

Town of Waterville
Local Hazard Mitigation Plan
2022-2027



Photos by Edna Lafountain

FEMA Approval Pending Adoption Received: 8/8/22

FEMA Formal Approval:8/30/22

Adopted by the Selectboard: 8/29/22

Plan Expires:8/29/27

This plan was developed by Waterville Town Officials (EMD, Planning Board, and Select Board) – with technical assistance provided by the Lamoille County Planning Commission (LCPC). FEMA Emergency Management Planning Grant secured by the LCPC from the Vermont Department of Emergency Management and Homeland Security provided the funding support for the development of the plan.

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Table of Contents

1.	Introduction and Purpose	2
1.1	Introduction.....	2
1.2	Purpose.....	3
1.3	Planning Process	3
2.	Community Background.....	6
2.1	Previous FEMA-declared natural disasters.....	7
3.	Waterville Hazard Inventory / Vulnerability Assessment	9
3.1	Waterville HI/RA Matrix	10
3.2	Community Vulnerability Analysis by Hazard.....	13
4.	HAZMAT Sites.....	19
4.1	Transportation Hazards.....	21
4.2	Areas of Local Concern	21
5.	Mitigation Goals	21
5.1	Town of Waterville Hazard Mitigation Goals	22
5.2	Planning and Development Guidelines that Support Hazard Mitigation.....	22
5.3	Existing Hazard Mitigation Programs, Projects and Activities	23
5.4	Identified Hazard Mitigation Programs, Projects and Activities	27
6.	Plan Maintenance Process.....	29
6.1	Monitoring, Evaluating, and Updating the Plan	29
6.2	Incorporation into Existing Planning Mechanisms.....	30
6.3	Continued Public Involvement	30
6.4	Town Prioritization and Mitigation Priorities.....	30
Appendix A.	Supporting Maps.....	31
Appendix B.	Action Evaluation and Prioritization Matrix	35
Appendix C.	Implementation Schedule for Prioritized Mitigation Projects	37
Appendix D.	Resolution for Town of Waterville Local Hazard Mitigation Plan 2017-2022 Adoption.....	36

Table of Tables

Table I.	Waterville HI/RA	11
Table II.	Waterville Potential Flood Loss.....	14
Table III.	Active Hazardous Waste Sites in Waterville.....	20
Table IV.	Waterville Potential Tier II Hazard Loss (fixed).....	21
Table V.	Waterville Potential Tier II Hazard Loss (transportation)	21

1. Introduction and Purpose

1.1 Introduction

This plan serves as a **single jurisdiction** Local Hazard Mitigation Plan (LHMP) for the Town of Waterville. The Waterville LHMP was last updated in 2017 and adopted by the Waterville Selectboard on September 5, 2017. The current Waterville LHMP expires September 26, 2022. The plan has been reviewed, amended, and updated in its entirety to reflect changes in development, progress in local mitigation efforts, and changes in priorities since the adoption of the 2017 Single Jurisdiction Plan.

The impact of expected, but unpredictable natural and human-caused events can be reduced through community planning. The goal of this plan is to provide all-hazards local mitigation strategies that make Waterville more disaster resilient.

Hazard mitigation is defined as any sustained action that reduces or eliminates long-term risk to lives and property resulting from the effects of natural and human-caused hazards. Based on the results of previous Project Impact efforts, FEMA, state, regional, and local agencies have come to recognize that it is less expensive to prevent disasters than to repeatedly repair damage after a disaster has struck. This plan recognizes that communities have opportunities to identify mitigation strategies and measures during each phase of Emergency Management-Preparedness: Response, Recovery and Mitigation. Hazards cannot be eliminated, but it is possible to identify what the local hazards are, where the hazards are most severe, and what local actions that can be taken to reduce the severity of incidents.

Hazard Mitigations Strategies and Measures **alter** the hazard by eliminating or reducing the frequency of occurrence, **avert** the hazard by redirecting the impact by means of a structure or land treatment, **adapt** to the hazard by modifying structures or standards, or **avoid** the hazard by stopping or limiting development and could include projects such as:

- Flood-proofing structures
- Tying down propane/fuel tanks in flood-prone areas
- Elevating furnaces and water heaters
- Identifying and modifying high traffic incident locations and routes
- Ensuring adequate water supply
- Elevating structures or utilities above flood levels
- Identifying and upgrading undersized culverts
- Proactive land use planning for floodplains and other flood-prone areas
- Proper road maintenance and construction
- Ensuring critical facilities are safely located
- Buyout and relocation of structures in harm's way
- Establishing and enforcing appropriate building codes
- Dissemination of public information

1.2 Purpose

The purpose of this Local Hazard Mitigation Plan (LHMP) is to assist the Town of Waterville in identifying all hazards facing the community and in developing strategies to begin reducing risks from these identified hazards.

1.3 Planning Process

Since the adoption of the 2017 Waterville Local Hazard Mitigation Plan, the Lamoille County Planning Commission (LCPC) and the Town of Waterville remained involved in the plan maintenance process through communication and support in the Regional Emergency Management Committee (REMC) meetings, participation in emergency response trainings and exercises), and actual hazard/disaster response and post event evaluation.

The update of the Waterville Local Hazard Mitigation plan was included in LCPC's FY20 and FY21 EMPG grant work scope. This allowed for LCPC to work with the town to update the plan to reflect current data and town priorities. The LCPC initiated the update of the LHMP in 2020. The LCPC updated maps associated with the plan based on input from the town EMD and Planning Board.

LCPC also conducted a formal review of the Waterville LHMP in 2021 and worked with the town's Emergency Management Director (EMD) to discuss the plan, assess changes in development trends, update progress in local mitigation efforts, and adjust mitigation priorities accordingly.

On March 3 of 2021 LCPC held a meeting with the Waterville Planning Board and the EMD to discuss the Waterville HI/RA Matrix (Table 1), The Action Evaluation and Prioritization Matrix (Appendix B), and The Implementation Schedule for Prioritized Mitigation Projects (Appendix C). The Floodplain, Bridge and Culvert Map, Areas of Local Concern Map, Critical Facilities Map, and the Culvert Inventory Map (Appendix A) were all discussed, and edits were noted. LCPC held a follow-up meeting with the Town Emergency Management Director where additional questions were answered. On September 15 of 2021 LCPC met again with the Waterville Planning Board. This meeting was used to confirm the edits made on the Three tables mentioned above, as well as get their input on current completed culvert projects from 2021. The EMD requested information from the town clerk that he promptly delivered to LCPC for further updates. The EMD also assisted LCPC with the updates to hazard mitigation maps. LCPC met with the Waterville Selectboard on December 6th, 2021. The selectboard provided comments on the plan's current edits and hazard mitigation maps. All meeting minutes from the above-mentioned meetings can be found in Appendix A. The plan was reviewed further by LCPC staff before it was sent out for public comment.

The Waterville Local Hazard Mitigation Plan was sent out for public comment on February 1st, 2022. The plan was posted on LCPC's website with a notice for public comment on Front Porch Forum as well as in the News and Citizen newspaper. The Front Porch Forum Post of the draft plan and public comment notice was issued by the Lamoille County Planning Commission and

reached members of the public in all Towns in the County (Belvidere, Cambridge, Eden, Elmore, Hyde Park, Johnson, Morristown, Stowe, Waterville, Wolcott).

The draft plan was sent directly by email to:
Belvidere Emergency Management Director
Belvidere Town Clerk
Cambridge Emergency Management Director
Cambridge Rescue Squad Chief
Cambridge Town Administrator
Eden Town Clerk
Eden Emergency Management Director
Eden Selectboard Assistant
Elmore Emergency Management Director
Elmore Town Clerk
Hyde Park Emergency Management Director
Hyde Park Fire Department Chief
Hyde Park Town Administrator
Johnson Emergency Management Director
Johnson Fire Department Chief
Johnson Town Administrator
Morristown Emergency Management Director
Morristown Police Chief
Morristown Fire Chief
Morristown Rescue
Stowe Police Chief
Stowe Emergency Management Director
Stowe Fire Department Chief
Stowe Rescue
Wolcott Town Clerk
Wolcott Emergency Management Director
Wolcott Fire Department Chief
The Lamoille REMC

Waterville officials and community members were encouraged to provide feedback on the draft Waterville Local Hazard Mitigation Plan at the February 17th Planning Board Meeting and proceeding the meeting by submitting comments via email to LCPC staff working with Waterville Town officials to update the plan. Public comment was received at the Waterville Planning Board meeting by Planning Board members and LCPC. The latest draft of the plan remained posted on LCPC's website to continue to solicit public input after the February 17th Planning Board Meeting. The public comment period ran from February 1st to March 1st of 2022. No comments were received from the general public.

Feedback received from the public, public officials, businesses, and emergency management officers was incorporated into the plan at all stages. Gathering oral histories, prioritizing hazards and mitigation strategies, and discussing where the public needs are most relevant was used to

form this plan. Without that input and support the plan would be lacking a crucial element and motivation for mitigation. In addition to public input, information was utilized from the following sources:

- State of Vermont Hazard Mitigation Plan
- Regional All-Hazards Mitigation Plan
- Vermont Agency of Transportation
- Vermont Division of Emergency Management and Homeland Security
- Vermont Center for Geographic Information
- Waterville Town Plan ,2019
- Waterville Local Emergency Management Plan, 2021
- Emergency Response Guidebook, 2016
- Flood Insurance Rate Maps
- U.S. Census, 2020
- 2013 Waterville Culvert Inventory
- 2020 Waterville Road Erosion Study

Revisions to mitigation actions in particular included goals and objectives from the 2019 Town Plan, 2021 Waterville Local Emergency Management Plan, 2013 Culvert Inventory, and 2020 Road Erosion Study.

The 2022 single jurisdiction Waterville Local Hazard Mitigation Plan was submitted to VEM for FEMA review on March 24, 2022. Notice of FEMA Review comments were received on April 26, 2022, 2022. Lamoille County Planning Commission staff contacted key Waterville town officials in spring of 2022 regarding FEMA review comments. On July 13, 2022, LCPC staff met with the Waterville EMD to discuss further revisions and town input for the Waterville Local Hazard Mitigation Plan. Additional input received from Waterville town officials was incorporated into plan revisions Summer of 2022. During the process of revising the plan, LCPC staff consulted with the State Hazard Mitigation Planner, Caroline Massa, and State Mitigation Officer, Stephanie Smith, from Vermont Emergency Management (VEM). The VEM representatives provided additional guidance and interpretation of FEMA review comments to help guide plan revisions. The Waterville EMD held a conference call with LCPC on July 12, 2022, to review the revised 2022 Waterville Local Hazard Mitigation Plan prior to submitting the plan for FEMA Approval. FEMA “Approval Pending Adoption” was received on August 8, 2022. The Waterville Selectboard adopted the final approved 2022-2027 Waterville Local Hazard Mitigation Plan on August 29, 2022. (See Appendix D for Adoption Resolution).

The Waterville Local Hazard Mitigation Plan will be monitored and evaluated by the Waterville EMD, John Terrel. Both LCPC and the town of Waterville will maintain copies of this plan on their websites as well as physical copies in their offices. This plan will be reviewed by the selectboard and EMD annually simultaneously with the Local Emergency Management Plan. The EMD, Planning Board, Selectboard, and LCPC will work together to make edits and updates as they arise. The year before this plan expires, LCPC will initiate the update process with the EMD and Planning Board.

2. Community Background

Waterville is a rural community made up of residential uses, small businesses and farms. The town is located in a small, low-lying valley between steep hills and mountains, and is situated in the northwestern section of Lamoille County. It is bounded by Bakersfield on the north and west, Cambridge on the south, Belvidere and Johnson on the east and Fletcher and Cambridge on the west. The town has a planning board and a town plan. It has no zoning or subdivision regulations and does not participate in the NFIP. Vermont Route 109 is the only state highway in Waterville, which bisects the town and serves as the primary connection to Route 118 to Montgomery, Route 100 to Eden and Cambridge and Route 108 to the west.

The main village center is located on Route 109. The population of Waterville has decreased from 673 in 2010 to 644 in 2020. This represents a population loss of approximately 4.3 percent over the last decade, in comparison to the 50 percent population increase from the previous 20 years. As of 2020, Waterville had 314 total housing units, including 242 single unit detached (78%) and 60 mobile homes (19%).

Since the Town of Waterville does not require building permits, it is difficult to determine what share of new housing activity observed during the 2000s took place after the previous LHMP was adopted in 20017. While Waterville's population reflected an overall decline, there have been no substantial changes in development patterns that would necessitate a major shift in mitigation priorities.

There is no town-supported water supply in Waterville, with most houses relying on individual springs or wells. The Waterville Water cooperative serves 22 houses in the village between the school and Nellie Chase house, drawing from an aquifer above the Nazarene Church. The Vermont Electric Cooperative, Inc., supplies electric service in Waterville. The Village of Enosburg Falls Electric Department shows a portion of its service area in Waterville, though the area is unpopulated and thus, there are no connections. There are local energy sources available, with wood being the most notable. Other energy sources are available through private companies and landowners.

Waterville shares emergency response services with nearby municipalities. Fire and rescue coverage is provided primarily by the Johnson Fire Department and Rescue Squad, which covers the towns of Johnson, Waterville, and Belvidere. The fire station is located on Route 15 in Johnson. Medical care is provided by Copley Hospital in Morrisville, a full-service community hospital for acute, outpatient and long-term care. More specialized services are available in Burlington, Berlin, and Lebanon, New Hampshire. Other outpatient care is available at community clinics in neighboring towns. Waterville contracts with the Lamoille County Sheriff's Office for 911 emergencies. The sheriff's department then dispatches the appropriate service. Ambulance service is provided by Northern Emergency Medical Service and the Cambridge Rescue Squad. Police service is provided by Vermont State Police.

The town has a Rapid Response Plan (RRP) and a Local Emergency Management Plan (LEMP), which is updated annually. A preliminary hazard/vulnerable site analysis identifies the

Waterville Elementary School as a high a risk population. Essential facilities identified in the RRP include the Town Offices and the Waterville Elementary School for an emergency operations center and the Waterville Elementary School and Town Hall as community shelters. Another location that can serve as an alternate community shelter is the Belvidere Elementary School. A third alternative would be the Town Clerks Office. There are also several bridges and buildings of historical interest.

The rural character of the town makes it necessary to have an automobile or other vehicle for transportation. The town of Waterville is unique in that the transportation infrastructure leading into and out of the town is essential in disaster/emergency response. During flooding events, the town can essentially become an island as all routes in the town have the potential to be under water. Route 118 from the northeast floods around the intersection with Route 109; Route 109 floods in Waterville; Hogback Road from Johnson is prone to flooding as well. The only other routes into Waterville are Plot Road from Johnson and Lapland Road from Bakersfield, which are Class 3 roads that can be difficult for emergency vehicles to traverse during winter and mud season. Additionally, with the right type of vehicle (snowmobile, ATV etc...), Coddington Hollow Road can serve as an emergency passage route to travel to Johnson, Beals Hill Road to connect to Belvidere, and Lapland Road to travel to Bakersfield, Vermont.

2.1 Previous FEMA-declared natural disasters

Since 1990 Waterville has received public assistance funding from FEMA for the following natural disasters:

January 1996 (DR 1101)	\$4,965
July 1997 (DR 1184)	\$15,713
July 1998 (DR 1228)	\$18,766
August 2004 (DR 1559)	\$19,911
July 2008 (DR 1784)	\$11,860
May 2012 (DR-4066)	\$63,000
April 15, 2014 (DR-4178)	\$68,127
December 9, 2014 (DR-4207)	\$0.00
October 29, 2017 (DR-4356)	\$0.00
May 4, 2018 (DR-4380)	\$0.00
October 31, 2019 (DR-4474)	\$0.00
January 20, 2020 (DR-4532)	\$0.00

January 1996: Mid-winter flood event brought statewide destruction of private and public property with eleven Vermont counties included in the declared disaster area. This event left more than 150 communities eligible for public assistance (FEMA-1101-DR-VT).

July 1997: Excessive rain in several northern Vermont counties caused flash flooding and destruction of public and private property (FEMA-1184-DR-VT). High velocity waters damaged many roads in Belvidere.

July 1998: Eleven of the fourteen Vermont counties experienced severe damage from excessive rainfall (FEMA-1228-DR-VT). The torrential rains came in much the same pattern as they had in

the summer of 1997, but occurred further south than the 1997 floods. The flash flooding left many homes destroyed, roads and bridges damaged, and communities cut off from the rest of the state. Waterville suffered flood damage to road surfaces, culverts and ditches.

August 2004: (FEMA-1559-DR-VT): Severe thunderstorms on August 12, 29 and 30 caused flooding and washed out roads. A federal disaster was declared in Addison, Caledonia, Chittenden, Franklin, Lamoille, Orleans and Windham counties. The Town of Waterville received more than \$19,911 in federal share funds for public assistance projects related to debris removal, brush cutting and chipping.

July 2008: (FEMA-1784-DR-VT): Severe storms (tornado) and flooding struck Waterville on July 18th. A federal disaster was declared on August 15, 2008. Waterville received \$11,860 in federal public assistance funds to repair damage and debris removal resulting from a tornado.

May 29, 2012: Flash flooding, thunderstorms, heavy rain, and strong winds struck parts of Vermont, including Lamoille County, causing a federal disaster declaration (DR-4066) for Addison, Lamoille, and Orleans counties. Public Assistance funds were allocated to repair roads, bridges, and culverts. Waterville received \$63,000 in Public Assistance funds for six road and highway projects.

April 15, 2014: Heavy rainfall and snowmelt caused widespread minor to moderate flooding across Lamoille County, mainly along and west of Route 100 (DR 4178). Numerous highways were flooded and there was widespread damage to gravel roadsides and many culverts failed in Johnson, Belvidere, Cambridge and Waterville. In Stowe, the recreation path sustained damage. Total public assistance provided by FEMA to the State to repair damages was \$1,844,155. Elmore did not request FEMA public assistance funds.

Additionally, declared disasters regarding the following winter storms impacted the Town of Waterville and Lamoille County area. The hazard definition for a winter storm disaster is “severe winter storms bring the threat of heavy accumulations of snow, cold/wind chills, strong winds, power outages and property damage.”

Two winter storms that resulted in FEMA disaster declarations since 2011 occurred in December 2013 (DR 4163) and December 2014 (DR 4207). The storms had a primary impact on utilities serving Lamoille County and caused damages estimated at \$390,000 and \$230,000, respectively.

December 9, 2014: Heavy, wet snowfall totals across Lamoille County. The snow ranged from 6-18 inches. The heavy, wet snow resulted in county wide power outages and vehicular accidents.

Low pressure moved north along the eastern seaboard on December 9th. It stalled across New England until the 11th. It then lifted northeast into the Canadian Maritime. The storm occurred in three phases. The first phase was rain and wet snow that moved into Vermont during midday of December 9th. The conditions changed to heavy, wet snow during the evening and into the early night. The second phase characterized itself with moderate snowfall that impacted much of

northern Vermont during the afternoon and evening hours on December 10th. The third phase consisted of scattered snow showers which ended on December 12th.

October 29, 2017: Numerous tree damage and power outages along with structural damage were caused by measured wind gusts in the range of 45-65 mph.

Energy and deep tropical moisture from the remnants of Tropical Storm Phillippe interacted with the developing east cast storm. This created an intense storm Sunday night off the mid-Atlantic coast which traveled into Northern Vermont by October 30th. Consistent winds of 25-35 mph with frequent gusts of 50-70 mph occurred in the early morning of the 30th. These heavy gusts occurred across portions of Northern Vermont due to the fully mature mountain waves.

Widespread outages occurred due to downed branches, trees, snapped and uprooted trees. 30% of the power grid was disabled which led to greater than 100 thousand residents being without power. Home and vehicles were also damaged due to falling branches/trees.

May 4, 2018: Severe windstorms and flooding in Lamoille County occurred between May 4th and May 5th, 2018. A disaster declaration was requested in July 2018.

October 2019: Steady rain developed during the mid to late evening of October 31st and became heavy at times through the early morning hours of November 1st. Numerous flooded streams and washed-out roads were reported in northern Vermont beginning just after midnight on November 1st and several larger rivers flooded as well, including the Lamoille, Missisquoi basins and portions of the Winooski and Mad River basins.

In addition, strong southwest to west winds, gusting to 40 to 50 mph and locally higher, developed around sunrise and continued through mid-afternoon before quickly diminishing by evening. These persistent strong winds combined with over-saturated soils, led to numerous downed trees, structural damage and escalated power outages to their peak of more than 100,000 outages throughout Vermont.

Federal Disaster DR-4474 was declared in Franklin, Orleans, Essex, Chittenden, Lamoille, Addison, Washington, and Orange County.

January 2020: The COVID-19 pandemic was declared a disaster in Vermont on April 8, 2020. COVID-19 can cause people to experience fever, shortness of breath and difficulty breathing, and many other flu-like symptoms. This virus proved to be harmful to the elderly and people who are immunocompromised. To date Vermont has had over 29,000 positive cases. A vaccine has been approved for use in Vermont. To date 77% of Vermonters have been fully vaccinated.

3. Waterville Hazard Inventory / Vulnerability Assessment

The following assessment is based on the revised, 2007 State of Vermont HI/RA and Section 2 of the amended RHMP. The first column is a list of possible hazards that could affect the

community. The hazards were evaluated to have a *Rare, Unlikely, Unusual, Likely, or Frequent* frequency of being a threat to the community.

The **FREQUENCY** of occurrence is classified as shown:

- Rare: < 1% probability in the next 100 years; may never have occurred in Vermont.
- Unlikely: 1% to 4% probability in the next year, this type of event has occurred in Vermont.
- Unusual: 4% to 10% probability in the next year, or at least one chance in the next 100 years.
- Likely: 10% to 50% probability in the next year, or at least one chance in the next 10 years.
- Frequent: Greater than 50% probability in the next year; an event that occurs often but degree varies.

The **SEVERITY** (percentage of the community affected) of the hazard can be classed as follows:

- Minor: < 10% of properties damaged/Minimal disruption to quality of life.
- Serious: 10% to < 25% of properties damaged/Loss of essential facilities/services for up to 7 days/Few (< 1% of population) injuries possible.
- Extensive: 25% to 50% of properties damaged/Loss of essential facilities/services for > 7 days < 14 days/Major (< 10% of population) injuries/few deaths possible.
- Catastrophic: > 50% of properties damaged/loss of essential facilities/services for > 14 days/Severe (> 10% of population) injuries/multiple deaths possible.

The combination of the impact of the hazard (severity) and the frequency was used to determine the **COMMUNITY VULNERABILITY/RISK** as *High, Moderate or Low*.

The **WORST THREATS** to the community are designated with an asterisk *. The worst threats are those hazards with threats that have **(a) frequent possibility of occurrence, and/or (b) catastrophic or extensive impact to your community**.

3.1 Waterville HI/RA Matrix

Table I. Waterville HI/RA

Possible Hazard	Frequency	Severity	Extent of Damage**	Community Vulnerability / Risk	Most vulnerable										
Flood inundation and flash floods*	Frequent	Catastrophic	<p>Measured using the Jeffersonville Flood Gage of the Lamoille River. Waterville has not historically experienced these levels of flood stage.</p> <p>Flood Categories (in feet)</p> <table border="1"> <tr> <td>Major Flood Stage:</td> <td>45</td> </tr> <tr> <td>Moderate Flood Stage:</td> <td>45</td> </tr> <tr> <td>Flood Stage:</td> <td>45</td> </tr> <tr> <td>Action Stage:</td> <td>44</td> </tr> <tr> <td></td> <td>7</td> </tr> </table>	Major Flood Stage:	45	Moderate Flood Stage:	45	Flood Stage:	45	Action Stage:	44		7	High	Damage to roads, culverts, bridges, residences, and public facilities; potential water source contamination
Major Flood Stage:	45														
Moderate Flood Stage:	45														
Flood Stage:	45														
Action Stage:	44														
	7														
Fluvial Erosion	Likely	Serious	Minimal	Moderate	Damage to roads and property near the Lamoille River.										
Winter storms and ice storms*	Frequent	Extensive	Notable to Crippling. Recent significant occurrence for measure include: 1 inch of ice (12/2013) or 2+ feet of snow (12/9/2014) per storm event.	High	Property damage, road closures, loss of electricity from fallen trees, infrastructure damage, debris removal										
Windstorms, incl. hurricanes and tropical storms*	Likely	Serious	Saffir-Simpson Scale Category 1, Beaufort Scale 8 or 9, Flood Gage reaching 450 feet	Moderate	Road closures and loss of electricity from fallen trees; other vulnerabilities associated with flooding										

Power Outage*	Frequent	Serious	Partial or town wide power loss	High	Residences town wide
Structure Fire	Likely	Serious	Incipient to Growth stages; depends on age of structure	Moderate	Spread of fire through the Village Center (concentration of population centers) and housing complexes
Major highway and railroad accidents	Likely	Serious	Minimal	Moderate	Along Vermont Route 109
Major wildfire/forest fire	Unusual	Extensive	Decay stage	Moderate	Widespread damage to structures and natural resources
Drought	Likely	Serious	Degree and duration of meteorological dryness	Moderate	Private well failures, wildfires, agricultural losses
Tornado	Unlikely	Serious	F1 or F2	Low	Road closures and loss of electricity from fallen trees; major structure damage
Earthquake	Unlikely	Serious	Micro to Light (0 – 4.9)	Low	See VT Geological Survey HAZUS report (9/03)
Major hailstorm	Unlikely	Minor	2.00 in magnitude	Low	Damage to structures and other public and private property
Ice Jams	Unusual	Serious	Minimal	Low	Near North Branch of the Lamoille River near the Elementary School and along Coddington Hollow Road
Hazardous materials spill	Unusual	Extensive	Amount, seepage depth	Moderate	Exposure to residences and general population, along Vermont Route 109
Landslide	Unusual	Minor	Richter scale; Beaufort scale; rainfall	Low	Damage to roads and structures

*Consistently significant hazards in the Town of Waterville

**Extent of damage measured using the following sources from the International Fire Service Training Center and National Climatic Data Center: Northeast Snow Impact Scale, Fujita Scale, and Richter Scale and based on the frequency, severity, and risk to the community using past trends.

3.2 Community Vulnerability Analysis by Hazard

Based on recent conversations with the local Emergency Management Director and Planning Board, the history of disasters in town, and the Waterville HI/RA, the following hazards were identified consistently as significant threats to the community:

- Flood Inundation and Flash Flooding
- Windstorms
- Winter Storm/Ice Storm
- Power Outages

Each of these threats has the potential to cause power outages, which may place lives and property in damage, especially during winter months. Overall, interviews indicate that the following hazards are listed as Likely, Frequent or Unusual in terms of **Frequency**: Winter Storm/Ice Storm, Flood Inundation and Flash Floods, Structure Fire, High Wind, Dam Failures and Highway-Transportation Accidents. In terms of **Severity**, the town rated these hazards as Catastrophic or Extensive: Flood Inundation and Flash Flood, Winter Storm/Ice Storm, Wildfire/Forest Fire, Hazardous Materials, Dam Failures.

The paragraphs below expand upon local vulnerabilities identified in the Waterville HI/RA. Significant hazards noted above are profiled in detail in the section below. Other hazards facing the community are profiled below in the “Other Hazards” section. For a complete analysis of potential hazards facing the community refer to the Vermont Hazard Mitigation Plan. The following hazards were not profiled due to the lack of vulnerability, frequency, applicability to the Town, and resources available to address all hazards:

- Terrorism
- Infectious disease outbreak
- Nuclear power plant failure
- Dam Failure
- Invasive species
- Extreme temperatures
- Civil disturbance
- Coastal erosion
- Expansive Soil
- Sink hole
- Tsunami
- Volcano

Flood Inundation, Flash Flooding, and Fluvial Erosion

The community vulnerability to a Flood is *High* based on the *Frequent* possibility (Near 100% probability in the next year) of an incident with the potential for *Catastrophic* (>50% of the community) impact.

Based on the results of utilizing GIS to overlay the digital FHBM with the location of structures in Waterville– which were GPS located for the development of the Enhanced 911 Emergency

services dispatch system– twenty (20) vulnerable locations were identified to have flood inundation potential, based on the 100-year floodplain. The estimated loss for damage to these properties was calculated by using the median housing value estimated by the 2019 American Community Survey.

Table II. Waterville Potential Flood Loss

Town	Median Housing Value	Structures in Floodplain	Potential Flood Loss
Waterville	\$169,100	20	\$3,382,000

The Floodplain, Bridge and Culvert map (Tab a) identifies the areas of town that are within the 100-year floodplain. Generally, these include lands adjacent to the North Branch of the Lamoille River in southeastern Waterville. The Local Areas of Concern map (Tab c) identifies other areas of potential loss to infrastructure due to erosion and road flooding. Waterville historically has recorded numerous floods. Annual flood events are common in some form. Damage covers a wide range. The 1927 flood caused extensive damage in the community, including structural damage, destruction of roads, bridges, railroad bed/bridges, and loss of crops and supply interruptions. The floods of 1984, 1995 and 1997 also caused significant damage. Roads, bridges, residences, and businesses along the North Branch of the Lamoille River have experienced repeated damage caused by flooding.

In more recent years flooding impacts have occurred on a more localized scale in Town near the Waterville Elementary School and recreation fields, south of Hogback Road on VT-109, and on Plot Rd towards Route 15. Along the North Branch of the Lamoille River near the Elementary School, property owners have experienced a reduction in agricultural land due to flooding and fluvial erosion impacts. Plot Road has especially experienced recent flooding due to smaller existing culverts not able to withstand increasing precipitation and flood events. Flooding has also been a concern along Rogers Road in the north part of town near Streeter Brook. Additional flooding impacts experienced recently in Waterville include the flooding of basements during spring flooding events in homes located towards the end of Church Street. Waterville saw major flooding events on October 31st, 2019. This storm produced large amounts of precipitation which flooded many streams and washed-out roads. Lapland Rd, Smithville Rd, and Plot Rd all washed out during this storm. Culverts and bridges were damaged including the Church St bridge.

Floods are the most probable natural cause of emergencies or disaster in Waterville. High-elevation ponds and rivers have been one notable cause flooding in the past. Advance weather prediction is not always accurate and extreme precipitation can develop without adequate warning. Flooding, especially flash flooding, can impact areas in town that are located above designated floodplains. The mountainous areas in town are especially vulnerable to this phenomenon. Spring thaws and ice breakups may cause some lowland flooding. Summer or fall storms are more likely to be responsible for major flooding. Water contamination of private wells and springs is a potential problem during flood events. The town has no public water supply however the Village operates its own co-op and the well is monitored by Ross Environmental Associates out of Stowe. Beaver dams have also caused some flooding concerns and water quality issues near the Waterville Road Commissioner’s Garage. These issues have

been temporarily fixed. In the case of a major flooding event, other flooding concerns pertain to the potential for damage to the two town water tanks which could release a fair amount of water downstream and cause infrastructure damage along Oakes Road.

National Flood Insurance Program

Waterville does not participate in the NFIP and thus has no repetitive loss properties. The town has no flood hazard bylaw and must have one in place for residents to apply for federally subsidized insurance. Historically, Waterville has elected not to enroll in NFIP due to the small extent of floodplain in the community and limited demand for flood insurance among residents. During the 2019 Waterville Town Plan update, LCPC staff met with the Waterville Planning Board to review the benefits and potential parameters associated with a flood hazard bylaw. At the time the Town elected not to pursue the NFIP program further. During the 2022 LHMP the Waterville Planning Board re-visited the topic of NFIP and identified exploring the program further as an action item in this plan.

Winter Storm/Ice Storm

The community vulnerability to a Winter Storm/Ice Storm is *High* based on the *Frequent* (Near 100% probability in the next year) occurrence and the potential for *Extensive* (25% to 50% of the community) impact.

Winter storms with snow, ice, and freezing temperatures in various combinations are commonplace in Waterville. Recent winter storms of December 2013, and December 9th, 2014, generated up to 1 inch of ice and 2+ feet of wet heavy snow. The town is geared to handle most winter emergencies. A potential for emergency exists when such storms also result in the loss of electricity, leaving people without adequate heating capability. Heavy wet snows of early fall and late spring cause most power failures; however, ice storms can also cause power outages.

Due to the region's mountainous terrain, it is not uncommon for precipitation to range from rain in the valley area to ice in the middle elevations with heavy snows in the higher terrain. This poses a major challenge to highway maintenance personnel. Waterville contracts out snow removal and road maintenance for all town highways, and Vermont Agency of Transportation maintains equipment for state highways. Snowfalls that are within normal snowfall limits are handled effectively; however, during heavy snowfall for extended periods of time, removal of snow becomes an issue. Historically, these events are not frequent and are short in duration. During such events, radio communications is maintained between highway crews and town emergency responders. Local construction equipment in the community has been used in the past to augment community resources. Most residents are accessible during severe weather conditions, although access may be delayed. In the event of a winter emergency, the Highway Department will assist fire and ambulance crews by making private roads passable.

Windstorms/High Winds














Powerful windstorms represent a four-season hazard in Vermont. Impacts may vary from highly localized events to storms causing widespread damage. These storms frequently damage structures, trees, and powerlines. In December 2010, a damaging windstorm in central and

northwest Vermont led to a federal disaster declaration for Chittenden, Franklin, and Lamoille counties. Windstorms pose risk to the entire community. The October 31st, 2019 storm also came with damaging winds. Much of the county was left without power due to fallen trees and damaged power lines.

Damaging winds and flooding may also be caused by hurricanes and tropical storms, which travel up the Atlantic coastline. While the risk to Vermont is not on par with the South Atlantic and Gulf Coast states, the associated rain and flooding caused by these storms has had devastating impacts locally. In 1938, a hurricane swept across New England, causing what was once cited as the worst flooding in the state’s history. In some regions, the 1938 hurricane was only recently eclipsed by the impact of Tropical Storm Irene, which devastated southern and central Vermont in August 2011 (Waterville was fortunate to have sustained minimal damage from Irene).

Windstorms and tropical storms can be measured using the following scales:

Beaufort Scale

Beaufort number	Wind Speed (mph)	Seaman's term		Effects on Land
0	Under 1	Calm		Calm; smoke rises vertically.
1	1-3	Light Air		Smoke drift indicates wind direction; vanes do not move.
2	4-7	Light Breeze		Wind felt on face; leaves rustle; vanes begin to move.
3	8-12	Gentle Breeze		Leaves, small twigs in constant motion; light flags extended.
4	13-18	Moderate Breeze		Dust, leaves and loose paper raised up; small branches move.
5	19-24	Fresh Breeze		Small trees begin to sway.
6	25-31	Strong Breeze		Large branches of trees in motion; whistling heard in wires.
7	32-38	Moderate Gale		Whole trees in motion; resistance felt in walking against the wind.
8	39-46	Fresh Gale		Twigs and small branches broken off trees.
9	47-54	Strong Gale		Slight structural damage occurs; slate blown from roofs.
10	55-63	Whole Gale		Seldom experienced on land; trees broken; structural damage occurs.
11	64-72	Storm		Very rarely experienced on land; usually with widespread damage.
12	73 or higher	Hurricane Force		Violence and destruction.

Saffir–Simpson hurricane wind scale	
Category	Wind speeds
Five	≥70 m/s, ≥137 knots ≥157 mph, ≥252 km/h
Four	58–70 m/s, 113–136 knots 130–156 mph, 209–251 km/h
Three	50–58 m/s, 96–112 knots 111–129 mph, 178–208 km/h
Two	43–49 m/s, 83–95 knots 96–110 mph, 154–177 km/h
One	33–42 m/s, 64–82 knots 74–95 mph, 119–153 km/h
Additional classifications	
Tropical storm	18–32 m/s, 35–63 knots 39–73 mph, 63–118 km/h
Tropical depression	<17 m/s, <34 knots <38 mph, <62 km/h

Power Outages

One of the most common impacts of major natural disasters can be the prolonged loss of electricity, whether from localized damage to distribution systems or from remote impacts to generation and transmission facilities. Based on the rural character of the town and its concerns with transportation infrastructure in inclement weather, protracted loss of power could significantly endanger health and safety, have substantial economic consequences, or cause

stress and severe inconvenience to the town's residents and businesses. The shortage of energy and food supplies could threaten the welfare of the citizens of Waterville. The dependency upon out of state sources can become a problem when normal deliveries are interrupted. The VT Department of Health and Lamoille County Sheriff's Department maintain a list of vulnerable populations who may require additional assistance during long term outages. Additionally, the Town of Waterville maintains a list of vulnerable populations and residents requiring immediate assistance during a power outage.

Other Hazards

Tornado: Tornadoes are an *unlikely* occurrence in Waterville due to the area's mountainous topography. In July 2008 a tornado struck the Town of Waterville. While tornadoes are unlikely in Town, they have the potential to cause serious damage within a storm's pathway.

Major Highway and Railroad Accidents: The community vulnerability to a **highway accident** is *Moderate* based on the *Likely* (Near 100% probability in the next year) occurrence and the potential for *Serious* (few <1% of the population, injuries impact). Waterville is transected by VT Route 109, which serves as an inter-regional trucking and transportation corridor. Motorists travel at high speeds on the state highway network, creating potentially dangerous intersections with local roadways. The threat of a major highway accident is an ever-present possibility in communities across the United States. The threat of a major railroad accident is non-existent, as there are no active rail lines in Waterville.

Hailstorm: With Vermont's variable weather patterns, hail is a four-season threat to both public and private property. While the likelihood of a severe hailstorm is low, smaller storms may damage homes and automobiles. Hailstorms pose risk to the entire community.

Ice Jams: Ice Jams are an *unusual* occurrence in the Town of Waterville. Possible areas for an ice jam to occur include along the North Branch of the Lamoille River near Coddington Hollow Road and behind the Waterville Elementary School. If an ice jam were to occur in these areas downstream flooding could cause serious damage. Due to their unusual occurrence and minimal extent of damage, ice jams pose a low risk to the community.

Hazardous Materials (HAZMAT) Spill: In Vermont, businesses and facilities storing hazardous materials are required to file a report with Vermont Division of Emergency Management and Homeland Security (DEMHS) and the Statewide Local Emergency Planning Committee (LEPC), detailing the volume and type of substance (see Section 3.2.1). LEPCs previously received funds from DEMHS to carry out planning and preparedness activities, including commodity flow studies to track the transport of hazardous substances and outreach to non-reporting HAZMAT storage sites. **Hazardous material accidents** are less likely but are of particular concern as Route 109 is a thruway for HAZMAT carriers and the proximity of critical facilities, schools and residences to the road creates potential for **mass casualty incidents** (more than 4 injured people) including motor vehicle accidents (particularly tour or school busses) where response agencies may be overburdened.

Structure Fire: The risk of large-scale **structure fires** is moderate in Waterville. The most significant risks involve the village area and residences with long driveways that may prolong response time involved. Historically, structure fires have been isolated incidences, but they pose risk to the entire community. Mutual aid agreements with surrounding municipalities are in place for fire services. For the location of dry hydrants in Waterville please see the Critical Facilities map in Tab C.

Wild Forest Fire: Across much of Vermont, small wildland and brush fires are common, but the probability of major forest fire is very low. Peak wildfire season is in April, just after spring “green-up.” A second window of wildfire vulnerability typically occurs in early fall. Every town in Vermont has a designated Forest Fire Warden, who receives daily updates from the Division of Forestry during periods of elevated risk. The Division of Forestry also hosts annual Forest Fire Warden trainings at locations throughout the state. The risk of wildfires is most severe in outlying areas of development— away from the town’s major highways— where structures are surrounded by ignitable hard and softwood forests.

Drought: **Droughts** represent a hazard in late summer, when local spring and well levels are reduced to minimal flows. The local water table reached an all time low during the nationwide drought of 1988, however, recovery was rapid. The town has no public water reservoirs if private wells go dry. Drought poses risk to the entire community.

Earthquake: According to the U.S. Geological Survey (USGS), the risk of **earthquakes** in Vermont and much of northern New England is rated moderate, compared with the high risk attributed to much of the West Coast and lower-Midwest. Lamoille County has not experienced any property damage or loss of life attributed to an earthquake in its history. Minor earthquakes have occurred in Waterville within the past decade. If an earthquake were to occur flooding would be the likely secondary effect of concern.

Landslides, Bank Failure, Rock Cuts: The risk of a **landslide** is most often associated with flooding, erosion, and other impacts of heavy rain. No landslides have been recorded in Waterville within the past decade. Areas in town concerning major erosion issues and bank failure within the past five years include the intersection of Coddling Hollow and Locke Road, and Oakes Road. These areas of notable erosion have been fixed within recent years. Although landslides have caused property damage in the nearby Towns of Johnson and Cambridge in recent years, Waterville’s topography and rural development pattern leaves few homes and critical facilities exposed to the threat of a landslide.

Air crash: The potential for an **air crash** exists due to the proximity of the Morrisville-Stowe airport and the rugged terrain found in Waterville. The potential for development of the airport creates the possibility of larger aircraft to fly into town. Overall, more training on this hazard is needed. For a more detailed profile of the above *Other Hazards* please refer to the State of Vermont Hazard Mitigation Plan.

Infectious Diseases: This constitutes a widespread outbreak caused by a variety of organisms, typically including bacteria, protozoan, fungi, or viruses that enter the body and grow. Some of these diseases return seasonally and therefore require continuous monitoring. An epidemic emerges when an infectious disease occurs suddenly and exceeds the normally expected number of cases. This threat is a danger primarily to emergency responders, healthcare providers, and schools, but is often present in the general population as well.

Influenza returns yearly as a possible threat, although there has not been a serious outbreak in Vermont in recent history. However, more serious strains of flu may occur in an upcoming year that are not included in the annual flu vaccine. There are many other diseases such as HIV/AIDS, SARS, cholera, malaria, and antibiotic-resistant tuberculosis that are major problems elsewhere but are not prevalent here. Illnesses that are present in Lamoille County include Pertussis, Giardia, Salmonella, and Lyme disease. All these illnesses are present at normal levels. While climate change has not yet been directly linked to an increase in infectious disease cases, there is a speculated connection.

The pandemic of Coronavirus/Covid-19 emerged as a problem in early 2020, when the governor issued a State of Emergency on March 13, 2020, and a subsequent stay-at-home order. This disrupted supply chains, shut down tourism and resulted in major shifts in the economy, workforce, and quality of life. The Covid-19 pandemic continues to this day, although cases are not as severe in Vermont due to the development of a vaccine. This global pandemic is still a concern for the economy, supply chain, and public health. As of Nov. 11, 2021, the Vermont Health Department reported 42,910 total positive cases of Covid-19. The vaccination efforts have been widespread. Around 79% of eligible Vermonters have received at least one dose of the vaccine. The fatalities from Covid-19 total 388 people in Vermont.

Fluvial Erosion: Flooding in the Waterville area makes fluvial erosion an additional hazard for the town. Fluvial erosion is the removal of sediment from stream channel banks by the channel flow. This process occurs naturally over time as a stream channel adjusts. However, fluvial erosion can occur more quickly and severely during flood events and can pose a significant risk to infrastructure and buildings within the river corridor. Fluvial erosion is especially dangerous where the North Branch of the Lamoille River and other smaller tributaries run alongside Vermont Route 109 and other important town roads. The North Branch runs directly behind the Waterville elementary school and could pose a threat to vulnerable populations and infrastructure if the fluvial erosion were to extend west towards the school. Historically Smithville Road has been affected by fluvial erosion. Roughly half a mile north from Vermont Route 109, the North branch bends drastically from North/South to East/West. This bend happens adjacent to Smithville Road. During flooding events, the high velocity water erodes the riverbank and pushes the river profile closer to Smithville Road. This section of Smithville Road was subject to washouts due to this erosion in the past few years.

4. HAZMAT Sites

Data from the inventory previously maintained by LEPC #11 identifies no Tier II sites in the town of Waterville. A Tier II site is defined by federal law under the Emergency Planning & Community Right to Know Act (EPCRA) and is generally any facility which uses or possesses reportable quantities of chemicals requiring material safety data sheets by VOSHA, known human carcinogens, extremely hazardous substances, explosives which require licensing or certain threshold quantities of petroleum products.

According to the State’s Waste Management Interactive database, there have been no hazardous material spills in the town of Waterville since 2015. As of November 2021, the following table lists active waste sites in Waterville. This list includes petroleum as well as non-petroleum sites. Prior to database consolidation in 1991, different site numbering systems were used. In order to minimize confusion, the petroleum site numbering system was adopted. This system consists of a two- or four-digit prefix (year site was identified) and a four-digit (site specific) number. All sites identified since January 1, 1991, have been consecutively numbered beginning with 91-1000. Sites identified prior to January 1, 1991, have retained their previously assigned site identification numbers. Due to database requirements for a six-digit site number, the non-petroleum sites identified prior to January 1, 1991, have a 77 prefix added to their previously assigned site identification numbers.

As of November 2021, the State’s Waste Management Interactive Database Lists the sites below:

Table III. Active Hazardous Waste Sites in Waterville (as of November 2021)

Site#	Site Name	Address	Town	County	Priority	Discovery
20144485	Waterville FD #1 VOCs	Route 109	Waterville	Lamoille	HIGH	09-26-2013
20164679	Former Gas Station	598 Route 109	Waterville	Lamoille	MED	05-15,2015

The State’s database lists no hazardous waste generators and one active underground storage tank facility location in the Town. The potential for severe pollution impacts to water quality and ecosystems exists from hazardous waste sites and/or from spills at facilities which use hazardous materials. The Town of Waterville has no commercial hazardous sites. Hazardous fuels are only located within Town on a smaller scale such as household heating fuels or heating fuels for local farms. Releases of hazardous materials from fixed site locations in Waterville are an *unusual* occurrence.

The accompanying Areas of Local Concern map (Tab b) outlines the potential impact of a HAZMAT incident in terms of structures affected within a community from a fixed site and in terms of structures affected along a HAZMAT transportation corridor or route where an accident might occur.

When assessing community vulnerability, the impact of both fixed sites and transportation were considered. Using the Department of Transportation Emergency Response Guidebook, a 1,000-

foot buffer was selected for fixed site facilities to determine the area of potential impact. For potential transportation incidents, a 500-foot buffer on each side of Class I and II roads was used to determine potential impact. In Waterville, there are no Tier II sites and thus no structures are within 1,000 feet of a Tier II site (Table III). Based on the median housing value for Waterville provided by the 2011-2015 American Community Survey, the estimated potential loss for all properties within 500 feet of a major roadway is \$11,736,400 (Table IV below).

Table IV. Waterville Potential Tier II Hazard Loss (fixed)

Town	Median Housing Value	Structures within 1000' of Tier II site (% of total)	Potential Tier II Hazard Loss
Waterville	\$169,100	0 (0)	\$0

Table V. Waterville Potential Tier II Hazard Loss (transportation)

Town	Median Housing Value	Structures within 500' of a major road	Potential Tier II Hazard Loss
Waterville	\$169,100	132	\$22,321,200

4.1 Transportation Hazards

No major intersections have been identified by the Vermont Agency of Transportation (VTrans) as having a history of accidents. A culvert study was conducted in 2004 and some culverts may fail during flooding events. Repair or replacement of culverts is almost always needed. LCPC is in the process of working with all of its member towns to update culvert inventories. All bridges located in town are identified on the Floodplain, Bridge and Culvert map (Tab a). Bridges with a federal sufficiency rating of less than 50 (out of 100) are also identified on the Areas of Local Concern Map (Tab b). Three (3) bridges in Waterville have a federal sufficiency rating of less than 50.

4.2 Areas of Local Concern

Although there are no Tier II sites in town, HAZMAT carriers do travel along Route 109 past the village, town offices, elderly housing, and the local school. There are five critical facilities in the town (Tab c), three of which are impacted by one known hazard. Known hazards include being within the 100-year floodplain, being within 500 feet of a major road, and being within 1,000 feet of a Tier II site (Tab b.) Additional Areas of Local Concern include the Elementary School and Town Offices, which also serve as the town's EOCs/emergency shelters, though neither has an emergency generator.

5. Mitigation Goals

5.1 Town of Waterville Hazard Mitigation Goals

The following goals were re-evaluated and re-affirmed by the local community as being valid and effective:

- Provide the technical support for, and aid in the development of, implementation protection mechanisms at the local level that will serve to avoid land use investments that would be, over time, endangered by, incompatible or in conflict with fluvial adjustment and erosion processes, and landslides
- Encourage hazard mitigation planning as a part of the Local Planning Process
- Endorse and support the implementation of the Lamoille County Hazard Mitigation goals

5.2 Planning and Development Guidelines that Support Hazard Mitigation

In the 2019 revision of the Waterville Town Plan, Waterville integrated hazard mitigation planning efforts into its Town Plan goals and policies. The town has not adopted zoning or subdivision regulations. In 1974, FEMA produced Flood Hazard Boundary Maps (FHBMs) for Waterville although to this point the town has elected not to enact a flood hazard bylaw. This is an area in which the Waterville Planning Board is willing to explore within the next five years in relation to participating in NFIP. The Town Plan update process incorporated more awareness of hazards and what the community can do to improve resiliency. It also identified the following goals: consider adopting flood hazard regulations, install more dry fire hydrants to increase firefighting capacity in the community, and maintaining buffers between development and the river. The 2019 Waterville Town Plan was adopted by the community on May 13, 2019. Town Plan policies in the existing 2019 plan pertaining to hazard mitigation and flood resiliency include:

Waterville Flood Resilience and Hazard Mitigation Policies

Overall Policy: For Waterville's water resources, including its ponds, streams, rivers, wetlands, groundwater, and associated habitats, to be preserved, and, where degraded, improved in order to ensure water quality for drinking, recreation, and the environment. Policies related to various water resources are outlined below:

- **Rivers and Streams:** To ensure Waterville's rivers and streams contain clean water, a healthy riparian habitat and stable stream banks.
- **Lakes and Ponds:** To encourage maintenance of the overall health of our ponds for recreation and environmental purposes.
- **Wetlands:** To preserve and protect wetlands from pollution, filling, and any other uses or activities that will result in their degradation or a reduction in its capacity to provide wildlife habitat, flood control and water storage.
- **Flood Hazard Areas and River Corridors:** To protect the health, safety and welfare of the residents of Waterville by discouraging new development in flood hazard areas and river corridors.

- **Groundwater:** To encourage maintenance of the quality and quantity of local groundwater supplies, per state regulations.
- **Water Quality:** To maintain and, where degraded, improve the water quality within the town.
- Existing floodplain encroachments caused by the transportation network should be mitigated when technically and financially feasible. This may involve upsizing bridges and culverts and/or restoring floodplain areas disturbed by past infrastructure investments.
- Upland forests should be maintained and managed to attenuate floodwaters.

Specific Policies:

- Encourage Best Management Practices (BMPs) on municipal roads to direct sediment and run off away from streams and reduce flooding impacts by installing turnouts, proper crowning/road drainage, stone line or vegetative ditches, and check dams.
- Where possible, encourage tree plantings and vegetative buffers to mitigate flood impacts along the North Branch of the Lamoille River including near the Waterville Elementary School.
- Any development related to wetlands shall adhere to state regulations.
- Ensure all construction provides adequate erosion control per state guidelines and regulations.
- Continue to monitor water quality and encourage the implementation of best practices as needed at the Waterville Garage.

The Town of Waterville received a Municipal Planning Grant in December of 2016 to develop a Flood Resiliency Element to the Waterville Town Plan. In 2017 the Waterville Planning Board worked closely with the Lamoille County Planning Commission and the local Emergency Management Director to develop a Flood Resiliency Plan. Planning goals and action items from this 2021 Waterville Local Hazard Mitigation plan update will be incorporated into the next update of the Waterville Town Plan, Flood Resiliency chapter.

Further, the Town of Waterville’s Emergency Management Director has been active in integrating hazard mitigation projects into existing town functions. As a rural community with limited capacity, it is up to volunteers to continue pursuing funding mechanisms, trainings, and awareness raising to local leaders. The EMD has pursued grant funding for a generator for the emergency shelter, encouraged ICS trainings for municipal officials, and participates in the Regional Emergency Management Committee. Given Waterville’s lack of regulatory authority, these are the best methods by which to convey hazard mitigation strategy and prioritization.

5.3 Mitigation Strategies

5.3 Existing Hazard Mitigation Programs, Projects and Activities

The following is a list of anticipated or recently completed mitigation programs, projects or activities in the Town of Waterville. This list includes the status of mitigation actions from the

previous Waterville LHMP and additional action items added during this plan update. Notes for each section describe the completed, deleted or deferred mitigation action as a benchmark for progress; if activities are unchanged, a description has been provided as to why no changes occurred, or are not necessary.

Community Preparedness Activities

- Complete yearly updates of the Basic Emergency Operations Plan and complete annual NIMS compliance survey. *Ongoing. BEOP was adopted on September 18, 2012, and updates will occur on an ongoing basis.*
- Participation at Local Emergency Planning Committee meetings and activities. *Ongoing*
- Ensure procedures are in place for rapid evacuation of essential facilities. *A draft plan was created and the RPC and REMC will continue work on this document during the existing planning cycle.*
- Review and study the need for additional foam capability by the Fire Department to minimize the impact of a HAZMAT incident. *Complete. Town of Johnson Fire Department now has foam capability.*
- Ensure that all emergency response and management personnel receive HAZMAT Awareness training as a minimum. *Ongoing. Trainings are accomplished through DEMHS and REMC; EMD is participating in training.*
- Continue to train public officials and local responders in the use of the Incident Command System. *Ongoing. EMD has participated in ICS training.*
- Continue to enhance training of the Emergency Management Director (EMD). *Ongoing. EMD has been receiving training and training will continue through REMC and DEMHS supported activities.*
- Integrate additional mitigation measures in local land use planning. *Ongoing. Town adopted a new Town Plan in 2009 that encourages participation in NFIP and designating a flood hazard district that prohibits new development in the plan policies and recommendations. The plan update, starting in 2013, will address mitigation measures the Town can undertake if it so chooses.*
- Consider a floodplain management ordinance and work towards enrolling the town in the National Flood Insurance Program. *Ongoing. Town is not currently participating in NFIP; LCPC will continue to work with the Town Selectboard and Planning Board on flood hazard planning.*

Financial and Tax Incentives

- Annual investment of local tax dollars in highway mitigation projects. *Ongoing*
- Use of State and Federal funding for mitigation projects and activities. *Ongoing*

Hazard Control and Protective Works

- Develop a Highway Maintenance Program (culvert survey & replacement, ditching along roadways, cutting vegetation to allow visibility at intersections). *Ongoing with regularly scheduled maintenance.*

- County-wide mutual aid agreement for emergency road work. *Ongoing. Discussions about creating an intermunicipal agreement to provide emergency road services would benefit Waterville given its limited highway maintenance capabilities.*

Municipal Town Plan

- Waterville Town Plan 2019.

Protection/Retrofit of Infrastructure and Critical Facilities

- Mapping of Critical and Essential Facilities. *Remapped as of 2021.*

Public Awareness, Training & Education

- Use this plan for Hazard Identification and Mapping; include all public partners. *Since the first plan iteration, the disaster/declaration and response process has informed Town operations and the general public concerning the need for infrastructure and systems evaluation, monitoring and documentation especially as related to floods, winter storms, and power outages. This process will continue as public discussion, input and funding options for hazard mitigation projects are brought forward to the Selectboard. Additionally, all local and regional partners will use disaster events as a trigger to evaluate and improve the efficacy of this plan and necessary mitigation efforts. Each town will also play a role in the plan maintenance process spelled out in the Lamoille Regional All-Hazard Mitigation Plan.*
- Institute an Emergency Preparedness Education Program in the school. *Ongoing. Waterville Elementary School is working on an updated Emergency Plan. Ongoing actions will continue in this planning cycle through the REMC activities.*
- Enhance public education and outreach regarding the National Flood Insurance Program. *Ongoing. The RPC held 3 county-wide workshops on the NFIP program and flood hazards for municipal officials in 2007.*
- Support Family and Community Disaster Preparedness. *Deferred from last planning cycle. Progress was made on emergency preparedness planning to address local educational institutions and special populations. In this planning cycle efforts will focus on community notification of evacuation plans and mitigation resources.*
- Participate in HAZMAT Drills involving all elements of the community to practice procedures associated with a simulated HAZMAT incident. *Police Department and Fire Department participated in drills during previous planning cycle. Drills will be an ongoing function of the REMC during this planning cycle with EMD participation encouraged.*
- Collaborate with American Red Cross and LCPC to complete shelter surveys and shelter agreements. *Completed. A representative from the American Red Cross visited Waterville in September 2010 to execute a shelter agreement for Waterville Elementary School and the Town Offices.*

Public Protection

- Survey and designation of shelter(s). *Completed. Town has received American Red Cross certification for shelters at the Waterville Elementary School and Waterville Town Hall.*

- Emergency communications and information systems (NOAA weather receivers, Emergency Alert System (EAS)). *Ongoing*
- Auxiliary Power for School (Emergency Operations Center/Shelter). *Deferred action. Efforts are ongoing to secure funding to purchase a generator for the EOC/shelter.*
- Hazard Vulnerability Assessments. *Ongoing assessments following exercises and real events.*
- Review and modify evacuation and sheltering plans based on the results of drills and exercises or procedures implemented in an actual incident, share results with community. *Efforts will continue following planned drills and exercises by REMC.*
- Identify a Commodity Point of Distribution (CPOD). *Completed. Waterville Elementary School has been designated a CPOD location in the event of catastrophic emergency where supplies must be brought in.*
- Work with local and regional providers to develop informational database on special needs populations and elderly residents. *Ongoing. In 2009 a partnership of health, human services, and emergency response agencies and organizations developed a notification card to be used by special populations. This self-reporting card was distributed to the public and returned to the Lamoille County United Way. Locations of self-reporting persons have been mapped, and the maps and information are stored at dispatch locations and shared with responders on an as-needed basis. Lamoille County's program has become a model for a statewide effort in Vermont. Currently, methods are being developed for maintaining the database.*

Science and Technology

- Stream Geomorphic Assessments to identify flood and erosion hazards. *Ongoing. Two rivers were completed at various stages in Waterville during the previous planning cycle: North Branch of the Lamoille River and Judevine Brook.*
 - *North Branch – The stream geomorphic assessment tool and windshield survey were completed (Phase 1). A Phase 1 Report and Phase 2 assessment (in-stream study) for sections of the North Branch will be completed in the next planning cycle.*
 - *Judevine Brook - The Phase 1 assessment was partially completed with bridge and culvert data entered the State data management system with the exception of the lower reach. During the next planning cycle the Phase 1 assessment and report will be completed.*
- Fluvial Geomorphic and Erosion Hazard Assessment to evaluate erosion potential in Waterville along the North Branch of the Lamoille River. *Ongoing*
- Traffic calming and alternate transportation project. *Speed limit enforcement ongoing. Numerous transportation structure replacements occurred in previous planning cycle.*
- Annually, review the Waterville Culvert Inventory to assess condition of culverts and complete maintenance and replacement projects. *Ongoing. Town has made annual progress during last cycle and will work with RPC in next planning cycle to update culvert study completed in 2004.*
- Add emergency generators to the EOC and emergency shelter. *Deferred from last planning cycle due to proximity of a designated ARC (American Red Cross) shelter in*

Belvidere equipped with a generator. Waterville will continue to seek funding for school generator.

- Provide emergency equipment and early warning systems for population of villages. *Deferred from last planning cycle due to change in EMD appointments. Town plans to investigate obtaining a warning siren for the village during this planning cycle.*
- Increase quantity of emergency equipment such as pumps, generators and drinking water storage systems to mitigate risk to community. *Ongoing. Town will pursue funding for additional dry hydrants and water supplies for fire suppression as well as a generator for the emergency shelter (Elementary School).*

5.4 Identified Hazard Mitigation Programs, Projects and Activities

The following identified programs, projects and activities are new and/or planned for the Town of Waterville and complement Appendix C of the Waterville Local Hazard Mitigation Plan. In Waterville, the major concern is the impact of a serious flooding and/or snow or ice storm incident where power may be out and transportation routes to the town would be impacted, effectively leaving the general public and special needs populations at risk due to delayed response time. Partners involved in completing these projects are identified in parentheses following the description.

Ultimately, hazard mitigation priorities are determined by Waterville's ability to finance and implement these activities within the town's existing tax base. When weighing investments in hazard mitigation, Waterville will prioritize projects that generate the highest cost-benefit ratio for the greatest number of residents. See Appendix C for more information on these projects.

- Annually review the Waterville Culvert Inventory to assess existing infrastructure and continue progress in system upgrades, maintenance and implementation to ensure safe and available access to roads. Also, incorporate the results into a new map. An update to the Waterville Culvert Study will provide the town with valuable information on where investments in new structures are needed to mitigate future flood damages and ice jam damages caused by undersized and failing culverts.
- Conduct annual review and prioritize fixes for bank failure and road erosion areas including maintaining turn outs and crowning to reduce flooding impacts.
 - An annual review will allow the town to reassess infrastructures improvement needs and update the Road Erosion Inventory database. Incorporate the results into a new map for use by the Town and Highway Foreman.
- Complete Fluvial Geomorphic Assessment work on specified rivers to provide actions that can reduce the risk of infrastructure damage due to fluvial erosion during flood and flash flood events.
 - North Branch (Phase 1 report, Phase 2 assessment for sections of the North Branch).
 - Judevine Branch (Phase 1 report)

- A geomorphic assessment will support existing and future development by accommodating the river's fluvial movement.
- Ice jams and flooding can be mitigated through this action.
- Purchase back-up generator for the Waterville Elementary School emergency shelter
 - A generator for the emergency shelter is a critical piece in Waterville's emergency preparedness and mitigation activities. Because Waterville is served by one power company, if there is a power outage, it will affect many residents in town. A generator would complement past mitigation activities to prepare the town for a major emergency requiring opening a shelter. The generator is useful for ice storms, flooding, and summer-related weather events (tornadoes, etc.).
- Develop an emergency early warning system for population of the Town
 - Assess the feasibility of a siren warning system for the Town and "reverse" E911 call system to alert residents. This is a present and future mitigation activity.
 - Mitigates year-round damage from year-round weather events or hazardous materials spills (not limited to any specific time of year).
- To increase fire suppression capacity, explore new locations for installing additional hydrants including near water resources on Plot Road.
 - Additional dry hydrants will mitigate potential damage caused by a fire outbreak. Because there is a limited water supply in Waterville, dry hydrants provide necessary firefighting capabilities in rural communities with limited infrastructure. They also allow for disbursed firefighting capability to accommodate the rural settlement pattern in Waterville. More dry hydrants will accommodate existing and future growth patterns.
 - Fires are common in the winter in Vermont given the reliance on woodstoves and wood-burning heating devices. Fires may also occur in the summer due to drought or dry conditions.
- Consider developing and adopting flood hazard regulations to limit damage to property and loss of life for flood prone areas.
 - Developing and adopting Flood Hazard Regulations for the Town of Waterville would make the Town eligible for participation in the National Flood Insurance program.
 - Flood hazard regulations would allow the Town to further protect existing and future development while encouraging flood proofing practices and steering future development away from flood prone areas or areas impacted by fluvial erosion.
- Consider participating in the National Flood Insurance Program to allow property owners to obtain flood insurance for flood prone areas and the Town of Waterville to leverage increasing ERAF (Emergency Relief Assistance Fund) funding to fund disaster mitigation projects.

- Joining NFIP would have several benefits, including mitigating future damages to structures built within the FEMA delineated floodplain and allowing all residents to purchase subsidized flood insurance.
- This will mitigate future damage to property and people for existing and future development in Waterville.
- Conduct annual review and update of list of vulnerable people in town that need immediate assistance during a power outage.
 - Keeping a list of vulnerable people who need immediate assistance during a power outage will allow responders to know where to go first in order to protect the lives of those on life support systems.
- Develop a resource list of local people (contractors, residents skilled in certain manual labor trades) and equipment (snow mobiles, kayaks, four wheelers) that can assist locally in disaster response to access isolated residents and distribute supplies.
- Identify roadblock points and detours to implement if an ice jam were to occur.
 - Identifying roadblocks, detours and general evacuation routes for an ice jam scenario will allow traffic control to flow smoother and reduce the loss of life and injuries resulting from major flooding impacts.
- Educate local homeowners and builders to build to withstand high wind speeds, heavy snow loads, and earthquake impacts.
 - Further education of building standards will encourage homeowners and local builders to construct structures in a sound manner to withstand high winds and heavy snow loads to prevent structures from collapsing or experiencing severe storm damage.
- Educate local residents, farmers, and business on water conservation measures to reduce the impacts of drought.
 - Further education on water conservation measures can encourage farmers and homeowners to utilize conservation measures as common practice and reduce the impacts of drought on farming operations and household activities.
- Explore funding opportunities to implement hazard mitigation action items including infrastructure, structural repairs to bring buildings up to code, and installing a generator at the Emergency Shelter.
 - Key town officials will explore and collaborate with LCPC to identify funding opportunities (grants, tax credits etc...) to implement mitigation action items.

6. Plan Maintenance Process

6.1 Monitoring, Evaluating, and Updating the Plan

The Waterville LHMP will be evaluated and updated regularly by the Waterville Planning Board and Emergency Management Director, with technical assistance from LCPC staff and input from the Waterville Selectboard. The 5-year plan update will begin 1 year from the expiration of the

plan. Any significant disaster event will prompt a review of this plan between members of the Planning Board, the Waterville EMD and LCPC. At the very minimum, the plan will be amended as required within five years from the date of FEMA approval.

The Waterville Planning Board in conjunction with the Waterville Emergency Management Director and input from the Waterville Selectboard will also perform a mid-cycle review of the Waterville Local Hazard Mitigation Plan within three years of adoption. The mid-cycle review will monitor the status of the actions in this plan and evaluate their effectiveness in meeting plan goals. The mid-cycle review will take place at a Waterville Planning Board Meeting open to the public and warned as a regularly scheduled meeting through agenda postings at the Town Clerk's Office, Post Office, Waterville Market, and on the Town website. Ultimately, the long-term success of this and other LHMPs is dependent on the availability of funding to implement mitigation priorities.

6.2 Incorporation into Existing Planning Mechanisms

During the update and re-adoption processes for the Town Plan, bylaws, and/or regulations, the Town and LCPC will provide guidance and recommendations to the respective Town Boards for the incorporation and integration of state, and local hazard mitigation goals and strategies into the specific programs and practices described in these other planning mechanisms.

Specific opportunities for the Town to incorporate this Plan's mitigation strategies into their own planning mechanisms include but are not limited to:

- Municipal comprehensive plans
- Municipal capital budgets
- Transportation improvement programs
- Mutual aid agreements
- Annual update of the Local Emergency Operations Plan

In order to effectively incorporate mitigation strategies into these existing planning mechanisms, it is important to demonstrate how these approaches maximize benefit to the entire community. This can be achieved through the utilization of a cost-benefit analysis, which quantifies the benefits of mitigation against anticipated losses. Such an analysis is an integral part of prioritizing potential mitigation strategies and actions and is also a requirement for submitting future FEMA mitigation grant applications.

6.3 Continued Public Involvement

There are four principal avenues for broad public comment that include:

- Community involvement through the local and regional planning process relating to updating existing planning mechanisms
- Participation at the regular REMC meetings (REMC meetings are typically attended by a variety of parties: first responders, municipal officials, non-profit health care agencies, disaster assistance groups, and communications industry officials)
- Posting of the LHMP on the LCPC webpage for public comment

- Town-level meetings and trainings where awareness issues are raised. As a small community, Waterville is able to bring people together for decision-making.
- Other opportunities for continued public involvement include announcements in church bulletins or at Sunday Service and Thursday Morning Jam, and postings at the Waterville Post Office, Town Clerk’s Office, and the general store.

The general public will be notified of review and update efforts over the next five years through press releases to local newspapers, social media, announcements by local radio stations, and updates to the LCPC website. This opportunity will allow for a community discussion to focus on land use planning as a mitigation strategy, in order to utilize regulatory and non-regulatory tools. Additionally, LCPC will reach out to other regional stakeholders, including the Lamoille Mutual Aid Association and Lamoille County Sheriff’s Department, to ensure mitigation planning efforts align with the county’s public safety interests.

6.4 Town Prioritization and Mitigation Priorities and Progress

The following mitigation actions and priorities highlighted in Appendix B and C were review and updated in 2020 through 2021 by local municipal officials. The Waterville Emergency Management Director conducted a thorough review of town priorities and mitigation actions. The EMD met and consulted with the Waterville Planning Board and Selectboard on hazard mitigation planning actions. The Waterville Selectboard are scheduled to further review and refine town priority mitigation actions. Town priorities are based on community need, likeliness of funding, and the timeframe in which the Town feels action items are feasible to achieve. Public safety and protection of property and public infrastructure were key considerations when updating mitigation actions. Town priority actions represent opportunities to reduce long-term risk of a wide range of hazards currently or potentially impacting the community. Benefit cost analysis data was not available during prioritization. See Appendix B and C for more details on town hazard mitigation priorities and a proposed implementation schedule. In Appendix B below, the bolded individual or agency is the primary lead for implementing mitigation actions and other listed leadership are partners or supporting organizations.

Since the last update of the Waterville Local Hazard Mitigation Plan in 2017, town priorities have expanded to incorporate 2019 Town Plan goals, address additional hazards, and emphasize community preparedness. An example of incorporating Town Plan goals includes adding an action item to explore participating in the National Flood Insurance Program. Additional action items were prioritized to address other hazards such as drought through water conservation measures, and potential ice jams by identifying roadblocks and detours. This plan expands on community preparedness by incorporating additional action items to address vulnerable populations during a disaster or power outage, increase fire suppression capacity, develop key resource lists to assist in disaster response, and increase education on sound building practices. Mitigation priorities were also updated to encourage continued implementation of infrastructure improvements to address flooding and road erosion concerns.

Since the last update of the Waterville Local Hazard Mitigation Plan in 2017, the Town has continued to make progress on implementing hazard mitigation projects. Progress within the past few years implementing best management practices identified in the 2020 Road Erosion Study, addressing culvert issues noted in the 2013 Culvert Inventory, and implementing water system improvements. Recently, Waterville implemented road erosion control practices including stone-line ditching along the lower end of Beals Hill Road. To address flooding and erosion concerns, the Town has completed extensive ditch, culvert and road work on Beals Hill Rd, Lapland Rd, and Oakes Rd. The Waterville Planning Board has developed a Flood Resiliency Plan to outline goals and objectives to address flooding concerns and build a more resilient community. Lastly, the Waterville EMD continues to incorporate mitigation strategies into the Town’s annual update of the Local Emergency Operations Plan.

Mitigation Action Progress Table:

Below is the list of actions identified in 2017 Waterville LHMP and their implementation status:

Action	Status
Conduct annual review and update of list of vulnerable people in town that need immediate assistance during a power outage	The Waterville EMD created a list of vulnerable people in town that need immediate assistance during a power outage. John Terrel updates this annually and submits it to the Town Clerk and includes in the Waterville LEMP (Local Emergency Management Plan). This action item is being kept in the current LHMP for annual review.
Add emergency generator to the Waterville school emergency shelter.	The Waterville EMD had conversations with VEM and the Waterville Selectboard about funding for a generator for the school shelter. This action item is being kept in the current LHMP to further explore funding.
Complete Fluvial Geomorphic Assessment work on the North Branch of the Lamoille River and Judevine Brook	This action item is being kept in the current LHMP as these assessments are still being looked into.
Annually review the Culvert Inventory to assess existing infrastructure, continue system planning and prioritize infrastructure improvements	This action item is reviewed annually and will be kept in the current LHPM.
Conduct annual review and prioritize fixes for bank failure and road erosion areas including	This action item is reviewed annually and will be kept in the current LHPM.

<p>maintaining turn outs and crowning to reduce flooding impacts.</p>	
<p>Develop an emergency early warning system for population of the Town</p>	<p>Changed to read “Educate Waterville residents about Vermont Alert and other alert notices (VPR) to inform the public about emergencies”.</p>
<p>To increase fire suppression capacity, explore new locations for installing additional hydrants including near water resources on Plot Rd</p>	<p>The Johnson Fire Department tests them annually. John Terrel, Waterville EMD helped write a grant for the installation and worked with Troy Dare from the Rural Fire Protection Program. Current dry hydrants are located on Church Street and near the intersection of Rogers and Smithville Road. John noted there is another dry hydrant off VT 109 just past Hogback Rd near the Waterville/Cambridge Town line. John has initiated conversations with local landowners regarding potential wet hydrant locations in Town. This action item is being kept in the current LHMP as the town continues to look into more hydrant locations. Changed language to read. “to increase fire suppression capacity, revisit exploring new locations for installing dry and wet hydrants in Waterville”.</p>
<p>Consider adopting flood hazard regulations to limit damage to property and people for flood-prone areas.</p>	<p>This action item is being kept in the current LHMP as the town may still pursue these regulations in the future.</p>
<p>Develop a resource list of local people (contractors, residents skilled in certain manual labor trades) and equipment (snow mobiles, kayaks, four wheelers) that can assist locally in disaster response to access isolated residents and distribute supplies</p>	<p>The Waterville EMD has created a list of local people (contractors/residents skilled in certain manual labor trades) and equipment (boats, four wheelers) that could assist in an emergency to access isolated residents and distribute supplies. John noted the only component of this list he could not get is those who have snowmobiles. This action item has been completed and removed from the current LHMP.</p>
<p>Consider participating in the National Flood Insurance Program to allow property owners to obtain flood insurance for flood prone areas and the Town of Waterville to leverage</p>	<p>This action item is being kept in the current LHMP as the town may decide to pursue NFIP participation in the future.</p>

increasing ERAF (Emergency Relief Assistance Fund) funding to fund disaster mitigation projects	
Educate local homeowners and builders to build to withstand high wind speeds, heavy snow loads, and earthquake impacts	This action item is being kept in the current LHMP as the town continues to encourage building to withstand hazards in the area.
Educate local residents, farmers, and business on water conservation measures to reduce the impacts of drought	The Town occasionally puts out a notice about Drought and fire safety. In the future the Town could put out a notice on Front Porch Forum regarding water usage and drought. John Terrel noted he and other residents in town have had their wells dry up during severe drought. This action item is being kept in the current LHPM as drought is a growing concern in the area.
Identify roadblock points and detours to implement if an ice jam were to occur	Removed from current LHMP as Waterville is not affected by ice jams.
Explore funding opportunities to implement hazard mitigation action items including infrastructure, structural repairs to bring buildings up to code, and installing a generator at the Emergency Shelter.	This action item is being kept in the current LHMP as funding is always a limiting factor when it comes to implementing these mitigation action items.

Appendix A. Town of Waterville Supplemental Data and Maps

- Floodplain, Bridge and Culvert Map
- Structures in the Floodplain
- Critical Facilities Map
- Culvert and Bridge Map
- Meeting minutes/notes from 2022 Waterville LHMP update

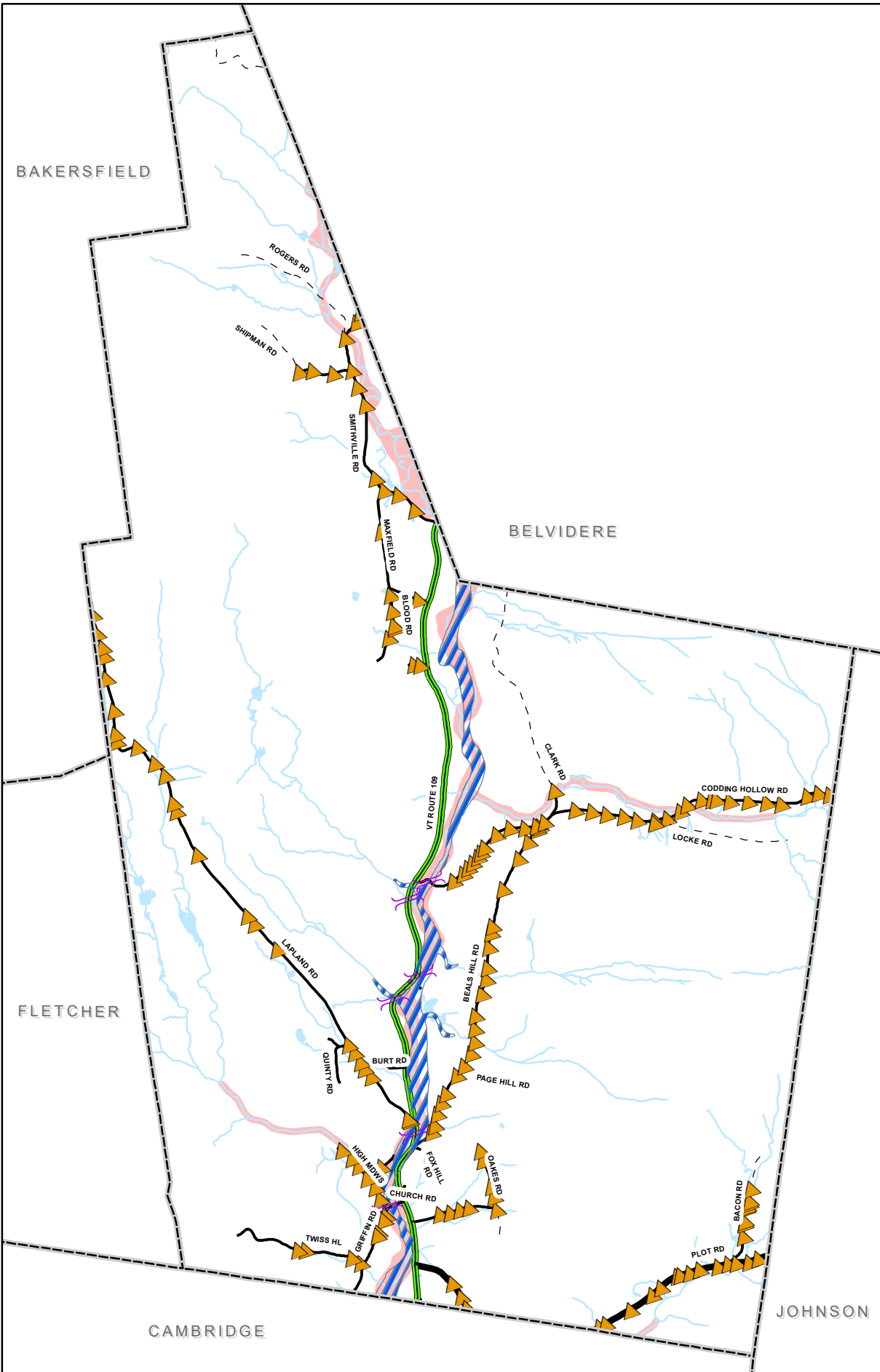
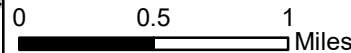
FLOODPLAIN, BRIDGES & CULVERTS

TOWN OF WATERVILLE







For planning purposes only.
Not for regulatory interpretation.

Traverse Mercator,
VT State Plane,
Meters, NAD83.

Lamoille County
Planning Commission
PO Box 1637, 52 Portland Street
Morrisville, VT 05661
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www.lcpcvt.org
March, 2021



Legend

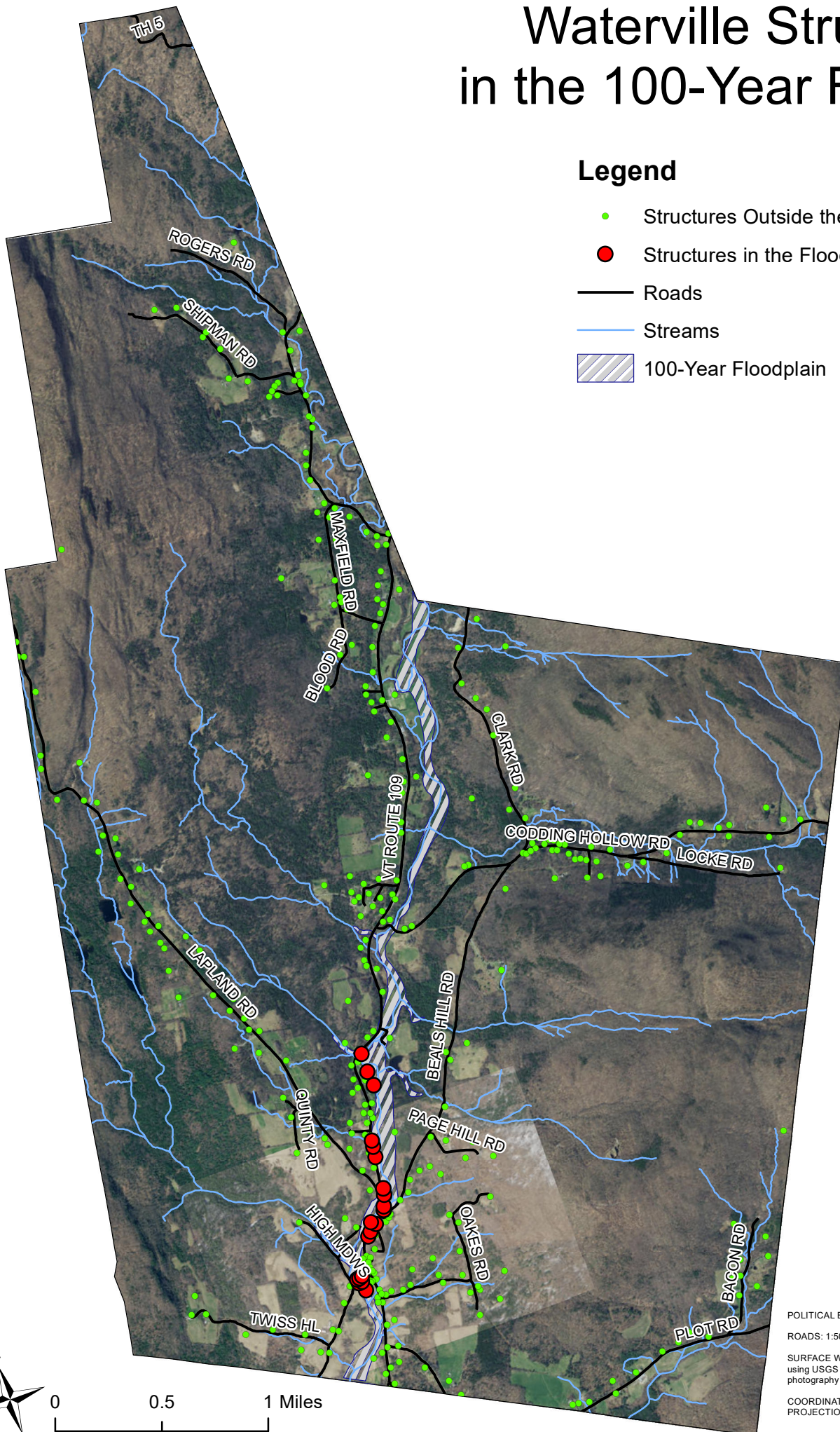
-  BRIDGE
-  CULVERT
-  RIVER / STREAM
-  LAKE / POND
-  100 YEAR FLOOD
-  RIVER CORRIDORS

Data Sources:
2013 Bridge and Culvert Data,
Vermont Center for Geographic
Information and LCPC 2013
Inventory
Roads, E-911 Database, VCGI,
2019
Surface Water, VCGI for VHD-
USGS, 2001
Flood Plain, Digital Flood
Insurance Rate Map
(DFIRM), FEMA, 2006

Waterville Structures in the 100-Year Floodplain

Legend

- Structures Outside the Floodplain
- Structures in the Floodplain
- Roads
- Streams
- ▨ 100-Year Floodplain



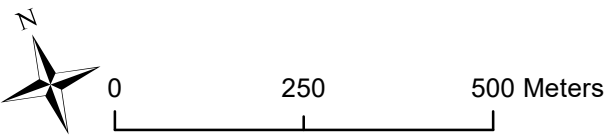
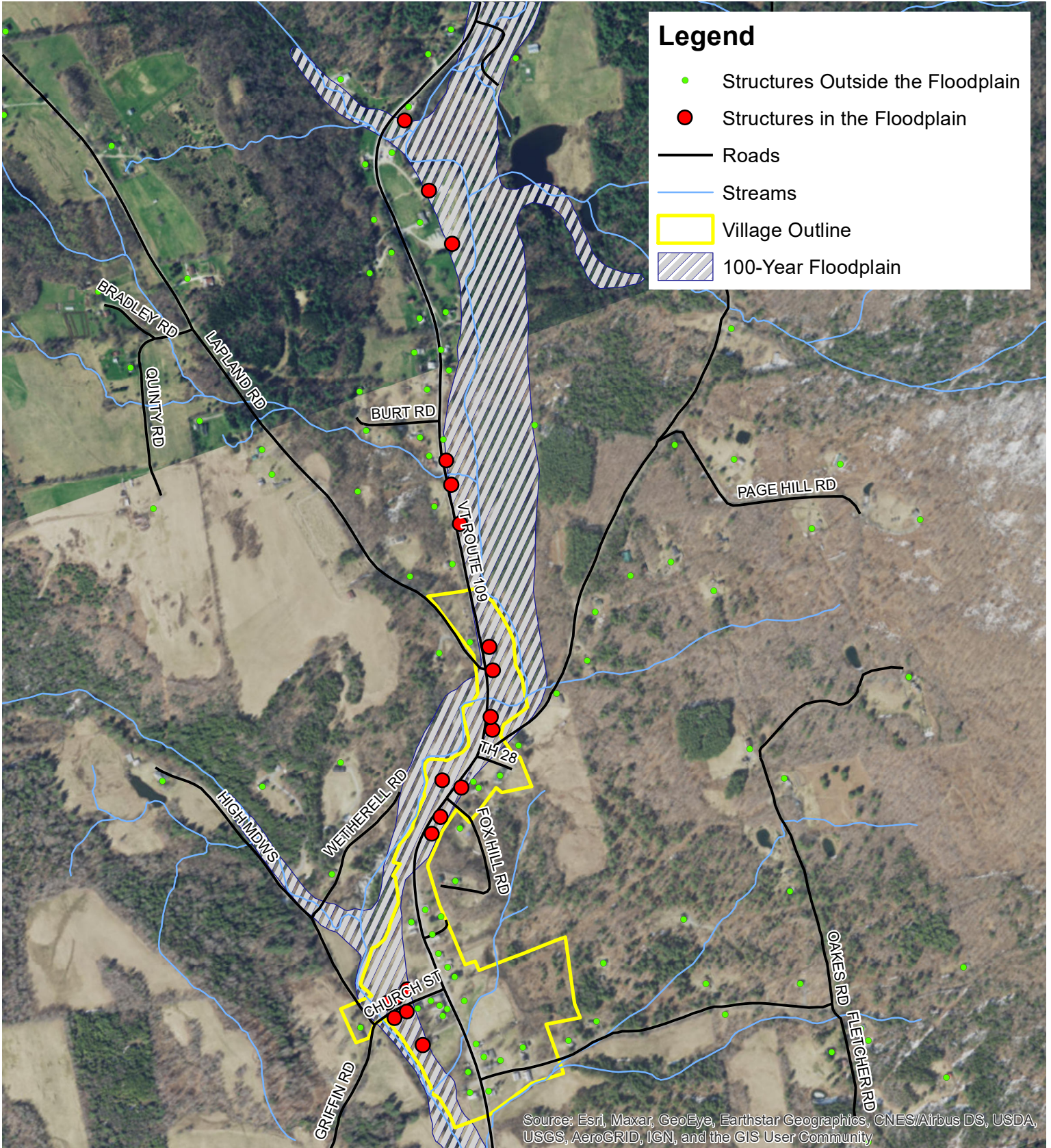
POLITICAL BOUNDARIES: 1:24000 USGS Quadrangles, VCGI, 1991.

ROADS: 1:5000 E-911 Road Data, 2019.

SURFACE WATER: On-screen digitized from 1:5000 digital orthophotos using USGS 7 1/2' quadrangles and 1:20000 color infrared aerial photography as additional source material, VCGI for VHD-USGS, 2001.

COORDINATE SYSTEM: Vermont State Plane, Meters.
PROJECTION: Transverse Mercator, NAD 1983.

Waterville Structures in the 100-Year Floodplain (Zoomed to Village Extent)



POLITICAL BOUNDARIES: 1:24000 USGS Quadrangles, VCGI, 1991.

ROADS: 1:5000 E-911 Road Data, 2019.

SURFACE WATER: On-screen digitized from 1:5000 digital orthophotos using USGS 7 1/2' quadrangles and 1:20000 color infrared aerial photography as additional source material, VCGI for VHD-USGS, 2001.

COORDINATE SYSTEM: Vermont State Plane, Meters.
PROJECTION: Transverse Mercator, NAD 1983.

CRITICAL FACILITIES

TOWN OF WATERVILLE

For planning purposes only.
Not for regulatory interpretation.









Traverse Mercator,
VT State Plane,
Meters, NAD83.

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www.lcpcvt.org
April, 2017



0 0.475 0.95
Miles

Legend

-  CHURCH
-  DRY HYDRANT
-  SCHOOL
-  MUNICIPAL BUILDINGS
-  MUNICIPAL WATER/FIRE DISTRICT
-  RIVER / STREAM
-  LAKE / POND
-  100 YEAR FLOOD

Emergency Operations Centers (EOC):

- Waterville Elementary School
3414 VT Rte. 109
- Waterville Town Office
850 VT Rte. 109
- Belvidere Elementary School
VT Rte. 109

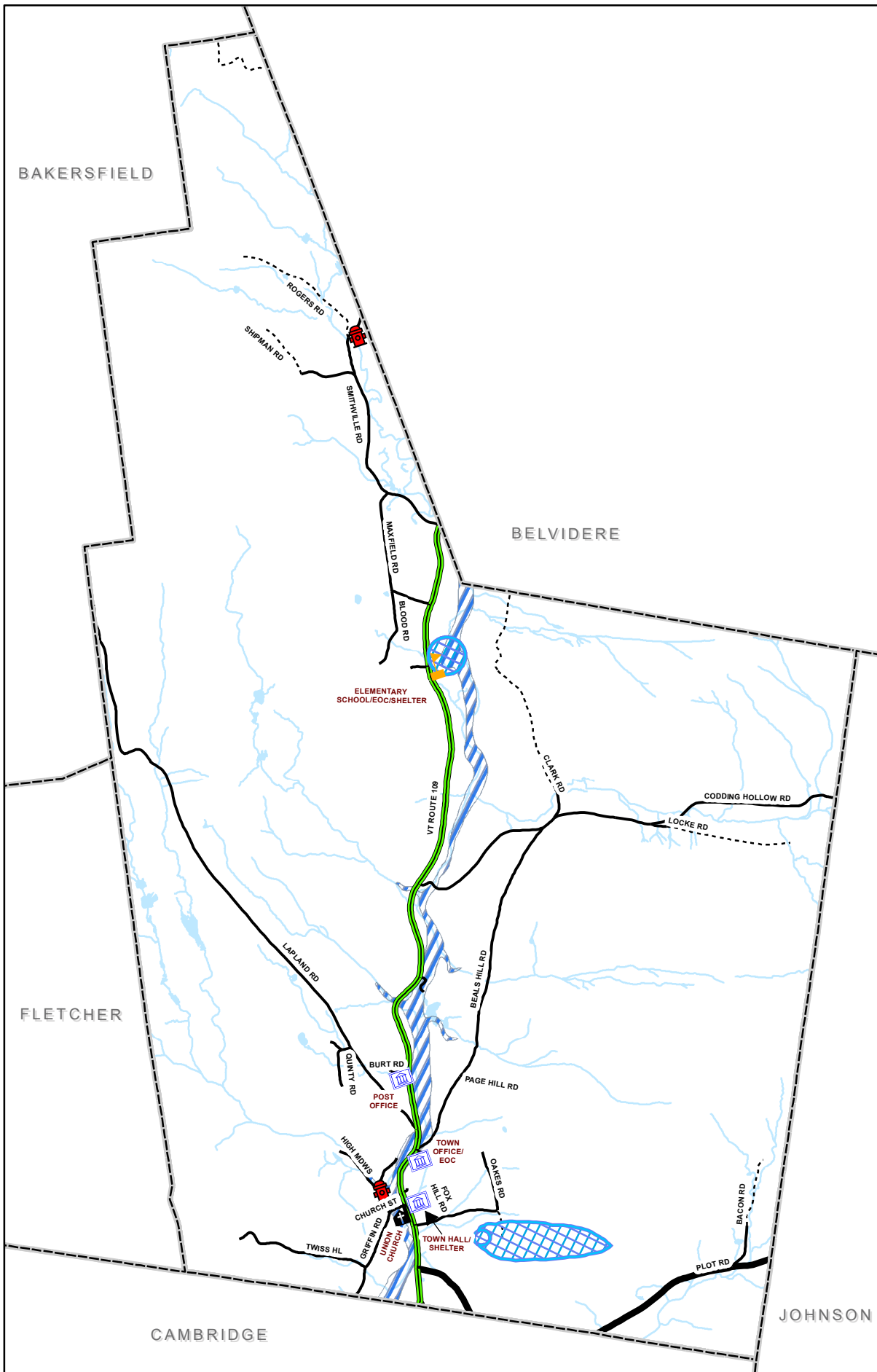
Designated Emergency Shelters:

- Waterville Elementary School
3414 VT Rte. 109
- Waterville Town Hall
544 VT Rte. 109
- Belvidere Elementary School
VT Rte. 109

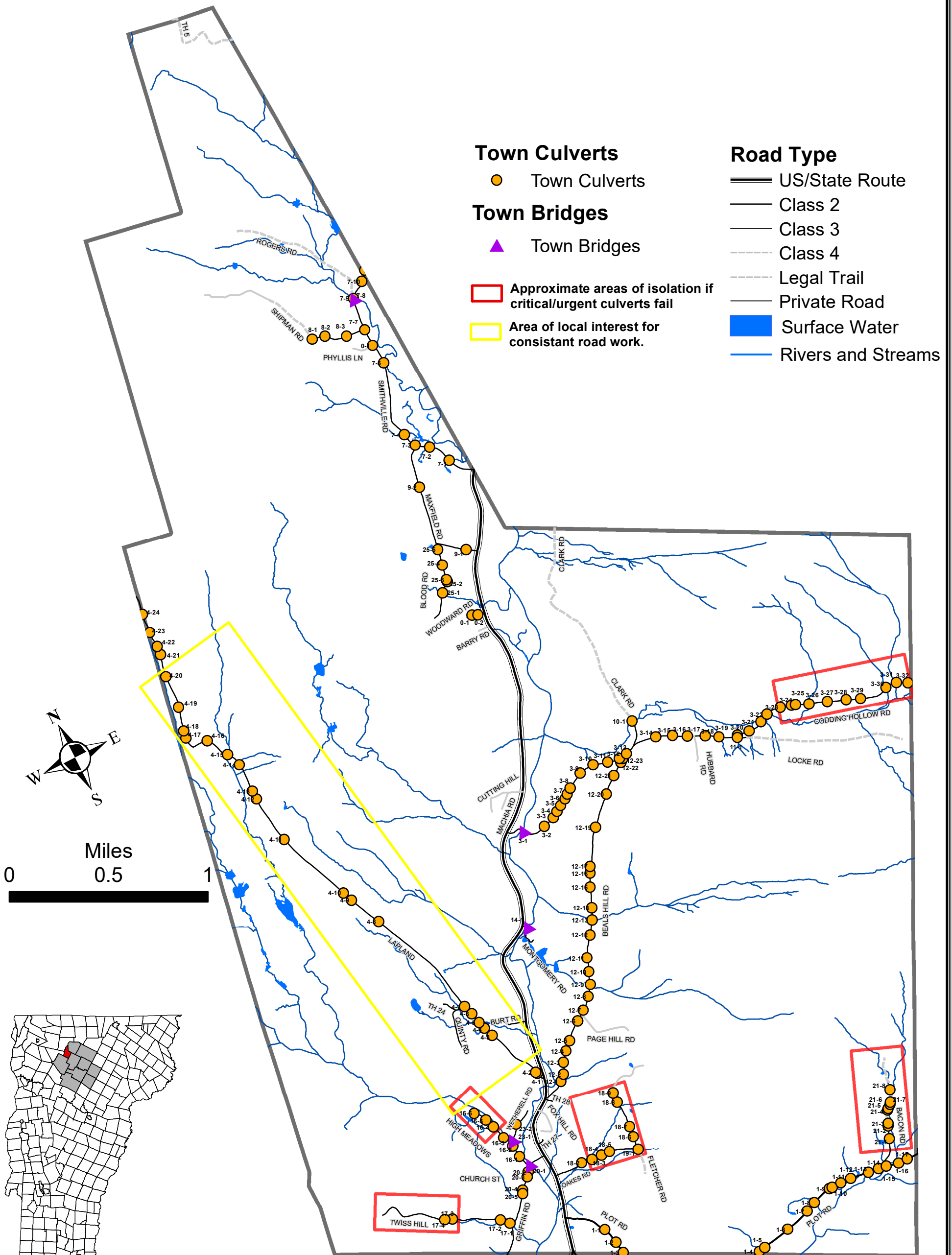
Community Shelter:

- Union Church
36 Church Street, Waterville, VT

Data Sources:
Critical Facilities, digitized by LCPC 2017
Municipal Water/Fire District, VANR-DEC-Water Supply Division and VT Dept. of Health, 1998.
Roads, E-911 Database, VCGI, 2019
Surface Water, VCGI for VHD-USGS, 2001
Flood Plain, Digital Flood Insurance Rate Map (DFIRM), FEMA, 2006.



Town of Waterville: Culverts and Bridges



SOURCE:

CULVERT DATA: LCPC 2013 Inventory. Map updates provided by Waterville Selectboard, December 2021.

POLITICAL BOUNDARIES: 1:24000 USGS Quadrangles, VCGI, 1991.

ROADS: 1:5000 E-911 Road Data, 2019.

SURFACE WATER: On-screen digitized from 1:5000 digital orthophotos using USGS 7 1/2' quadrangles and 1:20000 color infrared aerial photography as additional source material, VCGI for VHD-USGS, 2001.

COORDINATE SYSTEM: Vermont State Plane, Meters.
PROJECTION: Transverse Mercator, NAD 1983.

Map intended for planning purposes only.

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December 2021

Waterville Planning Board Meeting

March 3rd, 2021 at 6pm

Present: Alec Jones (LCPC), Carlos Martin (Waterville Planning Board), Heather Mateja (Waterville Planning Board Chair), Nancy Patch (Cold Hollow to Canada Board member/Founder), Monica Przyperhart (Cold Hollow to Canada Woodlot Manager), Dave Ransom (Waterville Planning Board), Lucy Rogers (Cold Hollow to Canada Board member/VT Representative), Meghan Rodier (LCPC), John Terrel (Waterville EMD), Jeff Tilton (Waterville Planning Board)

6:03pm meeting start. Heather Mateja, Planning Board Chair initiated introductions.

Presentation on Cold Hollow to Canada

Monica Przyperhart the Woodlot Manger for Cold Hollow to Canada (CHC) provided an introduction on what CHC does and how they could work with the Town of Waterville. Cold Hollow to Canada focuses on the northern Vermont forest and managing intact forest. The towns CHC covers includes Bakersfield, Belvidere, Enosburg, Fletcher, Montgomery, Richford, and Waterville. CHC would like to expand their efforts to work in the Waterville/Belvidere area. The three pillars CHC focuses on are 1) land stewardship, 2) Conservation, and 3) community empowerment. Monica manages the Woodlots Program which provides educational opportunities such as hosting woodlot walks where landowners can share forest management practices. CHC helps landowners learn how to manage healthy forests more affordably and can connect landowners to Vermont Land Trust if they are interested in conserving their property. CHC has a Conservation Fund to help make conserving land more affordable. CHC can help with Town planning involving wildlife habitat and assist Towns in establishing a Conservation Commission.

How Cold Hollow to Canada Can Help in Waterville

Monica noted Cold Hollow to Canada would like to provide healthy forest planning assistance to Waterville and inquired how they could help in the area. John Terrel asked about the parameters of a land trust. Monica explained CHC works with forest owners and can help connect owners to the Vermont Land Trust to place land into a conservation easement. The easement will state how the land can be used and subdivided in the future. Nancy Patch mentioned the Current Use Program. She and Emily Potter (Forester for Lamoille County) could host an educational talk on the Current Use Program. Heather suggested CHC could help with mapping/visioning for recreation opportunities in Waterville and opportunities to get outside in town. Dave suggested CHC connect with the local trail groups; LVRT, Green Mountain Club (manages the Long Trail), Hazen's Notch organization, Appalachian Trail, and Catamount Trail groups. Jeff Tilton asked where to find a record of CHC projects. Monica noted the newsletter is the best resource for projects.

Monica will be in touch regarding scheduling events/ opportunities in Waterville.

Waterville Local Hazard Mitigation Plan Update

Community Vulnerability Assessment/ Hazard Inventory

Meghan Rodier kick started the update by providing an overview of the purpose of the Local Hazard Mitigation Plan (LHMP) and how it identifies hazards the community is most vulnerable to and action items to mitigate those hazards to reduce loss of property and life. Meghan referred to section 3.2 “The Community Vulnerability Assessment by Hazard” and inquired if there are other hazards that should be included in the Hazard Inventory/Risk Assessment table. Meghan inquired if the Board felt it was appropriate to include pandemic/ infectious diseases outbreak and invasive species in the “Other Hazards” section and provide a small profile on them. Jeff Tilton noted there is not much Waterville could do in the pandemic situation other than follow the guidance from the VT Health Department. It is a global issue, not localized and does not warrant its own section in the Waterville LHMP. Heather asked if other Towns call out the pandemic in their LHMP. Meghan noted she will check other more recent Lamoille plans (Cambridge, Hyde Park, Jeffersonville) to see if they called it out. Meghan mentioned that Wolcott indirectly addressed the pandemic with action items around increasing broadband and cell phone coverage that would help in a pandemic situation and with communications for other emergencies. Regarding invasive species Carlos Martin noted that while Waterville does have issues with Knotweed along the roadside and rivers, it is a broad issue not localized. Referring to the State Hazard Mitigation Plan for information on that hazard makes sense. Dave Ransom raised the concern of poor water quality as a hazard. Meghan will check to see if that is listed in the State Hazard Mitigation Plan.

Appendix C Implementation Schedule for Prioritized Mitigation Projects

The Waterville Planning Board and EMD reviewed the Prioritized Mitigation Projects table. While reviewing the mitigation actions Dave noted the issue of dams and flooding including beaver dams. Meghan noted dams can be profiled in the “Other Hazards” section. She will look at the dams GIS layer to see what dams are left in Waterville and note the beaver dam issue as well when profiling dams. During discussion of action items pertaining to fire suppression, Meghan noted she can include an updated dry hydrants map in the Waterville Local Hazard Mitigation Plan. John Terrel mentioned the hydrants map is in the LEMP for reference.

Progress and changes to mitigation actions in appendix C were discussed as follows:

Progress:

1. The Waterville EMD created a list of vulnerable people in town that need immediate assistance during a power outage. John Terrel updates this annually and submits it to the Town Clerk and includes in the Waterville LEMP (Local Emergency Management Plan). Keep this action item for annual review.
2. The Waterville EMD had conversations with VEM and the Waterville Selectboard about funding for a generator for the school shelter. Grant funding for this has dried up. This would be an item that would have to be budgeted for in the Town Budget.
3. There are two dry hydrants in Waterville. The Johnson Fire Department tests them annually. John Terrel, Waterville EMD helped write a grant for the installation and worked with Troy Dare from the Rural Fire Protection Program. Current dry hydrants are located on Church Street and near the intersection of Rogers and Smithville Road. John noted there is another dry hydrant off VT 109 just past Hogback Rd near the Waterville/Cambridge Town line. John has initiated conversations with local landowners regarding potential wet hydrant locations in Town. He noted Pete Tilton’s pond would be an ideal size for a wet hydrant. Carlos noted there are some

ponds near his property and Jay's house, but they are smaller. John noted the bigger the pond the better for a wet hydrant. John can revisit this and explore new locations for hydrants.

4. The Waterville EMD has created a list of local people (contractors/residents skilled in certain manual labor trades) and equipment (boats, four wheelers) that could assist in an emergency to access isolated residents and distribute supplies. John noted the only component of this list he could not get is those who have snowmobiles. He reached out to VAST many times but got no response.
5. The Town sometimes puts out a notice about Drought and fire safety. In the future the Town could put out a notice on Front Porch Forum regarding water usage and drought. John Terrel noted he and other residents in town have had their wells dry up during severe drought.

Mitigation Actions Suggested Changes:

- A. Change action about developing an early warning system to "Educate Waterville residents about Vermont Alert and other alert notices (VPR) to inform the public about emergencies." Use multimedia to outreach such as Front Porch Forum and Town Meeting Day.
- B. Change action item about fire suppression to "to increase fire suppression capacity, revisit exploring new locations for installing dry and wet hydrants in Waterville."
- C. Remove completed action about developing a local resource list.
- D. Modify action about educating residents about water conservation to include the Town publishing a notice on Front Porch Forum about water usage and drought as applicable.
- E. Remove action item about roadblocks and ice jams. John noted that Waterville is not affected by ice jams because the water all gets sent down to Cambridge where ice jams is an issue.

Meeting adjourned at 7:50pm

Waterville Planning Board Meeting

September 15th, 2021 at 6pm

Waterville Library

Present: Alec Jones (LCPC), Carlos Martin (Waterville Planning Board), Heather Mateja (Waterville Planning Board Chair), Salvador Morales (LCPC), Meghan Rodier (LCPC)

6:00pm meeting start. Heather Mateja, Planning Board Chair initiated introductions.

Waterville Local Hazard Mitigation Plan (LHMP) Update

Appendix B: Action Evaluation and Prioritization Matrix

Waterville Planning Board members and LCPC staff revisited the Prioritization Matrix for mitigation actions in the Local Hazard Mitigation Plan. Carlos noted the second mitigation action down in the matrix “Add emergency generator to the Waterville school emergency shelter” should score higher in this matrix. It is listed as the second priority in Appendix C. Meghan noted John Terrel (Waterville EMD) spoke with the Selectboard about grant match for the generator. LCPC staff (Seth and Melanie) are working on a USDA grant application to help fund a portion of installing a generator at the emergency shelter.

Meghan inquired if an action item about the pandemic should be included. She noted an example from Stowe’s LHMP about maintaining a stockpile of PPE. Carlos and Heather agreed a similar action item regarding maintaining a stockpile of PPE for Town employees and Waterville local officials should be included in this matrix and Appendix C. It can be ranked at a similar level as other educational action items such as “Educate Waterville residents about Vermont Alert.” Heather noted the Waterville Public Health Officer can be referenced in this action item for more information. This action item would reflect preparedness for future infectious diseases outbreaks.

Appendix C: Implementation Schedule for Prioritized Mitigation Projects

Add mitigation action item regarding maintaining a stockpile of PPE for Town employees and Waterville local officials. See reference to this above under Appendix B.

Section 5: Mitigation Goals

LCPC staff and Waterville Planning Board members discussed the following changes/ additions to the mitigation goals:

- Update goal #3 to reference hazard mitigation goals in the Lamoille County Regional Plan
- Add a goal that states, “Continue to mitigate erosion and flooding on Waterville municipal roads.”
- Add a goal that states, “Continue to educate Waterville residents about local hazards and emergency preparedness.”

Draft Local Hazard Mitigation Plan Maps

Update the Town of Waterville Culverts and Bridges map to reflect road work that just took place in 2021 (Lapland Rd, Beals Hill Rd). Heather noted Hunter the Road Commissioner would be a good person to get in touch with about this.

Waterville MPG Project Update

Meghan provided an overview of requests that Rob Moore, LCPC Transportation Planner, submitted to VTrans in response to the community visioning that came out of this “Waterville Main Street Initiative” project. She explained that the painted version of the proposed pedestrian zone was not approved by VTrans for a demonstration, but they offered a few alternative options. The Waterville Selectboard agreed the alternate option of a “signed” pedestrian zone/Area in the Village Center makes the most sense. This signed pedestrian zone option was submitted to VTrans to carry out as a work order. Meghan noted other sign improvements were also submitted to VTrans through normal request channels such as new school area signs near the Waterville Elementary School and installing a new “bus stop ahead” sign in the Village Center to warn vehicles of the bus-transfer location.

Carlos and Heather noted the Town should still look into installing a flashing light/beacon at the school as a future improvement. Meghan noted that will be a recommendation in the MPG Project Final Report. The Final Report will be completed by end of October 2021.

Meeting adjourned at 7:03pm

Waterville Selectboard Meeting

December 6th, 2021

Alec Jones, Sal Morales, Donald Lynch, Arthur Tilton, Jay Marsh

LCPC brought copies of the Local Hazard Mitigation Tables and Maps for the Waterville Selectboard to review and comment on. No changes were added to the Hazard Mitigation Tables at this time. The selectboard felt comfortable with the edits that the Planning Commission and the EMD have suggested. The Hazard mitigation maps were reviewed. Alec took notes on local roads that would be most impacted during an emergency as well as roads that the town is prioritizing with their culvert and road work efforts. The selectboard suggested some edits to the culvert map regarding current projects and outdated data. LCPC will take these notes back and edit the maps accordingly.

Waterville Planning Board Meeting

2/17/2022

Attendance: Heather Mateja, Carlos Martin, Dave Ransom, John Terrel, Meghan Rodier (LCPC), Alec Jones (LCPC)

The meeting was called open at 5:35pm. There were no changes to the agenda.

MPG Project Update-

Meghan gave an update on the status of the Pedestrian MPG project. There has been a new school sign as well as a new bus stop sign installed in the town. The MPG report that LCPC is developing is almost done, Seth and Kate are just finishing up formatting and finalizing it.

Local Hazard Mitigation Plan Public Hearing-

Public hearing opened by Heather at 5:45. There were no comments from the Planning Board. Meghan suggested edits listed below:

1. Page 4- You don't need to list individual REMC member names, just the Town/position.
2. Appendix C- Under Leadership, first list the position title of the local official who will be the lead on implementing mitigation actions, then the supporting Committee as applicable.
3. Maps- Change zoomed in floodplain map title to reference that it is a village inset.
4. Page 23- Update BEOP reference to LEMP and the most recent adoption date.
5. Page 24-25- Take out the reference to CERT.

There was no additional public comment.

Public meeting closed by Heather at 5:55pm

John gave an update on the annual meeting that will be held on July 7th, 2022. He also discussed the generator project. They have 2 proposals for the generator. John will meet with the Select Board to discuss funding for this project then Seth will submit the proposals to USDA. This will need to be voted on at town meeting.

Planning Board Chair Position-

Heather is resigning as the chair of the Planning Board, but would like to remain a member of the Planning Board. Heather nominates Carlos to the chair position. This was seconded by Dave Ransom and passed with 3 votes.

Motion to adjourn by Heather, Seconded by Carlos.

Meeting adjourned at 6:10pm

Appendix B. Action Evaluation and Prioritization Matrix

Action Evaluation and Prioritization Matrix Town: Waterville

5 = Excellent 4 = Good 3 = Average 2 = below average (or unknown) 1 = poor

Mitigation Action	Responds to significant (likely or high risk) hazard	Likelihood of funding	Protect threatened infra-structure	Implemented quickly	Socially / Politically acceptable	Technically Feasible	Administratively Realistic	Reasonable cost to benefit	Environmentally sound	TOTAL SCORE
Conduct annual review and update of list of vulnerable people in town that need immediate assistance during a power outage	5	5	5	5	5	5	5	4	4	43
Add emergency generator to the Waterville school emergency shelter	3	2	3	3	3	3	4	3	3	27
Complete Fluvial Geomorphic Assessment work on the North Branch of the Lamoille River and Judevine Brook	4	4	3	3	3	4	4	3	4	32
Annually review the Culvert Inventory to assess existing infrastructure and continue system planning and prioritize infrastructure improvements	5	5	5	5	5	5	5	4	4	43
Conduct annual review and prioritize fixes for bank failure and road erosion areas including maintaining turn outs and crowning to reduce flooding impacts.	5	5	5	5	5	5	5	4	4	43
Educate Waterville residents about Vermont Alert and other alert notices (VPR) to inform the public about emergencies.	4	3	4	4	3	4	4	4	4	34

To increase fire suppression capacity, revisit exploring new locations for installing dry and wet hydrants in Waterville.	4	4	5	4	4	4	4	3	4	36
Consider adopting flood hazard regulations to limit damage to property and people for flood-prone areas.	4	2	4	2	2	3	2	2	5	26
Develop a resource list of local people (contractors, residents skilled in certain manual labor trades) and equipment (snow mobiles, kayaks, four wheelers) that can assist locally in disaster response to access isolated residents and distribute supplies	4	3	2	4	3	4	3	3	3	29
Consider participating in the National Flood Insurance Program to allow property owners to obtain flood insurance for flood prone areas and the Town of Waterville to leverage increasing ERAF (Emergency Relief Assistance Fund) funding to fund disaster mitigation projects	4	2	4	2	2	3	2	2	5	26
Educate local homeowners and builders to build to withstand high wind speeds, heavy snow loads, and earthquake impacts	3	3	2	4	3	4	3	3	3	28
Educate residents, farmers, and business on water conservation measures to reduce the impacts of drought. Publish public notice regarding water usage as needed.	3	3	2	4	3	4	3	3	3	28
Explore funding opportunities to implement hazard mitigation action items including infrastructure, structural repairs to bring buildings up to code, and installing a generator at the Emergency Shelter.	4	4	4	4	3	4	3	3	3	32

Appendix C. Implementation Schedule for Prioritized Mitigation Projects

MITIGATION ACTION	WHO (LEADERSHIP)	WHEN (TIMEFRAME)	HOW (FUNDING SOURCE)	HAZARD BEING MITIGATED
Conduct annual review and update of list of vulnerable people in town that need immediate assistance during a power outage	Waterville EMD, Select Board	Annually; (2022-2027)	Town of Waterville	Power Outage
Add emergency generator to the Waterville school emergency shelter	Waterville EMD, Select Board	1-3 years (2022-2025)	VEM, Town of Waterville	Power Outage, Winter Storms, Floods; All
Complete Fluvial Geomorphic Assessment work on the North Branch of the Lamoille River and Judevine Brook	LCPC, ANR	3 years – by 2025	State & Federal Grants	Flood, Landslides/Bank Failure, Ice Jams
Annually review the Culvert Inventory to assess existing infrastructure, continue system planning and prioritize infrastructure improvements	Town of Waterville Highway Foreman, LCPC	Annually; (2022-2027)	Town of Waterville, VT Agency of Transportation	Flood
Conduct annual review and prioritize fixes for bank failure and road erosion areas including maintaining turn outs and crowning to reduce flooding impacts.	Town of Waterville Highway Foreman, LCPC	Annually; (2022-2027)	Town of Waterville, VT Agency of Transportation	Flood, Landslides/Bank Failure
Educate Waterville residents about Vermont Alert and other alert notices (VPR) to inform the public about emergencies.	Waterville EMD, VEM	1-3 years (2022-2025)	VEM, Town of Waterville	All
To increase fire suppression capacity, revisit exploring new locations for installing dry and wet hydrants in Waterville.	Waterville EMD, Select Board	1-5 years (2022-2027)	Better Backroads, Town of Waterville, VEM	Fire
Consider adopting flood hazard regulations to limit damage to property and people for flood-prone areas.	Town of Waterville Planning Board, Select Board, LCPC	1 – 5 years (2022-2027)	State (Municipal Planning Grant), HMGP	Flood

Consider participating in the National Flood Insurance Program to allow property owners to obtain flood insurance for flood prone areas and the Town of Waterville to leverage increasing ERAF (Emergency Relief Assistance Fund) funding to fund disaster mitigation projects	Town of Waterville Planning Board, Select Board, LCPC	1 – 5 years (2022-2027)	VEM, Town of Waterville	Flood
Educate local homeowners and builders to build to withstand high wind speeds, heavy snow loads, and earthquake impacts	Waterville EMD, Waterville Planning Board, Select Board, LCPC	1 – 5 years (2022-2027)	State (Municipal Planning Grant), DEMHS	Windstorms, Winter Storms, Earthquakes
Educate residents, farmers, and business on water conservation measures to reduce the impacts of drought. Publish public notice regarding water usage as needed.	Waterville EMD, NRCS, LCCD	1 – 5 years (2022-2027)	State & Federal Grants	Drought
Explore funding opportunities to implement hazard mitigation action items including infrastructure, structural repairs to bring buildings up to code, and installing a generator at the Emergency Shelter.	Waterville Planning Board, Waterville EMD, LCPC	1 – 5 years (2022-2027)	Town of Waterville, LCPC staff time	All

Appendix D. Resolution for Town of Waterville Local Hazard Mitigation Plan 2022-2027

Resolution

Adopting the Town of Waterville Local Hazard Mitigation Plan 2022-2027

The Selectboard of the Town of Waterville find that:

- A) The adoption of a multi-hazard plan is required as a condition for communities to remain eligible for future Federal Emergency Management Agency (FEMA) mitigation grant funds.
- B) The Town of Waterville has prepared a single jurisdiction Waterville Local Hazard Mitigation Plan in order to meet FEMA's funding requirements.
- C) The Selectboard has reviewed and considered the Waterville Local Hazard Mitigation Plan.
- D) The mitigation strategies and actions identified in the plan will be implemented only when funding sources have been identified and projects have been prioritized as outlined in the Plan.

NOW THEREFORE,

BE IT RESOLVED BY THE SELECTBOARD OF THE TOWN OF WATERVILLE, A MUNICIPALITY OF THE STATE OF VERMONT, AS FOLLOWS:

Section 1. Based on the above findings, which are hereby adopted, the Waterville Local Hazard Mitigation Plan is approved as the official Multi-Hazard Mitigation Plan for the Town of Waterville.

Section 2. This resolution shall become effective immediately upon adoption.

The foregoing Resolution is hereby adopted this 29 day of August, 2022

Selectboard Chair 

Selectboard Member 

Selectboard Member 

Town Clerk received 