State of Vermont

# Hazard Mitigation Grant Program

## *Project Application*

| | FEMA- DR- 4022 VT | **Date Submitted:** | 31-Jan-13 |
|---|---|---|---|

## Part 1: Applicant Information

| | |
|---|---|
| **Applicant Name:** (*Eligible Applicant i.e. local government, state agency, non-profit*) | **Town of Ludlow** |
| **County:** | Windsor |
| **Name of Local Hazard Mitigation Plan:** (*County or Town*) | Ludlow All Hazard Mitigation Plan |
| **Date of FEMA approval of Local Plan:** | Submitted for Review and Approval on November 30, 2012 |

**Primary Contact Information**

| | | | |
|---|---|---|---|
| **Name:** | Frank Heald | | |
| **Title:** | Town Manager | | |
| **Organization:** | Town of Ludlow | | |
| **Mailing Address:** | P.O. Box 359 | | |
| **Work Phone Number:** | 802-228-2841 | **Alternate Phone Number:** | |
| **Fax Number** | 802-228-2813 | **Email:** | tmanager@ludlow.vt.us |

**Secondary Contact Information**

| | | | |
|---|---|---|---|
| **Name:** | Pam Cruickshank | | |
| **Title:** | | | |
| **Organization:** | Town of Ludlow | | |
| **Mailing Address:** | P.O. Box 359 | | |
| **Work Phone Number:** | 802-228-2841 | **Alternate Phone Number:** | |
| **Fax Number** | 802-22-2813 | **Email:** | village@tds.net |

## Part 2: Problem Description

| | | | | | |
|---|---|---|---|---|---|
| **Location of Project:** | Latitude: | | Longitude: | | *(in decimals)* |
| Identify adjacent roads/streets and bodies of water: | Commonwealth Avenue, Vermont Route 103, Meadow St., Black River Main Stem | | | | |

| | | |
|---|---|---|
| **Required Maps:** | ☐ | **Local General Highway Map *(attached)*** |
| | ☐ | **Flood Insurance Rate Map with panel number *(attached)*** |
| | ☐ | **Topographic Map *(attached)*** |
| **Problem Statement:** *(What's Happening?)* | The existing drainage system for an unnamed tributary to the Black River Main Stem is commonly overwhelmed during periods of heavy rain and runoff. During Tropical Storm Irene, the drainage system failed resulting in substantial damage to homes, businesses, and municipal infrastructure. The existing drainage system includes culverts, channelized ditching, and a small bridge before the tributary enters in the Black River main stem. Please see the attached report from Hoyle, Tanner Associates for additional information on current conditions. | |
| **Supporting Documentation:** (*Attach*) | ☑ | **Photos** |
| | ☑ | **Engineering Studies** |
| | ☑ | **Site Diagrams** |

## Part 2: Problem Description
**continued**

**Statement of Damages**

| Date | Event | Description of Direct Damages | Description of Indirect Damages | Cost of Damage |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 11-Aug | TSI | Heavy rain caused flooding and the overtopping of town infrastructure | Water and flood damage to homes and businesses | |
| Ongoing | Rain | Heavy rain storms continually overtop an undersized culvert | Water and flood damage to nearest home(s) | |
| | | | | |
| | | | | |
| | | | | |
| | | | **Total Damage** | |

| **Part 3:** | **Project Objective** |
|---|---|
| **Project Objective** | The project objective is the replacement of the current drainage system with a sytem which allows for greater water capacity flowage during high water events, designed to meet the 100-year storm event. The project will include the reshaping of existing drainage ways, infrastructure improvements including both culvert and bridge replacement with adequately sized structures. |

| **Part 4:** | **Analysis of Alternative Solutions** | |
|---|---|---|
| **Alternative Solutions** | | |
| **Alternative Solution** | **Brief Title** | **Description of Alternative** |
| 1 | Box Culvert, Bridge Replacement, Bank Stabilization | The preferred solution to the ongoing drainage problem for the unnamed Black River tributary is the replacement of the exsiting municipal infrastructure with structures which will allow for greater water passage. |
| 2 | Additional Arch Culvert | Adding an additional steel arch culvert will allow for greater water passage from Commonwealth Ave.; up to a 50 year storm event. |
| 3 | **No Action** | **No Action** |
| **Supporting Documentation:** *(Attach)* | ☑ Yes | **Did any of the alternatives have significant impacts or limitations?** |
| | ☑ Yes | **If Yes, provide additional information concerning these impacts Is the information attached?** |
| | ☑ Yes | **Hydrology/ hydraulics reports, if applicable** |
| | ☑ | **Supporting documentation for the alternatives (i.e. drawings, designs, pictures)** ***(Attached)*** |
| **Preferred Alternative** | | |
| **Chosen Alternative:** | | |
| **Justification:** | Box Culvert, Bridge Replacement, Bank Stabilization | |

| **Part 5:** | **Project Description** |
|---|---|
| **Project Description** | With the current inadequate drainage system causing flood and water damage during periods of heavy rain, funding through the FEMA Hazard Mitigaiton Grant Program will be utilized to improve the current system to better meet town needs. The project would replace the existing culvert system with a single, precast concrete box culvert allowing for the passage of water, ice, and debris. Additionally, the Meadow Street bridge and stream channel would be altered and/or replaced to meet the same flow thresholds as the culvert. For addtional information, refer to the attached engineering report. |

| | | |
|---|---|---|
| **Expected Life of Project** | | |
| **Supporting Documentation:** *(Attach)* | ☑ | **Photos** |
| | ☑ | **Engineering Studies** |
| | ☑ | **Site Diagrams** |

**Project Costs for Preferred Alternative**

| Item | Unit Qty. | Unit Measurement | Unit Cost | Cost Estimate |
|---|---|---|---|---|
| Clearing and grubbing of site, including excavation, preparation and site work for new structures | | | | $97,528.00 |
| Concrete Box Culvert, Pre-Cast Bridge, Curb Replacement | | | | $437,200.00 |
| Final Site Work including landscaping | | | | $48,570.00 |
| Engineering Costs | | | | $198,713.00 |
| Stream Diversion, Utility Pole Relocations, Fire Hydrant Removal, etc. | | | | $191,631.00 |
| Other non-classed expenses including monitoring, personnel, structure removal | | | | $152,358.00 |
| | | | | |
| | | | | |
| | | Total Project Cost Estimate | | $1,090,000.00 |

**Summary of Project Costs**

| | | |
|---|---|---|
| **A** | **Total Project Costs** | **$1,090,000.00** |
| **B** | **FEMA Share (75% of Line A)** | $817,500.00 |
| **C** | **Local Share (25% of Line A)** Note: The sum of lines 1-3 must equal Line C | $272,500.00 |
| | 1. Cash | |
| | 2. In-Kind Service | |
| | 3. Other | |
| **D** | **Total Local Share** (Equal to Line C) | $272,500.00 |
| **E** | **Total Project Costs (Line B + D) Lines A & E Are Equal** | **$1,090,000.00** |
| **Identify source of local non-federal match:** | Town of Ludlow funding | |

## Part 6: Benefit/Cost Analysis

| | | | |
|---|---|---|---|
| Estimated Project Cost | $1,090,000 | Future Maintenance costs for life of project | |
| Total Cost = Project Cost + Future Maintenance | | **Total Cost** | |
| Benefit/Cost Ratio = Anticipated Loss or Benefit /Total Cost | | **Benefit/Cost Ratio** | |

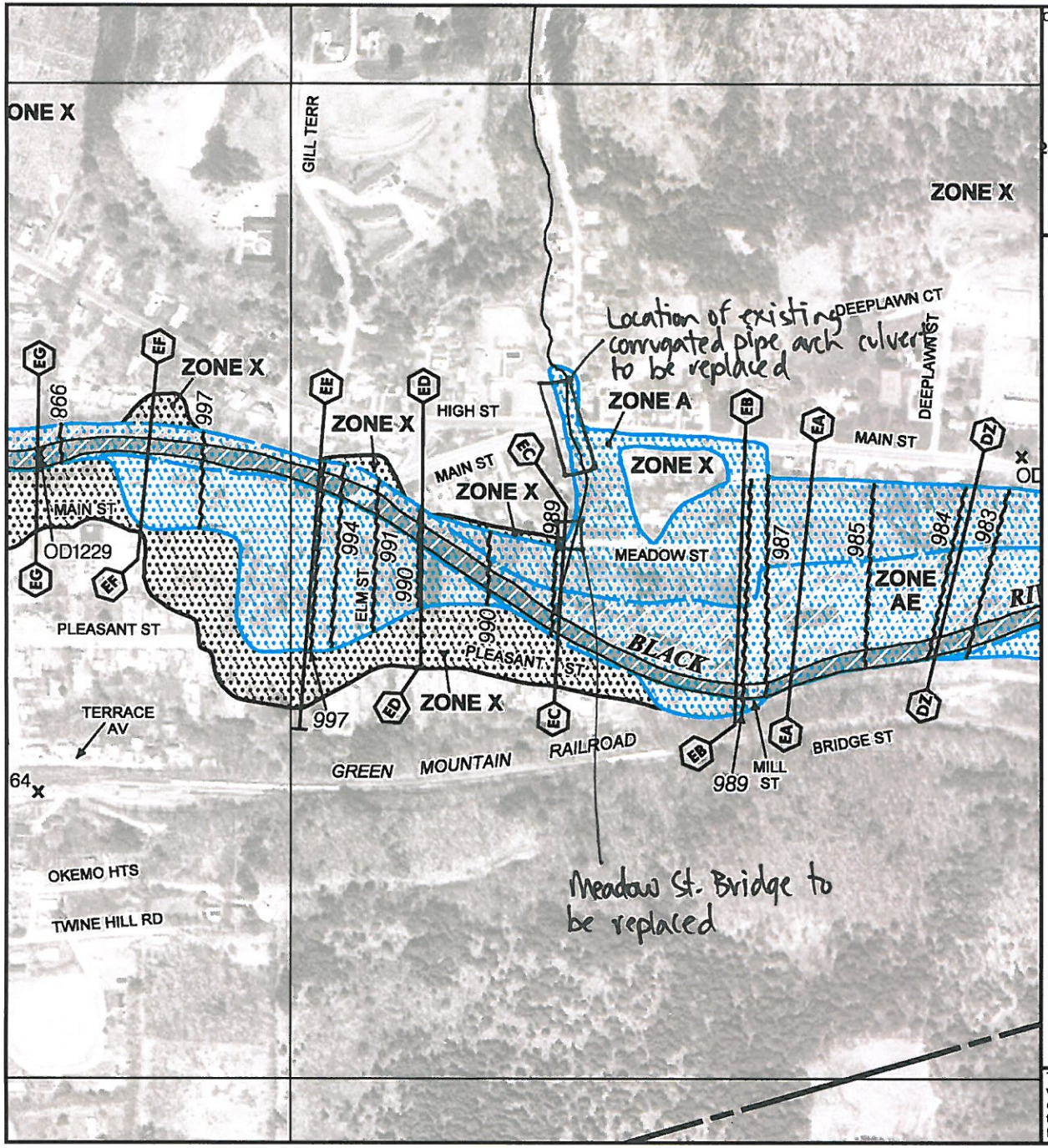
**Only those projects with a benefit-cost ratio of 1.0 or greater will be considered; please attach a separate benefit cost analysis (BCA). Planning applications do not require a BCA.**

| Part 7: | Scope of Work |
|---|---|

| Task Description | Days to Complete |
|---|---|
| See attached engineering study and project scoping | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

| Part 8: | | Technical Confirmation |
|---|---|---|
| **Supporting Documentation:** *(Attach)* | ☐ | **Has the hydrology/hydraulics/structural design of this project been endorsed by the local Vtrans District Engineer, ANR Stream Alteration Engineer, consulting engineer or other technical expert?** |
| | ☐ | **Supporting letter(s)** ***(attached)*** |

| Part 9: | Authorized Signature |
|---|---|
| I certify that I am the authorized agent for the applicant and have responsibility for the development and completion of this application and all the information contained herein is true and accurate. | |
| Mgr. Mgr. | 2-1-2013 |
| *Authorized Agent's Signature* | *Date* |




onal Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0589E

# FIRM

## FLOOD INSURANCE RATE MAP

WINDSOR COUNTY
VERMONT
(ALL JURISDICTIONS)

**PANEL 589 OF 831**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

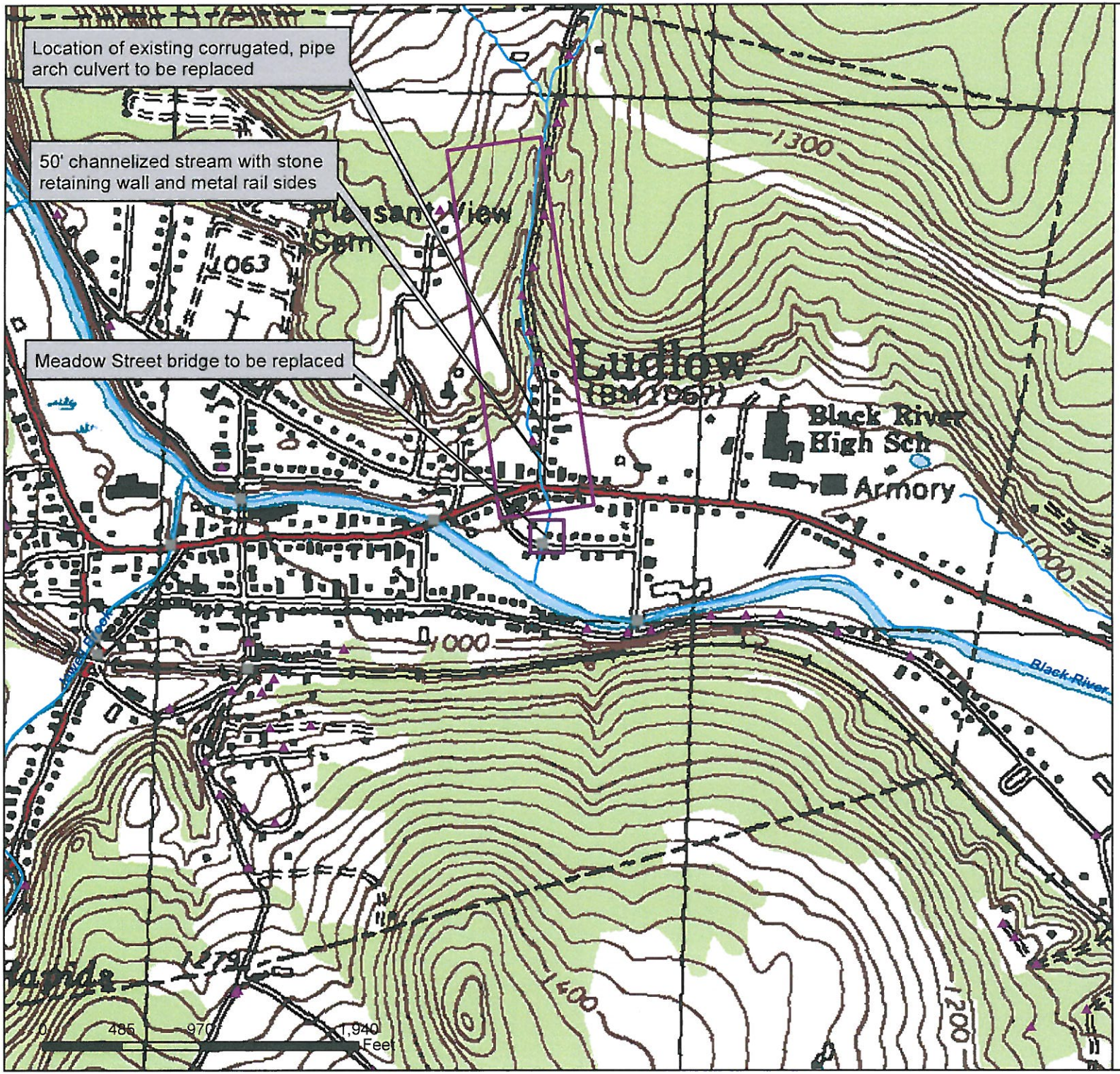
| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| LUDLOW, TOWN OF | 500150 | 0589 | E |
| LUDLOW, VILLAGE OF | 500294 | 0589 | E |

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

**MAP NUMBER**
**50027C0589E**

**EFFECTIVE DATE**
**SEPTEMBER 28, 2007**

Federal Emergency Management Agency




# Commonwealth Avenue
# Ludlow, VT

- Culvert
- Bridge
- River/ Stream (2008)
- Lakes/ Pond (2008)

*Data from VCGI, VTrans and Town of Ludlow. Topographic map (USGS 2003, 1:24,000).*

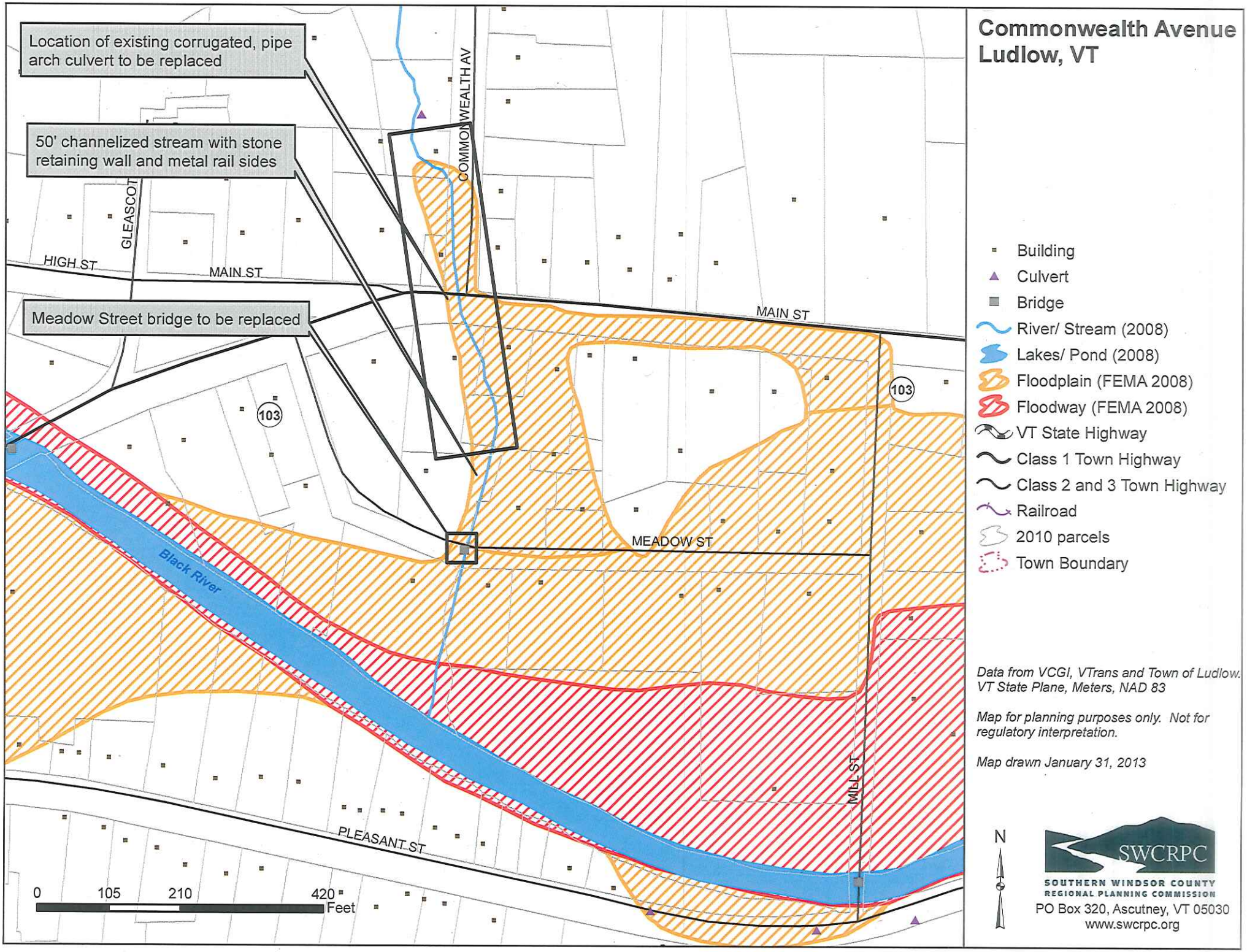
*VT State Plane, Meters, NAD 83*

*Map for planning purposes only. Not for regulatory interpretation.*

*Map drawn February 20, 2013*

N

SWCRPC
SOUTHERN WINDSOR COUNTY REGIONAL PLANNING COMMISSION
PO Box 320, Ascutney, VT 05030
www.swcrpc.org




# Commonwealth Avenue
# Ludlow, VT

- Building
- Culvert
- Bridge
- River/ Stream (2008)
- Lakes/ Pond (2008)
- Floodplain (FEMA 2008)
- Floodway (FEMA 2008)
- VT State Highway
- Class 1 Town Highway
- Class 2 and 3 Town Highway
- Railroad
- 2010 parcels
- Town Boundary

*Data from VCGI, VTrans and Town of Ludlow.*
*VT State Plane, Meters, NAD 83*

*Map for planning purposes only. Not for regulatory interpretation.*

*Map drawn January 31, 2013*

N

SWCRPC
SOUTHERN WINDSOR COUNTY
REGIONAL PLANNING COMMISSION
PO Box 320, Ascutney, VT 05030
www.swcrpc.org

**25% MATCH CERTIFICATION**

**TOWN OF LUDLOW, VERMONT**

**Hazard Mitigation Grant Program Applicant Funding Certification**

It is acknowledged that the applicant, **Town of Ludlow** will be considered for a state matching grant to cover the 25% local match share in connection with proposed project or plan under the FEMA Hazard Mitigation Grant Program.

In the event the 25% local match share is not provided by the state, the **Town of Ludlow** hereby certifies that we have the capability to meet the financial obligations of the 25% cost share under this Hazard Mitigation Grant Program Application.

Project Name or Proposed Mitigated Address:

Commonwealth Avenue Drainage System (Ludlow)

Authorized Representative: Town of Ludlow by: Frank Heald
(City/Town, Planning Commission, or Non-Profit)

Title: Municipal Manager

Signature: _____

Date: 2-22-2013

FOR PROPERTY ACQUISTIONS:

Homeowner: _____

Signature: _____

Date: _____

*Please fill out a separate 25% Match Certification signed by each landowner on the deed*

## I. PROPOSED SCOPE OF WORK

The scope of work being proposed for this Hazard Mitigation Grant Program Application includes the removal of the existing metal culvert and replacing with a concrete box culvert, the removal of the existing concrete bridge including abutments and replacing with a concrete box culvert, the removal of metal and concrete retaining walls on the existing channel between the culvert outlet and the Black River and replacing with stone armored and vegetated sloped embankments, and all incidental work associated with these improvements.

The existing culvert removal and replacement is approximately 500 feet long beginning at the inlet behind the property 8 Commonwealth Avenue and ending at the outlet behind the property 80 Main Street. The culvert has several drop inlet structures at points along Commonwealth Ave and Main Street (Route 103). The culvert crosses both of these paved roadways; significant construction costs for the removal and replacement include pavement removal, traffic control, and stream diversion. The existing culvert to be removed is described below as a 3'-0" x 5'-0" metal pipe arch culvert. The proposed culvert has been designed to meet the Q100 stream flow as a 10'-0" span x 4'-0" rise precast concrete box culvert.

The existing Meadow Street Bridge is a concrete slab bridge with concrete abutments spanning 6'-0" with a 4'-0" clearance above the stream bed. The bridge needs to meet the upstream improved structure size which has been described above as 10'-0" x 4'-0" waterway area. The proposed replacement structure for this bridge is the 10'-0" span x 4'-0" rise precast concrete box culvert.

The existing channel between the culvert outlet at 80 Main Street and the Black River is described below as a mix between metal and concrete retaining systems, and sloped earthen embankments. The current system has potential to constrict flow and cause jamming of the stream flow. The proposed work is to remove retaining structures and construct stone armored stream embankments. This will increase flow capacity, provide a more natural stream environment, and reduce jamming potential due to ice flow and high water events.

| **Part 7:** | **Scope of Work** |
|---|---|
| **Task Description** | **Days to Complete (Construction Estimate)** |
| Culvert Replacement | 90 |
| Bridge Replacement | 30 |
| Channel Improvements | 60 |

## II. BACKGROUND

The existing drainage system for an unnamed stream, which collects drainage adjacent to Commonwealth Ave. in the Town of Ludlow, failed as a result of the Tropical Storm Irene event. The roadway and local buildings were flooded, which caused a substantial amount of damage to residences, businesses, and infrastructure. The existing drainage system crosses three roadways: Commonwealth Ave., Main St. (VT Route 103), and Meadow St. before exiting into the Black River. See the attached Site Plan for a map of the location.


Flooding on VT Route 103
(picture facing South – opposite of Commonwealth Ave.)


Flooding at the Intersection of Commonwealth Ave. & VT Route 103

Hoyle, Tanner & Associates, Inc. (Hoyle, Tanner) was contracted by the Town of Ludlow to perform field observations and to conduct a hydraulic study of the stream in order to evaluate the existing system and develop proposed solutions to meet the hydraulic demands at this location. This report is a summary of the design criteria proposed alternatives for improvements to the drainage system.

## III. EXISTING CONDITIONS

The existing system consists of several components that include channels, structures, culverts, and drop inlets. The map in Appendix A illustrates approximate locations of the components that are labeled with letters, which correlate to the photos on the pages that follow.

**Existing Channel at Culvert Inlet** – The system starts at an existing rectangular channel (A) approximately 9.5 feet wide and 4 feet deep located in the backyard of residences on the west side of Commonwealth Ave. The channel walls consist of two retaining types: metal rail and concrete.

A Rectangular Channel Upstream of Culvert (Facing North)

**Existing Culvert at Stream Inlet** – The existing channel flows into a corrugated steel pipe arch culvert (B) approximately 3 feet deep and 5 feet wide with a cast-in-place reinforced concrete headwall. The culvert connects into a catch basin structure in the drive of the adjacent southern residence. The culvert size and material is consistent to its outlet at the residence backyard south of Main St.

B Culvert Inlet w/ Headwall (Facing South)

C Path of Culvert (Facing South)

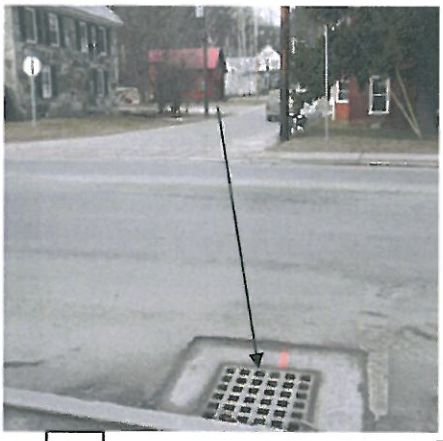
**Existing Catch Basin Structure** – The structure (D) in the drive of the Commonwealth Ave. residence is 6 feet wide with walls composed of concrete masonry units, a concrete bottom, and a metal inlet grate on top. It is believed that the primary function of the catch basin is to accept drainage overflow during periods when the upstream culvert exceeds its flow capacity and water overtops its headwall.

D Catch Basin Structure & Culvert Path (Facing South)

**Existing Drop Inlets** – The culvert accepts stormwater inflow at four locations by way of drop inlets with either a circular or square inlet grate and a 32 inch diameter riser. The first inlet (E) is located on the west side of Commonwealth Ave. approximately 125 feet north of Main Street. The next two inlets (F & G) are on Main St.; one on the north side of the street and one on the south side of the street. The last inlet (H) is located approximately 60 feet south of Main St. in the drive of a local residence.

E Drop Inlet & Culvert Path (Facing South)

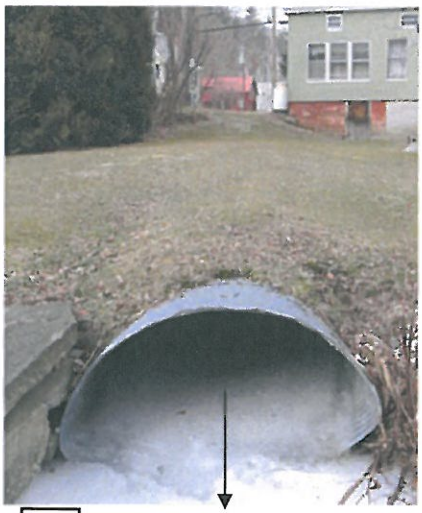
F Drop Inlet & Culvert Path (Facing South)



G Drop Inlet & Culvert Path (Facing North)

H Drop Inlet & Culvert Path (Facing North)

**Existing Culvert Outlet** – The culvert (I) outlets into an existing rectangular channel approximately 11.5 feet wide and 3 feet deep located in the backyard of a residence along the south side of Main St. The western wall of the channel is constructed of a stone retaining wall (J) approximately 3 feet high. This wall is approximately 50 feet long and transitions to a sloped bank. The east side of the channel (K) is a sloped earthen bank with a 3 foot tall metal rail wall to direct debris and water flow downstream.



I Culvert Outlet (Facing North)

J Culvert Outlet & Channel (Facing South)

**Existing Channel North of Meadow St.** – The western side of the channel (K) continues as sloped earthen bank to the bridge at Meadow St. The eastern side of the channel is primarily composed of a 3 foot tall metal rail wall with a short section of 3 foot tall concrete wall (L).

K Channel (Facing South)

L Channel at Bridge Structure (Facing North)

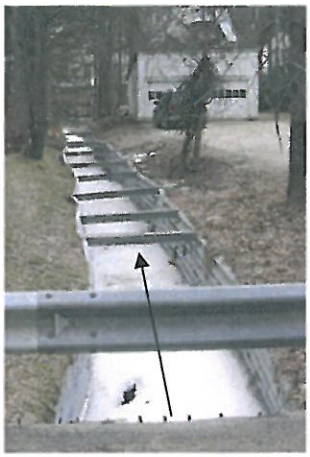
**Existing Bridge Structure** – The Meadow St. bridge (M,N) crosses the channel approximately 250 feet north of the Black River and is composed of cast-in-place abutments and a cast-in-place deck. The abutments have shifted and wood beams were installed to brace the walls. The concrete along the edge of the existing bridge deck has spalled and reinforcement is exposed (O). The opening beneath the bridge is a little over 4 feet high and the width varies with a minimum width measuring just less than 6 feet.

M Bridge Structure (Facing South)

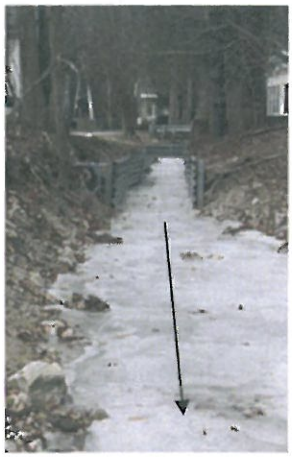
N Bridge Structure (Facing North)

O Exposed Steel in Bridge Deck (Facing South)

**Existing Channel South of Meadow St.** – The channel proceeds south of Meadow St. in a southerly direction and flows into the Black River. The channel (P) consists of metal rail retaining walls braced with small steel channels. The channel is approximately 5 feet wide by 3 feet high spanning a distance of approximately 150 feet south of Meadow St. The channel walls end approximately 100 feet north of the Black River becoming sloped earthen banks with a 10 foot channel width to the outlet at the Black River.



P Channel at Bridge (Facing South)



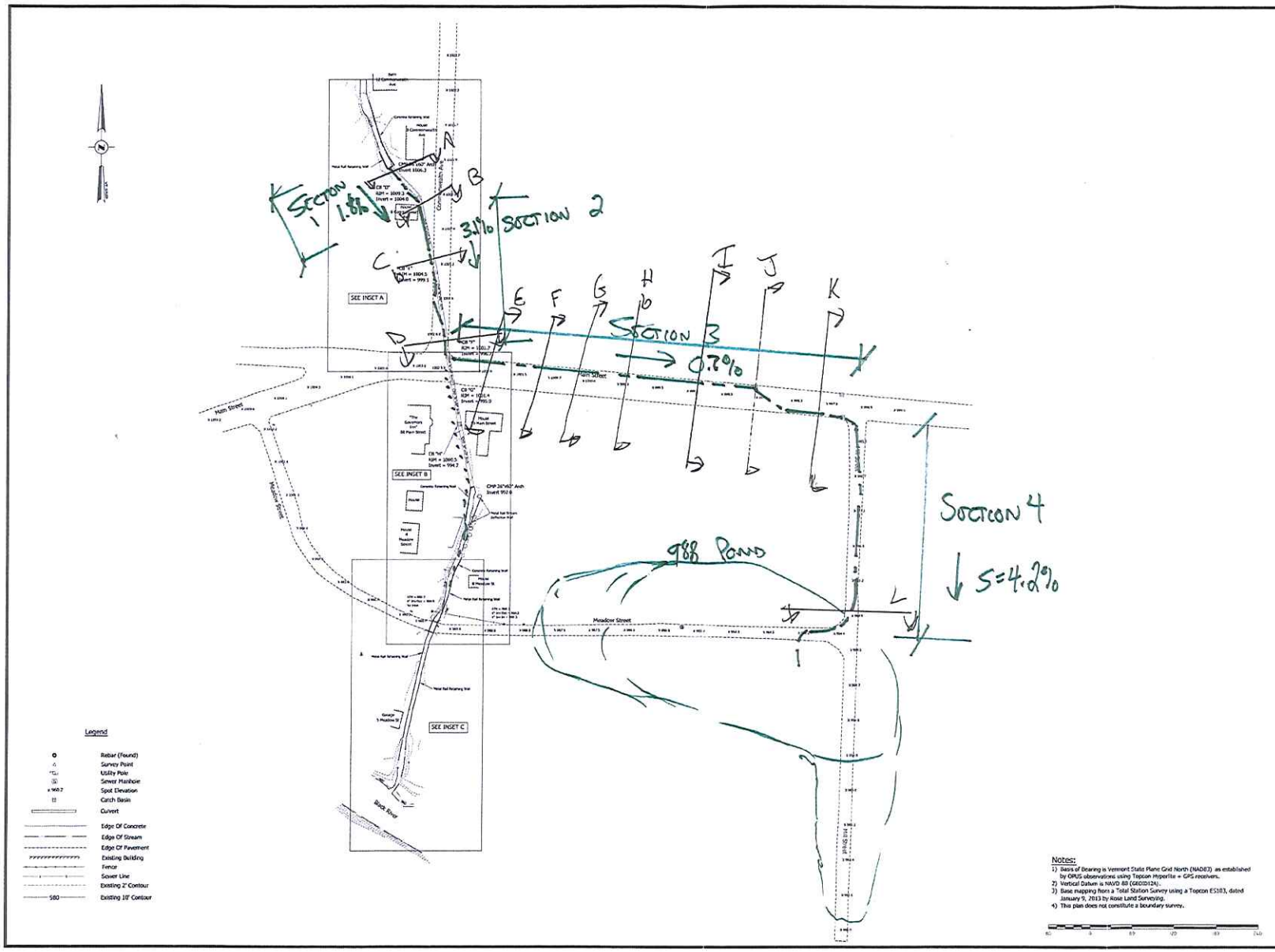
Q Channel (Facing North)

R Channel Outlet in the Black River (Facing South)

## IV. EXISTING OVERFLOW

The existing culvert overflows at its inlet located at 8 Commonwealth Ave just above the streamflow for a 10 year storm event. Water proceeds down Commonwealth Avenue to the intersection with Main Street (Route 103), where it turns east along Main Street to the intersection of Mill Street. The overflow continues south on Mill Street to the intersection with Meadow Street where it hits a low spot and a pond builds extending West on Meadow Street and South on Mill Street.

Residences and Commercial properties along this path are routinely impacted from these storm events. Pictures located in Section I of this document show the flooding on Main Street in the aftermath of Tropical Storm Irene.




EXISTING CONDITIONS PLAN
FOR
TOWN OF LUDLOW
IN
LUDLOW, VERMONT

ROSE LAND SURVEYING
P.O. BOX 72
LUDLOW, VERMONT 05149
(802) 228-4434

SURVEYED: EMR, JRC, MR
DRAWN: EMR
CHECKED: ERC
DATE: 1/17/2013

TOWN OF LUDLOW

COMMONWEALTH AVE DRAIN

SHEET 1 OF 2

© 2013
ROSE LAND SURVEYING
FILE: C:\13\GIS\L306\94
PROJECT: 13GIS COMMONWEALTH AVE

Hoyle, Tanner & Associates, Inc.
125 College Street, 4th Floor
Burlington, Vermont 05401
802-860-1331
802-860-6499 fax
www.hoyletanner.com

January 25, 2013

Mr. Frank Heald
Municipal Manager
Town of Ludlow
P.O. Box 359
Ludlow, Vermont 05149

Subject: Unnamed Stream from Commonwealth Ave.
Hydrology & Hydraulic Study

Dear Mr. Heald,

Hoyle, Tanner & Associates, Inc. (Hoyle, Tanner) has completed our final hydraulic study for the unnamed stream beginning at the culvert inlet adjacent to Commonwealth Avenue, proceeding south under VT Route 103, outlet into a channel flowing South of VT Route 103 towards Meadow Street, crossing Meadow Street under a concrete slab bridge, and following a rectangular channel South where it outlets into the Black River. Reference the Project Description Report as prepared by Hoyle, Tanner dated January 25, 2013 and the attached site plan for more information. The following summarizes our findings and recommendations for proposed replacement structures.

In January 2013 the Town of Ludlow contracted Rose Land Surveying to collect detailed site and stream survey for the purposes of final hydraulic analysis. With this information we have completed the hydraulic calculations, reviewed existing structure capacities, and analyzed structure replacement options using the HY-8 culvert analysis software.

**Hydrology**

This unnamed stream collects flow from a hilly to mountainous drainage basin. It is mostly forested. The total contributing drainage area is approximately 0.35 sq. mi. at the inlet of the culvert. There is an approximate overall length of 4,000 feet from the extreme point of the perennial stream to the inlet of the culvert at Commonwealth Ave. with a 400ft drop in elevation, giving an average overall channel slope of 10% upstream of the culvert. The elevation difference between the inlet and outlet of the culvert is approximately 14.25 feet over approximately 487 feet, or a slope of approximately 0.0293 ft/ft. The VTrans Hydraulics Manual describes several hydraulic methods to determine flow rates. We used all applicable hydraulic methods and compared the results

omitting the methods that produced the highest and lowest values. We used statistical methodology outlined in the VTrans Hydraulics Manual to combine the remaining methods by summing the mean and standard deviation to determine the following flow rates:

| Recurrence Interval in Years | Flow Rate in Cubic Feet per Second (cfs) |
|---|---|
| Q10 | 73 |
| Q50 | 115 – State Highway Design Flow |
| Q100 | 134 – Hazard Mitigation Design Flow |

## Existing Conditions

### Culvert

The existing structure consists of a corrugated steel pipe arch culvert approximately 3 feet deep and 5 feet wide with a cast-in-place reinforced concrete headwall at the culvert inlet. The culvert receives drainage through one catch basin and 3 drop inlets along its approximate length of 487 feet. The structure provides a waterway area of 12 sq ft and is inadequate hydraulically. The maximum capacity of this culvert is Q10, or a 10-year storm event, beyond which water overtops the headwall and proceeds south along Commonwealth Ave. to Main St. (VT Route 103). This is consistent with historical reports from the Town.

The Town has experienced flows overtopping the culvert during several events over the past 15 years. The Town performs routine ice removal at the culvert inlet and outlet to avoid flow restriction issues.

### Meadow Street Bridge

The unnamed stream crosses under Meadow Street below a concrete slab bridge. This bridge spans 6.25' and has a 4' clear height to the stream bed. This waterway area meets the Q25 flow, beyond which the stream overtops the bridge.

### Channels

The stream flows in channels for approximately 480 ft through a residential area from the culvert outlet to the Black River. Portions of the channel have sloped embankments and portions of the channel consist of concrete and metal vertical walls. The metal walls are braced at their tops to resist overturning. These braces constrict high stream flow and have the potential to block debris and ice.

The general shape of the channels is rectangular with the width varying from approximately 5' to 6', and a height of approximately 4'. Hydraulic calculations indicate the stream is within 3" of the top during the Q100 flow.

## Recommendations

Culvert

Based on the proximity of this culvert and impact that overflow presents to adjacent properties and VT Route 103, we recommend that the structure be designed to convey the Q100 design storm and allow for the passage of ice and debris. Based on our calculations we estimate a minimum waterway of 36 square feet to allow for 1 foot of freeboard at Q100 flows. The minimum width of structure should be greater than the full bank width of the stream (which is 9' at the culvert inlet).

We have considered the following alternatives for this project:

1. Double Metal Pipe Arch Culvert: Double pipe arches with 6' span x 4' rise installed side by side meet the hydraulic flow requirements for a Q100 event. However, we do not recommend this replacement alternative as double pipes are more prone to plugging issues than a single, wider structure. The double pipe also increases the width of construction, which is costly and presents additional constructability challenges at this location.

2. Precast Concrete Box Culvert: This culvert shall have a 10' span x 4' rise inside opening, providing a 40 sq ft waterway area. The structure will be located under Commonwealth Avenue and VT Route 103. Depending on the burial depth it may need to be designed for vehicular loads. The length of the culvert is to match the existing length of 487 feet. This structure has a headwater depth of 1'-0" at the Q100 flow, and a width of 10' which meets the full bank width requirements. **Hoyle, Tanner recommended alternative.**

3. An equal closed culvert structure with a minimum waterway area of 36 sq ft.

Generally, alternatives should have the following:

Inlet: The structure should be constructed with a concrete (precast or cast-in-place) headwall and wingwalls at 90 degrees to the stream flow.

Outlet: The stream bottom at the outlet should be constructed with scour protection.

Channel Banks: Stone Fill, Type II should be used to protect disturbed channel banks at the structure's inlet and outlet. Fill should extend up to a height of at least one-foot above the top of the opening. Fill should be limited to within 5' of the inlet and outlet. Repair banks disturbed during construction beyond this limit to match existing conditions. Stone fill should not constrict the channel or the structure opening. Fill should be installed in accordance with VTrans specifications for finished conditions where stones are 'locked' together with a relatively even finished surface.

Meadow Street Bridge

It is recommended that the Meadow Street Bridge be removed and replaced with a structure that provides a minimum waterway area of 36 sq. feet, matching the capacity of the upstream culvert structure. Due to the geometric constraints of this location, the top of the structure shall be capable of directly supporting vehicular traffic. Suitable alternatives for this replacement include:

- 10' span x 4' rise Concrete Box Culvert
- 10' span Concrete slab bridge

Channels

The current construction of the channels which requires bracing at the top of walls presents a hazard for blocking debris and causing the stream to crest it's banks. We recommend removing vertical walls and replacing them with sloped embankments designed for erosion protection. This will increase the waterway area, and reduce the risk of debris/ice jams.

Please contact us if you have any questions or would like to discuss the findings of the report.

Sincerely,

Jon A. Olin, P.E.
Hoyle, Tanner & Associates, Inc.

**Benefit Cost Analysis Technical Report – Ludlow Flood Control Project**

**Risk/Benefit Categories**

The analysis considers the avoided damages to structures that occur due to the reduction in water surface elevation on the project area.

## Structure Damages

The benefit/cost ratios for the structures were determined by use of FEMA's flood model (version 4.8), which calculates a present value of future damages that are estimated to occur over the useful life of the project (in our case, 50 years) and divides that figure into the cost of the project. The estimated future damages are based on varying flood depth scenarios for different storm events and flood flows.

A detailed project description is included as an attached to both the application and to this memo.

The flow rates and water surface elevations (H and H data) were provided by Jon A. Olin, P.E., Senior Structural Engineer, with Hoyle, Tanner Associates, Inc. The existing and proposed condition H and H data were determining by Mr. Olin using the survey information available, VTrans Hydraulics Manual, the HY-8 Culvert Analysis program. Based on this thorough assessment, we have determined that the project is ***Potentially Cost Effective.*** The FEMA HMA guidance addresses this specific situation in the following manner.

> *A.9 Phased Projects*
> *In general, sufficient technical information is provided by the Applicant or subapplicant to allow FEMA to make an eligibility determination on a subapplication. The costs to obtain this information are generally eligible as pre-award costs (See Part IV F for more information). However, in rare circumstances it is beyond the subapplicant's technical and financial resources to provide the complete technical information required for a full eligibility or environmental review of a complex project. The Applicant and FEMA may provide technical assistance to the subapplicant to develop this complete body of technical data by approving a subapplication to complete a Phase I design, engineering, environmental, or feasibility study. The Phase I study provides FEMA with a technical body of information mutually concurred on by the subapplicant, the Applicant, and FEMA to determine project eligibility. If the results of the Phase I review indicate that the project meets HMGP requirements, the project would then be eligible for funding for construction under a Phase II approval. Phase I study funding is part of the project's total estimated cost, and is subject to HMGP cost share requirements.*
>
> *The use of a Phase I study should be limited to complex projects that require technical or environmental data beyond the scope of that generally required for a typical HMGP project. The following provides guidelines and outlines the process for selecting projects for Phase I/Phase II project approval.*
>
> *Pre-Screening Process*
> *The project must meet the following pre-screening criteria for a conditional Phase I approval in the following sequence:*
> - *State or Tribal (Standard or Enhanced) Mitigation Plan – The proposed project must be in*
> - *conformance with the State or Tribal (Standard or Enhanced) Mitigation Plan.*
> - *Justification for Selection of the Proposed Project – Justification must be provided for the selection of the proposed solution after consideration of a range of options.*

- ***Potential Cost Effectiveness*** *– The project demonstrates potential cost effectiveness based on a preliminary assessment of anticipated project benefits and cost. It is imperative that the subapplicant is aware that this preliminary assessment is solely for the purpose of the Phase I pre-screening process and is not the final cost-effectiveness determination.*
- *EHP Review – Initial environmental review to identify major EHP compliance issues. The Phase I study is categorically excluded from NEPA review.*
- *Hydrologic and Hydraulic or Other Relevant Technical Data – The subapplicant provides available hydrologic and hydraulic data based on existing models, and other relevant technical data, as appropriate.*

*Phase I Conditional Approval*
*The Applicant and FEMA may approve projects meeting the above pre-screening requirements for technical assistance under a Phase I conditional approval. FEMA and the Applicant will coordinate closely to ensure mutual concurrence on all data and technical information as the Phase I technical review process proceeds. The sequence for the process is as follows:*

- *Hydrologic and Hydraulic or Other Relevant Technical Data – If appropriate, the Applicant and FEMA will review the hydrologic and hydraulic or other technical data provided by the subapplicant.*
- *Preliminary Engineering Design – Based upon the technical data, the subapplicant develops a preliminary engineering design and layout and cost estimates with ad-hoc technical assistance from the Applicant and FEMA. The subapplicant's design and costing must meet Applicant and FEMA approval before proceeding with the BCA.*
- *EO 11988 – If applicable, based upon the technical data and revised engineering design, the project must demonstrate compliance with floodplain management requirements under this EO. If a FIRM amendment or revision will be necessary, the Applicant and FEMA will provide the subapplicant with technical assistance to meet this requirement.*
- *Refinement of the Cost-Effectiveness Assessment – Based upon the revised design and cost estimates, the Applicant and FEMA will refine the preliminary assessment of cost effectiveness conducted in the Phase I pre-screening process. This will result in a final cost effectiveness, which will include the all project costs including Phase I.*
- *EHP Review – The Applicant and FEMA will conduct a review of the revised project design to ensure EHP compliance. The project will meet EHP review requirements before Phase II approval.*

*Phase II Approval-Construction Process*
*If the project is determined to be eligible, technically feasible, cost effective, and compliant with EHP requirements under the Phase I technical review, the project may then be approved for construction under Phase II.*

The elevation reference to mean sea level was shot By David N. Rose, LS, of Rise Land Surveying. Elevations used or the BCA report are attached to this memo.

***Structure Depth-Damage Functions for Residential Uses***

Structural damage functions for all residential buildings are FEMA defaults.

***Contents Depth-Damage Functions for Residential Uses***

Contents damage functions for all residential buildings are FEMA defaults.

***Structure Replacement Value Determinations***

For the residential structures we used current Marshall and Swift dollar per square foot based on the type, size, and quality of construction for the replacement cost portion of the B/C analysis. The information from the Lister Cards (tax database) was used to determine the sqft, type, and quality of construction. Lister Cards for each parcel in the benefit area and Marshall and Swift tables are attached to this report.

**Project Costs**

All cost estimates were based on research, quotes, industry information, pricing manuals, and Engineering expertise. The cost estimates were developed by Jon A. Olin, P.E., Senior Structural Engineer, with Hoyle, Tanner Associates, Inc. The cost estimate is attached to the application and to this memo.

| | |
|---|---|
| Benefits | $1,211,488.00 |
| Project costs | $1,090,000.00 |
| B/C = | 1.11 |

Hoyle, Tanner & Associates, Inc.
125 College Street, 4th Floor
Burlington, Vermont 05401
802-860-1331
802-860-6499 fax
www.hoyletanner.com

February 7, 2013

Mr. Frank Heald
Town Manager
Town of Ludlow
PO Box B
Ludlow, VT 05149

RE: Town of Ludlow – Commonwealth Ave Study
HTA Project No. 916408

Dear Mr. Heald:

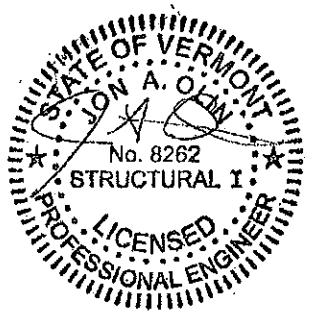
This letter is a statement that I have prepared the attached flow and stream elevation information for the purposes of conducting a preliminary Cost Benefit Analysis to be used with the submittal for Hazard Mitigation Funding. I have prepared the Hydrologic and Hydraulic information using the survey information available, VTrans Hydraulics Manual, the HY-8 Culvert Analysis program. Stream Elevations calculated at each residence were developed using the survey, calculated flow overtopping the existing and proposed culvert, and standard open flow equations.

I have performed this analysis to the best of my abilities within the timeframe allowed in order to meet application deadlines. It is with the understanding that the first step of the project once funding is approved is to complete a detailed Hydrology & Hydraulic Study using HEC-RAS software to determine more accurately the stream flow elevations at each residence for the Q10, Q50, Q100, and Q500 events.

In order to run the BCA program some data was required to be modified. The bottom of stream elevation was lowered from that which was developed based on the survey data. The proposed input was generated to allow the program to run, but calculations indicate there will be little to no sheet flow under the proposed condition as the culvert capacity is large enough to meet the demands of all flow events.

Sincerely

Jon A. Olin



Hoyle, Tanner & Associates, Inc.

SUMMARY

Unnamed Stream in Ludlow, VT

H&H Study – Estimated Stream Information from Culvert Overflow

| Location | Q50 (ft) | Q100 (ft) | Streambed Elevation (ft) |
|---|---|---|---|
| Commonwealth Ave | | | |
| 3 Commonwealth Ave | 1006.5 | 1006.7 | 1005.5 |
| 6 Commonwealth Ave | 1010.5 | 1010.7 | 1009.3 |
| 8 Commonwealth Ave | 1011.6 | 1011.8 | 1010.4 |
| | | | |
| Main St | | | |
| 66 Main St | 999.2 | 999.5 | 997.9 |
| 68 Main St | 999.2 | 999.2 | 997.9 |
| 70 Main St | 1000.4 | 1000.7 | 999.1 |
| 72 Main St | 1001.2 | 1001.5 | 999.9 |
| 74 Main St | 1002.0 | 1002.3 | 1000.7 |
| 76 Main St | 1002.2 | 1002.5 | 1000.9 |
| 80 Main St | 1002.8 | 1003.1 | 1001.5 |
| 81 Main St | 1003.8 | 1004.0 | 1002.8 |
| | | | |
| Meadow St * Stream path hits low spot at Mill/Meadow St – Ponding occurs | | | |
| 7 Meadow St | 988 | 988 | 983.1 |
| 8 Meadow St | 988 | 988 | 983.1 |
| 9 Meadow St | 988 | 988 | 983.1 |
| 10 Meadow St | 988 | 988 | 983.1 |
| 12 Meadow St | 988 | 988 | 983.1 |
| 15 Meadow St | 988 | 988 | 983.1 |
| 16 Meadow St | 988 | 988 | 983.1 |
| 17 Meadow St | 988 | 988 | 983.1 |
| 18 Meadow St | 988 | 988 | 983.1 |
| 21 Meadow St | 988 | 988 | 983.1 |
| | | | |
| Mill St | | | |
| 6 Mill St | 988 | 988 | 983.1 |
| 12 Mill St | 988 | 988 | 983.1 |
| 16 Mill St | 988 | 988 | 983.1 |
| 18 Mill St | 988 | 988 | 983.1 |

## Existing

| Location | Q10 | Q50 (ft) | Q100 (ft) | Q 500 | Streambed Elevation (ft) |
|---|---|---|---|---|---|
| Commonwealth Ave | | | | | |
| 3 Commonwealth Ave | 1005.7 | 1006.5 | 1006.7 | 1007.4 | 1003.8 |
| 6 Commonwealth Ave | 1009.5 | 1010.5 | 1010.7 | 1011.6 | 1007.2 |
| 8 Commonwealth Ave | 1010.6 | 1011.6 | 1011.8 | 1012.7 | 1008.3 |
| | | | | | |
| Main St | | | | | |
| 66 Main St | 998.1 | 999.2 | 999.5 | 999.9 | 996.1 |
| 68 Main St | 998.1 | 999.2 | 999.5 | 999.6 | 996.1 |
| 70 Main St | 999.3 | 1000.4 | 1000.7 | 1001.1 | 997.3 |
| 72 Main St | 1000.1 | 1001.2 | 1001.5 | 1001.9 | 998.1 |
| 74 Main St | 1000.9 | 1002 | 1002.3 | 1002.7 | 998.9 |
| 76 Main St | 1001.1 | 1002.2 | 1002.5 | 1002.9 | 999.1 |
| 80 Main St | 1001.7 | 1002.8 | 1003.1 | 1003.5 | 999.7 |
| 81 Main St | 1003 | 1003.8 | 1004 | 1004.4 | 1001.4 |
| | | | | | |
| Meadow St * Stream path hits low spot at Mill/Meadow St – Ponding occurs | | | | | |
| 7 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 8 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 9 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 10 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 12 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 15 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 16 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 17 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 18 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 21 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| | | | | | |
| Mill St | | | | | |
| 6 Mill St | 983.3 | 988 | 988 | 988.4 | 978 |
| 12 Mill St | 983.3 | 988 | 988 | 988.4 | 978 |
| 16 Mill St | 983.3 | 988 | 988 | 988.4 | 978 |
| 18 Mill St | 983.3 | 988 | 988 | 988.4 | 978 |

## Proposed

| Location | Q10 | Q50 (ft) | Q100 (ft) | Q 500 | Streambed Elevation (ft) |
|---|---|---|---|---|---|
| Commonwealth Ave | | | | | |
| 3 Commonwealth Ave | 1004 | 1004.8 | 1005 | 1005.7 | 1003.8 |
| 6 Commonwealth Ave | 1007.4 | 1008.4 | 1008.6 | 1009.5 | 1007.2 |
| 8 Commonwealth Ave | 1008.5 | 1009.5 | 1009.7 | 1010.6 | 1008.3 |
| | | | | | |
| Main St | | | | | |
| 66 Main St | 996.3 | 997.4 | 997.7 | 998.1 | 996.1 |
| 68 Main St | 996.3 | 997.4 | 997.7 | 998.1 | 996.1 |
| 70 Main St | 997.5 | 998.6 | 998.9 | 999.3 | 997.3 |
| 72 Main St | 998.3 | 999.4 | 999.7 | 1000.1 | 998.1 |
| 74 Main St | 999.1 | 1000.2 | 1000.5 | 1000.9 | 998.9 |
| 76 Main St | 999.3 | 1000.4 | 1000.7 | 1001.1 | 999.1 |
| 80 Main St | 999.9 | 1001 | 1001.3 | 1001.7 | 999.7 |
| 81 Main St | 1001.6 | 1002.4 | 1002.6 | 1003 | 1001.4 |
| | | | | | |
| Meadow St * Stream path hits low spot at Mill/Meadow St – Ponding occurs | | | | | |
| 7 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 8 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 9 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 10 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 12 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 15 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 16 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 17 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 18 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 21 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| | | | | | |
| Mill St | | | | | |
| 6 Mill St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 12 Mill St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 16 Mill St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 18 Mill St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |

## Existing

| Location | Q10 | Q50 (ft) | Q100 (ft) | Q 500 | Streambed Elevation (ft) |
|---|---|---|---|---|---|
| Commonwealth Ave | | | | | |
| 3 Commonwealth Ave | 1005.7 | 1006.5 | 1006.7 | 1007.4 | 1003.8 |
| 6 Commonwealth Ave | 1009.5 | 1010.5 | 1010.7 | 1011.6 | 1007.2 |
| 8 Commonwealth Ave | 1010.6 | 1011.6 | 1011.8 | 1012.7 | 1008.3 |
| | | | | | |
| Main St | | | | | |
| 66 Main St | 998.1 | 999.2 | 999.5 | 999.9 | 996.1 |
| 68 Main St | 998.1 | 999.2 | 999.5 | 999.6 | 996.1 |
| 70 Main St | 999.3 | 1000.4 | 1000.7 | 1001.1 | 997.3 |
| 72 Main St | 1000.1 | 1001.2 | 1001.5 | 1001.9 | 998.1 |
| 74 Main St | 1000.9 | 1002 | 1002.3 | 1002.7 | 998.9 |
| 76 Main St | 1001.1 | 1002.2 | 1002.5 | 1002.9 | 999.1 |
| 80 Main St | 1001.7 | 1002.8 | 1003.1 | 1003.5 | 999.7 |
| 81 Main St | 1003 | 1003.8 | 1004 | 1004.4 | 1001.4 |
| | | | | | |
| Meadow St * Stream path hits low spot at Mill/Meadow St – Ponding occurs | | | | | |
| 7 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 8 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 9 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 10 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 12 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 15 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 16 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 17 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 18 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| 21 Meadow St | 983.3 | 988 | 988 | 988.4 | 978 |
| | | | | | |
| Mill St | | | | | |
| 6 Mill St | 983.3 | 988 | 988 | 988.4 | 978 |
| 12 Mill St | 983.3 | 988 | 988 | 988.4 | 978 |
| 16 Mill St | 983.3 | 988 | 988 | 988.4 | 978 |
| 18 Mill St | 983.3 | 988 | 988 | 988.4 | 978 |

## Proposed

| Location | Q10 | Q50 (ft) | Q100 (ft) | Q 500 | Streambed Elevation (ft) |
|---|---|---|---|---|---|
| Commonwealth Ave | | | | | |
| 3 Commonwealth Ave | 1004 | 1004.8 | 1005 | 1005.7 | 1003.8 |
| 6 Commonwealth Ave | 1007.4 | 1008.4 | 1008.6 | 1009.5 | 1007.2 |
| 8 Commonwealth Ave | 1008.5 | 1009.5 | 1009.7 | 1010.6 | 1008.3 |
| | | | | | |
| Main St | | | | | |
| 66 Main St | 996.3 | 997.4 | 997.7 | 998.1 | 996.1 |
| 68 Main St | 996.3 | 997.4 | 997.7 | 998.1 | 996.1 |
| 70 Main St | 997.5 | 998.6 | 998.9 | 999.3 | 997.3 |
| 72 Main St | 998.3 | 999.4 | 999.7 | 1000.1 | 998.1 |
| 74 Main St | 999.1 | 1000.2 | 1000.5 | 1000.9 | 998.9 |
| 76 Main St | 999.3 | 1000.4 | 1000.7 | 1001.1 | 999.1 |
| 80 Main St | 999.9 | 1001 | 1001.3 | 1001.7 | 999.7 |
| 81 Main St | 1001.6 | 1002.4 | 1002.6 | 1003 | 1001.4 |
| | | | | | |
| Meadow St * Stream path hits low spot at Mill/Meadow St – Ponding occurs | | | | | |
| 7 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 8 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 9 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 10 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 12 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 15 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 16 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 17 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 18 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 21 Meadow St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| | | | | | |
| Mill St | | | | | |
| 6 Mill St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 12 Mill St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 16 Mill St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |
| 18 Mill St | 978.2 | 982.9 | 982.9 | 983.3 | 978 |

Commonwealth Ave.
Ludlow, VT

Stormwater Improvements
Budgeting Cost Estimate

1/31/2013

**CONSTRUCTION COSTS:**

| Item No. | Item Description | Quantity | Unit | Unit Cost | Total Cost |
|---|---|---|---|---|---|
| 201.10 | Clearing and Grubbing, Including Individual Trees and Stumps | 1 | LS | $10,000 | $10,000 |
| 201.15 | Removing Medium Trees | 20 | EACH | $650 | $13,000 |
| 203.28 | Excavation of Surfaces and Pavements | 60 | CY | $60 | $3,600 |
| 203.30 | Earth Borrow | 1400 | CY | $15 | $21,000 |
| 203.27 | Unclassified Channel Excavation | 200 | CY | $20 | $4,000 |
| 204.25 | Structure Excavation | 1800 | CY | $20 | $36,000 |
| 204.30 | Granular Backfill for Structures | 110 | CY | $35 | $3,850 |
| 301.35 | Subbase of Dense Graded Crushed Stone | 200 | CY | $30 | $6,000 |
| 404.65 | Emulsified Asphalt | 1.3 | CWT | $60 | $78 |
| 406.25 | Bituminous Concrete Pavement | 130 | TON | $240 | $31,200 |
| 519.20 | Sheet Membrane Waterproofing, Torch Applied | 780 | SY | $25 | $19,500 |
| 525.44 | Bridge Railing, Galvanized HDSB/Fascia Mounted/Steel Tubing | 30 | LF | $200 | $6,000 |
| 529.15a | Removal of Structure (Culvert) | 1 | EACH | $40,000 | $40,000 |
| 529.15b | Removal of Structure (Bridge) | 1 | EACH | $10,000 | $10,000 |
| 540.10a | Precast Concrete Structure (Culvert) | 1 | LS | $350,000 | $350,000 |
| 540.10b | Precast Concrete Structure (Bridge) | 1 | LS | $25,000 | $25,000 |
| 604.18 | Precast Reinforced Concrete Drop Inlet with Cast Iron Grate | 4 | EACH | $2,500 | $10,000 |
| 613.11 | Stone Fill, Type II | 80 | CY | $35 | $2,800 |
| 616.28 | Cast-in-Place Concrete Curb, Type B | 50 | LF | $50 | $2,500 |
| 618.11 | Portland Cement Concrete Sidewalk, 8 Inch | 40 | SY | $75 | $3,000 |
| 629.29 | Relocate Hydrant | 1 | EACH | $4,000 | $4,000 |
| 630.10 | Uniformed Traffic Officers | 320 | HR | $45 | $14,400 |
| 630.15 | Flaggers | 640 | HR | $20 | $12,800 |
| 635.11 | Mobilization/Demobilizatioin (10% constr. cost) | 1 | LS | $72,794 | $72,794 |
| 641.10 | Traffic Control (5% of constr. cost) | 1 | LS | $36,397 | $36,397 |
| 649.31 | Geotextile Under Stone Fill | 110 | SY | $3 | $330 |
| 649.51 | Geotextile for Silt Fence | 400 | SY | $5 | $2,000 |
| 651.15 | Seed | 40 | LB | $11 | $440 |
| 651.18 | Fertilizer | 110 | LB | $5 | $550 |
| 651.20 | Agricultural Limestone | 1 | TON | $600 | $600 |
| 651.25 | Hay Mulch | 1 | TON | $650 | $650 |
| 651.35 | Top Soil | 200 | CY | $30 | $6,000 |
| 651.40 | Grubbing Material | 1300 | SY | $10 | $13,000 |
| 652.10 | EPSC Plan | 1 | LS | $5,000 | $5,000 |
| 652.20 | Monitoring of EPSC Plan | 16 | HR | $40 | $640 |
| 652.30 | Maintenance of EPSC Plan (N.A.B.I.) | 1 | LU | $7,000 | $7,000 |
| 656.20 | Evergreen Trees | 5 | EACH | $150 | $750 |
| 656.25 | Evergreen Shrubs | 15 | EACH | $50 | $750 |
| 656.30 | Deciduous Trees | 10 | EACH | $300 | $3,000 |
| 656.35 | Deciduous Shrubs | 10 | EACH | $50 | $500 |
| 900.620 | Remove and Reset Utility Poles | 4 | EACH | $2,000 | $8,000 |
| 900.645 | Stream Diversion | 1 | LS | $30,000 | $30,000 |
| 900.650 | Specialized Excavation | 1 | LU | $20,000 | $20,000 |

Construction Subtotal = $837,129

**ENGINEERING COSTS:**

| Item No. | Item Description | Quantity | Unit | Unit Cost | Total Cost |
|---|---|---|---|---|---|
| 1000.10 | Hydrologic Study for Cost Benefit Analysis | 1 | LS | $15,000 | $15,000 |
| 1000.20 | PENG Preliminary Engineering (10% Constr. cost) | 1 | LS | $83,713 | $83,713 |
| 1000.30 | ROWA Right-of-Way (Easement/Acquisitions) | 1 | LS | $20,000 | $20,000 |
| 1000.40 | Consultant Construction Engineering | 1 | LS | $20,000 | $20,000 |
| 1000.50 | Resident Engineering Support Services | 1 | LS | $60,000 | $60,000 |

Engineering Subtotal = $198,713
Subtotal Construction & Engineering = $1,035,842
5% Contingency = $51,792
Total = $1,087,634
**Total with Rounding = $1,090,000**

ROSE LAND SURVEYING
P.O. Box 72 Ludlow, Vermont 05149 Phone: 802-228-4634 Email:dnrose@tds.net
David N. Rose L.S. www.rosesurveying.com

January 17, 2013

Finished Frist Floor Elevations For The Town of Ludlow Commonwealth Avenue Drainage Project

| Commonwealth Avenue | FFE | Description |
|---|---|---|
| 3 Commonwealth Ave | 1006.5' | Two Family Home |
| 6 Commonwealth Ave | 1010.4' | Single Family Home |
| 8 Commonwealth Ave | 1017.2' | Two Family Home |
| **Main Street** | **FFE** | **Description** |
| 66 Main Street | 1000.2' | Three Family Home |
| 68 Main Street | 1002.8' | Single Family Home |
| 70 Main Street | 1004.1' | Commercial (Office Building) |
| 72 Main Street | 1002.3' | Three Family Home |
| 74 Main Street | 1002.4' | Single Family Home |
| 76 Main Street | 1002.6' | Single Family Home |
| 80 Main Street | 1002.9' | Two Family Home |
| 81 Main Street | 1003.6' | Two Family Home |
| 86 Main Street | 1006.9' | Governor's Inn |
| 86 Main Street | 1002.7' | Single Family Home (Owners quarters behind Inn) |
| 85 Main Street | 1007.8' | Laundry mat |
| 88 Main Street | 1008.6' | Fletcher Library |
| **Meadow Street** | **FFE** | **Description** |
| 4 Meadow Street | 1001.3' | Single Family Home |
| 5 Meadow Street | 993.2' | Single Family Home |
| 7 Meadow Street | 992.2' | Single Family Home |

| | | |
|---|---|---|
| 8 Meadow Street | 994.5' | Single Family Home |
| 9 Meadow Street | 991.8' | Single Family Home |
| 10 Meadow Street | 992.4' | Single Family Home |
| 12 Meadow Street | 991.7' | Commercial (Funeral Home) |
| 15 Meadow Street | 989.8' | Single Family Home |
| 16 Meadow Street | 997.3' | Single Family Home |
| 17 Meadow Street | 988.9' | Single Family Home |
| 18 Meadow Street | 985.4' | Single Family Home |
| 21 Meadow Street | 987.9 | Single Family Home |
| Mill Street | FFE | Description |
| 6 Mill Street | 986.9' | Commercial (Mountain Side House) |
| 12 Mill Street | 987.5' | Two Family Home |
| 16 Mill Street | 987.0' | Commercial (Mill Office Building) |
| 18 Mill Street | 984.6' | Commercial (Mill Building) |

*Finished floor elevations (FFE) shown recorded at entry door threshold. Vertical Datum is NAVD 88 (Geoid12A) as established by OPUS observations using Topcon Hyperlite + GPS receivers.

| Item No.: | 201.10 | Clearing and Grubbing, Including Individual Trees and Stumps | Units: LS |
|---|---|---|---|

Note: Approximate length was determined in CAD and width was assumed based on location and nature of the work.

| Location | Approx. Width | Approx. Length | Approx. Area | Constr. |
|---|---|---|---|---|
| North of Commonwealth Ave. | 6 ft | 160 ft | 960 sf | culvert |
| South of Main St. | 3 ft | 360 ft | 1080 sf | culvert |
| South of Meadow St. | 8 ft | 230 ft | 1840 sf | channel |
| | | Total = | 3880 sf | |
| | | Total = | 0.09 acre | |

Determination of Unit Cost

Approx. VTrans 2 yr avg per acre = $37,000

Cost w/ 2 yr avg = $3,295.68

Factor for location = 2.5 (tight area, lots of buildings, and overhead utilities)

Lump sum = $8,239.21

SAY → $10,000

---

| Item No.: | 201.15 | Removing Medium Trees | Units: EACH |
|---|---|---|---|

Quantity = 20 EACH

(Quick assumption based on photos and Google street view)

Determination of Unit Cost

From VTrans Estimator software = $636 EACH

SAY → $650 EACH

| Item No.: | 203.28 | Excavation of Surfaces and Pavements | Units: CY |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Length = | 175 | ft | (from CAD for Commonwealth Ave. & Main St.) |
| Width = | 28 | ft | (based on 4x10 box culvert excavation) |
| Depth = | 0.33 | ft | (assumed) |
| Volume = | 1633.33 | cf | |
| Volume = | 60.49 | CY | |
| SAY → | 60 | CY | |

Determination of Unit Cost

| | |
|---|---|
| Approx. VTrans 2 yr avg per cy = | $20 |
| Factor for small qty = | 3 |
| Unit $ = | $60 |

---

| Item No.: | 203.30 | Earth Borrow | Units: CY |
|---|---|---|---|

Note: Approximate length was determined in CAD and cross sectional area was assumed based on location and nature of the work.

| Location | Approx. Length | Approx. X-sectional area | Approx. Vol. | |
|---|---|---|---|---|
| Culvert | 500 ft | 35 sf | 17500 cf | (assume d = 6' & 1:1 slope) |
| Channel | 230 ft | 20 sf | 4600 cf | (assume d = 4.5' & 1:1 slope) |
| stream diversion | 500 ft | 30 sf | 15000 | (assume d = 6' & w = 5') |
| | | Total = | 37100 cf | |
| | | Total = | 1374.07 cy | |
| | | SAY → | 1400 cy | |

Determination of Unit Cost

| | |
|---|---|
| Approx. VTrans 2 yr avg per cy = | $10 |
| Factor for different borrow at roadway = | 1.5 |
| Unit $ = | $15 |

---

| Item No.: | 203.27 | Unclassified Channel Excavation | Units: CY |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Vol. = | 4600 | cf | (same as vol. for 203.30) |
| Vol. = | 170.3704 | cy | |
| SAY → | 200 | cy | |

Determination of Unit Cost

| | |
|---|---|
| Approx. VTrans 2 yr avg per cy = | $20 |

| Item No.: | 204.25 | Structure Excavation | Units: CY |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Vol. for 1:1 side slope = | 17500 | cf | (same as vol. for 203.30) |
| Vol. for culvert = | 27500 | cf | (assume 500'x11'x'5) |
| Vol. for bridge = | 1470 | cf | (2 sides x 30'x7'x7'x1/2) |
| Total vol. = | 46470 | cf | |
| Total vol. = | 1721.111 | cy | |
| SAY → | 1800 | cy | |

Determination of Unit Cost

Approx. VTrans 2 yr avg per cy = $20

---

| Item No.: | 204.30 | Granular Backfill for Structures | Units: CY |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Vol. for culvert = | 2000 | cf | (0.5'x8'x500') |
| Vol. for bridge = | 750 | cf | (2 sides x 30'x5'x5'x1/2) |
| Total vol. = | 2750 | cf | |
| Total vol. = | 101.85 | cy | |
| SAY → | 110 | cy | |

Determination of Unit Cost

Approx. VTrans 2 yr avg per cy = $35

---

| Item No.: | 301.35 | Subbase of Dense Graded Crushed Stone | Units: CY |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Area = | 4900 | sf | (see item 203.28) |
| Depth = | 1 | ft | (assumed) |
| Vol. = | 4900 | cf | |
| Vol. = | 181.4815 | cy | |
| SAY → | 200 | cy | |

Determination of Unit Cost

Approx. VTrans 5 yr avg per cy = $30

| Item No.: 404.65 | Emulsified Asphalt | Units: CWT |
|---|---|---|

Note: CWT = hundred weight = 100 pounds

| | | | |
|---|---|---|---|
| Area = | 4900 | sf | (see item 203.28) |
| Area = | 544.44 | sy | |
| Application rate = | 0.03 | gal/sy | |
| Vol. = | 16.33 | gal | |
| Unit wt. = | 8.1 | lb/gal | (REF. Karnak neo-asphalt) |
| Wt. = | 1.323 | CWT | |
| SAY → | 1.3 | CWT | |

Determination of Unit Cost

Approx. VTrans 2 yr avg per CWT = $60

---

| Item No.: 406.25 | Bituminous Concrete Pavement | Units: TON |
|---|---|---|

| Location | Area | | |
|---|---|---|---|
| Culvert crossing | 4900 | sf | (see item 203.28) |
| Bridge | 300 | sf | (10'x30') |
| Total area = | 5200 | sf | |
| D = | 0.33 | ft | (assumed) |
| Vol. = | 1733.3333 | cf | |
| Unit wt. = | 150 | pcf | |
| Wt. = | 260000 | lb | |
| Wt. = | 130 | ton | |

Determination of Unit Cost

From VTrans Estimator software = $240 (small quantity)

| Item No.: | 519.20 | Sheet Membrane Waterproofing, Torch Applied | Units: SY |
|---|---|---|---|

Area = 7000 sf (500'x14')
Area = 777.78 sy

SAY → 780 sy

Determination of Unit Cost

Approx. VTrans 2 yr avg per sy = $25

---

| Item No.: | 525.44 | Bridge Railing, Galvanized HDSB/Fascia Mounted/Steel Tubing | Units: LF |
|---|---|---|---|

L = 30 ft

Determination of Unit Cost

Approx. VTrans 2 yr avg per lf = $200 (↑ due to low qty)

---

| Item No.: 529.15a | Removal of Structure (Culvert) | Units: EACH |
|---|---|---|

Existing items included in overall cost of removal:

| | | Unit Cost | Cost |
|---|---|---|---|
| Metal pipe arch culvert (60" x 36") by 500' long | 500 ft | $70 per lf | $35,000 |
| Catch basins (5 total) | 5 ea | $600 ea | $3,000 |
| Conrete headwalls at culvert inlet and outlet | 4 ea | $500 ea | $2,000 |
| | | Total cost = | $40,000 |

Basis of cost:

Unit price for pipe removal is assumed and unit prices for catch basins and headwalls are based on rough approximate volume at $400 per cy for concrete removal in VTrans 2 yr avg cost.

| Item No.: 540.10b | Removal of Structure (Bridge) | Units: EACH |
|---|---|---|

Existing items included in overall cost of removal:

| | | Approx. Vol. | |
|---|---|---|---|
| Deck | | 144 cf | |
| Wingwalls | | 152 cf | |
| Abutments | | 288 cf | |
| | Total = | 584 cf | |
| | Total = | 21.63 cy | |
| | | $400 per cy | (VTrans 2 yr avg for conc. Removal) |
| | Cost = | $8,651.85 | |
| | SAY → | $10,000 | |

---

| Item No.: 540.10a | Precast Concrete Structure (Culvert) | Units: LS |
|---|---|---|

Note: The following cost has been developed by using a base quote from a similar project in Sharon, VT dated 2/9/2012.

Quote: 12'x6'x54' long precast concrete box culvert

Need to adjust cost for 10'x4'x500' long

| Item: | Cost | Factored Cost | Apply 6% tax | Description of cost adjustment |
|---|---|---|---|---|
| Box Culvert | $28,295 | $145,550 | $154,283 | [Quote $ x (10'x4')/(12'x6')x(500'/54')] |
| Walls and Footings | $13,040 | $6,520 | $6,911 | (13'-8" walls for quote divide by 2) |
| Engineering | $4,000 | $8,000 | $8,480 | (doubled due to increased traffic load) |
| Delivery | $5,200 | $48,148 | $48,148 | (Quote $ x (500'/54'))(taxes do not apply) |
| Installation | $15,000 | $125,000 | $125,000 | ($ from White Brook x 20'/60') (sim. Project 8/2012) |
| | | Total = | $342,823 | |
| | | SAY → | $350,000 | |

| Item No.: 540.10b | Precast Concrete Structure (Bridge) | Units: LS |
|---|---|---|

Note: The following cost has been developed by using a base quote from a similar project in Sharon, VT dated 2/9/2012.

Quote: 12'x6'x54' long precast concrete box culvert

Need to adjust cost for 10'x4'x20' long

| Item: | Cost | Factored Cost | Apply 6% tax | Description of cost adjustment |
|---|---|---|---|---|
| Box Culvert | $28,295 | $5,822 | $6,171 | [Quote $ x (10'x4')/(12'x6')x(20'/54')] |
| Walls and Footings | $13,040 | $6,520 | $6,911 | (13'-8" walls for quote divide by 2) |
| Engineering | $4,000 | $4,000 | $4,240 | (used same similar traffic load) |
| Delivery | $5,200 | $1,926 | $1,926 | (Quote $ x (20'/54'))(taxes do not apply) |
| Installation | $15,000 | $5,000 | $5,000 | ($ from White Brook x 20'/60') (sim. Project 8/2012) |
| | | Total = | $24,248 | |
| | | SAY → | $25,000 | |

---

| Item No.: 604.18 | Precast Reinforced Concrete Drop Inlet with Cast Iron Grate | Units: EACH |
|---|---|---|

Total = 4 ea

Determination of Unit Cost

Approx. VTrans 2 yr avg per ea = $2,500

---

| Item No.: 613.11 | Stone Fill, Type II | Units: CY |
|---|---|---|

Description: Stonefill at culvert outlet & channel

Vol. = 1940 cf (2 sides x 5'x5'x2' deep + 2 sides x 230'x2'x2' deep)
Vol. = 71.85 cy

SAY → 80 cy

Determination of Unit Cost

Approx. VTrans 2 yr avg per cy = $35

| Item No.: | 616.28 | Cast-in-Place Concrete Curb, Type B | Units: LF |
|---|---|---|---|

L = 50 lf (assumed)

Determination of Unit Cost

Approx. VTrans 2 yr avg per lf = $50 (↑ due to low qty)

---

| Item No.: | 618.11 | Portland Cement Concrete Sidewalk, 8 Inch | Units: SY |
|---|---|---|---|

L = 50 lf (assumed)
W = 6 ft (assumed)
A = 300 sf
A = 33.33 sy

SAY → 40 sy

Determination of Unit Cost

Approx. VTrans 5 yr avg per sy = $75 (↑ due to low qty)

---

| Item No.: | 629.29 | Relocate Hydrant | Units: EACH |
|---|---|---|---|

Total = 1 ea

Determination of Unit Cost

Approx. VTrans 5 yr avg per ea = $4,000

---

| Item No.: | 630.10 | Uniformed Traffic Officers | Units: HR |
|---|---|---|---|

Approx. no. of months = 2
Work days per month = 20
No. of U.T.O's per day = 1
Hours per day = 8
Total no. of hours = 320 hr

Determination of Unit Cost

Approx. VTrans 2 yr avg per hr = $45

| Item No.: | 630.15 | Flaggers | Units: HR |
|---|---|---|---|

| | | |
|---|---|---|
| Approx. no. of months = | 2 | |
| Work days per month = | 20 | |
| No. of flaggers per day = | 2 | |
| Hours per day = | 8 | |
| Total no. of hours = | 640 | hr |

Determination of Unit Cost

Approx. VTrans 2 yr avg per hr = $20

---

| Item No.: | 649.31 | Geotextile Under Stone Fill | Units: SY |
|---|---|---|---|

Description: Geotextile under stonefill at culvert outlet & channel

| | | | |
|---|---|---|---|
| Vol. = | 970 | sf | (2 sides x 5'x5' + 2 sides x 230'x2') |
| Vol. = | 107.78 | sy | |
| SAY → | 110 | sy | |

Determination of Unit Cost

Approx. VTrans 5 yr avg per sy = $3

---

| Item No.: | 649.51 | Geotextile for Silt Fence | Units: SY |
|---|---|---|---|

| | | |
|---|---|---|
| L = | 1500 | ft |
| h = | 2 | ft |
| a = | 3000 | sf |
| a = | 333.33 | sy |
| SAY → | 400 | sy |

Determination of Unit Cost

Approx. VTrans 2 yr avg per sy = $5

| Item No.: | 651.15 | Seed | Units: LB |
|---|---|---|---|

A = 9000 sf (300'x30')
A = 0.21 acre
Application rate = 160 lb/acre
Wt. = 33.06 lb/acre

SAY → 40 lb

Determination of Unit Cost

Approx. VTrans 2 yr avg per lb = $11

---

| Item No.: | 651.18 | Fertilizer | Units: LB |
|---|---|---|---|

A = 9000 sf (300'x30')
A = 0.21 acre
Application rate = 500 lb/acre
Wt. = 103.31 lb/acre

SAY → 110 lb

Determination of Unit Cost

Approx. VTrans 2 yr avg per sy = $5

---

| Item No.: | 651.20 | Agricultural Limestone | Units: TON |
|---|---|---|---|

A = 9000 sf (300'x30')
A = 0.21 acre
Application rate = 2 tons/acre
Wt. = 0.41 tons/acre

SAY → 1 ton

Determination of Unit Cost

Approx. VTrans 2 yr avg per ton = $600

| Item No.: | 651.25 | Hay Mulch | Units: TON |
|---|---|---|---|

A = 9000 sf (300'x30')
A = 0.21 acre
Application rate = 2 tons/acre
Wt. = 0.41 tons/acre

SAY → 1 ton

Determination of Unit Cost

Approx. VTrans 2 yr avg per ton = $650

---

| Item No.: | 651.35 | Top Soil | Units: CY |
|---|---|---|---|

A = 9000 sf (300'x30')
D = 0.5 ft (assumed)
V = 4500 cf
V = 166.67 cy

SAY → 200 cy

Determination of Unit Cost

Approx. VTrans 5 yr avg per cy = $30

---

| Item No.: | 651.40 | Grubbing Material | Units: SY |
|---|---|---|---|

Description: For channel

A = 11500 sf (2 sides x 230'x5'x5')
A = 1277.78 sy

SAY → 1300 sy

Determination of Unit Cost

Approx. VTrans 2 yr avg per cy = $10

| Item No.: | 652.10 | EPSC Plan | Units: LS |
|---|---|---|---|

Cost = $5,000 (assumed)

---

| Item No.: | 652.20 | Monitoring of EPSC Plan | Units: HR |
|---|---|---|---|

Approx. no. of months = 2
Weeks per month = 4
Hours per week = 2
Total no. of hours = 16 hr

Determination of Unit Cost

Approx. VTrans 2 yr avg per hr = $40

---

| Item No.: | 652.30 | Maintenance of EPSC Plan (N.A.B.I.) | Units: LU |
|---|---|---|---|

Cost = $7,000 (assumed based on VTrans 2 yr avg)

---

| Item No.: | 656.20 | Evergreen Trees | Units: EACH |
|---|---|---|---|

Total = 5 ea (rough est.)

Determination of Unit Cost

Approx. VTrans 5 yr avg per ea = $150

---

| Item No.: | 656.25 | Evergreen Shrubs | Units: EACH |
|---|---|---|---|

Total = 15 ea (rough est.)

Determination of Unit Cost

Approx. VTrans 2 yr avg per ea = $50

| Item No.: 656.30 | Deciduous Trees | Units: EACH |
|---|---|---|

Total = 10 ea (rough est.)

Determination of Unit Cost

Approx. VTrans 2 yr avg per ea = $300

---

| Item No.: 656.35 | Deciduous Shrubs | Units: EACH |
|---|---|---|

Total = 10 ea (rough est.)

Determination of Unit Cost

Approx. VTrans 2 yr avg per ea = $50

---

| Item No.: 900.620 | Remove and Reset Utility Poles | Units: EACH |
|---|---|---|

Total = 4 ea

Unit cost = $2,000 (assumed)

---

| Item No.: 900.645 | Stream Diversion | Units: LS |
|---|---|---|

Description: Maintain stream in existing culvert
Proposed culvert requires moving existing culvert

Cost = $30,000 (based on previous experience)

---

| Item No.: 900.650 | Specialized Excavation | Units: LU |
|---|---|---|

Description: Need to occur at two buildings. Would need temporary support and careful excavation at footings.

Cost = $20,000 (assumed)

| Item No.: | 1000.10 | Hydrologic Study for Cost Benefit Analysis | Units: LS |
|---|---|---|---|

Cost = $15,000 (assume $10,000 engineering & $5,000 for survey)

---

| Item No.: | 1000.30 | ROWA Right-of-Way (Easement/Acquisitions) | Units: LS |
|---|---|---|---|

Cost = $20,000 (assumed)

---

| Item No.: | 1000.40 | Consultant Construction Engineering | Units: LS |
|---|---|---|---|

Determination of Cost:

| | |
|---|---|
| No. of months = | 5 |
| Hrs per month = | 40 |
| Cost per hr = | $100 |

Cost = $20,000

---

| Item No.: | 1000.50 | Resident Engineering Support Services | Units: LS |
|---|---|---|---|

Determination of Cost:

| | |
|---|---|
| No. of months = | 5 |
| Hrs per month = | 160 |
| Cost per hr = | $75 |

Cost = $60,000

# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230507-000 | **Account Number** | 363-112-10953 |
| **Prior Parcel ID** | -- | | |
| **Property Owner** | FLETCHER MEMORIAL LIBRARY | **Property Location** | 88 MAIN STREET |
| | | **Property Use** | EX-TOWN |
| **Mailing Address** | 88 MAIN STREET | **Most Recent Sale Date** | |
| | | **Legal Reference** | |
| **City** | LUDLOW | **Grantor** | |
| **Mailing State** | VT Zip 05149 | **Sale Price** | 0 |
| **ParcelZoning** | | **Land Area** | 0.670 acres |

## Current Property Assessment

| Card 1 Value | Building Value | Xtra Features Value | Land Value | Total Value |
|---|---|---|---|---|
| | 458,400 | 1,200 | 180,200 | 639,800 |

## Building Description

| | | |
|---|---|---|
| **Building Style** LIBRARY | **Foundation Type** MASONRY | **Flooring Type** CARPET |
| **# of Living Units** 1 | **Frame Type** WOOD | **Basement Floor** CONCRETE |
| **Year Built** 1901 | **Roof Structure** HIP | **Heating Type** STEAM |
| **Building Grade** GOOD (+) | **Roof Cover** SLATE | **Heating Fuel** OIL |
| **Building Condition** Good | **Siding** BRICK | **Air Conditioning** 0% |
| **Finished Area (SF)** 4510 | **Interior Walls** DRYWALL | **# of Bsmt Garages** 0 |
| **Number Rooms** 0 | **# of Bedrooms** 0 | **# of Full Baths** 0 |
| **# of 3/4 Baths** 0 | **# of 1/2 Baths** 2 | **# of Other Fixtures** 0 |

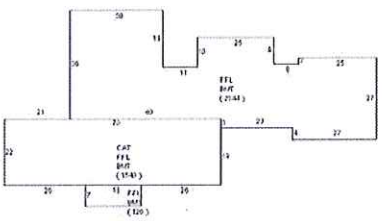
## Legal Description

MAIN STREET 88 NON-PROFIT 32VSA3802(4)

## Narrative Description of Property

This property contains 0.670 acres of land mainly classified as EX-TOWN with a(n) LIBRARY style building, built about 1901 , having BRICK exterior and SLATE roof cover, with 1 unit(s), 0 room(s), 0 bedroom(s), 0 bath(s), 2 half bath(s).

## Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranteed.

# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| Parcel ID | 230508-000 | Account Number | 363-112-11596 |
| Prior Parcel ID | -- | | |
| Property Owner | KUBEC JAMES R<br>KUBEC CATHY E | Property Location | 86 MAIN STREET |
| | | Property Use | RESD 1 |
| Mailing Address | 86 MAIN STREET | Most Recent Sale Date | |
| | | Legal Reference | |
| City | LUDLOW | Grantor | |
| Mailing State | VT Zip 05149 | Sale Price | 0 |
| ParcelZoning | | Land Area | 0.440 acres |

## Current Property Assessment

| | | | | | |
|---|---|---|---|---|---|
| Card 1 Value | Building Value 415,200 | Xtra Features Value 2,300 | Land Value 166,400 | Total Value 583,900 |
| Total Parcel Value | Building Value 543,600 | Xtra Features Value 2,300 | Land Value 166,400 | Total Value 712,300 |

## Building Description

| | | |
|---|---|---|
| Building Style INN | Foundation Type MASONRY | Flooring Type SOFTWOOD |
| # of Living Units 1 | Frame Type WOOD | Basement Floor CONCRETE |
| Year Built 1890 | Roof Structure GABLE | Heating Type FORCED H/W |
| Building Grade AVG. (+) | Roof Cover SLATE | Heating Fuel OIL |
| Building Condition Very Good | Siding CLAPBOARD | Air Conditioning 100% |
| Finished Area (SF) 4245.99999 | Interior Walls PLASTER | # of Bsmt Garages 0 |
| Number Rooms 15 | # of Bedrooms 9 | # of Full Baths 4 |
| # of 3/4 Baths 6 | # of 1/2 Baths 0 | # of Other Fixtures 2 |

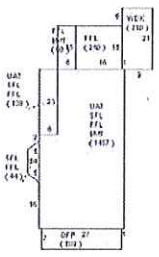
## Legal Description

MAIN STREET 86 GOVERNORS INN

## Narrative Description of Property

This property contains 0.440 acres of land mainly classified as RESD 1 with a(n) INN style building, built about 1890 , having CLAPBOARD exterior and SLATE roof cover, with 1 unit(s), 15 room(s), 9 bedroom(s), 4 bath(s), 0 half bath(s).

## Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranteed.

# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230511-000 | **Account Number** | 363-112-12052 |
| **Prior Parcel ID** | -- | | |
| **Property Owner** | MIELE FLOYD R<br>MIELE FAITH | **Property Location** | 76 MAIN STREET |
| | | **Property Use** | RESD 1 |
| **Mailing Address** | 76 MAIN STREET | **Most Recent Sale Date** | |
| | | **Legal Reference** | |
| **City** | LUDLOW | **Grantor** | |
| **Mailing State** | VT Zip 05149 | **Sale Price** | 0 |
| **ParcelZoning** | | **Land Area** | 0.340 acres |

## Current Property Assessment

| Card 1 Value | Building Value 113,700 | Xtra Features Value 0 | Land Value 57,700 | Total Value 171,400 |
|---|---|---|---|---|

## Building Description

| | | | | | |
|---|---|---|---|---|---|
| **Building Style** | OLD STYLE | **Foundation Type** | MASONRY | **Flooring Type** | CARPET |
| **# of Living Units** | 1 | **Frame Type** | WOOD | **Basement Floor** | EARTH |
| **Year Built** | 1900 | **Roof Structure** | GABLE | **Heating Type** | FORCED H/A |
| **Building Grade** | AVERAGE | **Roof Cover** | ASPHALT SH | **Heating Fuel** | OIL |
| **Building Condition** | Average | **Siding** | CLAPBOARD | **Air Conditioning** | 0% |
| **Finished Area (SF)** | 1628.80002 | **Interior Walls** | DRYWALL | **# of Bsmt Garages** | 0 |
| **Number Rooms** | 5 | **# of Bedrooms** | 2 | **# of Full Baths** | 1 |
| **# of 3/4 Baths** | 0 | **# of 1/2 Baths** | 0 | **# of Other Fixtures** | 0 |

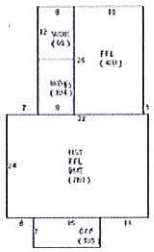
## Legal Description

MAIN STREET 76

## Narrative Description of Property

This property contains 0.340 acres of land mainly classified as RESD 1 with a(n) OLD STYLE style building, built about 1900 , having CLAPBOARD exterior and ASPHALT SH roof cover, with 1 unit(s), 5 room(s), 2 bedroom(s), 1 bath(s), 0 half bath(s).

## Property Images



# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230515-000 | **Account Number** | 363-112-10169 |
| **Prior Parcel ID** | – | | |
| **Property Owner** | BEMIS CONSTANCE J | **Property Location** | 74 MAIN STREET |
| | | **Property Use** | RESD 1 |
| **Mailing Address** | 74 MAIN STREET | **Most Recent Sale Date** | |
| | | **Legal Reference** | |
| **City** | LUDLOW | **Grantor** | |
| **Mailing State** | VT Zip 05149 | **Sale Price** | 0 |
| **ParcelZoning** | | **Land Area** | 0.140 acres |

## Current Property Assessment

| Card 1 Value | Building Value 135,600 | Xtra Features Value 0 | Land Value 53,400 | Total Value 189,000 |
|---|---|---|---|---|

## Building Description

| | | |
|---|---|---|
| **Building Style** OLD STYLE | **Foundation Type** MASONRY | **Flooring Type** CARPET |
| **# of Living Units** 2 | **Frame Type** WOOD | **Basement Floor** EARTH |
| **Year Built** 1900 | **Roof Structure** GABLE | **Heating Type** FORCED H/W |
| **Building Grade** AVG. (+) | **Roof Cover** STDG SEAM | **Heating Fuel** OIL |
| **Building Condition** Average | **Siding** VINYL | **Air Conditioning** 0% |
| **Finished Area (SF)** 1756 | **Interior Walls** DRYWALL | **# of Bsmt Garages** 0 |
| **Number Rooms** 5 | **# of Bedrooms** 2 | **# of Full Baths** 1 |
| **# of 3/4 Baths** 1 | **# of 1/2 Baths** 1 | **# of Other Fixtures** 0 |

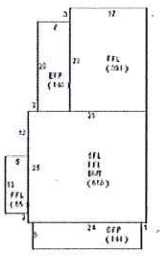
## Legal Description

MAIN STREET 74 ONE FAMILY

## Narrative Description of Property

This property contains 0.140 acres of land mainly classified as RESD 1 with a(n) OLD STYLE style building, built about 1900 , having VINYL exterior and STDG SEAM roof cover, with 2 unit(s), 5 room(s), 2 bedroom(s), 1 bath(s), 1 half bath(s).

## Property Images



# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230518-000 | **Account Number** | 363-112-11374 |
| **Prior Parcel ID** | – | | |
| **Property Owner** | HUNTER IV WILLIAM A | **Property Location** | 72 MAIN STREET |
| | | **Property Use** | RESD 1 |
| **Mailing Address** | RR 1 BOX 48 | **Most Recent Sale Date** | |
| | | **Legal Reference** | |
| **City** | CAVENDISH | **Grantor** | |
| **Mailing State** | VT Zip 05142 | **Sale Price** | 0 |
| **ParcelZoning** | | **Land Area** | 0.500 acres |

## Current Property Assessment

| Card 1 Value | Building Value | Xtra Features Value | Land Value | Total Value |
|---|---|---|---|---|
| | 202,100 | 0 | 61,200 | 263,300 |

## Building Description

| | | | | | |
|---|---|---|---|---|---|
| **Building Style** | OLD STYLE | **Foundation Type** | MASONRY | **Flooring Type** | HARDWOOD |
| **# of Living Units** | 3 | **Frame Type** | WOOD | **Basement Floor** | CONCRETE |
| **Year Built** | 1830 | **Roof Structure** | GABLE | **Heating Type** | FORCED H/W |
| **Building Grade** | AVG. (+) | **Roof Cover** | ASPHALT SH | **Heating Fuel** | OIL |
| **Building Condition** | Average | **Siding** | CLAPBOARD | **Air Conditioning** | 0% |
| **Finished Area (SF)** | 3041.40002 | **Interior Walls** | DRYWALL | **# of Bsmt Garages** | 0 |
| **Number Rooms** | 0 | **# of Bedrooms** | 0 | **# of Full Baths** | 3 |
| **# of 3/4 Baths** | 0 | **# of 1/2 Baths** | 0 | **# of Other Fixtures** | 0 |

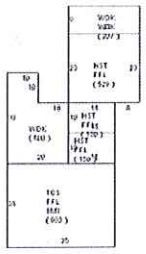
## Legal Description

MAIN STREET 72 THREE FAMILY

## Narrative Description of Property

This property contains 0.500 acres of land mainly classified as RESD 1 with a(n) OLD STYLE style building, built about 1830 , having CLAPBOARD exterior and ASPHALT SH roof cover, with 3 unit(s), 0 room(s), 0 bedroom(s), 3 bath(s), 0 half bath(s).

## Property Images



# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230521-000 | **Account Number** | 363-112-11708 |
| **Prior Parcel ID** | -- | | |
| **Property Owner** | LEVEY HOUSE LLC | **Property Location** | 70 MAIN STREET |
| | | **Property Use** | COMMERCIAL |
| **Mailing Address** | 1502 POPPLE DUNGEON ROAD | **Most Recent Sale Date** | |
| | | **Legal Reference** | |
| **City** | CHESTER | **Grantor** | |
| **Mailing State** | VT Zip 05143 | **Sale Price** | 0 |
| **ParcelZoning** | | **Land Area** | 0.610 acres |

## Current Property Assessment

| Card 1 Value | Building Value | Xtra Features Value | Land Value | Total Value |
|---|---|---|---|---|
| | 249,500 | 4,800 | 176,600 | 430,900 |

## Building Description

| | | |
|---|---|---|
| **Building Style** COMM/RESD | **Foundation Type** MASONRY | **Flooring Type** HARDWOOD |
| **# of Living Units** 4 | **Frame Type** WOOD | **Basement Floor** CONCRETE |
| **Year Built** 1900 | **Roof Structure** HIP | **Heating Type** FORCED H/A |
| **Building Grade** GOOD (-) | **Roof Cover** SLATE | **Heating Fuel** OIL |
| **Building Condition** Good | **Siding** CLAPBOARD | **Air Conditioning** 100% |
| **Finished Area (SF)** 2590 | **Interior Walls** DRYWALL | **# of Bsmt Garages** 0 |
| **Number Rooms** 0 | **# of Bedrooms** 0 | **# of Full Baths** 0 |
| **# of 3/4 Baths** 0 | **# of 1/2 Baths** 4 | **# of Other Fixtures** 5 |

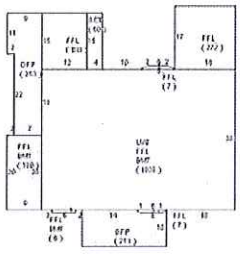
## Legal Description

MAIN STREET 70

## Narrative Description of Property

This property contains 0.610 acres of land mainly classified as COMMERCIAL with a(n) COMM/RESD style building, built about 1900 , having CLAPBOARD exterior and SLATE roof cover, with 4 unit(s), 0 room(s), 0 bedroom(s), 0 bath(s), 4 half bath(s).

## Property Images



# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230524-000 | **Account Number** | 363-112-12275 |
| **Prior Parcel ID** | -- | | |
| **Property Owner** | O`HARA MARY JANE | **Property Location** | 68 MAIN STREET |
| | | **Property Use** | RESD 1 |
| **Mailing Address** | PO BOX 184 | **Most Recent Sale Date** | |
| | | **Legal Reference** | |
| **City** | LUDLOW | **Grantor** | |
| **Mailing State** | VT Zip 05149 | **Sale Price** | 0 |
| **ParcelZoning** | | **Land Area** | 0.290 acres |

## Current Property Assessment

| Card 1 Value | Building Value 128,800 | Xtra Features Value 0 | Land Value 56,700 | Total Value 185,500 |
|---|---|---|---|---|

## Building Description

| | | | | | |
|---|---|---|---|---|---|
| **Building Style** | OLD STYLE | **Foundation Type** | MASONRY | **Flooring Type** | HARDWOOD |
| **# of Living Units** | 1 | **Frame Type** | WOOD | **Basement Floor** | EARTH |
| **Year Built** | 1900 | **Roof Structure** | GABLE | **Heating Type** | FORCED H/W |
| **Building Grade** | AVERAGE | **Roof Cover** | ASPHALT SH | **Heating Fuel** | OIL |
| **Building Condition** | Average | **Siding** | CLAPBOARD | **Air Conditioning** | 0% |
| **Finished Area (SF)** | 1974 | **Interior Walls** | DRYWALL | **# of Bsmt Garages** | 0 |
| **Number Rooms** | 0 | **# of Bedrooms** | 5 | **# of Full Baths** | 1 |
| **# of 3/4 Baths** | 2 | **# of 1/2 Baths** | 0 | **# of Other Fixtures** | 0 |

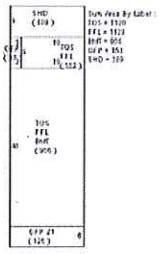
## Legal Description

MAIN STREET 68

## Narrative Description of Property

This property contains 0.290 acres of land mainly classified as RESD 1 with a(n) OLD STYLE style building, built about 1900 , having CLAPBOARD exterior and ASPHALT SH roof cover, with 1 unit(s), 0 room(s), 5 bedroom(s), 1 bath(s), 0 half bath(s).

## Property Images



# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230526-000 | **Account Number** | 363-112-10668 |
| **Prior Parcel ID** | -- | | |
| **Property Owner** | DAVIS VERA | **Property Location** | 66 MAIN STREET |
| | | **Property Use** | RESD 1 |
| **Mailing Address** | 66 MAIN STREET | **Most Recent Sale Date** | |
| | | **Legal Reference** | |
| **City** | LUDLOW | **Grantor** | |
| **Mailing State** | VT Zip 05149 | **Sale Price** | 0 |
| **ParcelZoning** | | **Land Area** | 0.590 acres |

## Current Property Assessment

| Card 1 Value | Building Value 261,400 | Xtra Features Value 0 | Land Value 63,100 | Total Value 324,500 |
|---|---|---|---|---|

## Building Description

| | | |
|---|---|---|
| **Building Style** MULTI-CONV | **Foundation Type** MASONRY | **Flooring Type** CARPET |
| **# of Living Units** 3 | **Frame Type** WOOD | **Basement Floor** EARTH |
| **Year Built** 1900 | **Roof Structure** GABLE | **Heating Type** FORCED H/W |
| **Building Grade** AVG. (+) | **Roof Cover** SLATE | **Heating Fuel** OIL |
| **Building Condition** Average | **Siding** ALUMINUM | **Air Conditioning** 0% |
| **Finished Area (SF)** 4222 | **Interior Walls** PLASTER | **# of Bsmt Garages** 0 |
| **Number Rooms** 14 | **# of Bedrooms** 6 | **# of Full Baths** 3 |
| **# of 3/4 Baths** 1 | **# of 1/2 Baths** 0 | **# of Other Fixtures** 0 |

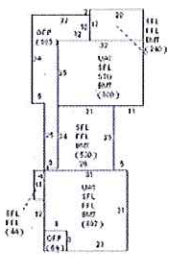
## Legal Description

MAIN STREET 66 THREE FAMILY

## Narrative Description of Property

This property contains 0.590 acres of land mainly classified as RESD 1 with a(n) MULTI-CONV style building, built about 1900 , having ALUMINUM exterior and SLATE roof cover, with 3 unit(s), 14 room(s), 6 bedroom(s), 3 bath(s), 0 half bath(s).

## Property Images



# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230527-000 | **Account Number** | 363-112-10584 |
| **Prior Parcel ID** | – | | |
| **Property Owner** | COUCH ALAN I<br>COUCH KATHERINE W | **Property Location** | 21 MEADOW STREET |
| | | **Property Use** | RESD 1 |
| **Mailing Address** | 21 MEADOW ST | **Most Recent Sale Date** | 3/18/2002 |
| | | **Legal Reference** | 213/484 |
| **City** | LUDLOW | **Grantor** | |
| **Mailing State** | VT Zip 05149 | **Sale Price** | 130,500 |
| **ParcelZoning** | | **Land Area** | 0.560 acres |

## Current Property Assessment

| Card 1 Value | Building Value 124,400 | Xtra Features Value 0 | Land Value 54,700 | Total Value 179,100 |
|---|---|---|---|---|

## Building Description

| | | |
|---|---|---|
| **Building Style** CAPE | **Foundation Type** CONC BLOCK | **Flooring Type** HARDWOOD |
| **# of Living Units** 1 | **Frame Type** WOOD | **Basement Floor** CONCRETE |
| **Year Built** 1955 | **Roof Structure** GABLE | **Heating Type** FORCED H/W |
| **Building Grade** AVERAGE | **Roof Cover** ASPHALT SH | **Heating Fuel** OIL |
| **Building Condition** Fair-Avg | **Siding** ASBESTOS | **Air Conditioning** 0% |
| **Finished Area (SF)** 1809.60004 | **Interior Walls** DRYWALL | **# of Bsmt Garages** 0 |
| **Number Rooms** 6 | **# of Bedrooms** 2 | **# of Full Baths** 0 |
| **# of 3/4 Baths** 1 | **# of 1/2 Baths** 1 | **# of Other Fixtures** 0 |

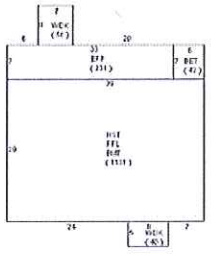
## Legal Description

MEADOW STREET 21 ONE FAMILY

## Narrative Description of Property

This property contains 0.560 acres of land mainly classified as RESD 1 with a(n) CAPE style building, built about 1955 , having ASBESTOS exterior and ASPHALT SH roof cover, with 1 unit(s), 6 room(s), 2 bedroom(s), 0 bath(s), 1 half bath(s).

## Property Images



# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230555-000 | **Account Number** | 363-112-10787 |
| **Prior Parcel ID** | -- | | |
| **Property Owner** | CRES MANAGEMENT LLC<br>C/O FRANCIS J DWYER | **Property Location** | 18 MILL STREET |
| | | **Property Use** | COMMERCIAL |
| **Mailing Address** | 10 EAST MAIN STREET | **Most Recent Sale Date** | 10/15/2007 |
| | | **Legal Reference** | 316-167 |
| **City** | FREEHOLD | **Grantor** | DUBIN,PAUL TRUSTEE |
| **Mailing State** | NJ Zip 07728 | **Sale Price** | 265,000 |
| **ParcelZoning** | | **Land Area** | 5.170 acres |

## Current Property Assessment

| | | | | |
|---|---|---|---|---|
| **Card 1 Value** | **Building Value** 37,000 | **Xtra Features Value** 6,800 | **Land Value** 109,600 | **Total Value** 153,400 |
| **Total Parcel Value** | **Building Value** 39,600 | **Xtra Features Value** 6,800 | **Land Value** 109,600 | **Total Value** 156,000 |

## Building Description

| | | | | | |
|---|---|---|---|---|---|
| **Building Style** | INDUST-LT | **Foundation Type** | SLAB | **Flooring Type** | CONCRETE |
| **# of Living Units** | 1 | **Frame Type** | WOOD | **Basement Floor** | N/A |
| **Year Built** | 1900 | **Roof Structure** | GABLE | **Heating Type** | UNIT HTRS |
| **Building Grade** | FAIR (+) | **Roof Cover** | METAL | **Heating Fuel** | OIL |
| **Building Condition** | Delapitated | **Siding** | CORREG STL | **Air Conditioning** | 0% |
| **Finished Area (SF)** | 31272 | **Interior Walls** | MINIMUM | **# of Bsmt Garages** | 0 |
| **Number Rooms** | 0 | **# of Bedrooms** | 0 | **# of Full Baths** | 0 |
| **# of 3/4 Baths** | 1 | **# of 1/2 Baths** | 2 | **# of Other Fixtures** | 0 |

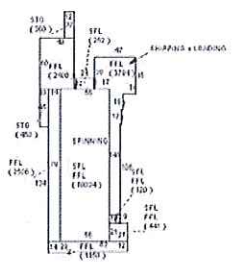
## Legal Description

MILL STREET 18 MANUFACTURING INCL 230556-000

## Narrative Description of Property

This property contains 5.170 acres of land mainly classified as COMMERCIAL with a(n) INDUST-LT style building, built about 1900 , having CORREG STL exterior and METAL roof cover, with 1 unit(s), 0 room(s), 0 bedroom(s), 0 bath(s), 2 half bath(s).

## Property Images



# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230525-000 | **Account Number** | 363-112-11365 |
| **Prior Parcel ID** | -- | | |
| **Property Owner** | HUGHES LORRAINE L | **Property Location** | 18 MEADOW STREET |
| | | **Property Use** | VACN 1 |
| **Mailing Address** | 3 WILD ROSE COURT | **Most Recent Sale Date** | |
| | | **Legal Reference** | |
| **City** | CROMWELL | **Grantor** | |
| **Mailing State** | CT **Zip** 06416 | **Sale Price** | 0 |
| **ParcelZoning** | | **Land Area** | 0.190 acres |

## Current Property Assessment

| Card 1 Value | Building Value 69,900 | Xtra Features Value 0 | Land Value 47,700 | Total Value 117,600 |
|---|---|---|---|---|

## Building Description

| | | |
|---|---|---|
| **Building Style** RANCH | **Foundation Type** SLAB | **Flooring Type** CARPET |
| **# of Living Units** 1 | **Frame Type** WOOD | **Basement Floor** N/A |
| **Year Built** 1951 | **Roof Structure** GABLE | **Heating Type** FORCED H/A |
| **Building Grade** AVG. (-) | **Roof Cover** STDG SEAM | **Heating Fuel** GAS |
| **Building Condition** Average | **Siding** VINYL | **Air Conditioning** 0% |
| **Finished Area (SF)** 864 | **Interior Walls** PLY PANEL | **# of Bsmt Garages** 0 |
| **Number Rooms** 5 | **# of Bedrooms** 3 | **# of Full Baths** 1 |
| **# of 3/4 Baths** 0 | **# of 1/2 Baths** 0 | **# of Other Fixtures** 0 |

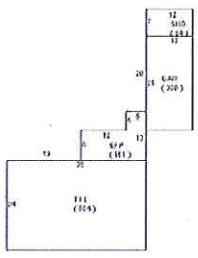
## Legal Description

MEADOW STREET 18 ONE FAMILY

## Narrative Description of Property

This property contains 0.190 acres of land mainly classified as VACN 1 with a(n) RANCH style building, built about 1951 , having VINYL exterior and STDG SEAM roof cover, with 1 unit(s), 5 room(s), 3 bedroom(s), 1 bath(s), 0 half bath(s).

## Property Images



# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230523-000 | **Account Number** | 363-112-10322 |
| **Prior Parcel ID** | – | | |
| **Property Owner** | REILLY LYNN D | **Property Location** | 17 MEADOW STREET |
| | | **Property Use** | RESD 1 |
| **Mailing Address** | 17 MEADOW ST | **Most Recent Sale Date** | 10/30/2003 |
| | | **Legal Reference** | 251-173-175 |
| **City** | LUDLOW | **Grantor** | REILLY,LYNN D |
| **Mailing State** | VT Zip 05149 | **Sale Price** | 230,000 |
| **ParcelZoning** | | **Land Area** | 1.040 acres |

## Current Property Assessment

| Card 1 Value | Building Value | Xtra Features Value | Land Value | Total Value |
|---|---|---|---|---|
| | 131,300 | 2,200 | 63,100 | 196,600 |

## Building Description

| | | |
|---|---|---|
| **Building Style** OLD STYLE | **Foundation Type** CONCRETE | **Flooring Type** CARPET |
| **# of Living Units** 1 | **Frame Type** WOOD | **Basement Floor** CONCRETE |
| **Year Built** 1900 | **Roof Structure** GABLE | **Heating Type** STEAM |
| **Building Grade** AVERAGE | **Roof Cover** ASPHALT SH | **Heating Fuel** OIL |
| **Building Condition** Avg-Good | **Siding** VINYL | **Air Conditioning** 0% |
| **Finished Area (SF)** 1790 | **Interior Walls** PLASTER | **# of Bsmt Garages** 0 |
| **Number Rooms** 6 | **# of Bedrooms** 3 | **# of Full Baths** 1 |
| **# of 3/4 Baths** 1 | **# of 1/2 Baths** 0 | **# of Other Fixtures** 0 |

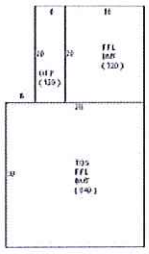
## Legal Description

MEADOW STREET 17 ONE FAMILY 230556

## Narrative Description of Property

This property contains 1.040 acres of land mainly classified as RESD 1 with a(n) OLD STYLE style building, built about 1900 , having VINYL exterior and ASPHALT SH roof cover, with 1 unit(s), 6 room(s), 3 bedroom(s), 1 bath(s), 0 half bath(s).

## Property Images



# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230522-000 | **Account Number** | 363-112-13149 |
| **Prior Parcel ID** | -- | | |
| **Property Owner** | ROURKE JOSHUA J<br>PROLI LISA | **Property Location** | 16 MEADOW STREET |
| | | **Property Use** | RESD 1 |
| **Mailing Address** | 44 POND STREET | **Most Recent Sale Date** | 9/21/2004 |
| | | **Legal Reference** | 274-159-160 |
| **City** | LUDLOW | **Grantor** | O`SHEA,KATHLEEN A |
| **Mailing State** | VT Zip 05149 | **Sale Price** | 155,000 |
| **ParcelZoning** | | **Land Area** | 0.150 acres |

## Current Property Assessment

| Card 1 Value | Building Value | Xtra Features Value | Land Value | Total Value |
|---|---|---|---|---|
| | 77,600 | 2,100 | 49,500 | 129,200 |

## Building Description

| | | |
|---|---|---|
| **Building Style** CONVENTNL | **Foundation Type** CONC BLOCK | **Flooring Type** CARPET |
| **# of Living Units** 1 | **Frame Type** WOOD | **Basement Floor** CONCRETE |
| **Year Built** 1930 | **Roof Structure** GABLE | **Heating Type** STEAM |
| **Building Grade** AVG. (-) | **Roof Cover** METAL | **Heating Fuel** OIL |
| **Building Condition** Average | **Siding** ASBESTOS | **Air Conditioning** 0% |
| **Finished Area (SF)** 1425.60004 | **Interior Walls** WALLBOARD | **# of Bsmt Garages** 0 |
| **Number Rooms** 6 | **# of Bedrooms** 2 | **# of Full Baths** 1 |
| **# of 3/4 Baths** 0 | **# of 1/2 Baths** 0 | **# of Other Fixtures** 0 |

## Legal Description

MEADOW STREET 16

## Narrative Description of Property

This property contains 0.150 acres of land mainly classified as RESD 1 with a(n) CONVENTNL style building, built about 1930 , having ASBESTOS exterior and METAL roof cover, with 1 unit(s), 6 room(s), 2 bedroom(s), 1 bath(s), 0 half bath(s).

## Property Images

# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230520-000 | **Account Number** | 363-112-12468 |
| **Prior Parcel ID** | – | | |
| **Property Owner** | BREHM GEORGIA<br>BURLAMACHI ELIZABETH | **Property Location** | 15 MEADOW STREET |
| | | **Property Use** | VACN 1 |
| **Mailing Address** | 15 MEADOW STREET | **Most Recent Sale Date** | 6/21/2010 |
| | | **Legal Reference** | 342-3 |
| **City** | LUDLOW | **Grantor** | FENCLAU,DOUGLAS L & LISA A |
| **Mailing State** | VT Zip 05149 | **Sale Price** | 185,000 |
| **ParcelZoning** | | **Land Area** | 0.970 acres |

## Current Property Assessment

| Card 1 Value | Building Value 96,300 | Xtra Features Value 0 | Land Value 65,900 | Total Value 162,200 |
|---|---|---|---|---|

## Building Description

| | | |
|---|---|---|
| **Building Style** RANCH | **Foundation Type** CONC BLOCK | **Flooring Type** CARPET |
| **# of Living Units** 1 | **Frame Type** WOOD | **Basement Floor** CONCRETE |
| **Year Built** 1951 | **Roof Structure** GABLE | **Heating Type** FORCED H/W |
| **Building Grade** AVERAGE | **Roof Cover** ASPHALT SH | **Heating Fuel** OIL |
| **Building Condition** Average | **Siding** ALUMINUM | **Air Conditioning** 0% |
| **Finished Area (SF)** 1020 | **Interior Walls** DRYWALL | **# of Bsmt Garages** 0 |
| **Number Rooms** 0 | **# of Bedrooms** 0 | **# of Full Baths** 1 |
| **# of 3/4 Baths** 0 | **# of 1/2 Baths** 0 | **# of Other Fixtures** 0 |

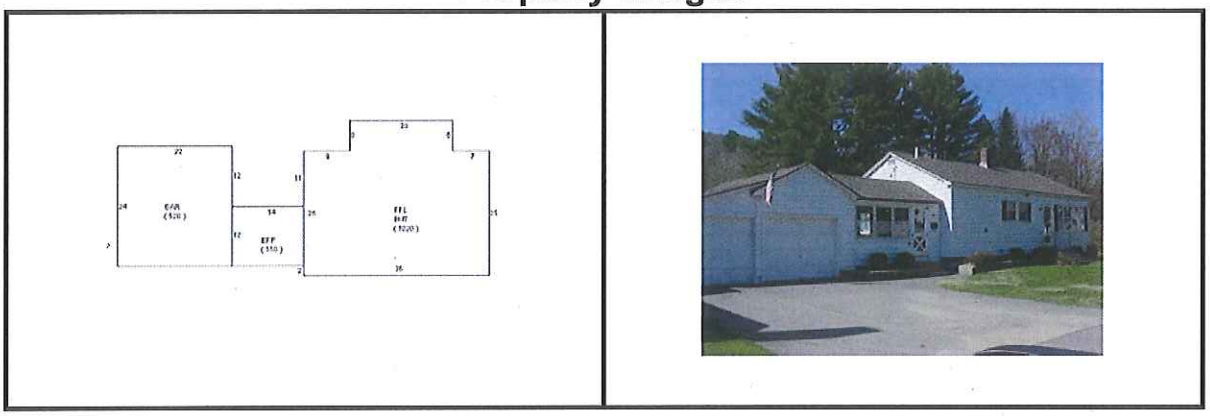
## Legal Description

MEADOW STREET 15

## Narrative Description of Property

This property contains 0.970 acres of land mainly classified as VACN 1 with a(n) RANCH style building, built about 1951 , having ALUMINUM exterior and ASPHALT SH roof cover, with 1 unit(s), 0 room(s), 0 bedroom(s), 1 bath(s), 0 half bath(s).

## Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranteed.

# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230530-000 | **Account Number** | 363-112-12645 |
| **Prior Parcel ID** | -- | | |
| **Property Owner** | ROGERS LEONARD R<br>ROGERS SUEANNE M | **Property Location** | 12 MILL STREET |
| | | **Property Use** | RESD 1 |
| **Mailing Address** | 10 MILL STREET | **Most Recent Sale Date** | |
| | | **Legal Reference** | |
| **City** | LUDLOW | **Grantor** | |
| **Mailing State** | VT Zip 05149 | **Sale Price** | 0 |
| **ParcelZoning** | | **Land Area** | 2.700 acres |

## Current Property Assessment

| Card 1 Value | Building Value | Xtra Features Value | Land Value | Total Value |
|---|---|---|---|---|
| | 186,900 | 0 | 57,100 | 244,000 |

## Building Description

| | | |
|---|---|---|
| **Building Style** MULTI-CONV | **Foundation Type** MASONRY | **Flooring Type** HARDWOOD |
| **# of Living Units** 2 | **Frame Type** WOOD | **Basement Floor** EARTH |
| **Year Built** 1900 | **Roof Structure** GABLE | **Heating Type** FORCED H/W |
| **Building Grade** AVERAGE | **Roof Cover** SLATE | **Heating Fuel** GAS |
| **Building Condition** Fair | **Siding** VINYL | **Air Conditioning** 0% |
| **Finished Area (SF)** 4784 | **Interior Walls** PLASTER | **# of Bsmt Garages** 0 |
| **Number Rooms** 14 | **# of Bedrooms** 6 | **# of Full Baths** 2 |
| **# of 3/4 Baths** 0 | **# of 1/2 Baths** 0 | **# of Other Fixtures** 0 |

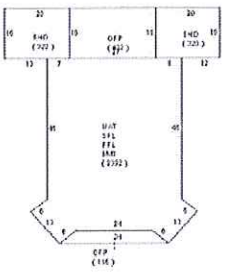
## Legal Description

MILL STREET 12

## Narrative Description of Property

This property contains 2.700 acres of land mainly classified as RESD 1 with a(n) MULTI-CONV style building, built about 1900 , having VINYL exterior and SLATE roof cover, with 2 unit(s), 14 room(s), 6 bedroom(s), 2 bath(s), 0 half bath(s).

## Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranteed.

# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230519-000 | **Account Number** | 363-112-11528 |
| **Prior Parcel ID** | -- | | |
| **Property Owner** | KEYSTONE VT INC<br>C/O SCI MANAGEMENT | **Property Location** | 12 MEADOW STREET |
| | | **Property Use** | COMMERCIAL |
| **Mailing Address** | PO BOX 130548 | **Most Recent Sale Date** | |
| | | **Legal Reference** | |
| **City** | HOUSTON | **Grantor** | |
| **Mailing State** | TX Zip 77219 | **Sale Price** | 0 |
| **ParcelZoning** | | **Land Area** | 0.350 acres |

## Current Property Assessment

| Card 1 Value | Building Value | Xtra Features Value | Land Value | Total Value |
|---|---|---|---|---|
| | 226,200 | 0 | 53,500 | 279,700 |

## Building Description

| | | |
|---|---|---|
| **Building Style** FUNERAL HM | **Foundation Type** MASONRY | **Flooring Type** CARPET |
| **# of Living Units** 2 | **Frame Type** WOOD | **Basement Floor** CONCRETE |
| **Year Built** 1900 | **Roof Structure** GABLE | **Heating Type** FORCED H/W |
| **Building Grade** AVERAGE | **Roof Cover** METAL | **Heating Fuel** OIL |
| **Building Condition** Avg-Good | **Siding** VINYL | **Air Conditioning** 0% |
| **Finished Area (SF)** 3216.5 | **Interior Walls** PLY PANEL | **# of Bsmt Garages** 0 |
| **Number Rooms** 4 | **# of Bedrooms** 2 | **# of Full Baths** 1 |
| **# of 3/4 Baths** 0 | **# of 1/2 Baths** 1 | **# of Other Fixtures** 0 |

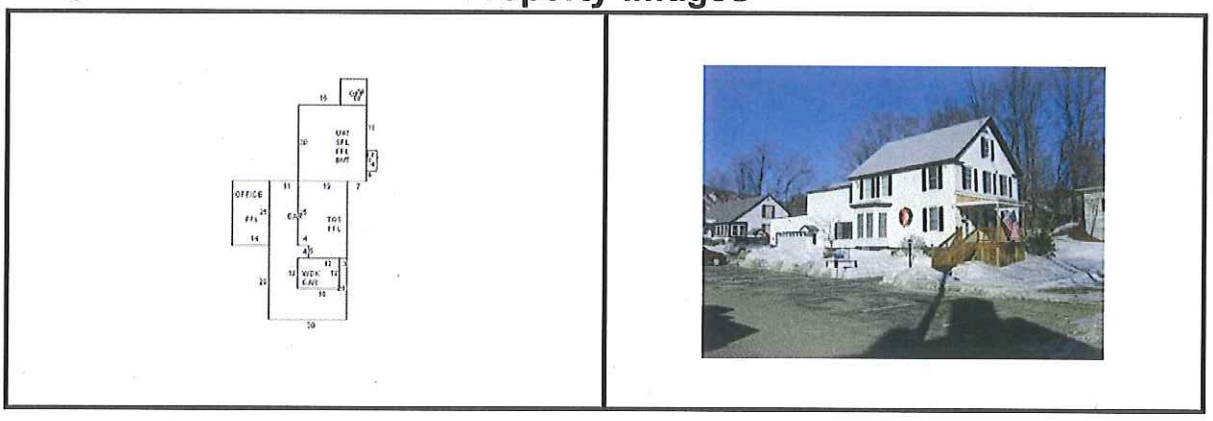
## Legal Description

MEADOW STREET 12 COMMERCIAL

## Narrative Description of Property

This property contains 0.350 acres of land mainly classified as COMMERCIAL with a(n) FUNERAL HM style building, built about 1900 , having VINYL exterior and METAL roof cover, with 2 unit(s), 4 room(s), 2 bedroom(s), 1 bath(s), 1 half bath(s).

## Property Images



# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230516-000 | **Account Number** | 363-112-11516 |
| **Prior Parcel ID** | -- | | |
| **Property Owner** | BUSWELL JAMES S | **Property Location** | 10 MEADOW STREET |
| | | **Property Use** | VACN 1 |
| **Mailing Address** | PO BOX 19 | **Most Recent Sale Date** | 11/15/2007 |
| | | **Legal Reference** | 317-423 |
| **City** | LUDLOW | **Grantor** | KENNEDY,MATTHEW J |
| **Mailing State** | VT Zip 05149 | **Sale Price** | 150,000 |
| **ParcelZoning** | | **Land Area** | 0.190 acres |

## Current Property Assessment

| Card 1 Value | Building Value | Xtra Features Value | Land Value | Total Value |
|---|---|---|---|---|
| | 103,800 | 0 | 50,300 | 154,100 |

## Building Description

| | | | | | |
|---|---|---|---|---|---|
| **Building Style** | CONVENTNL | **Foundation Type** | CONC BLOCK | **Flooring Type** | HARDWOOD |
| **# of Living Units** | 1 | **Frame Type** | WOOD | **Basement Floor** | EARTH |
| **Year Built** | 1900 | **Roof Structure** | GABLE | **Heating Type** | FORCED H/W |
| **Building Grade** | AVERAGE | **Roof Cover** | ASPHALT SH | **Heating Fuel** | OIL |
| **Building Condition** | Average | **Siding** | ALUMINUM | **Air Conditioning** | 0% |
| **Finished Area (SF)** | 1581.60004 | **Interior Walls** | PLASTER | **# of Bsmt Garages** | 0 |
| **Number Rooms** | 7 | **# of Bedrooms** | 3 | **# of Full Baths** | 1 |
| **# of 3/4 Baths** | 1 | **# of 1/2 Baths** | 0 | **# of Other Fixtures** | 0 |

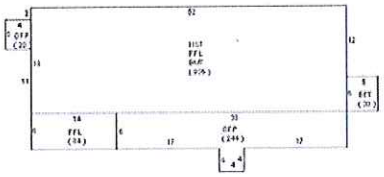
## Legal Description

MEADOW STREET 10

## Narrative Description of Property

This property contains 0.190 acres of land mainly classified as VACN 1 with a(n) CONVENTNL style building, built about 1900 , having ALUMINUM exterior and ASPHALT SH roof cover, with 1 unit(s), 7 room(s), 3 bedroom(s), 1 bath(s), 0 half bath(s).

## Property Images



# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230514-000 | **Account Number** | 363-112-13335 |
| **Prior Parcel ID** | -- | | |
| **Property Owner** | WILKINS DORIS<br>WILKINS MILDRED | **Property Location** | 9 MEADOW STREET |
| | | **Property Use** | RESD 1 |
| **Mailing Address** | 9 MEADOW STREET | **Most Recent Sale Date** | |
| | | **Legal Reference** | |
| **City** | LUDLOW | **Grantor** | |
| **Mailing State** | VT Zip 05149 | **Sale Price** | 0 |
| **ParcelZoning** | | **Land Area** | 0.770 acres |

## Current Property Assessment

| Card 1 Value | Building Value | Xtra Features Value | Land Value | Total Value |
|---|---|---|---|---|
| | 71,800 | 400 | 61,900 | 134,100 |

## Building Description

| | | |
|---|---|---|
| **Building Style** OLD STYLE | **Foundation Type** MASONRY | **Flooring Type** CARPET |
| **# of Living Units** 1 | **Frame Type** WOOD | **Basement Floor** CONCRETE |
| **Year Built** 1910 | **Roof Structure** GABLE | **Heating Type** STEAM |
| **Building Grade** FAIR (+) | **Roof Cover** SLATE | **Heating Fuel** OIL |
| **Building Condition** Fair-Avg | **Siding** ASPHALT | **Air Conditioning** 0% |
| **Finished Area (SF)** 1680.70001 | **Interior Walls** PLASTER | **# of Bsmt Garages** 0 |
| **Number Rooms** 7 | **# of Bedrooms** 4 | **# of Full Baths** 1 |
| **# of 3/4 Baths** 0 | **# of 1/2 Baths** 0 | **# of Other Fixtures** 0 |

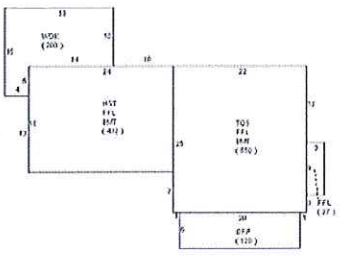
## Legal Description

MEADOW STREET 9

## Narrative Description of Property

This property contains 0.770 acres of land mainly classified as RESD 1 with a(n) OLD STYLE style building, built about 1910 , having ASPHALT exterior and SLATE roof cover, with 1 unit(s), 7 room(s), 4 bedroom(s), 1 bath(s), 0 half bath(s).

## Property Images



# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| Parcel ID | 230512-000 | Account Number | 363-112-10518 |
| Prior Parcel ID | -- | | |
| Property Owner | CIUFO SALVATORE<br>CIUFO JOAN | Property Location | 8 MEADOW STREET |
| | | Property Use | RESD 1 |
| Mailing Address | 8 MEADOW STREET | Most Recent Sale Date | |
| | | Legal Reference | |
| City | LUDLOW | Grantor | |
| Mailing State | VT Zip 05149 | Sale Price | 0 |
| ParcelZoning | | Land Area | 0.430 acres |

## Current Property Assessment

| Card 1 Value | Building Value | Xtra Features Value | Land Value | Total Value |
|---|---|---|---|---|
| | 161,600 | 4,600 | 55,100 | 221,300 |

## Building Description

| | | |
|---|---|---|
| Building Style COLONIAL | Foundation Type MASONRY | Flooring Type CARPET |
| # of Living Units 1 | Frame Type WOOD | Basement Floor CONCRETE |
| Year Built 1900 | Roof Structure GAMBREL | Heating Type FORCED H/W |
| Building Grade AVG. (+) | Roof Cover ASPHALT SH | Heating Fuel OIL |
| Building Condition Avg-Good | Siding VINYL | Air Conditioning 0% |
| Finished Area (SF) 1716 | Interior Walls PLASTER | # of Bsmt Garages 0 |
| Number Rooms 6 | # of Bedrooms 2 | # of Full Baths 1 |
| # of 3/4 Baths 0 | # of 1/2 Baths 0 | # of Other Fixtures 0 |

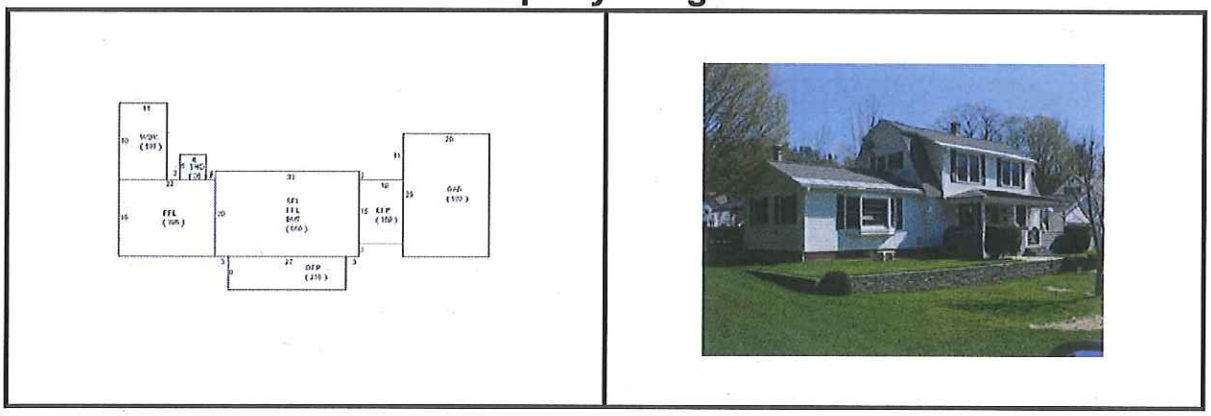
## Legal Description

MEADOW STREET 8 ONE FAMILY 230515.100 230517.000

## Narrative Description of Property

This property contains 0.430 acres of land mainly classified as RESD 1 with a(n) COLONIAL style building, built about 1900 , having VINYL exterior and ASPHALT SH roof cover, with 1 unit(s), 6 room(s), 2 bedroom(s), 1 bath(s), 0 half bath(s).

## Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranteed.

# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230240-000 | **Account Number** | 363-112-12991 |
| **Prior Parcel ID** | -- | | |
| **Property Owner** | STRYHAS P BRUCE | **Property Location** | 8 COMMONWEALTH AVENUE |
| | | **Property Use** | RESD 1 |
| **Mailing Address** | 9 DEPOT STREET | **Most Recent Sale Date** | |
| | | **Legal Reference** | |
| **City** | LUDLOW | **Grantor** | |
| **Mailing State** | VT Zip 05149 | **Sale Price** | 0 |
| **ParcelZoning** | | **Land Area** | 0.280 acres |

## Current Property Assessment

| Card 1 Value | Building Value | Xtra Features Value | Land Value | Total Value |
|---|---|---|---|---|
| | 106,100 | 0 | 52,100 | 158,200 |

## Building Description

| | | |
|---|---|---|
| **Building Style** MULTI-CONV | **Foundation Type** CONCRETE | **Flooring Type** CARPET |
| **# of Living Units** 2 | **Frame Type** WOOD | **Basement Floor** CONCRETE |
| **Year Built** 1900 | **Roof Structure** GABLE | **Heating Type** FORCED H/A |
| **Building Grade** AVG. (-) | **Roof Cover** METAL | **Heating Fuel** OIL |
| **Building Condition** Average | **Siding** CLAPBOARD | **Air Conditioning** 0% |
| **Finished Area (SF)** 1961 | **Interior Walls** PLASTER | **# of Bsmt Garages** 0 |
| **Number Rooms** 6 | **# of Bedrooms** 4 | **# of Full Baths** 2 |
| **# of 3/4 Baths** 0 | **# of 1/2 Baths** 0 | **# of Other Fixtures** 0 |

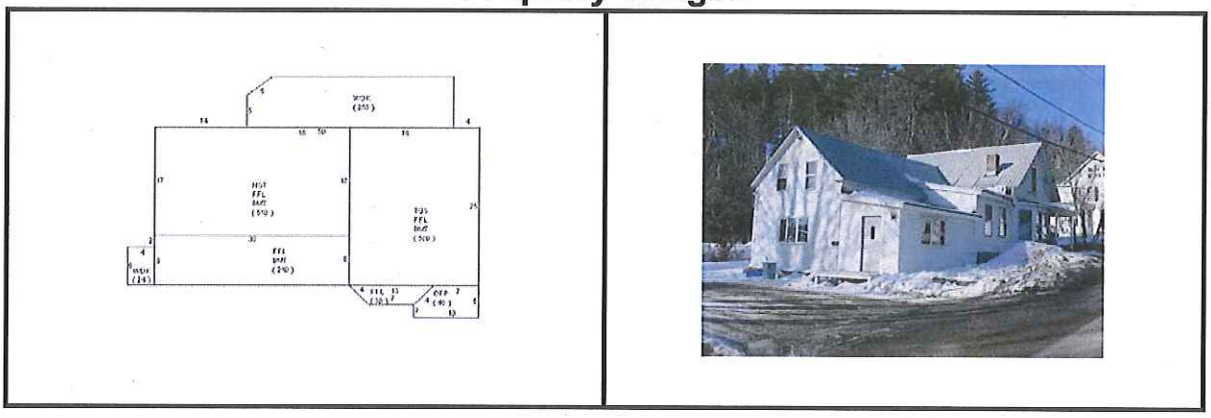
## Legal Description

COMMONWEALTH AVE 8

## Narrative Description of Property

This property contains 0.280 acres of land mainly classified as RESD 1 with a(n) MULTI-CONV style building, built about 1900 , having CLAPBOARD exterior and METAL roof cover, with 2 unit(s), 6 room(s), 4 bedroom(s), 2 bath(s), 0 half bath(s).

## Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranteed.

# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| Parcel ID | 230513-000 | Account Number | 363-112-11923 |
| Prior Parcel ID | -- | | |
| Property Owner | MARTIN MARYBETH<br>MARTIN BARRY | Property Location | 7 MEADOW STREET |
| | | Property Use | RESD 1 |
| Mailing Address | 7 MEADOW STREET | Most Recent Sale Date | 3/18/2002 |
| | | Legal Reference | 214/1 |
| City | LUDLOW | Grantor | |
| Mailing State | VT Zip 05149 | Sale Price | 120,000 |
| ParcelZoning | | Land Area | 0.420 acres |

## Current Property Assessment

| Card 1 Value | Building Value | Xtra Features Value | Land Value | Total Value |
|---|---|---|---|---|
| | 118,200 | 0 | 54,900 | 173,100 |

## Building Description

| | | |
|---|---|---|
| Building Style OLD STYLE | Foundation Type MASONRY | Flooring Type SOFTWOOD |
| # of Living Units 1 | Frame Type WOOD | Basement Floor EARTH |
| Year Built 1900 | Roof Structure GABLE | Heating Type FORCED H/W |
| Building Grade AVERAGE | Roof Cover SLATE | Heating Fuel OIL |
| Building Condition Average | Siding VINYL | Air Conditioning 0% |
| Finished Area (SF) 1697 | Interior Walls PLASTER | # of Bsmt Garages 0 |
| Number Rooms 7 | # of Bedrooms 3 | # of Full Baths 1 |
| # of 3/4 Baths 0 | # of 1/2 Baths 0 | # of Other Fixtures 0 |

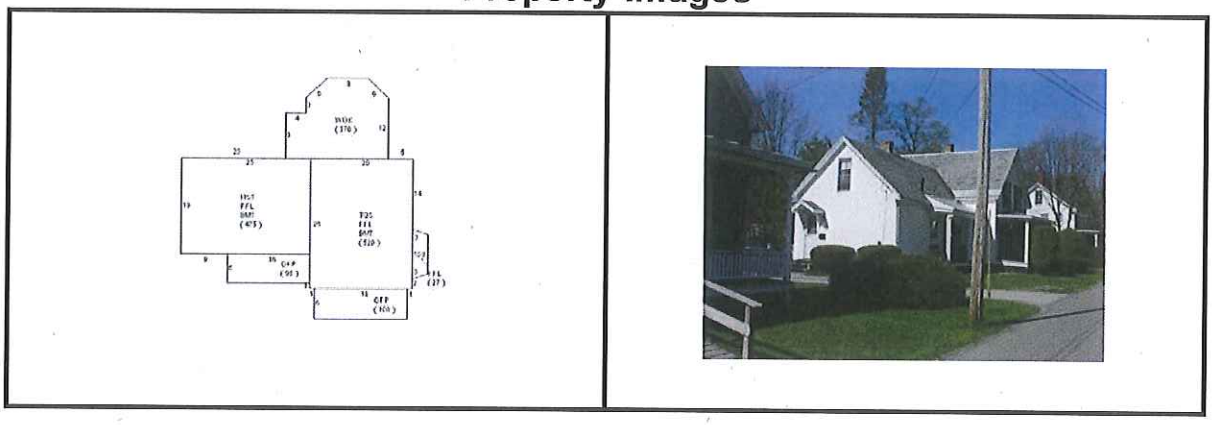
## Legal Description

MEADOW STREET 7

## Narrative Description of Property

This property contains 0.420 acres of land mainly classified as RESD 1 with a(n) OLD STYLE style building, built about 1900 , having VINYL exterior and SLATE roof cover, with 1 unit(s), 7 room(s), 3 bedroom(s), 1 bath(s), 0 half bath(s).

## Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranteed.

# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| Parcel ID | 230529-000 | Account Number | 363-112-13364 |
| Prior Parcel ID | -- | | |
| Property Owner | WINDSOR COUNTY YOUTH SERVICES | Property Location | 6 MILL STREET |
| | | Property Use | COMMERCIAL |
| Mailing Address | 6 MILL STREET | Most Recent Sale Date | 10/10/2001 |
| | | Legal Reference | 210/178 |
| City | LUDLOW | Grantor | |
| Mailing State | VT Zip 05149 | Sale Price | 0 |
| ParcelZoning | | Land Area | 0.260 acres |

## Current Property Assessment

| Card 1 Value | Building Value | Xtra Features Value | Land Value | Total Value |
|---|---|---|---|---|
| | 110,800 | 0 | 43,600 | 154,400 |

## Building Description

| | | | | | |
|---|---|---|---|---|---|
| Building Style | OLD STYLE | Foundation Type | MASONRY | Flooring Type | HARDWOOD |
| # of Living Units | 1 | Frame Type | WOOD | Basement Floor | CONCRETE |
| Year Built | 1900 | Roof Structure | GABLE | Heating Type | FORCED H/W |
| Building Grade | AVERAGE | Roof Cover | ASPHALT SH | Heating Fuel | OIL |
| Building Condition | Fair | Siding | VINYL | Air Conditioning | 0% |
| Finished Area (SF) | 2373 | Interior Walls | DRYWALL | # of Bsmt Garages | 0 |
| Number Rooms | 0 | # of Bedrooms | 0 | # of Full Baths | 1 |
| # of 3/4 Baths | 0 | # of 1/2 Baths | 0 | # of Other Fixtures | 0 |

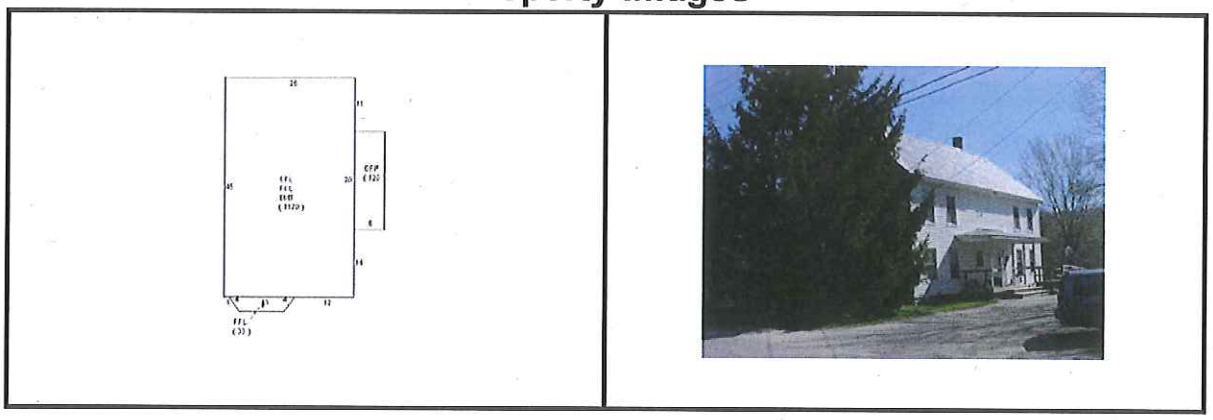
## Legal Description

MILL STREET 6

## Narrative Description of Property

This property contains 0.260 acres of land mainly classified as COMMERCIAL with a(n) OLD STYLE style building, built about 1900 , having VINYL exterior and ASPHALT SH roof cover, with 1 unit(s), 0 room(s), 0 bedroom(s), 1 bath(s), 0 half bath(s).

## Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranteed.

# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230241-000 | **Account Number** | 363-112-12051 |
| **Prior Parcel ID** | -- | | |
| **Property Owner** | MIELE FLOYD<br>MIELE FAITH | **Property Location** | 6 COMMONWEALTH AVENUE |
| | | **Property Use** | RESD 1 |
| **Mailing Address** | 6 COMMONWEALTH AVENUE | **Most Recent Sale Date** | 8/24/2010 |
| | | **Legal Reference** | 343-172 |
| **City** | LUDLOW | **Grantor** | MIELE,FLOYD R |
| **Mailing State** | VT Zip 05149 | **Sale Price** | 0 |
| **ParcelZoning** | | **Land Area** | 0.160 acres |

## Current Property Assessment

| Card 1 Value | Building Value | Xtra Features Value | Land Value | Total Value |
|---|---|---|---|---|
| | 87,200 | 0 | 49,700 | 136,900 |

## Building Description

| | | | | | |
|---|---|---|---|---|---|
| **Building Style** | OLD STYLE | **Foundation Type** | CONCRETE | **Flooring Type** | HARDWOOD |
| **# of Living Units** | 1 | **Frame Type** | WOOD | **Basement Floor** | CONCRETE |
| **Year Built** | 1900 | **Roof Structure** | GABLE | **Heating Type** | FORCED H/W |
| **Building Grade** | AVERAGE | **Roof Cover** | METAL | **Heating Fuel** | OIL |
| **Building Condition** | Average | **Siding** | CLAPBOARD | **Air Conditioning** | 0% |
| **Finished Area (SF)** | 1100.75 | **Interior Walls** | DRYWALL | **# of Bsmt Garages** | 0 |
| **Number Rooms** | 6 | **# of Bedrooms** | 3 | **# of Full Baths** | 2 |
| **# of 3/4 Baths** | 0 | **# of 1/2 Baths** | 0 | **# of Other Fixtures** | 0 |

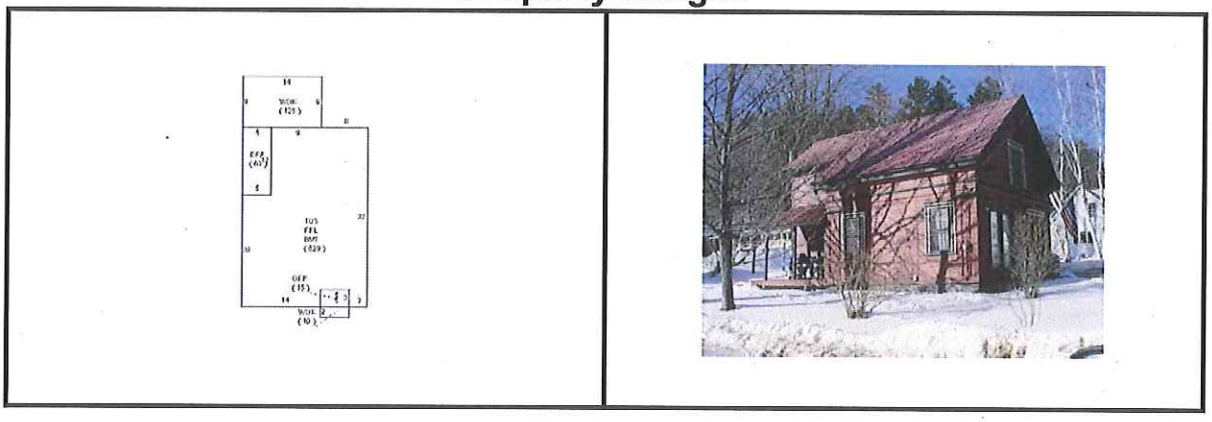
## Legal Description

COMMONWEALTH AVE 6

## Narrative Description of Property

This property contains 0.160 acres of land mainly classified as RESD 1 with a(n) OLD STYLE style building, built about 1900 , having CLAPBOARD exterior and METAL roof cover, with 1 unit(s), 6 room(s), 3 bedroom(s), 2 bath(s), 0 half bath(s).

## Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranteed.

# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| Parcel ID | 230506-000 | Account Number | 363-112-10848 |
| Prior Parcel ID | -- | | |
| Property Owner | ELLISON FRANK P<br>ELLISON JOYCE D | Property Location | 5 MEADOW STREET |
| | | Property Use | RESD 1 |
| Mailing Address | 5 MEADOW STREET | Most Recent Sale Date | |
| | | Legal Reference | |
| City | LUDLOW | Grantor | |
| Mailing State | VT Zip 05149 | Sale Price | 0 |
| ParcelZoning | | Land Area | 1.320 acres |

## Current Property Assessment

| | | | | |
|---|---|---|---|---|
| Card 1 Value | Building Value 126,000 | Xtra Features Value 2,400 | Land Value 67,600 | Total Value 196,000 |
| Total Parcel Value | Building Value 192,600 | Xtra Features Value 2,400 | Land Value 67,600 | Total Value 262,600 |

## Building Description

| | | |
|---|---|---|
| Building Style COLONIAL | Foundation Type MASONRY | Flooring Type CARPET |
| # of Living Units 1 | Frame Type WOOD | Basement Floor CONCRETE |
| Year Built 1860 | Roof Structure GABLE | Heating Type STEAM |
| Building Grade AVERAGE | Roof Cover SLATE | Heating Fuel OIL |
| Building Condition Fair-Avg | Siding VINYL | Air Conditioning 0% |
| Finished Area (SF) 2004 | Interior Walls PLASTER | # of Bsmt Garages 0 |
| Number Rooms 9 | # of Bedrooms 4 | # of Full Baths 1 |
| # of 3/4 Baths 1 | # of 1/2 Baths 0 | # of Other Fixtures 0 |

## Legal Description

MEADOW STREET 5 ONE FAMILY

## Narrative Description of Property

This property contains 1.320 acres of land mainly classified as RESD 1 with a(n) COLONIAL style building, built about 1860 , having VINYL exterior and SLATE roof cover, with 1 unit(s), 9 room(s), 4 bedroom(s), 1 bath(s), 0 half bath(s).

## Property Images

Disclaimer: This information is believed to be correct but is subject to change and is not warranteed.

# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230509-000 | **Account Number** | 363-112-10531 |
| **Prior Parcel ID** | -- | | |
| **Property Owner** | CLOUART LOUISE<br>KOWALSKI RANDY | **Property Location** | 4 MEADOW STREET |
| | | **Property Use** | RESD 1 |
| **Mailing Address** | 4 MEADOW STREET | **Most Recent Sale Date** | 2/12/2001 |
| | | **Legal Reference** | 199/175 |
| **City** | LUDLOW | **Grantor** | |
| **Mailing State** | VT Zip 05149 | **Sale Price** | 128,000 |
| **ParcelZoning** | | **Land Area** | 0.370 acres |

## Current Property Assessment

| Card 1 Value | Building Value | Xtra Features Value | Land Value | Total Value |
|---|---|---|---|---|
| | 95,900 | 0 | 56,800 | 152,700 |

## Building Description

| | | |
|---|---|---|
| **Building Style** RANCH | **Foundation Type** MASONRY | **Flooring Type** HARDWOOD |
| **# of Living Units** 1 | **Frame Type** WOOD | **Basement Floor** CONCRETE |
| **Year Built** 1948 | **Roof Structure** GABLE | **Heating Type** FORCED H/W |
| **Building Grade** AVERAGE | **Roof Cover** STDG SEAM | **Heating Fuel** OIL |
| **Building Condition** Average | **Siding** WOOD | **Air Conditioning** 0% |
| **Finished Area (SF)** 1438 | **Interior Walls** DRYWALL | **# of Bsmt Garages** 1 |
| **Number Rooms** 0 | **# of Bedrooms** 0 | **# of Full Baths** 2 |
| **# of 3/4 Baths** 0 | **# of 1/2 Baths** 0 | **# of Other Fixtures** 0 |

## Legal Description

MEADOW STREET 4 ONE FAMILY

## Narrative Description of Property

This property contains 0.370 acres of land mainly classified as RESD 1 with a(n) RANCH style building, built about 1948 , having WOOD exterior and STDG SEAM roof cover, with 1 unit(s), 0 room(s), 0 bedroom(s), 2 bath(s), 0 half bath(s).

## Property Images

Disclaimer: This information is believed to be correct but is subject to change and is not warranteed.

# Unofficial Property Record Card - Ludlow, VT

## General Property Data

| | | | |
|---|---|---|---|
| **Parcel ID** | 230237-000 | **Account Number** | 363-112-13045 |
| **Prior Parcel ID** | -- | | |
| **Property Owner** | TAVOULARIS ARLENE<br>MIELE DONALD S | **Property Location** | 3 COMMONWEALTH AVENUE |
| | | **Property Use** | RESD 1 |
| **Mailing Address** | 7106 TERRY LANE | **Most Recent Sale Date** | |
| | | **Legal Reference** | |
| **City** | FALLS CHURCH | **Grantor** | |
| **Mailing State** | VA **Zip** 22042 | **Sale Price** | 0 |
| **ParcelZoning** | | **Land Area** | 0.070 acres |

## Current Property Assessment

| Card 1 Value | Building Value | Xtra Features Value | Land Value | Total Value |
|---|---|---|---|---|
| | 49,500 | 0 | 50,500 | 100,000 |

## Building Description

| | | | | | |
|---|---|---|---|---|---|
| **Building Style** | OLD STYLE | **Foundation Type** | CRAWL | **Flooring Type** | HARDWOOD |
| **# of Living Units** | 1 | **Frame Type** | WOOD | **Basement Floor** | CONCRETE |
| **Year Built** | 1910 | **Roof Structure** | GABLE | **Heating Type** | UNIT HTRS |
| **Building Grade** | AVERAGE | **Roof Cover** | ASPHALT SH | **Heating Fuel** | OIL |
| **Building Condition** | Fair | **Siding** | CLAPBOARD | **Air Conditioning** | 0% |
| **Finished Area (SF)** | 1300 | **Interior Walls** | PLY PANEL | **# of Bsmt Garages** | 0 |
| **Number Rooms** | 6 | **# of Bedrooms** | 3 | **# of Full Baths** | 1 |
| **# of 3/4 Baths** | 0 | **# of 1/2 Baths** | 0 | **# of Other Fixtures** | 0 |

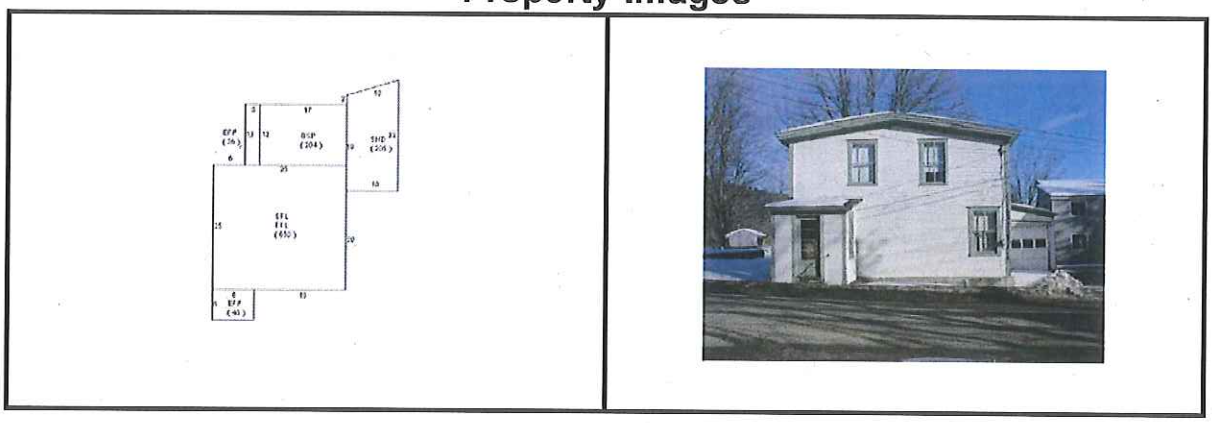
## Legal Description

COMMONWEALTH AVE 3

## Narrative Description of Property

This property contains 0.070 acres of land mainly classified as RESD 1 with a(n) OLD STYLE style building, built about 1910 , having CLAPBOARD exterior and ASPHALT SH roof cover, with 1 unit(s), 6 room(s), 3 bedroom(s), 1 bath(s), 0 half bath(s).

## Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranteed.

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Project Summary:**

Project Number: Disaster #:

Program: PDM Agency:

Analyst: Jeff Ward

Point of Contact: Jeff Ward Phone Number:

Address: Virginia

Email:

Comments:

**Structure Summary For:**

10 Meadow Street, 10 Meadow Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $0 Costs: $0 BCR: 0.00

12 Meadow Street, 12 Meadow Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $0 Costs: $0 BCR: 0.00

12 Mill Street, 12 Mill Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $32,036 Costs: $0 BCR: 0.00

| Mitigation | Hazard | BCR | Benefits | Costs |
|---|---|---|---|---|
| Drainage Improvement | Flood | 0.00 | $32,036 | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

15 Meadow Street, 15 Meadow Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $2,108 Costs: $0 BCR: 0.00

| Mitigation | Hazard | BCR | Benefits | Costs |
|---|---|---|---|---|
| Drainage Improvement | Flood | 0.00 | $2,108 | $0 |

16 Meadow Street, 16 Meadow Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $0 Costs: $0 BCR: 0.00

17 Meadow Street, 17 Meadow Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $4,842 Costs: $0 BCR: 0.00

| Mitigation | Hazard | BCR | Benefits | Costs |
|---|---|---|---|---|
| Drainage Improvement | Flood | 0.00 | $4,842 | $0 |

18 Meadow Street, 18 Meadow Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $18,030 Costs: $0 BCR: 0.00

| Mitigation | Hazard | BCR | Benefits | Costs |
|---|---|---|---|---|
| Drainage Improvement | Flood | 0.00 | $18,030 | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

18 Mill Street, 18 Mill Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $548,720 Costs: $0 BCR: 0.00

| Mitigation | Hazard | BCR | Benefits | Costs |
|---|---|---|---|---|
| Drainage Improvement | Flood | 0.00 | $548,720 | $0 |

21 Meadow Street, 21 Meadow Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $14,631 Costs: $0 BCR: 0.00

| Mitigation | Hazard | BCR | Benefits | Costs |
|---|---|---|---|---|
| Drainage Improvement | Flood | 0.00 | $14,631 | $0 |

3 Commonwealth Ave, 3 Commonwealth Ave, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $28,484 Costs: $1,090,000 BCR: 0.03

| Mitigation | Hazard | BCR | Benefits | Costs |
|---|---|---|---|---|
| Drainage Improvement | Flood | 0.03 | $28,484 | $1,090,000 |

4 Meadow Street, 4 Meadow Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $0 Costs: $0 BCR: 0.00

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

5 Meadow Street, 5 Meadow Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $0 Costs: $0 BCR: 0.00

6 Commonwealth Ave, 6 Commonwealth Ave, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $205,807 Costs: $0 BCR: 0.00

| Mitigation | Hazard | BCR | Benefits | Costs |
|---|---|---|---|---|
| Drainage Improvement | Flood | 0.00 | $205,807 | $0 |

6 Mill Street, 6 Mill Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $4,705 Costs: $0 BCR: 0.00

| Mitigation | Hazard | BCR | Benefits | Costs |
|---|---|---|---|---|
| Drainage Improvement | Flood | 0.00 | $4,705 | $0 |

66 Main Street, 66 Main Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $70,981 Costs: $0 BCR: 0.00

| Mitigation | Hazard | BCR | Benefits | Costs |
|---|---|---|---|---|
| Drainage Improvement | Flood | 0.00 | $70,981 | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

68 Main Street, 68 Main Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $0 Costs: $0 BCR: 0.00

7 Meadow Street, 7 Meadow Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $0 Costs: $0 BCR: 0.00

70 Main Street, 70 Main Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $0 Costs: $0 BCR: 0.00

72 Main Street, 72 Main Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $60,677 Costs: $0 BCR: 0.00

| Mitigation | Hazard | BCR | Benefits | Costs |
|---|---|---|---|---|
| Drainage Improvement | Flood | 0.00 | $60,677 | $0 |

74 Main Street, 74 Main Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $94,246 Costs: $0 BCR: 0.00

| Mitigation | Hazard | BCR | Benefits | Costs |
|---|---|---|---|---|
| Drainage Improvement | Flood | 0.00 | $94,246 | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

76 Main Street, 76 Main Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $126,221 Costs: $0 BCR: 0.00

| Mitigation | Hazard | BCR | Benefits | Costs |
|---|---|---|---|---|
| Drainage Improvement | Flood | 0.00 | $126,221 | $0 |

8 Commonwealth Ave, 8 Commonwealth Ave, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $0 Costs: $0 BCR: 0.00

8 Meadow Street, 8 Meadow Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $0 Costs: $0 BCR: 0.00

81 Main Street, 81 Main Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $0 Costs: $0 BCR: 0.00

86 Main Street, 86 Main Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $0 Costs: $0 BCR: 0.00

| Mitigation | Hazard | BCR | Benefits | Costs |
|---|---|---|---|---|
| Drainage Improvement | Flood | 0.00 | $0 | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

88 Main Street, 88 Main Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $0 Costs: $0 BCR: 0.00

| Mitigation | Hazard | BCR | Benefits | Costs |
|---|---|---|---|---|
| Drainage Improvement | Flood | 0.00 | $0 | $0 |

9 Meadow Street, 9 Meadow Street, Ludlow, Vermont, 05149, Windsor

Structure Type: Building Historic Building: No Contact: Jeff Ward

Benefits: $0 Costs: $0 BCR: 0.00

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Structure and Mitigation Details For:** 12 Mill Street, 12 Mill Street, Ludlow, Vermont, 05149, Windsor

Benefits: $32,036 Costs: $ BCR: .00

---

Hazard: **Flood**

Mitigation Option: Drainage Improvement

| | | | | | |
|---|---|---|---|---|---|
| Latitude: | | Longitude: | | | |
| Size of Building: | 4,784 | BRV ($/sf): | $62.67 | Total BRV: | $299,813 |
| Residential: | Yes | Building Type: | Two or More Stories | | |
| Obstruction: | N/A | Foundation Type: | Slab | Basement: | Yes |
| Building Primary Use: | | Structure Type: | | Historic Building: | No |
| Structure Elevation: | 987.50 | First Floor Being Raised: | | Demolition Threshold: | 50.00% |
| Source of Flood Data: | HH | Project in SFHA: | Unknown | Community ID Number: | |
| Effective FIS Date: | | FIRM Panel Number: | | FIRM Effective Date: | |
| Project Useful Life: | 50 | H&H Study Title: | | H&H Effective Date: | 01/01/1900 |
| Flood Zone: | | | | | |
| Building Contents: | $299,813 (Default) | Loss of Rent: | $0 | Displacement Costs: | $6,889 (Default) |
| Ground Surface Elevation: | | | | One Time Displacement Costs: | $0 |
| Breaking wave height: | | | | Value of Crawlspace Contents: | $0 |
| Height FFE above grade: | 987.50 | | | Flood Zone Determination: | |
| | | | | Utilities that are not elevated: | No |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Riverine Elevation and Discharge Data

Streambed Elevation (ft): 978.0 Flood Profile Number:

Flood Source Name:

Elevation At Which Barrier Will Be Overtopped:

FEMA Elevation Certificate Diagram Description: Diagram 1A Other Elevation Source:

| Recurrence Interval (yr) | Percent Annual Chance (%) | Elevation Before Mitigation (ft) | Discharge Before Mitigation (cfs) | Elevation After Mitigation (ft) | Discharge After Mitigation (cfs) |
|---|---|---|---|---|---|
| 10 | 10.00% | 983.30 | 73.0 | 978.20 | 73.0 |
| 50 | 2.00% | 988.00 | 115.0 | 982.90 | 115.0 |
| 100 | 1.00% | 988.00 | 134.0 | 982.90 | 134.0 |
| 500 | 0.20% | 988.40 | 150.0 | 983.30 | 150.0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Building | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 10.2% | 0.0% | $30,581 | 10.2% | 0.0% | $30,581 |
| -1.0 | 13.9% | 0.0% | $41,674 | 13.9% | 0.0% | $41,674 |
| 0.0 | 17.9% | 0.0% | $53,667 | 17.9% | 0.0% | $53,667 |
| 1.0 | 22.3% | 0.0% | $66,858 | 22.3% | 0.0% | $66,858 |
| 2.0 | 27.0% | 0.0% | $80,950 | 27.0% | 0.0% | $80,950 |
| 3.0 | 31.9% | 0.0% | $95,640 | 31.9% | 0.0% | $95,640 |
| 4.0 | 36.9% | 0.0% | $110,631 | 36.9% | 0.0% | $110,631 |
| 5.0 | 41.9% | 0.0% | $125,622 | 41.9% | 0.0% | $125,622 |
| 6.0 | 46.9% | 0.0% | $140,612 | 46.9% | 0.0% | $140,612 |
| 7.0 | 51.8% | 0.0% | $299,813 | 51.8% | 0.0% | $299,813 |
| 8.0 | 56.4% | 0.0% | $299,813 | 56.4% | 0.0% | $299,813 |
| 9.0 | 60.8% | 0.0% | $299,813 | 60.8% | 0.0% | $299,813 |
| 10.0 | 64.8% | 0.0% | $299,813 | 64.8% | 0.0% | $299,813 |
| 11.0 | 68.4% | 0.0% | $299,813 | 68.4% | 0.0% | $299,813 |
| 12.0 | 71.4% | 0.0% | $299,813 | 71.4% | 0.0% | $299,813 |
| 13.0 | 73.7% | 0.0% | $299,813 | 73.7% | 0.0% | $299,813 |
| 14.0 | 75.4% | 0.0% | $299,813 | 75.4% | 0.0% | $299,813 |
| 15.0 | 76.4% | 0.0% | $299,813 | 76.4% | 0.0% | $299,813 |
| 16.0 | 76.4% | 0.0% | $299,813 | 76.4% | 0.0% | $299,813 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Contents | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 8.4% | 0.0% | $25,184 | 8.4% | 0.0% | $25,184 |
| -1.0 | 10.1% | 0.0% | $30,281 | 10.1% | 0.0% | $30,281 |
| 0.0 | 11.9% | 0.0% | $35,678 | 11.9% | 0.0% | $35,678 |
| 1.0 | 13.8% | 0.0% | $41,374 | 13.8% | 0.0% | $41,374 |
| 2.0 | 15.7% | 0.0% | $47,071 | 15.7% | 0.0% | $47,071 |
| 3.0 | 17.7% | 0.0% | $53,067 | 17.7% | 0.0% | $53,067 |
| 4.0 | 19.8% | 0.0% | $59,363 | 19.8% | 0.0% | $59,363 |
| 5.0 | 22.0% | 0.0% | $65,959 | 22.0% | 0.0% | $65,959 |
| 6.0 | 24.3% | 0.0% | $72,855 | 24.3% | 0.0% | $72,855 |
| 7.0 | 26.7% | 0.0% | $80,050 | 26.7% | 0.0% | $80,050 |
| 8.0 | 29.1% | 0.0% | $87,246 | 29.1% | 0.0% | $87,246 |
| 9.0 | 31.7% | 0.0% | $95,041 | 31.7% | 0.0% | $95,041 |
| 10.0 | 34.4% | 0.0% | $103,136 | 34.4% | 0.0% | $103,136 |
| 11.0 | 37.2% | 0.0% | $111,531 | 37.2% | 0.0% | $111,531 |
| 12.0 | 40.0% | 0.0% | $119,925 | 40.0% | 0.0% | $119,925 |
| 13.0 | 43.0% | 0.0% | $128,920 | 43.0% | 0.0% | $128,920 |
| 14.0 | 46.1% | 0.0% | $138,214 | 46.1% | 0.0% | $138,214 |
| 15.0 | 49.3% | 0.0% | $147,808 | 49.3% | 0.0% | $147,808 |
| 16.0 | 52.6% | 0.0% | $157,702 | 52.6% | 0.0% | $157,702 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Displacement | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $10,192 | 45.0 | | $10,192 |
| 2.0 | 90.0 | | $20,384 | 90.0 | | $20,384 |
| 3.0 | 135.0 | | $30,576 | 135.0 | | $30,576 |
| 4.0 | 180.0 | | $40,768 | 180.0 | | $40,768 |
| 5.0 | 225.0 | | $50,959 | 225.0 | | $50,959 |
| 6.0 | 270.0 | | $61,151 | 270.0 | | $61,151 |
| 7.0 | 315.0 | | $71,343 | 315.0 | | $71,343 |
| 8.0 | 360.0 | | $81,535 | 360.0 | | $81,535 |
| 9.0 | 405.0 | | $91,727 | 405.0 | | $91,727 |
| 10.0 | 450.0 | | $101,919 | 450.0 | | $101,919 |
| 11.0 | 495.0 | | $112,111 | 495.0 | | $112,111 |
| 12.0 | 540.0 | | $122,303 | 540.0 | | $122,303 |
| 13.0 | 585.0 | | $132,495 | 585.0 | | $132,495 |
| 14.0 | 630.0 | | $142,686 | 630.0 | | $142,686 |
| 15.0 | 675.0 | | $152,878 | 675.0 | | $152,878 |
| 16.0 | 720.0 | | $163,070 | 720.0 | | $163,070 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using USACE Generic**

| **Loss of Function** | **Before Mitigation Values:** | | | **After Mitigation Values:** | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $0 | 45.0 | | $0 |
| 2.0 | 90.0 | | $0 | 90.0 | | $0 |
| 3.0 | 135.0 | | $0 | 135.0 | | $0 |
| 4.0 | 180.0 | | $0 | 180.0 | | $0 |
| 5.0 | 225.0 | | $0 | 225.0 | | $0 |
| 6.0 | 270.0 | | $0 | 270.0 | | $0 |
| 7.0 | 315.0 | | $0 | 315.0 | | $0 |
| 8.0 | 360.0 | | $0 | 360.0 | | $0 |
| 9.0 | 405.0 | | $0 | 405.0 | | $0 |
| 10.0 | 450.0 | | $0 | 450.0 | | $0 |
| 11.0 | 495.0 | | $0 | 495.0 | | $0 |
| 12.0 | 540.0 | | $0 | 540.0 | | $0 |
| 13.0 | 585.0 | | $0 | 585.0 | | $0 |
| 14.0 | 630.0 | | $0 | 630.0 | | $0 |
| 15.0 | 675.0 | | $0 | 675.0 | | $0 |
| 16.0 | 720.0 | | $0 | 720.0 | | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Other Benefits

### Other Benefits Before Mitigation

No Data

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Other Benefits After Mitigation**

No Data

## Summary Of Benefits

| Expected Annual Damages Before Mitigation | | Expected Annual Damages After Mitigation | | Expected Avoided Damages After Mitigation (Benefits) | |
|---|---|---|---|---|---|
| Annual: | $4,322 | Annual: | $2,001 | Annual: | $2,321 |
| Present Value: | $59,649 | Present Value: | $27,613 | Present Value: | $32,036 |

| | | | |
|---|---|---|---|
| Mitigation Benefits: | $32,036 | Mitigation Costs: | $0 |
| Benefits Minus Costs: | $32,036 | Benefit-Cost Ratio: | Infinity |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Cost Estimate

| | | | |
|---|---|---|---|
| Project Useful Life (years): | 50 | Construction Type: | |
| Mitigation Project Cost: | $0 | Detailed Scope of Work: | Yes |
| Annual Project Maintenance Cost: | $0 | Detailed Estimate for Entire Project: | Yes |
| Final Mitigation Project Cost: | $0 | Years of Maintenance: | 50 |
| Cost Basis Year: | | Present Worth of Annual Maintenance Costs: | $0 |
| Construction Start Year: | | Estimate Reflects Current Prices: | Yes |
| Construction End Year: | | Project Escalation: | |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Justification/Attachments

| Field | Description | Attachments |
|---|---|---|

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Structure and Mitigation Details For:** 15 Meadow Street, 15 Meadow Street, Ludlow, Vermont, 05149, Windsor

Benefits: $2,108 Costs: $ BCR: .00

---

Hazard: **Flood**

Mitigation Option: Drainage Improvement

| | | | | | |
|---|---|---|---|---|---|
| Latitude: | | Longitude: | | | |
| Size of Building: | 1,020 | BRV ($/sf): | $81.71 | Total BRV: | $83,344 |
| Residential: | Yes | Building Type: | One-Story | | |
| Obstruction: | N/A | Foundation Type: | Slab | Basement: | Yes |
| Building Primary Use: | | Structure Type: | | Historic Building: | No |
| Structure Elevation: | 989.80 | First Floor Being Raised: | | Demolition Threshold: | 50.00% |
| Source of Flood Data: | HH | Project in SFHA: | Unknown | Community ID Number: | |
| Effective FIS Date: | | FIRM Panel Number: | | FIRM Effective Date: | |
| Project Useful Life: | 50 | H&H Study Title: | | H&H Effective Date: | 01/01/1900 |
| Flood Zone: | | | | | |
| Building Contents: | $83,344 (Default) | Loss of Rent: | $0 | Displacement Costs: | $1,469 (Default) |
| Ground Surface Elevation: | | | | One Time Displacement Costs: | $0 |
| Breaking wave height: | | | | Value of Crawlspace Contents: | $0 |
| Height FFE above grade: | 989.80 | | | Flood Zone Determination: | |
| | | | | Utilities that are not elevated: | No |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Riverine Elevation and Discharge Data

Streambed Elevation (ft): 978.0 Flood Profile Number:

Flood Source Name:

Elevation At Which Barrier Will Be Overtopped:

FEMA Elevation Certificate Diagram Description: Diagram 1A Other Elevation Source:

| Recurrence Interval (yr) | Percent Annual Chance (%) | Elevation Before Mitigation (ft) | Discharge Before Mitigation (cfs) | Elevation After Mitigation (ft) | Discharge After Mitigation (cfs) |
|---|---|---|---|---|---|
| 10 | 10.00% | 983.30 | 73.0 | 978.20 | 73.0 |
| 50 | 2.00% | 988.00 | 115.0 | 982.90 | 115.0 |
| 100 | 1.00% | 988.00 | 134.0 | 982.90 | 134.0 |
| 500 | 0.20% | 988.40 | 150.0 | 983.30 | 150.0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Building | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 13.8% | 0.0% | $11,502 | 13.8% | 0.0% | $11,502 |
| -1.0 | 19.4% | 0.0% | $16,169 | 19.4% | 0.0% | $16,169 |
| 0.0 | 25.5% | 0.0% | $21,253 | 25.5% | 0.0% | $21,253 |
| 1.0 | 32.0% | 0.0% | $26,670 | 32.0% | 0.0% | $26,670 |
| 2.0 | 38.7% | 0.0% | $32,254 | 38.7% | 0.0% | $32,254 |
| 3.0 | 45.5% | 0.0% | $37,922 | 45.5% | 0.0% | $37,922 |
| 4.0 | 52.2% | 0.0% | $83,344 | 52.2% | 0.0% | $83,344 |
| 5.0 | 58.6% | 0.0% | $83,344 | 58.6% | 0.0% | $83,344 |
| 6.0 | 64.5% | 0.0% | $83,344 | 64.5% | 0.0% | $83,344 |
| 7.0 | 69.8% | 0.0% | $83,344 | 69.8% | 0.0% | $83,344 |
| 8.0 | 74.2% | 0.0% | $83,344 | 74.2% | 0.0% | $83,344 |
| 9.0 | 77.7% | 0.0% | $83,344 | 77.7% | 0.0% | $83,344 |
| 10.0 | 80.1% | 0.0% | $83,344 | 80.1% | 0.0% | $83,344 |
| 11.0 | 81.1% | 0.0% | $83,344 | 81.1% | 0.0% | $83,344 |
| 12.0 | 81.1% | 0.0% | $83,344 | 81.1% | 0.0% | $83,344 |
| 13.0 | 81.1% | 0.0% | $83,344 | 81.1% | 0.0% | $83,344 |
| 14.0 | 81.1% | 0.0% | $83,344 | 81.1% | 0.0% | $83,344 |
| 15.0 | 81.1% | 0.0% | $83,344 | 81.1% | 0.0% | $83,344 |
| 16.0 | 81.1% | 0.0% | $83,344 | 81.1% | 0.0% | $83,344 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| **Contents** | **Before Mitigation Values:** | | | **After Mitigation Values:** | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 10.5% | 0.0% | $8,751 | 10.5% | 0.0% | $8,751 |
| -1.0 | 13.2% | 0.0% | $11,001 | 13.2% | 0.0% | $11,001 |
| 0.0 | 16.0% | 0.0% | $13,335 | 16.0% | 0.0% | $13,335 |
| 1.0 | 18.9% | 0.0% | $15,752 | 18.9% | 0.0% | $15,752 |
| 2.0 | 21.8% | 0.0% | $18,169 | 21.8% | 0.0% | $18,169 |
| 3.0 | 24.7% | 0.0% | $20,586 | 24.7% | 0.0% | $20,586 |
| 4.0 | 27.4% | 0.0% | $22,836 | 27.4% | 0.0% | $22,836 |
| 5.0 | 30.0% | 0.0% | $25,003 | 30.0% | 0.0% | $25,003 |
| 6.0 | 32.4% | 0.0% | $27,004 | 32.4% | 0.0% | $27,004 |
| 7.0 | 34.5% | 0.0% | $28,754 | 34.5% | 0.0% | $28,754 |
| 8.0 | 36.3% | 0.0% | $30,254 | 36.3% | 0.0% | $30,254 |
| 9.0 | 37.7% | 0.0% | $31,421 | 37.7% | 0.0% | $31,421 |
| 10.0 | 38.6% | 0.0% | $32,171 | 38.6% | 0.0% | $32,171 |
| 11.0 | 39.1% | 0.0% | $32,588 | 39.1% | 0.0% | $32,588 |
| 12.0 | 39.1% | 0.0% | $32,588 | 39.1% | 0.0% | $32,588 |
| 13.0 | 39.1% | 0.0% | $32,588 | 39.1% | 0.0% | $32,588 |
| 14.0 | 39.1% | 0.0% | $32,588 | 39.1% | 0.0% | $32,588 |
| 15.0 | 39.1% | 0.0% | $32,588 | 39.1% | 0.0% | $32,588 |
| 16.0 | 39.1% | 0.0% | $32,588 | 39.1% | 0.0% | $32,588 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Displacement | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $2,173 | 45.0 | | $2,173 |
| 2.0 | 90.0 | | $4,346 | 90.0 | | $4,346 |
| 3.0 | 135.0 | | $6,519 | 135.0 | | $6,519 |
| 4.0 | 180.0 | | $8,692 | 180.0 | | $8,692 |
| 5.0 | 225.0 | | $10,865 | 225.0 | | $10,865 |
| 6.0 | 270.0 | | $13,038 | 270.0 | | $13,038 |
| 7.0 | 315.0 | | $15,211 | 315.0 | | $15,211 |
| 8.0 | 360.0 | | $17,384 | 360.0 | | $17,384 |
| 9.0 | 405.0 | | $19,557 | 405.0 | | $19,557 |
| 10.0 | 450.0 | | $21,730 | 450.0 | | $21,730 |
| 11.0 | 495.0 | | $23,903 | 495.0 | | $23,903 |
| 12.0 | 540.0 | | $26,076 | 540.0 | | $26,076 |
| 13.0 | 585.0 | | $28,249 | 585.0 | | $28,249 |
| 14.0 | 630.0 | | $30,422 | 630.0 | | $30,422 |
| 15.0 | 675.0 | | $32,595 | 675.0 | | $32,595 |
| 16.0 | 720.0 | | $34,768 | 720.0 | | $34,768 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using USACE Generic**

| **Loss of Function** | **Before Mitigation Values:** | | | **After Mitigation Values:** | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $0 | 45.0 | | $0 |
| 2.0 | 90.0 | | $0 | 90.0 | | $0 |
| 3.0 | 135.0 | | $0 | 135.0 | | $0 |
| 4.0 | 180.0 | | $0 | 180.0 | | $0 |
| 5.0 | 225.0 | | $0 | 225.0 | | $0 |
| 6.0 | 270.0 | | $0 | 270.0 | | $0 |
| 7.0 | 315.0 | | $0 | 315.0 | | $0 |
| 8.0 | 360.0 | | $0 | 360.0 | | $0 |
| 9.0 | 405.0 | | $0 | 405.0 | | $0 |
| 10.0 | 450.0 | | $0 | 450.0 | | $0 |
| 11.0 | 495.0 | | $0 | 495.0 | | $0 |
| 12.0 | 540.0 | | $0 | 540.0 | | $0 |
| 13.0 | 585.0 | | $0 | 585.0 | | $0 |
| 14.0 | 630.0 | | $0 | 630.0 | | $0 |
| 15.0 | 675.0 | | $0 | 675.0 | | $0 |
| 16.0 | 720.0 | | $0 | 720.0 | | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Other Benefits

### Other Benefits Before Mitigation

No Data

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Other Benefits After Mitigation**

No Data

## Summary Of Benefits

| Expected Annual Damages Before Mitigation | | Expected Annual Damages After Mitigation | | Expected Avoided Damages After Mitigation (Benefits) | |
|---|---|---|---|---|---|
| Annual: | $658 | Annual: | $505 | Annual: | $153 |
| Present Value: | $9,078 | Present Value: | $6,970 | Present Value: | $2,108 |

Mitigation Benefits: $2,108 Mitigation Costs: $0

Benefits Minus Costs: $2,108 Benefit-Cost Ratio: Infinity

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Cost Estimate

| | | | |
|---|---|---|---|
| Project Useful Life (years): | 50 | Construction Type: | |
| Mitigation Project Cost: | | Detailed Scope of Work: | Yes |
| Annual Project Maintenance Cost: | $0 | Detailed Estimate for Entire Project: | Yes |
| Final Mitigation Project Cost: | $0 | Years of Maintenance: | 50 |
| Cost Basis Year: | | Present Worth of Annual Maintenance Costs: | $0 |
| Construction Start Year: | | Estimate Reflects Current Prices: | Yes |
| Construction End Year: | | Project Escalation: | |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Justification/Attachments

| Field | Description | Attachments |
|---|---|---|

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Structure and Mitigation Details For:** 17 Meadow Street, 17 Meadow Street, Ludlow, Vermont, 05149, Windsor

Benefits: $4,842 Costs: $ BCR: .00

---

Hazard: **Flood**

Mitigation Option: Drainage Improvement

| | | | | | |
|---|---|---|---|---|---|
| Latitude: | | Longitude: | | | |
| Size of Building: | 1,790 | BRV ($/sf): | $69.99 | Total BRV: | $125,282 |
| Residential: | Yes | Building Type: | Split Level | | |
| Obstruction: | N/A | Foundation Type: | Slab | Basement: | Yes |
| Building Primary Use: | | Structure Type: | | Historic Building: | No |
| Structure Elevation: | 988.90 | First Floor Being Raised: | | Demolition Threshold: | 50.00% |
| Source of Flood Data: | HH | Project in SFHA: | Unknown | Community ID Number: | |
| Effective FIS Date: | | FIRM Panel Number: | | FIRM Effective Date: | |
| Project Useful Life: | 50 | H&H Study Title: | | H&H Effective Date: | 01/01/1900 |
| Flood Zone: | | | | | |
| Building Contents: | $125,282 (Default) | Loss of Rent: | $0 | Displacement Costs: | $2,578 (Default) |
| Ground Surface Elevation: | | | | One Time Displacement Costs: | $0 |
| Breaking wave height: | | | | Value of Crawlspace Contents: | $0 |
| Height FFE above grade: | 988.90 | | | Flood Zone Determination: | |
| | | | | Utilities that are not elevated: | No |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Riverine Elevation and Discharge Data

Streambed Elevation (ft): 978.0 Flood Profile Number:

Flood Source Name:

Elevation At Which Barrier Will Be Overtopped:

FEMA Elevation Certificate Diagram Description: Other Elevation Source:

| Recurrence Interval (yr) | Percent Annual Chance (%) | Elevation Before Mitigation (ft) | Discharge Before Mitigation (cfs) | Elevation After Mitigation (ft) | Discharge After Mitigation (cfs) |
|---|---|---|---|---|---|
| 10 | 10.00% | 983.30 | 73.0 | 978.20 | 73.0 |
| 50 | 2.00% | 988.00 | 115.0 | 982.90 | 115.0 |
| 100 | 1.00% | 988.00 | 134.0 | 982.90 | 134.0 |
| 500 | 0.20% | 988.40 | 150.0 | 983.30 | 150.0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Building | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 10.4% | 0.0% | $13,029 | 10.4% | 0.0% | $13,029 |
| -1.0 | 14.2% | 0.0% | $17,790 | 14.2% | 0.0% | $17,790 |
| 0.0 | 18.5% | 0.0% | $23,177 | 18.5% | 0.0% | $23,177 |
| 1.0 | 23.2% | 0.0% | $29,065 | 23.2% | 0.0% | $29,065 |
| 2.0 | 28.2% | 0.0% | $35,330 | 28.2% | 0.0% | $35,330 |
| 3.0 | 33.4% | 0.0% | $41,844 | 33.4% | 0.0% | $41,844 |
| 4.0 | 38.6% | 0.0% | $48,359 | 38.6% | 0.0% | $48,359 |
| 5.0 | 43.8% | 0.0% | $54,874 | 43.8% | 0.0% | $54,874 |
| 6.0 | 48.8% | 0.0% | $61,138 | 48.8% | 0.0% | $61,138 |
| 7.0 | 53.5% | 0.0% | $125,282 | 53.5% | 0.0% | $125,282 |
| 8.0 | 57.8% | 0.0% | $125,282 | 57.8% | 0.0% | $125,282 |
| 9.0 | 61.6% | 0.0% | $125,282 | 61.6% | 0.0% | $125,282 |
| 10.0 | 64.8% | 0.0% | $125,282 | 64.8% | 0.0% | $125,282 |
| 11.0 | 67.2% | 0.0% | $125,282 | 67.2% | 0.0% | $125,282 |
| 12.0 | 68.8% | 0.0% | $125,282 | 68.8% | 0.0% | $125,282 |
| 13.0 | 69.3% | 0.0% | $125,282 | 69.3% | 0.0% | $125,282 |
| 14.0 | 69.3% | 0.0% | $125,282 | 69.3% | 0.0% | $125,282 |
| 15.0 | 69.3% | 0.0% | $125,282 | 69.3% | 0.0% | $125,282 |
| 16.0 | 69.3% | 0.0% | $125,282 | 69.3% | 0.0% | $125,282 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Contents | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 7.3% | 0.0% | $9,146 | 7.3% | 0.0% | $9,146 |
| -1.0 | 9.4% | 0.0% | $11,777 | 9.4% | 0.0% | $11,777 |
| 0.0 | 11.6% | 0.0% | $14,533 | 11.6% | 0.0% | $14,533 |
| 1.0 | 13.8% | 0.0% | $17,289 | 13.8% | 0.0% | $17,289 |
| 2.0 | 16.1% | 0.0% | $20,170 | 16.1% | 0.0% | $20,170 |
| 3.0 | 18.2% | 0.0% | $22,801 | 18.2% | 0.0% | $22,801 |
| 4.0 | 20.2% | 0.0% | $25,307 | 20.2% | 0.0% | $25,307 |
| 5.0 | 22.1% | 0.0% | $27,687 | 22.1% | 0.0% | $27,687 |
| 6.0 | 23.6% | 0.0% | $29,567 | 23.6% | 0.0% | $29,567 |
| 7.0 | 24.9% | 0.0% | $31,195 | 24.9% | 0.0% | $31,195 |
| 8.0 | 25.8% | 0.0% | $32,323 | 25.8% | 0.0% | $32,323 |
| 9.0 | 26.3% | 0.0% | $32,949 | 26.3% | 0.0% | $32,949 |
| 10.0 | 26.3% | 0.0% | $32,949 | 26.3% | 0.0% | $32,949 |
| 11.0 | 26.3% | 0.0% | $32,949 | 26.3% | 0.0% | $32,949 |
| 12.0 | 26.3% | 0.0% | $32,949 | 26.3% | 0.0% | $32,949 |
| 13.0 | 26.3% | 0.0% | $32,949 | 26.3% | 0.0% | $32,949 |
| 14.0 | 26.3% | 0.0% | $32,949 | 26.3% | 0.0% | $32,949 |
| 15.0 | 26.3% | 0.0% | $32,949 | 26.3% | 0.0% | $32,949 |
| 16.0 | 26.3% | 0.0% | $32,949 | 26.3% | 0.0% | $32,949 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Displacement | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $3,813 | 45.0 | | $3,813 |
| 2.0 | 90.0 | | $7,627 | 90.0 | | $7,627 |
| 3.0 | 135.0 | | $11,440 | 135.0 | | $11,440 |
| 4.0 | 180.0 | | $15,254 | 180.0 | | $15,254 |
| 5.0 | 225.0 | | $19,067 | 225.0 | | $19,067 |
| 6.0 | 270.0 | | $22,881 | 270.0 | | $22,881 |
| 7.0 | 315.0 | | $26,694 | 315.0 | | $26,694 |
| 8.0 | 360.0 | | $30,507 | 360.0 | | $30,507 |
| 9.0 | 405.0 | | $34,321 | 405.0 | | $34,321 |
| 10.0 | 450.0 | | $38,134 | 450.0 | | $38,134 |
| 11.0 | 495.0 | | $41,948 | 495.0 | | $41,948 |
| 12.0 | 540.0 | | $45,761 | 540.0 | | $45,761 |
| 13.0 | 585.0 | | $49,575 | 585.0 | | $49,575 |
| 14.0 | 630.0 | | $53,388 | 630.0 | | $53,388 |
| 15.0 | 675.0 | | $57,202 | 675.0 | | $57,202 |
| 16.0 | 720.0 | | $61,015 | 720.0 | | $61,015 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using USACE Generic**

| **Loss of Function** | **Before Mitigation Values:** | | | **After Mitigation Values:** | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $0 | 45.0 | | $0 |
| 2.0 | 90.0 | | $0 | 90.0 | | $0 |
| 3.0 | 135.0 | | $0 | 135.0 | | $0 |
| 4.0 | 180.0 | | $0 | 180.0 | | $0 |
| 5.0 | 225.0 | | $0 | 225.0 | | $0 |
| 6.0 | 270.0 | | $0 | 270.0 | | $0 |
| 7.0 | 315.0 | | $0 | 315.0 | | $0 |
| 8.0 | 360.0 | | $0 | 360.0 | | $0 |
| 9.0 | 405.0 | | $0 | 405.0 | | $0 |
| 10.0 | 450.0 | | $0 | 450.0 | | $0 |
| 11.0 | 495.0 | | $0 | 495.0 | | $0 |
| 12.0 | 540.0 | | $0 | 540.0 | | $0 |
| 13.0 | 585.0 | | $0 | 585.0 | | $0 |
| 14.0 | 630.0 | | $0 | 630.0 | | $0 |
| 15.0 | 675.0 | | $0 | 675.0 | | $0 |
| 16.0 | 720.0 | | $0 | 720.0 | | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Other Benefits

### Other Benefits Before Mitigation

No Data

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Other Benefits After Mitigation**

No Data

## Summary Of Benefits

| Expected Annual Damages Before Mitigation | | Expected Annual Damages After Mitigation | | Expected Avoided Damages After Mitigation (Benefits) | |
|---|---|---|---|---|---|
| Annual: | $1,126 | Annual: | $775 | Annual: | $351 |
| Present Value: | $15,538 | Present Value: | $10,696 | Present Value: | $4,842 |

Mitigation Benefits: $4,842 Mitigation Costs: $0

Benefits Minus Costs: $4,842 Benefit-Cost Ratio: Infinity

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Cost Estimate

| | | | |
|---|---|---|---|
| Project Useful Life (years): | 50 | Construction Type: | |
| Mitigation Project Cost: | $0 | Detailed Scope of Work: | Yes |
| Annual Project Maintenance Cost: | $0 | Detailed Estimate for Entire Project: | Yes |
| Final Mitigation Project Cost: | $0 | Years of Maintenance: | 50 |
| Cost Basis Year: | | Present Worth of Annual Maintenance Costs: | $0 |
| Construction Start Year: | | Estimate Reflects Current Prices: | Yes |
| Construction End Year: | | Project Escalation: | |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Justification/Attachments

| Field | Description | Attachments |
|---|---|---|

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Structure and Mitigation Details For:** 18 Meadow Street, 18 Meadow Street, Ludlow, Vermont, 05149, Windsor

Benefits: $18,030 Costs: $ BCR: .00

---

Hazard: **Flood**

Mitigation Option: Drainage Improvement

| | | | | | |
|---|---|---|---|---|---|
| Latitude: | | Longitude: | | | |
| Size of Building: | 864 | BRV ($/sf): | $84.55 | Total BRV: | $73,051 |
| Residential: | Yes | Building Type: | One-Story | | |
| Obstruction: | N/A | Foundation Type: | Slab | Basement: | No |
| Building Primary Use: | | Structure Type: | | Historic Building: | No |
| Structure Elevation: | 985.40 | First Floor Being Raised: | | Demolition Threshold: | 50.00% |
| Source of Flood Data: | HH | Project in SFHA: | Unknown | Community ID Number: | |
| Effective FIS Date: | | FIRM Panel Number: | | FIRM Effective Date: | |
| Project Useful Life: | 50 | H&H Study Title: | | H&H Effective Date: | 01/01/1900 |
| Flood Zone: | | | | | |
| Building Contents: | $73,051 (Default) | Loss of Rent: | $0 | Displacement Costs: | $1,244 (Default) |
| Ground Surface Elevation: | | | | One Time Displacement Costs: | $0 |
| Breaking wave height: | | | | Value of Crawlspace Contents: | $0 |
| Height FFE above grade: | 985.40 | | | Flood Zone Determination: | |
| | | | | Utilities that are not elevated: | No |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Riverine Elevation and Discharge Data

Streambed Elevation (ft): 978.0 Flood Profile Number:

Flood Source Name:

Elevation At Which Barrier Will Be Overtopped:

FEMA Elevation Certificate Diagram Description: Diagram 1A Other Elevation Source:

| Recurrence Interval (yr) | Percent Annual Chance (%) | Elevation Before Mitigation (ft) | Discharge Before Mitigation (cfs) | Elevation After Mitigation (ft) | Discharge After Mitigation (cfs) |
|---|---|---|---|---|---|
| 10 | 10.00% | 983.30 | 73.0 | 978.20 | 73.0 |
| 50 | 2.00% | 988.00 | 115.0 | 982.90 | 115.0 |
| 100 | 1.00% | 988.00 | 134.0 | 982.90 | 134.0 |
| 500 | 0.20% | 988.40 | 150.0 | 983.30 | 150.0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Building | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 0.0% | 0.0% | $0 | 0.0% | 0.0% | $0 |
| -1.0 | 2.5% | 0.0% | $1,826 | 2.5% | 0.0% | $1,826 |
| 0.0 | 13.4% | 0.0% | $9,789 | 13.4% | 0.0% | $9,789 |
| 1.0 | 23.3% | 0.0% | $17,021 | 23.3% | 0.0% | $17,021 |
| 2.0 | 32.1% | 0.0% | $23,449 | 32.1% | 0.0% | $23,449 |
| 3.0 | 40.1% | 0.0% | $29,294 | 40.1% | 0.0% | $29,294 |
| 4.0 | 47.1% | 0.0% | $34,407 | 47.1% | 0.0% | $34,407 |
| 5.0 | 53.2% | 0.0% | $73,051 | 53.2% | 0.0% | $73,051 |
| 6.0 | 58.6% | 0.0% | $73,051 | 58.6% | 0.0% | $73,051 |
| 7.0 | 63.2% | 0.0% | $73,051 | 63.2% | 0.0% | $73,051 |
| 8.0 | 67.2% | 0.0% | $73,051 | 67.2% | 0.0% | $73,051 |
| 9.0 | 70.5% | 0.0% | $73,051 | 70.5% | 0.0% | $73,051 |
| 10.0 | 73.2% | 0.0% | $73,051 | 73.2% | 0.0% | $73,051 |
| 11.0 | 75.4% | 0.0% | $73,051 | 75.4% | 0.0% | $73,051 |
| 12.0 | 77.2% | 0.0% | $73,051 | 77.2% | 0.0% | $73,051 |
| 13.0 | 78.5% | 0.0% | $73,051 | 78.5% | 0.0% | $73,051 |
| 14.0 | 79.5% | 0.0% | $73,051 | 79.5% | 0.0% | $73,051 |
| 15.0 | 80.2% | 0.0% | $73,051 | 80.2% | 0.0% | $73,051 |
| 16.0 | 80.7% | 0.0% | $73,051 | 80.7% | 0.0% | $73,051 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| **Contents** | **Before Mitigation Values:** | | | **After Mitigation Values:** | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 0.0% | 0.0% | $0 | 0.0% | 0.0% | $0 |
| -1.0 | 2.4% | 0.0% | $1,753 | 2.4% | 0.0% | $1,753 |
| 0.0 | 8.1% | 0.0% | $5,917 | 8.1% | 0.0% | $5,917 |
| 1.0 | 13.3% | 0.0% | $9,716 | 13.3% | 0.0% | $9,716 |
| 2.0 | 17.9% | 0.0% | $13,076 | 17.9% | 0.0% | $13,076 |
| 3.0 | 22.0% | 0.0% | $16,071 | 22.0% | 0.0% | $16,071 |
| 4.0 | 25.7% | 0.0% | $18,774 | 25.7% | 0.0% | $18,774 |
| 5.0 | 28.8% | 0.0% | $21,039 | 28.8% | 0.0% | $21,039 |
| 6.0 | 31.5% | 0.0% | $23,011 | 31.5% | 0.0% | $23,011 |
| 7.0 | 33.8% | 0.0% | $24,691 | 33.8% | 0.0% | $24,691 |
| 8.0 | 35.7% | 0.0% | $26,079 | 35.7% | 0.0% | $26,079 |
| 9.0 | 37.2% | 0.0% | $27,175 | 37.2% | 0.0% | $27,175 |
| 10.0 | 38.4% | 0.0% | $28,052 | 38.4% | 0.0% | $28,052 |
| 11.0 | 39.2% | 0.0% | $28,636 | 39.2% | 0.0% | $28,636 |
| 12.0 | 39.7% | 0.0% | $29,001 | 39.7% | 0.0% | $29,001 |
| 13.0 | 40.0% | 0.0% | $29,220 | 40.0% | 0.0% | $29,220 |
| 14.0 | 40.0% | 0.0% | $29,220 | 40.0% | 0.0% | $29,220 |
| 15.0 | 40.0% | 0.0% | $29,220 | 40.0% | 0.0% | $29,220 |
| 16.0 | 40.0% | 0.0% | $29,220 | 40.0% | 0.0% | $29,220 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using USACE Generic**

| **Displacement** | **Before Mitigation Values:** | | | **After Mitigation Values:** | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $1,841 | 45.0 | | $1,841 |
| 2.0 | 90.0 | | $3,681 | 90.0 | | $3,681 |
| 3.0 | 135.0 | | $5,522 | 135.0 | | $5,522 |
| 4.0 | 180.0 | | $7,363 | 180.0 | | $7,363 |
| 5.0 | 225.0 | | $9,203 | 225.0 | | $9,203 |
| 6.0 | 270.0 | | $11,044 | 270.0 | | $11,044 |
| 7.0 | 315.0 | | $12,885 | 315.0 | | $12,885 |
| 8.0 | 360.0 | | $14,725 | 360.0 | | $14,725 |
| 9.0 | 405.0 | | $16,566 | 405.0 | | $16,566 |
| 10.0 | 450.0 | | $18,407 | 450.0 | | $18,407 |
| 11.0 | 495.0 | | $20,247 | 495.0 | | $20,247 |
| 12.0 | 540.0 | | $22,088 | 540.0 | | $22,088 |
| 13.0 | 585.0 | | $23,929 | 585.0 | | $23,929 |
| 14.0 | 630.0 | | $25,769 | 630.0 | | $25,769 |
| 15.0 | 675.0 | | $27,610 | 675.0 | | $27,610 |
| 16.0 | 720.0 | | $29,451 | 720.0 | | $29,451 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using USACE Generic**

| **Loss of Function** | **Before Mitigation Values:** | | | **After Mitigation Values:** | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $0 | 45.0 | | $0 |
| 2.0 | 90.0 | | $0 | 90.0 | | $0 |
| 3.0 | 135.0 | | $0 | 135.0 | | $0 |
| 4.0 | 180.0 | | $0 | 180.0 | | $0 |
| 5.0 | 225.0 | | $0 | 225.0 | | $0 |
| 6.0 | 270.0 | | $0 | 270.0 | | $0 |
| 7.0 | 315.0 | | $0 | 315.0 | | $0 |
| 8.0 | 360.0 | | $0 | 360.0 | | $0 |
| 9.0 | 405.0 | | $0 | 405.0 | | $0 |
| 10.0 | 450.0 | | $0 | 450.0 | | $0 |
| 11.0 | 495.0 | | $0 | 495.0 | | $0 |
| 12.0 | 540.0 | | $0 | 540.0 | | $0 |
| 13.0 | 585.0 | | $0 | 585.0 | | $0 |
| 14.0 | 630.0 | | $0 | 630.0 | | $0 |
| 15.0 | 675.0 | | $0 | 675.0 | | $0 |
| 16.0 | 720.0 | | $0 | 720.0 | | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Other Benefits

### Other Benefits Before Mitigation

No Data

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Other Benefits After Mitigation**

No Data

## Summary Of Benefits

| Expected Annual Damages Before Mitigation | | Expected Annual Damages After Mitigation | | Expected Avoided Damages After Mitigation (Benefits) | |
|---|---|---|---|---|---|
| Annual: | $1,839 | Annual: | $532 | Annual: | $1,307 |
| Present Value: | $25,374 | Present Value: | $7,344 | Present Value: | $18,030 |

Mitigation Benefits: $18,030 Mitigation Costs: $0

Benefits Minus Costs: $18,030 Benefit-Cost Ratio: Infinity

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Cost Estimate

| | | | |
|---|---|---|---|
| Project Useful Life (years): | 50 | Construction Type: | |
| Mitigation Project Cost: | $0 | Detailed Scope of Work: | Yes |
| Annual Project Maintenance Cost: | $0 | Detailed Estimate for Entire Project: | Yes |
| Final Mitigation Project Cost: | $0 | Years of Maintenance: | 50 |
| Cost Basis Year: | | Present Worth of Annual Maintenance Costs: | $0 |
| Construction Start Year: | | Estimate Reflects Current Prices: | Yes |
| Construction End Year: | | Project Escalation: | |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Justification/Attachments

| Field | Description | Attachments |
|---|---|---|

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Structure and Mitigation Details For:** 18 Mill Street, 18 Mill Street, Ludlow, Vermont, 05149, Windsor

Benefits: $548,720 Costs: $ BCR: .00

---

Hazard: **Flood**

Mitigation Option: Drainage Improvement

| | | | | | |
|---|---|---|---|---|---|
| Latitude: | | Longitude: | | | |
| Size of Building: | 31,272 | BRV ($/sf): | $100.00 | Total BRV: | $3,127,200 |
| Residential: | No | Building Type: | | | |
| Obstruction: | N/A | Foundation Type: | | Basement: | |
| Building Primary Use: | Industrial Light | Structure Type: | Pre-Engineered | Historic Building: | No |
| Structure Elevation: | 984.60 | First Floor Being Raised: | | Demolition Threshold: | 50.00% |
| Source of Flood Data: | HH | Project in SFHA: | Unknown | Community ID Number: | |
| Effective FIS Date: | | FIRM Panel Number: | | FIRM Effective Date: | |
| Project Useful Life: | 50 | H&H Study Title: | | H&H Effective Date: | 01/01/1900 |
| Flood Zone: | | | | | |
| Building Contents: | $1,469,784 (Default) | Loss of Rent: | | Displacement Costs: | $0 |
| Ground Surface Elevation: | | | | One Time Displacement Costs: | $0 |
| Breaking wave height: | | | | Value of Crawlspace Contents: | |
| Height FFE above grade: | | | | Flood Zone Determination: | |
| | | | | Utilities that are not elevated: | No |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Riverine Elevation and Discharge Data

Streambed Elevation (ft): 978.0 Flood Profile Number:

Flood Source Name:

Elevation At Which Barrier Will Be Overtopped:

FEMA Elevation Certificate Diagram Description: Diagram 1A Other Elevation Source:

| Recurrence Interval (yr) | Percent Annual Chance (%) | Elevation Before Mitigation (ft) | Discharge Before Mitigation (cfs) | Elevation After Mitigation (ft) | Discharge After Mitigation (cfs) |
|---|---|---|---|---|---|
| 10 | 10.00% | 983.30 | 73.0 | 978.20 | 73.0 |
| 50 | 2.00% | 988.00 | 115.0 | 982.90 | 115.0 |
| 100 | 1.00% | 988.00 | 134.0 | 982.90 | 134.0 |
| 500 | 0.20% | 988.40 | 150.0 | 983.30 | 150.0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using Industrial Light (Default)

| Building | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 0.5% | 0.0% | $15,636 | 0.5% | 0.0% | $15,636 |
| -1.0 | 0.5% | 0.0% | $15,636 | 0.5% | 0.0% | $15,636 |
| 0.0 | 1.0% | 0.0% | $31,272 | 1.0% | 0.0% | $31,272 |
| 1.0 | 11.9% | 0.0% | $372,137 | 11.9% | 0.0% | $372,137 |
| 2.0 | 19.8% | 0.0% | $619,186 | 19.8% | 0.0% | $619,186 |
| 3.0 | 25.7% | 0.0% | $803,690 | 25.7% | 0.0% | $803,690 |
| 4.0 | 31.6% | 0.0% | $988,195 | 31.6% | 0.0% | $988,195 |
| 5.0 | 34.4% | 0.0% | $1,075,757 | 34.4% | 0.0% | $1,075,757 |
| 6.0 | 39.9% | 0.0% | $1,247,753 | 39.9% | 0.0% | $1,247,753 |
| 7.0 | 43.2% | 0.0% | $1,350,950 | 43.2% | 0.0% | $1,350,950 |
| 8.0 | 47.7% | 0.0% | $1,491,674 | 47.7% | 0.0% | $1,491,674 |
| 9.0 | 52.6% | 0.0% | $3,127,200 | 52.6% | 0.0% | $3,127,200 |
| 10.0 | 53.9% | 0.0% | $3,127,200 | 53.9% | 0.0% | $3,127,200 |
| 11.0 | 53.9% | 0.0% | $3,127,200 | 53.9% | 0.0% | $3,127,200 |
| 12.0 | 53.9% | 0.0% | $3,127,200 | 53.9% | 0.0% | $3,127,200 |
| 13.0 | 53.9% | 0.0% | $3,127,200 | 53.9% | 0.0% | $3,127,200 |
| 14.0 | 53.9% | 0.0% | $3,127,200 | 53.9% | 0.0% | $3,127,200 |
| 15.0 | 53.9% | 0.0% | $3,127,200 | 53.9% | 0.0% | $3,127,200 |
| 16.0 | 53.9% | 0.0% | $3,127,200 | 53.9% | 0.0% | $3,127,200 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using Industrial Light (Default)

| Contents | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 0.0% | 0.0% | $0 | 0.0% | 0.0% | $0 |
| -1.0 | 0.0% | 0.0% | $0 | 0.0% | 0.0% | $0 |
| 0.0 | 0.0% | 0.0% | $0 | 0.0% | 0.0% | $0 |
| 1.0 | 19.0% | 0.0% | $279,259 | 19.0% | 0.0% | $279,259 |
| 2.0 | 31.0% | 0.0% | $455,633 | 31.0% | 0.0% | $455,633 |
| 3.0 | 42.0% | 0.0% | $617,309 | 42.0% | 0.0% | $617,309 |
| 4.0 | 52.0% | 0.0% | $764,288 | 52.0% | 0.0% | $764,288 |
| 5.0 | 61.0% | 0.0% | $896,568 | 61.0% | 0.0% | $896,568 |
| 6.0 | 72.0% | 0.0% | $1,058,244 | 72.0% | 0.0% | $1,058,244 |
| 7.0 | 82.0% | 0.0% | $1,205,223 | 82.0% | 0.0% | $1,205,223 |
| 8.0 | 91.0% | 0.0% | $1,337,503 | 91.0% | 0.0% | $1,337,503 |
| 9.0 | 94.0% | 0.0% | $1,381,597 | 94.0% | 0.0% | $1,381,597 |
| 10.0 | 95.0% | 0.0% | $1,396,295 | 95.0% | 0.0% | $1,396,295 |
| 11.0 | 95.0% | 0.0% | $1,396,295 | 95.0% | 0.0% | $1,396,295 |
| 12.0 | 95.0% | 0.0% | $1,396,295 | 95.0% | 0.0% | $1,396,295 |
| 13.0 | 95.0% | 0.0% | $1,396,295 | 95.0% | 0.0% | $1,396,295 |
| 14.0 | 95.0% | 0.0% | $1,396,295 | 95.0% | 0.0% | $1,396,295 |
| 15.0 | 95.0% | 0.0% | $1,396,295 | 95.0% | 0.0% | $1,396,295 |
| 16.0 | 95.0% | 0.0% | $1,396,295 | 95.0% | 0.0% | $1,396,295 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using Industrial Light (Default)**

| **Displacement** | **Before Mitigation Values:** | | | **After Mitigation Values:** | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $0 | 45.0 | | $0 |
| 2.0 | 90.0 | | $0 | 90.0 | | $0 |
| 3.0 | 135.0 | | $0 | 135.0 | | $0 |
| 4.0 | 180.0 | | $0 | 180.0 | | $0 |
| 5.0 | 225.0 | | $0 | 225.0 | | $0 |
| 6.0 | 270.0 | | $0 | 270.0 | | $0 |
| 7.0 | 315.0 | | $0 | 315.0 | | $0 |
| 8.0 | 360.0 | | $0 | 360.0 | | $0 |
| 9.0 | 405.0 | | $0 | 405.0 | | $0 |
| 10.0 | 450.0 | | $0 | 450.0 | | $0 |
| 11.0 | 450.0 | | $0 | 450.0 | | $0 |
| 12.0 | 450.0 | | $0 | 450.0 | | $0 |
| 13.0 | 450.0 | | $0 | 450.0 | | $0 |
| 14.0 | 450.0 | | $0 | 450.0 | | $0 |
| 15.0 | 450.0 | | $0 | 450.0 | | $0 |
| 16.0 | 450.0 | | $0 | 450.0 | | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using Industrial Light (Default)**

| Loss of Function | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $0 | 45.0 | | $0 |
| 2.0 | 90.0 | | $0 | 90.0 | | $0 |
| 3.0 | 135.0 | | $0 | 135.0 | | $0 |
| 4.0 | 180.0 | | $0 | 180.0 | | $0 |
| 5.0 | 225.0 | | $0 | 225.0 | | $0 |
| 6.0 | 270.0 | | $0 | 270.0 | | $0 |
| 7.0 | 315.0 | | $0 | 315.0 | | $0 |
| 8.0 | 360.0 | | $0 | 360.0 | | $0 |
| 9.0 | 405.0 | | $0 | 405.0 | | $0 |
| 10.0 | 450.0 | | $0 | 450.0 | | $0 |
| 11.0 | 450.0 | | $0 | 450.0 | | $0 |
| 12.0 | 450.0 | | $0 | 450.0 | | $0 |
| 13.0 | 450.0 | | $0 | 450.0 | | $0 |
| 14.0 | 450.0 | | $0 | 450.0 | | $0 |
| 15.0 | 450.0 | | $0 | 450.0 | | $0 |
| 16.0 | 450.0 | | $0 | 450.0 | | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Other Benefits

### Other Benefits Before Mitigation

No Data

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Other Benefits After Mitigation**

No Data

## Loss of Services

**Service Types Provided by Facility:**

| Service Name | Annual Budget ($) |
|---|---|
| Total Annual Budget | |

## Summary Of Benefits

| Expected Annual Damages Before Mitigation | | Expected Annual Damages After Mitigation | | Expected Avoided Damages After Mitigation (Benefits) | |
|---|---|---|---|---|---|
| Annual: | $55,300 | Annual: | $15,539 | Annual: | $39,761 |
| Present Value: | $763,175 | Present Value: | $214,455 | Present Value: | $548,720 |

Mitigation Benefits: $548,720 Mitigation Costs: $0

Benefits Minus Costs: $548,720 Benefit-Cost Ratio: Infinity

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Cost Estimate

| | | | |
|---|---|---|---|
| Project Useful Life (years): | 50 | Construction Type: | |
| Mitigation Project Cost: | $0 | Detailed Scope of Work: | Yes |
| Annual Project Maintenance Cost: | $0 | Detailed Estimate for Entire Project: | Yes |
| Final Mitigation Project Cost: | $0 | Years of Maintenance: | 50 |
| Cost Basis Year: | | Present Worth of Annual Maintenance Costs: | $0 |
| Construction Start Year: | | Estimate Reflects Current Prices: | Yes |
| Construction End Year: | | Project Escalation: | |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Justification/Attachments

| Field | Description | Attachments |
|---|---|---|

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Structure and Mitigation Details For:** 21 Meadow Street, 21 Meadow Street, Ludlow, Vermont, 05149, Windsor

Benefits: $14,631 Costs: $ BCR: .00

---

Hazard: **Flood**

Mitigation Option: Drainage Improvement

| | | | | | |
|---|---|---|---|---|---|
| Latitude: | | Longitude: | | | |
| Size of Building: | 1,809 | BRV ($/sf): | $74.97 | Total BRV: | $135,621 |
| Residential: | Yes | Building Type: | One-Story | | |
| Obstruction: | N/A | Foundation Type: | Slab | Basement: | Yes |
| Building Primary Use: | | Structure Type: | | Historic Building: | No |
| Structure Elevation: | 987.90 | First Floor Being Raised: | | Demolition Threshold: | 50.00% |
| Source of Flood Data: | HH | Project in SFHA: | Unknown | Community ID Number: | |
| Effective FIS Date: | | FIRM Panel Number: | | FIRM Effective Date: | |
| Project Useful Life: | 50 | H&H Study Title: | | H&H Effective Date: | 01/01/1900 |
| Flood Zone: | | | | | |
| Building Contents: | $135,621 (Default) | Loss of Rent: | $0 | Displacement Costs: | $2,605 (Default) |
| Ground Surface Elevation: | | | | One Time Displacement Costs: | $0 |
| Breaking wave height: | | | | Value of Crawlspace Contents: | $0 |
| Height FFE above grade: | 987.90 | | | Flood Zone Determination: | |
| | | | | Utilities that are not elevated: | No |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Riverine Elevation and Discharge Data

Streambed Elevation (ft): 978.0 Flood Profile Number:

Flood Source Name:

Elevation At Which Barrier Will Be Overtopped:

FEMA Elevation Certificate Diagram Description: Diagram 1A Other Elevation Source:

| Recurrence Interval (yr) | Percent Annual Chance (%) | Elevation Before Mitigation (ft) | Discharge Before Mitigation (cfs) | Elevation After Mitigation (ft) | Discharge After Mitigation (cfs) |
|---|---|---|---|---|---|
| 10 | 10.00% | 983.30 | 73.0 | 978.20 | 73.0 |
| 50 | 2.00% | 988.00 | 115.0 | 982.90 | 115.0 |
| 100 | 1.00% | 988.00 | 134.0 | 982.90 | 134.0 |
| 500 | 0.20% | 988.40 | 150.0 | 983.30 | 150.0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Building | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 13.8% | 0.0% | $18,716 | 13.8% | 0.0% | $18,716 |
| -1.0 | 19.4% | 0.0% | $26,310 | 19.4% | 0.0% | $26,310 |
| 0.0 | 25.5% | 0.0% | $34,583 | 25.5% | 0.0% | $34,583 |
| 1.0 | 32.0% | 0.0% | $43,399 | 32.0% | 0.0% | $43,399 |
| 2.0 | 38.7% | 0.0% | $52,485 | 38.7% | 0.0% | $52,485 |
| 3.0 | 45.5% | 0.0% | $61,707 | 45.5% | 0.0% | $61,707 |
| 4.0 | 52.2% | 0.0% | $135,621 | 52.2% | 0.0% | $135,621 |
| 5.0 | 58.6% | 0.0% | $135,621 | 58.6% | 0.0% | $135,621 |
| 6.0 | 64.5% | 0.0% | $135,621 | 64.5% | 0.0% | $135,621 |
| 7.0 | 69.8% | 0.0% | $135,621 | 69.8% | 0.0% | $135,621 |
| 8.0 | 74.2% | 0.0% | $135,621 | 74.2% | 0.0% | $135,621 |
| 9.0 | 77.7% | 0.0% | $135,621 | 77.7% | 0.0% | $135,621 |
| 10.0 | 80.1% | 0.0% | $135,621 | 80.1% | 0.0% | $135,621 |
| 11.0 | 81.1% | 0.0% | $135,621 | 81.1% | 0.0% | $135,621 |
| 12.0 | 81.1% | 0.0% | $135,621 | 81.1% | 0.0% | $135,621 |
| 13.0 | 81.1% | 0.0% | $135,621 | 81.1% | 0.0% | $135,621 |
| 14.0 | 81.1% | 0.0% | $135,621 | 81.1% | 0.0% | $135,621 |
| 15.0 | 81.1% | 0.0% | $135,621 | 81.1% | 0.0% | $135,621 |
| 16.0 | 81.1% | 0.0% | $135,621 | 81.1% | 0.0% | $135,621 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Contents | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 10.5% | 0.0% | $14,240 | 10.5% | 0.0% | $14,240 |
| -1.0 | 13.2% | 0.0% | $17,902 | 13.2% | 0.0% | $17,902 |
| 0.0 | 16.0% | 0.0% | $21,699 | 16.0% | 0.0% | $21,699 |
| 1.0 | 18.9% | 0.0% | $25,632 | 18.9% | 0.0% | $25,632 |
| 2.0 | 21.8% | 0.0% | $29,565 | 21.8% | 0.0% | $29,565 |
| 3.0 | 24.7% | 0.0% | $33,498 | 24.7% | 0.0% | $33,498 |
| 4.0 | 27.4% | 0.0% | $37,160 | 27.4% | 0.0% | $37,160 |
| 5.0 | 30.0% | 0.0% | $40,686 | 30.0% | 0.0% | $40,686 |
| 6.0 | 32.4% | 0.0% | $43,941 | 32.4% | 0.0% | $43,941 |
| 7.0 | 34.5% | 0.0% | $46,789 | 34.5% | 0.0% | $46,789 |
| 8.0 | 36.3% | 0.0% | $49,230 | 36.3% | 0.0% | $49,230 |
| 9.0 | 37.7% | 0.0% | $51,129 | 37.7% | 0.0% | $51,129 |
| 10.0 | 38.6% | 0.0% | $52,350 | 38.6% | 0.0% | $52,350 |
| 11.0 | 39.1% | 0.0% | $53,028 | 39.1% | 0.0% | $53,028 |
| 12.0 | 39.1% | 0.0% | $53,028 | 39.1% | 0.0% | $53,028 |
| 13.0 | 39.1% | 0.0% | $53,028 | 39.1% | 0.0% | $53,028 |
| 14.0 | 39.1% | 0.0% | $53,028 | 39.1% | 0.0% | $53,028 |
| 15.0 | 39.1% | 0.0% | $53,028 | 39.1% | 0.0% | $53,028 |
| 16.0 | 39.1% | 0.0% | $53,028 | 39.1% | 0.0% | $53,028 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Displacement | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $3,854 | 45.0 | | $3,854 |
| 2.0 | 90.0 | | $7,708 | 90.0 | | $7,708 |
| 3.0 | 135.0 | | $11,562 | 135.0 | | $11,562 |
| 4.0 | 180.0 | | $15,416 | 180.0 | | $15,416 |
| 5.0 | 225.0 | | $19,270 | 225.0 | | $19,270 |
| 6.0 | 270.0 | | $23,123 | 270.0 | | $23,123 |
| 7.0 | 315.0 | | $26,977 | 315.0 | | $26,977 |
| 8.0 | 360.0 | | $30,831 | 360.0 | | $30,831 |
| 9.0 | 405.0 | | $34,685 | 405.0 | | $34,685 |
| 10.0 | 450.0 | | $38,539 | 450.0 | | $38,539 |
| 11.0 | 495.0 | | $42,393 | 495.0 | | $42,393 |
| 12.0 | 540.0 | | $46,247 | 540.0 | | $46,247 |
| 13.0 | 585.0 | | $50,101 | 585.0 | | $50,101 |
| 14.0 | 630.0 | | $53,955 | 630.0 | | $53,955 |
| 15.0 | 675.0 | | $57,809 | 675.0 | | $57,809 |
| 16.0 | 720.0 | | $61,663 | 720.0 | | $61,663 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using USACE Generic**

| **Loss of Function** | **Before Mitigation Values:** | | | **After Mitigation Values:** | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $0 | 45.0 | | $0 |
| 2.0 | 90.0 | | $0 | 90.0 | | $0 |
| 3.0 | 135.0 | | $0 | 135.0 | | $0 |
| 4.0 | 180.0 | | $0 | 180.0 | | $0 |
| 5.0 | 225.0 | | $0 | 225.0 | | $0 |
| 6.0 | 270.0 | | $0 | 270.0 | | $0 |
| 7.0 | 315.0 | | $0 | 315.0 | | $0 |
| 8.0 | 360.0 | | $0 | 360.0 | | $0 |
| 9.0 | 405.0 | | $0 | 405.0 | | $0 |
| 10.0 | 450.0 | | $0 | 450.0 | | $0 |
| 11.0 | 495.0 | | $0 | 495.0 | | $0 |
| 12.0 | 540.0 | | $0 | 540.0 | | $0 |
| 13.0 | 585.0 | | $0 | 585.0 | | $0 |
| 14.0 | 630.0 | | $0 | 630.0 | | $0 |
| 15.0 | 675.0 | | $0 | 675.0 | | $0 |
| 16.0 | 720.0 | | $0 | 720.0 | | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Other Benefits

### Other Benefits Before Mitigation

No Data

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Other Benefits After Mitigation**

No Data

## Summary Of Benefits

| Expected Annual Damages Before Mitigation | | Expected Annual Damages After Mitigation | | Expected Avoided Damages After Mitigation (Benefits) | |
|---|---|---|---|---|---|
| Annual: | $1,990 | Annual: | $930 | Annual: | $1,060 |
| Present Value: | $27,465 | Present Value: | $12,834 | Present Value: | $14,631 |

Mitigation Benefits: $14,631 Mitigation Costs: $0

Benefits Minus Costs: $14,631 Benefit-Cost Ratio: Infinity

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Cost Estimate

| | | | |
|---|---|---|---|
| Project Useful Life (years): | 50 | Construction Type: | |
| Mitigation Project Cost: | $0 | Detailed Scope of Work: | Yes |
| Annual Project Maintenance Cost: | $0 | Detailed Estimate for Entire Project: | Yes |
| Final Mitigation Project Cost: | $0 | Years of Maintenance: | 50 |
| Cost Basis Year: | | Present Worth of Annual Maintenance Costs: | $0 |
| Construction Start Year: | | Estimate Reflects Current Prices: | Yes |
| Construction End Year: | | Project Escalation: | |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Justification/Attachments

| Field | Description | Attachments |
|---|---|---|

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Structure and Mitigation Details For:** 3 Commonwealth Ave, 3 Commonwealth Ave, Ludlow, Vermont, 05149, Windsor

Benefits: $28,484 Costs: $1,090,000 BCR: .03

---

Hazard: **Flood**

Mitigation Option: Drainage Improvement

| | | | | | |
|---|---|---|---|---|---|
| Latitude: | | Longitude: | | | |
| Size of Building: | 1,300 | BRV ($/sf): | $74.55 | Total BRV: | $96,915 |
| Residential: | Yes | Building Type: | Two or More Stories | | |
| Obstruction: | N/A | Foundation Type: | Slab | Basement: | No |
| Building Primary Use: | | Structure Type: | | Historic Building: | No |
| Structure Elevation: | 1,006.50 | First Floor Being Raised: | | Demolition Threshold: | 50.00% |
| Source of Flood Data: | HH | Project in SFHA: | Unknown | Community ID Number: | |
| Effective FIS Date: | | FIRM Panel Number: | | FIRM Effective Date: | |
| Project Useful Life: | 50 | H&H Study Title: | | H&H Effective Date: | 01/01/1900 |
| Flood Zone: | | | | | |
| Building Contents: | $96,915 (Default) | Loss of Rent: | $0 | Displacement Costs: | $1,872 (Default) |
| Ground Surface Elevation: | | | | One Time Displacement Costs: | $0 |
| Breaking wave height: | | | | Value of Crawlspace Contents: | $0 |
| Height FFE above grade: | 1,006.50 | | | Flood Zone Determination: | |
| | | | | Utilities that are not elevated: | No |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Riverine Elevation and Discharge Data

Streambed Elevation (ft): 1,003.8 Flood Profile Number:

Flood Source Name:

Elevation At Which Barrier Will Be Overtopped:

FEMA Elevation Certificate Diagram Description: Diagram 1A Other Elevation Source:

| Recurrence Interval (yr) | Percent Annual Chance (%) | Elevation Before Mitigation (ft) | Discharge Before Mitigation (cfs) | Elevation After Mitigation (ft) | Discharge After Mitigation (cfs) |
|---|---|---|---|---|---|
| 10 | 10.00% | 1,005.70 | 73.0 | 1,004.00 | 73.0 |
| 50 | 2.00% | 1,006.50 | 115.0 | 1,004.80 | 115.0 |
| 100 | 1.00% | 1,006.70 | 134.0 | 1,005.00 | 134.0 |
| 500 | 0.20% | 1,007.40 | 150.0 | 1,005.70 | 150.0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Building | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 0.0% | 0.0% | $0 | 0.0% | 0.0% | $0 |
| -1.0 | 3.0% | 0.0% | $2,907 | 3.0% | 0.0% | $2,907 |
| 0.0 | 9.3% | 0.0% | $9,013 | 9.3% | 0.0% | $9,013 |
| 1.0 | 15.2% | 0.0% | $14,731 | 15.2% | 0.0% | $14,731 |
| 2.0 | 20.9% | 0.0% | $20,255 | 20.9% | 0.0% | $20,255 |
| 3.0 | 26.3% | 0.0% | $25,489 | 26.3% | 0.0% | $25,489 |
| 4.0 | 31.4% | 0.0% | $30,431 | 31.4% | 0.0% | $30,431 |
| 5.0 | 36.2% | 0.0% | $35,083 | 36.2% | 0.0% | $35,083 |
| 6.0 | 40.7% | 0.0% | $39,444 | 40.7% | 0.0% | $39,444 |
| 7.0 | 44.9% | 0.0% | $43,515 | 44.9% | 0.0% | $43,515 |
| 8.0 | 48.8% | 0.0% | $47,295 | 48.8% | 0.0% | $47,295 |
| 9.0 | 52.4% | 0.0% | $96,915 | 52.4% | 0.0% | $96,915 |
| 10.0 | 55.7% | 0.0% | $96,915 | 55.7% | 0.0% | $96,915 |
| 11.0 | 58.7% | 0.0% | $96,915 | 58.7% | 0.0% | $96,915 |
| 12.0 | 61.4% | 0.0% | $96,915 | 61.4% | 0.0% | $96,915 |
| 13.0 | 63.8% | 0.0% | $96,915 | 63.8% | 0.0% | $96,915 |
| 14.0 | 65.9% | 0.0% | $96,915 | 65.9% | 0.0% | $96,915 |
| 15.0 | 67.7% | 0.0% | $96,915 | 67.7% | 0.0% | $96,915 |
| 16.0 | 69.2% | 0.0% | $96,915 | 69.2% | 0.0% | $96,915 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Contents | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 0.0% | 0.0% | $0 | 0.0% | 0.0% | $0 |
| -1.0 | 1.0% | 0.0% | $969 | 1.0% | 0.0% | $969 |
| 0.0 | 5.0% | 0.0% | $4,846 | 5.0% | 0.0% | $4,846 |
| 1.0 | 8.7% | 0.0% | $8,432 | 8.7% | 0.0% | $8,432 |
| 2.0 | 12.2% | 0.0% | $11,824 | 12.2% | 0.0% | $11,824 |
| 3.0 | 15.5% | 0.0% | $15,022 | 15.5% | 0.0% | $15,022 |
| 4.0 | 18.5% | 0.0% | $17,929 | 18.5% | 0.0% | $17,929 |
| 5.0 | 21.3% | 0.0% | $20,643 | 21.3% | 0.0% | $20,643 |
| 6.0 | 23.9% | 0.0% | $23,163 | 23.9% | 0.0% | $23,163 |
| 7.0 | 26.3% | 0.0% | $25,489 | 26.3% | 0.0% | $25,489 |
| 8.0 | 28.4% | 0.0% | $27,524 | 28.4% | 0.0% | $27,524 |
| 9.0 | 30.3% | 0.0% | $29,365 | 30.3% | 0.0% | $29,365 |
| 10.0 | 32.0% | 0.0% | $31,013 | 32.0% | 0.0% | $31,013 |
| 11.0 | 33.4% | 0.0% | $32,370 | 33.4% | 0.0% | $32,370 |
| 12.0 | 34.7% | 0.0% | $33,630 | 34.7% | 0.0% | $33,630 |
| 13.0 | 35.6% | 0.0% | $34,502 | 35.6% | 0.0% | $34,502 |
| 14.0 | 36.4% | 0.0% | $35,277 | 36.4% | 0.0% | $35,277 |
| 15.0 | 36.9% | 0.0% | $35,762 | 36.9% | 0.0% | $35,762 |
| 16.0 | 37.2% | 0.0% | $36,052 | 37.2% | 0.0% | $36,052 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Displacement | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $2,770 | 45.0 | | $2,770 |
| 2.0 | 90.0 | | $5,539 | 90.0 | | $5,539 |
| 3.0 | 135.0 | | $8,309 | 135.0 | | $8,309 |
| 4.0 | 180.0 | | $11,078 | 180.0 | | $11,078 |
| 5.0 | 225.0 | | $13,848 | 225.0 | | $13,848 |
| 6.0 | 270.0 | | $16,617 | 270.0 | | $16,617 |
| 7.0 | 315.0 | | $19,387 | 315.0 | | $19,387 |
| 8.0 | 360.0 | | $22,156 | 360.0 | | $22,156 |
| 9.0 | 405.0 | | $24,926 | 405.0 | | $24,926 |
| 10.0 | 450.0 | | $27,695 | 450.0 | | $27,695 |
| 11.0 | 495.0 | | $30,465 | 495.0 | | $30,465 |
| 12.0 | 540.0 | | $33,234 | 540.0 | | $33,234 |
| 13.0 | 585.0 | | $36,004 | 585.0 | | $36,004 |
| 14.0 | 630.0 | | $38,773 | 630.0 | | $38,773 |
| 15.0 | 675.0 | | $41,543 | 675.0 | | $41,543 |
| 16.0 | 720.0 | | $44,313 | 720.0 | | $44,313 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using USACE Generic**

| **Loss of Function** | **Before Mitigation Values:** | | | **After Mitigation Values:** | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $0 | 45.0 | | $0 |
| 2.0 | 90.0 | | $0 | 90.0 | | $0 |
| 3.0 | 135.0 | | $0 | 135.0 | | $0 |
| 4.0 | 180.0 | | $0 | 180.0 | | $0 |
| 5.0 | 225.0 | | $0 | 225.0 | | $0 |
| 6.0 | 270.0 | | $0 | 270.0 | | $0 |
| 7.0 | 315.0 | | $0 | 315.0 | | $0 |
| 8.0 | 360.0 | | $0 | 360.0 | | $0 |
| 9.0 | 405.0 | | $0 | 405.0 | | $0 |
| 10.0 | 450.0 | | $0 | 450.0 | | $0 |
| 11.0 | 495.0 | | $0 | 495.0 | | $0 |
| 12.0 | 540.0 | | $0 | 540.0 | | $0 |
| 13.0 | 585.0 | | $0 | 585.0 | | $0 |
| 14.0 | 630.0 | | $0 | 630.0 | | $0 |
| 15.0 | 675.0 | | $0 | 675.0 | | $0 |
| 16.0 | 720.0 | | $0 | 720.0 | | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Other Benefits

### Other Benefits Before Mitigation

No Data

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Other Benefits After Mitigation**

No Data

## Summary Of Benefits

| Expected Annual Damages Before Mitigation | | Expected Annual Damages After Mitigation | | Expected Avoided Damages After Mitigation (Benefits) | |
|---|---|---|---|---|---|
| Annual: | $2,630 | Annual: | $566 | Annual: | $2,064 |
| Present Value: | $36,291 | Present Value: | $7,807 | Present Value: | $28,484 |

| | | | |
|---|---|---|---|
| Mitigation Benefits: | $28,484 | Mitigation Costs: | $1,090,000 |
| Benefits Minus Costs: | ($1,061,516) | Benefit-Cost Ratio: | 0.03 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Cost Estimate

| | | | |
|---|---|---|---|
| Project Useful Life (years): | 50 | Construction Type: | |
| Mitigation Project Cost: | $1,090,000 | Detailed Scope of Work: | Yes |
| Annual Project Maintenance Cost: | $0 | Detailed Estimate for Entire Project: | Yes |
| Final Mitigation Project Cost: | $1,090,000 | Years of Maintenance: | 50 |
| Cost Basis Year: | | Present Worth of Annual Maintenance Costs: | $0 |
| Construction Start Year: | | Estimate Reflects Current Prices: | Yes |
| Construction End Year: | | Project Escalation: | |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Justification/Attachments

| Field | Description | Attachments |
|---|---|---|

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Structure and Mitigation Details For:** 6 Commonwealth Ave, 6 Commonwealth Ave, Ludlow, Vermont, 05149, Windsor

Benefits: $205,807 Costs: $ BCR: .00

---

Hazard: **Flood**

Mitigation Option: Drainage Improvement

| | | | | | |
|---|---|---|---|---|---|
| Latitude: | | Longitude: | | | |
| Size of Building: | 1,100 | BRV ($/sf): | $81.71 | Total BRV: | $89,881 |
| Residential: | Yes | Building Type: | One-Story | | |
| Obstruction: | N/A | Foundation Type: | Slab | Basement: | Yes |
| Building Primary Use: | | Structure Type: | | Historic Building: | No |
| Structure Elevation: | 1,010.40 | First Floor Being Raised: | | Demolition Threshold: | 50.00% |
| Source of Flood Data: | HH | Project in SFHA: | Unknown | Community ID Number: | |
| Effective FIS Date: | | FIRM Panel Number: | | FIRM Effective Date: | |
| Project Useful Life: | 50 | H&H Study Title: | | H&H Effective Date: | 01/01/1900 |
| Flood Zone: | | | | | |
| Building Contents: | $89,881 (Default) | Loss of Rent: | $0 | Displacement Costs: | $1,584 (Default) |
| Ground Surface Elevation: | | | | One Time Displacement Costs: | $0 |
| Breaking wave height: | | | | Value of Crawlspace Contents: | $0 |
| Height FFE above grade: | 1,010.40 | | | Flood Zone Determination: | |
| | | | | Utilities that are not elevated: | No |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Riverine Elevation and Discharge Data

Streambed Elevation (ft): 1,007.2 Flood Profile Number:

Flood Source Name:

Elevation At Which Barrier Will Be Overtopped:

FEMA Elevation Certificate Diagram Description: Diagram 1A Other Elevation Source:

| Recurrence Interval (yr) | Percent Annual Chance (%) | Elevation Before Mitigation (ft) | Discharge Before Mitigation (cfs) | Elevation After Mitigation (ft) | Discharge After Mitigation (cfs) |
|---|---|---|---|---|---|
| 10 | 10.00% | 1,009.50 | 73.0 | 1,007.40 | 73.0 |
| 50 | 2.00% | 1,010.50 | 115.0 | 1,008.40 | 115.0 |
| 100 | 1.00% | 1,010.70 | 134.0 | 1,008.60 | 134.0 |
| 500 | 0.20% | 1,011.60 | 150.0 | 1,009.50 | 150.0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Building | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 13.8% | 0.0% | $12,404 | 13.8% | 0.0% | $12,404 |
| -1.0 | 19.4% | 0.0% | $17,437 | 19.4% | 0.0% | $17,437 |
| 0.0 | 25.5% | 0.0% | $22,920 | 25.5% | 0.0% | $22,920 |
| 1.0 | 32.0% | 0.0% | $28,762 | 32.0% | 0.0% | $28,762 |
| 2.0 | 38.7% | 0.0% | $34,784 | 38.7% | 0.0% | $34,784 |
| 3.0 | 45.5% | 0.0% | $40,896 | 45.5% | 0.0% | $40,896 |
| 4.0 | 52.2% | 0.0% | $89,881 | 52.2% | 0.0% | $89,881 |
| 5.0 | 58.6% | 0.0% | $89,881 | 58.6% | 0.0% | $89,881 |
| 6.0 | 64.5% | 0.0% | $89,881 | 64.5% | 0.0% | $89,881 |
| 7.0 | 69.8% | 0.0% | $89,881 | 69.8% | 0.0% | $89,881 |
| 8.0 | 74.2% | 0.0% | $89,881 | 74.2% | 0.0% | $89,881 |
| 9.0 | 77.7% | 0.0% | $89,881 | 77.7% | 0.0% | $89,881 |
| 10.0 | 80.1% | 0.0% | $89,881 | 80.1% | 0.0% | $89,881 |
| 11.0 | 81.1% | 0.0% | $89,881 | 81.1% | 0.0% | $89,881 |
| 12.0 | 81.1% | 0.0% | $89,881 | 81.1% | 0.0% | $89,881 |
| 13.0 | 81.1% | 0.0% | $89,881 | 81.1% | 0.0% | $89,881 |
| 14.0 | 81.1% | 0.0% | $89,881 | 81.1% | 0.0% | $89,881 |
| 15.0 | 81.1% | 0.0% | $89,881 | 81.1% | 0.0% | $89,881 |
| 16.0 | 81.1% | 0.0% | $89,881 | 81.1% | 0.0% | $89,881 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| **Contents** | **Before Mitigation Values:** | | | **After Mitigation Values:** | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 10.5% | 0.0% | $9,438 | 10.5% | 0.0% | $9,438 |
| -1.0 | 13.2% | 0.0% | $11,864 | 13.2% | 0.0% | $11,864 |
| 0.0 | 16.0% | 0.0% | $14,381 | 16.0% | 0.0% | $14,381 |
| 1.0 | 18.9% | 0.0% | $16,988 | 18.9% | 0.0% | $16,988 |
| 2.0 | 21.8% | 0.0% | $19,594 | 21.8% | 0.0% | $19,594 |
| 3.0 | 24.7% | 0.0% | $22,201 | 24.7% | 0.0% | $22,201 |
| 4.0 | 27.4% | 0.0% | $24,627 | 27.4% | 0.0% | $24,627 |
| 5.0 | 30.0% | 0.0% | $26,964 | 30.0% | 0.0% | $26,964 |
| 6.0 | 32.4% | 0.0% | $29,121 | 32.4% | 0.0% | $29,121 |
| 7.0 | 34.5% | 0.0% | $31,009 | 34.5% | 0.0% | $31,009 |
| 8.0 | 36.3% | 0.0% | $32,627 | 36.3% | 0.0% | $32,627 |
| 9.0 | 37.7% | 0.0% | $33,885 | 37.7% | 0.0% | $33,885 |
| 10.0 | 38.6% | 0.0% | $34,694 | 38.6% | 0.0% | $34,694 |
| 11.0 | 39.1% | 0.0% | $35,143 | 39.1% | 0.0% | $35,143 |
| 12.0 | 39.1% | 0.0% | $35,143 | 39.1% | 0.0% | $35,143 |
| 13.0 | 39.1% | 0.0% | $35,143 | 39.1% | 0.0% | $35,143 |
| 14.0 | 39.1% | 0.0% | $35,143 | 39.1% | 0.0% | $35,143 |
| 15.0 | 39.1% | 0.0% | $35,143 | 39.1% | 0.0% | $35,143 |
| 16.0 | 39.1% | 0.0% | $35,143 | 39.1% | 0.0% | $35,143 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Displacement | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $2,343 | 45.0 | | $2,343 |
| 2.0 | 90.0 | | $4,687 | 90.0 | | $4,687 |
| 3.0 | 135.0 | | $7,030 | 135.0 | | $7,030 |
| 4.0 | 180.0 | | $9,374 | 180.0 | | $9,374 |
| 5.0 | 225.0 | | $11,717 | 225.0 | | $11,717 |
| 6.0 | 270.0 | | $14,061 | 270.0 | | $14,061 |
| 7.0 | 315.0 | | $16,404 | 315.0 | | $16,404 |
| 8.0 | 360.0 | | $18,748 | 360.0 | | $18,748 |
| 9.0 | 405.0 | | $21,091 | 405.0 | | $21,091 |
| 10.0 | 450.0 | | $23,435 | 450.0 | | $23,435 |
| 11.0 | 495.0 | | $25,778 | 495.0 | | $25,778 |
| 12.0 | 540.0 | | $28,121 | 540.0 | | $28,121 |
| 13.0 | 585.0 | | $30,465 | 585.0 | | $30,465 |
| 14.0 | 630.0 | | $32,808 | 630.0 | | $32,808 |
| 15.0 | 675.0 | | $35,152 | 675.0 | | $35,152 |
| 16.0 | 720.0 | | $37,495 | 720.0 | | $37,495 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using USACE Generic**

| **Loss of Function** | **Before Mitigation Values:** | | | **After Mitigation Values:** | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $0 | 45.0 | | $0 |
| 2.0 | 90.0 | | $0 | 90.0 | | $0 |
| 3.0 | 135.0 | | $0 | 135.0 | | $0 |
| 4.0 | 180.0 | | $0 | 180.0 | | $0 |
| 5.0 | 225.0 | | $0 | 225.0 | | $0 |
| 6.0 | 270.0 | | $0 | 270.0 | | $0 |
| 7.0 | 315.0 | | $0 | 315.0 | | $0 |
| 8.0 | 360.0 | | $0 | 360.0 | | $0 |
| 9.0 | 405.0 | | $0 | 405.0 | | $0 |
| 10.0 | 450.0 | | $0 | 450.0 | | $0 |
| 11.0 | 495.0 | | $0 | 495.0 | | $0 |
| 12.0 | 540.0 | | $0 | 540.0 | | $0 |
| 13.0 | 585.0 | | $0 | 585.0 | | $0 |
| 14.0 | 630.0 | | $0 | 630.0 | | $0 |
| 15.0 | 675.0 | | $0 | 675.0 | | $0 |
| 16.0 | 720.0 | | $0 | 720.0 | | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Other Benefits

### Other Benefits Before Mitigation

No Data

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Other Benefits After Mitigation**

No Data

## Summary Of Benefits

| Expected Annual Damages Before Mitigation | | Expected Annual Damages After Mitigation | | Expected Avoided Damages After Mitigation (Benefits) | |
|---|---|---|---|---|---|
| Annual: | $15,685 | Annual: | $773 | Annual: | $14,912 |
| Present Value: | $216,469 | Present Value: | $10,662 | Present Value: | $205,807 |

| | | | |
|---|---|---|---|
| Mitigation Benefits: | $205,807 | Mitigation Costs: | $0 |
| Benefits Minus Costs: | $205,807 | Benefit-Cost Ratio: | Infinity |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Cost Estimate

| | | | |
|---|---|---|---|
| Project Useful Life (years): | 50 | Construction Type: | |
| Mitigation Project Cost: | $0 | Detailed Scope of Work: | Yes |
| Annual Project Maintenance Cost: | $0 | Detailed Estimate for Entire Project: | Yes |
| Final Mitigation Project Cost: | $0 | Years of Maintenance: | 50 |
| Cost Basis Year: | | Present Worth of Annual Maintenance Costs: | $0 |
| Construction Start Year: | | Estimate Reflects Current Prices: | Yes |
| Construction End Year: | | Project Escalation: | |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Justification/Attachments

| Field | Description | Attachments |
|---|---|---|

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Structure and Mitigation Details For:** 6 Mill Street, 6 Mill Street, Ludlow, Vermont, 05149, Windsor

Benefits: $4,705 Costs: $ BCR: .00

---

Hazard: **Flood**

Mitigation Option: Drainage Improvement

| | | | | | |
|---|---|---|---|---|---|
| Latitude: | | Longitude: | | | |
| Size of Building: | 2,373 | BRV ($/sf): | $66.57 | Total BRV: | $157,971 |
| Residential: | No | Building Type: | | | |
| Obstruction: | N/A | Foundation Type: | Slab | Basement: | |
| Building Primary Use: | Office One-Story | Structure Type: | Engineered | Historic Building: | No |

| | | | | | |
|---|---|---|---|---|---|
| Structure Elevation: | 986.90 | First Floor Being Raised: | | Demolition Threshold: | 50.00% |
| Source of Flood Data: | HH | Project in SFHA: | Unknown | Community ID Number: | |
| Effective FIS Date: | | FIRM Panel Number: | | FIRM Effective Date: | |
| Project Useful Life: | 50 | H&H Study Title: | | H&H Effective Date: | 01/01/1900 |
| Flood Zone: | | | | | |
| Building Contents: | $18,956 (Default) | Loss of Rent: | $0 | Displacement Costs: | $3,417 |
| Ground Surface Elevation: | | | | One Time Displacement Costs: | $0 |
| Breaking wave height: | | | | Value of Crawlspace Contents: | $0 |
| Height FFE above grade: | 986.90 | | | Flood Zone Determination: | |
| | | | | Utilities that are not elevated: | No |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Riverine Elevation and Discharge Data

Streambed Elevation (ft): 978.0 Flood Profile Number:

Flood Source Name:

Elevation At Which Barrier Will Be Overtopped:

FEMA Elevation Certificate Diagram Description: Diagram 1A Other Elevation Source:

| Recurrence Interval (yr) | Percent Annual Chance (%) | Elevation Before Mitigation (ft) | Discharge Before Mitigation (cfs) | Elevation After Mitigation (ft) | Discharge After Mitigation (cfs) |
|---|---|---|---|---|---|
| 10 | 10.00% | 983.30 | 73.0 | 978.20 | 73.0 |
| 50 | 2.00% | 988.00 | 115.0 | 982.90 | 115.0 |
| 100 | 1.00% | 988.00 | 134.0 | 982.90 | 134.0 |
| 500 | 0.20% | 988.40 | 150.0 | 983.30 | 150.0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using Office One-Story (Default)**

| **Building** | **Before Mitigation Values:** | | | **After Mitigation Values:** | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 0.4% | 0.0% | $632 | 0.4% | 0.0% | $632 |
| -1.0 | 0.4% | 0.0% | $632 | 0.4% | 0.0% | $632 |
| 0.0 | 0.9% | 0.0% | $1,422 | 0.9% | 0.0% | $1,422 |
| 1.0 | 12.3% | 0.0% | $19,430 | 12.3% | 0.0% | $19,430 |
| 2.0 | 17.5% | 0.0% | $27,645 | 17.5% | 0.0% | $27,645 |
| 3.0 | 22.2% | 0.0% | $35,069 | 22.2% | 0.0% | $35,069 |
| 4.0 | 26.8% | 0.0% | $42,336 | 26.8% | 0.0% | $42,336 |
| 5.0 | 30.7% | 0.0% | $48,497 | 30.7% | 0.0% | $48,497 |
| 6.0 | 34.7% | 0.0% | $54,816 | 34.7% | 0.0% | $54,816 |
| 7.0 | 41.2% | 0.0% | $65,084 | 41.2% | 0.0% | $65,084 |
| 8.0 | 46.5% | 0.0% | $73,456 | 46.5% | 0.0% | $73,456 |
| 9.0 | 49.4% | 0.0% | $78,037 | 49.4% | 0.0% | $78,037 |
| 10.0 | 53.6% | 0.0% | $157,971 | 53.6% | 0.0% | $157,971 |
| 11.0 | 53.6% | 0.0% | $157,971 | 53.6% | 0.0% | $157,971 |
| 12.0 | 53.6% | 0.0% | $157,971 | 53.6% | 0.0% | $157,971 |
| 13.0 | 53.6% | 0.0% | $157,971 | 53.6% | 0.0% | $157,971 |
| 14.0 | 53.6% | 0.0% | $157,971 | 53.6% | 0.0% | $157,971 |
| 15.0 | 53.6% | 0.0% | $157,971 | 53.6% | 0.0% | $157,971 |
| 16.0 | 53.6% | 0.0% | $157,971 | 53.6% | 0.0% | $157,971 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using Office One-Story (Default)**

| **Contents** | **Before Mitigation Values:** | | | **After Mitigation Values:** | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 1.0% | 0.0% | $190 | 1.0% | 0.0% | $190 |
| -1.0 | 1.0% | 0.0% | $190 | 1.0% | 0.0% | $190 |
| 0.0 | 1.0% | 0.0% | $190 | 1.0% | 0.0% | $190 |
| 1.0 | 20.0% | 0.0% | $3,791 | 20.0% | 0.0% | $3,791 |
| 2.0 | 34.0% | 0.0% | $6,445 | 34.0% | 0.0% | $6,445 |
| 3.0 | 45.0% | 0.0% | $8,530 | 45.0% | 0.0% | $8,530 |
| 4.0 | 55.0% | 0.0% | $10,426 | 55.0% | 0.0% | $10,426 |
| 5.0 | 64.0% | 0.0% | $12,132 | 64.0% | 0.0% | $12,132 |
| 6.0 | 73.0% | 0.0% | $13,838 | 73.0% | 0.0% | $13,838 |
| 7.0 | 76.0% | 0.0% | $14,407 | 76.0% | 0.0% | $14,407 |
| 8.0 | 83.0% | 0.0% | $15,734 | 83.0% | 0.0% | $15,734 |
| 9.0 | 89.0% | 0.0% | $16,871 | 89.0% | 0.0% | $16,871 |
| 10.0 | 91.0% | 0.0% | $17,250 | 91.0% | 0.0% | $17,250 |
| 11.0 | 91.0% | 0.0% | $17,250 | 91.0% | 0.0% | $17,250 |
| 12.0 | 91.0% | 0.0% | $17,250 | 91.0% | 0.0% | $17,250 |
| 13.0 | 91.0% | 0.0% | $17,250 | 91.0% | 0.0% | $17,250 |
| 14.0 | 91.0% | 0.0% | $17,250 | 91.0% | 0.0% | $17,250 |
| 15.0 | 91.0% | 0.0% | $17,250 | 91.0% | 0.0% | $17,250 |
| 16.0 | 91.0% | 0.0% | $17,250 | 91.0% | 0.0% | $17,250 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using Office One-Story (Default)**

| **Displacement** | **Before Mitigation Values:** | | | **After Mitigation Values:** | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $5,055 | 45.0 | | $5,055 |
| 2.0 | 90.0 | | $10,111 | 90.0 | | $10,111 |
| 3.0 | 135.0 | | $15,166 | 135.0 | | $15,166 |
| 4.0 | 180.0 | | $20,222 | 180.0 | | $20,222 |
| 5.0 | 225.0 | | $25,277 | 225.0 | | $25,277 |
| 6.0 | 270.0 | | $30,333 | 270.0 | | $30,333 |
| 7.0 | 315.0 | | $35,388 | 315.0 | | $35,388 |
| 8.0 | 360.0 | | $40,444 | 360.0 | | $40,444 |
| 9.0 | 405.0 | | $45,499 | 405.0 | | $45,499 |
| 10.0 | 450.0 | | $50,555 | 450.0 | | $50,555 |
| 11.0 | 450.0 | | $50,555 | 450.0 | | $50,555 |
| 12.0 | 450.0 | | $50,555 | 450.0 | | $50,555 |
| 13.0 | 450.0 | | $50,555 | 450.0 | | $50,555 |
| 14.0 | 450.0 | | $50,555 | 450.0 | | $50,555 |
| 15.0 | 450.0 | | $50,555 | 450.0 | | $50,555 |
| 16.0 | 450.0 | | $50,555 | 450.0 | | $50,555 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using Office One-Story (Default)**

| Loss of Function | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $0 | 45.0 | | $0 |
| 2.0 | 90.0 | | $0 | 90.0 | | $0 |
| 3.0 | 135.0 | | $0 | 135.0 | | $0 |
| 4.0 | 180.0 | | $0 | 180.0 | | $0 |
| 5.0 | 225.0 | | $0 | 225.0 | | $0 |
| 6.0 | 270.0 | | $0 | 270.0 | | $0 |
| 7.0 | 315.0 | | $0 | 315.0 | | $0 |
| 8.0 | 360.0 | | $0 | 360.0 | | $0 |
| 9.0 | 405.0 | | $0 | 405.0 | | $0 |
| 10.0 | 450.0 | | $0 | 450.0 | | $0 |
| 11.0 | 450.0 | | $0 | 450.0 | | $0 |
| 12.0 | 450.0 | | $0 | 450.0 | | $0 |
| 13.0 | 450.0 | | $0 | 450.0 | | $0 |
| 14.0 | 450.0 | | $0 | 450.0 | | $0 |
| 15.0 | 450.0 | | $0 | 450.0 | | $0 |
| 16.0 | 450.0 | | $0 | 450.0 | | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Other Benefits

### Other Benefits Before Mitigation

No Data

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Other Benefits After Mitigation**

No Data

## Loss of Services

**Service Types Provided by Facility:**

| Service Name | Annual Budget ($) |
|---|---|
| Total Annual Budget | |

## Summary Of Benefits

| Expected Annual Damages Before Mitigation | | Expected Annual Damages After Mitigation | | Expected Avoided Damages After Mitigation (Benefits) | |
|---|---|---|---|---|---|
| Annual: | $947 | Annual: | $606 | Annual: | $341 |
| Present Value: | $13,067 | Present Value: | $8,362 | Present Value: | $4,705 |

Mitigation Benefits: $4,705 Mitigation Costs: $0

Benefits Minus Costs: $4,705 Benefit-Cost Ratio: Infinity

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Cost Estimate

| | | | |
|---|---|---|---|
| Project Useful Life (years): | 50 | Construction Type: | |
| Mitigation Project Cost: | $0 | Detailed Scope of Work: | Yes |
| Annual Project Maintenance Cost: | $0 | Detailed Estimate for Entire Project: | Yes |
| Final Mitigation Project Cost: | $0 | Years of Maintenance: | 50 |
| Cost Basis Year: | | Present Worth of Annual Maintenance Costs: | $0 |
| Construction Start Year: | | Estimate Reflects Current Prices: | Yes |
| Construction End Year: | | Project Escalation: | |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Justification/Attachments

| Field | Description | Attachments |
|---|---|---|

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Structure and Mitigation Details For:** 66 Main Street, 66 Main Street, Ludlow, Vermont, 05149, Windsor

Benefits: $70,981 Costs: $ BCR: .00

---

Hazard: **Flood**

Mitigation Option: Drainage Improvement

| | | | | | |
|---|---|---|---|---|---|
| Latitude: | | Longitude: | | | |
| Size of Building: | 4,222 | BRV ($/sf): | $62.67 | Total BRV: | $264,593 |
| Residential: | Yes | Building Type: | Two or More Stories | | |
| Obstruction: | N/A | Foundation Type: | Slab | Basement: | Yes |
| Building Primary Use: | | Structure Type: | | Historic Building: | No |
| Structure Elevation: | 1,000.20 | First Floor Being Raised: | | Demolition Threshold: | 50.00% |
| Source of Flood Data: | HH | Project in SFHA: | Unknown | Community ID Number: | |
| Effective FIS Date: | | FIRM Panel Number: | | FIRM Effective Date: | |
| Project Useful Life: | 50 | H&H Study Title: | | H&H Effective Date: | 01/01/1900 |
| Flood Zone: | | | | | |
| Building Contents: | $264,593 (Default) | Loss of Rent: | $0 | Displacement Costs: | $6,080 (Default) |
| Ground Surface Elevation: | | | | One Time Displacement Costs: | $0 |
| Breaking wave height: | | | | Value of Crawlspace Contents: | $0 |
| Height FFE above grade: | 1,000.20 | | | Flood Zone Determination: | |
| | | | | Utilities that are not elevated: | No |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Riverine Elevation and Discharge Data

Streambed Elevation (ft): 996.1 Flood Profile Number:

Flood Source Name:

Elevation At Which Barrier Will Be Overtopped:

FEMA Elevation Certificate Diagram Description: Diagram 1A Other Elevation Source:

| Recurrence Interval (yr) | Percent Annual Chance (%) | Elevation Before Mitigation (ft) | Discharge Before Mitigation (cfs) | Elevation After Mitigation (ft) | Discharge After Mitigation (cfs) |
|---|---|---|---|---|---|
| 10 | 10.00% | 998.10 | 73.0 | 996.30 | 73.0 |
| 50 | 2.00% | 999.20 | 115.0 | 997.40 | 115.0 |
| 100 | 1.00% | 999.50 | 134.0 | 997.70 | 134.0 |
| 500 | 0.20% | 999.90 | 150.0 | 998.10 | 150.0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Building | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 10.2% | 0.0% | $26,988 | 10.2% | 0.0% | $26,988 |
| -1.0 | 13.9% | 0.0% | $36,778 | 13.9% | 0.0% | $36,778 |
| 0.0 | 17.9% | 0.0% | $47,362 | 17.9% | 0.0% | $47,362 |
| 1.0 | 22.3% | 0.0% | $59,004 | 22.3% | 0.0% | $59,004 |
| 2.0 | 27.0% | 0.0% | $71,440 | 27.0% | 0.0% | $71,440 |
| 3.0 | 31.9% | 0.0% | $84,405 | 31.9% | 0.0% | $84,405 |
| 4.0 | 36.9% | 0.0% | $97,635 | 36.9% | 0.0% | $97,635 |
| 5.0 | 41.9% | 0.0% | $110,864 | 41.9% | 0.0% | $110,864 |
| 6.0 | 46.9% | 0.0% | $124,094 | 46.9% | 0.0% | $124,094 |
| 7.0 | 51.8% | 0.0% | $264,593 | 51.8% | 0.0% | $264,593 |
| 8.0 | 56.4% | 0.0% | $264,593 | 56.4% | 0.0% | $264,593 |
| 9.0 | 60.8% | 0.0% | $264,593 | 60.8% | 0.0% | $264,593 |
| 10.0 | 64.8% | 0.0% | $264,593 | 64.8% | 0.0% | $264,593 |
| 11.0 | 68.4% | 0.0% | $264,593 | 68.4% | 0.0% | $264,593 |
| 12.0 | 71.4% | 0.0% | $264,593 | 71.4% | 0.0% | $264,593 |
| 13.0 | 73.7% | 0.0% | $264,593 | 73.7% | 0.0% | $264,593 |
| 14.0 | 75.4% | 0.0% | $264,593 | 75.4% | 0.0% | $264,593 |
| 15.0 | 76.4% | 0.0% | $264,593 | 76.4% | 0.0% | $264,593 |
| 16.0 | 76.4% | 0.0% | $264,593 | 76.4% | 0.0% | $264,593 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Contents | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 8.4% | 0.0% | $22,226 | 8.4% | 0.0% | $22,226 |
| -1.0 | 10.1% | 0.0% | $26,724 | 10.1% | 0.0% | $26,724 |
| 0.0 | 11.9% | 0.0% | $31,487 | 11.9% | 0.0% | $31,487 |
| 1.0 | 13.8% | 0.0% | $36,514 | 13.8% | 0.0% | $36,514 |
| 2.0 | 15.7% | 0.0% | $41,541 | 15.7% | 0.0% | $41,541 |
| 3.0 | 17.7% | 0.0% | $46,833 | 17.7% | 0.0% | $46,833 |
| 4.0 | 19.8% | 0.0% | $52,389 | 19.8% | 0.0% | $52,389 |
| 5.0 | 22.0% | 0.0% | $58,210 | 22.0% | 0.0% | $58,210 |
| 6.0 | 24.3% | 0.0% | $64,296 | 24.3% | 0.0% | $64,296 |
| 7.0 | 26.7% | 0.0% | $70,646 | 26.7% | 0.0% | $70,646 |
| 8.0 | 29.1% | 0.0% | $76,996 | 29.1% | 0.0% | $76,996 |
| 9.0 | 31.7% | 0.0% | $83,876 | 31.7% | 0.0% | $83,876 |
| 10.0 | 34.4% | 0.0% | $91,020 | 34.4% | 0.0% | $91,020 |
| 11.0 | 37.2% | 0.0% | $98,429 | 37.2% | 0.0% | $98,429 |
| 12.0 | 40.0% | 0.0% | $105,837 | 40.0% | 0.0% | $105,837 |
| 13.0 | 43.0% | 0.0% | $113,775 | 43.0% | 0.0% | $113,775 |
| 14.0 | 46.1% | 0.0% | $121,977 | 46.1% | 0.0% | $121,977 |
| 15.0 | 49.3% | 0.0% | $130,444 | 49.3% | 0.0% | $130,444 |
| 16.0 | 52.6% | 0.0% | $139,176 | 52.6% | 0.0% | $139,176 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Displacement | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $8,995 | 45.0 | | $8,995 |
| 2.0 | 90.0 | | $17,989 | 90.0 | | $17,989 |
| 3.0 | 135.0 | | $26,984 | 135.0 | | $26,984 |
| 4.0 | 180.0 | | $35,978 | 180.0 | | $35,978 |
| 5.0 | 225.0 | | $44,973 | 225.0 | | $44,973 |
| 6.0 | 270.0 | | $53,968 | 270.0 | | $53,968 |
| 7.0 | 315.0 | | $62,962 | 315.0 | | $62,962 |
| 8.0 | 360.0 | | $71,957 | 360.0 | | $71,957 |
| 9.0 | 405.0 | | $80,951 | 405.0 | | $80,951 |
| 10.0 | 450.0 | | $89,946 | 450.0 | | $89,946 |
| 11.0 | 495.0 | | $98,941 | 495.0 | | $98,941 |
| 12.0 | 540.0 | | $107,935 | 540.0 | | $107,935 |
| 13.0 | 585.0 | | $116,930 | 585.0 | | $116,930 |
| 14.0 | 630.0 | | $125,924 | 630.0 | | $125,924 |
| 15.0 | 675.0 | | $134,919 | 675.0 | | $134,919 |
| 16.0 | 720.0 | | $143,914 | 720.0 | | $143,914 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using USACE Generic**

| Loss of Function | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $0 | 45.0 | | $0 |
| 2.0 | 90.0 | | $0 | 90.0 | | $0 |
| 3.0 | 135.0 | | $0 | 135.0 | | $0 |
| 4.0 | 180.0 | | $0 | 180.0 | | $0 |
| 5.0 | 225.0 | | $0 | 225.0 | | $0 |
| 6.0 | 270.0 | | $0 | 270.0 | | $0 |
| 7.0 | 315.0 | | $0 | 315.0 | | $0 |
| 8.0 | 360.0 | | $0 | 360.0 | | $0 |
| 9.0 | 405.0 | | $0 | 405.0 | | $0 |
| 10.0 | 450.0 | | $0 | 450.0 | | $0 |
| 11.0 | 495.0 | | $0 | 495.0 | | $0 |
| 12.0 | 540.0 | | $0 | 540.0 | | $0 |
| 13.0 | 585.0 | | $0 | 585.0 | | $0 |
| 14.0 | 630.0 | | $0 | 630.0 | | $0 |
| 15.0 | 675.0 | | $0 | 675.0 | | $0 |
| 16.0 | 720.0 | | $0 | 720.0 | | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Other Benefits

### Other Benefits Before Mitigation

No Data

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Other Benefits After Mitigation**

No Data

## Summary Of Benefits

| Expected Annual Damages Before Mitigation | | Expected Annual Damages After Mitigation | | Expected Avoided Damages After Mitigation (Benefits) | |
|---|---|---|---|---|---|
| Annual: | $6,402 | Annual: | $1,258 | Annual: | $5,144 |
| Present Value: | $88,346 | Present Value: | $17,365 | Present Value: | $70,981 |

Mitigation Benefits: $70,981 Mitigation Costs: $0

Benefits Minus Costs: $70,981 Benefit-Cost Ratio: Infinity

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Cost Estimate

| | | | |
|---|---|---|---|
| Project Useful Life (years): | 50 | Construction Type: | |
| Mitigation Project Cost: | $0 | Detailed Scope of Work: | Yes |
| Annual Project Maintenance Cost: | $0 | Detailed Estimate for Entire Project: | Yes |
| Final Mitigation Project Cost: | $0 | Years of Maintenance: | 50 |
| Cost Basis Year: | | Present Worth of Annual Maintenance Costs: | $0 |
| Construction Start Year: | | Estimate Reflects Current Prices: | Yes |
| Construction End Year: | | Project Escalation: | |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Justification/Attachments

| Field | Description | Attachments |
|---|---|---|

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Structure and Mitigation Details For:** 72 Main Street, 72 Main Street, Ludlow, Vermont, 05149, Windsor

Benefits: $60,677 Costs: $ BCR: .00

---

Hazard: **Flood**

Mitigation Option: Drainage Improvement

| | | | | | |
|---|---|---|---|---|---|
| Latitude: | | Longitude: | | | |
| Size of Building: | 3,041 | BRV ($/sf): | $68.01 | Total BRV: | $206,818 |
| Residential: | Yes | Building Type: | One-Story | | |
| Obstruction: | N/A | Foundation Type: | Slab | Basement: | Yes |
| Building Primary Use: | | Structure Type: | | Historic Building: | No |
| Structure Elevation: | 1,002.30 | First Floor Being Raised: | | Demolition Threshold: | 50.00% |
| Source of Flood Data: | HH | Project in SFHA: | Unknown | Community ID Number: | |
| Effective FIS Date: | | FIRM Panel Number: | | FIRM Effective Date: | |
| Project Useful Life: | 50 | H&H Study Title: | | H&H Effective Date: | 01/01/1900 |
| Flood Zone: | | | | | |
| Building Contents: | $206,818 (Default) | Loss of Rent: | $0 | Displacement Costs: | $4,379 (Default) |
| Ground Surface Elevation: | | | | One Time Displacement Costs: | $0 |
| Breaking wave height: | | | | Value of Crawlspace Contents: | $0 |
| Height FFE above grade: | 1,002.30 | | | Flood Zone Determination: | |
| | | | | Utilities that are not elevated: | No |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Riverine Elevation and Discharge Data

Streambed Elevation (ft): 998.1 Flood Profile Number:

Flood Source Name:

Elevation At Which Barrier Will Be Overtopped:

FEMA Elevation Certificate Diagram Description: Diagram 1A Other Elevation Source:

| Recurrence Interval (yr) | Percent Annual Chance (%) | Elevation Before Mitigation (ft) | Discharge Before Mitigation (cfs) | Elevation After Mitigation (ft) | Discharge After Mitigation (cfs) |
|---|---|---|---|---|---|
| 10 | 10.00% | 1,000.10 | 73.0 | 998.30 | 73.0 |
| 50 | 2.00% | 1,001.20 | 115.0 | 999.40 | 115.0 |
| 100 | 1.00% | 1,001.50 | 134.0 | 999.70 | 134.0 |
| 500 | 0.20% | 1,001.90 | 150.0 | 1,000.10 | 150.0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Building | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 13.8% | 0.0% | $28,541 | 13.8% | 0.0% | $28,541 |
| -1.0 | 19.4% | 0.0% | $40,123 | 19.4% | 0.0% | $40,123 |
| 0.0 | 25.5% | 0.0% | $52,739 | 25.5% | 0.0% | $52,739 |
| 1.0 | 32.0% | 0.0% | $66,182 | 32.0% | 0.0% | $66,182 |
| 2.0 | 38.7% | 0.0% | $80,039 | 38.7% | 0.0% | $80,039 |
| 3.0 | 45.5% | 0.0% | $94,102 | 45.5% | 0.0% | $94,102 |
| 4.0 | 52.2% | 0.0% | $206,818 | 52.2% | 0.0% | $206,818 |
| 5.0 | 58.6% | 0.0% | $206,818 | 58.6% | 0.0% | $206,818 |
| 6.0 | 64.5% | 0.0% | $206,818 | 64.5% | 0.0% | $206,818 |
| 7.0 | 69.8% | 0.0% | $206,818 | 69.8% | 0.0% | $206,818 |
| 8.0 | 74.2% | 0.0% | $206,818 | 74.2% | 0.0% | $206,818 |
| 9.0 | 77.7% | 0.0% | $206,818 | 77.7% | 0.0% | $206,818 |
| 10.0 | 80.1% | 0.0% | $206,818 | 80.1% | 0.0% | $206,818 |
| 11.0 | 81.1% | 0.0% | $206,818 | 81.1% | 0.0% | $206,818 |
| 12.0 | 81.1% | 0.0% | $206,818 | 81.1% | 0.0% | $206,818 |
| 13.0 | 81.1% | 0.0% | $206,818 | 81.1% | 0.0% | $206,818 |
| 14.0 | 81.1% | 0.0% | $206,818 | 81.1% | 0.0% | $206,818 |
| 15.0 | 81.1% | 0.0% | $206,818 | 81.1% | 0.0% | $206,818 |
| 16.0 | 81.1% | 0.0% | $206,818 | 81.1% | 0.0% | $206,818 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Contents | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 10.5% | 0.0% | $21,716 | 10.5% | 0.0% | $21,716 |
| -1.0 | 13.2% | 0.0% | $27,300 | 13.2% | 0.0% | $27,300 |
| 0.0 | 16.0% | 0.0% | $33,091 | 16.0% | 0.0% | $33,091 |
| 1.0 | 18.9% | 0.0% | $39,089 | 18.9% | 0.0% | $39,089 |
| 2.0 | 21.8% | 0.0% | $45,086 | 21.8% | 0.0% | $45,086 |
| 3.0 | 24.7% | 0.0% | $51,084 | 24.7% | 0.0% | $51,084 |
| 4.0 | 27.4% | 0.0% | $56,668 | 27.4% | 0.0% | $56,668 |
| 5.0 | 30.0% | 0.0% | $62,046 | 30.0% | 0.0% | $62,046 |
| 6.0 | 32.4% | 0.0% | $67,009 | 32.4% | 0.0% | $67,009 |
| 7.0 | 34.5% | 0.0% | $71,352 | 34.5% | 0.0% | $71,352 |
| 8.0 | 36.3% | 0.0% | $75,075 | 36.3% | 0.0% | $75,075 |
| 9.0 | 37.7% | 0.0% | $77,971 | 37.7% | 0.0% | $77,971 |
| 10.0 | 38.6% | 0.0% | $79,832 | 38.6% | 0.0% | $79,832 |
| 11.0 | 39.1% | 0.0% | $80,866 | 39.1% | 0.0% | $80,866 |
| 12.0 | 39.1% | 0.0% | $80,866 | 39.1% | 0.0% | $80,866 |
| 13.0 | 39.1% | 0.0% | $80,866 | 39.1% | 0.0% | $80,866 |
| 14.0 | 39.1% | 0.0% | $80,866 | 39.1% | 0.0% | $80,866 |
| 15.0 | 39.1% | 0.0% | $80,866 | 39.1% | 0.0% | $80,866 |
| 16.0 | 39.1% | 0.0% | $80,866 | 39.1% | 0.0% | $80,866 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Displacement | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $6,479 | 45.0 | | $6,479 |
| 2.0 | 90.0 | | $12,957 | 90.0 | | $12,957 |
| 3.0 | 135.0 | | $19,436 | 135.0 | | $19,436 |
| 4.0 | 180.0 | | $25,914 | 180.0 | | $25,914 |
| 5.0 | 225.0 | | $32,393 | 225.0 | | $32,393 |
| 6.0 | 270.0 | | $38,871 | 270.0 | | $38,871 |
| 7.0 | 315.0 | | $45,350 | 315.0 | | $45,350 |
| 8.0 | 360.0 | | $51,829 | 360.0 | | $51,829 |
| 9.0 | 405.0 | | $58,307 | 405.0 | | $58,307 |
| 10.0 | 450.0 | | $64,786 | 450.0 | | $64,786 |
| 11.0 | 495.0 | | $71,264 | 495.0 | | $71,264 |
| 12.0 | 540.0 | | $77,743 | 540.0 | | $77,743 |
| 13.0 | 585.0 | | $84,222 | 585.0 | | $84,222 |
| 14.0 | 630.0 | | $90,700 | 630.0 | | $90,700 |
| 15.0 | 675.0 | | $97,179 | 675.0 | | $97,179 |
| 16.0 | 720.0 | | $103,657 | 720.0 | | $103,657 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using USACE Generic**

| Loss of Function | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $0 | 45.0 | | $0 |
| 2.0 | 90.0 | | $0 | 90.0 | | $0 |
| 3.0 | 135.0 | | $0 | 135.0 | | $0 |
| 4.0 | 180.0 | | $0 | 180.0 | | $0 |
| 5.0 | 225.0 | | $0 | 225.0 | | $0 |
| 6.0 | 270.0 | | $0 | 270.0 | | $0 |
| 7.0 | 315.0 | | $0 | 315.0 | | $0 |
| 8.0 | 360.0 | | $0 | 360.0 | | $0 |
| 9.0 | 405.0 | | $0 | 405.0 | | $0 |
| 10.0 | 450.0 | | $0 | 450.0 | | $0 |
| 11.0 | 495.0 | | $0 | 495.0 | | $0 |
| 12.0 | 540.0 | | $0 | 540.0 | | $0 |
| 13.0 | 585.0 | | $0 | 585.0 | | $0 |
| 14.0 | 630.0 | | $0 | 630.0 | | $0 |
| 15.0 | 675.0 | | $0 | 675.0 | | $0 |
| 16.0 | 720.0 | | $0 | 720.0 | | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Other Benefits

### Other Benefits Before Mitigation

No Data

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Other Benefits After Mitigation**

No Data

## Summary Of Benefits

| Expected Annual Damages Before Mitigation | | Expected Annual Damages After Mitigation | | Expected Avoided Damages After Mitigation (Benefits) | |
|---|---|---|---|---|---|
| Annual: | $5,379 | Annual: | $982 | Annual: | $4,397 |
| Present Value: | $74,230 | Present Value: | $13,553 | Present Value: | $60,677 |

| | | | |
|---|---|---|---|
| Mitigation Benefits: | $60,677 | Mitigation Costs: | $0 |
| Benefits Minus Costs: | $60,677 | Benefit-Cost Ratio: | Infinity |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Cost Estimate

| | | | |
|---|---|---|---|
| Project Useful Life (years): | 50 | Construction Type: | |
| Mitigation Project Cost: | $0 | Detailed Scope of Work: | Yes |
| Annual Project Maintenance Cost: | $0 | Detailed Estimate for Entire Project: | Yes |
| Final Mitigation Project Cost: | $0 | Years of Maintenance: | 50 |
| Cost Basis Year: | | Present Worth of Annual Maintenance Costs: | $0 |
| Construction Start Year: | | Estimate Reflects Current Prices: | Yes |
| Construction End Year: | | Project Escalation: | |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Justification/Attachments

| Field | Description | Attachments |
|---|---|---|

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Structure and Mitigation Details For:** 74 Main Street, 74 Main Street, Ludlow, Vermont, 05149, Windsor

Benefits: $94,246 Costs: $ BCR: .00

---

Hazard: **Flood**

Mitigation Option: Drainage Improvement

| | | | | | |
|---|---|---|---|---|---|
| Latitude: | | Longitude: | | | |
| Size of Building: | 1,756 | BRV ($/sf): | $70.71 | Total BRV: | $124,167 |
| Residential: | Yes | Building Type: | Two or More Stories | | |
| Obstruction: | N/A | Foundation Type: | Slab | Basement: | Yes |
| Building Primary Use: | | Structure Type: | | Historic Building: | No |
| Structure Elevation: | 1,002.40 | First Floor Being Raised: | | Demolition Threshold: | 50.00% |
| Source of Flood Data: | HH | Project in SFHA: | Unknown | Community ID Number: | |
| Effective FIS Date: | | FIRM Panel Number: | | FIRM Effective Date: | |
| Project Useful Life: | 50 | H&H Study Title: | | H&H Effective Date: | 01/01/1900 |
| Flood Zone: | | | | | |
| Building Contents: | $124,167 (Default) | Loss of Rent: | $0 | Displacement Costs: | $2,529 (Default) |
| Ground Surface Elevation: | | | | One Time Displacement Costs: | $0 |
| Breaking wave height: | | | | Value of Crawlspace Contents: | $0 |
| Height FFE above grade: | 1,002.40 | | | Flood Zone Determination: | |
| | | | | Utilities that are not elevated: | No |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Riverine Elevation and Discharge Data

Streambed Elevation (ft): 998.9 Flood Profile Number:

Flood Source Name:

Elevation At Which Barrier Will Be Overtopped:

FEMA Elevation Certificate Diagram Description: Diagram 1A Other Elevation Source:

| Recurrence Interval (yr) | Percent Annual Chance (%) | Elevation Before Mitigation (ft) | Discharge Before Mitigation (cfs) | Elevation After Mitigation (ft) | Discharge After Mitigation (cfs) |
|---|---|---|---|---|---|
| 10 | 10.00% | 1,000.90 | 73.0 | 999.10 | 73.0 |
| 50 | 2.00% | 1,002.00 | 115.0 | 1,000.20 | 115.0 |
| 100 | 1.00% | 1,002.30 | 134.0 | 1,000.50 | 134.0 |
| 500 | 0.20% | 1,002.70 | 150.0 | 1,000.90 | 150.0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Building | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 10.2% | 0.0% | $12,665 | 10.2% | 0.0% | $12,665 |
| -1.0 | 13.9% | 0.0% | $17,259 | 13.9% | 0.0% | $17,259 |
| 0.0 | 17.9% | 0.0% | $22,226 | 17.9% | 0.0% | $22,226 |
| 1.0 | 22.3% | 0.0% | $27,689 | 22.3% | 0.0% | $27,689 |
| 2.0 | 27.0% | 0.0% | $33,525 | 27.0% | 0.0% | $33,525 |
| 3.0 | 31.9% | 0.0% | $39,609 | 31.9% | 0.0% | $39,609 |
| 4.0 | 36.9% | 0.0% | $45,818 | 36.9% | 0.0% | $45,818 |
| 5.0 | 41.9% | 0.0% | $52,026 | 41.9% | 0.0% | $52,026 |
| 6.0 | 46.9% | 0.0% | $58,234 | 46.9% | 0.0% | $58,234 |
| 7.0 | 51.8% | 0.0% | $124,167 | 51.8% | 0.0% | $124,167 |
| 8.0 | 56.4% | 0.0% | $124,167 | 56.4% | 0.0% | $124,167 |
| 9.0 | 60.8% | 0.0% | $124,167 | 60.8% | 0.0% | $124,167 |
| 10.0 | 64.8% | 0.0% | $124,167 | 64.8% | 0.0% | $124,167 |
| 11.0 | 68.4% | 0.0% | $124,167 | 68.4% | 0.0% | $124,167 |
| 12.0 | 71.4% | 0.0% | $124,167 | 71.4% | 0.0% | $124,167 |
| 13.0 | 73.7% | 0.0% | $124,167 | 73.7% | 0.0% | $124,167 |
| 14.0 | 75.4% | 0.0% | $124,167 | 75.4% | 0.0% | $124,167 |
| 15.0 | 76.4% | 0.0% | $124,167 | 76.4% | 0.0% | $124,167 |
| 16.0 | 76.4% | 0.0% | $124,167 | 76.4% | 0.0% | $124,167 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Contents | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 8.4% | 0.0% | $10,430 | 8.4% | 0.0% | $10,430 |
| -1.0 | 10.1% | 0.0% | $12,541 | 10.1% | 0.0% | $12,541 |
| 0.0 | 11.9% | 0.0% | $14,776 | 11.9% | 0.0% | $14,776 |
| 1.0 | 13.8% | 0.0% | $17,135 | 13.8% | 0.0% | $17,135 |
| 2.0 | 15.7% | 0.0% | $19,494 | 15.7% | 0.0% | $19,494 |
| 3.0 | 17.7% | 0.0% | $21,978 | 17.7% | 0.0% | $21,978 |
| 4.0 | 19.8% | 0.0% | $24,585 | 19.8% | 0.0% | $24,585 |
| 5.0 | 22.0% | 0.0% | $27,317 | 22.0% | 0.0% | $27,317 |
| 6.0 | 24.3% | 0.0% | $30,173 | 24.3% | 0.0% | $30,173 |
| 7.0 | 26.7% | 0.0% | $33,153 | 26.7% | 0.0% | $33,153 |
| 8.0 | 29.1% | 0.0% | $36,133 | 29.1% | 0.0% | $36,133 |
| 9.0 | 31.7% | 0.0% | $39,361 | 31.7% | 0.0% | $39,361 |
| 10.0 | 34.4% | 0.0% | $42,713 | 34.4% | 0.0% | $42,713 |
| 11.0 | 37.2% | 0.0% | $46,190 | 37.2% | 0.0% | $46,190 |
| 12.0 | 40.0% | 0.0% | $49,667 | 40.0% | 0.0% | $49,667 |
| 13.0 | 43.0% | 0.0% | $53,392 | 43.0% | 0.0% | $53,392 |
| 14.0 | 46.1% | 0.0% | $57,241 | 46.1% | 0.0% | $57,241 |
| 15.0 | 49.3% | 0.0% | $61,214 | 49.3% | 0.0% | $61,214 |
| 16.0 | 52.6% | 0.0% | $65,312 | 52.6% | 0.0% | $65,312 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Displacement | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $3,741 | 45.0 | | $3,741 |
| 2.0 | 90.0 | | $7,482 | 90.0 | | $7,482 |
| 3.0 | 135.0 | | $11,223 | 135.0 | | $11,223 |
| 4.0 | 180.0 | | $14,964 | 180.0 | | $14,964 |
| 5.0 | 225.0 | | $18,705 | 225.0 | | $18,705 |
| 6.0 | 270.0 | | $22,446 | 270.0 | | $22,446 |
| 7.0 | 315.0 | | $26,187 | 315.0 | | $26,187 |
| 8.0 | 360.0 | | $29,928 | 360.0 | | $29,928 |
| 9.0 | 405.0 | | $33,669 | 405.0 | | $33,669 |
| 10.0 | 450.0 | | $37,410 | 450.0 | | $37,410 |
| 11.0 | 495.0 | | $41,151 | 495.0 | | $41,151 |
| 12.0 | 540.0 | | $44,892 | 540.0 | | $44,892 |
| 13.0 | 585.0 | | $48,633 | 585.0 | | $48,633 |
| 14.0 | 630.0 | | $52,374 | 630.0 | | $52,374 |
| 15.0 | 675.0 | | $56,115 | 675.0 | | $56,115 |
| 16.0 | 720.0 | | $59,856 | 720.0 | | $59,856 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using USACE Generic**

| Loss of Function | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $0 | 45.0 | | $0 |
| 2.0 | 90.0 | | $0 | 90.0 | | $0 |
| 3.0 | 135.0 | | $0 | 135.0 | | $0 |
| 4.0 | 180.0 | | $0 | 180.0 | | $0 |
| 5.0 | 225.0 | | $0 | 225.0 | | $0 |
| 6.0 | 270.0 | | $0 | 270.0 | | $0 |
| 7.0 | 315.0 | | $0 | 315.0 | | $0 |
| 8.0 | 360.0 | | $0 | 360.0 | | $0 |
| 9.0 | 405.0 | | $0 | 405.0 | | $0 |
| 10.0 | 450.0 | | $0 | 450.0 | | $0 |
| 11.0 | 495.0 | | $0 | 495.0 | | $0 |
| 12.0 | 540.0 | | $0 | 540.0 | | $0 |
| 13.0 | 585.0 | | $0 | 585.0 | | $0 |
| 14.0 | 630.0 | | $0 | 630.0 | | $0 |
| 15.0 | 675.0 | | $0 | 675.0 | | $0 |
| 16.0 | 720.0 | | $0 | 720.0 | | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Other Benefits

### Other Benefits Before Mitigation

No Data

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Other Benefits After Mitigation**

No Data

## Summary Of Benefits

| Expected Annual Damages Before Mitigation | | Expected Annual Damages After Mitigation | | Expected Avoided Damages After Mitigation (Benefits) | |
|---|---|---|---|---|---|
| Annual: | $7,661 | Annual: | $832 | Annual: | $6,829 |
| Present Value: | $105,729 | Present Value: | $11,483 | Present Value: | $94,246 |

| | | | |
|---|---|---|---|
| Mitigation Benefits: | $94,246 | Mitigation Costs: | $0 |
| Benefits Minus Costs: | $94,246 | Benefit-Cost Ratio: | Infinity |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Cost Estimate

| | | | |
|---|---|---|---|
| Project Useful Life (years): | 50 | Construction Type: | |
| Mitigation Project Cost: | $0 | Detailed Scope of Work: | Yes |
| Annual Project Maintenance Cost: | $0 | Detailed Estimate for Entire Project: | Yes |
| Final Mitigation Project Cost: | $0 | Years of Maintenance: | 50 |
| Cost Basis Year: | | Present Worth of Annual Maintenance Costs: | $0 |
| Construction Start Year: | | Estimate Reflects Current Prices: | Yes |
| Construction End Year: | | Project Escalation: | |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Justification/Attachments

| Field | Description | Attachments |
|---|---|---|

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Structure and Mitigation Details For:** 76 Main Street, 76 Main Street, Ludlow, Vermont, 05149, Windsor

Benefits: $126,221 Costs: $ BCR: .00

---

Hazard: **Flood**

Mitigation Option: Drainage Improvement

| | | | | | |
|---|---|---|---|---|---|
| Latitude: | | Longitude: | | | |
| Size of Building: | 1,628 | BRV ($/sf): | $76.55 | Total BRV: | $124,623 |
| Residential: | Yes | Building Type: | One-Story | | |
| Obstruction: | N/A | Foundation Type: | Slab | Basement: | Yes |
| Building Primary Use: | | Structure Type: | | Historic Building: | No |
| Structure Elevation: | 1,002.60 | First Floor Being Raised: | | Demolition Threshold: | 50.00% |
| Source of Flood Data: | HH | Project in SFHA: | Unknown | Community ID Number: | |
| Effective FIS Date: | | FIRM Panel Number: | | FIRM Effective Date: | |
| Project Useful Life: | 50 | H&H Study Title: | | H&H Effective Date: | 01/01/1900 |
| Flood Zone: | | | | | |
| Building Contents: | $124,623 (Default) | Loss of Rent: | $0 | Displacement Costs: | $2,344 (Default) |
| Ground Surface Elevation: | | | | One Time Displacement Costs: | $0 |
| Breaking wave height: | | | | Value of Crawlspace Contents: | $0 |
| Height FFE above grade: | 1,002.60 | | | Flood Zone Determination: | |
| | | | | Utilities that are not elevated: | No |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Riverine Elevation and Discharge Data

Streambed Elevation (ft): 999.1 Flood Profile Number:

Flood Source Name:

Elevation At Which Barrier Will Be Overtopped:

FEMA Elevation Certificate Diagram Description: Diagram 1A Other Elevation Source:

| Recurrence Interval (yr) | Percent Annual Chance (%) | Elevation Before Mitigation (ft) | Discharge Before Mitigation (cfs) | Elevation After Mitigation (ft) | Discharge After Mitigation (cfs) |
|---|---|---|---|---|---|
| 10 | 10.00% | 1,001.10 | 73.0 | 999.30 | 73.0 |
| 50 | 2.00% | 1,002.20 | 115.0 | 1,000.40 | 115.0 |
| 100 | 1.00% | 1,002.50 | 134.0 | 1,000.70 | 134.0 |
| 500 | 0.20% | 1,002.90 | 150.0 | 1,001.10 | 150.0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Building | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 13.8% | 0.0% | $17,198 | 13.8% | 0.0% | $17,198 |
| -1.0 | 19.4% | 0.0% | $24,177 | 19.4% | 0.0% | $24,177 |
| 0.0 | 25.5% | 0.0% | $31,779 | 25.5% | 0.0% | $31,779 |
| 1.0 | 32.0% | 0.0% | $39,879 | 32.0% | 0.0% | $39,879 |
| 2.0 | 38.7% | 0.0% | $48,229 | 38.7% | 0.0% | $48,229 |
| 3.0 | 45.5% | 0.0% | $56,704 | 45.5% | 0.0% | $56,704 |
| 4.0 | 52.2% | 0.0% | $124,623 | 52.2% | 0.0% | $124,623 |
| 5.0 | 58.6% | 0.0% | $124,623 | 58.6% | 0.0% | $124,623 |
| 6.0 | 64.5% | 0.0% | $124,623 | 64.5% | 0.0% | $124,623 |
| 7.0 | 69.8% | 0.0% | $124,623 | 69.8% | 0.0% | $124,623 |
| 8.0 | 74.2% | 0.0% | $124,623 | 74.2% | 0.0% | $124,623 |
| 9.0 | 77.7% | 0.0% | $124,623 | 77.7% | 0.0% | $124,623 |
| 10.0 | 80.1% | 0.0% | $124,623 | 80.1% | 0.0% | $124,623 |
| 11.0 | 81.1% | 0.0% | $124,623 | 81.1% | 0.0% | $124,623 |
| 12.0 | 81.1% | 0.0% | $124,623 | 81.1% | 0.0% | $124,623 |
| 13.0 | 81.1% | 0.0% | $124,623 | 81.1% | 0.0% | $124,623 |
| 14.0 | 81.1% | 0.0% | $124,623 | 81.1% | 0.0% | $124,623 |
| 15.0 | 81.1% | 0.0% | $124,623 | 81.1% | 0.0% | $124,623 |
| 16.0 | 81.1% | 0.0% | $124,623 | 81.1% | 0.0% | $124,623 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Contents | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 10.5% | 0.0% | $13,085 | 10.5% | 0.0% | $13,085 |
| -1.0 | 13.2% | 0.0% | $16,450 | 13.2% | 0.0% | $16,450 |
| 0.0 | 16.0% | 0.0% | $19,940 | 16.0% | 0.0% | $19,940 |
| 1.0 | 18.9% | 0.0% | $23,554 | 18.9% | 0.0% | $23,554 |
| 2.0 | 21.8% | 0.0% | $27,168 | 21.8% | 0.0% | $27,168 |
| 3.0 | 24.7% | 0.0% | $30,782 | 24.7% | 0.0% | $30,782 |
| 4.0 | 27.4% | 0.0% | $34,147 | 27.4% | 0.0% | $34,147 |
| 5.0 | 30.0% | 0.0% | $37,387 | 30.0% | 0.0% | $37,387 |
| 6.0 | 32.4% | 0.0% | $40,378 | 32.4% | 0.0% | $40,378 |
| 7.0 | 34.5% | 0.0% | $42,995 | 34.5% | 0.0% | $42,995 |
| 8.0 | 36.3% | 0.0% | $45,238 | 36.3% | 0.0% | $45,238 |
| 9.0 | 37.7% | 0.0% | $46,983 | 37.7% | 0.0% | $46,983 |
| 10.0 | 38.6% | 0.0% | $48,105 | 38.6% | 0.0% | $48,105 |
| 11.0 | 39.1% | 0.0% | $48,728 | 39.1% | 0.0% | $48,728 |
| 12.0 | 39.1% | 0.0% | $48,728 | 39.1% | 0.0% | $48,728 |
| 13.0 | 39.1% | 0.0% | $48,728 | 39.1% | 0.0% | $48,728 |
| 14.0 | 39.1% | 0.0% | $48,728 | 39.1% | 0.0% | $48,728 |
| 15.0 | 39.1% | 0.0% | $48,728 | 39.1% | 0.0% | $48,728 |
| 16.0 | 39.1% | 0.0% | $48,728 | 39.1% | 0.0% | $48,728 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using USACE Generic

| Displacement | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $3,468 | 45.0 | | $3,468 |
| 2.0 | 90.0 | | $6,937 | 90.0 | | $6,937 |
| 3.0 | 135.0 | | $10,405 | 135.0 | | $10,405 |
| 4.0 | 180.0 | | $13,873 | 180.0 | | $13,873 |
| 5.0 | 225.0 | | $17,342 | 225.0 | | $17,342 |
| 6.0 | 270.0 | | $20,810 | 270.0 | | $20,810 |
| 7.0 | 315.0 | | $24,278 | 315.0 | | $24,278 |
| 8.0 | 360.0 | | $27,746 | 360.0 | | $27,746 |
| 9.0 | 405.0 | | $31,215 | 405.0 | | $31,215 |
| 10.0 | 450.0 | | $34,683 | 450.0 | | $34,683 |
| 11.0 | 495.0 | | $38,151 | 495.0 | | $38,151 |
| 12.0 | 540.0 | | $41,620 | 540.0 | | $41,620 |
| 13.0 | 585.0 | | $45,088 | 585.0 | | $45,088 |
| 14.0 | 630.0 | | $48,556 | 630.0 | | $48,556 |
| 15.0 | 675.0 | | $52,025 | 675.0 | | $52,025 |
| 16.0 | 720.0 | | $55,493 | 720.0 | | $55,493 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using USACE Generic**

| Loss of Function | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $0 | 45.0 | | $0 |
| 2.0 | 90.0 | | $0 | 90.0 | | $0 |
| 3.0 | 135.0 | | $0 | 135.0 | | $0 |
| 4.0 | 180.0 | | $0 | 180.0 | | $0 |
| 5.0 | 225.0 | | $0 | 225.0 | | $0 |
| 6.0 | 270.0 | | $0 | 270.0 | | $0 |
| 7.0 | 315.0 | | $0 | 315.0 | | $0 |
| 8.0 | 360.0 | | $0 | 360.0 | | $0 |
| 9.0 | 405.0 | | $0 | 405.0 | | $0 |
| 10.0 | 450.0 | | $0 | 450.0 | | $0 |
| 11.0 | 495.0 | | $0 | 495.0 | | $0 |
| 12.0 | 540.0 | | $0 | 540.0 | | $0 |
| 13.0 | 585.0 | | $0 | 585.0 | | $0 |
| 14.0 | 630.0 | | $0 | 630.0 | | $0 |
| 15.0 | 675.0 | | $0 | 675.0 | | $0 |
| 16.0 | 720.0 | | $0 | 720.0 | | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Other Benefits

### Other Benefits Before Mitigation

No Data

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Other Benefits After Mitigation**

No Data

## Summary Of Benefits

| Expected Annual Damages Before Mitigation | | Expected Annual Damages After Mitigation | | Expected Avoided Damages After Mitigation (Benefits) | |
|---|---|---|---|---|---|
| Annual: | $10,043 | Annual: | $897 | Annual: | $9,146 |
| Present Value: | $138,603 | Present Value: | $12,382 | Present Value: | $126,221 |

| | | | |
|---|---|---|---|
| Mitigation Benefits: | $126,221 | Mitigation Costs: | $0 |
| Benefits Minus Costs: | $126,221 | Benefit-Cost Ratio: | Infinity |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Cost Estimate

| | | | |
|---|---|---|---|
| Project Useful Life (years): | 50 | Construction Type: | |
| Mitigation Project Cost: | $0 | Detailed Scope of Work: | Yes |
| Annual Project Maintenance Cost: | $0 | Detailed Estimate for Entire Project: | Yes |
| Final Mitigation Project Cost: | $0 | Years of Maintenance: | 50 |
| Cost Basis Year: | | Present Worth of Annual Maintenance Costs: | $0 |
| Construction Start Year: | | Estimate Reflects Current Prices: | Yes |
| Construction End Year: | | Project Escalation: | |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Justification/Attachments

| Field | Description | Attachments |
|---|---|---|

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Structure and Mitigation Details For:** 86 Main Street, 86 Main Street, Ludlow, Vermont, 05149, Windsor

Benefits: $ Costs: $ BCR: .00

---

Hazard: **Flood**

Mitigation Option: Drainage Improvement

| | | | | | |
|---|---|---|---|---|---|
| Latitude: | | Longitude: | | | |
| Size of Building: | 4,245 | BRV ($/sf): | $100.00 | Total BRV: | $424,500 |
| Residential: | No | Building Type: | | | |
| Obstruction: | N/A | Foundation Type: | Slab | Basement: | |
| Building Primary Use: | Hotel | Structure Type: | Engineered | Historic Building: | No |
| Structure Elevation: | 1,006.90 | First Floor Being Raised: | | Demolition Threshold: | 50.00% |
| Source of Flood Data: | HH | Project in SFHA: | Unknown | Community ID Number: | |
| Effective FIS Date: | | FIRM Panel Number: | | FIRM Effective Date: | |
| Project Useful Life: | 50 | H&H Study Title: | | H&H Effective Date: | 01/01/1900 |
| Flood Zone: | | | | | |
| Building Contents: | $63,675 (Default) | Loss of Rent: | $0 | Displacement Costs: | $6,113 |
| Ground Surface Elevation: | | | | One Time Displacement Costs: | $0 |
| Breaking wave height: | | | | Value of Crawlspace Contents: | $0 |
| Height FFE above grade: | 1,006.90 | | | Flood Zone Determination: | |
| | | | | Utilities that are not elevated: | No |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Riverine Elevation and Discharge Data

Streambed Elevation (ft): 1,001.4 Flood Profile Number:

Flood Source Name:

Elevation At Which Barrier Will Be Overtopped:

FEMA Elevation Certificate Diagram Description: Diagram 1A Other Elevation Source:

| Recurrence Interval (yr) | Percent Annual Chance (%) | Elevation Before Mitigation (ft) | Discharge Before Mitigation (cfs) | Elevation After Mitigation (ft) | Discharge After Mitigation (cfs) |
|---|---|---|---|---|---|
| 10 | 10.00% | 1,003.00 | 73.0 | 1,001.60 | 73.0 |
| 50 | 2.00% | 1,003.80 | 115.0 | 1,002.40 | 115.0 |
| 100 | 1.00% | 1,004.00 | 134.0 | 1,002.60 | 134.0 |
| 500 | 0.20% | 1,002.80 | 150.0 | 1,003.00 | 150.0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using Hotel (Default)**

| Building | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 0.0% | 0.0% | $0 | 0.0% | 0.0% | $0 |
| -1.0 | 0.0% | 0.0% | $0 | 0.0% | 0.0% | $0 |
| 0.0 | 0.1% | 0.0% | $425 | 0.1% | 0.0% | $425 |
| 1.0 | 10.2% | 0.0% | $43,299 | 10.2% | 0.0% | $43,299 |
| 2.0 | 15.3% | 0.0% | $64,949 | 15.3% | 0.0% | $64,949 |
| 3.0 | 19.2% | 0.0% | $81,504 | 19.2% | 0.0% | $81,504 |
| 4.0 | 23.6% | 0.0% | $100,182 | 23.6% | 0.0% | $100,182 |
| 5.0 | 27.8% | 0.0% | $118,011 | 27.8% | 0.0% | $118,011 |
| 6.0 | 29.8% | 0.0% | $126,501 | 29.8% | 0.0% | $126,501 |
| 7.0 | 32.5% | 0.0% | $137,963 | 32.5% | 0.0% | $137,963 |
| 8.0 | 35.6% | 0.0% | $151,122 | 35.6% | 0.0% | $151,122 |
| 9.0 | 37.7% | 0.0% | $160,037 | 37.7% | 0.0% | $160,037 |
| 10.0 | 39.8% | 0.0% | $168,951 | 39.8% | 0.0% | $168,951 |
| 11.0 | 39.8% | 0.0% | $168,951 | 39.8% | 0.0% | $168,951 |
| 12.0 | 39.8% | 0.0% | $168,951 | 39.8% | 0.0% | $168,951 |
| 13.0 | 39.8% | 0.0% | $168,951 | 39.8% | 0.0% | $168,951 |
| 14.0 | 39.8% | 0.0% | $168,951 | 39.8% | 0.0% | $168,951 |
| 15.0 | 39.8% | 0.0% | $168,951 | 39.8% | 0.0% | $168,951 |
| 16.0 | 39.8% | 0.0% | $168,951 | 39.8% | 0.0% | $168,951 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using Hotel (Default)**

| Contents | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 0.0% | 0.0% | $0 | 0.0% | 0.0% | $0 |
| -1.0 | 0.0% | 0.0% | $0 | 0.0% | 0.0% | $0 |
| 0.0 | 0.0% | 0.0% | $0 | 0.0% | 0.0% | $0 |
| 1.0 | 16.0% | 0.0% | $10,188 | 16.0% | 0.0% | $10,188 |
| 2.0 | 26.0% | 0.0% | $16,556 | 26.0% | 0.0% | $16,556 |
| 3.0 | 34.0% | 0.0% | $21,650 | 34.0% | 0.0% | $21,650 |
| 4.0 | 40.0% | 0.0% | $25,470 | 40.0% | 0.0% | $25,470 |
| 5.0 | 49.0% | 0.0% | $31,201 | 49.0% | 0.0% | $31,201 |
| 6.0 | 52.0% | 0.0% | $33,111 | 52.0% | 0.0% | $33,111 |
| 7.0 | 58.0% | 0.0% | $36,932 | 58.0% | 0.0% | $36,932 |
| 8.0 | 61.0% | 0.0% | $38,842 | 61.0% | 0.0% | $38,842 |
| 9.0 | 63.0% | 0.0% | $40,115 | 63.0% | 0.0% | $40,115 |
| 10.0 | 65.0% | 0.0% | $41,389 | 65.0% | 0.0% | $41,389 |
| 11.0 | 65.0% | 0.0% | $41,389 | 65.0% | 0.0% | $41,389 |
| 12.0 | 65.0% | 0.0% | $41,389 | 65.0% | 0.0% | $41,389 |
| 13.0 | 65.0% | 0.0% | $41,389 | 65.0% | 0.0% | $41,389 |
| 14.0 | 65.0% | 0.0% | $41,389 | 65.0% | 0.0% | $41,389 |
| 15.0 | 65.0% | 0.0% | $41,389 | 65.0% | 0.0% | $41,389 |
| 16.0 | 65.0% | 0.0% | $41,389 | 65.0% | 0.0% | $41,389 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using Hotel (Default)**

| Displacement | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $9,044 | 45.0 | | $9,044 |
| 2.0 | 90.0 | | $18,087 | 90.0 | | $18,087 |
| 3.0 | 135.0 | | $27,131 | 135.0 | | $27,131 |
| 4.0 | 180.0 | | $36,174 | 180.0 | | $36,174 |
| 5.0 | 225.0 | | $45,218 | 225.0 | | $45,218 |
| 6.0 | 270.0 | | $54,262 | 270.0 | | $54,262 |
| 7.0 | 315.0 | | $63,305 | 315.0 | | $63,305 |
| 8.0 | 360.0 | | $72,349 | 360.0 | | $72,349 |
| 9.0 | 405.0 | | $81,392 | 405.0 | | $81,392 |
| 10.0 | 450.0 | | $90,436 | 450.0 | | $90,436 |
| 11.0 | 450.0 | | $90,436 | 450.0 | | $90,436 |
| 12.0 | 450.0 | | $90,436 | 450.0 | | $90,436 |
| 13.0 | 450.0 | | $90,436 | 450.0 | | $90,436 |
| 14.0 | 450.0 | | $90,436 | 450.0 | | $90,436 |
| 15.0 | 450.0 | | $90,436 | 450.0 | | $90,436 |
| 16.0 | 450.0 | | $90,436 | 450.0 | | $90,436 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using Hotel (Default)**

| Loss of Function | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $0 | 45.0 | | $0 |
| 2.0 | 90.0 | | $0 | 90.0 | | $0 |
| 3.0 | 135.0 | | $0 | 135.0 | | $0 |
| 4.0 | 180.0 | | $0 | 180.0 | | $0 |
| 5.0 | 225.0 | | $0 | 225.0 | | $0 |
| 6.0 | 270.0 | | $0 | 270.0 | | $0 |
| 7.0 | 315.0 | | $0 | 315.0 | | $0 |
| 8.0 | 360.0 | | $0 | 360.0 | | $0 |
| 9.0 | 405.0 | | $0 | 405.0 | | $0 |
| 10.0 | 450.0 | | $0 | 450.0 | | $0 |
| 11.0 | 450.0 | | $0 | 450.0 | | $0 |
| 12.0 | 450.0 | | $0 | 450.0 | | $0 |
| 13.0 | 450.0 | | $0 | 450.0 | | $0 |
| 14.0 | 450.0 | | $0 | 450.0 | | $0 |
| 15.0 | 450.0 | | $0 | 450.0 | | $0 |
| 16.0 | 450.0 | | $0 | 450.0 | | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Other Benefits

### Other Benefits Before Mitigation

No Data

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Other Benefits After Mitigation**

No Data

## Summary Of Benefits

| Expected Annual Damages Before Mitigation | Expected Annual Damages After Mitigation | Expected Avoided Damages After Mitigation (Benefits) |
|---|---|---|
| Annual: $0 | Annual: $0 | Annual: $0 |
| Present Value: $0 | Present Value: $0 | Present Value: $0 |

Mitigation Benefits: $0 Mitigation Costs: $0

Benefits Minus Costs: $0 Benefit-Cost Ratio: NaN

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Cost Estimate

| | | | |
|---|---|---|---|
| Project Useful Life (years): | 50 | Construction Type: | |
| Mitigation Project Cost: | $0 | Detailed Scope of Work: | Yes |
| Annual Project Maintenance Cost: | $0 | Detailed Estimate for Entire Project: | Yes |
| Final Mitigation Project Cost: | $0 | Years of Maintenance: | 50 |
| Cost Basis Year: | | Present Worth of Annual Maintenance Costs: | $0 |
| Construction Start Year: | | Estimate Reflects Current Prices: | Yes |
| Construction End Year: | | Project Escalation: | |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Justification/Attachments

| Field | Description | Attachments |
|---|---|---|

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Structure and Mitigation Details For:** 88 Main Street, 88 Main Street, Ludlow, Vermont, 05149, Windsor

Benefits: $ Costs: $ BCR: .00

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Hazard: **Flood**

Mitigation Option: Drainage Improvement

| | | | | | |
|---|---|---|---|---|---|
| Latitude: | | Longitude: | | | |
| Size of Building: | 4,510 | BRV ($/sf): | $100.00 | Total BRV: | $451,000 |
| Residential: | No | Building Type: | | | |
| Obstruction: | N/A | Foundation Type: | Slab | Basement: | |
| Building Primary Use: | Recreation | Structure Type: | Pre-Engineered | Historic Building: | No |
| Structure Elevation: | 1,008.60 | First Floor Being Raised: | | Demolition Threshold: | 50.00% |
| Source of Flood Data: | HH | Project in SFHA: | Unknown | Community ID Number: | |
| Effective FIS Date: | | FIRM Panel Number: | | FIRM Effective Date: | |
| Project Useful Life: | | H&H Study Title: | | H&H Effective Date: | 01/01/1900 |
| Flood Zone: | | | | | |
| Building Contents: | $135,300 (Default) | Loss of Rent: | $0 | Displacement Costs: | $6,494 |
| Ground Surface Elevation: | | | | One Time Displacement Costs: | $0 |
| Breaking wave height: | | | | Value of Crawlspace Contents: | $0 |
| Height FFE above grade: | 1,008.60 | | | Flood Zone Determination: | |
| | | | | Utilities that are not elevated: | No |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Riverine Elevation and Discharge Data

Streambed Elevation (ft): 1,001.4 Flood Profile Number:

Flood Source Name:

Elevation At Which Barrier Will Be Overtopped:

FEMA Elevation Certificate Diagram Description: Diagram 1A Other Elevation Source:

| Recurrence Interval (yr) | Percent Annual Chance (%) | Elevation Before Mitigation (ft) | Discharge Before Mitigation (cfs) | Elevation After Mitigation (ft) | Discharge After Mitigation (cfs) |
|---|---|---|---|---|---|
| 10 | 10.00% | 1,003.00 | 73.0 | 1,001.60 | 73.0 |
| 50 | 2.00% | 1,003.80 | 115.0 | 1,002.40 | 115.0 |
| 100 | 1.00% | 1,004.00 | 134.0 | 1,002.60 | 134.0 |
| 500 | 0.20% | 1,004.40 | 150.0 | 1,003.00 | 150.0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using Recreation (Default)

| Building | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 0.5% | 0.0% | $2,255 | 0.5% | 0.0% | $2,255 |
| -1.0 | 0.5% | 0.0% | $2,255 | 0.5% | 0.0% | $2,255 |
| 0.0 | 0.9% | 0.0% | $4,059 | 0.9% | 0.0% | $4,059 |
| 1.0 | 13.5% | 0.0% | $60,885 | 13.5% | 0.0% | $60,885 |
| 2.0 | 23.6% | 0.0% | $106,436 | 23.6% | 0.0% | $106,436 |
| 3.0 | 31.3% | 0.0% | $141,163 | 31.3% | 0.0% | $141,163 |
| 4.0 | 38.6% | 0.0% | $174,086 | 38.6% | 0.0% | $174,086 |
| 5.0 | 42.1% | 0.0% | $189,871 | 42.1% | 0.0% | $189,871 |
| 6.0 | 47.6% | 0.0% | $214,676 | 47.6% | 0.0% | $214,676 |
| 7.0 | 50.3% | 0.0% | $451,000 | 50.3% | 0.0% | $451,000 |
| 8.0 | 54.2% | 0.0% | $451,000 | 54.2% | 0.0% | $451,000 |
| 9.0 | 57.5% | 0.0% | $451,000 | 57.5% | 0.0% | $451,000 |
| 10.0 | 59.1% | 0.0% | $451,000 | 59.1% | 0.0% | $451,000 |
| 11.0 | 59.1% | 0.0% | $451,000 | 59.1% | 0.0% | $451,000 |
| 12.0 | 59.1% | 0.0% | $451,000 | 59.1% | 0.0% | $451,000 |
| 13.0 | 59.1% | 0.0% | $451,000 | 59.1% | 0.0% | $451,000 |
| 14.0 | 59.1% | 0.0% | $451,000 | 59.1% | 0.0% | $451,000 |
| 15.0 | 59.1% | 0.0% | $451,000 | 59.1% | 0.0% | $451,000 |
| 16.0 | 59.1% | 0.0% | $451,000 | 59.1% | 0.0% | $451,000 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using Recreation (Default)

| Contents | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (pct)** | **Before Mitigation User Entered (pct)** | **Before Mitigation ($)** | **After Mitigation (pct)** | **After Mitigation User Entered (pct)** | **After Mitigation ($)** |
| -2.0 | 0.0% | 0.0% | $0 | 0.0% | 0.0% | $0 |
| -1.0 | 0.0% | 0.0% | $0 | 0.0% | 0.0% | $0 |
| 0.0 | 0.0% | 0.0% | $0 | 0.0% | 0.0% | $0 |
| 1.0 | 26.0% | 0.0% | $35,178 | 26.0% | 0.0% | $35,178 |
| 2.0 | 44.0% | 0.0% | $59,532 | 44.0% | 0.0% | $59,532 |
| 3.0 | 63.0% | 0.0% | $85,239 | 63.0% | 0.0% | $85,239 |
| 4.0 | 73.0% | 0.0% | $98,769 | 73.0% | 0.0% | $98,769 |
| 5.0 | 80.0% | 0.0% | $108,240 | 80.0% | 0.0% | $108,240 |
| 6.0 | 84.0% | 0.0% | $113,652 | 84.0% | 0.0% | $113,652 |
| 7.0 | 91.0% | 0.0% | $123,123 | 91.0% | 0.0% | $123,123 |
| 8.0 | 95.0% | 0.0% | $128,535 | 95.0% | 0.0% | $128,535 |
| 9.0 | 95.0% | 0.0% | $128,535 | 95.0% | 0.0% | $128,535 |
| 10.0 | 95.0% | 0.0% | $128,535 | 95.0% | 0.0% | $128,535 |
| 11.0 | 95.0% | 0.0% | $128,535 | 95.0% | 0.0% | $128,535 |
| 12.0 | 95.0% | 0.0% | $128,535 | 95.0% | 0.0% | $128,535 |
| 13.0 | 95.0% | 0.0% | $128,535 | 95.0% | 0.0% | $128,535 |
| 14.0 | 95.0% | 0.0% | $128,535 | 95.0% | 0.0% | $128,535 |
| 15.0 | 95.0% | 0.0% | $128,535 | 95.0% | 0.0% | $128,535 |
| 16.0 | 95.0% | 0.0% | $128,535 | 95.0% | 0.0% | $128,535 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Depth-Damage Functions Using Recreation (Default)

| Displacement | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $9,608 | 45.0 | | $9,608 |
| 2.0 | 90.0 | | $19,216 | 90.0 | | $19,216 |
| 3.0 | 135.0 | | $28,824 | 135.0 | | $28,824 |
| 4.0 | 180.0 | | $38,433 | 180.0 | | $38,433 |
| 5.0 | 225.0 | | $48,041 | 225.0 | | $48,041 |
| 6.0 | 270.0 | | $57,649 | 270.0 | | $57,649 |
| 7.0 | 315.0 | | $67,257 | 315.0 | | $67,257 |
| 8.0 | 360.0 | | $76,865 | 360.0 | | $76,865 |
| 9.0 | 405.0 | | $86,473 | 405.0 | | $86,473 |
| 10.0 | 450.0 | | $96,082 | 450.0 | | $96,082 |
| 11.0 | 450.0 | | $96,082 | 450.0 | | $96,082 |
| 12.0 | 450.0 | | $96,082 | 450.0 | | $96,082 |
| 13.0 | 450.0 | | $96,082 | 450.0 | | $96,082 |
| 14.0 | 450.0 | | $96,082 | 450.0 | | $96,082 |
| 15.0 | 450.0 | | $96,082 | 450.0 | | $96,082 |
| 16.0 | 450.0 | | $96,082 | 450.0 | | $96,082 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Depth-Damage Functions Using Recreation (Default)**

| Loss of Function | Before Mitigation Values: | | | After Mitigation Values: | | |
|---|---|---|---|---|---|---|
| **Flood Depth (ft)** | **Before Mitigation (Days)** | **Before Mitigation User Entered (Days)** | **Before Mitigation ($)** | **After Mitigation (Days)** | **After Mitigation User Entered (Days)** | **After Mitigation ($)** |
| -2.0 | 0.0 | | $0 | 0.0 | | $0 |
| -1.0 | 0.0 | | $0 | 0.0 | | $0 |
| 0.0 | 0.0 | | $0 | 0.0 | | $0 |
| 1.0 | 45.0 | | $0 | 45.0 | | $0 |
| 2.0 | 90.0 | | $0 | 90.0 | | $0 |
| 3.0 | 135.0 | | $0 | 135.0 | | $0 |
| 4.0 | 180.0 | | $0 | 180.0 | | $0 |
| 5.0 | 225.0 | | $0 | 225.0 | | $0 |
| 6.0 | 270.0 | | $0 | 270.0 | | $0 |
| 7.0 | 315.0 | | $0 | 315.0 | | $0 |
| 8.0 | 360.0 | | $0 | 360.0 | | $0 |
| 9.0 | 405.0 | | $0 | 405.0 | | $0 |
| 10.0 | 450.0 | | $0 | 450.0 | | $0 |
| 11.0 | 450.0 | | $0 | 450.0 | | $0 |
| 12.0 | 450.0 | | $0 | 450.0 | | $0 |
| 13.0 | 450.0 | | $0 | 450.0 | | $0 |
| 14.0 | 450.0 | | $0 | 450.0 | | $0 |
| 15.0 | 450.0 | | $0 | 450.0 | | $0 |
| 16.0 | 450.0 | | $0 | 450.0 | | $0 |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Other Benefits

### Other Benefits Before Mitigation

No Data

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

**Other Benefits After Mitigation**

No Data

## Loss of Services

**Service Types Provided by Facility:**

| Service Name | Annual Budget ($) |
|---|---|
| Total Annual Budget | |

## Summary Of Benefits

| Expected Annual Damages Before Mitigation | | Expected Annual Damages After Mitigation | | Expected Avoided Damages After Mitigation (Benefits) | |
|---|---|---|---|---|---|
| Annual: | $2 | Annual: | $146 | Annual: | ($144) |
| Present Value: | $0 | Present Value: | $0 | Present Value: | $0 |

Mitigation Benefits: $0 Mitigation Costs: $0

Benefits Minus Costs: $0 Benefit-Cost Ratio: NaN

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Cost Estimate

| | | | |
|---|---|---|---|
| Project Useful Life (years): | | Construction Type: | |
| Mitigation Project Cost: | $0 | Detailed Scope of Work: | Yes |
| Annual Project Maintenance Cost: | $0 | Detailed Estimate for Entire Project: | Yes |
| Final Mitigation Project Cost: | $0 | Years of Maintenance: | 0 |
| Cost Basis Year: | | Present Worth of Annual Maintenance Costs: | $0 |
| Construction Start Year: | | Estimate Reflects Current Prices: | Yes |
| Construction End Year: | | Project Escalation: | |

Total Benefits: **$1,211,488** Total Costs: **$1,090,000** BCR: **1.11**

Project Number: Disaster #: Program: PDM Agency:

State: **Virginia** Point of Contact: Jeff Ward Analyst: Jeff Ward

## Justification/Attachments

| Field | Description | Attachments |
|---|---|---|