Town of Goshen, New Hampshire Hazard Mitigation Plan

Plan prepared, 2007
Approved by FEMA, May 19, 2008

Prepared by the:
Town of Goshen Hazard Mitigation Committee

&

Upper Valley Lake Sunapee Regional Planning Commission

Executive Summary

The *Goshen Hazard Mitigation Plan* serves as a means to reduce future losses from natural or man-made hazard events before they occur. The Town of Goshen Hazard Mitigation Committee developed the *Plan*.

The natural hazards addressed in this plan are as follows:

- Flooding
- Dam Breach and Failure
- Drought
- Wildfire
- Earthquake
- Landslide
- Tornado
- Hurricane
- Lightning
- Severe Winter Weather
- Hazardous Materials

The Goshen Hazard Mitigation Committee, as shown in Section IV, identified "Critical Facilities" and "Facilities/Populations to Protect" as follows:

Critical Facilities

- Fire Station
- Police Station
- Highway Department
- Grange Hall
- Post Office
- Library
- Goshen Community Church
- Power Conversion Station (Co-op)

Facilities/Populations to Protect

- Lumber Yard
- Goshen Country Store
- 75 Homes around Rand Pond Road
- Backside Inn
- Horseshoe Pines (Elderly Assisted Living Facility)

The Goshen Hazard Mitigation Committee, as shown in Section VI, identified existing hazard mitigation strategies as follows:

- Emergency Response Mutual Aid
- Ongoing Training
- Education and Outreach
- Emergency Operations Planning Committee
- National Incident Command System
- Incident Command System
- Community Emergency Response Team
- Flood Plain Ordinance
- Zoning Ordinance
- Trail Maintenance
- Generator
- Mitigate Groundwater Contamination
- Public Service of New Hampshire

The Goshen Hazard Mitigation Committee, as shown in Sections VII & VIII, developed a prioritized implementation schedule for newly identified hazard mitigation strategies as follows:

- Emergency Road Signage
- Fire Department Training
- Notification and Evacuation of Schools
- Capital Improvements Program
- Protecting Rights-of-way
- Policy and Procedure Manual
- Culvert Inventory
- Education and Outreach
- Protection for Emergency Responders
- Storm Water Management Study

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SECTION I
INTRODUCTION

BACKGROUND

The New Hampshire Bureau of Emergency Management (NHBEM) has a goal for all communities within the State of New Hampshire to establish local hazard mitigation plans as a means to reduce future losses from natural or man-made hazard events before they occur. The NHBEM has provided funding to the Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC), to prepare local Hazard Mitigation Plans with several of its communities. UVLSRPC began preparing a local Hazard Mitigation Plan for the Town of Goshen in December 2006. The *Goshen Hazard Mitigation Plan* serves as a strategic planning tool for use by the Town of Goshen in its efforts to reduce future losses from natural and/or man-made hazard events before they occur.

The Goshen Hazard Mitigation Committee prepared the *Goshen Hazard Mitigation Plan* with the assistance and professional services of the Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC) under contract with the New Hampshire Bureau of Emergency Management (NHBEM) operating under the guidance of the Federal Emergency Management Agency (FEMA). Once the Town receives official 'conditional approval' from FEMA the Town will hold a public hearing in order to adopt the Hazard Mitigation Plan.

PURPOSE

The Goshen Hazard Mitigation Plan is a planning tool for use by the Town of Goshen in its efforts to reduce future losses from natural and/or man-made hazards. This plan does not constitute a section of the Town Master Plan, nor is it adopted as part of the Zoning Ordinance.

HISTORY

On October 30, 2000, President Clinton signed into law the Disaster Mitigation Act of 2000 (DMA 2000). The ultimate purpose of the DMA 2000 is to:

- Establish a national disaster mitigation program that will reduce loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from disasters, and to
- Provide a source of pre-disaster mitigation funding that will assist States and local governments in accomplishing that purpose.

DMA 2000 amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act by, among other things, adding a new section: 322 – Mitigation Planning. This places new emphasis on local mitigation planning. It requires local governments to prepare and adopt jurisdiction-wide hazard mitigation plans as a condition to receiving Hazard Mitigation Grant Program (HMGP) project grants. *Local governments must review and if necessary, update the mitigation*

plan every five years to continue program eligibility. It is recommended that the project list and disaster history sections be reviewed and updated annually.

Why develop a Mitigation Plan?

The full cost of the damage resulting from the impact of natural hazards – personal suffering, loss of lives, disruption of the economy, and loss of tax base – is difficult to quantify and measure. The State of New Hampshire is vulnerable to many types of hazards, including flooding, severe winter weather, hazardous materials, hurricane/high wind events, wildfire/structure fire, seismic hazards, drought, and terrorism. All of these types of events can have significant economic and social impacts.

SCOPE OF THE PLAN

The scope of the *Goshen Hazard Mitigation Plan* includes the identification of natural hazards affecting the Town, as identified by the Goshen Hazard Mitigation Committee. The hazards were reviewed under the following categories:

- Flooding
- Dam Breach and Failure
- Drought
- Wildfire
- Earthquake
- Landslide
- Tornado
- Hurricane
- Lightning
- Severe Winter Weather
- Hazardous Materials Spill

METHODOLOGY

Using the *Hazard Mitigation Planning for New Hampshire Communities* handbook, as developed by the Southwest Regional Planning Commission (SWRPC), the Goshen Hazard Mitigation Committee, in conjunction with the UVLSRPC, developed the content of the *Goshen Hazard Mitigation Plan* by following the ten-step process set forth in the Handbook. The Committee held a total of six posted meetings beginning on December 4th, 2006 and ending on January 29th, 2007. All meetings were posted at the Town Office and open to the general public.

By nature, natural hazards affect areas not defined by political boundaries. Additionally, response to these disasters often may rely on neighboring communities for assistance such as the mutual aid services. Because of this it is important to notify and work with adjacent communities. Notification of this plan and its meetings were publicly noticed and posted, although direct invitations were not made to neighboring municipalities of Newport, Lempster, Unity, Washington, Sunapee, and Newbury. Future iterations and updates to this plan will incorporate invitations to those communities to comment and participate in the planning process.

Support for mitigation strategies is important in order to carry out implementation. Although this Hazard Mitigation Plan for the Town of Goshen was unable to interest additional parties, every effort will be made in the future to incorporate representation in future revisions of this plan. In order to ensure in the future that opportunity to participate in the planning process is given to other interested parties, the Town will send invitations to local businesses, educational institutions and non-profit organizations. Revisions of this plan shall incorporate press releases that will notice citizens, businesses and organizations of the progress of the plan while also soliciting input that could strengthen the value of the plan. This process will enable more successful implementation actions.

Upon notification from FEMA that this plan is been conditionally approved, the Town of Goshen will hold a public hearing. At this public hearing, public comment and input regarding the plan shall be taken. Once public input has been heard, the Town shall adopt the plan with any improvements or recommended changes that are appropriate.

The following hazard mitigation meetings were vital to the development of this Plan:

- December 4, 2006
- December 18, 2006
- January 8, 2007
- January 29, 2007

To complete this plan the Goshen Hazard Mitigation Committee completed the following planning steps:

Step 1: Map the Hazards
Committee members identified areas where damage from natural disasters had previously occurred, areas of potential damage, and man-made facilities and infrastructure that were at risk for loss of life, property damage, and other risk factors. A GIS-generated base map provided by the UVLSRPC was used in the process.

Step 2: Determine Potential Damage
Committee members identified facilities that were considered to be of value to the Town for emergency management purposes, for provision of utilities and services, and for historic, cultural and social value. A summary listing of identified hazards, critical facilities, and hazard prone areas can be found in Sections III, IV, and V.

Step 3: Identify Plans/Policies Already in Place
Using information and activities in the Handbook, the Committee and UVLSRPC staff identified existing mitigation strategies which are already implemented in the Town related to floods, dam breaches or failures, droughts, wildfires, earthquakes, landslides, tornados and downbursts, hurricanes, lightning, severe winter weather, and hazardous materials. The results of this activity are presented in Section VI.

Step 4: Identify the Gaps in Protection/Mitigation
Existing strategies were then reviewed for coverage, effectiveness and implementation, as well as need for improvement. A summary of recommended improvements in the current protection can be found in Section VI.

Step 5: Determine Actions to Take
During an open brainstorming session, the Hazard Mitigation Committee developed a list of other possible hazard mitigation actions and strategies for the Town of Goshen. Ideas proposed included structural projects, emergency operations projects, planning and engineering and public education. The list of potential mitigation actions can be found in Section VII.

Step 6: Evaluate Feasible Options
The Emergency Management Committee evaluated potential strategies based on eight criteria derived from the criteria listed in the evaluation chart found on page 27 of the Handbook. The eight criteria used for evaluation of potential mitigation strategies are listed in Section VII, p. 30. Each strategy was rated (good (3), average (2), or poor (1)) for its effectiveness in meeting each of the eight criteria (e.g., Does the mitigation strategy reduce disaster damage?). Strategies were ranked by overall score for preliminary prioritization then reviewed again under Step Eight. The ratings of the potential mitigation strategies can be found in Section VII.

Step 7: Coordinate with other Agencies/Entities
UVLSRPC staff reviewed the Goshen Master Plan. This was done in order to determine if any conflicts existed or if there were any potential areas for cooperation. NH Bureau of Emergency Management field staff were also invited to participate.

Step 8: Determine Priorities
The Committee reviewed the preliminary prioritization list in order to make changes and determine a final prioritization for new hazard mitigation actions and existing protection strategy improvements identified in previous steps. UVLSRPC also presented recommendations for the Committee to review and prioritize.

Step 9: Develop Implementation Strategy
Using the chart provided under Step Nine of the Handbook, the Committee created an implementation strategy which included person(s) responsible for implementation (who), a schedule for completion (when), and a funding source and/or technical assistance source (how) for each of the identified hazard mitigation actions. The prioritized implementation list can be found in Section VIII.

Step 10: Adopt and Monitor the Plan
UVLSRPC Staff compiled the results of steps one through nine in a draft document, as well as helpful and informative materials from the State of New Hampshire Natural Hazard Mitigation Plan, which served as a resource for the Goshen Hazard Mitigation Plan. The details related to the adoption and monitoring of the Plan can be found in Section IX.

HAZARD MITIGATION GOALS

The Town of Goshen Hazard Mitigation Committee reviewed the hazard mitigation goals for the State of New Hampshire, and revised them for Goshen.

They are as follows:

1. To protect the general population, the citizens of the town and guests, from all natural and man-made hazards.

2. To reduce the potential impact of natural and man-made disasters on the town's critical support services, critical facilities, and infrastructure.

3. To reduce the potential impact of natural and man-made disasters on the town's economy.

4. To reduce the potential impact of natural and man-made disasters on the town's natural environment, especially the water bodies.

5. To reduce the potential impact of natural and man-made disasters on the town's specific historic treasures and interests as well as other tangible and intangible characteristics which add to the quality of life of the citizens and guests of the town.

6. To identify, introduce and implement cost effective hazard mitigation measures so as to accomplish the town's goals and to raise the awareness and acceptance of hazard mitigation.

ACKNOWLEDGEMENTS

The following people participated in the development of this plan:

- Janny Kuwynia, Goshen Rescue
- John P. Hopkins, Health Officer
- Clark Wamsley, Captain Fire Department & Head of Goshen Rescue Unit
- Robert Hall, Goshen Selectman
- Jim Carrick, Selectman
- Melanie Bell, Selectman
- Daniel Peterson, New Hampshire Fire Warden & Deputy Fire Chief
- John Herr, Lieutenant Goshen Fire Department
- Bonnie Beaudry, Administrative Assistant
- Zachary Dickinson, Goshen Rescue
- Jack Warburton, Goshen Fire
- Mark Beaudry, Goshen Highway Department
- Mark K. Landry, Citizen of Goshen
- Edward Anderson, Chief of Police

- Duncan Domey, Patrolman Goshen Police Department
- Anthony Baslow, Goshen Highway Department
- Courtney Daniell, UVLSRPC

SECTION II
COMMUNITY PROFILE

INTRODUCTION

The Town of Goshen, NH is located in the southeaster corner of the Upper Valley Lake Sunapee Region in Sullivan County. New Hampshire Route 10 connects Goshen with northern and southern communities.

Locus Map of Goshen

Four major physiographic land features characterize the Town of Goshen. These are flood plains, terraces, mountains and upland hills.

Flood Plains

The nearly level flood plains are those areas subject to flooding from adjacent streams. They are located adjacent to the South Branch of the Sugar River, Blood Brook, Gunnison Brook and Babb Brook.

Terraces

Short, steep slopes in some areas, and slightly sloping topography in others characterize the terraces in Goshen. Terraces consist of deep sand or gravel. Large areas of terrace-type land features occur west of Route 10 and Route 31. Numerous small areas are just outside the flood plains of Gunnison, Blood, and Babb Brooks. A few additional, very small, isolated acreages are scattered throughout parts of the Town.

Mountains

Mountains in Goshen are mainly in the Mount Sunapee and Gove Mountain areas. They are typically steep and stony, with many areas of rock outcrop. Mountains occupy nearly one quarter of the Town of Goshen.

Upland Hills

The remainder of Goshen consists of upland hills, ranging from about 1,300 to 1,600 feet in elevation."[1]

DEVELOPMENT TRENDS

Despite a doubling of the population in the last thirty-five years, Goshen remains a rural community. The rate of growth was very high in the 1970's and 1980's, but has slowed significantly since then. In 2005, the total population was 819 persons, with a density of 36.5 persons per square mile of land area. Not counted in these statistics from the NH Office of Energy and Planning is the large seasonal population in Goshen; approximately one-quarter of housing units are not occupied for the full year.

Residents of Goshen are overwhelmingly in favor of maintaining the rural, uncrowded character of their community. The Goshen Master Plan, 2002, summarizes the following guideline for future development in the Town:

> *"Over the next ten years, Goshen should remain a small, rural residential community, with quiet, uncrowded living conditions, well-maintained buildings, roads, and recreational facilities, and undiminished scenic beauty."*

The pace of growth can be seen in the single planned development within Goshen at the time that this plan was being created; Mountain Reach is a proposed 27-unit condominium complex. In 2005, only 8 building permits were issued, according to the NH Office of Energy and Planning. It is not expected that development trends will change in the next ten years, due to the will of the Town and the slowdown in population growth county- and state-wide.

[1] Town of Goshen Master Plan, 2002, pp. 26-27

Population Growth Comparisons: Goshen and Neighboring Communities

Area	1970	1980	10-Yr. Growth Rate 70-80	1990	10-Yr. Growth Rate 80-90	2000	10-Yr. Growth Rate 90-00	30 Yr. Avg. Decadal Rate
Goshen	**395**	**549**	**39%**	**718**	**23%**	**744**	**4%**	**22%**
Newport	5,899	6,229	5%	6,110	-2%	6,269	3%	2%
Unity	709	1,092	54%	1,341	19%	1,530	12%	28%
Lempster	360	637	77%	948	33%	976	3%	38%
Washington	248	411	66%	629	35%	907	31%	44%
Sunapee	1384	2312	67%	3069	25%	3330	8%	33%
Newbury	509	961	89%	1351	29%	1712	21%	46%
Sullivan Co.	30,949	36,063	17%	38,592	7%	40,458	5%	9%
State of NH	737,681	920,610	25%	1,109,252	17%	1,235,786	10%	17%

SECTION III
HAZARD IDENTIFICATION

The Goshen Hazard Mitigation Committee reviewed the list of hazards provided in the State of New Hampshire Hazard Mitigation Plan concentrating on past hazards occurring in Sullivan County. For each hazard, a listing of the location, extent, previous occurrences, potential future events, and probability of future events was created and can be found starting on page 11 After compiling the list of past and potential hazards the Committee conducted a Risk and Vulnerability Assessment, located on page 28

Determination of the extent of a given hazard within the Town of Goshen was based on regional risk and the severity of past occurrences. Each hazard was assigned a descriptor for the worst damage likely to be caused by a hazard event, according to the following key:
-Minimal: Limited and scattered property damage; no damage to public infrastructure (roads, bridges, trains, airports, public parks, etc.); contained geographic area (i.e., 1 or 2 communities); essential services (utilities, hospitals, schools, etc.) not interrupted; no injuries or fatalities.
-Moderate: Scattered major property damage (more than 50% destroyed); some minor infrastructure damage; wider geographic area (several communities) essential services are briefly interrupted; some injuries and/or fatalities.
-Severe: Consistent major property damage; major damage to public infrastructure (up to several days for repairs); essential services are interrupted from several hours to several days; many injuries and fatalities.
-Catastrophic: Property and public infrastructure destroyed; essential services stopped, thousands of injuries and fatalities.

Determination of the probability of future events for each hazard was completed by the Goshen Hazard Mitigation Committee. Committee members assigned probability of occurrence values to each hazard type based on the committee's knowledge of past occurrences. The ratings were based on the probability that the occurrence may happen within the next ten years (Likely), between 10-25 years (Possible), or after 25 years (Not Likely). An n/a rating was given if there was insufficient evidence to make a decision.

WHAT ARE THE HAZARDS?

Goshen is prone to a variety of natural hazards. These include: floods, dam breaches or failures, droughts, wildfires, earthquakes, landslides, tornados and downbursts, hurricanes, lightning, severe winter weather, and hazardous materials.

Radon and avalanche hazards were included in the State Hazard Plan, but the Goshen Hazard Mitigation Committee did not identify that these hazards have occurred in the past or have the potential to occur in the Town of Goshen. According to a map included in the State Hazard Plan, the Town of Goshen had generally low radon concentrations; less than 25% of homes tested by the Bureau of Radiological Health had radon concentrations equal to or greater than the EPA's "action level" of 4 picocuries per liter. Avalanches are snowslides that are likely to occur in

mountainous regions with large snowfall, such as the White Mountain region of New Hampshire, and not likely to ever occur in the Town of Goshen.

DESCRIPTIONS OF NATURAL HAZARDS

Flooding

Overview
Flooding is the temporary overflow of water onto lands that are not normally covered by water. Flooding results from the overflow of major rivers and tributaries, storm surges, and inadequate local drainage. Floods can cause loss of life, property damage, crop/livestock damage, and water supply contamination, and can disrupt travel routes on roads and bridges.
Floods in the Goshen area are most likely to occur in the spring due to the increase in rainfall and snowmelt; however, floods can occur at any time of the year. A sudden winter thaw or a major summer downpour can cause flooding.

100-Year Floods
The term "100-year flood" does not mean that flooding will occur once every 100 years, but is a statement of probability to describe how one flood compares to others that are likely to occur. What it actually means is that there is a one percent chance of a flood in any given year.

River Ice Jams
"Ice forming in riverbeds and against structures presents significant hazardous conditions [;] … storm waters encounter these ice formations which may create temporary dams. These dams may create flooding conditions where none previously existed (i.e., as a consequence of elevation in relation to normal floodplains). Additionally, there is the impact of the ice itself on structures such as highway and railroad bridges. Large masses of ice may push on structures laterally and/or may lift structures not designed for such impacts" (This and all subsequent cited statements in this section are from NH State Hazard Mitigation Plan, page 16).

Rapid Snow Pack Melt
Warm temperatures and heavy rains cause rapid snowmelt. Quickly melting snow coupled with moderate to heavy rains are prime conditions for flooding.

Location
Floods are likely to occur on areas of land adjacent to lakes and streams. Roads that cross streams or lie next to streams are at risk of flood damage. In the town of Goshen, FEMA's Digital Flood Insurance Rate Maps indicate that sections of Rt. 10 and Brook Rd. lie within the 100-year floodplain (map included in Appendix F). Flooding is not limited to this area, as the Goshen Hazard Mitigation Committee identified multiple roads that have been flooded that do not lie within the 100-year floodplain (see Previous Occurrences section below). Large flooding events have affected the entire town, thus the entire town is at risk for floods.

Extent

The worst damage that flooding is likely to cause in the Town of Goshen is severe, based on the past occurrences of damage to the road network (see page 8 for key to determining extent description).

Previous Occurrences
Floods occur on an annual basis, most often in the spring. Nine regional or statewide flooding events have been recorded since 1927 that affected the Town of Goshen. A search on the Cold Regions Research and Environmental Laboratory (CRREL) and discussion with the Goshen Hazard Mitigation Committee revealed no history of ice jam-related events in the Town of Goshen.

Hazard	Date	Location	Description of Areas Impacted
Flood	November 3-4, 1927	Southern NH	Damage to Road Network. Caused many roads to wash out.
Flood	March 11-21, 1936	NH State	Damage to Road Network. Flooding caused by simultaneous heavy snowfall totals, heavy rains and warm weather. Run-off from melting snow with rain overflowed the rivers
Flood	August 7-11, 1990	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack & Sullivan Counties, NH	FEMA Disaster Declaration # 876. Flooding caused by a series of storm events with moderate to heavy rains. $2,297,777 in damage.
Flood	October 29, 1996	Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan Counties, NH	FEMA Disaster Declaration # 1144- DR. Flooding caused by heavy rains. $2,341,273 in damage.
Flood	July 2, 1998	Southern NH	FEMA Disaster Declaration # 1231. Severe storms and flooding
Flood	October 7-18, 2005	Cheshire, Grafton, Merrimack, Sullivan, and Hillsborough Counties, NH	FEMA Disaster Declaration # 1610. Severe storms and flooding.
Flood	October-November 2005	Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan counties	FEMA Disaster Declaration # DR-1144-NH
Flood	May 25th, 2006	Belknap, Carroll, Hillsborough, Merrimack, Rockingham, and Strafford Counties, NH	FEMA Disaster Declaration # 1643. Severe storms and flooding.
Flood	April 16, 2007	All counties, NH	FEMA Disaster Declaration # 1695. Severe storms and flooding.

Goshen Hazard Mitigation Committee members identified the following flood prone areas in the Town of Goshen:

- During the October 2005 flooding, several areas along waterways in Goshen were flooded, including:
    - The South Branch of the Sugar River extending along Blood Brook
    - Areas along Gunnison Brook
    - Province Road, along which is Horseshoe Pines, an elderly assisted living facility.
    - Mountain Road washed out and included in the washout were two culverts and bridge damage.

- On many occasions, town-maintained dirt roads, culverts and bridges have been lost to flooding. For example, Brick Yard Road is prone to wash outs because there is the potential for riverine flooding on one side of the road while the other side is bordered by a steep slope.

Probability of Future Events
According to the State of NH's 2004 Statewide Mitigation Plan, Sullivan County has a high risk of flooding. The Goshen Hazard Mitigation Committee determined that the probability of future flooding events in the Town is likely, or probable to occur within the next ten years.

Dam Breach or Failure

Overview
Dam failure or breach results in rapid loss of water that is normally held by the dam. The resultant flooding may pose a significant threat to both life and property.

Location
Twenty-seven dams are located within the Town of Goshen. Areas downstream of these dams are at risk of flooding due to dam breach or failure.

Extent
The worst damage dam breach or failure is likely to cause depends on the size and location of the dam in question. The New Hampshire Department of Environmental Services Water Division classifies dams into the following four categories, based on the potential damage that a dam failure would likely cause:

- Non-Menace (NM),
- Low Hazard (L),
- Significant Hazard (S), and
- High Hazard (H).

In the Town of Goshen, Site D-2 Dam (Gunnison Lake Dam) is classified as high hazard. One wildlife pond dam is classified as low hazard. No other dams are sizable enough to be of concern. Owners of dams with a significant or high hazard classification are required to craft an Emergency Action Plan in the event of dam breach or failure, including a map of the area that would be inundated due to a failure of the dam. This map is found in Appendix G.

Dams with a high hazard classification are of a size and in a location where dam failure would result in probable loss of human life as a result of:

- "Water levels and velocities causing the structural failure of a foundation of a habitable residential structure or commercial or industrial structure, which is occupied under normal conditions.
- Water levels rising above the first floor elevation of a habitable residential structure or a commercial or industrial structure, which is occupied under normal conditions when the rise due to dam failure is greater than one foot.

- Structural damage to an interstate highway, which could render the roadway impassable or otherwise interrupt public safety services.
- The release of a quantity and concentration of material, which qualify as "hazardous waste" as defined by RSA 471-A:2 VI..
- Any other circumstance that would more likely than not cause one or more deaths."

(Source: NH DES Environmental Fact Sheet WD-DB-15, 2006.)

The worst damage that dam breach or failure of Site D-2/Gunnison Lake Dam is likely to cause is severe. The Goshen Hazard Mitigation Committee identified 41 structures in Goshen that would be inundated with water if the dam were to experience breach or failure.

The worst damage that dam breach or failure of one of the low hazard or non-menace dams is likely to cause is minimal (see page 8 for key to determining extent description).

The table below shows all dams in the Town of Goshen; those without a hazard classification are non-active.

Dam #	Class	Dam Name	Owner	Status	Type	Height (ft)	IMPND (Acres)
095.26	NM	PHEASANT RUN FARM POND	PHEASANT RUN FARM	ACTIVE	EARTH	7.50	0.250
095.05	NM	ERICKSON DAM	MR CARL G ERICKSON	ACTIVE	EARTH	15.00	0.210
095.08	NM	FIRE POND	MR GEORGE A DORR JR	ACTIVE	EARTH	11.00	0.300
095.07	NM	FIRE POND	MR JOSEPH PERRINO	ACTIVE	EARTH	5.00	0.500
095.22	NM	FIRE POND	MR RICHARD ANDREWS	ACTIVE	EARTH	11.00	0.270
095.10	-	RECREATION POND DAM	MR EDWARD J ANDERSON	NOT BUILT	-	0.00	0.000
095.04	NM	RAND POND OUTLET BROOK DAM	NH FISH & GAME DEPARTMENT	ACTIVE	EARTH	4.00	0.150
095.17	NM	SCRANTON FARM POND DAM	MR JOHN SCRANTON	ACTIVE	EARTH	5.00	0.460
095.02	-	BRANCH GUNNERSON BROOK DAM	MR HARRY G BARTLETT	RUINS	-	0.00	0.000
095.06	-	STEPHAN FIRE POND DAM	MR DAVID W STEPHAN	NOT BUILT	-	0.00	0.000
095.14	-	WILDLIFE POND	MR ROY BALLA	NOT BUILT	EARTH	10.50	1.400
095.01	-	SOUTH BRANCH SUGAR RIVER DAM	MR ROBERT E HADLEY	RUINS	-	5.00	0.000
095.09	NM	FARM POND	MR ARTHUR G JILLETTE JR	ACTIVE	EARTH	8.00	0.200
095.11	NM	FIRE POND	MR & MRS HAROLD COVIT	ACTIVE	EARTH	13.00	0.260
095.24	-	RECREATION POND DAM	MR ARTHUR NELSON	EXEMPT	EARTH	3.00	1.000
095.03	-	BLOOD BROOK DAM	MS EMILY BLOSSOM	RUINS	-	0.00	0.000
095.25	H	GUNNISON LAKE SITE D2 DAM	NH WATER DIVISION	ACTIVE	EARTH	62.00	96.200
095.20	-	SUAREZ REDREATION POND DAM	MR RICHARD SUAREZ	EXEMPT	EARTH	2.00	0.300
095.13	NM	FARM POND	MS ADELORD AYOTTE	ACTIVE	EARTH	5.00	0.140
095.19	-	HUGHS WILDLIFE POND DAM	MR WILLIAM HUGHS	NOT BUILT	-	0.00	0.000
095.15	NM	WILDLIFE POND	MR SYLVAN SCHENDLER	ACTIVE	EARTH	8.00	0.540
095.21	NM	FIRE POND	MR SYLVAN SCHENDLER	ACTIVE	EARTH	4.00	0.200

095.12	NM	WILDLIFE POND	MR SYLVAN SCHENDLER	ACTIVE	EARTH	4.00	0.540
095.16	NM	WILDLIFE POND	MR THOMAS B POWERS	ACTIVE	EARTH	6.00	3.400
095.18	NM	FARM POND	MR THOMAS B POWERS	ACTIVE	EARTH	6.00	0.320
095.27	-	RAND POND	TOWN OF GOSHEN	RUINS	-	0.00	0.000
095.23	L	WILDLIFE POND DAM	MR DIRK R CASAGRANDE	ACTIVE	EARTH	15.50	6.000

Source: Dam information provided by the NH Dam Bureau in 2007 and will be verified by Town officials.

Previous Occurrences

Committee members could not recall any instances of dam breach or failure within the Town of Goshen.

Probability of Future Events

There is potential for dam breach or failure, and the Site D-2/Gunnison Lake Dam is of especial concern. This dam is inspected by the NH Department of Environmental Services Dam Bureau on a biennial basis.

The State Hazard Plan list Sullivan County as an area of low risk for dam failure. The Goshen Hazard Mitigation Committee determined that they did not have enough information to assign a value to the probability of future dam failure events in the Town.

Drought

Overview
A drought is a natural hazard that is difficult to define. During a drought, precipitation is abnormally low; this pattern of dry conditions can last for a few months to several years. The severity of a drought evolves over time and can be described by the amount of water deficit, the duration, and the size of the affected area. The effects of drought are indicated through measurements of soil moisture, groundwater levels and stream flow. Low stream flow and low ground water levels commonly cause diminished water supply.

Location
Drought in New Hampshire has a widespread geographic extent, and affects the entire Town of Goshen when it occurs.

Extent
The worst damage drought is likely to cause is moderate, due to the potential interruption of water supply for extended periods of time (see page 8 for key to determining extent description). In addition, drought increases the risk of wildfire.

Previous Occurrences
Droughts in New Hampshire appear to follow a 10 or 25 year interval; the last major drought in New Hampshire was in 2001-2002. In the past century, five major droughts were recorded.

The Goshen Hazard Mitigation Committee could not recall any major periods of drought in Goshen.

Hazard	Date	Location	Description of Areas Impacted
Drought	1929-1936	Statewide	Regional. Recurrence Interval 10 to > 25 years
Drought	1939-1944	Statewide	Severe in southeast and moderate elsewhere. Recurrence Interval 10 to > 25 years
Drought	1947-1950	Statewide	Moderate. Recurrence Interval 10 to > 25 years
Drought	1960-1969	Statewide	Regional longest recorded continuous spell of less than normal precipitation. Encompassed most of the Northeastern US. Recurrence Interval > 25 years
Drought	2001-2002	Statewide	Third worst drought on record, exceeded only by the drought of 1965-1966 and 1941-1942.

Probability of Future Events

According to the State Hazard Plan, Sullivan County has a medium risk of drought with recurrence intervals between 10 and 25 years. The Goshen Hazard Mitigation Committee determined that the probability of future drought events in the Town is possible, or probable to occur within the next ten to 25 years.

Wildfire

Overview
Wildfire is defined as any unwanted and unplanned fire burning in the forest, shrub or grass. Wildfires are frequently referred to as forest fires, shrub fires or grass fires, depending on their location. They often occur during drought and when woody debris on the forest floor is readily available to fuel the fire. The threat of wildfires is greatest where vegetation patterns have been altered by past unsafe land-use practices, fire suppression and fire exclusion. Vegetation buildup can lead to more severe wildfires.

Increased severity over recent years has decreased capability to extinguish wildfires. Wildfires are unpredictable and usually destructive, causing both personal property damage and damage to community infrastructure, cultural and economic resources. Negative short term effects of wildfires include destruction of timber, forage, wildlife habitats, scenic vistas and watersheds. Some long term effects include erosion and poor water quality.

Since 1985, approximately 9,000 homes have been lost to urban/wild land interface fires across the United States (Northeast States Emergency Consortium: www.nesec.org). The majority of wildfires usually occur in April and May, when home owners are cleaning up from the winter months, and when the majority of vegetation is void of any appreciable moisture making them highly flammable. As weather and human activities change with the seasons of the year, so does the incidence, causes and severity of fires. Cold winter weather increases indoor activities and

the need for heating, which brings about the peak period of heating structure fires. Daily fire incidence is at its highest in the spring. Spring is characterized by an increase in outside fires and a decrease in fires related to heating. The increase in outside spring fires is in large part due to the increase in tree, grass, and brush fires. Summer fires reflect an increase of incendiary and suspicious fires, fires associated with fireworks and natural fires caused by lightning strikes. These fires are a reflection of the change to warmer weather and the consequent increase in both outside activities and dry natural vegetation. Fire incidence is at its lowest in the fall. In fall, there is a decrease in outside fires, an increase in heating-related structure fires and the peak period of cooking fires.

Location
Forested, high elevation areas in Goshen are particularly vulnerable to wildfire events. Present concerns of New Hampshire Department of Resources and Economic Development, Division of Forests & Lands are that the Ice Storm of 1998 has left a significant amount of woody debris in the forests of the region as may fuel future wildfires.[2]

Extent
"New Hampshire averages 500 fires per year and averages ½ acre or less per fire due to the excellent coordination between Fire Towers and local Fire Departments."[3] The worst damage wildfire is likely to cause is minimal, due to the small size of most wildfires (see page 8 for key to determining extent description).

Previous Occurrences
The Goshen Hazard Mitigation Committee did not recall any wildfire events in the Town.

Probability of Future Events
Historically, large New Hampshire wildland fires have run in roughly 50 year cycles. Prolonged drought increases the likelihood of such events; severe droughts in New Hampshire appear to follow a 10 to 25 year interval. Changing patterns of settlement and land use affect fire regimes and vulnerability of structures and forests to fire. The map of the wildland-urban interface (Appendix H) provides an overview of the large amount of wildland-urban intermix and interface area in the western and northern section of Goshen that is vulnerable to wildfire.

The Goshen Hazard Mitigation Committee identified the following:

- There is the potential for wildfire in Blood Valley along some of the Class VI logging roads.
- There is the potential for wildfire along Mountain Road, Washington Road, Brook Road and Route 10.

Sullivan County has a high risk of wildfire, as identified in the State Hazard Plan. The Goshen Hazard Mitigation Committee determined that the probability of future wildfire events in the Town is possible, or probable to occur within the next ten to 25 years.

2 State of NH Hazard Mitigation Plan, p. 34
3 Ibid. p. 34

Earthquake

Overview
An earthquake is a rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric and phone lines, and cause landslides, flash floods and fires. The magnitude and intensity of an earthquake is determined by the use of scales such as the Richter scale and the Mercalli scale.

Location
New England is considered a moderate risk earthquake zone. Four earthquakes occurred in New Hampshire between 1924-1989 had a magnitude of 4.2 or more. Two of these had their epicenters in Ossipee, one west of Laconia, and one near the Quebec border, and the tremors were felt throughout the State of New Hampshire. An earthquake would affect the entire Town of Goshen.

Extent
The worst damage earthquake is likely to cause is limited, due to the minor damage sustained in past earthquakes (see page 8 for key to determining extent description).

Previous Occurrences
There are no records of an earthquake centered within the Town of Goshen or Sullivan County. Several earthquakes have occurred in the Northeast region, the tremors of which were felt throughout New Hampshire.

Hazard	Date	Location	Description of Areas Impacted
Earthquake	1638	Central New Hampshire	6.5-7
Earthquake	October 29, 1727	Off NH/MA coast	Widespread damage Massachusetts to Maine
Earthquake	December 29, 1727	Off NH/MA coast	Widespread damage Massachusetts to Maine
Earthquake	November 18, 1755	Cape Ann, MA	6.0, much damage
Earthquake	1800s	Statewide New Hampshire	83 felt earthquakes in New Hampshire
Earthquake	1900s	Statewide New Hampshire	200 felt earthquakes in New Hampshire
Earthquake	March 18, 1926	Manchester, NH	Felt in Hillsborough County
Earthquake	December 20, 1940	Ossipee, NH	Both earthquakes of magnitude 5.5, both felt for 400,000 sq miles, structural damage to homes, damage in Boston MA, water main rupture.
Earthquake	December 28, 1947	Dover-Foxcroft, ME	4.5
Earthquake	June 10, 1951	Kingston, RI	4.6

Earthquake	April 26, 1957	Portland, ME	4.7
Earthquake	April 10, 1962	Middlebury, VT	4.2
Earthquake	June 15, 1973	Near NH Quebec Border, NH	4.8
Earthquake	January 19, 1982	Gaza (west of Laconia), NH	4.5, walls and chimneys cracked, damage up to 15 miles away in Concord
Earthquake	October 20, 1988	Near Berlin, NH	4

Probability of Future Events
New Hampshire lies in a zone of moderate seismic vulnerability. Sullivan County has a medium risk of earthquakes, as identified in the State Hazard Plan. The Goshen Hazard Mitigation Committee determined that the probability of future earthquake events in the Town is unlikely, or not probable to occur within the next 25 years.

Landslide

Overview
A landslide is the downward or outward movement of slope-forming materials reacting under the force of gravity, including mudslides, debris flows, and rockslides. Landslides can damage or destroy roads, railroads, electrical and phone lines, and other structures.

Location
Goshen has many streams and hilly terrain; the area potentially at risk for landslides is widespread throughout the Town.

Extent
The worst damage landslide is likely to cause is minimal, due to the minor damage sustained in past landslides (see page 8 for key to determining extent description).

Previous Occurrences
The Committee identified an area along Gunnison Brook on the eastern edge of Goshen where a landslide event occurred in both 2000 and 2002.

Probability of Future Events
Sullivan County has a medium risk of landslides, as identified in the State Hazard Plan. The Goshen Hazard Mitigation Committee determined that the probability of future landslide events in the Town is unlikely, or not probable to occur within the next 25 years.

Tornado and Downburst

Overview
"A tornado is a violent windstorm characterized by a twisting, funnel shaped cloud. These events are spawned by thunderstorms and, occasionally by hurricanes, and may occur singularly or in multiples. They develop when cool air overrides a layer of warm air, causing the warm air to rise rapidly. Most vortices remain suspended in the atmosphere. Should they touch down,

they become a force of destruction." (NH Hazard Mitigation Plan). The Fujita Scale is the standard scale for rating the severity of a tornado as measured by the damage it causes. Most tornadoes are in the F0 to F2 Class. Building to modern wind standards provides significant property protection from these hazard events. New Hampshire is located within Zone 2 for Design Wind Speed for Community Shelters, which suggests that buildings should be built to withstand 160 mph winds.

"A downburst is a severe localized wind blasting down from a thunderstorm. These 'straight line' winds are distinguishable from tornadic activity by the pattern of destruction and debris. Depending on the size and location of these events, the destruction to property may be devastating. Downbursts fall into two categories. "Microbursts cover an area less than 2.5 miles in diameter and macrobursts cover an area at least 2.5 miles in diameter."

Location
All areas of Goshen are potentially at risk for property damage and loss of life due to tornados.

Extent
The worst damage that a tornado is likely to cause is severe, due to the likelihood of damage to property and infrastructure and the interruption of essential services (see page 8 for key to determining extent description).

Previous Occurrences
The National Climatic Data Center lists five tornado events in Sullivan County between the years 1950 and March 2007. The Goshen Hazard Mitigation Committee could not recall any specific tornado events within the Town.

Hazard	Date	Location	Fujita Scale	Property Damage
Tornado	October 24, 1955	Sullivan County	F0 scale	$25,000
Tornado	July 9, 1962	Sullivan County	F0 scale	$25,000
Tornado	July 9, 1962	Sullivan County	F2 scale	$3,000
Tornado	July 18, 1963	Sullivan County	F1 scale	$25,000
Tornado	August 13, 1999	East Plainfield, Sullivan County	F1 scale	$100,000

Probability of Future Events
The State Hazard Plan list Sullivan County as an area of medium risk for tornados and downbursts. The Goshen Hazard Mitigation Committee determined that the probability of future tornado events in the Town is possible, or probable to occur in the next 10 to 25 years.

Hurricane

Overview
A hurricane is an intense tropical weather system with a well-defined circulation and maximum sustained winds of 74 mph (64 knots) or higher. Hurricane winds blow in a large spiral around a relative calm center known as the "eye." The "eye" is generally 20 to 30 miles wide, and the

storm may extend outward 400 miles. As a hurricane nears land, it can bring torrential rains, high winds, and storm surges. A single hurricane can last for more than 2 weeks over open waters and can run a path across the entire length of the eastern seaboard. August and September are peak months during the hurricane season that lasts from June 1 through November 30. Damage resulting from winds of this force can be substantial, especially considering the duration of the event, which may last for many hours (NH Hazard Mitigation Plan; FEMA website).

Location
The location of a hurricane is large in nature and when occurring in Goshen affects the entire town.

Extent
The worst damage that a hurricane is likely to cause is severe, as flooding and high winds may cause major damage to public infrastructure and the disruption of essential services (see page 8 for key to determining extent description).

Previous Occurrences
Since 1635, fifteen hurricanes, tropical storms, or gales have reached New Hampshire.

Hazard	Date	Location	Description of Areas Impacted
Hurricane	August, 1635	n/a	
Hurricane	October 18-19, 1778	n/a	Winds 40-75 mph
Hurricane	October 9, 1804	n/a	
Gale	September 23, 1815	n/a	Winds > 50mph
Hurricane	September 8, 1869	n/a	
Hurricane	September 21, 1938	Southern New England	Flooding caused damage to road network and structures. 13 deaths, 494 injured throughout NH. Disruption of electric and telephone services for weeks. 2 Billion feet of marketable lumber blown down. Total storm losses of $12,337,643 (1938 dollars). 186 mph maximum winds.
Hurricane (Carol)	August 31, 1954	Southern New England	Category 3, winds 111-130 mph. Extensive tree and crop damage in NH, localized flooding
Hurricane (Edna)	September 11, 1954	Southern New England	Category 3 in Massachusetts. This Hurricane moved off shore but still cost 21 lives and $40.5 million in damages throughout New England. Following so close to Carol it made recovery difficult for some areas. Heavy rain in NH
Hurricane (Donna)	September 12, 1960	Southern and Central NH	Category 3 (Category 1 in NH). Heavy flooding in some parts of the State.
Tropical Storm (Doria)	August 28, 1971	New Hampshire	Center passed over NH resulting in heavy rain and damaging winds

Hurricane (Belle)	August 10, 1976	Southern New England	Primarily rain with resulting flooding in New Hampshire. Category 1
Hurricane (Gloria)	September, 1985	Southern New England	Category 2, winds 96-110 mph. Electric structures damaged; tree damages. This Hurricane fell apart upon striking Long Island with heavy rains, localized flooding, and minor wind damage in NH
Hurricane (Bob)	August 19, 1991	Southern New England	Structural and electrical damage in region from fallen trees. 3 persons were killed and $2.5 million in damages were suffered along coastal New Hampshire. Federal Disaster FEMA-917-DR
Hurricane (Edouard)	September 1, 1996	Southern New England	Winds in NH up to 38 mph and 1 inch of rain along the coast. Roads and electrical lines damaged
Tropical Storm (Floyd)	September 16-18, 1999	Southern New England	FEMA DR-1305-NH. Heavy Rains

Probability of Future Events
Hurricanes in Goshen are more likely to cause flooding from associated rain than disturbance and destruction from high winds, although the region has seen remnants from many hurricanes from the coast over the past 100 years. The extent of hurricanes in Goshen would most likely not be geographically bound and would affect the entire community.

The State Hazard Plan lists Sullivan County as a medium risk for future hurricanes based on past evidence. The Goshen Hazard Mitigation Committee determined that the probability of future tornado events in the Town is possible, or probable to occur in the next 10 to 25 years.

Lightning

Overview
"Lightning is a giant spark of electricity that occurs between the positive and negative charges within the atmosphere or between the atmosphere and the ground. In the initial stages of development, air acts as an insulator between the positive and negative charges. However, when the potential between the positive and negative charges becomes too great, there is a discharge of electricity that we know as lightning."

Location
All areas of Goshen are at risk for property damage and loss of life due to lightning.

Extent
The worst damage lightning is likely to cause is minimal, due to limited property damage and contained geographic area inherent in the nature of a lightning strike. There is potential for interruption of essential services if communications equipment or infrastructure is damaged (see page 8 for key to determining extent description).

Previous Occurrences
"Lightning kills an average of 87 people per year in the United States, and New Hampshire has the 16th highest casualty rate in the nation."[4] In Sullivan County, five lightning strikes have been reported from 1950 and 2007 to the National Climatic Data Center, including two lightning strikes that damaged equipment in town-owned buildings. The Goshen Hazard Mitigation Committee did not recall any lightning strikes within the Town.

Hazard	Date	Location	Description of Areas Impacted	Hazard
Lightning	July 21, 1994	Sullivan County	1 person injured	--
Lightning	May 31, 2002	Town of Sunapee	Storage barns struck & destroyed	$20,000
Lightning	June 5, 2002	Town of Washington	Tower of Town Hall struck; damage to tower and equipment	$11,000
Lightning	August 18, 2002	Town of Sunapee	Three people injured	--
Lightning	July 8, 2004	Town of Sunapee	Computer and radio equipment damaged at Town Office	$3,000

Probability of Future Events
Sullivan County has a medium risk of lightning strikes, according to the State Hazard Plan. The Goshen Hazard Mitigation Committee determined that they did not have enough information to assign a value to the probability of future earthquake events in the Town.

Severe Winter Weather Storms

Overview
Ice and snow events typically occur during the winter months and can cause loss of life, property damage, and tree damage.

Heavy Snow Storms
"A heavy snowstorm is generally considered to be one which deposits four or more inches of snow in a twelve-hour period… A blizzard is a winter storm characterized by high winds, low temperatures, and driving snow- according to the official definition given in 1958 by the U.S. Weather Bureau, the winds must exceed 35 miles per hour and the temperatures must drop to 20°F (-7°C) or lower. Therefore, intense Nor'easters, which occur in the winter months, are often referred to as blizzards. The definition includes the conditions under which dry snow, which has previously fallen, is whipped into the air and creates a diminution of visual range. Such conditions, when extreme enough, are called 'white outs'."

Ice Storms
"When a mass of warm moist air collides with a mass of cold arctic air, the less dense warm air will rise and the moisture may precipitate out in the form of rain. When this rain falls through the colder more dense air and comes in contact with cold surfaces, the latent heat of fusion is removed by connective and/or evaporative cooling. Ice forms on these cold surfaces and may continue to form until the ice is quite deep, as much as several inches. This condition may strain

4 State of NH Hazard Mitigation Plan, page 63

branches of trees, power lines and even transmission towers to the breaking point and often creates treacherous conditions for highway travel and aviation. Debris impacted roads make emergency access, repair and cleanup extremely difficult.

"Nor'easters"
In the winter months, [Towns within] the State may experience the additional coincidence of blizzard conditions with many of these events as well as the added impact of the masses of snow and/or ice upon infrastructure thus, impacting upon transportation and the delivery of goods and services for extended periods of time, as well as various related impacts upon the economy. The entire area of the State may be impacted by these events… Heavy snow and/or rainfall may be experienced in different areas of the State and the heavy rains may contribute to flood conditions. Nor'easter events which occur toward the end of a winter season may exacerbate the spring flooding conditions by depositing significant snow pack at a time of the season when spring rains are poised to initiate rapid snow pack melting."

Location
Severe winter storms are regional in nature, and when occurring in Goshen affect the entire town.

Extent
The worst damage that a severe winter storm is likely to cause is severe, due to the interruption of essential services and damage to property sustained during this type of event (see page 8 for key to determining extent description).

Previous Occurrences
Some damage from severe winter storms is recorded on an annual basis. The table below highlights the most severe winter storms with regional or statewide impact since 1929 as well as severe winter storms with local impact. The Goshen Hazard Mitigation Committee recalled that Goshen experienced severe winter weather with an accumulation of 36 inches of snow in March 2000. The Committee also recalled that the ice storm of 1998 affected higher elevations (greater than 1000 ft) in the Town.

Hazard	Date	Location	Description of Areas Impacted
Ice Storm	December 17-20, 1929	New Hampshire	Unprecedented disruption and damage to telephone telegraph and power system. Comparable to 1998 Ice Storm (see below)
Ice Storm	Dec. 29-30, 1942	New Hampshire	Glaze storm; severe intensity
Snow Storm	December 10-13, 1960	New Hampshire	Up to 17 inches of snow in southern NH
Snow Storm	January 18-20, 1961	New Hampshire	Up to 25 inches of snow in southern NH
Snow Storm	February 2-5, 1961	New Hampshire	Up to 18 inches of snow in southern NH
Snow Storm	January 11-16, 1964	New Hampshire	Up to 12 inches of snow in southern NH

Blizzard	January 29-31, 1966	New Hampshire	Third and most severe storm of 3 that occurred over a 10-day period. Up to 10 inches of snow across central NH
Snow Storm	December 26-28, 1969	New Hampshire	Up to 41 inches of snow in west central NH
Snow Storm	February 18-20, 1972	New Hampshire	Up to 19 inches of snow in southern NH
Snow Storm	January 19-21, 1978	New Hampshire	Up to 16 inches of snow in southern NH
Blizzard	February 5-7, 1978	New Hampshire	New England-wide. Up to 25 inches of snow in central NH
Snow Storm	April 5-7, 1982	New Hampshire	Up to 18 inches of snow in southern NH
Ice Storm	February 14, 1986	New Hampshire	Fiercest ice storm in 30 yrs in the higher elevations in the Monadnock region. It covered a swath about 10 miles wide from the MA border to Goshen NH
Extreme Cold	November-December, 1988	New Hampshire	Temperature was below 0 degrees F for a month
Ice Storm	March 3-6, 1991	New Hampshire	Numerous outages from ice-laden power lines in southern NH
Ice Storm	January 15, 1998	New Hampshire	Federal disaster declaration DR-1199-NH, 20 major road closures, 67,586 without electricity, 2,310 without phone service, $17+ million in damages to Public Service of NH alone
Snow Storm	December 6-7, 2004	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Sullivan Counties	Federal emergency declaration, EM-3193
Snow Storm	January 22-23, 2005	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, Sullivan Counties	Federal emergency declaration, EM-3207
Snow Storm	February 10-11, 2005	Carroll, Cheshire, Coos, Grafton, Sullivan Counties	Federal emergency declaration, EM-3208
Snow Storm	March 11-12, 2005	Carroll, Cheshire, Hillsborough, Rockingham, Sullivan Counties	Federal emergency declaration, EM-3211

Probability of Future Events

Three types of winter events are heavy snow, ice storms and extreme cold. Occasionally heavy snow will collapse buildings. Ice storms have disrupted power and communication services. Extreme cold affects the elderly. These random events make it difficult to set a cost to repair or replace any of the structures or utilities affected. The entire town of Goshen is at risk of severe winter weather.

Sullivan County, like the rest of New Hampshire, is at high risk of severe winter storms, as identified in the State Hazard Plan. The Goshen Hazard Mitigation Committee determined that

the probability of future severe winter storm events in the Town is likely, or probable to occur within the next 10 years.

Other Hazards:
Hazardous Materials Spill

Location
Route 31, Route 10, and Brook Rd are often traveled by propane trucks, making the areas along these roadways vulnerable to a hazardous material spill. The junkyard and transfer station have the potential to release hazardous materials into the groundwater.

Extent
A hazardous material release along any of these major roadways through Goshen would interrupt traffic and cause a hazard to human health of those residing nearby. The worst damage that a hazardous material spill is likely to cause is severe, due to the interruption of essential services and potential for contamination to the water supply during this type of event (see page 8 for key to determining extent description).

Previous Occurrences
The Goshen Hazard Mitigation Committee did not recall any hazardous material spills within the Town.

Probability of Future Events
The Goshen Hazard Mitigation Committee determined that the probability of a future hazardous material spill event in the Town is likely, or probable to occur within the next 10 years

Assessing Probability, Vulnerability and Risk

The Committee members completed a Risk Assessment all of the types hazards identified in Chapter III. Appendix E provides a detailed methodology for the Risk Assessment. The process involved assigning Unlikely, Possible, Likely values (numerically 1, 2 or 3) to each hazard type for its potential of occurring based on past historic information. (An n/a score was given if there was insufficient evidence to make a decision). To assess vulnerability, a 1, 2, or 3 value was assigned to each hazard type. Risk was calculated by multiplying probability by the vulnerability. Low-Medium-High risk was assigned as shown below.

0-1.9- Low 2.0-3.9- Low-Med 4-5.9- Med 6-7.9- Med-High 8-9- High

The Committee members completed a risk assessment of all type of hazards identified in Chapter III. The process also involved assigning vulnerability based on the Committee's opinion of the extent of damage the hazard may cause based on past occurrences and current assessments of the Town. Great amount of damage and cost (3), moderate amount of damage and cost (2), and limited damage or costs (1).

Risk Assessment

Hazards (Natural & Manmade)	Probability of Occurrence Likely (3), Possible (2) Unlikely (1)	Probability based on State Hazard Plan Likely (3), Possible (2), Unlikely (1)	Average of Prob-abilities	Vulnerability based on State Hazard Plan High (3), Moderate (2), Low (1)	Vulnerability High (3), Moderate (2), Low (1)	Average of Vulner-abilities	Risk Rating (Probability x Vulner-ability)
Flooding	3	3	3	1	3	2	**6**
Dam Failure	n/a	1	1	1	3	1	**3**
Drought	2	2	2	1	3	2	**4**
Wildfire	2	3	2.5	1	3	2	**5**
Earthquake	1	2	1.5	1	2	1.5	**3**
Landslide	1	2	1.5	1	2	1.5	**3**
Tornado & Downburst	2	2	2	1	2	1.5	**3**
Hurricane	2	2	2	1	2	1.5	**3**
Lightning	n/a	2	2	1	n/a	1	**2**
Severe Winter Weather	3	3	3	1	3	2	**6**
HazMat	3	n/a	3	1	3	1.5	**4.5**

SECTION IV
CRITICAL FACILITIES/LOCATIONS

The Critical Facilities list, identified by the Goshen Hazard Mitigation Committee, is divided into three categories. The Critical Facilities list, identified by the Goshen Hazard Mitigation Committee, is divided into three categories. The first category contains facilities needed for emergency response in the event of a disaster. The second category contains non-emergency response facilities that are not required in an event, but that are considered essential for the everyday operation of the Town of Goshen. The third category contains facilities/populations that the Committee wishes to protect in the event of a disaster.

Emergency Response Facilities, Services & Structures

Critical Facility	Replacement Value
Fire Station	$56,000.00
Police Station	$173,700.00
Highway Department	$36,920.00

Non-Emergency Response Facilities and Services

Critical Facility	Replacement Value
Grange Hall	$178,200.00
Post Office	$97,700.00
Library	$85,300.00
Goshen Community Church	$265,100.00
Power Conversion Station (Co-op)	$444,730.00

Facilities/Populations to Protect

Critical Facility	Replacement Value
Lumber Yard	$255,300.00
Goshen Country Store	$130,750.00
75 Homes around Rand Pond Road	N/A
Backside Inn	$362,000.00
Horseshoe Pines (Elderly Assisted Living Facility)	$154,490.00

SECTION V
DETERMINING HOW MUCH WILL BE AFFECTED

IDENTIFYING VULNERABLE COMMUNITY ELEMENTS

The tables below provide a summary of the vulnerability of the community elements to each hazard identified by the Goshen Hazard Mitigation Committee. The risk rating calculated in the risk assessment is included for each hazard.

To create this table, the Goshen Hazard Mitigation Committee identified the critical facilities vulnerable to each hazard as well as identified structures, infrastructure, and special populations that have been affected by these hazards in the past or are likely to be affected in the future (see Profile of Natural Hazards, starting on page 10). The Digital Flood Insurance Rate Map for the Town of Goshen was checked to determine which critical facilities lie within the 100-year floodplain. Natural resource vulnerability was assessed based on the most likely types of natural resources to be impacted by each hazard; detailed information on these resources was not available, so a general assessment was made.

Mountain Reach is a proposed 27-unit condominium development at the end of Old Province Road and was included in this hazard assessment. This is the only instance of planned or proposed future land development in Goshen, and so vulnerability of other undeveloped land in the Town of Goshen was not analyzed.

FLOODING – Medium-High Risk – Community Elements at Risk

Structures	Critical Facilities: Fire Station, Police Station, Grange Hall, Post Office, Library, Goshen Community Church, Lumber Yard, Goshen Country Store
Infrastructure	Route 10, Brook Rd - roadways, culverts, utility network along these roads
Special Populations	Residents within the 100-year floodplain are vulnerable.
Natural Resources	Forest and agricultural resources, and water resources are vulnerable.

DAM BREACH OR FAILURE – Low-Medium Risk -- Community Elements at Risk

Structures	41 structures below Site D-2/Gunnison Lake Dam
Infrastructure	Route 10, Route 31 - Roadway, culverts, utility network
Special Populations	Residents and workers in the 41 structures below dam
Natural Resources	Water resources are vulnerable.

DROUGHT – Medium Risk -- Community Elements at Risk

Structures	None identified
Infrastructure	None identified
Special Populations	All populations in Goshen are vulnerable.
Natural Resources	Forest and agricultural resources and water resources are vulnerable.

WILDFIRE – Medium Risk -- Community Elements at Risk

Structures	Large wooded tracts of land make the entire town vulnerable to forest fire.

Infrastructure	Utility network
Special Populations	All populations in Goshen are vulnerable.
Natural Resources	Forest and agricultural resources, and water resources are vulnerable.

EARTHQUAKE – Low-Medium Risk -- Community Elements at Risk

Structures	All structures are vulnerable. It is unknown how many structures were not built to seismic code. It is unknown if dam failure is likely due to earthquake.
Infrastructure	Roads, bridges (5 in town), culverts, utility network
Special Populations	All populations in Goshen are vulnerable.
Natural Resources	Water resources are vulnerable.

LANDSLIDE – Low-Medium Risk -- Community Elements at Risk

Structures	None identified
Infrastructure	None identified
Special Populations	None identified
Natural Resources	Water resources are vulnerable. 2000 and 2002 landslides affected Gunnison Brook.

TORNADO AND DOWNBURST – Low-Medium Risk -- Community Elements at Risk

Structures	The unpredictable nature of this hazard makes all structures in Goshen vulnerable.
Infrastructure	Roads, utility network
Special Populations	All populations in Goshen are vulnerable.
Natural Resources	Forest and agricultural resources are vulnerable.

HURRICANE – Low-Medium Risk -- Community Elements at Risk

Structures	The large-scale nature of this hazard makes all structures vulnerable.
Infrastructure	Roads, bridges (5 in town), culverts, utility network in entire town
Special Populations	All populations in Goshen are vulnerable.
Natural Resources	Forest and agricultural resources are vulnerable. Water resources are vulnerable to subsequent flooding caused by heavy rain associated with a hurricane.

LIGHTNING – Low-Medium Risk -- Community Elements at Risk

Structures	The unpredictable nature of this hazard makes all structures vulnerable.
Infrastructure	Utility network in entire town
Special Populations	All populations in Goshen are vulnerable.
Natural Resources	Forest resources are vulnerable.

SEVERE WINTER WEATHER – Medium-High Risk -- Community Elements at Risk

Structures	The large-scale nature of this hazard makes all structures vulnerable.
Infrastructure	Roads, utility network
Special Populations	All populations in Goshen are vulnerable, especially the following: Residents of 75 homes on Rand Pond Rd are vulnerable; Guests and workers at the Backside Inn; Residents of Mountain Reach, a proposed 27-unit condominium complex on Old Province Rd; Residents and workers at Horseshoe Pines, an elderly assisted living facility.

	In addition, the elderly are vulnerable to extreme cold.
Natural Resources	Forest resources are vulnerable.

HAZARDOUS MATERIALS SPILL – Medium Risk -- Community Elements at Risk

Structures	Structures along Rt. 10, Rt. 31, and Brook Rd.
Infrastructure	Roads, utility network
Special Populations	Residents along Rt. 10, Rt. 31, and Brook Rd. All populations in Goshen are vulnerable.
Natural Resources	Water resources are vulnerable.

POTENTIAL LOSS ESTIMATES

This section identifies areas in town that are most vulnerable to hazard events and estimates potential losses from these events. It is difficult to ascertain the amount of damage caused by a natural hazard because the damage will depend on the hazard's extent and severity, making each hazard event quite unique. Potential loss estimates were generated using the best available data and using FEMA's Understanding Your Risks: Identifying Hazards and Estimating Losses.

According to the 2005 Annual Report for the Town of Goshen, the total valuation of residences and manufactured housing for the Town is $43,633,710 (42,444,820 for residential buildings, 1,188,890 for manufactured housing). The value of commercial buildings is $992,360. From research in the town records, the value of the emergency response and non-emergency response facilities described on page 27 is $1,337,650 (buildings only). Thus, the best available estimate of total value for all town buildings is $45,963,720.

According to the NH Office of Energy and Planning, in 2005, 431 housing units were located in the Town of Goshen, 37 of which were manufactured housing units. Using statistics from the 2005 Annual Report, the best estimate of average residential unit value is $107,728, and $32,132 for the average value of a manufactured housing unit.

According to the 2005 Annual Report for the Town of Goshen, the farmland and forestland under Current Use restriction or conservation restriction is valued at $990,715.

The ability of the Goshen Hazard Mitigation Committee to complete potential loss estimates was hindered by lack of data, including but not limited to base flood elevations from the Digital Flood Insurance Rate Map, seismic design level for buildings within the Town, acreage of farmland and forestland within the Town, mapped locations of structures within the Town and loss estimates/insurance claim amounts from previous hazard events within the Town. In addition, resources for the development of this plan did not permit the inclusion of structure, contents, and function losses to present a full picture of total losses and impacts. Collection of these datasets to complete and improve future risk assessment analysis should be done when this mitigation plan is updated in the future.

All structures, infrastructure, populations, and natural resources listed below have been included in the tables in the section "Identifying Vulnerable Community Elements."

Flooding
The Goshen Hazard Mitigation Committee has identified areas of past and potential flooding. The following identified critical facilities are within the floodplain: the Fire Station, the Police Station, Grange Hall, the Post Office, the Library, Goshen Community Church, the Lumber Yard and Goshen Country Store. The total replacement value for these structures is $1,242,050.

Base flood elevations for special flood hazard areas have not been determined in the Digital Flood Insurance Rate Map for the Town of Goshen, therefore it is not possible to determine the likely height of flooding. However,

Dam Breach or Failure
The Site D-2/Gunnison Lake Dam is a high hazard structure; in the event of dam breach or failure, 41 structures in Goshen would be at risk for flooding. If these structures are all residences, the estimated total replacement value for these structures is $4,416,848.

The Emergency Action Plan does not specify the base flood elevations for the inundation area. In the event of 4-ft flooding, causing 28% damage (assuming all structures are one to two stories with basements), the potential loss estimate is $1,236,717.

In addition, several bridges would be damaged and potentially fail (refer to inundation map in Appendix H).

Drought
No structures have been identified as vulnerable to drought; during a drought, the effects are felt on reduction in water supply and crop damage or failure. The acreage of active farmland in Goshen is unknown, and so it is impossible to calculate a potential loss estimate for this vulnerable natural resource.

Wildfire
All structures in the Town of Goshen, including all critical facilities, are at risk of wildfire. It is unlikely that a single wildfire would destroy all structures in the Town of Goshen. The cost to control a wildfire is roughly $1,000 per acre for labor and materials. Wildfires in New Hampshire tend to be small, on average, less than ½ acre.

If 1% of the town's forest and farmland under Current Use or conservation restriction were burned and all value of the land lost, the loss estimate would be $ 99,071. If one residential structure in Goshen were destroyed in a wildfire, the estimated replacement value would be $107,728.

Earthquake
Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric and phone lines, and precipitate landslide and flash flood events.

Assuming 1% to 5% town-wide residential and critical facility building damage, an earthquake could result in $459,637 to $2,298,186 in building damages.

The costs for repairing or replacing roadways, power lines, telephone lines, dams, and the contents of structures has not been included in these estimates.

Landslide
The area along Gunnison Brook that has experienced two landslides within the past decade appears to be in a remote area. There are no associated losses to structures or infrastructure. It was not possible to estimate losses to the water resources of Gunnison Brook.

Tornado and Downburst
Tornadoes are relatively uncommon natural hazards in the State. On average, about six touch down each year. However, damage largely depends on where a tornado strikes. If it strikes an inhabited area, the impacts could be severe. In the State of New Hampshire, the total cost of tornadoes between 1950 and 1995 was $9,071,389 (*The Disaster Center*). The cost of a tornado in Goshen would not be town-wide as that is not the nature of a tornado. Dollar amounts would depend on whether the tornado hit an area with a high density of buildings.

If a tornado impacted 1% of the buildings in Goshen, it could result in $459,637 in building damage.

The costs for repairing or replacing roadways, power lines, telephone lines, dams, and the contents of structures has not been included in these estimates.

Hurricane
Damage caused by hurricanes can be both severe and expensive. In the past, Goshen has been impacted by wind and flooding damage as a result of hurricanes.

Assuming 1% to 5% town-wide building damage, a hurricane could result in $459,637 to $2,298,186 in building damages. If 1% of the town's forest and farmland under Current Use or conservation restriction were destroyed and all value of the land lost, the loss estimate would be $99,071.

The costs for repairing or replacing roadways, power lines, telephone lines, dams, and the contents of structures has not been included in these estimates.

Lightning
The entire Town of Goshen is vulnerable to lightning. Lightning strikes one point on the ground at a time, therefore a town-wide loss estimate is unrealistic. If one residence were destroyed due to fire caused by a lightning strike, the replacement value is estimated at $107,728.

Electronic equipment within a structure as well as utility networks are vulnerable to lightning strikes; loss estimates of contents and function were not able to be completed.

Severe Snow Weather
New England usually experiences at least one or two severe snowstorms, with varying degrees of severity, each year. Power outages, extreme cold, and impacts to infrastructure are all typical effects of winter storms in Goshen. Ice storms often cause widespread power outages by

downing power lines, and these storms can also cause severe damage to trees. All of these impacts are a risk to the community and put all residents, especially the elderly, at risk.

Assuming 1% to 5% town-wide building damage, a severe winter storm could result in $459,637 to $2,298,186 in building damages. If 1% of the town's forest and farmland under Current Use or conservation restriction were destroyed and all value of the land lost, the loss estimate would be $99,071.

The road and utility network is also vulnerable to severe winter weather. Estimates for repair of these networks were not available.

SECTION VI
EXISTING MITIGATION ACTIONS

The next step involves identifying existing mitigation strategies for the hazards likely to affect the Town and evaluating their effectiveness. The following is a list of current policies, regulations and programs in the Town of Goshen that protect people and property from natural and man-made hazards.

Multiple Hazards

- Emergency Response Mutual Aid
  To lessen the severity of potential hazardous material spills, the Town of Goshen can get assistance from the Keene Mutual Aid that could provide manpower and equipment. Additional assistance could be provided by the Upper Valley Hazardous Materials Response Team and from Sullivan County.
- The Fire, Police and Highway Departments receive ongoing training in mitigating hazards before they occur and in emergency response procedures.
- Hazard prevention educational materials are distributed with State Fire Permits in the Town of Goshen to inform citizens of fire safety precautions. During the Town Old Home Day, educational materials on safety are distributed by the Fire and Police Departments.
- The Town of Goshen has established a committee for emergency operations planning. A better response to potential hazards throughout the Town will lessen potential damage to structures and loss of life.
- The Town Fire Department participates in the National Incident Command System (NIMS) and the Incident Command System (ICS).
- The Town of Goshen Selectboard has signed an agreement with the Community Emergency Reaction Team joining others communities in the greater region in lessening the severity of hazard events.
- The Town of Goshen has adopted a floodplain ordinance following FEMA's guidelines.
- Zoning Ordinance
  The Town of Goshen regulates development on steep slopes thereby mitigating potential erosion and eventual landslides. There are several conservation easements in the Town that restrict development on lands that are not suitable.
- The Snowmobile Club maintains and maps trails that can be used to access remote areas in the event of a wildfire. The fire can be contained and prevented from affecting structures in more populated areas.
- The Town of Goshen has a generator that keeps the Fire Department running in the event of a power outage. The Fire Department is critical in the protection of people and property in the event of a hazard.
- The New Hampshire Department of Environmental Services is notified about potential groundwater contamination before it occurs.
- Public Service of New Hampshire maintains the transmission line running from the Lempster Wind Farm. The transmission line is a potential cause of fire in the area.

Summary of Recommended Improvements

The Goshen Hazard Mitigation Team recommended improvements to existing programs and potential mitigation measures as follows:

- The Town of Goshen would like more training for Fire, Police and Highway in the mitigation and response to hazardous material spills.
- The Committee noted that structures and infrastructure would be better protected if a Winter Maintenance Town Highway Plan were in place.
- The Town of Goshen could do more education and outreach concerning mitigating potential hazard events.
- The NIMS and CIS training could be extended to include all Town Employees.
- The Committee would like to provide additional generators to protect town buildings that are identified as critical facilities. Additionally, these facilities can be used for emergency operations and shelters.

SECTION VII
NEWLY IDENTIFIED MITIGATION ACTIONS

POTENTIAL MITIGATION ACTIONS

The Goshen Hazard Mitigation Committee brainstormed potential mitigation actions at a meeting on September 7, 2006. All of the actions brainstormed would mitigate multiple hazards.

Actions Mitigating Multiple Hazards

- Acquire signage for road closure in the event of flooding, ice, landslide, and any other hazards that would affect safe travel, evacuation, and/or access to critical facilities.
- Provide more training for the Fire Department in mitigating wildfire and in emergency response.
- Develop a plan for the notification and evacuation of the Goshen-Lempster Co-op School, Newport High School and Fall Mountain High School.
- Develop a capital improvements program to address when culverts, roads and bridges will be improved.
- Coordinate and implement the clearing of trees and brush that are in utility rights-of-way.
- Develop a standard policy and procedure manual for each Town Department. The manual could include standard practice for the mitigation of potential hazards, information on day to day operations and information on what to do in the event of a hazard. This plan should enhance communication between departments.
- Inventory culverts and replace damaged and undersized culverts in the Town of Goshen.
- Distribute educational literature at Town Meeting addressing mitigation efforts that citizens can undertake to protect property and life, for all hazards identified in this plan.
- Acquire masks for personal protection for emergency responders, so that they can work safely to lessen the damage to structures and infrastructure in the event of a hazard.
- Arrange for a storm water management study from the intersection of Brook Road and Route 10 heading north to the Newport Town Line for rechannelization of storm waters and reduction of flooding.

SUMMARY OF CRITICAL EVALUATION

The Goshen Hazard Mitigation Team reviewed each of the newly identified mitigation strategies using the following factors:

- Does it reduce disaster damage?
- Does it contribute to community objectives?
- Can it be quickly implemented?
- Is it socially acceptable?
- Is it technically feasible?
- Is it administratively possible?
- Is the action legal?
- Does the action offer reasonable benefit compared to cost of implementation?

The Goshen Hazard Mitigation Team assigned the following scores (Table 8) to each strategy for its effectiveness related to the critical evaluation questions listed above. For each critical evaluation question the Committee assigned a 1, 2, or 3 to the strategy being scored. Three indicated that the strategy ranked high in regard to the evaluation question, and one indicated that the strategy ranked low in regard to the evaluation question. The sum of the scores for each evaluation question equals the overall score for a particular strategy. The highest score suggests the highest priority. The highest possible total score is 24.

Project Evaluation

Project	Score	Additional Cost/Benefit Consideration	Mitigate Existing or New Built Environment, or Both?
Acquire signage for road closure in the event of flooding, ice, landslide, and any other hazards.	21	The Town of Goshen would benefit for a substantial amount of time from the re-use of the signs in the event of a hazard.	Both
Provide more training for the Fire Department in mitigating wildfire and in emergency response.	21	The benefit of this training would outweigh the cost incurred which would be primarily staff and volunteer time.	Both
Develop a plan for the notification and evacuation of the Goshen-Lempster Co-op School, Newport High School and Fall Mountain High School.	18	The administrative and coordination costs for this effort would be high but the Town would benefit from better communications in the event of a hazard.	Existing

Project	Score	Additional Cost/Benefit Consideration	Mitigate Existing or New Built Environment, or Both?
Develop a capital improvements program to address when culverts, roads and bridges will be improved.	18	The benefits from this action over time would far outweigh the costs.	Both
Coordinate and implement the clearing of trees and brush that are in utility rights-of-way.	17	This effort would greatly benefit communications in the event of a hazard.	Existing
Develop a standard policy and procedure manual for each Town Department.	18	This effort would benefit the Town over the long term.	Both
Inventory culverts and replace damaged and undersized culverts.	20	This effort would be beneficial in the long run as the Town is able to budget for the replacement and upkeep of culverts.	Both
Distribute educational literature at Town Meeting addressing mitigation efforts that citizens can undertake to protect property and life, for all hazards identified in this plan.	23	This effort requires very little cost outside of staff and volunteer time and the benefit could be substantial.	Both
Acquire masks for personal protection for emergency responders.	20	This effort would greatly benefit property protection and reduce loss of life.	Both
Arrange for a storm water management study.	18	This effort would be costly but could help to substantially reduce damages from flooding.	Both

SECTION VII
PRIORITIZED IMPLEMENTATION SCHEDULE

Actions are prioritized by the date upon which they will be implemented. The Goshen Hazard Mitigation Committee created the following action plan for implementation of priority mitigation actions:

Implementation Schedule

Mitigation Action	Who (Leadership)	When (Deadline)	Cost/Funding Source
Distribute educational literature at Town Meeting addressing mitigation efforts that citizens can undertake to protect property and life, for all hazards identified in this plan.	Emergency Management Director	Summer 2007	Volunteer Time
Acquire signage for road closure in the event of flooding, ice, landslide, and any other hazards.	Fire, Police and Road Agent	Town Meeting 2009	Grant Funding
Provide more training for the Fire Department in mitigating wildfire and in emergency response.	Fire and Rescue Department	October 2007	Staff Time and Town Funds
Acquire masks for personal protection for emergency responders.	Emergency Response Personnel	Town Meeting 2009	Grant Funding and Town Funds
Inventory culverts and replace damaged and undersized culverts.	Highway Department, Road Agent	Summer 2008	Staff Time and Town Funds
Develop a plan for the notification and evacuation of the Goshen-Lempster Co-op School, Newport High School and Fall Mountain High School.	Emergency Management Director	Summer 2008	Staff Time

Mitigation Action	Who (Leadership)	When (Deadline)	Cost (Funding Source)
Develop a capital improvements program to address when culverts, roads and bridges will be improved.	Planning Board	2008	Planning Board Staff and Funds
Develop a standard policy and procedure manual for each Town Department.	Coordination between all Town Departments	Fall 2007	Staff Time and Volunteer Time
Arrange for a storm water management study.	Selectboard	Town Meeting 2008	Town Funds, Staff and Volunteer Time

SECTION IX
ADOPTION & IMPLEMENTATION OF THE PLAN

A good plan needs to provide for periodic monitoring and evaluation of its successes and challenges, and to allow for updates of the Plan where necessary. In order to track progress and update the Mitigation Strategies identified in the Plan, the Town of Goshen will review the Hazard Mitigation Plan *annually, or after a hazard event*. The Plan will be updated on a five-year cycle. The Goshen Emergency Management Director will initiate this review, or update and should consult with the Hazard Mitigation Committee. Changes will be made to the plan to accommodate for projects that have failed, or that are not considered feasible after a review for their consistency with the evaluation criteria, the timeframe, the community's priorities, and funding resources. Priorities that were not ranked highest, but that were identified as potential mitigation strategies, will be reviewed as well during the monitoring and update of this plan, to determine feasibility for future implementation. During the five-year update, there will be a public hearing to receive public comment, and the Board of Selectmen will adopt the final Plan.

Implementation Through Existing Programs
The Plan will be adopted locally as a stand-alone document. The Board of Selectmen, during the Capital Improvement Process, will review and include any proposed structural projects outlined in this plan. During periods of review or update the Hazard Mitigation Committee will consult the Goshen Master Plan to ensure that the Hazard Mitigation Plan does not conflict with the Master Plan.

Continued Public Involvement
The public will continue to be involved in the hazard mitigation planning process. In future years, a public meeting will be held (separate from the adoption hearing) to inform and educate members of the public.

By their nature, natural hazards affect areas not defined by political boundaries. Additionally, response to these disasters often may rely on neighboring communities for assistance such as the mutual aid services. Because of this it is important to notify and work with adjacent communities. Notification of this plan and its meetings were publicly noticed and posted, although direct invitations were not made to neighboring municipalities of Newport, Lempster, Unity, Washington, Newbury, and Sunapee. Future iterations and updates to this plan will incorporate invitations to those communities to comment and participate in the planning process.

Support for mitigation strategies is important in order to carry out implementation. Although this Hazard Mitigation Plan for the Town of Goshen was unable to interest additional parties, every effort will be made in the future to incorporate representation in future revisions of this plan. In order to ensure in the future that opportunity to participate in the planning process is given to other interested parties, the Town will send invitations to local businesses, educational institutions and non-profit organizations. Revisions of this plan shall incorporate press releases that will notice citizens, businesses and organizations of the progress of the plan while also soliciting input that could strengthen the value of the plan. This process will enable more successful implementation actions.

Additionally, a press release will be distributed, and information will be posted in the Town.

Copies of the HazMit Plan have been or will be sent to the following parties for review and comment:

- Emergency Management Directors, neighboring towns
- Jeremy LaPlante, Field Representative, NH BEM
- Board of Selectmen
- Conservation Commission
- Planning Board
- Police Dept.
- Fire Dept.
- Highway Dept.

Adoption Resolution

RESOURCES USED IN THE PREPARATION OF THIS PLAN

NH BEM's *State of New Hampshire Natural Hazards Mitigation Plan* (9/99)

Guide to Hazard Mitigation Planning for New Hampshire Communities, prepared for NH BEM by the Southwest Regional Planning Commission (October 2002)

FEMA's *Community Based Hazard Mitigation Planning: Lowering the Risks and Costs of Disasters* (8/98)

Town of Goshen Master Plan, 2002

Town of Hanover, New Hampshire Hazard Mitigation Plan

Town of New London, New Hampshire Hazard Mitigation Plan

Town of Unity, New Hampshire Hazard Mitigation Plan

www.nesec.org: *Website for Northeast States Emergency Consortium (NESEC)*

www.tornadoproject.com: Website for The Tornado Project

www.fema.gov: FEMA *website*

www.crrel.usace.army.mil/: *Cold Regions Research and Engineering Laboratory website*

"Classification of Dams in New Hampshire" NH DES Environmental Fact Sheet WD-DB-15, 2006

APPENDICES

Appendix A: Technical Resources

Appendix B: Technical and Financial Assistance

Appendix C: Matrix of Federal All-Hazards Grants

Appendix D: Meeting Documentation

Appendix E: Risk Assessment Methodology

Appendix F: Map of 100-Year Floodplain

Appendix G: Inundation Map for Site D-2 Dam

Appendix H: Map of Wildland-Urban Interface

Appendix A:

Technical Resources

APPENDIX A:

TECHNICAL RESOURCES

1) Agencies

New Hampshire Bureau of Emergency Management 271-2231
Hazard Mitigation Section 271-2231

Federal Emergency Management Agency .....(617) 223-4175

NH Regional Planning Commissions:
Upper Valley Lake Sunapee Regional Planning Commission 448-1680

NH Executive Department:
Governor's Office of Energy and Community Services 271-2611
New Hampshire Office of State Planning 271-2155

NH Department of Cultural Affairs: 271-2540
Division of Historical Resources 271-3483

NH Department of Environmental Services: 271-3503
Air Resources 271-1370
Waste Management 271-2900
Water Resources 271-3406
Water Supply and Pollution Control 271-3504
Rivers Management and Protection Program 271-1152

NH Office of State Planning and Energy Programs 271-2155

NH Municipal Association 224-7447

NH Fish and Game Department 271-3421

NH Department of Resources and Economic Development: 271-2411
Natural Heritage Inventory 271-3623
Division of Forests and Lands 271-2214
Division of Parks and Recreation 271-3255

NH Department of Transportation 271-3734

Northeast States Emergency Consortium, Inc. (NESEC).....(781) 224-9876

US Department of Commerce:
National Oceanic and Atmospheric Administration:
National Weather Service; Gray, Maine 207-688-3216

US Department of the Interior:
US Fish and Wildlife Service 225-1411
US Geological Survey 225-4681
US Army Corps of Engineers.....(978) 318-8087

US Department of Agriculture:
Natural Resource Conservation Service 868-7581

2) Mitigation Funding Resources

404 Hazard Mitigation Grant Program (HMGP) .....NH Bureau of Emergency Management
406 Public Assistance and Hazard Mitigation .....NH Bureau of Emergency Management

Community Development Block Grant (CDBG)..... NH BEM, NH OSP, also refer to RPC

Dam Safety Program ..... NH Department of Environmental Services

Disaster Preparedness Improvement Grant (DPIG) ..... NH Office of Emergency Management

Emergency Generators Program by NESEC‡ ..... NH Office of Emergency Management

Emergency Watershed Protection (EWP) ProgramUSDA, Natural Resources Conservation Service

Flood Mitigation Assistance Program (FMAP) ..... NH Office of Emergency Management

Flood Plain Management Services (FPMS) ..... US Army Corps of Engineers

Mitigation Assistance Planning (MAP) ..... NH Office of Emergency Management

Mutual Aid for Public Works..... NH Municipal Association

National Flood Insurance Program (NFIP) †.....NH Office of State Planning

Power of Prevention Grant by NESEC‡ ..... NH Office of Emergency Management

Project Impact..... NH Office of Emergency Management

Roadway Repair & Maintenance Program(s) ..... NH Department of Transportation

Section 14 Emergency Stream Bank Erosion & Shoreline Protection…….US Army Corps of Engineers

Section 103 Beach Erosion……US Army Corps of Engineers

Section 205 Flood Damage Reduction……US Army Corps of Engineers
Section 208 Snagging and Clearing ..... US Army Corps of Engineers

Shoreline Protection Program.……...NH Department of Environmental Services

Various Forest and Lands Program(s)NH Department of Resources and Economic Development

Wetlands Programs...NH Department of Environmental Services

‡NESEC – Northeast States Emergency Consortium, Inc. is a 501(c)(3), not-for-profit natural disaster, multi-hazard mitigation and emergency management organization located in Wakefield, Massachusetts. Please, contact NH BEM for more information.

† Note regarding **National Flood Insurance Program** (NFIP) and **Community Rating System** (CRS):
The National Flood Insurance Program has developed suggested floodplain management activities for those communities who wish to more thoroughly manage or reduce the impact of flooding in their jurisdiction. Through use of a rating system (CRS rating), a community's floodplain management efforts can be evaluated for effectiveness. The rating, which indicates an above average floodplain management effort, is then factored into the premium cost for flood insurance policies sold in the community. The higher the rating achieved in that community, the greater the reduction in flood insurance premium costs for local property owners. The NH Office of State Planning can provide additional information regarding participation in the NFIP-CRS Program.

3) Websites

Sponsor	Internet Address	Summary of Contents
Natural Hazards Research Center, U. of Colorado	http://www.colorado.edu/litbase/hazards/	Searchable database of references and links to many disaster-related websites.
Atlantic Hurricane Tracking Data by Year	http://wxp.eas.purdue.edu/hurricane	Hurricane track maps for each year, 1886 – 1996
National Emergency Management Association	http://nemaweb.org	Association of state emergency management directors; list of mitigation projects.
NASA – Goddard Space Flight Center "Disaster Finder:	http://www.gsfc.nasa.gov/ndrd/disaster/	Searchable database of sites that encompass a wide range of natural disasters.
NASA Natural Disaster Reference Database	http://ltpwww.gsfc.nasa.gov/ndrd/main/html	Searchable database of worldwide natural disasters.
U.S. State & Local Gateway	http://www.statelocal.gov/	General information through the federal-state partnership.
National Weather Service	http://nws.noaa.gov/	Central page for National Weather Warnings, updated every 60 seconds.

Sponsor	Internet Address	Summary of Contents
USGS Real Time Hydrologic Data	http://h20.usgs.gov/public/realtime.html	Provisional hydrological data
Dartmouth Flood Observatory	http://www.dartmouth.edu/artsci/geog/floods/	Observations of flooding situations.
FEMA, National Flood Insurance Program, Community Status Book	http://www.fema.gov/fema/csb.htm	Searchable site for access of Community Status Books
Florida State University Atlantic Hurricane Site	http://www.met.fsu.edu/explores/tropical.html	Tracking and NWS warnings for Atlantic Hurricanes and other links
National Lightning Safety Institute	http://lightningsafety.com/	Information and listing of appropriate publications regarding lightning safety.
NASA Optical Transient Detector	http://www.ghcc.msfc.nasa.gov/otd.html	Space-based sensor of lightning strikes
LLNL Geologic & Atmospheric Hazards	http://wwwep.es.llnl.gov/wwwep/ghp.html	General hazard information developed for the Dept. of Energy.
The Tornado Project Online	http://www.tornadoroject.com/	Information on tornadoes, including details of recent impacts.
National Severe Storms Laboratory	http://www.nssl.uoknor.edu/	Information about and tracking of severe storms.
Independent Insurance Agents of America IIAA Natural Disaster Risk Map	http://www.iiaa.iix.com/ndcmap.htm	A multi-disaster risk map.
Earth Satellite Corporation	http://www.earthsat.com/	Flood risk maps searchable by state.
USDA Forest Service Web	http://www.fs.fed.us/land	Information on forest fires and land management.
Northeast Emergency Consortium	http://www.serve.com/NESEC	Information on disasters and preparedness.

Appendix B:

Technical and Financial Assistance

APPENDIX B:

TECHNICAL AND FINANCIAL ASSISTANCE FOR HAZARD MITIGATION

Note – *Communities must have an approved Hazard Mitigation Plan to be eligible for HMGP and PDM grants.*

♦ HAZARD MITIGATION GRANT PROGRAM - "Section 404 Mitigation"

The Hazard Mitigation Grant Program (HMGP) in New Hampshire is administered in accordance with the 404 HMGP Administration Plan, which was derived under the authority of Section 404 of the Stafford Act in accordance with Subpart N. of 44 CFR.

The program receives its funding pursuant to a Notice of Interest submitted by the Governor's Authorized Representative (or GAR, i.e. the Director of NHOEM) to the FEMA Regional Director within 60 days of the date of a Presidentially Declared Disaster. The amount of funding that may be awarded to the State/Grantee under the HMGP may not exceed 15% of (over and above) the overall funds as are awarded to the State pursuant to the Disaster Recovery programs as are listed in 44 CFR Subpart N. Section 206.431 (d) (inclusive of all Public Assistance, Individual Assistance, etc.). Within 15 days of the Disaster Declaration, an Inter-Agency Hazard Mitigation Team is convened consisting of members of various Federal, State, County, Local and Private Agencies with an interest in Disaster Recovery and Mitigation. From this meeting, a Report is produced which evaluates the event and stipulates the State's desired Mitigation initiatives.

Upon the GAR's receipt of the notice of an award of funding by the Regional Director, the State Hazard Mitigation Officer (SHMO) publishes a Notice of Interest (NOI) to all NH communities and State Agencies announcing the availability of funding and solicits applications for grants. The 404 Administrative Plan calls for a State Hazard Mitigation Team to review all applications. The Team is comprised of individuals from various State Agencies.

Eligible Subgrantees include:

- State and Local governments,
- Certain Not for Profit Corporations
- Indian Tribes or authorized tribal organizations
- Alaskan corporations not privately owned.

Minimum Project Criteria

- Must conform with the State's "409" Plan
- Have a beneficial impact on the Declared area
- Must conform with:
- NFIP Floodplain Regulations
- Wetlands Protection Regulations
- Environmental Regulations
- Historical Protection Regulations
- Be cost effective and substantially reduce the risk of future damage
- Not cost more than the anticipated value of the reduction of both direct damages and subsequent negative impacts to the area if future disasters were to occur i.e., min 1:1 benefit/cost ratio
- Both costs and benefits are to be computed on a "net present value" basis
- Has been determined to be the most practical, effective and environmentally sound alternative after a consideration of a range of options
- Contributes to a long-term solution to the problem it is intended to address
- Considers long-term changes and

Eligible Projects may be of any nature that will result in the protection to public or private property and include:

- Structural hazard control or protection projects
- Construction activities that will result in protection from hazards
- Retrofitting of facilities
- Certain property acquisitions or relocations
- Development of State and local mitigation standards
- Development of comprehensive hazard mitigation programs with implementation as an essential component
- Development or improvement of warning systems

FLOOD MITIGATION ASSISTANCE (FMA) PROGRAM

New Hampshire has been a participant in the Flood Mitigation Assistance Program (FMA or FMAP) since 1996/97. In order to be eligible, a community must be a participant in the National Flood Insurance Program.

In 1997, the State was awarded funds to assist communities with Flood Mitigation Planning and Projects. A Planning Grant from the 1996/97 fund was awarded to the City of Keene in 1998. In preparation for the development of the Flood Mitigation Plan, the Planning Department of the City of Keene created a digital database of its floodplain including the digitizing of its tax assessing maps as well as its Special Flood Hazard Areas in GIS layers. The Plan Draft was submitted to FEMA for review and approval in March of 2000. The Plan includes a detailed inventory of projects and a "model" project prioritization approach.

Flood Mitigation Assistance Program

- NFIP Funded by a % of Policy Premiums
- Planning Grants
- Technical Assistance Grants to States (10% of Project Grant)
- Project Grants to communities
- Communities must have FEMA approved Flood Mitigation Plan to receive Project Funds

In 1998, the FMAP Planning Grant was awarded to the Town of Salem. Given the complexity of the issues in the Spicket River watershed, the Town of Salem subcontracted a substantial portion of the development of its Flood Mitigation Planning to SFC Engineering Partnership of Manchester, NH, a private engineering firm. Salem submitted a Plan and proposed projects to the State and FEMA in May of 1999, which were approved by FEMA. This made Salem the first community in NH to have a FEMA/NFIP approved Flood Mitigation Plan.

Eligible Projects

(44 CFR Part 78)

- Elevation of NFIP insured residential structures
- Elevation and dry-proofing of NFIP insured non-residential structures
- Acquisition of NFIP insured structures and underlying real property
- Relocation of NFIP insured structures from acquired or restricted real property to sites not prone to flood hazards
- Demolition of NFIP insured structures on acquired or restricted real property
- Other activities that bring NFIP insured structures into compliance with statutorily authorized floodplain management requirements
- Beach nourishment activities that include planting native dune vegetation and/or the installation of sand-fencing.
- Minor physical mitigation projects that do not duplicate the flood prevention activities of other Federal agencies and lessen the frequency of flooding or severity of flooding and decrease the predicted flood damages in localized flood problem areas. These include: modification of existing culverts and bridges, installation or modification of flood gates, stabilization of stream banks, and creation of small debris or flood/storm water retention basins in small watersheds (not dikes, levees, seawalls etc.)

♦ PRE-DISASTER MITIGATION PROGRAM (PDM)

FEMA has long been promoting disaster resistant construction and retrofit of facilities that are vulnerable to hazards in order to reduce potential damages due to a hazard event. The goal is to reduce loss of life, human suffering, economic disruption, and disaster costs to the Federal taxpayer. This has been, and continues to be accomplished, through a variety of programs and grant funds.

Although the overall intent is to reduce vulnerability before the next disaster threatens, the bulk of the funding for such projects actually has been delivered through a "post-disaster" funding mechanism, the Hazard Mitigation Grant Program (HMGP). This program has successfully addressed the many hazard mitigation opportunities uniquely available following a disaster. However, funding of projects "pre-disaster" has been more difficult, particularly in states that have not experienced major disasters in the past decade. In an effort to address "pre-disaster

mitigation", FEMA piloted a program from 1997-2001 entitled "Project Impact" that was community based and multi-hazard oriented.

Through the Disaster Mitigation Act of 2000, Congress approved creation of a national Predisaster Hazard Mitigation program to provide a funding mechanism that is not dependent on a Presidential disaster declaration. For FY2002, $25 million has been appropriated for the new grant program entitled the ***Pre-Disaster Mitigation Program (PDM)***. This new program builds on the experience gained from Project Impact, the HMGP, and other mitigation initiatives.

Here are the high points of the FY 2002 PDM program:

The program will be administered by each State, with a base allocation of $250,000, and additional funds provided via a population formula.

Eligible projects include:

- State and local hazard mitigation planning
- Technical assistance [e.g. risk assessments, project development]
- Mitigation Projects
  - Acquisition or relocation of vulnerable properties
  - Hazard retrofits
  - Minor structural hazard control or protection projects
- Community outreach and education [up to 10% of state allocation]

The emphasis for FY2002 will be on mitigation planning, to help localities meet the new planning requirements of the Disaster Mitigation Act of 2000.

Each state establishes grant selection criteria and priorities based on:

- The State Hazard Mitigation Plan
- The degree of commitment of the community to hazard mitigation
- The cost effectiveness of the proposed project
- The type and degree of hazard being addressed
- For project grants, "good standing" of the community in the National Flood Insurance Program

The funding is 75% Federal share, 25% non-Federal, except as noted below. The grant performance periods will be 18 months for planning grants, and 24 months for mitigation project grants. The PDM program is available to regional agencies and Indian tribes. Special accommodation will be made for "small and impoverished communities", who will be eligible for 90% Federal share, 10% non-Federal.

♦ DISASTER PREPAREDNESS IMPROVEMENT GRANT (DPIG)

FEMA and the State co-sponsor the DPIG Program, which supports the development and updating of disaster assistance plans and capabilities and promotes educational opportunities with respect to preparedness and mitigation. Authority: See Subchapter E. of 44 CFR.

Past DPIG initiatives include:

- Support of the position of Protection Planner/Hazard Mitigation Officer
- Installation of river gauges
- Support of the NH State Environthon School Program
- Coordinate the Voluntary Organizations Active in Disasters (VOAD) Program (See Resource Profile Annex) NHOEM via the DPIG has sponsored annual meetings with training workshops
- Sponsoring Dam Safety Training initiatives and workshops
- Production and distribution of a handbook for small embankment dam owners
- Inventory of the State's Dams
- Review of Dam Plans
- Sponsored extensive statewide, two day workshops for Granite State Incident Stress Debriefing Teams and funded educational materials
- Community visits and production of informational materials
- Assist with Plan Annex update for local Haz Mat planning.
- Funding workshops for NH Road Agents in cooperation with the T2 program of the Technology Transfer Center at the University of New Hampshire

Disaster Preparedness Improvement Grant

- ***Evaluate natural hazards on a continuing basis and develop programs and actions required to mitigate such hazards***
- ***Provide Technical Assistance***
- ***Grants to States of up to $50,000 annually***
- ***(50% State match - cash or in kind)***

Eligible Projects Include:

- Evaluations of Natural Hazards
- Hazard Mitigation activities (i.e. Plan/ policy/program/strategy development
- Plan updates
- Handbooks: publication & distribution
- Creating exercise materials
- Developing Standard Operating Procedures
- Training state employees
- Report of formal analysis of State enabling legislation and authorities
- Update inventory of State/local Critical Facilities
- Develop a tracking system of critical actions to be taken post-event
- Creating Damage Assessment Plans and defining procedures
- Developing Plans for procedures when no Federal Aid is forthcoming
- Creating Plans for Search and Rescue Operations
- Developing Disaster accounting procedures

This list is not exhaustive

Present DPIG funded Hazard Mitigation initiatives

- Support the position of Protection Planner/Hazard Mitigation Officer
- Continued support of the Environthon Program
- Development of this Plan
- Providing Technical Assistance to State and local officials
- Development of Emergency Operations Plans (EOPs) for Significant and High Hazard dams

Future DPIG funded Hazard Mitigation initiatives

- Continued Support the position of Protection Planner/Hazard Mitigation Officer
- Continued support of the Environthon Program
- Update and maintenance of this Plan
- Provide Technical Assistance to State and local officials
- Support of other planning, technical assistance and training as indicated
- Digitization of EOPs for the State's "Significant" and "High Hazard" dams to provide rapid access to information in Emergency situations and to facilitate Plan maintenance.

COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM

These Federal funds are provided through the U.S. Department of Housing and Urban Development (HUD) and are administered by the CDBG Program of the New Hampshire Office of State Planning.

Some CDBG disaster related funding has been transferred to FEMA recently and the SHMO is scheduled to receive guidance as to which specific funds and, new program management criteria.

The specific CDBG funds designated for hazard mitigation purposes are made available to address "unmet needs" pursuant to a given Disaster Declaration to States which request them. For these funds, project selection guidance is provided by NHBEM and NHOEP administers the grant.

Pursuant to Declaration DR-1144-NH, $557,000.00 was made available to the State and pursuant to DR-1199-NH; the grant award is targeted at $1,500,000.00.

In October of 1998, HUD announced the program guidelines for the expenditure of the DR-1144-NH related funding and the community of Salem applied for, and has received preliminary approval for funding to acquire a 19-unit trailer park in the Floodplain.

Community Development Block Grant

- ***U.S. Dept. of Housing and Urban Development***
- ***Funds for a Declared Disaster's "Unmet Needs"***
- ***Projects must meet one of three National Objectives***
- ***Provide a direct benefit to low and moderate income persons or households***
- ***Prevent or eliminate slums and blight***
- ***Eliminate conditions which seriously and immediately threaten the public health and welfare***

Additional conditions with respect to the expenditure of these funds includes the provision that at least 50% of the grant award must be expended in a manner which benefits individuals who earn 80% or less than the area's (county's) median income.

Mitigation Programs of Other NH State Agencies

The following agencies of the State of New Hampshire are directly or indirectly involved in activities that include Hazard Mitigation Planning and/or program implementation.

NH Department of Transportation Bureau of Repair and Maintenance

NH OEP/NFIP Program
NH OEP Coastal Program
NH DRED Division of Forests and Lands
NH DES Water Resources Division – Dam Safety Program
NH DES Wetlands Program
NH DES Shoreline Protection Program

Appendix C:

Matrix of Federal All-Hazards Grants

Matrix of Federal All-Hazards Grants

This matrix provides information about key all-hazards grant programs from the Departments of Homeland Security, Justice, Transportation, Health and Human Services, and Education under which state, local, and tribal governments, first responders, and the public are eligible to receive preparedness, response, recovery, mitigation, and prevention assistance. It lists the purpose of the program, amount appropriated for this program in FY 2002 and 2003, and the website where additional information can be found.[1]

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
Preparedness					**Programs to prepare the Nation to address the consequences of natural and man-made disasters and emergencies.**	
Department of Homeland Security	*Border and Transportation Security Directorate*	State Homeland Security Grant Program www.ojp.usdoj.gov	*See DOJ State Domestic Preparedness Grant Program*	$566.3 million *$39.7 M Planning* *$29.8 M Training* *$99.3 M Exercises* *$397.4 M Equipment*	To provide for the purchase of specialized equipment to enhance the capability of state and local agencies to prevent and respond to incidents of terrorism involving the use of chemical, biological, radiological, nuclear or explosive (CBRNE) weapons; for the protection of critical infrastructure and prevention of terrorist incidents; for costs related to the design, development, conduct and evaluation of CBRNE exercises; for costs related to the design, development and conduct of a state CBRNE Training Program; and for costs associated with updating and implementing each state's Homeland Security Strategy.	State and local governments; first responders
	Emergency Preparedness and Response Directorate	Emergency Management Performance Grants www.fema.gov	$134 million	$165 million	To provide basic assistance to sustain the nation's emergency management system, build state and local emergency management capability, and serve as the foundation for first responder activities.	States with pass through to local emergency management organizations

[1] FY03 funding information for some grant programs and cooperative agreements are not yet available.

Updated – April 1, 2003

Source: New Hampshire Bureau of Emergency Management

Matrix of Federal All-Hazards Grants

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
	Emergency Preparedness and Response Directorate	Assistance to Firefighters Grant Program www.usfa.fema.gov/grants	$360 million	$750 million	To provide direct assistance to local fire departments in order to support basic levels of capability to protect the health and safety of the public and firefighting personnel against fire and fire-related hazards, and to provide assistance for fire prevention programs	Local Fire Departments
	Emergency Preparedness and Response Directorate	State and Local Emergency Operations Planning Grants www.fema.gov	$100 million	$0	To provide funding assistance to States and local governments to update their all-hazards Emergency Operations Plans, with an emphasis making sure WMD hazards are covered in the plans.	States with a pass through to local governments
	Emergency Preparedness and Response Directorate	State and Local Emergency Operation Centers (EOCs) www.fema.gov	$56 million	$25 million	To address the most immediate EOC needs nationwide to build state and local capabilities to respond to all-hazards, including acts of terrorism.	States; local governments may be sub-grantees of the State
	Emergency Preparedness and Response Directorate	Citizen Corps www.citizencorps.gov	$4 million	$0	To support the formation of state and local Citizen Corps Councils to help drive local citizen participation by coordinating Citizen Corps programs, developing community action plans, assessing possible threats and identifying local resources to make communities safer, stronger, and better prepared to respond to the threats of terrorism, crime, public health issues, and disasters of all kinds.	States with a pass through to local governments
	Emergency Preparedness and Response Directorate	Community Emergency Response Teams www.fema.gov	$17 million	$18.8 million	To train people in neighborhoods, the workplace, and schools in basic disaster response skills, such as fire suppression, urban search and rescue, and medical operations, and helps them take a more active role in emergency preparedness.	States with pass through to local jurisdictions
	Emergency Preparedness and Response Directorate	National Fire Academy Training Grants www.fema.gov	$1.2 million	$1.2 million	To provide financial assistance to State Fire Training Systems for the delivery of a variety of National Fire Academy courses/programs.	State fire training organizations

Updated – April 1, 2003
Source: New Hampshire Bureau of Emergency Management

Matrix of Federal All-Hazards Grants

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
	Emergency Preparedness and Response Directorate	Emergency Management Institute Training Assistance www.fema.gov	$1.4 million	$1.4	To defray travel and per diem expenses of State, local and tribal emergency management personnel who attend training courses conducted by the Emergency Management Institute, at the Emmitsburg, Maryland facility; Bluemont, Virginia facility; and selected off-site locations. Its purpose is to improve emergency management practices among State, local and tribal government managers, in response to emergencies and disasters. Programs embody the Comprehensive Emergency Management System by unifying the elements of management common to all emergencies: planning, preparedness, mitigation, response, and recovery.	State, local, and tribal emergency managers
	Emergency Preparedness and Response Directorate	Hazardous Materials Assistance Program (CERCLA Implementation)	$330,000	200,000	Provide technical and financial assistance through the States to support State, local and tribal governments in oil and hazardous materials emergency planning and exercising. To support the Comprehensive Hazardous Materials (HAZMAT) Emergency Response – Capability Assessment Program (CHER-CAP) activities.	State, local, and tribal governments, state emergency response committees, local emergency planning commissions
	Emergency Preparedness and Response Directorate	Interoperable Communications Equipment Grant	$0	$25 million	To facilitate communications interoperability among public safety emergency responders at the state and local level. (This funding is being coordinated with funding provides through COPS.)	N/A

Updated – April 1, 2003
Source: New Hampshire Bureau of Emergency Management

Matrix of Federal All-Hazards Grants

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
	Emergency Preparedness and Response Directorate	SARA Title III Training Program www.fema.gov	$193,000	$187,000	To make funding available to provide training in support of Tribal governments emergency planning, preparedness, mitigation, response, and recovery capabilities. These programs must provide special emphasis on emergencies associated with hazardous chemicals.	Indian tribal governments
	Emergency Preparedness and Response Directorate	Chemical Stockpile Emergency Preparedness Program www.fema.gov	$64.8 million	$72.1 million	A cooperative agreement to enhance emergency preparedness capabilities of the States and local communities at each of the eight chemical agent stockpile storage facilities. The purpose of the program is to assist States and local communities in efforts to improve their capacity to plan for and respond to accidents associated with the storage of chemical warfare materials.	State and local governments and the general public in the vicinity of the eight chemical agent stockpile storage facilities.
	Emergency Preparedness and Response Directorate	Metropolitan Medical Response System www.mmrs.hhs.gov	*See HHS MMRS Grant*	$50 million	To provide contractual funding to the 122 largest metropolitan jurisdictions to sustain and enhance the integrated medical response plans to a WMD terrorist attack.	Local governments
Department of Justice	*Office of Domestic Preparedness*	State Domestic Preparedness Equipment Support Program www.usdoj.gov	$315.7 million *$301.7 M Equipment $14 M Exercises*	*See State Homeland Security Grant Program*	Funding will be provided to enhance first responder capabilities, and to provide for equipment purchases and exercise planning activities for response to Weapons of Mass Destruction (WMD) domestic terrorist incidents.	State and local governments
	National Institutes of Justice	Domestic Anti-Terrorism Technology Development Program www.usdoj.gov/nij	$47 million	N/A	To support the development of counter terrorism technologies, assist in the development of standards for those technologies, and work with state and local jurisdictions to identify particular areas of vulnerability to terrorist acts and be better prepared to respond if such acts occur.	States and local governments, nonprofit and for profit organizations, universities

Updated – April 1, 2003
Source: New Hampshire Bureau of Emergency Management

Matrix of Federal All-Hazards Grants

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
	Office of Community Oriented Police Services (COPS)	COPS Interoperable Communications Technology Program www.cops.usdoj.gov	N/A	$19.9 million	To facilitate communications interoperability public safety responders at the state and local level.	Tribal, State, and local law enforcement agencies
Department of Health and Human Services		Public Health and Social Services Emergency Fund www.hhs.gov	$242.9 million	$2.3 billion *$514 M Hospital Preparedness* *$940 M Public Health Preparedness*	To continue to prepare our nation's public health system and hospitals for possible mass casualty events, and to accelerate research into new treatments and diagnostic tools to cope with possible bioterrorism incidents.	Individuals, families, Federal, State, and local government agencies and emergency health care providers
	Health Resources and Services Administration	State Rural Hospital Flexibility Program www.ruralhealth.hrsa.gov	$25 million	$25 million	To help States work with rural communities and hospitals to develop and implement a rural health plan, designate critical access hospitals (CAHs), develop integrated networks of care, improve emergency medical services and improve quality, service and organizational performance.	States with at least one hospital in a non-metropolitan region
	Health Resources and Services Administration	EMS for Children www.hrsa.gov	$18.9 million	$19.5 million	To support demonstration projects for the expansion and improvement of emergency medical services for children who need treatment for trauma or critical care. It is expected that maximum distribution of projects among the States will be made and that priority will be given to projects targeted toward populations with special needs, including Native Americans, minorities, and the disabled.	State governments and schools of medicine

Updated – April 1, 2003
Source: New Hampshire Bureau of Emergency Management

Matrix of Federal All-Hazards Grants

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
	National Institute of Health	Superfund Hazardous Substances Basic Research and Education www.nih.gov	$25 million	$48.9 million	To establish and support an innovative program of basic research and training consisting of multi-project, interdisciplinary efforts that may include each of the following: (1) Methods and technologies to detect hazardous substances in the environment; (2) advance techniques for the detection, assessment, and evaluation of the effects of hazardous substances on humans; (3) methods to assess the risks to human health presented by hazardous substances; and (4) and basic biological, chemical, and physical methods to reduce the amount and toxicity of hazardous substances.	Any public or private entity involved in the detection, assessment, evaluation, and treatment of hazardous substances; and State and local governments
		Metropolitan Medical Response System www.mmrs.hhs.gov	$25 million	*See EP&R MMRS Grant*	To provide contractual funding to the 122 largest metropolitan jurisdictions to sustain and enhance the integrated medical response plans to a WMD terrorist attack.	Local governments
	Centers for Disease Control	Immunization Research, Demonstration, Public Information and Education www.cdc.gov	$9 million	$9 million	To assist States, political subdivisions of States, and other public and private nonprofit entities to conduct research, demonstrations, projects, and provide public information on vaccine-preventable diseases and conditions.	States and nonprofits organizations
	Centers for Disease Control	Surveillance of Hazardous Substance Emergency Events www.atsdr.cdc.gov	$1.32 million	$1.84 million	To assist State health departments in developing a State-based surveillance system for monitoring hazardous substance emergency events. This surveillance system will allow the State health department to better understand the public health impact of hazardous substance emergencies by developing, implementing, and evaluating a State-based surveillance system.	State, local, territorial, and tribal public health departments

Updated – April 1, 2003
Source: New Hampshire Bureau of Emergency Management

Matrix of Federal All-Hazards Grants

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
	Centers for Disease Control	Human Health Studies, Applied Research and Development www.atsdr.cdc.gov	$1.5 million	$1.8 million	To solicit scientific proposals designed to answer public health questions arising from situations commonly encountered at hazardous waste sites. The objective of this research program is to fill gaps in knowledge regarding human health effects of hazardous substances identified during the conduct of ATSDR's health assessments, consultations, toxicological profiles, and health studies, including but not limited to those health conditions prioritized by ATSDR.	State health departments
Department of Education		School Emergency Response and Crisis Management Plan Discretionary Grant Program www.ed.gov/emergencyplan/	N/A	$30 million	To provide school districts with funds to strengthen and improve current school crisis plans in preparation for emergencies including potential terrorist attacks.	School Districts
Department of Transportation	*Research and Special Programs Administration*	Hazardous Materials Emergency Preparedness Training and Planning Grants www.rspa.dot.gov	$12.8 million	$12.8 million	Increase state, local, territorial, and Native American tribal effectiveness to safely and efficiently handle HazMat accidents and incidents; enhance implementation of the Emergency Planning and Community Right-to-Know Act of 1986; and encourage a comprehensive approach to emergency planning and training by incorporating response to transportation standards.	States, local, territorial, tribal governments.
Response					**Programs to coordinate Federal response efforts and to assists states, localities, and tribes in responding to disasters and emergencies.**	
Department of Homeland Security	*Emergency Preparedness and Response Directorate*	Urban Search and Rescue www.fema.gov	$32.4 million	$60 million	To expand the capabilities of existing Urban Search and Rescue Task Forces.	28 existing US&R Task Forces

Updated – April 1, 2003
Source: New Hampshire Bureau of Emergency Management

Matrix of Federal All-Hazards Grants

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
Recovery					**Programs to provide assistance to States, localities, tribes, and the public to alleviate suffering and hardship resulting from Presidentially declared disasters and emergencies caused by all types of hazards.**	
Department of Homeland Security	*Emergency Preparedness and Response Directorate*	Individual Assistance	$256 million (as of 4/03 for disasters and emergencies declared in FY02; additional funding expected as assistance is provided; FY01=$1.39 billion as of 4/03)	N/A	To provide assistance to individuals and families who have been affected by natural or man-made Presidentially declared disasters. Funding provided from the Disaster Relief Fund.	Individuals and Families
	Emergency Preparedness and Response Directorate	Public Assistance	$519 million (as of 4/03 for disasters and emergencies declared in FY02; additional funding expected as assistance is provides; FY01=$3.6 billion as of 4/03)	N/A	To provide assistance to states, localities, tribes, and certain non-profit organizations affected by natural or man-made Presidentially declared disasters. Funding provided from the Disaster Relief Fund	State, local and tribal governments; private non-profit organizations

Updated – April 1, 2003
Source: New Hampshire Bureau of Emergency Management

Matrix of Federal All-Hazards Grants

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
	Emergency Preparedness and Response Directorate	Fire Management Assistance Grant Program	$56 million (as of 4/03; for fires declared in FY02; additional funding is expected as assistance is provided)	N/A	Provide funds to States, local, and tribal governments for the mitigation, management, and control of wildland fires posing serious threats to improved property.	State, local and tribal governments
Small Business Administration	*Office of Disaster Assistance*	Disaster Loan Program www.sba.gov/disaster/			To offer financial assistance to those who are trying to rebuild their homes and businesses in the aftermath of a disaster.	Individuals, families, private sector
Department of Justice	*Office for Victims of Crime*	Antiterrorism and Emergency Assistance Program www.usdoj.gov	Based on Need of Applicant Community	Based on Need of Applicant Community	To provide assistance programs for victims of mass violence and terrorism occurring within and outside the United States and a compensation program for victims of international terrorism.	Public and private nonprofit victim assistance agencies
Mitigation					**Programs to reduce or eliminate future risk to lives and property from disasters.**	
Department of Homeland Security	*Emergency Preparedness and Response Directorate*	Hazard Mitigation Grant Program	$16.5 million (as of 4/03 for disasters declared in FY02; additional funding expected as assistance is provided; FY01=$319 million as of 4/03)	N/A	To provide assistance to states, localities, and tribes to fund projects that will reduce the loss of lives and property in future disasters. Funding is provides from the Disaster Relief Fund and administered by the states according to their own priorities.	State, local, and tribal governments

Updated – April 1, 2003
Source: New Hampshire Bureau of Emergency Management

Matrix of Federal All-Hazards Grants

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
	Emergency Preparedness and Response Directorate	Pre-Disaster Mitigation Program	$25 million	$150 million	This program provides funding for mitigation activities before disaster strikes. In recent years it has provided assistance for mitigation planning. In FY03, Congress passes a competitive pre-disaster mitigation grant program that will include project funding.	State, local, and tribal governments
	Emergency Preparedness and Response Directorate	Map Modernization	$11 million	$33 million	This funding provides assistance to develop digital flood maps, support flood-mapping activities and expand the Cooperating Technical Partners Program to communities and regional entities.	State, local and tribal governments
Prevention					**Programs to interdict potentially hazardous events from occurring**	
Department of Health and Human Services	*Centers for Disease Control*	Immunization Grants www.cdc.gov	$350 million (317 Grants) $745 million (VFC Grants)	$403 million (317 Grants) $772.3 million (VFC Grants)	To assist States and communities in establishing and maintaining preventive health service programs to immunize individuals against vaccine-preventable diseases.	States

Updated – April 1, 2003
Source: New Hampshire Bureau of Emergency Management

Appendix D:

Meeting Documentation

Upper Valley Lake Sunapee
Regional Planning Commission

Hazard Mitigation Committee
Town of Goshen

AGENDA
Monday, December 4, 2006
7:30 p.m. – 9:30 p.m.
Goshen, NH Town Hall

7:30	Review work plan and establish meeting schedule
8:00	Map past and potential hazards
9:00	Identify hazard areas and vulnerable structures/populations
9:30	Adjourn

30 Bank Street, Lebanon, New Hampshire 03766-1756 (603) 448-1680 Fax (603) 448-0170 www.uvlsrpc.org

Upper Valley Lake Sunapee
Regional Planning Commission

Hazard Mitigation Committee
Town of Goshen

AGENDA
Monday, December 18, 2006
7:30 p.m. – 9:30 p.m.
Goshen, NH Town Hall

7:30	Identify critical facilities
8:00	Map critical facilities
9:00	Brainstorm existing mitigation strategies
9:30	Adjourn

30 Bank Street, Lebanon, New Hampshire 03766-1756 (603) 448-1680 Fax (603) 448-0170 www.uvlsrpc.org

U V L S R P C
Upper Valley Lake Sunapee
Regional Planning Commission

Hazard Mitigation Committee
Town of Goshen

AGENDA
Monday, January 8, 2006
7:00 – 9:00 p.m.
Goshen Town Hall

7:00	Review identified hazards; Review identified critical facilities
8:00	Identify existing mitigation strategies, and Goshen's gaps in protection
9:00	Adjourn

30 Bank Street, Lebanon, New Hampshire 03766-1756 (603) 448-1680 Fax (603) 448-0170 www.uvlsrpc.org

Upper Valley Lake Sunapee
Regional Planning Commission

Hazard Mitigation Committee
Town of Goshen

AGENDA
Monday, January 29, 2007
7:00 – 9:00 p.m.
Goshen Town Hall

7:00	Identify gaps in the current protection
7:30	Brainstorm potential mitigation strategies
9:00	Adjourn

30 Bank Street, Lebanon, New Hampshire 03766-1756 (603) 448-1680 Fax (603) 448-0170 www.uvlsrpc.org

UVLSRPC

Upper Valley Lake Sunapee
Regional Planning Commission

Hazard Mitigation Committee
Town of Goshen

AGENDA
Monday, March 19, 2007
7:00 p.m. – 9:00 p.m.
Goshen Town Hall

7:00	Review past meeting information
8:00	Establish prioritized implementation schedule
8:30	Discuss public process and adoption
9:00	Adjourn

30 Bank Street, Lebanon, New Hampshire 03766-1756 (603) 448-1680 Fax (603) 448-0170 www.uvlsrpc.org

Appendix E:
Risk Assessment Methodology

Probability

The Committee members completed a risk assessment of all types of hazards identified in Chapter III. The process involved assigned Unlikely (1), Possible (2), Likely (3) to each hazard type for its potential of occurring based on the committee's knowledge of past historic information. The ratings were based on the probability that the occurrence may happen within the next ten years (3), between 10-25 years (2), or after 25-years (1). (An n/a score was given if there was insufficient evidence to make a decision). To ensure some balance with a more scientific measurement, the plan also identifies the probability of occurrence from the State Hazard Plan as shown below.

State Hazard Plan – "By weighting both the building value and population, each county is assigned a Vulnerability Level, as seen in Table 4.2 on the next page. In addition you will find Table 4.1 which identifies the hazard risk (probability of occurring) by county. By evaluating the two tables you can compare each county's vulnerability with it's' risk to the 12 different hazards that occur in New Hampshire.

In summary, the counties of Hillsborough, Merrimack and Rockingham have a high vulnerability due to large population concentration and high value of state owned buildings as well as high risk of flooding, wildfire, tornadoes/downburst, and severe winter weather."

Table 4.1 Hazard Risk by County

Flood	*Dam Failure*	*Drought*	*Wildfire*	*Earth quake*	*Land slide*	*Tornado*	*Hurricane*	*Lightning*	*Sever Winter*
H	*L*	*M*	*H*	*M*	*M*	*M*	*M*	*M*	*H*

Table 4.2 Hazard Risk Vulnerability by County

Hillsborough	*Merrimack*	*Rockingham*	*Grafton*	*Stratford*	*Coos*	*Belknap*	*Cheshire*	*Sullivan*	*Carroll*
H	*H*	*H*	*M*	*M*	*L*	*L*	*L*	*L*	*L*

Vulnerability

The Committee members completed a risk assessment of all type of hazards identified in Chapter III. The process also involved assigning vulnerability based on the Committee's opinion of the extent of damage the hazard may cause based on past occurrences and current assessments of the Town. Great amount of damage and cost (3), moderate amount of damage and cost (2), and limited damage or costs (1).

The probabilities and vulnerabilities were then averaged with those that were determined by the State Hazard Plan.

The averages of each vulnerability and probability were multiplied to arrive at the overall risk the hazard has on the community.

Risk

An adjective description (High, Medium, or Low) of the overall threat posed by a hazard over the next 25 years.

HIGH: (1) There is strong potential for a disaster of major proportions during the next 25 years; or (2) history suggests the occurrence of multiple disasters of moderate proportions during the next 25 years. The threat is significant enough to warrant major program effort to prepare for, respond to, recover from, and mitigate against this hazard. This hazard should be a major focus of the town's emergency management training and exercise program.

MEDIUM: There is moderate potential for a disaster of less than major proportions during the next 25 years. The threat is great enough to warrant modest effort to prepare for, respond to, recover from, and mitigate against this hazard. This hazard should be included in the town's emergency management training and exercise program.

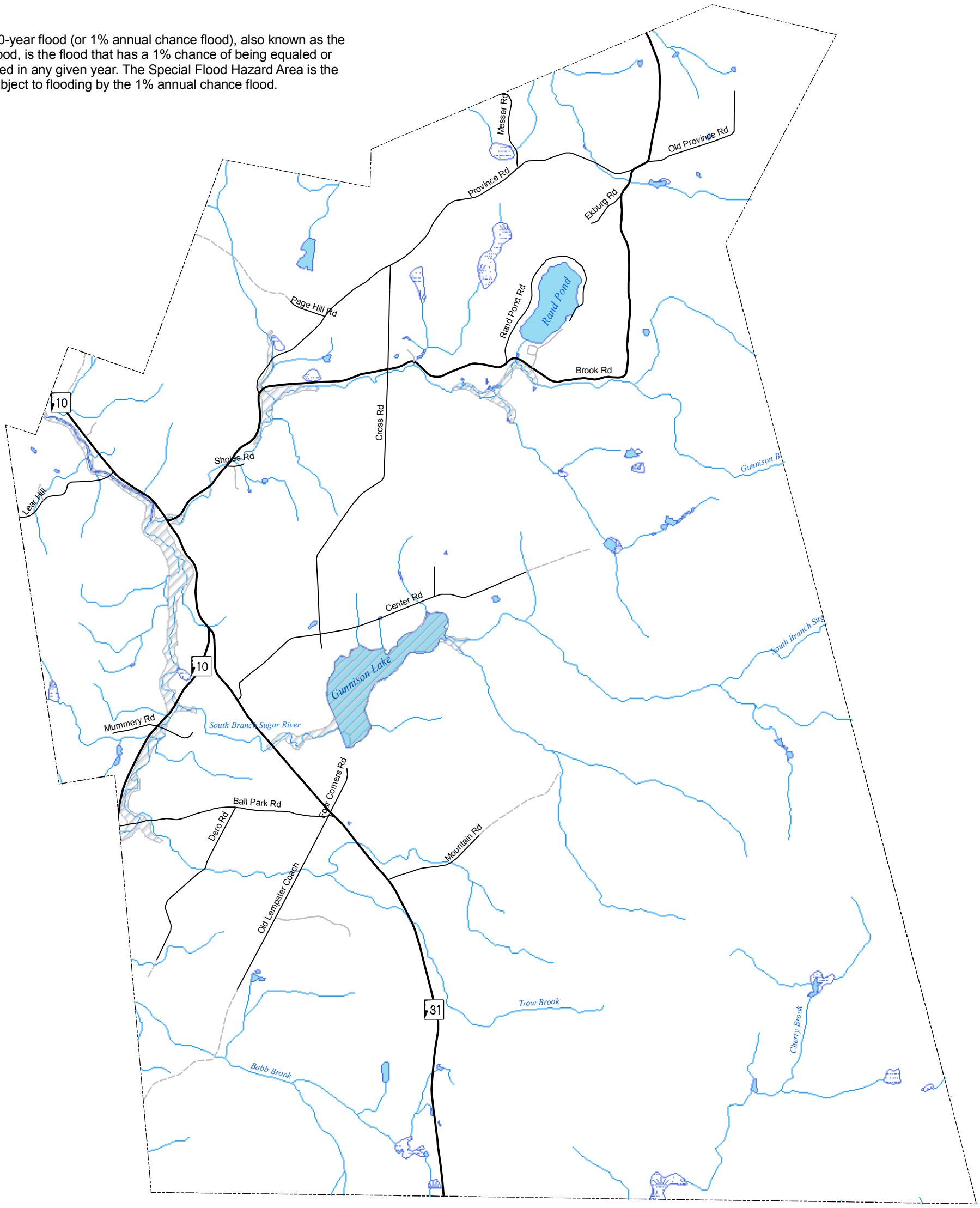
LOW: There is little potential for a disaster during the next 25 years. The threat is such as to warrant no special effort to prepare for, respond to, recover from, or mitigate against this hazard. This hazard need not be specifically addressed in the town's emergency management training and exercise program except as generally dealt with during hazard awareness training.

Appendix F:

Map of 100-Year Floodplains

Town of Goshen, NH
100-Year Floodplains

The 100-year flood (or 1% annual chance flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood.



Legend

- Town Line
- Special Flood Hazard Area

Road Network

- State
- Local
- Private
- Not Maintained

Water Features

- Lake/Pond
- Reservoir
- Swamp/Marsh
- Stream/River

N
W E
S

0 0.9 1.8 Miles

1:35,000

Source Data:
100-year floodplains from FEMA Digital Flood Insurance Rate Map database, distributed by NH GRANIT.

Base map features from NH GRANIT, digitized by Complex Systems Research Center, UNH.

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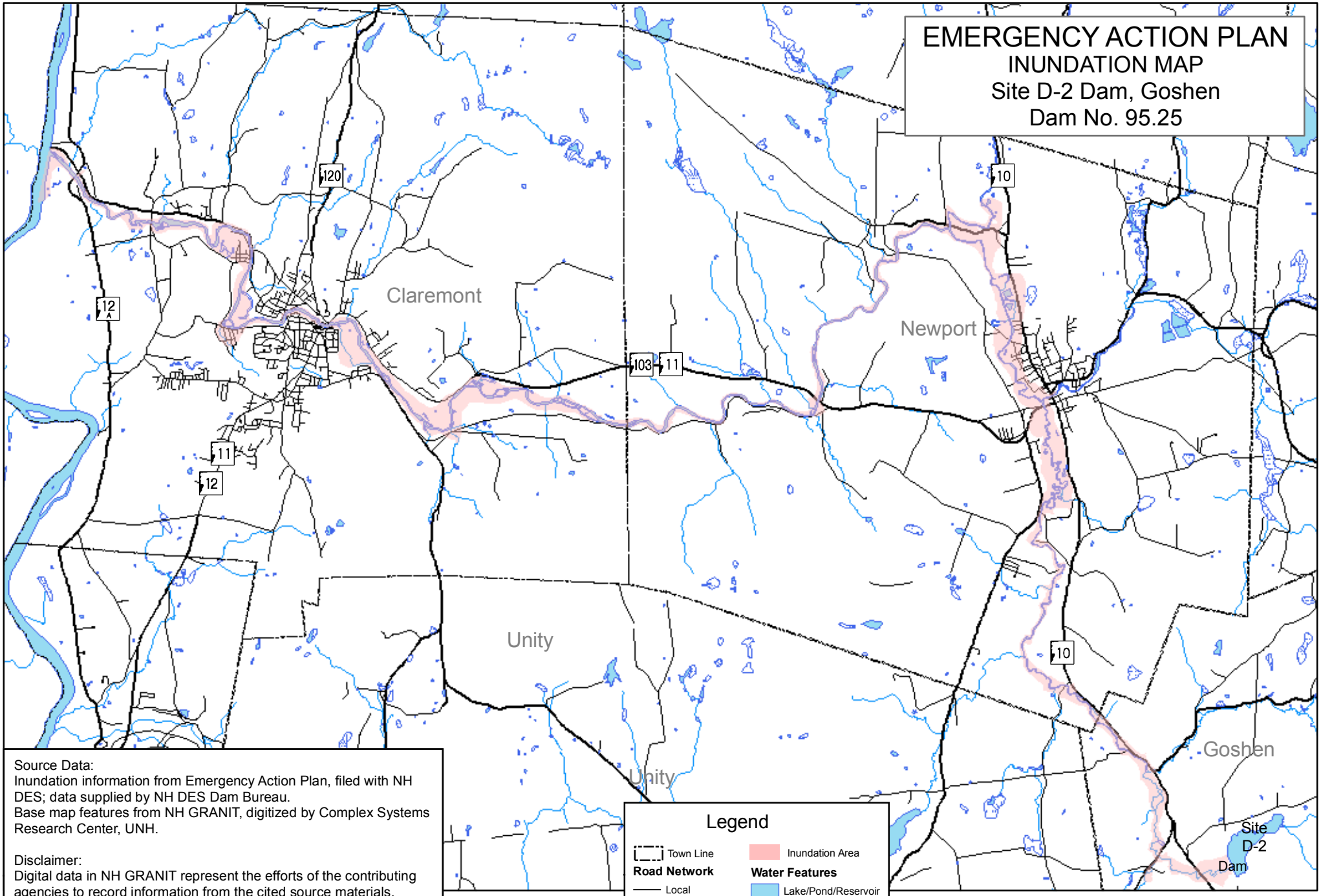
UVLSRPC

Map created by
Upper Valley Lake Sunapee Regional Planning Commission,
November 2007.

Appendix G:

Inundation Map of Site D-2 Dam



Source Data:
Inundation information from Emergency Action Plan, filed with NH DES; data supplied by NH DES Dam Bureau.
Base map features from NH GRANIT, digitized by Complex Systems Research Center, UNH.

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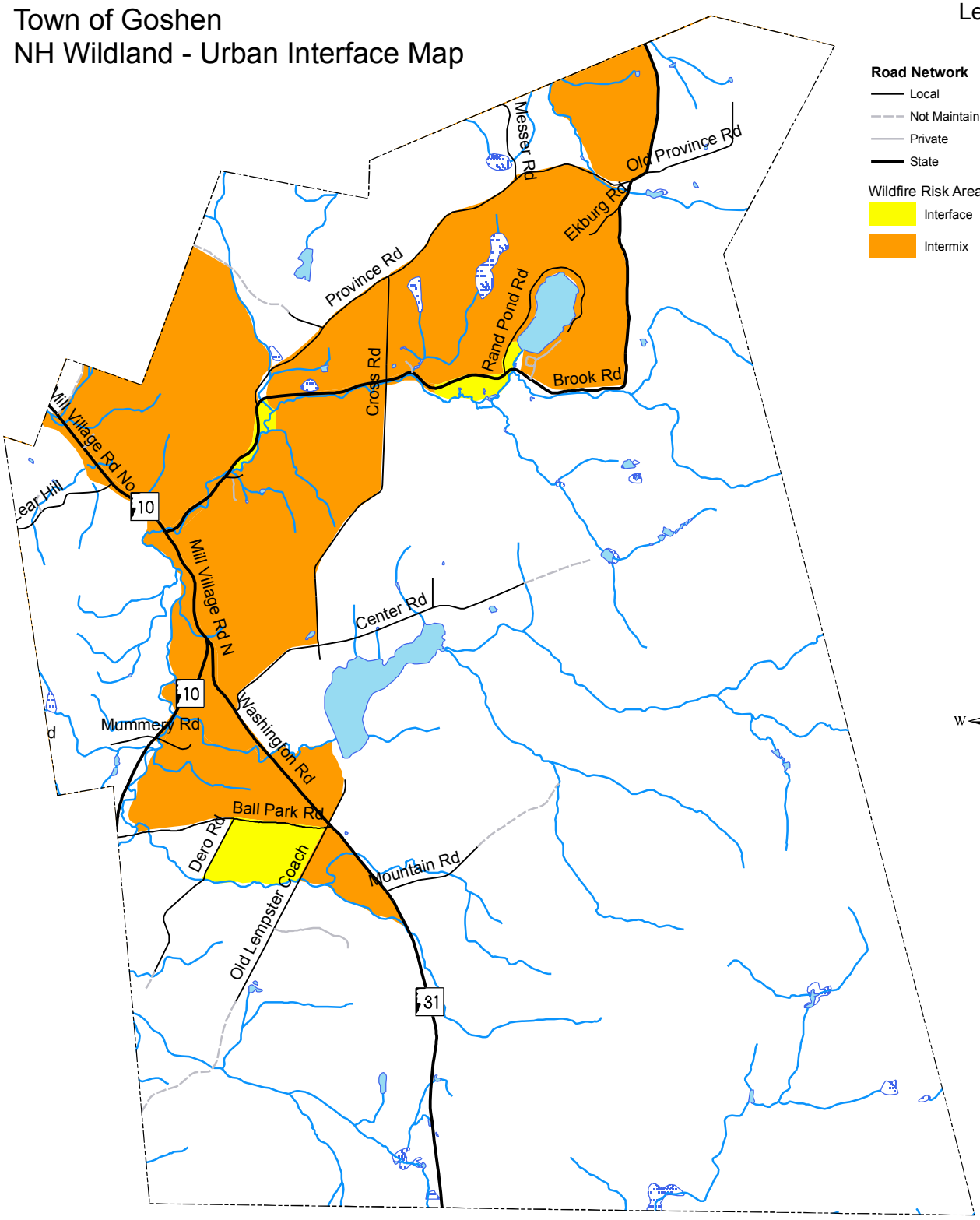
Map created by
Upper Valley Lake Sunapee Regional Planning Commission,
December 2007.

Appendix H:

Map of Wildland – Urban Interface

Town of Goshen
NH Wildland - Urban Interface Map



Legend

Road Network
- Local
- Not Maintained
- Private
- State

Water Features
- Lake/Pond
- Reservoir
- Swamp/Marsh
- Stream/River
- Town Line

Wildfire Risk Area
- Interface
- Intermix

N
W
E
S

1:50,000

0 3,000 6,000 9,000 12,000 Feet

Map created by
Upper Valley Lake Sunapee Regional Planning Commission,
November 2007.

Source Data:
Radeloff, V. C., R. B. Hammer, S. I Stewart, J. S. Fried, S. S. Holcomb, and J. F. McKeefry. 2005. The Wildland Urban Interface in the United States. Ecological Applications 15:799-805.

Base map features from NH GRANIT, digitized by Complex Systems Research Center, UNH.

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