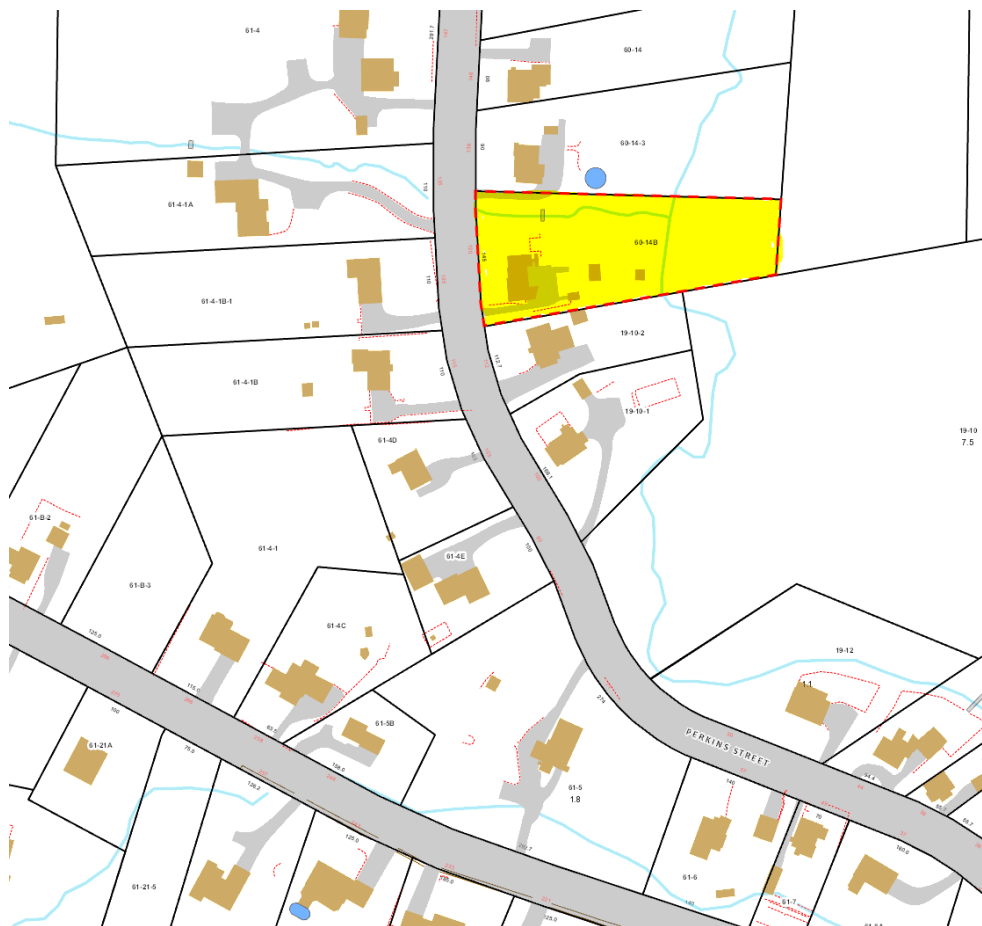


Figure 32: Location Map - 120 Perkins Street



Figure 33: Erosion at Invert of Channel

302 Candlewood Drive

Summary of Workorder:

Resident indicated that the stream on his property has been eroded by the recent storm and has caused flooding in his yard. The resident also believes that the City has an easement for maintenance of the stream.

Field Investigations:

A 24" storm water outfall pipe located along the north side of 302 Candlewood Drive discharges to an unnamed stream along the east side of the property. The outfall pipe is located within a City owned easement and the stream itself appears to be entirely on private property. During field investigation the DPW noted that erosion within the channel appears to be minor. Small deposits of sediment were observed along the channel banks.

Current Action:

The DPW is in the process of producing concept plans to stabilize the outfall within the City's easement. The proposed work will likely involve removing sediment and installing riprap at the drainage outfall. The City will take no action in maintaining areas of the channel located on private property.

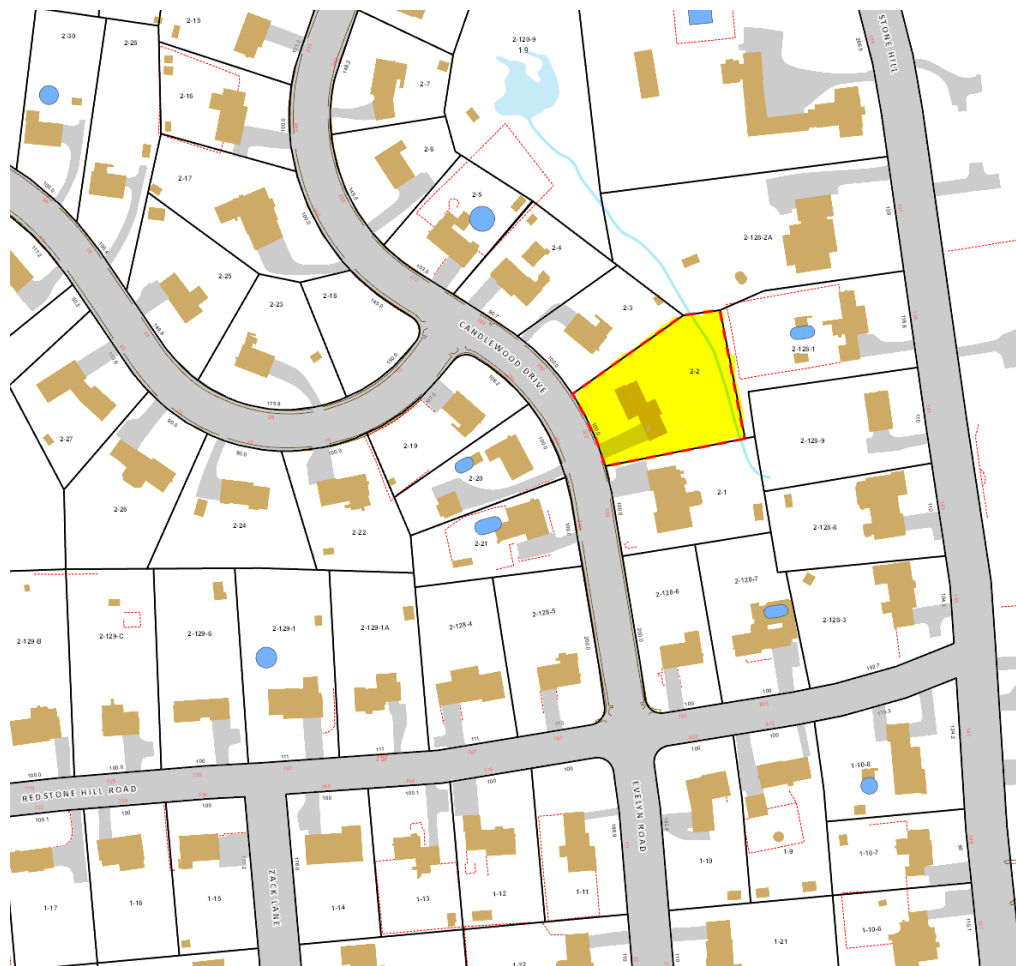


Figure 34: Location Map - 302 Candlewood Drive



Figure 35: Stormwater Overtopping Channel Banks

68 Litchfield Lane

Summary of Workorder:

Storm water from the street has been jumping the driveway apron and has caused flooding around the house.

Field Investigations:

During field investigations there did not appear to be sediment build up in any of the basins. The outfall was located and did not appear to be obstructed by sediment or debris.

Current Action:

The DPW sent a crew on site to clean the basins and jet the lines. The Department has contacted the homeowner and will continue to monitor the situation.



Figure 36: Location Map - Litchfield Lane

87 Collins Road

Summary or Workorder:

The resident claims that during the recent storm, water from the street has overtopped the basin in front of her house and has caused flooding in the yard.

Field Investigations:

A 12" drainage outfall located on the north side of the property discharges stormwater from the street to a wetlands area behind the house. The City is currently in the process of acquiring an easement from an adjacent property owner for a drainage improvements project that would involve upsizing the existing drainage pipe. Upsizing the existing pipe would require extending the outfall so it could drain to daylight.

Current Action:

The DPW has contacted the owner of 87 Collins Road and the adjacent property owner informing them that the City is requesting an easement for drainage improvements.



Figure 37: Location of Proposed Easement

215 Rockwell Avenue

Summary of Workorder:

During the recent storm a clogged drain pipe has caused flooding to several property owners.

Field Investigations:

An unnamed stream flows down a steep drop off located in the southern corner of the property. A private storm drain receives these flows and pipes them to the storm sewer along the street. During the storm on July 16th DPW forces unclogged the inlet of the private storm drain and cut a trench along the southwest side of the property. The trench helped to divert flows away from the house and direct them to a drain along the street. Within a few hours of doing so sediment had built up around the pipe and was again blocking flows.

Current Action:

The homeowner was informed that the inlet of the pipe is a part of their private drainage system and they should monitor and maintain sediment around the inlet.

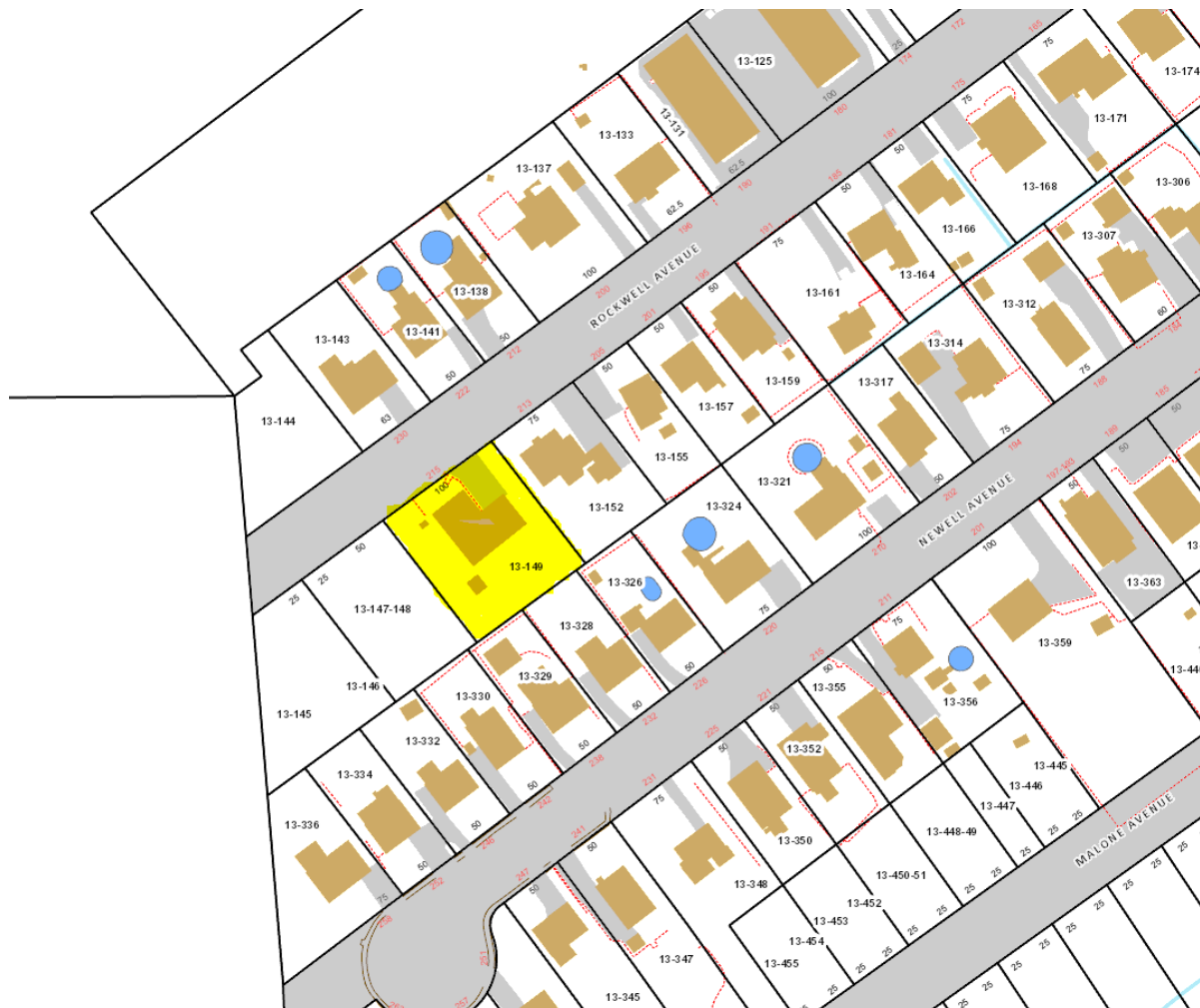


Figure 38: Location Map - 215 Rockwell Avenue

74 Peck Lane

Summary of Workorder:

Stormwater from the street has been jumping the curb and driveway apron and has caused erosion around the foundation of the house.

Email From Property Owner:

"Attached are photos showing the flash flood damage to our property, as well as the sidewalk above us and across the street affected by the same water flow. The photos progress in the direction the water flows. There are currently no storm drains on Peck Ln between our house and Maywood Ln. When flash flooding occurs there are multiple inches of fast moving water coming down Peck Ln and across our yard to hit our foundation. I think an additional storm drain above our house would help mitigate damage to our house as well as the sidewalk and street. I really appreciate your consideration."

Field Investigations:

The DPW inspected the existing storm system and when doing so observed evidence of stormwater flowing from the street onto private property toward 74 Peck Lane. The department believes this problem is largely contributed by not having any catch basins along the west gutter line for a 1,300' stretch uphill of the property. It is likely that storm water is channelizing along the gutter and overtopping the curb in front of 74 Peck Lane.

Current Action:

The DPW is currently in the process of developing a conceptual plan aimed to reduce the amount of stormwater that contributes to the flooding at 74 Peck Lane. Improvements will include installing a new catch basin(s) on the uphill side of the driveway, constructing a more substantial curb, and reconstructing the driveway apron with a standard sized lip.



Figure 39: Location Map - 74 Peck Lane



Figure 40: Erosion of Material Caused by Stormwater



Figure 41: Deposits of Eroded Material

George Street Culvert

Summary of Workorder:

During the storm on July 16th high water levels largely contributed to by a buildup of debris and intense rainfall caused severe flooding along South Street when water overtopped the George Street Culvert. The existing culvert is 6 ft x 8 ft in dimension and spans for approximately 900 ft.

Current Action:

A private contractor performed a visual inspection of the culvert and removed debris including a large obstruction at the outfall shown in the figure below.

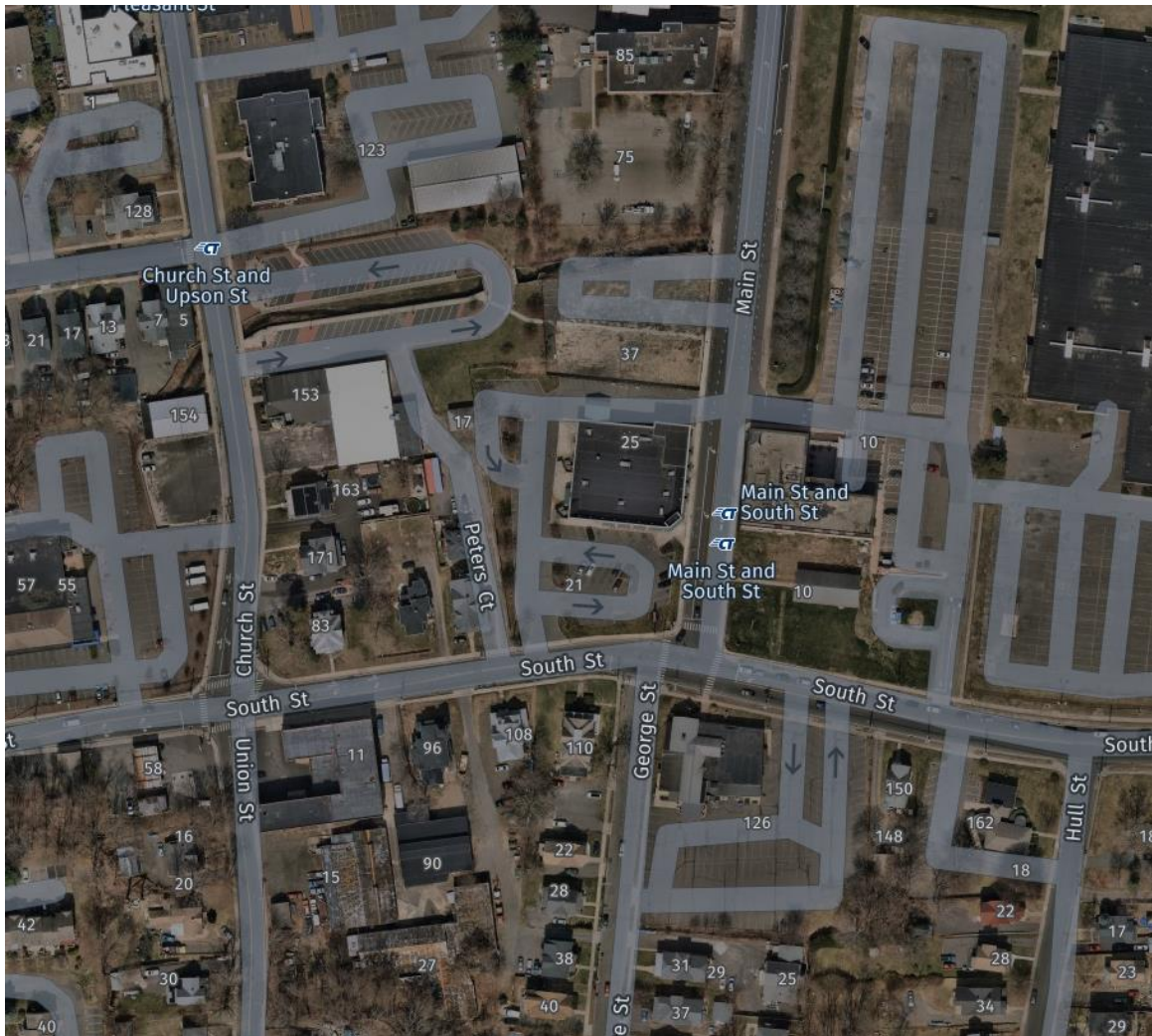


Figure 42: Location Map

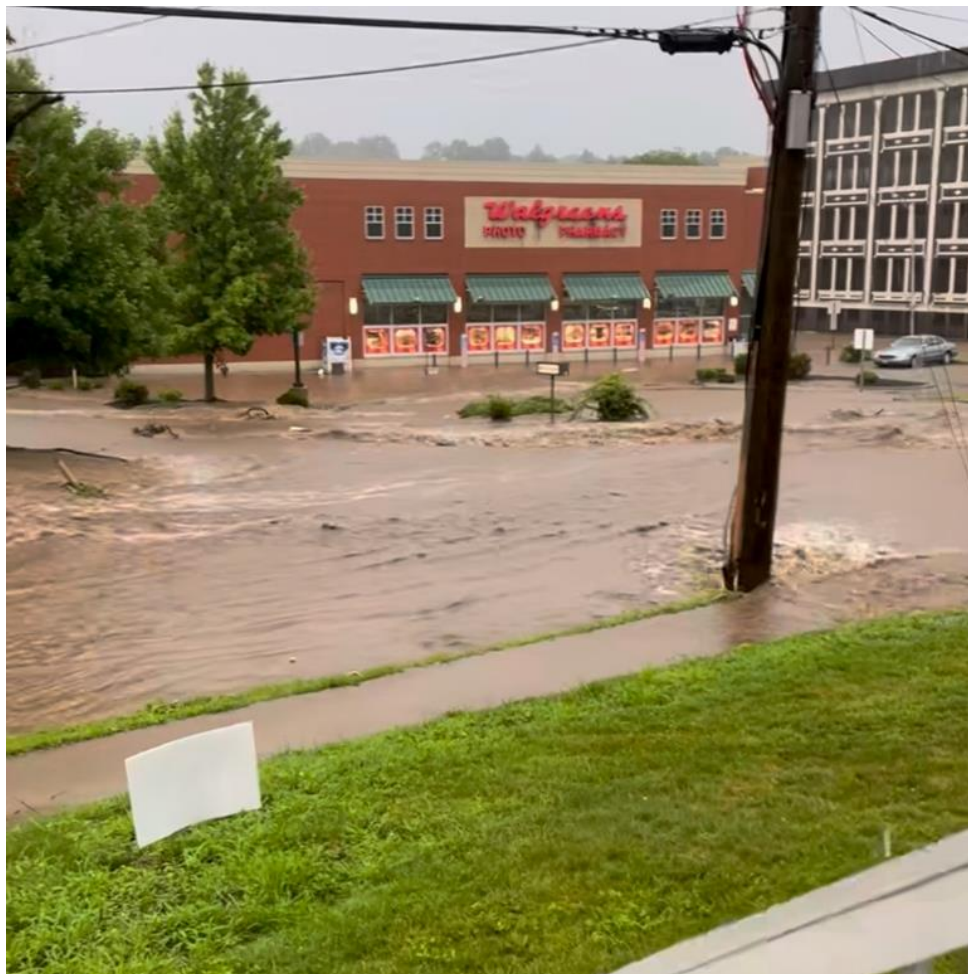


Figure 43: Flooding Along South Street



Figure 44: Debris Blocking Flows at Culvert



Figure 45: Obstruction at Culvert Outfall

Memorial Blvd. Retaining Wall

Summary of Workorder:

During the storm on July 16th a portion of retaining wall supporting the sidewalk parallel to Memorial Blvd. had collapsed.

Field Investigations:

The Pequabuck River runs west to east parallel to Memorial Blvd. During the storm on July 16th the water level of the Pequabuck reached a stage of 8.99-feet which is approximately 70% of the recorded high which occurred during the flood of 1955. These water levels at high velocity were able to dislodge large chunks of concrete and stone which were being used as the end treatment of an existing cast-in-place concrete wall. The section of wall that collapsed was approximately 15' in length.

Current Action:

A private contractor was contacted and will be submitting a quote to make repairs.

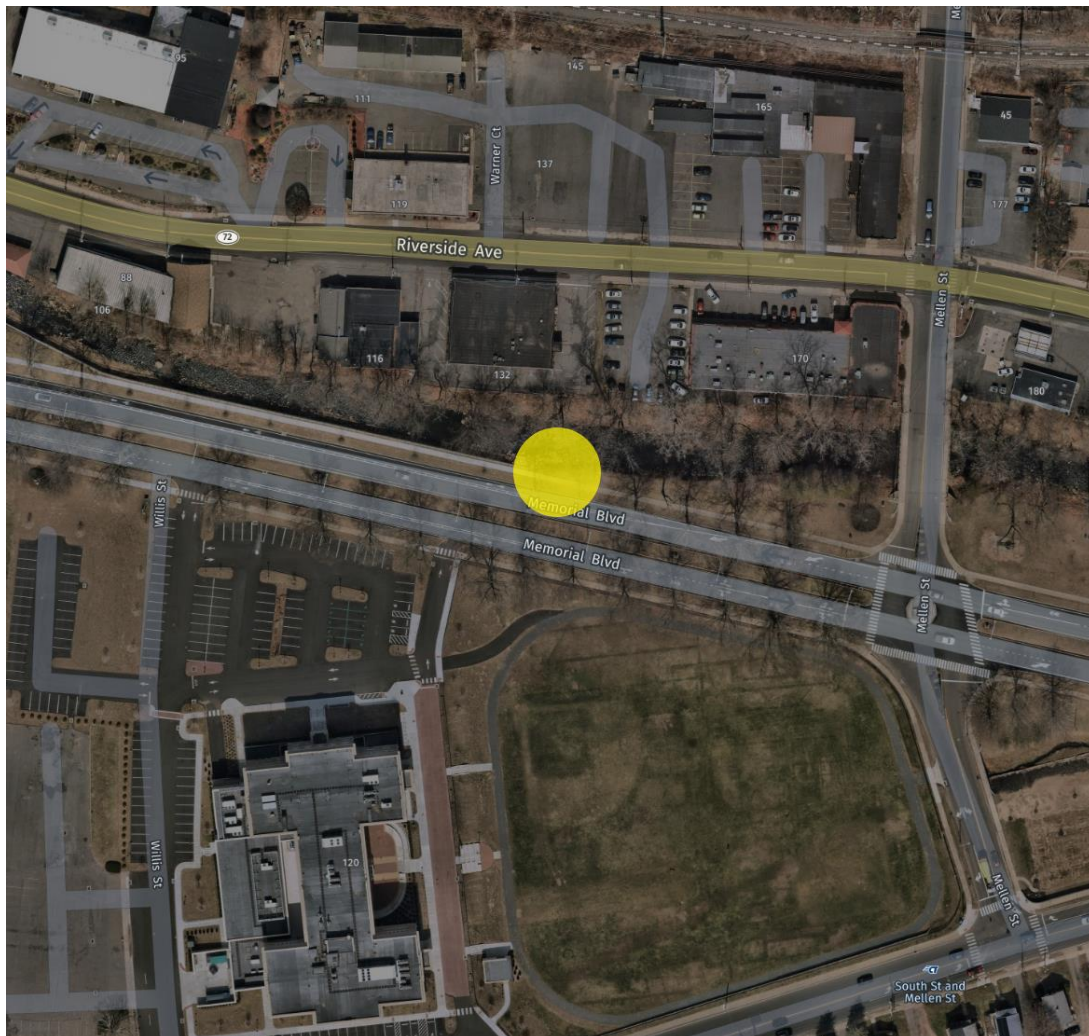


Figure 46: Location Map - Memorial Blvd. Retaining Wall



Figure 47: Collapse of Existing Dry Stack Stone Wall

James Street Culvert

Summary of Workorder:

Flooding overtopping the roadway and into several houses.

Current Action:

The existing culvert is currently owned and maintained by Laviero Contractors. Following the recent storms, Laviero was onsite to clear the culvert from brush and debris. The DPW also sent a crew to clean the existing basins and to sweep the street.

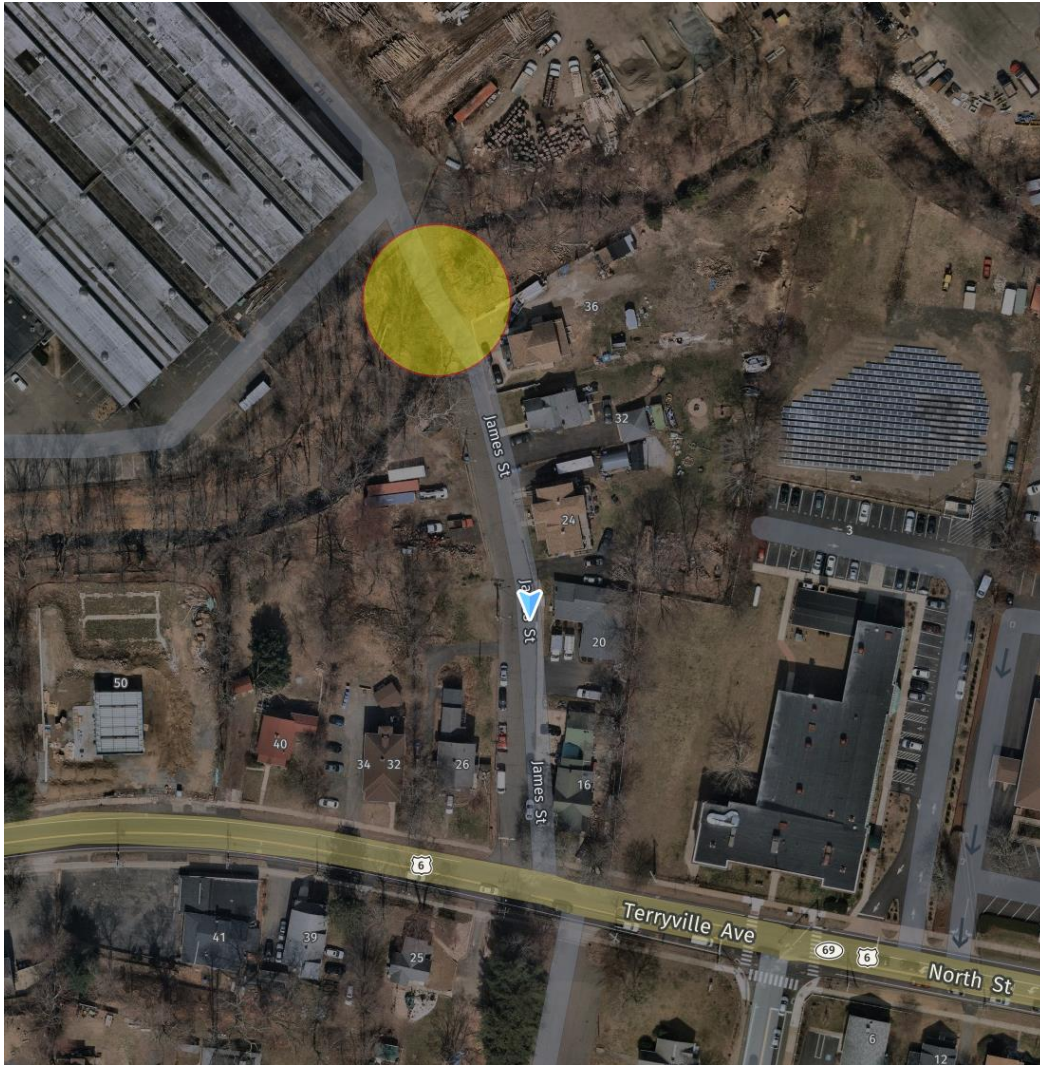


Figure 48: Location Map - James Street Culvert



Figure 49: James Street Culvert



Figure 50: Channel Looking Downstream



Figure 51: Debris Removed from Channel



Figure 52: Fish Washed On Shore From High Flood Water

Divinity Street Culvert

Summary of Workorder:

An unnamed stream flowing south to north crosses Divinity Street 250 ft east of the intersection of Peck Lane. Flows are facilitated by a 5 ft x 5 ft concrete box culvert which is hydraulically undersized. During the storm on July 16th floodwaters overtopped the culvert and caused significant damage do the adjacent properties as shown in the photos below.

Current Action:

The DPW sent a crew onsite to temporarily repair the damages to the adjacent properties. The Department is currently in the process of finalizing the design of a new culvert. The culvert size will increase from 5 ft high X 5 ft wide to 5 ft high by 8 ft wide. Work is scheduled to be completed after the completion of the CT DOT Route72/69 project. Culvert is currently on the West End intersection detour plan (2024).

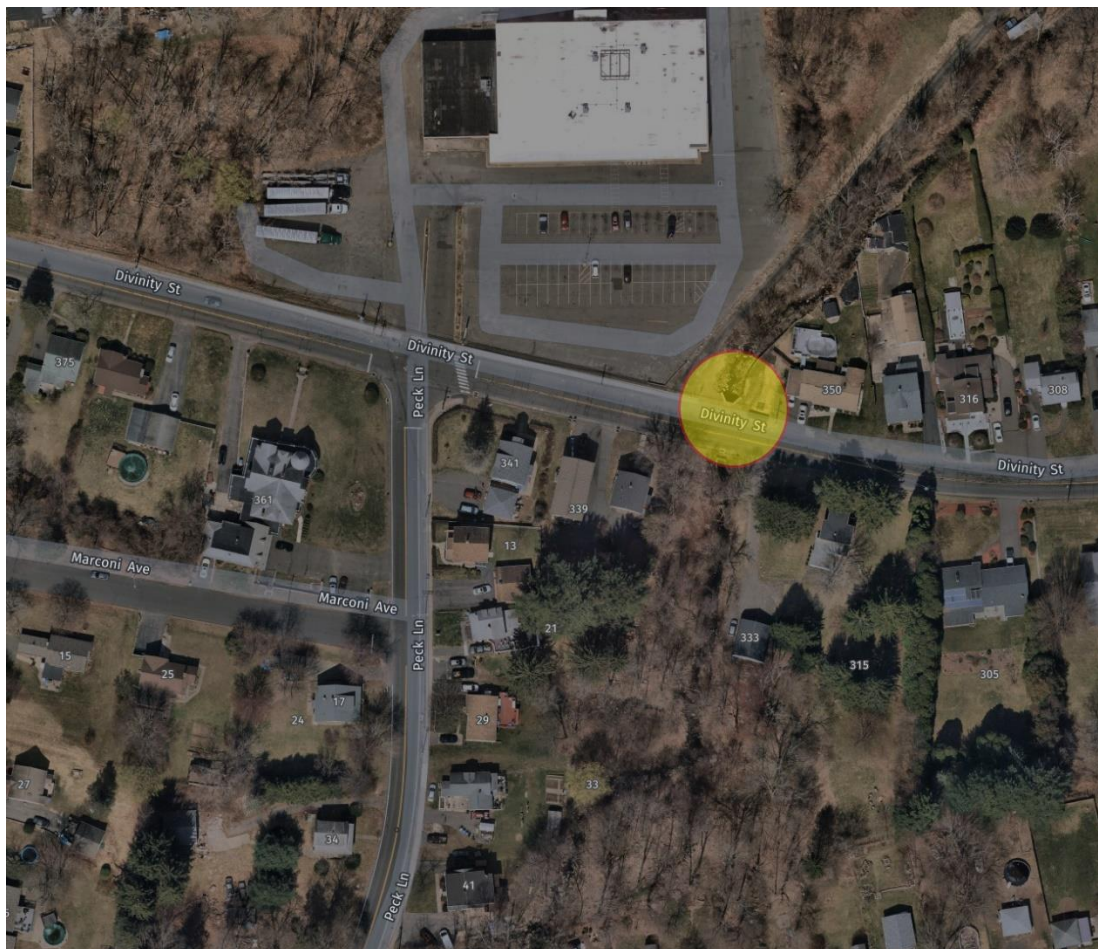


Figure 53: Location Map - Divinity Street Culvert



Figure 54: Damaged Driveway on Private Property



Figure 55: 316 Divinity Street Property Damage



Figure 56: 316 Divinity Street Property Damage



Figure 57: 316 Divinity Street Property Damage

West End / Park Street Flooding

Summary of Workorder:

An unnamed stream flowing west to east parallel to Park Street caused severe flooding when water overtopped the roadway during the storm on July 16th. A large contributor to the flooding was a private culvert clogged with 30'-40' of debris. The buildup of debris was partially caused by an exposed gas lateral penetrating through the culvert. Due to the blockage flows were forced out of the channel and over the roadway. Another large contributor to the flooding was a dumpster upstream that was washed into the watercourse and became lodge against a pedestrian bridge impeding flow. The flooding extended from the culvert along Park Street to the intersection of RT 69.

Current Action.

The culvert has been cleared by a private contractor as directed by the DPW. DPW has approached Eversource regarding relocation of the lateral as to help prevent the buildup of debris in the future.

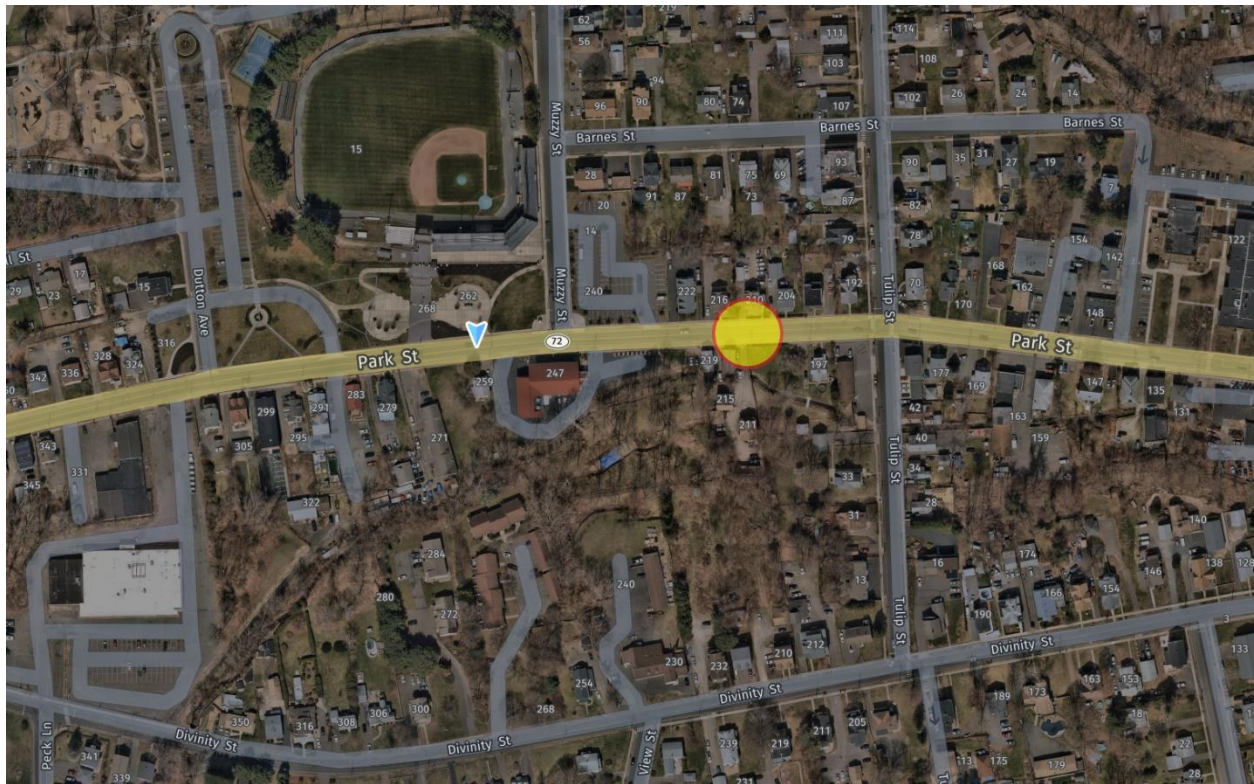


Figure 58: Location Map of Private Culvert



Figure 59: Flooding Along Park Street



Figure 60: Private Culvert Cleared of Debris



Figure 61: Buildup of Debris Within Private Culvert



Figure 62: Dumpster Obstructing Flows

King Street

Summary:

During the storm on July 16th Page Park Pond overflowed spilling water onto King Street. DPW cut a trench to divert floodwaters off of King Street as shown in the photos below. Page Park Pond is being pumped down. Page Park Revitalization project will be reviewed upon submission. The purpose of the project is to improve the control of floodwater and to mitigate future flooding.



Figure 63: Location Map



Figure 64: Ponding at Page Park

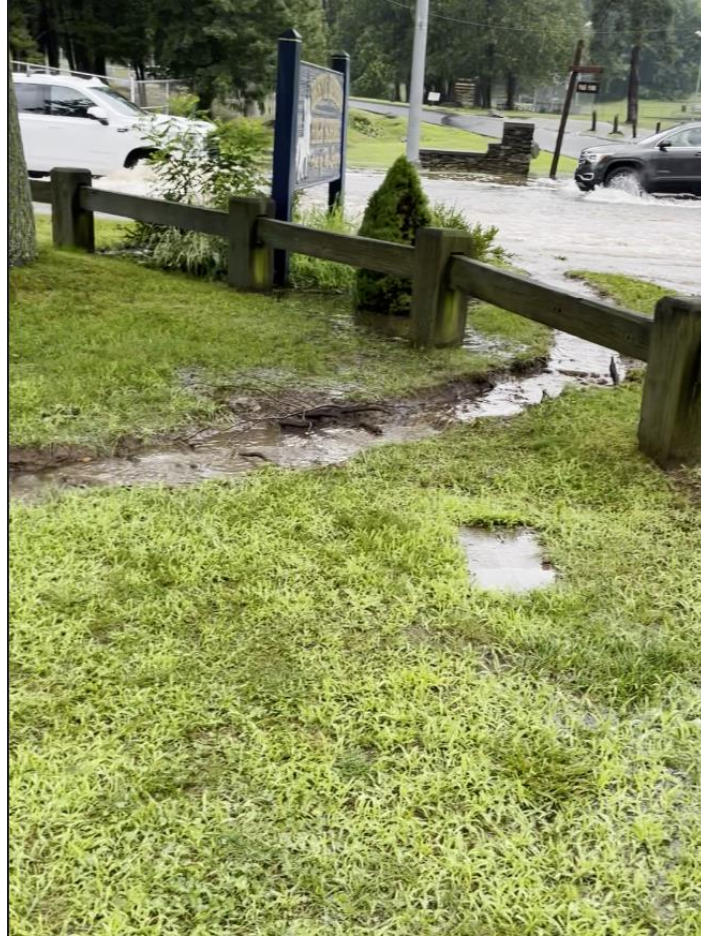


Figure 65: Swale Cut Along King Street

Frederick Street

Fredrick Street is carried over the Coppermine Brook south of the intersection of Curtiss Ave. During the flood of July 16th waters of the Coppermine reached near record highs. The area west of the Fredrick Street bridge is a low point of the roadway and experienced flooding. The bridge did not overtop. However, the road was closed due to flooding for approximately 3 hours after the storm.

DPW has provided regular maintenance of the area on the bridge to ensure flow during storm events. The existing debris will be removed along with the sediment under the bridge. Due to flooding the property owner pumped water out from behind the berm into the Coppermine Brook.

Email From Home Owner:

"Well as you know, we got hit with flooding on July 16, 2023. We should be getting help from the city to pump out our backyard. We have to pump out your open space in order for us to get dry and start our clean up.

Still waiting for our drain to be installed in our backyard.

I would appreciate the storm drains being cleaned thoroughly due to all the silt. I think this should be an automatic in the future after street flooding. Also road should have a sign to warn about potential water on the street. The street should also closed with a barricade not caution tape.

I cleared out the storm drains on the street and also the drain in Theis's parking lot. The parking lot was totalled blocked.

The owner of Black Bear finally removed the tree, blocking the Coppermine.

Please communicate at your earliest convenience on the progress moving forward."



Figure 66: Location Map - Frederick Street Bridge

Sharon Road

Summary of Workorder:

Severe Flooding Along Sharon Road between Lexington St and Burlington Ave (CT Route 69). DPW completed installation of new storm drainage in 2018. The project consisted of increasing the old pipe size from Lexington to the property on Burlington Ave. The new pipe more than doubled the pipe area/capacity. The Department believes the reason Sharon Road is still experiencing flooding, even after the recent drainage improvements project, is due to the State-Owned system receiving flows from Sharon Road. This system is undersized and does not have enough capacity to handle the stormwater.

Email From Property Owner:

"I'm writing to you in hopes that we can once and for all resolve the drainage issue on Sharon St. Every time there is significant rain, the drains can not handle the volume of water causing the road to flood. This issue was apparently corrected when they put in new pipes however there is still an ongoing issue. We are supposed to be in a non flood zone area. We shouldn't have to worry about our street flooding and rising so high that it's 5 inches above the basement windows and entering our homes. When there is significant rain, the situation escalates rapidly and more severe. Not only does Sharon St. flood, but the water from behind us on Lexington St flood up and over into our yards completely surrounding and flooding out at least 4 homes (2 on Sharon St and 2 or 3 on Lexington St.) We are not by the Pequabuck River, nor have any local streams. This is purely a City of Bristol drainage issue, that needs to get addressed. The work that was recently done to repair the drainage issue failed and actually made it worse because neighbor's yards that didn't flood, are flooding now due to the grade put in the driveways and yards when the."

Current Action:

DPW jetted/cleaned the drainage piping to ensure that it clear and is scheduled to perform a video inspection of the pipe connecting into the Burlington Ave (CT Route 69) drainage system to ensure that there are no blockages. We are also modifying the down gradient manhole grate to increase flow. DPW will be contacting the State regarding increasing the capacity of the Burlington Ave (CT Route 69) drainage system.



Figure 67: Location Map - Sharon Street Flooding



Figure 68: Sharon Street Flooding



Figure 69: Sharon Street Flooding



Figure 70: Sharon Street Flooding



Department of Public Works | 860.584.6125

MEMORANDUM

DATE: September 5, 2023 revised/updated from June 5, 2023

TO: Mayor Jeffrey Caggiano
Board of Public Works

FROM: Raymond A. Rogozinski, P.E., Director of Public Works

RE: Revised FEMA Mapping – Pequabuck River and Coppermine Brook (Farmington River)

FEMA is currently in the process of revising and updating the flood plain/floodway maps for the Pequabuck River and Coppermine Brook. The FEMA map revisions are for the entire Farmington River and its tributaries, and therefore include the Pequabuck River and Coppermine Brook. The work will include a new detailed study with new hydrology (flow) and hydraulics (water elevation) analysis.

Based on a review of the draft maps, the base flood elevation (BFE) of the water surface during a 100-year flood event is indicated as approximately 1 to 1.5 ft. lower than the current elevation in large areas of the Pequabuck River. However, there are areas along the river where the draft maps indicate an expansion (increase area) and decreases of the flood plain. In addition, the maps depict isolated areas of flood hazard areas known as Flood Zone A. These areas, identified as Flood Zone A, are regulated as Flood Zones, however, a BFE for a 100-year flood elevation has not been established. As a result, Zone A areas require additional analysis by an engineer to establish the BFE required for a flood plain permit, or to establish defined elevations to obtain potentially lower flood insurance rates.

The DRAFT maps of the Special Flood Hazard Areas are available for review [online](#)

The above link was provided to the City by the engineering consultant firm performing the remapping work, CDM Smith Inc.

The City has received the preliminary FEMA maps and studies. The preliminary mapping include vertical profiles of the water surface elevations. The extent of the changes from the currently FEMA mapping to the PRELIMINARY maps is currently being evaluated however it appears approximately 200 houses will be removed from the flood plain and approximately 200 houses not previously in the flood plan will now be included within the flood plain zone.

The revisions to the City's FEMA flood plain maps will have a critical impact on the City. The current proposed revisions to the FEMA flood plain maps have increased the flood plain in certain areas, and have decreased the flood plain in other areas, which will impact both development and flood insurance cost to property owners.

Based on correspondence with the Department of Public Works, CT DEEP provided the following information associated with the proposed FEMA map revisions and FEMA flood plain management requirements:

- 1. The City of Bristol joined the National Flood Insurance Program (NFIP) on November 18, 1981 and received its first flood insurance rate map (FIRM) and flood insurance study (FIS) from FEMA. A FIRM depicts the boundaries of the 100-year floodplain and base flood elevations (BFE). The hydrologic and hydraulic analysis for all significant flooding sources in Bristol was completed in 1978 and included in the 1981 FIRM and FIS. Prior to entry into the NFIP, Bristol received an initial Flood Hazard Boundary Map (FHBM) from FEMA on May 17, 1974. FHBM are based on approximate flood hazard data and provided the general the location of the 100-year floodplain within the community.*
- 2. The NFIP is a direct relationship between FEMA and the local community. When a community chooses to join the NFIP it must adopt the FIRM, FIS and the minimum NFIP floodplain construction requirements (44 CFR 59.1 and 60.3) into its zoning regulations or a stand-alone floodplain ordinance. Through this adoption of FIRM, FIS and regulations, the City has committed to the enforcement of these standards, and as a result federally-regulated flood insurance is made available to Bristol property owners. Flood insurance is required by a lender as a condition of a mortgage if the structure is located within the mapped 100-year floodplain. Although there are some private insurance companies that write flood insurance, it is much easier for a property owner to obtain insurance through the federal program that will satisfy the lender's requirements.*
- 3. The initial 1981 FIRMs depict the 100-year floodplain boundaries superimposed over simplified street maps. No aerial photography was used on these FIRMs. They were simple blueprint style maps and depicted the floodplain only within the Bristol corporate limits. At this time FEMA provided each participating community its own floodplain mapping.*
- 4. Bristol FIRM were then revised on September 26, 2008. The FEMA Map Modernization initiative combined individual community maps into a countywide format. This goal of this initiative was to take paper maps and convert them to a digital product in order that they were more accessible to users and easier to update in the future. Bristol was included in the FIRM and FIS for Hartford County. These new countywide maps included aerial photography and an updated vertical datum (NAVD88). Updated topographic data was included in this map revision that refined floodplain boundaries. The revised maps made it easier to locate property but did not include updated hydrology (elevation of 100-year flood water surface level). The countywide maps were updated again on September 16, 2011 following a detailed study of the Connecticut River watershed, however this update did not produce any updated FIRM panels for Bristol. On May 16, 2017, one FIRM panel in Bristol was updated through the Quinnipiac River watershed re-study project.*
- 5. Bristol is currently part of the Farmington River watershed study initiated by FEMA. This project includes 23 communities in Hartford and Litchfield Counties. The project began with a Discovery Meeting on September 25, 2018. Draft works maps were issued to the communities on July 21 and 22, 2020. Bristol had an individual meeting to discuss its work maps with FEMA on August 11, 2020. Preliminary FIRM and FIS are schedule to be issued to communities on June 8, 2023. These proposed FIRM revisions will include updated hydrology and will depict new 100-year floodplain boundaries and base flood elevations (BFE). Updated topographic data is also used in this study.*
- 6. These updated FIRM may increase or decrease the floodplain boundary on a particular property. FEMA does provide resources to communities to identify the changes in the floodplain from existing to proposed mapping.*



Department of Public Works | 860.584.6125

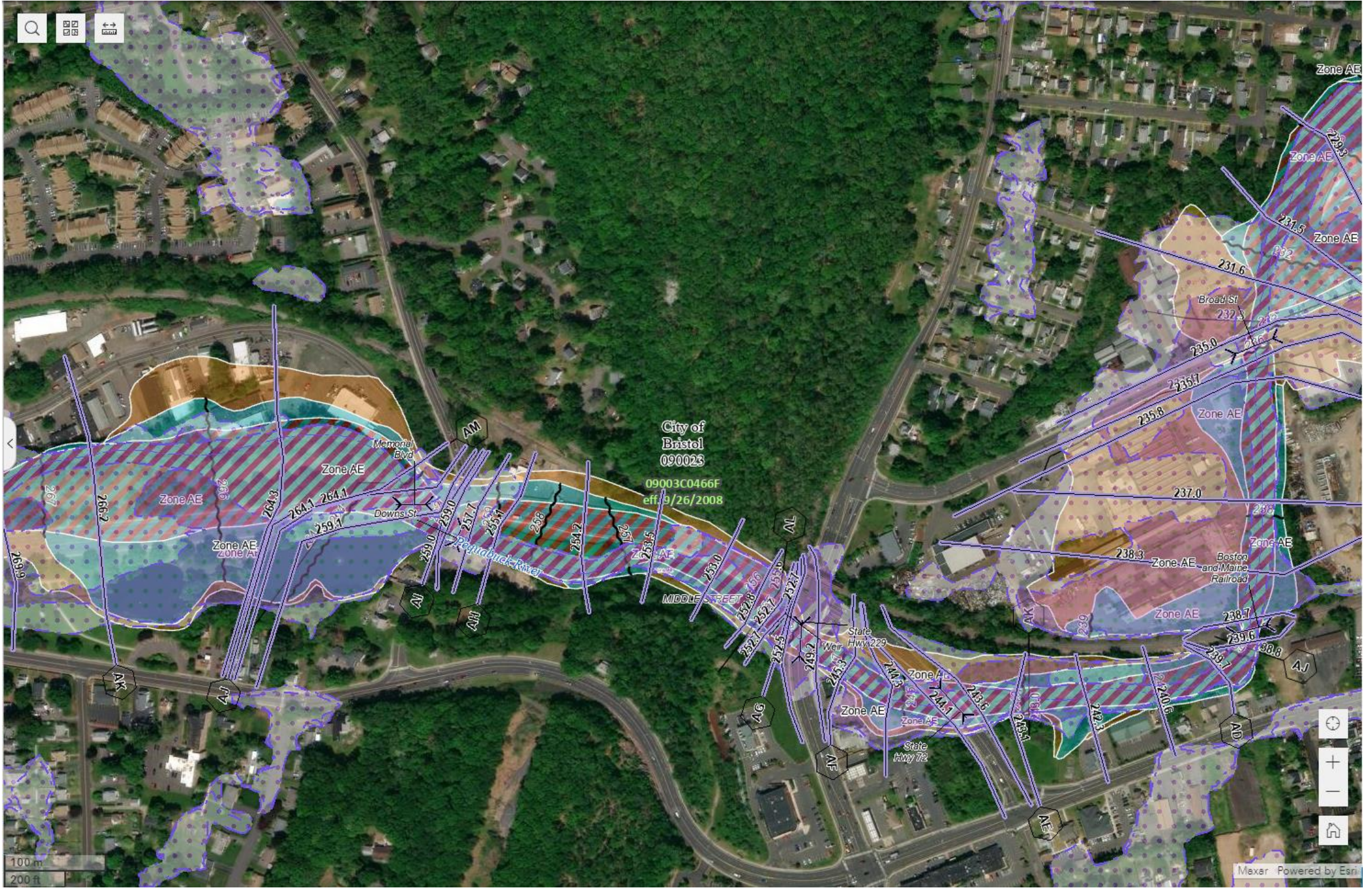
7. *Federally-insured or backed lenders are required to determine if a structure is located in the mapped 100-year floodplain and require flood insurance as part of a mortgage, home equity line or construction loan. This is called the "Mandatory Purchase Requirement". Lenders typically hire a flood determination company to determine if a structure is located in the floodplain.*
8. *The cost of flood insurance is increasing as prior grandfathering rules and subsidies are slowly being removed due to past federal flood insurance legislation (Biggert-Waters Flood Insurance Reform Act of 2012 and Homeowners Flood Insurance Affordability Act of 2014). FEMA recently introduced a new premium calculation methodology called Risk Rating 2.0 which includes many more rating criteria in order to achieve a more individualized premium.*
9. *FIRM and FIS are prepared by FEMA and its hired mapping contractor. Municipalities and state agencies participate in the mapping update process through meetings and feedback on work maps. A formal appeals process is also included in the map update procedure. Outside of a formal mapping study, map amendments and revisions require a formal request to FEMA and the services of either a Licensed Surveyor or Licensed Engineer, or both depending on the complexity of the request. These requests are called Letter of Map Amendment or Letter of Map Revision (LOMA or LOMR) and FEMA provides standard forms for these requests. A statement from a property owner indicating that the property has not flooded is not considered as factual data in the LOMA or LOMR process.*

The FEMA map amendment process includes an appeal period, however the appeal requires engineering data to substantiate a map revision. Property owners indicating that their property have not flooding in the past is insufficient to justify an appeal. Since the new maps are based on new topographic lidar, hydrology and river hydraulic including a complete computer HEC RAS model of water surface elevations, providing engineering support for a map appeal is an extreme challenge.

Please feel free to contact me with any questions or concerns at 860-584-6113.



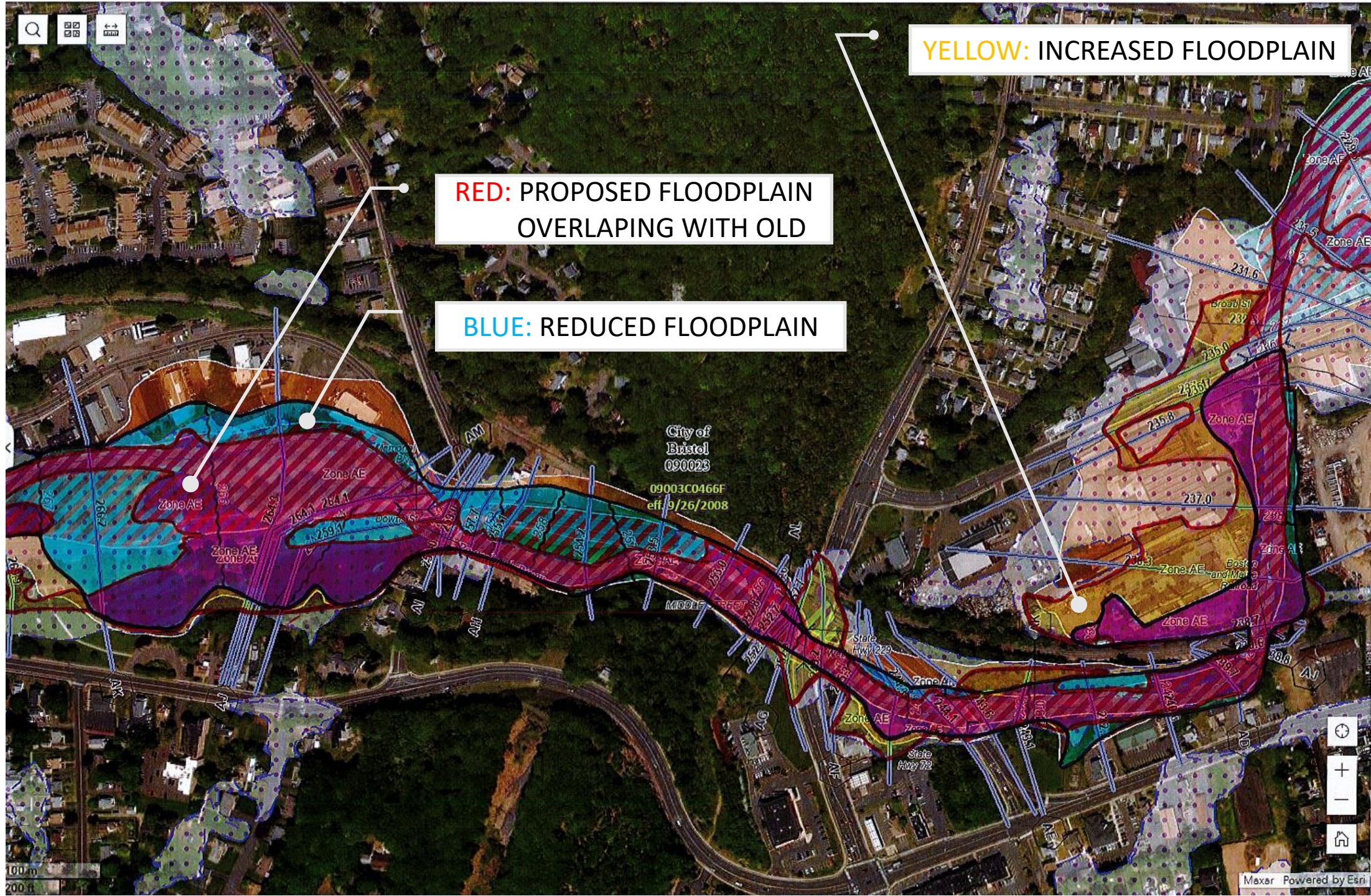




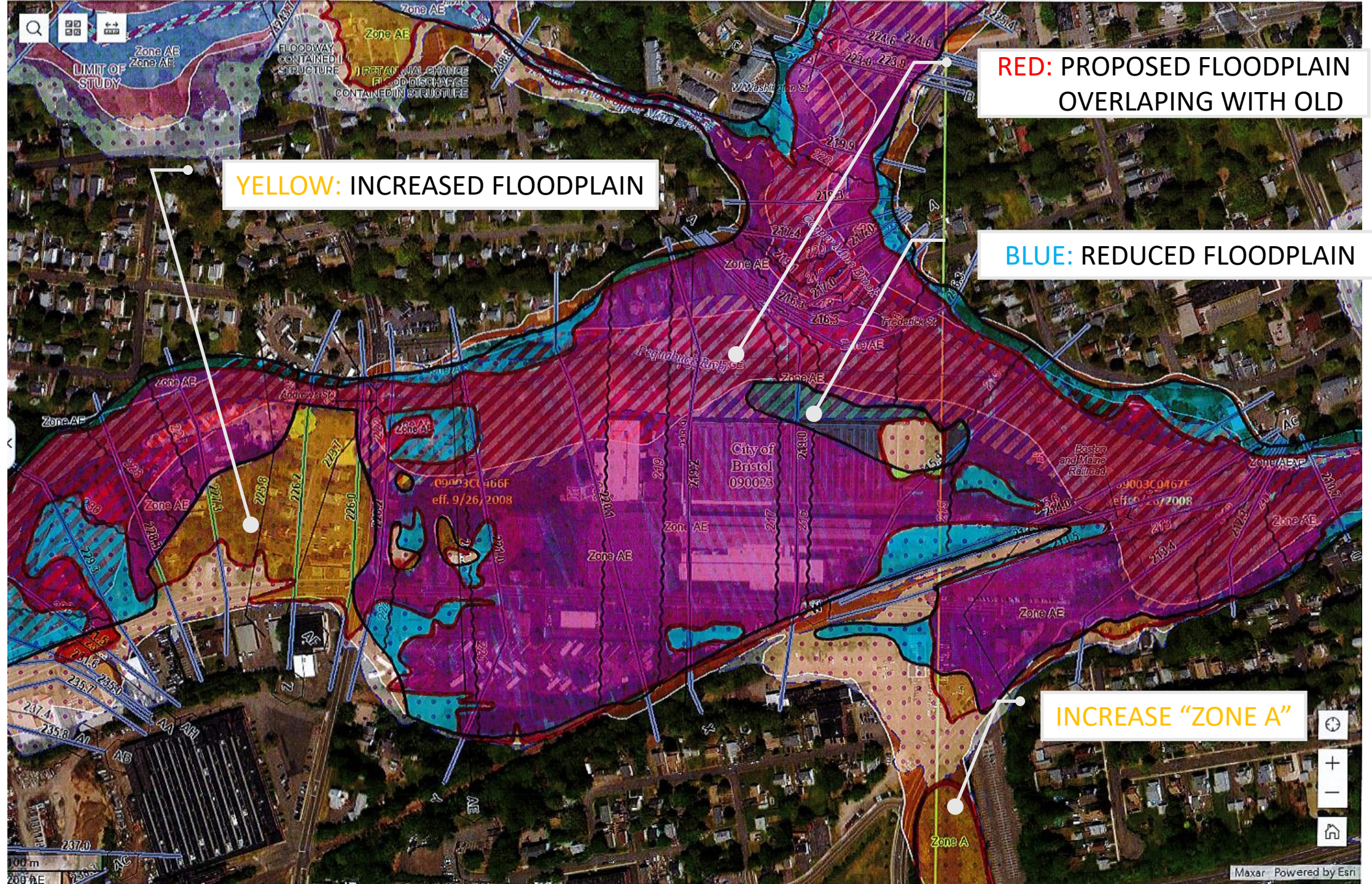
YELLOW: INCREASED FLOODPLAIN

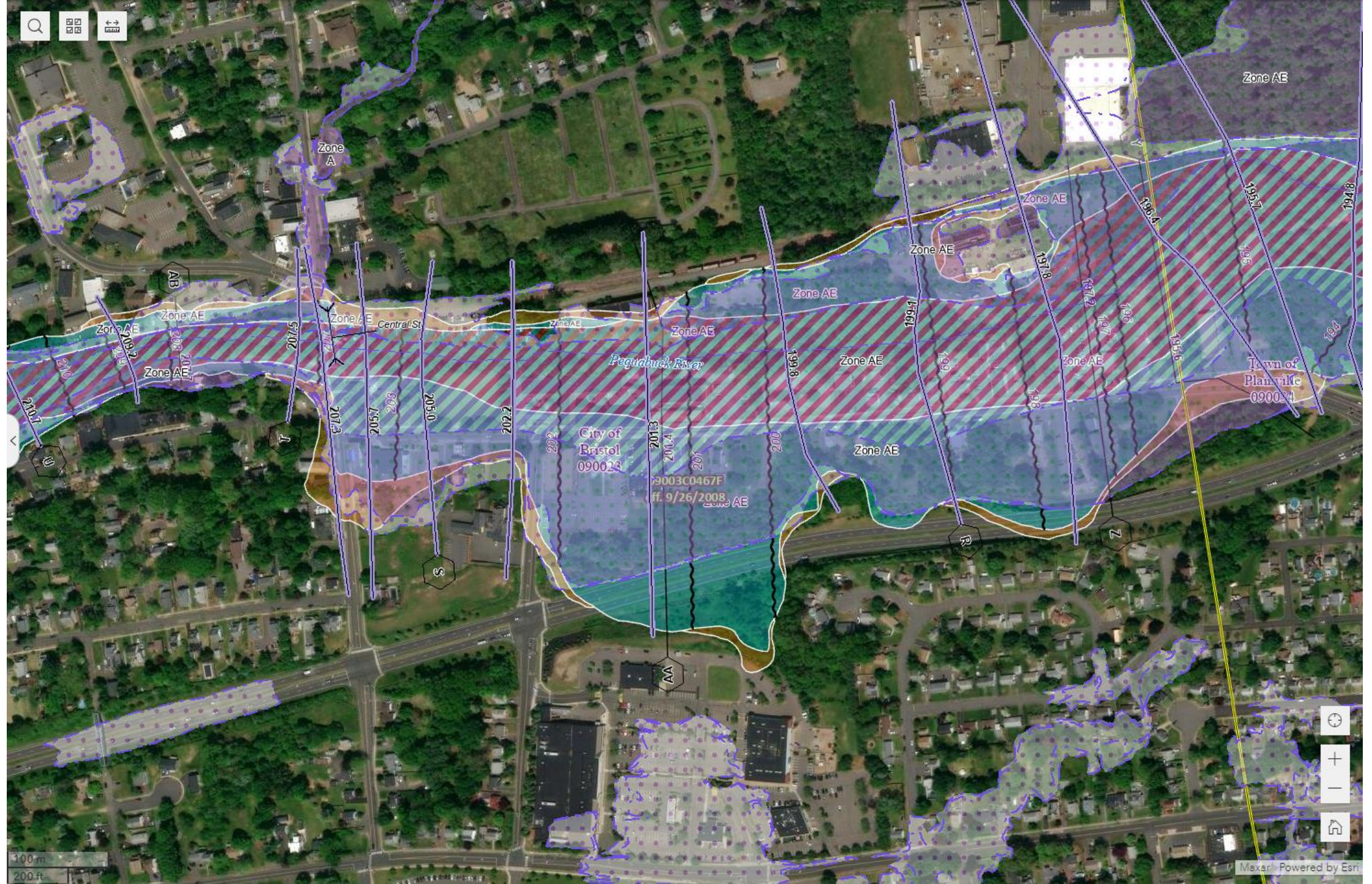
RED: PROPOSED FLOODPLAIN
OVERLAPING WITH OLD

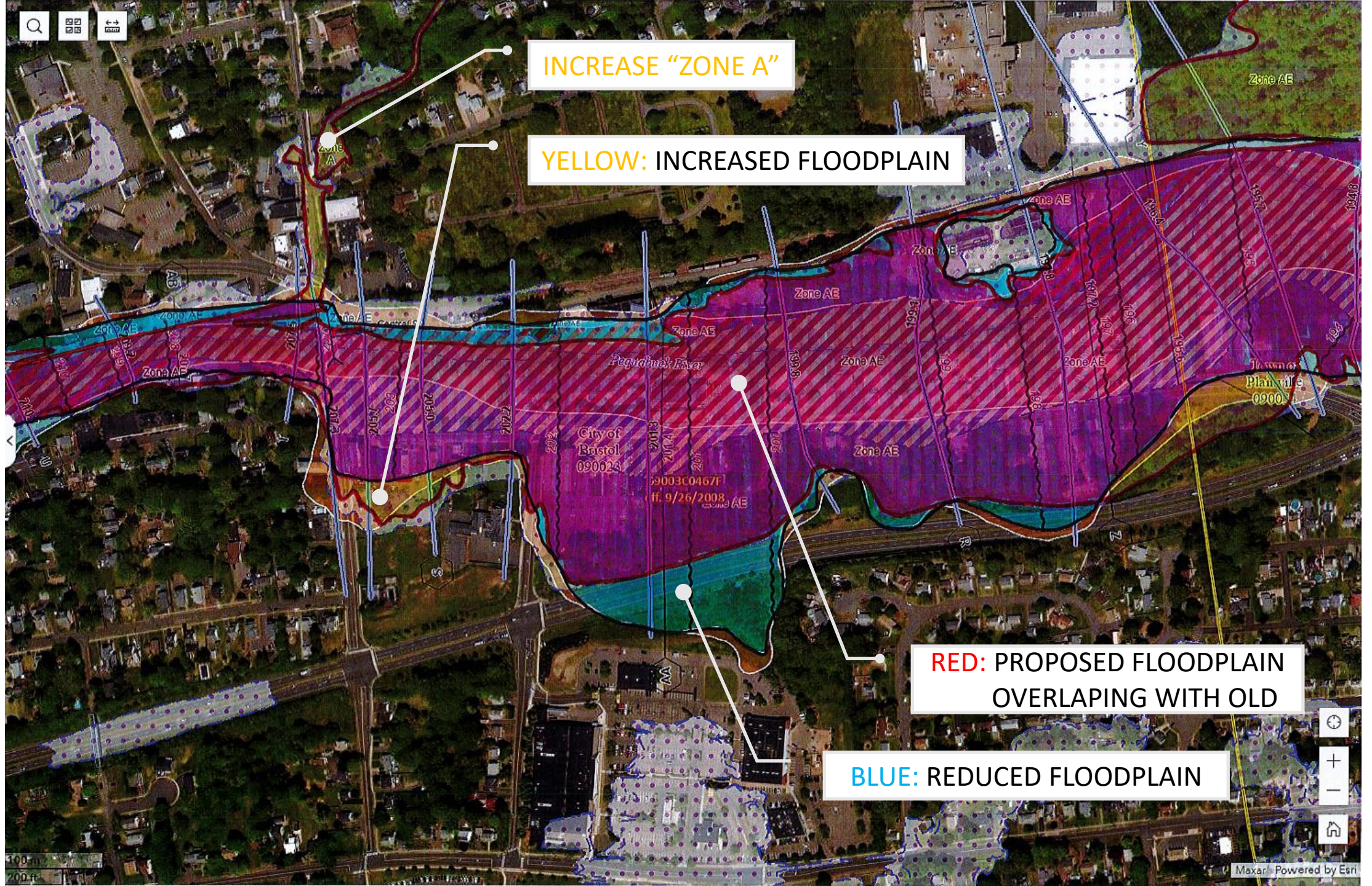
BLUE: REDUCED FLOODPLAIN













Department of Public Works | 860.584.6125

MEMORANDUM

DATE: September 5, 2023

TO: Mayor Jeffrey Caggiano
Flood Erosions Control Board & Board of Public Works
FROM: Raymond A. Rogozinski, P.E., Director of Public Works

RE: DPW – CT DEEP CLIMATE RESILLIENCE GRANT

The City has received a Climate Resilience Grant in the amount of \$250,000 from CT DEEP. The purpose of the grant is to assist residents in becoming more resilient to flooding. The proposed grant work will include an engineering analysis of the Pequabuck River and Coppermine Brook flood plain to determine if there is an engineering solution that will mitigate flooding. However, as indicated in the attached grant application “ *The City has participated in several mitigation measures that have included realignment of river channel reaches, expansion of floodways/ overflow channels, property acquisitions, and revisions to land use regulations and public outreach/education about FEMA regulations and resources. To date the measures have been isolated and associated with specific projects or the planning has consisted of a regional (multi-community) approach. The City is seeking this grant to expand past resiliency planning measures to include a comprehensive approach across flooding affected areas within the Pequabuck River and Coppermine Brook watershed/floodplain areas while focusing on activity within the City.*” Base on the findings of previous completed flood studies, the Department of Public Works does NOT anticipate the identification of a project that will prevent or mitigate flooding across the City.

A critical component of the grant is to provide community outreach to residents to advise them of floodplain limits, regulations, insurance requirements, practices/methods to potentially reduce flood insurance requirements/cost and advise residents and what cost are covered by typical flood insurance. As part of the grant, a community emergency plan will be developed to address roadway flooding that cuts off and isolates sections of the City during large storm events. In addition to a City service emergency plan, public education will be provided to residents of the flood-prone areas to assist in the development of individual action plans. These plans would address evacuation routes, alternate housing, moving of vehicles, and plans for the retention of important papers and insurance policies/ bank records.

The grant will also identify potential land parcel that should be considered as open space acquisitions due to flooding. The grant will also review City land use, drainage requirements and develop a cost benefit ratio associated with open space acquisitions for flooding purposes.

A copy of a previous prepared letter report dated October 12, 2021 outlines potential sources of flooding assistance and indicates the viability of receiving assistance.

Feel free to contact me at 860-584-6113 with any questions/concerns.

DEEP Climate Resilience Fund

TRACK 1: PLANNING APPLICATION

September 6, 2023

Section 1 – Applicant Details

1.	Applicant name:	City of Bristol
2.	Mailing Address:	111 North Main Street Bristol, CT 06010
3.	Primary Contact Name:	Raymond Rogozinski
	Primary Contact Email Address:	raymondrogozinski@bristolct.gov
	Primary Contact Phone Number:	860-584-6191
4.	Fiscal Agent name:	Diane Waldron
	Fiscal Agent contact email address:	dianewaldron@bristolct.gov
	Fiscal Agent contact phone number:	860-584-6128
5.	Organization EIN:	06-6001866
6.	Requested Amount:	\$250,000

Section 2 – Proposal Overview

1.	Which of the following relevant hazards will your plan or project address? (select all that apply)	☐ Extreme precipitation ☒ Flooding from riverine (including ice jams and dam failures), stormwater, tidal sources, or a combination. ☐ Sea level rise (including groundwater impacts) ☐ Extreme temperatures (heat and cold) ☐ Extreme weather (winter storms, nor'easters, severe thunderstorms, tornadoes) ☐ Tropical storm and hurricane impacts ☐ Windstorms ☐ Fire ☐ Drought
2.	☒ [CHECK BOX] I understand that all plans must examine climate change impacts to 2050 or beyond and that DEEP will provide technical assistance for support throughout the process.	
3.	☒ [CHECK BOX] I understand that a climate change vulnerability assessment is a required component of the resilience plan and that the assessment will examine how climate change and related extreme weather will affect community function and assets, including to identified critical facilities and community lifelines.	
4.	Is your planning team including a budgetary request for grant writing for federal resilience funding at the end of the planning process as part of this application? (Note: this is an allowable cost and is encouraged for planning teams that want to pursue federal resilience grant competition funding for next steps.)	☐ (a) Yes.
		☒ (b) No. We have our own support for applying for federal resilience grant funding.
		☐ (c) No. We do not intend to apply for federal resilience grant funding.

Section 3 – Community/Regional Overview

5.	What type of plan will this be?	☒ (A) Municipal scale (See question 6) ☐ (B) Regional scale (Go directly to Question 7) ☐ (C) Neighborhood/Hyper-Local scale (Go directly to Question 8)
6.	Which municipality/municipalities will this plan serve? Please include a map of the municipality (a screenshot of a Google map is fine).	Bristol
7.	(Only answer if you selected B in Question 5) If this is a regional plan, please note the boundaries and how these municipalities/entities have worked together on any previous planning. Please include a map of the plan area (a screenshot of a Google map is fine).	Click or tap here to enter text.
8.	(Only answer if you selected C in Question 5). If this is a hyper-local/neighborhood level plan, please describe the boundaries of this neighborhood Please include a map of the plan area (a screenshot of a Google map is fine).	Click or tap here to enter text.
9.	For all plans, please describe any partnership between municipalities and community-based organizations for this proposal and list specific partners that will be receiving any funding as subawards. The City will direct the consultant to contact the Foresville Village Association and the West End Association to engage their members as well as the general public in educational sessions and public hearings that solicit their views on flooding remediation opportunities.	

10.	Please give a brief overview of current resilience-related issues and concerns. (Do not discuss any previous resilience planning in this section, just focus on any identified concerns and issues.)
	The Pequabuck River flows west to east, bisecting the City of Bristol, and ultimately flowing into Farmington River. The Coppermine Brook runs through the center of the City from the north to join the Pequabuck River in the Forestville section of town. This smaller brook overflows its banks during storms and especially when snow melt is high, despite the City having invested in bridge and culvert reconstruction and maintenance. Most days these bodies of water form an unobtrusive element of the Bristol landscape. However, they have historically flooded their banks and impacted the surrounding landowners, which include residential as well as commercial entities. While much of the problem is considered “nuisance flooding” (below ground and impacting primarily basement areas), the impact still represents loss of property as well as threats to public health and utility service delivery.

Section 4 – Vulnerable Populations

Executive Order 21-3 states that at least 40 percent of the resources in this program MUST go to planning activities/project development that serves vulnerable populations. For example, if DEEP awards a total of \$10 million in planning grants, at least \$4 million of that amount must directly serve vulnerable populations as defined in Section 16-243y(7). The questions in this section will help DEEP evaluate whether your proposed plan will benefit vulnerable populations.

11.	Is your plan located in an Environmental Justice municipality or census tract identified on the DEEP Connecticut Environmental Justice Communities map?	☒ Yes ☐ No
12.	Is your plan located in a community eligible for community reinvestment pursuant to section 36a-30 and the Community Reinvestment Act of 1977, 12 USC 2901 et seq., as amended from time to time?	☒ Yes ☐ No
13.	People who are considered vulnerable to climate change with limited capacity to adapt include: • Communities of color • Children and seniors • Low-income communities • People with disabilities • Pregnant people • People with Limited English Proficiency (LEP) • Other historically disadvantaged people • People impacted by the social determinants of health • Populations identified by the American Public Health Association.	

	Tell us more about the vulnerable populations in the planning area? Be specific and include data if available. The planning area includes the city's designated "Opportunity Zone" (census tract 4061), as well as census tracts 4057 and 4060.01 (very low income) and census tract 4052.02. These are areas through which the Pequabuck River and Coppermine Brook flow (and which have flooded in the past several years). The Opportunity Zone includes a section of the West End, which has a high concentration of low income households, elderly housing, and people with Limited English Proficiency (LEP). A map of the City is attached that shows census tracts identified as "Moderate," "Low," and "Very Low" income.
14.	How will your plan and planning process benefit the people you have identified as vulnerable? Be specific. By partnering with community groups and local churches, as well as social service agencies that serve individuals in the target area, the City will host meetings to obtain input from groups identified as vulnerable. These include LEP population, clients of St. Vincent DePaul Shelter, Chrysalis House, Bristol Housing Authority, Human Resource Agency of New Britain, the Bristol Boys & Girls Club, Agape House, Brian's Angels Homeless Outreach, and the West End Association. The Commission on Persons with Disabilities, the "Bristol Cares" networking group, and the Task Force to End Homelessness are among the groups that will be called upon to facilitate this outreach activity. St. Joseph Church has a large Spanish-speaking congregation which will be contacted to establish date(s) for a community meeting, and other area congregations will be consulted through the "Bristol Cares" outreach.
15.	☒ [CHECK BOX] I understand that the vulnerability assessment portion of the planning process must examine social vulnerability.

Section 5 – Planning Process, Including Assessing Vulnerability

16.	Please describe any prior resiliency planning efforts in the municipality(ies)/region you are working in, including natural hazard mitigation planning. If the municipality you are working in has conducted stand-alone resilience planning, make sure to note how this proposal expands upon previous efforts. The City has participated in several mitigation measures that have included realignment of river channel reaches, expansion of floodways/ overflow channels, property acquisitions, and revisions to land use regulations and public outreach/education about FEMA regulations and resources. To date the measures have been isolated and associated with specific projects or the planning has consisted of a regional (multi-community) approach. The City is seeking this grant to expand past resiliency planning measures to include a comprehensive approach across flooding affected areas within the Pequabuck River and Coppermine Brook watershed/floodplain areas while focusing on activity within the City.
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17.	What are the expected goals and outcomes of this plan?
	The primary goal of the application is to determine if there is an engineering solution to mitigate flooding in Bristol. It appears that one potential viable solution is to purchase a number of properties along both the Pequabuck River and the Coppermine Brook, and thus to create additional floodway/floodplain designations for these areas. Once complete, the floodplain areas can serve as a potential linear park/open space along the waterways. A critical part of the project would be community outreach to seek alternate solutions. The project would also include community-based meetings to define in detail level of flooding and provide public education as to the available FEMA, State, and local resources available to residents after flooding events. The project will include the development of a community emergency plan to address roadway flooding that cuts off and isolates sections of the City during large storm events. Leaders of the City's Police, Fire, and Emergency Management Departments would participate in plan development along with input from the community. In addition to a City service emergency plan, public education will be provided to residents of the flood-prone areas to assist in the development of individual action plans. These plans would address evacuation routes, alternate housing, moving of vehicles, and plans for the retention of important papers and insurance policies/ bank records.
18.	Describe how you will assess the planning area's vulnerability to the climate change impacts you identified at the beginning of the application. Please list the parameters you will use and how you will assess impacts to community assets, including critical facilities and community lifelines. Areas of critical infrastructure that will be included in the resiliency planning consist of City/ State roadway, sanitary sewer collection systems, and potable water supply and pump stations (City of Bristol and New Britain). One of the focal points in resiliency planning is emergency management planning associated with road closures that occur during flooding. As a result of flooding, the northeast section of the City is often cut off/isolated from Police and Fire Headquarters along with hospital and ambulance services. In addition, during flooding events both Bristol Water and New Britain Water must take measures to safeguard and maintain the water supply.
19.	Please describe the proposed processes for assessing vulnerability and developing a plan in a stakeholder-driven process and what, if any, resilience frameworks your team will use. The objective of this planning study is to educate Bristol residents and policymakers about the nature and scope of the flooding problem along the Pequabuck River and Coppermine Brook. With the results of a deeper analysis of the problem, the consultants will present potential remediation options that may include the creation of a no-build flood plain (which would include the purchase and demolition of multiple affected properties; better understanding of the nature of "nuisance flooding" which is individually impactful but not sufficient to qualify for FEMA funded relief; the City's participation in the National Flood Insurance Program and the objectives of local ordinances regarding Flood Damage Prevention. The City will follow the steps outlined in the U.S. Climate Resilience Toolkit, "Steps to Resilience:" The Steps to Resilience is a proven framework for reducing climate-related risk. Following the steps, groups compile a list of the things they care about and explore which climate hazards could harm them. They assess what is vulnerable, investigate possible solutions,

	and set priorities among the options to address their highest risks. Built on foundational work by climate scientists and professional planners, the Steps to Resilience framework can help neighborhoods, cities, regions, and tribal or state governments quantify their vulnerability and risk and integrate considerations of people, ecosystems, and economics into their plans. A critical issue for the Northeast is addressing its aging infrastructure: roads, bridges, railroad lines, water and wastewater pipelines, culverts, and electrical power networks. The region has the oldest industry and building inventory in the United States, much of which was built along the coast and in estuaries—both of which are highly vulnerable to flooding. The region's climate is also changing. Recent State of the Climate reports point out the likely impacts of a changing climate on both human and natural resources, which are threatened by rising temperatures, changing precipitation patterns, and a warming ocean, especially in the Gulf of Maine. The stretch of coastline from the tip of the Delmarva Peninsula in Virginia to the elbow of Cape Cod in Massachusetts is experiencing the greatest increase in sea level rise rate globally: 2 to 3.7 mm per year—more than three times the global average.
20.	How will local government staff be incorporated in this planning process? Please detail any commitment for municipal staff time, including departments and positions of those that will participate, and a brief description of their roles/duties. The City's Public Works Engineering and planning staff will serve as the project coordinators, however the City is seeking an integrated solution therefore the project team will include represented of the Police, Fire, Emergency Management, and Economic Development departments. The commitment in time is projected to be the following: Director of Public Works Department – 8%; City Engineer – 5%; DPW Project Manager – 3%; Project team members: Police, Fire, Emergency Management – 2%; and Economic Development (Grants Administration) – 3%.
21.	How will your planning team evaluate nature-based solutions as part of the process? Natural based solutions will be at the core of City planning. The City is seeking sustainable solutions and is not focused on piping and bridge reconstruction. The focus is re-establishing floodplain and wetland areas to potentially mitigate flooding and is looking to establish a public dialogue and education to reset resident's expectations with respect to flooding. Education will focus on living with "nuisance flooding" (flooding below building first floors).
22.	How will your planning team evaluate the inclusion of project ideas that have co-benefits (reduce emissions, solve multiple problems, serve as a community amenity, etc.)? Potential mitigation projects will be evaluated and ranked based on multi-benefits such as creating passive recreation/ park areas along the river (after purchase and demolition of frequently flooded homes), promoting pedestrian/ bike use, and addressing environmental justice concerns. The City is engaged in an ongoing project to upgrade high-volume traffic lights to reduce idle times and vehicular emissions in high density areas.

23.	Anything else you would like to share with DEEP regarding the community's commitments to improving resilience?
	One of the public educational components will be the impact of flood insurance on home purchases. In typically (non-flood plain) sections of the City home ownership is a function of house price, mortgage rates and local property taxes. However, within flood plain areas home ownership and the ability to sustain ownership is a function of flood plain insurance and can be a significant monthly expense. Part of the public education program will be education on FEMA flood insurance and potential ways to reduce insurance cost such as elevation certificates.
24.	☒ [CHECK BOX] I understand that the final plan must include a list of prioritized next steps, including identified potential projects that, if implemented, would reduce vulnerability and increase community resilience. This list shall also identify potential federal funding opportunities the applicant or partners intend to pursue for funding implementation.
25.	☒ [CHECK BOX] I understand the final plan must include an exercise for municipal government to assess capacity to raise locally derived match funding and other capital costs associated with implementing resilience measures. This includes examining the measures authorized in An Act Concerning Climate Change Adaptation (Public Act 21-115), including the opportunity to form stormwater authorities, explore special taxing districts, and form flood prevention, climate resilience, and erosion control boards.

Section 6 – Community and Stakeholder Engagement

26.	Describe how this team will engage residents and stakeholders. Be specific. Include details about the number of meetings, charettes, workshops, public feedback sessions, etc., and any other outreach and engagement strategies. Also include how much notice you will provide to the public regarding public meetings and how information collected during those sessions will be used to inform the project. Note: Planning teams must hold a minimum of three (3) public meetings, including one (1) to share results with residents. Meetings must provide adequate public notice.
	The objective of this project is to educate Bristol residents about the nature and scope of the City's flooding concerns – which will undoubtedly worsen as the climate changes – and discuss the type of remediation activities that are possible. The consulting firm hired to perform the planning study will be responsible for organizing and facilitating public outreach, taking care to engage in particular those individuals living within the study area that are not typically engaged in municipal activities.

27.	Describe how your project team specifically will engage and collaborate with residents who are considered vulnerable populations.
	The consultants will be directed to collaborate with the Forestville Village Association and the West End Association to engage their membership along with residents of each area. These organizations have the ability to host informational sessions at the Manross Library in Forestville and the Bristol Public Library.
28.	How will you communicate the findings of the plan and get final input from residents and stakeholders? Note: Planning teams must hold at least 1 public meeting to disseminate results to residents. The consulting firm will utilize the City's website and social media to convey information to residents and business owners. Additionally, the consultants will be obliged to report the results of their work at a public meeting AND at public meetings of various stakeholder groups, including but not limited to the DPW Board, the Inland-Wetlands Commission, the Zoning and Planning Commissions, and the City Council (a live televised monthly event).

Attachments:

Please attach this application document and the following documents in an email to DEEP.climate resilience@ct.gov as your application submission.

- **Milestone Chart** ([Please use template provided.](#))
- **Budget summary and justification** ([Please use template provided.](#))
- **Resumes for all principals** (please keep to no more than 2 pages and edit to include only relevant experience, including volunteer work)
- **Letters of support from project partners, municipalities, community-based organizations, etc.**
 - Letters must include how project partners or organizations will participate in the project.
 - If the applicant is not a municipality, i.e., a Council of Government or non-profit organization, letters of support should come from every municipality involved in the plan, and those letters must commit staff time to participating in the planning process and engagement efforts.
 - Letters of support can be sent as part of the package or emailed by the author directly to DEEP.climate resilience@ct.gov. Subject line must include the name of the primary applicant and must be received by the application deadline.
- **Optional: Map of planning area.** You may send your required map as an attachment if you are not able to embed the image file into the application.

October 12, 2021

Raymond A Rogozinski, P.E.
Director of Public Works
City of Bristol Public Works Department
111 North Main Street
Bristol, CT 06010

Re: Flood Assistance
Reference Number 1003.001

Dear Mr. Rogozinski:

Resilient Land And Water, LLC (“Resilient Land & Water”) has developed the subject memorandum to describe appropriate sources of aid or support for residents that have suffered various types of flood damage, from riverine flooding (i.e., the Pequabuck River) to flooding caused by overwhelmed drainage systems.

Situation

Connecticut was adversely affected by several flood events that occurred in summer 2021. Specifically, flood events occurred on the following dates:

- T.S. Elsa - July 9, 2021
- T.S. Fred - August 19, 2021
- T.S. Henri - August 22-23, 2021
- T.D. Ida - September 1, 2021

However, not all four events caused damage in Bristol. Based on various reports, the rainfall associated with Storm Ida was the most damaging event in Bristol in summer 2021. According to the City, the type of damaged typically experienced in Bristol is nonstructural and often does not exceed 50% value of the house. Damage could include the following:

- Flooding of basements from surface water
- Damage to stored materials in basements
- Damage requiring replacement of HVAC equipment in basement
- Basement flooding due to groundwater
- Basement flooding due to sewage backups
- Sewage backup into first floor living area
- Trees down on property
- Flooding of yards with or without erosion
- Flooding within first floor that damages contents but not the structure
- Damage to culverts that are in place to facilitate to access property/house (such as a driveway culvert)

Although the City has undertaken considerable steps to address methods of reducing flood damage by evaluating improvements in the Pequabuck River and Coppermine Brook watersheds, intense rain events nevertheless can cause flooding. Residents and business owners have reportedly requested information about how to receive financial assistance to address recent damage and minimize future flood damage. However, the appropriate sources of aid or support can often be difficult to identify.

Types of Assistance

Flood Insurance

Flood insurance can be purchased from the National Flood Insurance Program (NFIP) either directly, or through a variety of insurance companies. The Federal government has financial responsibility for underwriting losses. Flood insurance is available anywhere in a community – in or out of mapped floodplains – and changes in the NFIP (“Risk Rating 2.0”¹) will soon result in new calculations of premiums based on a number of factors.

The maximum limits of coverage available for a residence is \$250,000 for the building and \$100,000 for contents. Specific items covered can be researched in FEMA’s resources related to flood insurance². A property with a mortgage is required to carry flood insurance, as the insurance helps the lender protect its investment. The amount of coverage is determined by the lender, and whether the coverage includes the building or contents is also determined by the lender. If a mortgage has been paid, a property owner can drop flood insurance. However, carrying flood insurance is often advisable given the protections provided.

Damage from mold and/or mildew resulting from the after-effects of a flood is typically covered by flood insurance, but each case is evaluated on an individual basis. Mold/mildew conditions that existed prior to a flooding event are not covered. After a flood, the policyholder is responsible for taking reasonable and appropriate mitigation actions to eliminate mold and mildew.

Flood insurance does not cover basement improvements or items that are not necessary to make the home safe, sanitary, and functional. In other words, items in the basement that are *not* covered include carpeting, finished walls, floors, ceilings, furniture, or personal belongings that are kept in the basement. Necessary items are included under building coverage and some under contents coverage.

NFIP figures for a community are available from FEMA. According to the NFIP profile dated August 31, 2021, Bristol hosts 137 flood insurance policies. Total coverage is \$28,937,800 and the total annual premiums paid was \$272,604.

A total of 213 flood losses have been paid in Bristol. This is not the number of properties; some properties have filed multiple losses, so the number of properties with losses is lower than 213. However, the breakdown is not visible in the data table. Furthermore, the dates of payment are not provided by FEMA in the data table. To date, the total payout for losses in Bristol is \$3,573,886. This equates to an average payout of \$16,779 per loss.

¹ <https://www.fema.gov/flood-insurance/risk-rating>

² <https://www.floodsmart.gov/how/what-is-covered>

The former CCRPA Hazard Mitigation Plan (2016) reported that 32 repetitive loss properties were located in Bristol, with a total of 95 losses adding to \$1,594,955. Neglecting changes over the last five years, this demonstrates that losses submitted for repetitive loss properties are about 45% of total losses in Bristol whether calculated from the number of claims (95/213) or when calculated from the losses paid (\$1,594,955/\$3,573,886).

The NVCOG Hazard Mitigation Plan (2021) notes that the City reports 32 RL properties whereas FEMA's list from 2018 reports 26 RL properties. The discrepancy can be cleared up as needed by the City's floodplain manager through the completion of specific forms issued by FEMA to the City.

While the flood loss profiles for Bristol are not insignificant, the data shows that only a very small percentage of properties in the city (137 properties out of thousands) are carrying flood insurance and claiming losses to be paid under the NFIP.

- ***Recommendation #1: Given that flood insurance is the first line of defense in assisting property owners and residents with responding to flood damage, the City should promote a wider purchase of flood insurance.***

Homeowners Insurance

Flood damage is not covered by homeowners insurance policies. In this context, a flood is defined as water affecting more than one property where the ground surface is normally not submerged³. Examples could include an overflowing stream or river, a rapidly expanding pool of water along a road that cannot drain quickly, or sheet flow downhill along a slope into nearby basements.

Some flood coverage can be provided as part of some renters' insurance policies (i.e., USAA), but this is not standard practice and ultimately would not apply to property owners. Additionally, some types of water damage can be covered by homeowners insurance policies, such as a broken pipe, sewage backup, or sump pump failure. The specific details will vary, and a property owner should become familiar with the terms of his or her policy.

- ***Recommendation #2: Property owners should contact their homeowners insurance companies to inquire about add-on coverages such as sump pump failure.***

Not Covered by Insurance

If a flood occurs and adversely impacts a building that is insured with flood insurance, the owner may be able to claim a loss and seek reimbursement for damage to the building or contents. If a building is not insured with flood insurance, the owner cannot seek reimbursement for damage to the building or contents using homeowners insurance. In both cases – *with or without flood insurance* – damage to

³ The National Flood Insurance Program (NFIP) defines a flood as "A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties (at least one of which is the policyholder's property)"

property outside the building such as landscaping, a driveway, or a vehicle is not covered by insurance. However, flood damage to passenger vehicles is sometimes covered by auto insurance.

- ***Recommendation #3: Property owners should contact their auto insurance companies to inquire about covering flood damage to vehicles.***

FEMA Public Assistance (PA)

PA funding is available to municipalities when expenses are incurred during an event that is later declared a major disaster. If a severe event affects Connecticut and the declaration of a disaster is made, FEMA will specify which counties are eligible for PA reimbursement. If Hartford County is part of the region covered by PA, Bristol can participate. In order to obtain reimbursement under the PA program, the City of Bristol will need to compile detailed records of costs such as cleaning up trees after a wind event or repairing a washed-out road after a flood event.

Reimbursement for private property damage is not available from PA. Community costs are typically divided into the following categories allowed by FEMA:

- Emergency Work:
 - Category A: Debris removal
 - Category B: Emergency protective measures
- Permanent Work:
 - Category C: Roads and bridges
 - Category D: Water control facilities
 - Category E: Public buildings and contents
 - Category F: Public utilities
 - Category G: Parks, recreational, and other facilities

Perhaps of significant interest in Bristol, FEMA may determine that certain emergency protective measures conducted on private property are eligible under the PA Program if:

- The immediate threat is widespread, affecting numerous homes and businesses such that it is a threat to the health and safety of the general public;
- The municipality has legal authority to perform the work; and
- The municipality obtained rights-of-entry and agreements to indemnify and hold harmless the Federal government.

Situations where this may occur are generally limited to:

- Demolition of unsafe private structures that endanger the public
- Installation of fiber-reinforced sheeting to cover damaged roofs
- Provision of emergency access
- Pumping of flooded basements
- Pumping of septic tanks or decontamination of wells causing a pollution threat
- Residential electric meter repair
- Safety inspections

- Stabilizing a slope

The fourth item, pumping of flooded basements, is potentially a suitable tool that the City of Bristol can use to assist property owners will mitigating damage from floods.

We recommend that the City evaluate this possibility in the short-term. To be successful in reimbursement under PA, the City must include the following support documentation: a detailed explanation documenting the City's legal authority and responsibility to enter private property; the basis for the determination that a threat exists to the general public; and copies of the rights-of-entry and agreements to indemnify and hold harmless the Federal government. If the rights-of-entry and agreements to indemnify and hold harmless take time to develop, the City should begin looking into this soon, so they may be in place before the next severe storm.

- ***Recommendation #4: Take steps to ensure that pumping of flooded basements is eligible for PA reimbursement if a disaster is later declared.***

FEMA Individual Assistance (IA)

IA funding is available to properties owners in municipalities when exceptional individual expenses are incurred during an event that is later declared a major disaster. If a disaster affects Connecticut, FEMA will specify which counties are eligible for IA reimbursement. If Hartford County is part of the region covered by IA, Bristol individuals can participate. Unfortunately, IA is not a typical outcome for a flood disaster in Connecticut. Consider the following:

- The State's most recent disaster declaration for a flood (for the events of September 25, 2018) *did not include IA eligibility anywhere in the State*. Furthermore, Hartford County was not eligible for PA reimbursement for this event.
- Hurricane Sandy was the last time IA was available in Connecticut, but Hartford County was not included as an eligible area.

The last three flood events that resulted in the availability of IA in Hartford County were:

- T.S. Irene, DR-4023-CT, August 2011
- Nor'easter, DR-1700-CT, April 2007
- T.S. Floyd, DR-1302-CT, August 1999

More than ten years have passed since IA was available in Hartford County and, therefore, in Bristol. This demonstrates that long periods of time may occur between floods that are sufficiently severe for FEMA to make IA possible.

The specific types of assistance under the IA program are found within the following broad categories:

- Mass Care/Emergency Services
- Individuals and Households Program (IHP)
- Disaster Case Management
- Crisis Counseling Assistance and Training Program

- Disaster Legal Services
- Disaster Unemployment Assistance
- Voluntary Agency Coordination

We will focus here on IHP because that is the category typically employed in Connecticut during the rare occurrences that IA has been available, and is also the category that includes reimbursement for repairs. FEMA is clear in its statements that “IHP assistance is not a substitute for insurance and cannot compensate for all losses.” IHP assistance comprises two provisions: Housing Assistance and Other Needs Assistance (ONA):

- Housing Assistance may be provided in the form of financial assistance (funds provided to an applicant) or direct assistance (housing provided to the applicant by FEMA). Examples of financial assistance include lodging reimbursement, rental assistance, home repair assistance, and home replacement assistance. *The most important factor to understand is that the housing assistance part of IHP is for home repair services. This can include the foundation, walls, windows, roofing, heating systems, and utilities but will not fencing or landscaping.* In some cases, Housing Assistance may include access and egress, including privately-owned roads and bridges. This is a potentially intriguing use of IA, as flood insurance and homeowners insurance do not cover driveways. However, a person should never assume that IA will be available for access-related repairs.
- The ONA provision of the IHP provides financial assistance for disaster-related necessary expenses and needs that are not covered by insurance or provided by any other source. Some covered expenses are funeral assistance, medical assistance, childcare, assistance for moving, and assistance for cleaning. Personal property assistance is available if Small Business Administration (SBA) coverage does help (see Page 8 for more about SBA). Personal property assistance can help pay for things like appliances and bedding, but only for mobility-impaired residents. In general, ONA is rarely used and only nominally helpful in Bristol as presented below.

IA figures for the City of Bristol were accessed from the following FEMA data sets⁴:

- Housing Assistance Program Data for Owners
- Housing Assistance Program Data for Renters
- Registration Intake and Individuals Household Program

According to these data sets, the nor’easter of April 2007 resulted in 45 individual registrations in Bristol. A figure of \$27,078 was approved for the IHP, split into a figure of \$26,585 for Housing Assistance and a figure of \$492 for ONA. Renters’ assistance was *not* approved through IA for the April 2007 nor’easter. Without further details about how reimbursements were used, only broad conclusions can be made about the levels of individual assistance that each property may have obtained. Dividing \$27,078 by 45 properties, the amount per property averages \$602. This is significantly lower than the averages discussed on Page 2-3 for flood insurance payouts.

Detailed data were also available for T.S. Irene of August 2011. Approximately 115 owners were approved for \$434,416 in total damage, and 16 renters were approved for \$29,709 in total damage. The breakdown for Housing Assistance and ONA was not available for T.S. Irene as it was for the nor’easter

⁴ Data were not available for floods prior to the early 2000s.

of April 2007. Without details available, only broad conclusions can be made about the levels of individual assistance that each property may have obtained. Dividing \$434,416 by 115 owner-occupied properties, the amount per property averages \$3,778. While the per-property average after T.S. Irene is certainly larger than the \$602 per property after the nor'easter of April 2007, neither figure is significant relative to replacement of walls, floors, heating equipment, etc.; and they are significantly lower than the averages discussed on Page 2-3 for flood insurance payouts. Turning to the rental payouts, and dividing \$29,709 by 16 renters, the reimbursement per applicant is about \$1,800; this probably covers only a couple months of rent.

The bottom line regarding the IA reimbursements in the City of Bristol after the flood events of 2007 and 2011 is that they were likely much lower than the flood insurance reimbursements received by neighbors who carried flood insurance.

- ***Recommendation #5: Given that flood insurance can be accessed more frequently than IA reimbursements and tends to result in higher reimbursement, the City should promote a wider purchase of flood insurance (this is the same as Recommendation #1).***

In order to help the State of Connecticut facilitate eligibility under the IA program, a municipality such as Bristol must compile detailed records about specific private property damages. These records are then sent to DEMHS to aggregate with other communities and build a case for IA assistance in the affected counties. At the same time, DEMHS may conduct its own damage assessments. This is reportedly occurring in October 2021 to help determine whether IA should be available for the flood following T.S. Ida.

Increased Cost of Compliance (ICC)

ICC is available to property owners that have flood insurance. If a property owner receives a determination from the City's floodplain administrator that the home or building is substantially or repetitively damaged, the owner (flood insurance policy holder) may file a claim for ICC coverage. A policyholder may receive up to \$30,000 to help offset the costs to bring a home or business into compliance with floodplain management ordinance or regulations through elevation, floodproofing, etc.

- ***Recommendation #6: The City's floodplain manager should work with owners of damaged property to address ICC on a case-by-case basis, since the substantial damage threshold is likely not reached during most flood events.***

Commercial Flood Insurance and Business Interruption Insurance

Damage from flooding typically is not covered under a standard commercial insurance policy for a business. Some *private* insurance companies offer commercial flood insurance to small and medium-sized business owners and commercial buildings. Typical private flood insurance policies include the coverages offered by the NFIP with the additional option of business interruption coverage. With business interruption coverage, a business can be covered up to a maximum payout or reimbursement based on a set rate (\$ per day) for up to a maximum number of days.

Flood damage to vehicles owned by a business and used for business purposes would typically be covered by the vehicle insurance policies, as explained above for residential vehicles.

- ***Recommendation #7: The City's business outreach teams (i.e., a chamber of commerce and/or the Economic and Community Development Department) should be prepared to provide information about private insurance companies that can be contacted to purchase insurance.***

Small Business Administration (SBA) Disaster Loans

Businesses located in declared disaster areas, private nonprofit organizations, homeowners, and renters affected by declared disasters may be eligible for SBA loans. Loans can be used for losses not covered by insurance or FEMA IA. Losses can include physical damage or business interruption. As with PA and IA, the eligibility is tied to a declared disaster. A property must be in a declared disaster area to be eligible for SBA disaster assistance.

Homeowners may apply for up to \$200,000 to replace or repair a primary residence. Renters and homeowners may borrow up to \$40,000 to replace or repair personal property such as clothing, furniture, cars, and appliances. An important point is that proceeds from insurance coverage on a home or property will be deducted from the total damage estimate to determine the eligible loan amount. In other words, SBA loans are used for expenses in excess of flood insurance and other insurance reimbursements.

SBA can issue physical disaster loans of up to \$2 million to qualified businesses or most private nonprofit organizations. These loan proceeds may be used for the repair or replacement of real property, machinery and equipment, fixtures, and inventory. Like the homeowner assistance described in the preceding paragraph, the SBA Business Physical Disaster Loan covers disaster losses that are not fully covered by insurance.

- ***Recommendation #8: The City's outreach teams (i.e., the floodplain manager and the Economic and Community Development Department) should be prepared to provide information about SBA loans if a disaster declaration is activated.***

State Funds and Programs Available to Avoid Future Flood Damage

Two types of approaches are generally available to avoid future damages: developing capacity for response and securing funds to develop and administer programs to reduce future flooding. The following are ideas for future consideration.

- Response mechanisms to have in place prior to a flood could include acquiring more pump-out vehicles and securing mutual assistance MOUs to get help from other communities and/or organizations. If response can be deployed rapidly and across a wider area, then the duration of exposure of building materials and contents to water can be shortened, perhaps reducing the cost to recover. Various state and federal grant programs can be accessed for pump-out vehicles, such as the Assistance to Firefighters grant program administered by FEMA.

- The development of programs to pay for flood control and mitigation is currently receiving increased attention in the State of Connecticut. The State has taken an interest in the capacities of Flood and Erosion Control Boards, and has set aside resources to help set up stormwater utilities in Connecticut municipalities. The City of New London has recently implemented a stormwater utility that will collect fees from property owners and pay for stormwater management improvements that can reduce flooding caused by impaired or overwhelmed drainage systems. The Connecticut Institute for Resilience and Climate Adaptation (CIRCA) plans to administer a municipal assistance grant program in 2022 to help municipalities get started with stormwater utilities.

Summary

The following table provides a summary of coverage for each of the types of damage listed on Page 1.

Item	<i>Coverage or Reimbursement Possible?</i>					
	Flood Insurance	Homeowners Insurance	Commercial/ Business Insurance	FEMA PA*	FEMA IA*	SBA*
Flooding of basements from surface water	Yes	No	Yes, if included in a private policy	No	Yes	Yes
City's efforts to pump water from basements	No	No	No	Yes	No	No
Damage to stored materials in basements	No	No	Yes, if included in a private policy	No	No	Yes
Damage requiring replacement of HVAC equipment in basement	Yes	No	Yes, if included in a private policy	No	Yes	Yes
Basement flooding due to groundwater	Yes, if related to the flood event	No	Yes, if included in a private policy	No	Yes, if related to the flood event	Yes, if related to the flood event
Basement flooding due to sewage backups	Yes, if related to the flood event	Yes, if <i>not</i> related to a flood event	Yes, if included in a private policy	No	Yes, if related to the flood event	Yes, if related to the flood event
Sewage backup into first floor living area	Yes, if related to the flood event	Yes, if <i>not</i> related to a flood event	Yes, if included in a private policy	No	Yes, if related to the flood event	Yes, if related to the flood event
Trees down on property	No	Yes, depending on damage	Yes, if included in a private policy	No	No	No
Flooding of yards with or without erosion	No	No	Yes, if included in a private policy	No	No	No

Item	<i>Coverage or Reimbursement Possible?</i>					
	Flood Insurance	Homeowners Insurance	Commercial/ Business Insurance	FEMA PA*	FEMA IA*	SBA*
Flooding within first floor that damages contents but not the structure	Yes	No	Yes, if included in a private policy	No	Yes	Yes
Damage to culverts that are in place to facilitate to access property/house (such as a driveway culvert)	No	No	Yes, if included in a private policy	Depends on ownership and location	Possibly, if approved	No

*Disaster declaration is needed for IA, PA, and SBA

In summary, the approach to reducing and addressing flood damage may be complex and require a multi-faceted approach. At a minimum, the City should promote more widespread purchase of flood insurance, as the reimbursements from flood insurance will tend to exceed reimbursements from the FEMA IA program; and are not merely loans like the SBA programs.

Please contact the undersigned if you have any questions.

Sincerely,



David Murphy, P.E, Certified Floodplain Manager (CFM)