

Town of Weymouth
Flood Hazard Mitigation Plan

Submitted to:
Flood Hazard Community Planning Team
Town of Weymouth

December, 2001



Presented by:

Bourne Consulting Engineering
Franklin, Massachusetts

TOWN OF WEYMOUTH
FLOOD HAZARD MITIGATION PLAN
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Appendices

- A) Technical and Financial Assistance for Mitigation Available to Weymouth (10 pages)
- B) Recent Flood Mitigation Projects – CDBG funded (1 page)
- C) Portion of Town Master Drainage Plan (14 pages, including cover)
- D) Adoption of the FHMP by the Mayor (1 page)

Section I - Purpose

1.1 Introduction

The Town of Weymouth, under the direction of the Flood Hazard Community Planning Team (FHCPT), has developed this Flood Hazard Mitigation Plan to address chronic coastal and inland flooding problems. These chronic flooding problems pose health, safety, economic, and emotional threats to homeowners.

For instance, flooded residents in the community at large face potential health threats from lowered water quality, sewerage backups and the potential of chemical pollution in flood waters.

Town of Weymouth

Total Area	17.7 sq. miles
Land Area	16.84 sq. miles
Population	53,988
Density	3,206 people/sq. mile

(Ref. Town of Weymouth GIS and 2000 Census.)

One benefit of proactive flood hazard mitigation is improved funding eligibility. Even with Federal economic assistance to assist in flooding responses, the Town incurs many costs which go unreimbursed. By utilizing the planning process as outlined in this study, it increases the Town's chances of receiving planning and implementation funds from a variety of sources as well as to become eligible for credit under a program called The Community Rating System (CRS). The CRS provides discounts on the National Flood Insurance premiums for residents in Weymouth who voluntarily participate in this program.

The goal of the Flood Hazard Mitigation Plan for the Town of Weymouth is to mitigate flood hazards and to stop the cycle of flood damage and loss. This is accomplished by directing actions before flooding occurs as well as directing development and redevelopment to areas not subject to loss. Responding after a flood occurs does nothing to prevent people from becoming victims or reduce the social and economic costs incurred by flooding. The goals of this plan are as follows:



**Backyard off Carolyn Rd.
at Mill River**

- Reduce public and private flood damage costs from social and economic disruption due to flooding events in the Town of Weymouth.
- Identify and implement post-flooding projects that will limit the damage of subsequent flooding events.

1.2 What Is Flood Hazard Mitigation

Did you know that in order to receive Federal disaster assistance, the President must declare a major disaster?

Flood Hazard Mitigation is any sustained action that reduces flooding and minimizes flood damages to structures, infrastructure and other resources. The term “hazard mitigation” means preventative actions that a community can take now to help reduce future costs created by a major flood or other potentially hazardous event. The Town of Weymouth has an active emergency response system that deals with preparedness plans, warning systems, and evacuations. These only deal with the immediate event of the flood. Mitigation is a long-term, comprehensive approach which reduces the response required for emergencies which have a social and economical impact on the Town of Weymouth.

1.3 The Importance of Planning For Flood

Floods are a fact of life. Floods will occur again and again, but they don't have to cause repeated damage for the Town of Weymouth. A plan for reducing flood impacts is vital to reduce future damage to Weymouth residences, businesses, industries, roads, bridges and public facilities in the flood hazard areas.

1.4 Floods Cost Money

After a major flood event and Presidential disaster declaration, communities will receive economic assistance from the State and Federal Governments for emergency repairs and to recover from flood losses. However, if the flooding event is isolated, the Town may be burdened with the entire cost of the recovery. These are economic realities within the Town of Weymouth. Weymouth must take action now to prevent costly future damages.



**Flood waters overtopping
Randolph St. at Great Pond**

1.5 Problems Can Be Solved Through Existing Measures

Local governments, like the Town of Weymouth, have many land use regulations, conservation measures and flood control initiatives in place that assist in reducing future flood losses. This plan evaluates these measures to see where they can be coordinated.

1.6 The Relationship of This Plan To Post Disaster Recovery

Did you know that the most typical form of Federal Disaster assistance is a loan that must be paid back with interest?

This plan will emphasize actions to be taken now to prevent or reduce future flooding damages as well as aid in developing some of the post disaster responses including safety improvements and public education and awareness.

This plan enables the community to develop programs and policies prior to events in order to allow Weymouth to make the most of post-disaster opportunities. Post-disaster benefits resulting from creation of this plan include the following:

- Flood hazard mitigation will be more easily understood by the public immediately following a flood.
- The opportunity to educate the public about proper land use will be more easily promoted.
- Chances of obtaining financial and technical assistance from outside the community to implement mitigation projects will be increased.



Wituwamat Rd. @ Wessagussett Rd.

By having a plan in place that includes post disaster actions, the Town will insure that opportunities for mitigation are not overlooked or lost in the urgency and chaos of a post-disaster rebuild.

Section II - Planning Process

2.1 Town of Weymouth Flood Hazard Mitigation Plan Process

The Town of Weymouth created a Flood Hazard Community Planning Team (FHCPT). The task of the team was to develop a scope of work for the team and its consultant to follow. The following is the scope of work that was developed by the team for the development of this plan:

Did you know that the Federal Emergency Management Agency's Individual and Family Grant Program (for Personal Property) and Temporary Housing Program (for Home Repair and Rental Assistance) are available only if the President declares a major disaster and makes that assistance available?

1. Identify and map existing flood hazards
Existing flood hazards identified are areas within the FEMA flooding map, the current flooding areas as documented by the Town and recurrent flood areas as mapped by the Town.
2. Identify and map potential risks and critical facilities
The risks within the Town of Weymouth can be grouped into two separate categories: one is coastal flooding and the other is inland flooding.
3. Identify existing flood hazard mitigation measures.
4. Identify gaps or areas of improvement for existing flood hazard mitigation areas.
5. Identify new and proposed flood hazard mitigation measures.
6. Determine the feasibility of the proposed action.
7. Develop a prioritized list of proposed flood hazard mitigation measures.
8. Develop flood hazard mitigation plan.
9. Adoption of the Flood Hazard Mitigation Plan (FHMP) by the Mayor (Town Government) and monitoring of the FHMP by an implementation group.

During each step of the process, the FHCTP commented on the steps of the process in order to insure a complete and balanced valuation of the flood hazard mitigation measures being employed as well as the proposed measures.

2.2 Town of Weymouth Flood Hazard Community Planning Team

The FHCPT is comprised of the following members from the Town of Weymouth:

Jeff Coates – Director of Inspectional Services, Department of Municipal Licenses and Inspections

Chip Fontaine – Town Engineer, Department of Public Works

Rod Fuqua – Principal Planner, Office of Planning and Community Development

Caroline LaCroix – Director of Administrative Services, Office of the Mayor

Richard Marino – Director of Public Health, Health Department

John Mulveyhill – Emergency Management Director, Emergency Management and Civil Defense

Bill Woodward – Conservation Agent

Did you know that because more and more buildings, roads and parking lots are being built where forests and meadows used to be, floods are becoming more severe?



Wituwamat Rd. @ Wessagussett Rd.



Seawall @ Fore River Ave.

Did you know that floods are the most common natural disaster?

Section III - Identifying Weymouth's Flood Risks

3.1 Coastal Flooding Problems

The Town of Weymouth has approximately 13 miles of coastline and a complex system of storm protection comprised of seawalls, jetties and drainage infrastructure. Much of the currently existing coastal protection system was constructed in the 1950s and is in poor repair, particularly the seawalls. The Town has been making repairs and upgrades to its storm protection infrastructure for a number of years, however, the effort has been reactive as opposed to proactive. The biggest problem facing the Town of Weymouth is funding for these expensive repairs. The following is a list of the major coastal flood events that have occurred in the last 25 years.

1. Blizzard of "92": Severe storm surge with high winds and tidal flooding accompanied with heavy snowfall and ice. Storm surge and high winds caused coastal flooding along coastal areas. Considered a 100-year storm. Flooding 1-2 feet of salt water caused flooding of approx. 25 homes.

Damage estimate of \$75,000. This estimate was established through interviews with storm cleanup crews and residents affected by flooding.

2. No Name Storm (Oct. '91): Severe storm surge with high winds and tidal flooding associated with northeast wind push. Heavy rains and tides caused flooding along the coastal area. Asphalt street and parking areas undermined and damage. Considered a 100-year storm.

Damage estimate of \$30,000. This estimate established through interviews with storm cleanup crews and residents affected by flooding.

3. Blizzard of '78: Storm surge flooding associated with northeast wind, heavy ocean tide surge, heavy wet snowfall and long storm duration. The result was severe flooding along the ocean frontage. Considered a 500-year storm. Flooding 4-5 feet deep of salt water for 3-4 days resulting in approximately 80 homes flooding and families relocated.

Damage estimate of \$150,000. This estimate established through interviews with storm cleanup crews and residents affected by flooding.

3.2 Non-Coastal Flooding Problems

A partial list of some chronic non-coastal flooding areas that have caused damage are as follows:

Did you know that you cannot qualify for Rental Assistance unless your home has been destroyed or significantly damaged?

1. Off North Street at Weymouth Heights: Heavy rains caused local flooding. Existing drain system prone to root congestion. This drain problem re-occurs during heavy rain periods.

Damage estimate of \$6,000. This estimate established through interviews with storm cleanup crews and residents affected by flooding.

2. Gaslight Drive*: Heavy rains and winds causing local drainage system to surcharge and flood parking area and cars.

Damage estimate of \$15,000. This estimate established through interviews with residents with flooded vehicles.

3. Woodrock Road: Heavy rains and winds causing local drainage culvert trash grate to clog and the drain channel to surcharge, flooding parking area and street.

Damage estimate of \$4,000. This estimate established through interviews with residents and business owners.

4. Off John Street*: Flow restriction of unknown origin causing clogged drain system back ups and floods during heavy rain events. Flooding local to back yards.

Damage estimate of \$3,000. This estimate established through interviews with residents with flooded property.



Fort Point Rd. seawall

*Recent work done at Gaslight Drive and John Street has resolved these situations, at least for the time being.

In **Exhibit 3.1.A & B**, the repetitive losses as reported to FEMA are detailed. **Exhibit 3.2** details the Town of Weymouth with all of its road and structures with the FEMA flood zones shown. **Exhibit 3.3**, shows the flooding problem areas identified by the Town. **Exhibit 3.4** shows the location of chronic sewer overflows, as identified by the Town of Weymouth Sanitary Sewer System Assessment Report, dated March 2000.

Exhibit 3.1.A (Table)
National Flood Insurance Program (NFIP) Insured Properties with Repetitive Loss
(From 1978 to 6/15/01)

ADDRESS	INSURED	LOSSES	DATE LOSS 1	DATE LOSS 2	DATE LOSS 3	DATE LOSS 4
41 Alta Road	No	4	1/2/87	3/29/84	1/25/79	2/7/78
21 Fort Point Road	Yes	4	12/11/92	10/30/91	1/2/87	2/6/78
1002 Main Street	No	4	5/30/84	3/15/83	10/3/79	1/21/79
164 Wessagussett Road	Yes	3	12/11/92	10/30/91	1/2/87	
17 Bacon Road	Yes	3	12/11/92	10/30/91	1/2/87	
67 North Street	Yes	2	12/12/92	10/30/91		
8 Adorn Street	No	2	10/5/78	1/9/78		
11 Birch Road	Yes	2	12/12/92	10/30/91		
2 Caldwell Street	Yes	2	10/20/96	10/29/91		
8 Commercial Street	No	2	1/25/79	10/6/78		
125 Fort Point Road	Yes	2	12/12/92	10/30/91		
119 Fort Point Road	Yes	2	12/12/92	10/30/91		
17 Fort Point Road	Yes	2	1/2/87	2/7/78		
55 Fort Point Road	Yes	2	10/30/91	1/2/87		
59 Fort Point Road	Yes	2	12/11/92	10/30/91		
70 Pearl Street	No	2	8/26/90	8/11/90		
50 River Street	Yes	2	10/30/91	1/2/87		
66 Rosemont Road	Yes	2	10/30/91	1/2/87		
126 Wessagussett Road	Yes	2	12/11/92	10/30/91		
141 Wessagussett Road	Yes	2	12/12/92	10/30/91		
151 Wessagussett Road	No	2	12/11/92	10/30/91		
12 Wolcott Street	Yes	2	12/11/92	10/30/91		

(Ref. Flood Hazard Mitigation Program, Massachusetts Dept. of Environmental Management.)

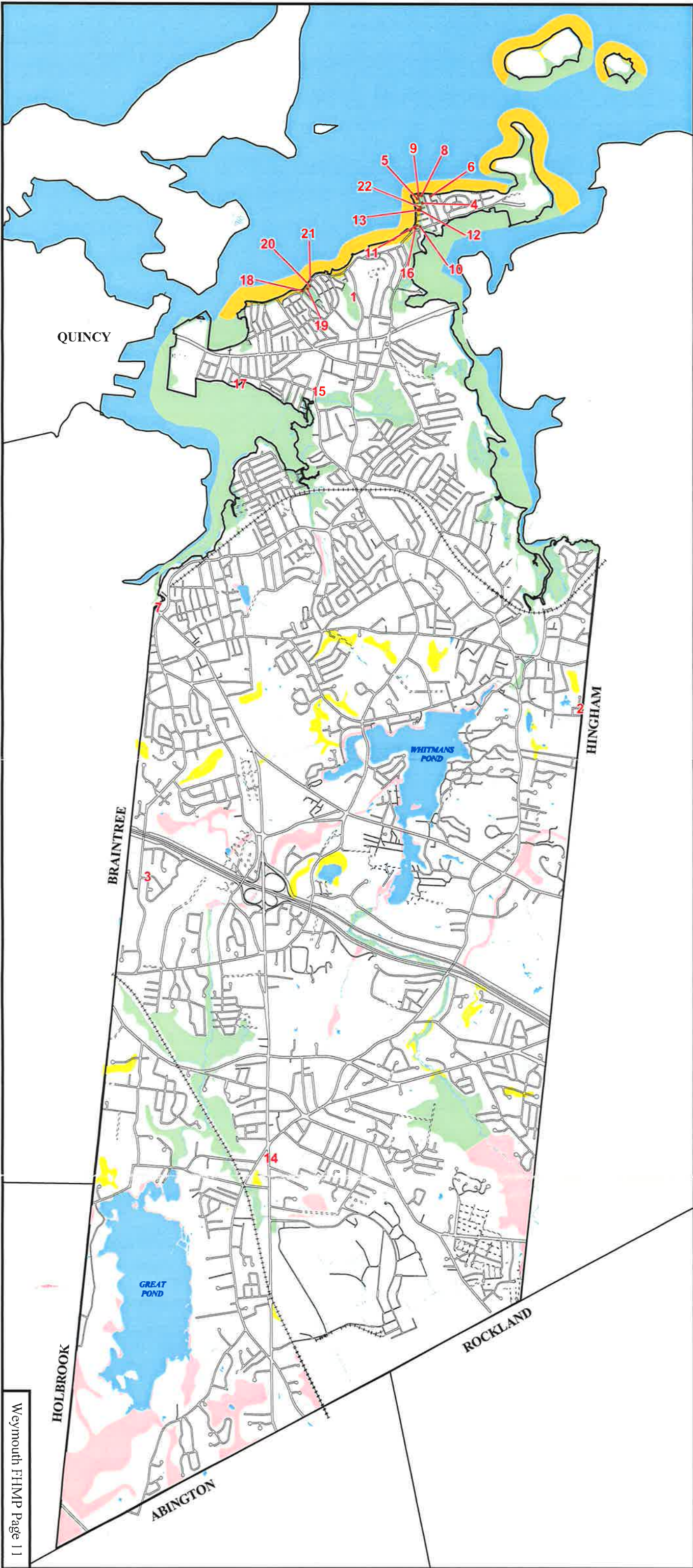


EXHIBIT 3.1.B

NFIP Repetitive Loss Properties

Town of Weymouth



LEGEND

- Q3 Flood Data Zone A
- Q3 Flood Data Zone AE
- Q3 Flood Data Zone VE
- Q3 Flood Data Zone X500
- Hydrography
- Street
- Paper Street
- Town Boundary
- Rail Road

	Location
1	- 67 North Street
2	- 41 Alta Road
3	- 8 Adorn Street
4	- 17 Bacon Road
5	- 11 Birch Road
6	- 2 Caldwell Street
7	- 8 Commercial Street
8	- 125 Fort Point Road
9	- 119 Fort Point Road
10	- 17 Fort Point Road
11	- 21 Fort Point Road
12	- 55 Fort Point Road
13	- 59 Fort Point Road
14	- 1002 Main Street
15	- 70 Pearl Street
16	- 50 River Street
17	- 66 Rosemont Road
18	- 126 Wessagussett Road
19	- 141 Wessagussett Road
20	- 151 Wessagussett Road
21	- 164 Wessagussett Road
22	- 12 Wolcott Street

3200 0 3200 Feet

Scale: 1 inch = 3200 feet



Produced on December 26, 2001

DISCLAIMER:
The Town of Weymouth makes no claims, no representations, and no warranties, expressed or implied, concerning the validity (expressed or implied), the reliability or the accuracy of the GIS data and GIS data products furnished by the Town, including the implied validity of any uses of such data. The use of this data, in any such manner, shall not supersede any federal, state or local laws or regulations.

ADDITIONAL SOURCES:
Federal Emergency Management Agency National Flood Insurance Program: Q3 Flood Data

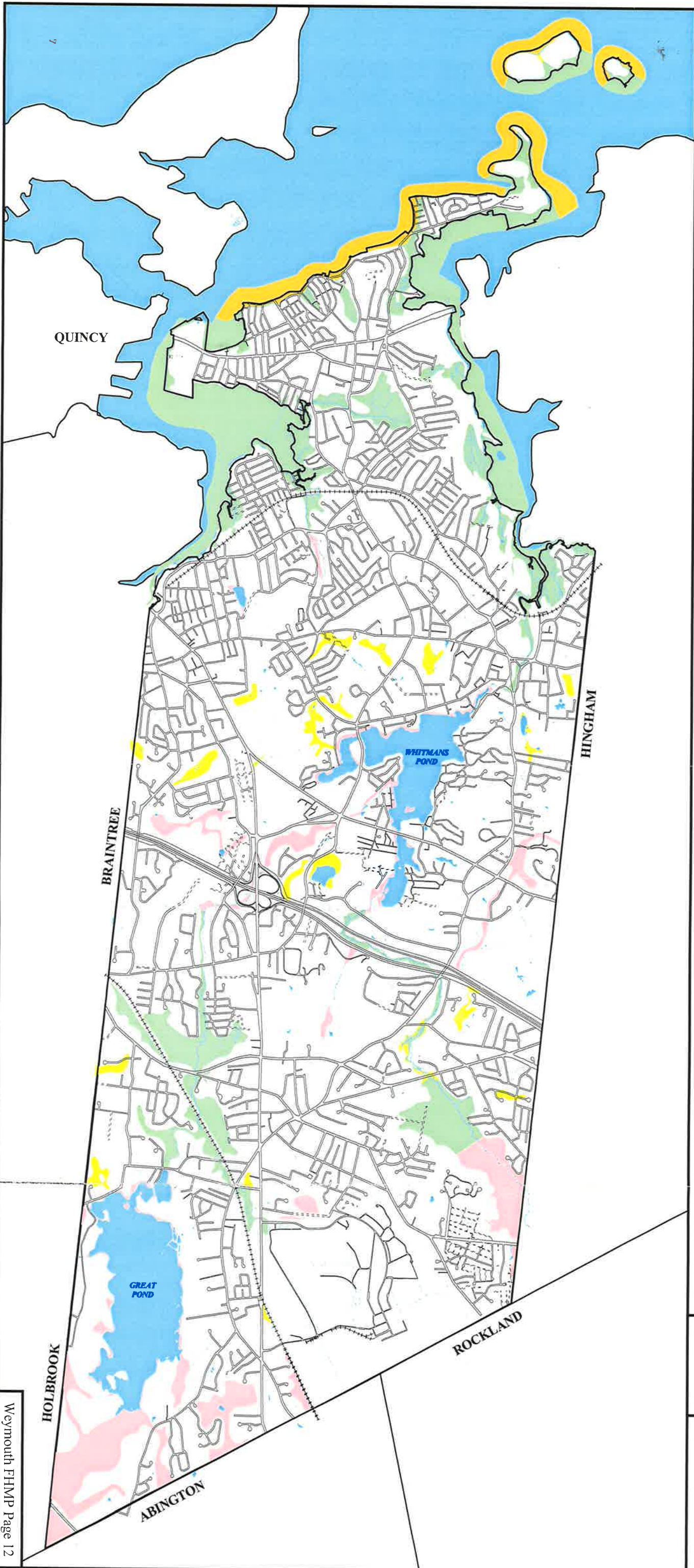
EXHIBIT 3.2
FEMA Flood Areas

Town of Weymouth



LEGEND

- Q3 Flood Data Zone A
- Q3 Flood Data Zone AE
- Q3 Flood Data Zone VE
- Q3 Flood Data Zone X500
- Hydrography
- Street
- Paper Street
- Town Boundary
- Rail Road



3200 0 3200 Feet

Scale: 1 inch = 3200 feet

Produced on June 21, 2001



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ADDITIONAL SOURCES:
Federal Emergency Management Agency National Flood Insurance Program: Q3 Flood Data

EXHIBIT 3.2

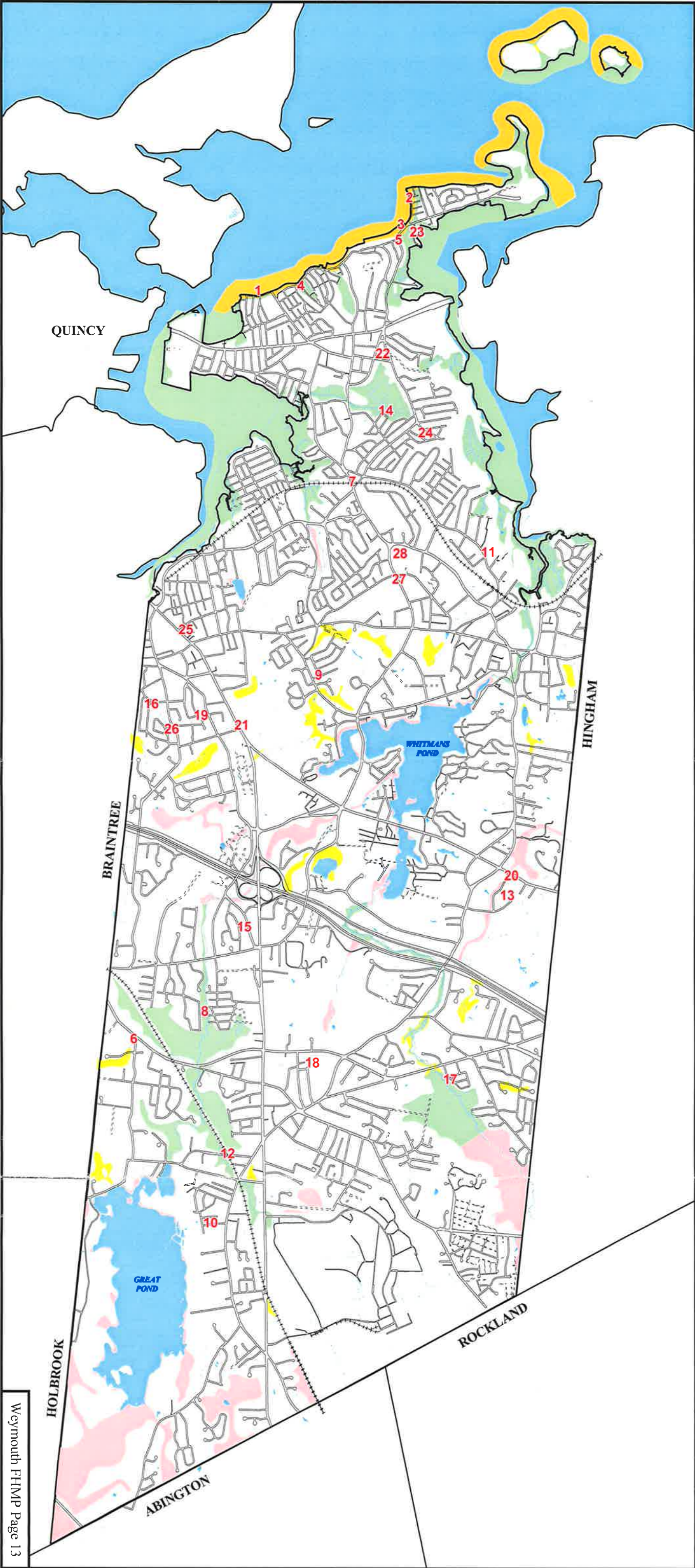


EXHIBIT 3.3
Flood Problem
Areas

Town of Weymouth



LEGEND

- Q3 Flood Data Zone A
- Q3 Flood Data Zone AE
- Q3 Flood Data Zone VE
- Q3 Flood Data Zone X500
- Hydrography
- Street
- Paper Street
- Town Boundary
- Rail Road

	Location	Severity of Problem
1	- Fore River Ave.	3
2	- Fort Point Rd./Wolcott St.	3
3	- River St.	4
4	- Wessagusset Rd. @ Wituwamut Rd.	4
5	- Neck Rd. @ Regatta Rd.	3
6	- Culvert/pipes at Colombian St.	1
7	- North St. at the RR bridge	3
8	- Mill River drain	2
9	- Essex St./House Rock Area	2
10	- Sycamore Rd. (Mill River & Partridge Rd.)	2
11	- Lee St. & K St. (leaching catch basin)	2
12	- Randolph St. @ RR tracks	1
13	- Woodrock Rd. & Argyle Ct.	2
14	- Donnellan Cir. & Moreland Rd.	2
15	- Ryder Rd.	3
16	- Healy Rd.	2
17	- Chisolm St.	2
18	- Tower Ave.	1
19	- Welland Cir.	1
20	- Plymouth River culvert & Washington St.	1
21	- Washington St. @ Federal St.	2
22	- Neck St. & Shaw St.	2
23	- Beach Rd.	1
24	- John St.	4
25	- Bakers Ave.	2
26	- Apple Tree Ln.	1
27	- Middle St.	1
28	- Legion Field	2

3200 0 3200 Feet

Scale: 1 inch = 3200 feet

Produced on June 21, 2001



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ADDITIONAL SOURCES:
Federal Emergency Management Agency National Flood Insurance Program: Q3 Flood Data

EXHIBIT 3.3

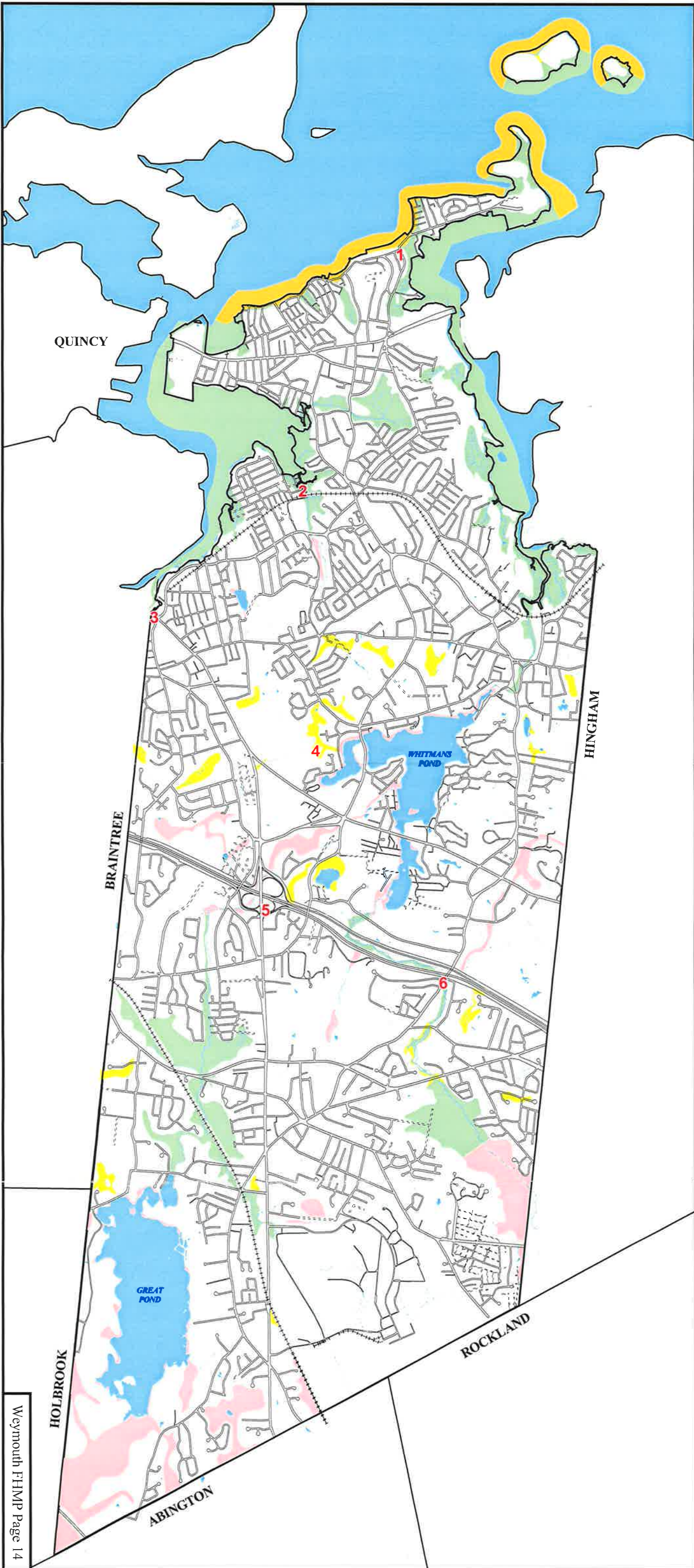


EXHIBIT 3.4
Flooding due to
Sewer Overflows

Town of Weymouth



LEGEND

- Q3 Flood Data Zone A
- Q3 Flood Data Zone AE
- Q3 Flood Data Zone VE
- Q3 Flood Data Zone X500
- Hydrography
- Street
- Paper Street
- Town Boundary
- Rail Road

	Location
1	- NECK ST./RIVER ST. P.S. OVERFLOW
2	- MONTCALM ST. OVERFLOW
3	- COMMERCIAL ST./LANDING P.S. OVERFLOW
4	- RUGGIANO CIRCLE OVERFLOW
5	- RTE. 3 CLOVERLEAF OVERFLOW
6	- PINE ST./PLEASANT ST. OVERFLOW

3200 0 3200 Feet

Scale: 1 inch = 3200 feet



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ADDITIONAL SOURCES:
Federal Emergency Management Agency National Flood Insurance Program: Q3 Flood Data

EXHIBIT 3.4

3.3 Critical Facilities

The term critical facility is any type of facility that is critical to flood response and emergency operations, facilities that are critical to public health and safety and other important infrastructure. The list of these structures are as follows:

- Emergency Operations Center
- Town Offices
- Water and Wastewater treatment facilities
- Sewage Pumping stations
- Police and Fire Stations
- Schools
- Hospitals
- Day-care Facilities
- Power Substations
- Public Works Garages
- Nursing Homes
- Elderly Housing
- Correctional Facilities
- Shelters
- Hazardous Materials Facilities
- Power Plants

Did you know that the average premium for an NFIP flood insurance policy in Weymouth is \$589 a year?

Exhibit 3.5 shows the location of the critical facilities within the Town of Weymouth.



Overflowing Drain Manhole, Wessagussett Rd. at Wituwamat Rd.

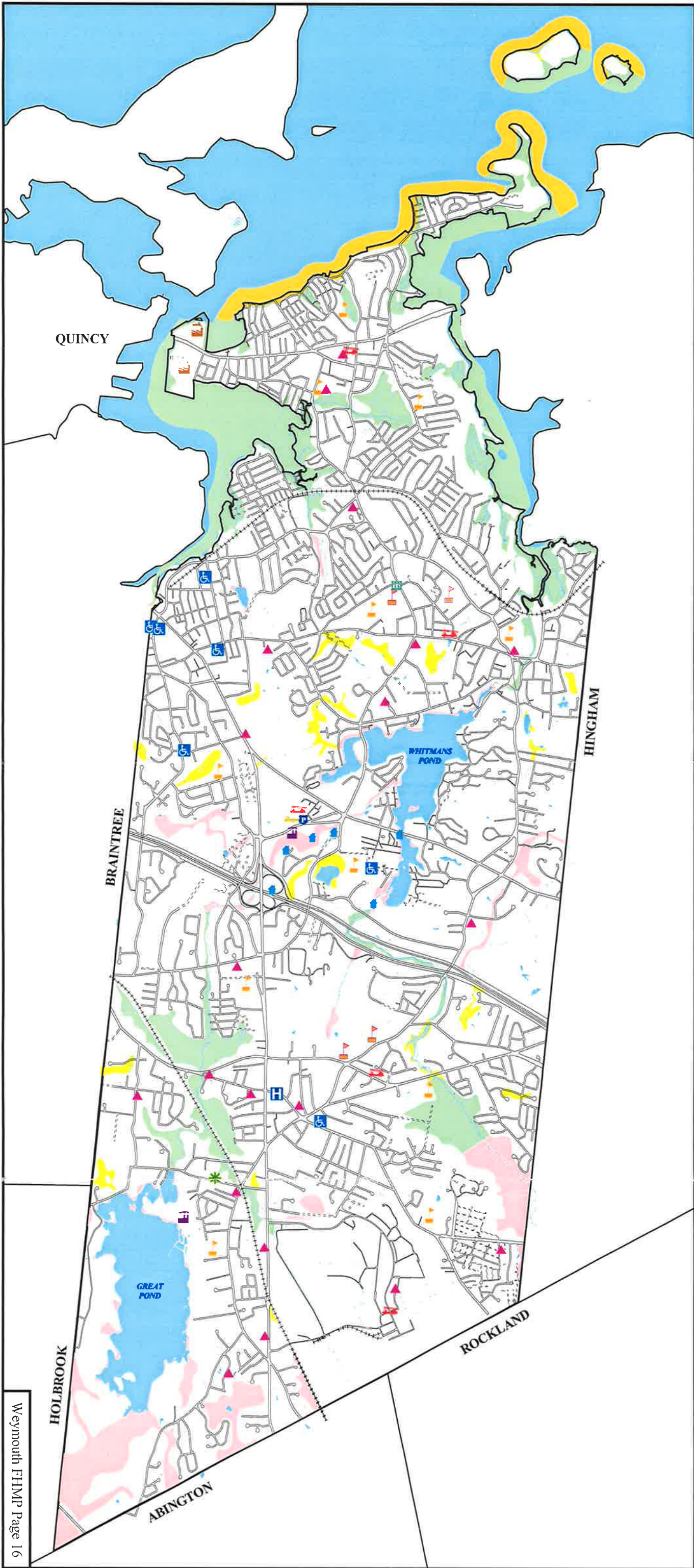


EXHIBIT 3.5
Critical Facilities & Evacuation Routes

Town of Weymouth



LEGEND

- Q3 Flood Data Zone A
- Q3 Flood Data Zone AE
- Q3 Flood Data Zone VE
- Q3 Flood Data Zone X500
- Hydrography
- Street
- Paper Street
- Town Boundary
- Rail Road
- Day-Care Facility
- Police Station
- Department of Public Works
- Treatment Plant
- School
- School/Shelter
- Pump Station
- Power Plant
- Nursing Home/Elderly Housing
- Hospital
- Fire Station
- Emergency Operation Center
- Town Hall

3200 0 3200 Feet

Scale: 1 inch = 3200 feet



Produced on June 21, 2001

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ADDITIONAL SOURCES:
Federal Emergency Management Agency National Flood Insurance Program: Q3 Flood Data

EXHIBIT 3.5

Section IV - Existing Protections

4.1 Existing Protections

*Did you know that in the last 5 years,
61% of all Presidentially declared
disasters included flooding?*



Seawall at Fore River Ave.

The existing protections currently utilized in the Town of Weymouth are a combination of environmental and zoning regulations, existing land use, infrastructure maintenance and channel clearing. The most effective of the protections for new structures is the Wetlands Protection Act and the requirement of elevation certificates for foundations. These protections do little for existing structures and don't give the Town opportunity for input until the property owner applies for permits for improvements. Infrastructure maintenance is successful with clog type problems and somewhat successful with capacity problems due to root obstructions. Large scale capacity problems that require pipe replacement or invert elevation modifications are subject to the capital budget process and are prioritized within the Town budget. Lack of funding hampers completion of these projects as well as obtaining easements for projects that cross private property.

Other protections utilized in the Town have varied results. The work of the Norfolk County Mosquito Control (NCMC) is effective when directed for flooding purposes, however, both goals do not always coincide nor do the scopes of the projects. Public education is difficult to measure in addition to the difficulties in targeting various audiences. The education process is effective for a very short time after flood events, but becomes less effective as the event fades in the memory.

In **Exhibit 4.1**, the types of existing protection are outlined along with the effectiveness/enforcement of the measure and improvements to the system that were developed as part of the Flood Hazard Mitigation Plan.

Exhibit 4.2 details the existing flood hazards and the current mitigation measures utilized by the Town of Weymouth. In this exhibit, the severity of the problem is assigned a numerical value from 1 to 4 with a minor flooding issue as 1 and severe flooding as 4.

Exhibit 4.1 Existing Protection Matrix

Type of Existing Protection	Description	Effectiveness and/or Enforcement
Wetlands Protection Act	The Town implements the requirements of the WPA for all development within the Jurisdictional boundaries of the Act and requires all projects to meet the performance standards	Very effective for new projects, limited ability to affect existing structures.
Zoning Regulations	The Town has Zoning regulations limiting development and construction in hazard areas	Very effective for new projects, limited ability to affect existing structures.
Land Acquisition	As funding and properties are available, the Town is active in acquiring properties in the flood hazard areas	Limited success due to limited funding
Infrastructure Maintenance	The Town is active in repair, replacement and cleaning of its infrastructure	Small projects are successful with Town forces, large scale projects limited by funding. Large projects have been successful when funded.
NCMC Channel Clearing	The Town coordinates the efforts of the Norfolk County Mosquito Control office to clear / clean areas that present drainage problems	Small scale projects have been helpful to drain minor floods in low areas
Public Information	The Town has available information on flood and property protection issues	Difficult to measure
Stormwater Management	Town of Weymouth has a Master Drainage plan in place. It was updated in 1988 and contains a prioritized list of projects (included as Appendix C in FHMP)	Drainage projects on the list are limited by funding
Elevation Certificates	All building construction within the 100 year floodplain require elevation certificates as of December 15, 1991.	The program is successful in limiting the cost of flooding damage to new structures

Exhibit 4.2
Existing Flood Hazard / Mitigation Matrix

Location	Type of Problem*	Severity of Problem**	Flood Issue	Current Flood Mitigation Practice	Long Term Mitigation Solution
Wessagusset Rd. @ Wituwamat Rd.	F	4	Area floods at high tide / storms; flapper valve and groundwater contributing issues.	Reactive during events.	Requires investigation / engineering solution.
River St.	F	4	Flooding at hightides / storms due to seawater overtopping seawall.	Reactive during events.	Requires investigation / engineering solution.
Fort Point Rd. / Wolcott St.	F	4	Area floods at high tide / storms; flapper valve failure; other possibilities.	Reactive during events.	Requires investigation / engineering solution. Wolcott is private way.
Fore River Ave.	F	3	Area floods at high tide / storms; seawall contributing.	Reactive during events.	Requires investigation / engineering solution.
John St.	D	3	Pipe inverts could be too low and roots clog the pipe (willow tree). The outfall area is into a slow draining marsh area.	Reactive during events.	Requires investigation, potential replacement of pipe. (Note: recent work has resolved this situation for the time being.)
North St. at RR bridge	D	3	Capacity (undersized, misaligned and/or clogged pipes), no easements to repair, inlet lower than outlet.	Keep area cleaned prior to large storm predictions.	Get easements, resize and replace pipes, fix manholes
Neck St. @ Regatta Rd.	D	3	Infiltration into sewer pipe causing overflow; capacity issue.	Reactive during events.	Requires I/I investigation/mitigation.
Ryder Rd.	D	3	Roots in pipe, pipe is in backyards, willow tree.	Monthly rodding to keep line open.	Requires investigation / engineering solution.
Donnellan Cir. / Moreland Rd.	D	2	Outfall pipe lower than surrounding swamp area.	Reactive during events.	NCMC clean/dredge swampy area; potential engineering solution.
Bakers Ave.	D	2	Pipe in yards does not allow maintenance.	Reactive during events.	Reroute pipe into ROW. Bakers is private way.
Legion Field	I	2	Low point with very poor soils, inadequate drainage.	Reactive when field use is required.	Town had plan for mitigation of soils problem, no funding for project.
Washington St. @ Federal St.	D	2	May be due to damaged, clogged and/or undersized pipes in state highway.	Reactive during events.	State responsibility.

*Type of Problem: F = Flooding; D = Drainage Problem; I = Isolated Drain Problem

**Severity of Problem: 1 = Minor Problem, 4 = Major Problem

Exhibit 4.2
Existing Flood Hazard / Mitigation Matrix

Location	Type of Problem*	Severity of Problem**	Flood Issue	Current Flood Mitigation Practice	Long Term Mitigation Solution
Neck and Shaw Sts.	D	2	Roots combined with undersized pipe.	Attempts to clean pipe undertaken.	Resize and replace pipe.
Mill River	D	2	River constriction (ledge outcrop), upper section needs dredging.	Problem is tied to Rte. 228/Columbian St. culvert that plugs due to sediment build up, must keep up on state to limit the problem.	Major project, will require focused study to find a solution that is environmentally sound and economically feasible (high cost, permits difficult to obtain).
Essex St. / House Rock Area	I	2	Low area that is built up; pipes are clogged.	Reactive during events.	Have NCMC clear channels, verify effect on downstream watercourse. Look into necessary cleaning/repairs.
Sycamore Rd. (Mill River and Partridge Rd.)	D	2	Pipe in backyards and woods, may be undersized/obstructed.	Reactive during events.	One costly option: re-route pipe to Pond Street.
Lee and K Sts. (leaching catch basins)	I	2	Leaching catch basins are not functioning properly; may need full redesign/reconstruction.	Reactive during events.	Lee St.: direct to large off-road leach chamber. K St.: replace pipe in East street to tie into that pipe. Private ways.
Woodrock Rd. / Argyle Ct.	D	2	Root problem in pipe, require easements to access the area.	Reactive during events.	Require a study, possible pipe replacement and easements. Woodrock is private way.
Healy Rd.	I	2	Open grate that clogs.	Cleaning / different inlet structure.	Redesign / replace grate inlet structure.
Chisolm St.	D	2	Pipe is under sized and has insufficient slope to be effective.		Resize and replace pipe.
Tower Ave.	D	1	Root problem and undersized pipe.	Reactive during events.	Resize and replace pipe.
Welland Cir.	D	1	Pipe is undersized and in back yards.	Reactive during events.	Reroute pipe into ROW.
Plymouth River culvert @ Washington St.	D	1	Culvert that is undersized.	Reactive during events.	State responsibility. Downstream evaluation required prior to modification.
Beach Rd.	F	1	Flooding in area after construction of boat ramp. Leaching catch basin.	Reactive during events.	Requires investigation as to exact cause, likely fix will be a leaching chamber.

*Type of Problem: F = Flooding; D = Drainage Problem; I = Isolated Drain Problem

**Severity of Problem: 1 = Minor Problem, 4 = Major Problem

Exhibit 4.2
Existing Flood Hazard / Mitigation Matrix

Location	Type of Problem*	Severity of Problem**	Flood Issue	Current Flood Mitigation Practice	Long Term Mitigation Solution
Randolph St. @ RR tracks	D	1	The outfall is low, creating limited storage. This is associated with the Mill River problem.	Reactive during events.	See Mill River.
Apple Tree Ln.	D	1	Related to Healy Rd. grate problem.	Reactive during events.	Repair of Healy Road will likely alleviate this problem.
Culvert / pipes at Colombian and Forest Sts.	D	1	Capacity issue; possible pipe broken, undersized, and/or obstructions.	Reactive during events.	Clean and/or replace/resize pipe. State responsibility.

*Type of Problem: F = Flooding; D = Drainage Problem; I = Isolated Drain Problem

**Severity of Problem: 1 = Minor Problem, 4 = Major Problem

Section V - Flood Hazard Planning Options

5.1 Planning and Public Input

The FHCPT held several scoping and planning sessions in addition to two public hearings in the development of this plan. These hearings allowed the stakeholders the opportunity to have any flooding related issues discussed in addition to the areas that are well known and documented as flood areas. The hearings were publicly advertised in the local paper. The following is a list of the issues that developed from these hearings.



Wessagussett Beach

- Dredge rivers (Mill) and other areas to increase flow
- Clean storm drains and grate inlets
- Potential restrictions on new buildings in flood areas
- Provide stormwater collection and possible pumping
- Land acquisition of existing flood prone dwellings
- Land acquisition of flood area to allow a place for flood waters
- Disclosure of flooding to potential buyers
- Relocate drainage from areas behind houses to limit root problems
- Relocate drainage from areas behind houses to allow access from ROW
- Resize / evaluate flood areas (See Exhibit 4.2)
- Fix flapper valves
- Fix / replace seawalls to provide better flood and surge protection
- Replace / rehabilitate the seawall scupper system to allow drainage

These ideas and issues were placed in the matrices of **Exhibit 5.1 and 5.2**. These matrices evaluate the actions that were developed by the FHCPT and the public.

Exhibit 5.1
Evaluation of the Options

Suggested Action	Will it minimize flood risk?	Will it reduce flood losses?	Is it a complete solution or will it need to be combined with others?	How soon does it have to take place to be effective?
Dredge rivers (Mill) and other areas to increase flow	● *	●	◐	Immediately
Clean storm drains and grate inlets	●	●	◐	Immediately
Restrictions on new building in flood area	●	●	◐	Immediately
Provide stormwater collection and pumping	○	●	◐	Immediately
Land acquisition of existing flood prone dwellings	●	●	◐	Immediately
Land acquisition of flood area to allow a place for flood waters	○	●	◐	Immediately
Disclosure of flooding to potential buyers	●	○ **	◐	Immediately
Relocate drainage from areas behind houses to limit root problems	●	●	◐	Immediately
Relocate drainage from areas behind houses to allow access from ROW	●	●	◐	Immediately
Resize / evaluate flood areas (See Ex. 4.2)	●	●	◐	Immediately
Fix Flapper valves	●	●	◐	Immediately
Fix / replace seawalls to provide better flood and surge protection	● ***	● ***	◐	Immediately
Replace / rehabilitate the scupper system to allow drainage	●	●	◐	Immediately

* Downstream may be affected, evaluation required.

** Area will still flood and be damaged.

*** Assumes new design is more effective.

● - Yes
◐ - Possible
○ - No

Exhibit 5.2
Evaluation of the Options Using FEMA Analysis Method

Suggested Action	Socially Acceptable	Technically Feasible	Administratively Possible	Politically Acceptable	Legal	Economically Sound	Environmentally Sound
Dredge rivers (Mill) and other areas to increase flow	●	●	●	●	○	○	○
Clean storm drains and grate inlets	●	●	●	●	●	●	●
Restrictions on new building in flood area	●	●	●	●	●	●	●
Provide stormwater collection and pumping	●	●	●	◐	◐	◐	◐
Land acquisition of existing flood prone dwellings	●	●	●	●	●	◐	●
Land acquisition of flood area to allow a place for flood waters	●	●	●	●	●	◐	●
Disclosure of flooding to potential buyers	●	◐	●	◐	●	●	N/A
Relocate drainage from areas behind houses to limit root problems	●	●	●	●	●	●	◐
Relocate drainage from areas behind houses to allow access from ROW	●	●	●	●	●	●	●
Resize / evaluate flood areas (See Ex. 4.2)	●	●	◐	◐	◐	◐	◐
Fix Flapper valves	●	●	●	●	●	●	●
Fix / replace seawalls to provide better flood and surge protection	●	●	●	●	●	●	○
Replace / rehabilitate the scupper system to allow drainage	●	●	●	●	●	●	●

● Yes
 ◐ Possible
 ○ No

Section VI - Flood Hazard Mitigation Actions

6.1 Category Descriptions

The following describes the categories that are to be used in evaluating potential mitigation actions.

Prevention activities include planning, zoning, open space preservation, floodplain and wetland development regulations, stormwater management, dune and beach maintenance, harbor plans, channel maintenance, waterway dumping regulations, watershed protection measures and best management practices, and soil erosion and sediment control.

Property Protection activities include acquisition, building relocation, building elevation, barriers, dry/wet floodproofing, utility relocation or floodproofing, sewer backup protection, and insurance.

Public Information activities include providing map information, informational mailings or workshops, real estate disclosure of flood hazards, environmental education, and technical assistance provided on floodplain management issues.

Structural Projects include construction, maintenance or repair of levees, berms, dams, seawalls, floodwalls, tide gates, channel improvements, beach nourishment, drainage and sewer improvements, and detention/retention basins.

Emergency Services include flood threat recognition, flood warning, flood response, protection of critical facilities, and health and safety maintenance.

Measures for Other Hazards include activities to mitigate the effects of such hazards as dam failure, earthquake, wildfire, or winds caused by hurricanes or tornadoes.

Proposed action items are prioritized within each category utilizing the following criteria. Items that can be accomplished with Town forces and/or with funds provided by grants or modifications to capital spending are rated the highest. Investigations or studies to determine the required mitigation are next in order of priority. The items that have the potential to protect the most property and/or have the greatest impact on public safety are ranked the highest within this group.

6.2 Prevention

<u>Priority</u>	<u>Location</u>	<u>Project Description</u>
1	North Street @ Rail Road	Clean area regularly. Evaluate for structural project. MBTA assistance?
2	John St.	As much as possible, clear roots/debris. Evaluate re-route pipes.
3	Mill River	Improve capacity by removing sediment and debris (NCMCP, Mass Highway). Consider for structural project.
4	Donnellan Cir./Moreland Rd.	Clean/enlarge drainage (NCMCP). Evaluate for structural project.
5	Essex St. at House Rock	Clean / enlarge drainage ditches (NCMCP). Clear roots/debris. Evaluate

		for structural project.
6	Woodrock Rd.	As much as possible, clear roots/debris. Evaluate re-route pipes.
7	Randolph St. @ Rail Road	Clean drainage as much as possible. Associated with Mill River problems.
8	Washington St. @ Federal St.	State road. Must contact State for fix.
9	Plymouth River @ Washington St.	State road. Must contact State for fix.

6.3 Property Protection

Priority	Location	Project Description
1	Neck St. at Regatta Rd.	Investigate Infiltration/Inflow problems.
2	Ryder Rd.	Remove roots. Evaluate for structural project.
3	Neck and Shaw Sts.	Remove roots. Evaluate for structural project.
4	Bakers Ave.	Pipe location prevents maintenance, re-route pipe.
5	Beach Road	Investigate cause of flooding after boat ramp construction.
6	Colombian and Forest Sts.	Evaluate situation. State road.

6.4 Public Information

Priority	Location	Project Description
1	Town Wide	Provide Public information in all Town mailings about homeowner specific mitigation measures and flood insurance

6.5 Structural Projects

Priority	Location	Project Description
1	Wessagussett Rd./Wituwamat Rd.	Investigation and design resulting in construction of recommended mitigation. Possible alternatives include replacement of the flapper valve with a rubber duckbill check valve, replacement of parts of the drain system, raising the road, and/or installing a drain pumping station.
2	Fort Point Rd./Wolcott St.	Replace flapper valve with rubber duckbill check valve
3	River St.	Investigation and design of seawall system

4	Fore River Ave.	Investigation and design of seawall system
5	Healy Rd./Apple Tree Ln.	Redesign grate to prevent clogging.
6	Lee and K Sts.	Replace leaching catch basins with new drain system design.
7	Chisolm St.	Replace pipe with increased capacity.
8	Sycamore Rd.	Re-route pipe and increase capacity.
9	Welland Cir.	Re-route and replace pipe.
10	Tower Ave.	Replace pipe with increased capacity.
11	Legion Field	Provide improved drainage system in field; soil issues to be investigated.

6.6 Emergency Services

<u>Priority</u>	<u>Location</u>	<u>Project Description</u>
	No Emergency Services actions have been identified at this time.	

6.7 Measures for Other Hazards

<u>Priority</u>	<u>Location</u>	<u>Project Description</u>
	No Measures for Other Hazards actions have been identified at this time.	

Section VII - Implementation Strategy

7.1 Strategy for Implementing the Plan



Dixon Park Road

When implementing a flood mitigation plan, it is important to remember that mitigation is an ongoing process. A strategy for the implementation of the priority actions is the next step. An outline of the implementation items is as follows:

- The Town of Weymouth (Mayor) must formally adopt the plan.
- Selection and appointment of an implementation team by the local governing body (Mayor).
- The implementation team must prepare an action plan with responsibilities.
- The implementation team must meet on a regular basis.
- The team must update the priorities based on events and previous implementation work.
- An annual update should be presented to the Mayor.

APPENDICES

- A) Technical and Financial Assistance for Mitigation for the Town of Weymouth**
- B) CDBG Projects – Past Success Stories**
- C) Portion of Town Master Drainage Plan**
- D) Adoption of the FHMP by the Mayor**

**APPENDIX A:
TECHNICAL & FINANCIAL ASSISTANCE FOR MITIGATION**

STATE

EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

251 Causeway Street
Boston, MA 02114
(617) 626-1000
Website: www.state.ma.us/envir

MassGIS

EOEA Data Center
20 Somerset Street
3rd Floor
Boston, MA 02108
MassGIS Director: Christian Jacqz
(617) 727-5227 X309
Can cooperate with municipal staff or consultants on mapping projects for flood hazard mitigation.
Provides land use data and maps (fee for some services), can scan or convert existing data.

Office of Coastal Zone Management

Coastal Geologist: Wendy Quigley
(508) 291-3625 X17
Shoreline change and coastal high hazard mapping, barrier beach maps, Harbor Planning Guidelines and mooring checklist; Guidelines for Barrier Beach Management; technical assistance on natural resource Protection methods for erosion and flood control.

Division of Conservation Services

Director: Joel Lerner
(617) 626-1012
Open Space Planner: Jennifer Soper
(617) 626-1015
Provides technical assistance on conservation restrictions; works with NRCS and Conservation Districts on non-point source and streambank stabilization grant projects; provides self-help grants to Conservation Commissions to purchase land at up to 70% reimbursement; provides urban self-help grants to develop parks, playgrounds, and other open space in urban areas; works in conjunction with the MA Watershed Initiative.

Massachusetts Watershed Initiative

Watershed Manager: Karl Honkonen
(617) 626-1138
Manages, coordinates and integrates all activities within watersheds on a 5-year cycle of outreach, research, assessment, planning/implementation and evaluation. Involves federal, state, regional and local groups and agencies to protect and restore the environmental integrity of the state's waterways.
Watershed Team Contact Website: www.state.ma.us/envir/watersheds.htm

Department of Environmental Management

251 Causeway Street

Boston, MA 02114

(617) 973-8700

Website: www.state.ma.us/dem

Director, Bureau of Resource Protection: Richard Thibedeau

(617) 626-1396

Provides resource planning and scientific services to DEM and is responsible for implementing statewide natural, historic and water resources planning and management programs, including the state's hazard mitigation program.

Flood Hazard Management Program

Program Manager: Richard Zingarelli

(508) 626-1406

Flood insurance (National Flood Insurance and Community Program rating system administration), floodplain management technical assistance, floodplain management ordinance review, substantial damage/improvement requirements, "Handbook for Local Officials for Projects in the Floodplain", "A Coastal Homeowner's Guide to Floodproofing", retrofitting/floodproofing information, state Hazard Mitigation Plan, 404 Hazard Mitigation Grant Program administration.

Office of Dam Safety

Devons, MA

Director: David Clark

(508) 792-7716

Dam Safety information, including data on high hazard dams and unsafe dams, dam construction inspections; grants municipally-owned dam repairs.

Office of Waterways

Hingham, MA

Director: Nancy Thornton

Hingham (781) 740-1600

Design, construction and grants for water dependent structures, including flood control, dredging and coastal structures.

Office of Water Resources

Director: Mike Gildesgame

(617) 626-1371

Provides water resources engineering, planning and scientific services to DEM Forest and Parks and to communities statewide, including collection, analysis and distribution of hydrologic information for the Commonwealth's 27 river basins; and provides technical assistance and grants to municipalities for lake and pond planning and restoration and flood hazard mitigation.

Office of Water Resources – Lakes and Ponds Program

Coordinator: Steve Asen

(617) 626-1353

Grants for protection, preservation and enhancement of lakes and ponds; "Statewide Water Management Assistance" brochure.

Office of Natural Resources

Director: Richard Thibedeau
(617) 626-1396

Land acquisition, planning resource management planning, Area of Critical Environmental Concern (ACEC) program, greenways, bikeway planning, coastal access programs and GIS.

Metropolitan District Commission

20 Somerset Street
Boston, MA 02108

Director of Planning: Julia O'Brien
(617) 727-9693 X262

Land acquisition programs, greenway and open space planning for Metropolitan District properties and adjacent areas; watershed protection initiatives for Metropolitan District water supply.

Department of Environmental Protection

1 Winter Street
Boston, MA 02108

(617) 292-5500

Website: www.state.ma.us.dep

Bureau of Resource

Watershed Management Division
627 Main Street, 2nd Floor

Worcester, MA 01608

(508) 792-7470

Supervisor: Dennis Dunn

(508) 767-2874

Contact: Douglas.Roth@state.ma.us

Coordinates watershed teams to survey water quality and provide opportunities for communities to improve watershed health. Watersheds are assessed on a 5-year schedule. Administers two grant programs, the 319 Nonpoint Source Competitive Grants Program, and the 604(b) Water Quality Management Grant.

Bureau of Resource Protection

Wetlands and Waterways Program

Contact: Ronald.Maribett@state.ma.us

Acting Deputy Director: Lois Bruinoog

(617) 292-5500

"Protecting Coastal Property from Major Storm Damage" brochure, "Wetlands Report" quarterly newsletter; provides training on wetlands delineation, information on wetlands and waterways permitting; oversees stormwater management handbooks; publications "Storm Water Management" and Rivers Protection Act Information."

Division of Water Pollution Control

Title 5 Hotline: 1-800-266-1122 or (617) 292-5656

Information on inspections and requirements for upgrading septic systems.

DEPT. OF FISHERIES, WILDLIFE & ENVIRONMENTAL LAW ENFORCEMENT

251 Causeway Street, Suite 400
Boston, MA 02114
(617) 626-1500

Riverways Program

Director: Joan Kimball
(617) 626-1540

Provides technical assistance and outreach on river, stream and watershed protection, restoration and stewardship; assists in formation and strengthening of Adopt-A-Stream teams including technical assistance to groups conducting Shoreline Surveys.

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

One Congress Street
10th Floor
Boston, MA 02114
(617) 727-7001
(see also Housing and Urban Development under "Federal Resources")

Bureau of Planning and Municipal Management

Principal Planner: Donald Schmidt
(617) 727-7001 X482

Information on planning policy and procedures; "Weighing Your Options"; A Balanced Growth Approach" available.

Division of Municipal Development

Program Manager: Bob Sumeyko
(617) 727-7001 X435
General Information on Community Development Block Grant and related programs

EXECUTIVE OFFICE OF PUBLIC SAFETY

Massachusetts Emergency Management Agency

Disaster Recovery Manager: Christine McCombs
(508) 820-2067

Administers post-disaster Public Assistance funds; grants manager of Hazard Mitigation Grant Program; provides training on preparedness, mitigation, response and recovery.

Board of Building Regulations and Standards

Technical Director: Brian Gore
(617) 727-3200 X604

Reviews appeals to the State Building Code; provides interpretations of code, including Section 2102.0, "Flood Resistant Construction".

EXECUTIVE OFFICE OF TRANSPORTATION AND CONSTRUCTION

Massachusetts Highway Department

10 Park Plaza
Boston, MA 02116
Chief Engineer: Thomas F. Broderick
(617) 973-7830

Upon written request from communities, provides assistance in improving or repairing state-owned roads and highways.

OFFICE OF THE SECRETARY OF THE COMMONWEALTH

Massachusetts Historical Commission

220 Morrissey Boulevard
State Archives Building
Boston, MA 02125
(617) 727-8470

Provides technical assistance on historic preservation issues; reviews state and federal undertakings for impacts to historic and cultural resources, including Army Corps of Engineers projects; assesses damage to historic and archaeological resources; and provides emergency grant assistance for historic properties in municipal or nonprofit ownership; as office of the State Archaeologists, can assist in evaluating effects of flood mitigation measures on archaeological sites. Provides copies of FEMA's publication, "Safeguarding Your Historic Site: Basic Preparedness and Recovery Measures for Natural Disasters."

REGIONAL

REGIONAL PLANNING AGENCIES

1. **Metropolitan Area Planning Council**
60 Temple Place, Boston, MA 02111
(617) 451-2770
2. **Old Colony Planning Council**
70 School Street, Brockton, MA 02401
(508) 583-1833
3. **Southeastern Regional Planning & Economic Development District**
88 Broadway, Taunton, MA 02780
(508) 824-1367

REGIONAL WATERSHED ORGANIZATIONS

Massachusetts Watershed Coalition

P.O. Box 577
Leominster, MA 01453-0577
(978) 534-0379

Website: www.ultranet.com/~mwe

Contact this organization for information on watershed groups in your area. This group's website also lists other local watershed associations around the state.

LOCAL CONSERVATION DISTRICTS

Massachusetts Association of Conservation Districts, Inc.

319 Littleton Road
Westford, MA 01886
(978) 692-9395

The MACD is a non-profit organization of Conservation Districts statewide which acts as advocates for land users; many individual districts have plant sales and work to support the Massachusetts Envirothon. Many free sources of information on Envirothon topics are available from conservation districts across the state.

FEDERAL

FEDERAL EMERGENCY MANAGEMENT AGENCY

Region 1 Office

J.W. McCormack POCH, Room 442

Boston, MA 02109-4595

(617) 223-9500

Website: www.fema.gov

Mitigation Division

Administers National Flood Insurance Program and Community Rating System; prepares and revises flood insurance studies and maps; information on past and current acquisition, relocation and retrofitting programs; expertise in other natural and technological hazards, including hurricanes, earthquakes and hazardous materials. Financial assistance includes Hazard Mitigation Grant Program (post-disaster), Flood Mitigation Assistance Program (pre and post-flood), Hurricane Property Protection Grants (pre-disaster) and training for local officials at Emergency Management Institute in Emmitsburg, Maryland.

Response and Recovery Division

Information on dollar amounts of past disaster assistance, including Public Assistance, Individual Assistance and Temporary Housing; information on retrofitting and acquisition/relocation initiatives. Coordinates federal disaster assistance programs, including 75% grants for mitigation projects to protect eligible damaged public and private nonprofit facilities from future damage through the Public Assistance Program, and 100% "minimization" grants through the Individual and Family Grant Program and/or Home Repair Grants.

Computer Sciences Corporation

New England Headquarters

140 Wood Road, Suite 200

Braintree, MA 02184

(617) 848-1908

A private company contracted by the Federal Insurance Administration as the National Flood Insurance Program Statistical Agent, CSC provides information and assistance on flood insurance, including handling policy and claims questions, and providing workshops to lenders, insurance agents and communities.

U.S. ARMY CORPS OF ENGINEERS

New England Division

696 Virginia Road

Concord, MA 01742-2751

Chief, Special Studies Branch: John Kennelly

(978) 318-8505

Provides 100% funding for floodplain management planning and technical assistance under the Floodplain Management Services (FPMS) program and on a 50/50 matching basis for other water resources issues under the Section 22 Planning Assistance to States program. Various flood protection

measures such as beach nourishment, stream clearance and snagging projects, floodproofing and flood preparedness funded through other programs.

DEPARTMENT OF AGRICULTURE

Natural Resources Conservation Service

(formerly Soil Conservation Service)

451 West Street

Amherst, MA 01002

State Conservation Engineer: Carl Gustafson

(413) 253-4362

Technical assistance to individual land owners, groups of landowners, communities and soil and water conservation, districts on land-use and conservation planning, resource development, stormwater management, flood prevention, erosion control and sediment reduction, detailed soil surveys, watershed/river-basin planning and recreation, fish and wildlife management. Financial assistance is available to reduce flood damage in small watersheds and to improve water quality. See Local Conservation District listing under "State Resources" heading.

Rural Economic and Community Development

451 West Street

Amherst, MA 01002

(413) 253-4340

Technical assistance to rural areas and smaller communities in rural areas on financing public works projects; can purchase local bond issues to help obtain lower interest rates.

Farm Service Agency

445 West Street

Amherst, MA 01002

(413) 253-4500

Manages the Wetland Reserve (useful in open space or acquisition projects by purchasing easements on wetlands properties) and farm land set aside programs. Can also cost-share on wetland restoration projects (good for flood control, stormwater management and water quality).

DEPARTMENT OF COMMERCE

National Weather Service

Forecast Office

445 Myles Standish Blvd.

Taunton, MA 02780

Service Hydrologist: David Vallee

(508) 823-2262

Prepares and issues flood, severe weather and coastal storm warnings. Staff hydrologists can work with communities on flood warning issues; can give technical assistance in preparing flood warning plans.

Economic Development Administration (EDA)

143 North Main Street, Suite 209

Concord, NH 03301

(603) 225-1624

Assists communities with technical assistance for economic development planning. Following disasters funding is sometimes available for programs designed to assist in the long-term economic recovery of the affected area; can include relocation and redevelopment of flood prone businesses to a safer location.

DEPARTMENT OF THE INTERIOR

National Park Service

Rivers and Trails Conservation Program
Regional Office
15 State Street
Boston, MA 02109
(617) 223-5203

Technical assistance with open space preservation planning; can help facilitate meetings and identify non-structural options for floodplain redevelopment.

Fish and Wildlife Services

New England Field Office
22 Bridge Street, Unit 1
Concord, NH 03301-4986
(603) 225-1411

Can provide technical and financial assistance to restore wetlands and riparian habitats through the North American Wetland Conservation Fund and the Partners for Wildlife programs.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Region 1
O'Neill Federal Building
10 Causeway Street
Boston, MA 02222
Community Planning & Development Representative: Karen Malfy
(617) 565-5354

Community Development Block Grants

Communities larger than 50,000 automatically receive CDBG grants; only these communities should contact HUD directly regarding CDBG. Communities smaller than 50,000 compete for funds allocated to the state Department of Housing and Community Development (DHCD) (see listing under State Resources, above: smaller communities should contact the DHCD directly at (617) 727-7001). One program objective is to improve housing conditions for low and moderate income families: can include acquiring floodprone homes or protecting them from flood damage. Funding is a 100% grant; can be used as a source of local matching funds for other funding programs, such as FEMA's "404" Hazard Mitigation Grant Program. Funds can also be applied toward "blighted" conditions, which is often the post-flood condition. A separate set of funds exist for conditions which create an "imminent threat". The funds have been used in the past to replace (and redesign) bridges where flood damage eliminated police and fire access to the other side of the waterway.

HOME Program

Administered by Massachusetts Dept. of Housing & Community Development (DHCD)
Division of Private Housing
(617) 727-7824

Through this program, counties can receive funding for rehabilitation and new construction of housing for low-income families. Following disasters such as Hurricane Andrew and The Great Midwest Floods of 1993, supplemental Congressional appropriations provided extra disaster relief funding through both the HOME and CDBG programs.

Small Business Administration

360 Rainbow Boulevard South, 3rd Floor
Niagara Falls, NY 14303
Disaster Area Director: William Leggiero
(800) 659-2955

SBA has the authority to “declare” disaster areas following disasters that affect a significant number of homes and businesses, but that would not need additional assistance through FEMA. (SBA is triggered by a FEMA declaration, however.) SBA can provide additional low-interest funds (up to 20% above what an eligible applicant would “normally” qualify for) to install mitigation measures. They can also loan the cost of bringing a damaged property up to state or local code requirements. Can be used in combination with the new “mitigation insurance” under the NFIP, or in lieu of that coverage.

ENVIRONMENTAL PROTECTION AGENCY

Region 1

JFK Federal Building
Government Center
Boston, MA 02203
(617) 565-3400

Capitalization Grants for State Revolving Funds

Low interest loans to governments to repair, replace or relocate wastewater treatment plants damaged in floods. Does not apply to drinking water or other utilities.

Clean Water Action Section 319 Grants

Cost-share grants to state agencies that can be used for funding watershed resource restoration activities, including wetlands and other aquatic habitat (riparian zones). Only those activities that control nonpoint pollution are eligible.

Wetlands Protection – State Development Grants

Grants for states and Federally recognized Indian Tribes to develop and enhance wetland protection programs. Projects must demonstrate a direct link to increasing a state’s ability to protect wetland resources. (Funds can be used for identification of, but not purchase of, flood easements).

OTHER RESOURCES

The Association of State Floodplain Managers (ASFPM)

Website: www.floods.org

Professional association of state employees that assists communities with the NFIP with a membership of almost 1000. ASFPM has developed a series of technical and topical research papers, and a series of Proceedings from their annual conferences. Many mitigation “success stories” have been documented through these resources and provide a good starting point for planning.

Floodplain Management Resource Center

(303) 492-5787 (M-F: 11:00 a.m. – 6:00 p.m. Eastern)

Free library and referral service of the ASFPM for floodplain management publications. Co-located with the Natural Hazards Center at the University of Colorado in Boulder, staff can use keywords to identify useful publications from the more than 900 flood-related documents in the library.

Volunteer Organizations

Volunteer organizations, such as the American Red Cross, the Salvation Army, Habitat for Humanity, Interfaith and Mennonite Disaster Service are often available to help after disasters. Service Organizations such as the Lions, Elks, and VFW are also. These organizations have helped others with food, shelter, clothing, money, etc. Habitat for Humanity and the Mennonite Disaster Service provide skilled labor to help rebuilt damaged buildings incorporating mitigation or floodproofing concepts. The offices of individual organizations can be contacted directly, or the FEMA Regional Office may be able to assist.

Flood Relief Funds

After a disaster, local businesses, residents and out-of-town groups often donate to local relief funds. They may be managed by the local government, one or more local churches or an ad hoc committee. No government disaster declaration is needed. Local officials should recommend that the funds be held until an applicant exhausts all sources of public disaster assistance. That would allow the funds to be used for mitigation and other projects that cannot be funded elsewhere.

New England States Emergency Consortium (NESEC)

Lakeside Office Park

419 Main Street, Suite 5

Wakefield, MA 01880

Director: Edward Fratto

(617) 224-9876

Website: www.nesec.org

NESEC conducts public awareness and education programs on natural disaster and emergency management activities throughout New England. Brochures and videotapes are available on such topics as earthquakes preparedness, mitigation, and hurricane safety tips.

New England Floodplain & Stormwater Management Association (NEFSMA)

Website: www.seacoast.com/~nefsma/

NEFSMA is modeled after the national Association of State Floodplain Managers (ASFPM), as well as a number of regional chapters around the country. NEFSMA's purpose is to promote sound floodplain and stormwater management practices, enhance cooperation among the various related private, local, state and federal agencies, and to encourage and ensure effective, new and innovative approaches to managing the region's floodplain and stormwater systems.

APPENDIX B

Recent Flood Mitigation Projects

(All Community Development Block Grant funded)

Project Name	Project Description	Project Outcome
Alpine Rd. at Westminster Rd. (1999)	Replaced catch basin and installed new piping, drain manholes and new outfall pipe	Project stopped flooding in the roadway
Lake St. at Prince St. (1998)	Replaced pipe & catch basins and installed new pipe & catch basin	Project successfully stopped roadway flooding
Skelley Ave. (1997)	Replaced catch basins and pipes, increasing capacity	Project stopped flooding that impacted roadway

APPENDIX C

Town of Weymouth, Massachusetts
Portion of Master Drainage Plan Update
August 1988

TOWN OF WEYMOUTH
MASTER DRAINAGE PLAN UPDATE

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SECTION 7

RECOMMENDED IMPROVEMENTS

7.1 INTRODUCTION

Having established the rainfall-runoff response of each basin (Section 5) and having identified the problem areas (Section 6), the remaining task is to determine solutions to the problems. In order to assess the impacts of various alternative solutions, the data input into the original computer models were adjusted to reflect particular alternative configurations. For example, in order to assess the impact of a flood detention facility at a storage area, the data required to represent the storage facility was input to HEC-1 and the model was re-run. The new peak discharges and culvert geometry developed in this way were then used in the HEC-2 model and their impact on water surface elevations was determined. The purpose of the following sections is to explain the recommended improvements.

7.2 RECOMMENDED PLAN - TOWN WIDE

Several recommendations are general, and apply to all three study basins. These recommendations were developed to reduce the flooding and to reduce the potential impacts of future development on flooding. We recommend that the Town allow no construction of habitable structures at elevations less than the 100-year water surface elevation as shown on the water surface profiles in Appendix A. These elevations are typically higher than levels in the Town's Flood Insurance Study, the current guidance document. The reason for the differences in the predicted water surface elevations is the Master Drainage Plan Update uses a more detailed hydrologic analysis which predicts higher discharges than the FIS. We further recommend that the Town, through the Conservation Commission, require strict adherence and enforcement of erosion and sediment control measures during construction. This effort will reduce the amount of sediment that reaches the river systems, which has been a major problem in the past. The Conservation Commission and the Planning Board should also require developers to properly design and construct detention facilities at new development.

Our final Town wide recommendation is that an annual town wide maintenance program should be performed to remove sediment and debris from the drainage structures. This program should include the following:

- o Street sweeping of all Town roadways in the Spring;
- o Cleaning street drainage structures; and
- o Removing trash and debris from streams and rivers.

The Town may also wish to consider zoning changes, particularly in the Plymouth River Basin. For example, changing land zoned industrial to residential would result in less impervious area being developed. Similarly an increase in lot size requirements in residential areas would also result in less total impervious area.

7.3 RECOMMENDED PLAN - OLD SWAMP RIVER BASIN

The problem areas on Old Swamp River include flooding of houses on Pine Street, overtopping of Elm Street, overtopping of Ralph Talbot Street and flooding of houses on Chisholm Road (near the intersection with Ralph Talbot Street). The recommended improvements are presented on Table 7-1 and shown on Figure 7. These improvements reduce or eliminate the flooding from the design storm events. The improvements include the following:

- o Removing sediment from the river from Ralph Talbot Street to Pleasant Street;
- o Replacing culverts at Elm Street and Ralph Talbot Street.

Though flooding will be reduced, it is not economically feasible to eliminate all flooding along Chisholm Road from the 100-year design storm. Larger improvements than those recommended at Ralph Talbot Street would result in increases in flooding at downstream locations, which is not acceptable. It is recommended that the order of the work be performed in the following sequence:

1. Elm Street culvert replacement;
2. Sediment removal; and then,
3. Ralph Talbot Street culvert replacement

The lowering of the water surface elevation and the subsequent benefits to be derived from these improvements can be seen in the Flood Profiles for the Old Swamp River which are in Appendix A.

The total estimated construction cost for these improvements to Old Swamp River is \$1,360,000. The detailed cost of each improvement is provided in Appendix B.

Alternatives - Several alternatives were also examined but were found to be deficient either because they did not substantially reduce flooding or because they were judged too costly. One of the most promising alternatives was to construct a detention basin upstream of Ralph Talbot Street to create a large storage area. However, suitable location for the detention basin could not be found. All locations investigated caused higher flood levels for upstream residents. At Elm Street and at Ralph Talbot Street various size culverts were investigated before selecting the recommended sizes. The selection of the culvert at Elm Street was based on the maximum size possible, but without increasing flows or water depths downstream at Pleasant Street. The selection of the culvert at Ralph Talbot Street was balanced between maintaining the storage capacity of the upstream area and preventing the overtopping of Ralph Talbot Street.

7.4 RECOMMENDED PLAN - MILL RIVER BASIN

The plan for improvements in the Mill River Basin focuses on culvert improvements, sediment removal, and preservation of existing storage areas. The plan is presented in Table 7-2 and shown on Figure 8. The plan includes the following:

- o Culvert replacement at Park Avenue and Columbian Street;
- o Culvert replacement at Pond and Hollis Streets;

- o Culvert removal at the Gravel Road (downstream of Pond and Hollis Streets);
- o Sediment removal in the river bed from Park Avenue and Columbian Street to West Street;
- o Raising a length of the Derby Street roadway;
- o Culvert replacement at Randolph Street (lower priority)

The benefits to be derived from these improvements can be seen by the lower water surface as shown in the Flood Profiles for Mill River and Tributary A (Appendix A). All improvements were targeted to perform adequately at the 100-year design level, except at the Pond and Hollis Streets area on Tributary A. Improvements here were targeted to the 50-year design level, where space constraints precluded improvements large enough to handle the 100-year design storm.

The estimated construction cost for these improvements is \$1,256,000. The detailed construction cost estimate of each improvement is presented in Appendix B.

The sequence of the work for these improvements is as follows:

1. The Pond and Hollis Streets culvert replacement;
2. All other improvements should be constructed in order starting downstream and working upstream.

Alternatives - Numerous alternatives were examined by changing the appropriate parameters in the simulation model from the recommended set of improvements. These alternatives included raising the Park Avenue and Columbian Street roadway to increase storage upstream of this area. This modification resulted in flooding of upstream residents. Diverting flood flows on Tributary A upstream of Pond and Hollis Streets through a large drain pipe separate from Tributary A to the Mill River was also investigated. Though this alternative did reduce the flooding in the Pond and Hollis Streets area, the cost of this improvement was considered to be prohibitively high.

7.5 RECOMMENDED PLAN - PLYMOUTH RIVER BASIN

The Plymouth River Basin experiences the most severe flooding problems of the basins studied. The improvement plan prepared for this basin includes channel improvements and culvert replacement as presented in Table 7-3 and shown in Figure 9. Culverts should be enlarged or replaced at:

- o Two roads in the Queen Anne Gate Condominium (Colonels Lane)
- o Washington Street
- o Dynavac Driveway
- o Woodrock Road
- o Five driveways crossing between Woodrock Road and Moore Road
- o Moore Road

Channel improvements include widening the channel bottom and stabilizing the channel's sideslope. These improvements allow the channel and culverts to carry more of the flood waters. We recommend that these improvements be constructed in order, starting downstream and proceeding upstream.

The improvements will control flooding from the 10-year design storm level. They will not control flooding at the 100-year design level; however, the depth of flooding and the time period of flooding will be reduced. The flood profiles in Appendix A show design storm elevations along the Plymouth River before and after improvements.

The total estimated construction cost for the improvements to the Plymouth River Basin is \$1,483,000. The detailed cost of each improvement is provided in Appendix B.

It is important to note that the basin was evaluated completely developed, within the constraints of existing zoning, for the design conditions. Flooding will be less extensive if development is less intense than the design conditions or if proper detention facilities are installed at new developments to control runoff.

Alternatives - Prior to selecting the recommended plan for the Plymouth River Basin numerous alternatives were simulated using the computer models. Construction of a detention basin and/or diverting flood flows to the Old Swamp River above Moore Road were examined. However, both of these improvements did not reduce the flooding sufficiently to justify their costs. Improvements to the 100-year design level were also investigated. The improvements for the 100-year level of protection would include increasing the width of the river channel three-fold and constructing 'bridges' across the new river channel to replace the driveways. These improvements are not recommended because of the space constraints in the industrial area and the very high costs.

7.6 SUMMARY

The recommended plan for reducing the impact of floods in the Mill, Old Swamp, and Plymouth River Basins includes non-structural and structural controls. The non-structural controls include proper erosion control during construction within the drainage basins (to prevent sediment build-up and the subsequent reduction of stream capacity), preservation of selected natural storage areas in their current condition, use of the 100-year flood profile presented herein to restrict floodplain development, and enforcement of rules and regulations requiring runoff controls (such as detention ponds) at new facilities. The structural recommendations consist of sediment removal, raising roadway surfaces, and replacing or adding culverts at road crossings. The total cost of structural improvements is estimated to be \$4,100,000. Once recommendations are in place, the magnitude and frequency of flooding in the study basins will be significantly reduced.

MASTER DRAINAGE PLAN UPDATE

TABLE 7-1

RECOMMENDED IMPROVEMENTS - OLD SWAMP RIVER -

LOCATION	RECOMMENDATION	COST(\$)
River Reach between Elm St. & Pleasant St. (Sta. 5+20 to 21+42)	Remove stream sediment	\$ 315,000
River reach between Talbot Street and Elm Street (21+42 to 57+80)	Remove stream sediment	661,000
Elm Street Crossing	New twin 8 ft. wide by 6 ft. high concrete box culverts	171,000
Ralph Talbot Street	New twin 8 ft. wide by 6 ft. high concrete box culverts	213,000
TOTAL		\$ 1,360,000

MASTER DRAINAGE PLAN UPDATE

TABLE 7-2

RECOMMENDED IMPROVEMENTS - MILL RIVER -

LOCATION	RECOMMENDATION	COST (\$)
X Park Ave. & Columbian Street Crossing	New twin 6.25 ft. wide by 4.5 ft. high concrete box culvert	\$ 262,000
Randolph Street Crossing	New twin 5 ft. wide by 3.5 ft. high concrete box culverts	167,000
✓ Pond & Hollis Streets Crossing	New twin 4 ft. wide by 4 ft. high concrete box culverts	554,000
— River reach between West Street to Railroad (17+82 to 62+57)	Remove stream sediment	197,000
— Derby Street	Raise Derby Street by 2 feet	76,000
TOTAL		\$ 1,256,000

MASTER DRAINAGE PLAN UPDATE

TABLE 7-3

RECOMMENDED IMPROVEMENTS - PLYMOUTH RIVER -

LOCATION	RECOMMENDATION	COSTS(\$)
River reach between (16+10 to 40+36)	Remove stream sediment & stabilize slopes	\$260,000
Lower crossing on Colonels Lane	Add 6 ft diameter concrete pipe next to existing culvert	49,000
Upper crossing on Colonels Lane	Add 4.5 ft wide by 5 ft high concrete box next to existing culvert	44,000
Washington Street crossing	New triple 6 ft wide by 5 ft high concrete box culvert	254,000
Dynavac Driveway crossing	New triple 6 ft wide by 5 ft high concrete box culvert	197,000
Woodrock Road	New triple 6 ft wide by 5 ft high concrete box culvert	187,000
5 Driveways crossing between Woodrock Road and Moore Road	Add 5 ft diameter concrete pipe next to existing culvert at each driveway	320,000
Moore Road crossing	New twin 5 ft wide by 4 ft high concrete box culvert	172,000
TOTAL		\$1,483,000

Appendix D

*Town of Weymouth
Massachusetts*



David M. Madden
Mayor

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MEMORANDUM

TO: FLOOD HAZARD COMMUNITY PLANNING TEAM
FROM: DAVID M. MADDEN, MAYOR
RE: ACCEPTANCE OF FLOOD HAZARD MITIGATION PLAN
DATE: DECEMBER 27, 2001

I would like to inform you that I have approved the Flood Hazard Mitigation Plan that you, as a committee, have prepared. Formal adoption of this Plan will allow the Town of Weymouth eligibility for State and Federal Grants for flood mitigation. At this time, you are directed to begin implementation of the plan.

Please advise me of any changes or assistance that my office can render in the implementation of this plan. I personally thank all of the Flood Hazard Community Planning Team members for their diligent work in preparing the plan.

David M. Madden
Mayor

Cc: Jeff Coates
Chip Fontaine
Rod Fuqua
Caroline LaCroix
Richard Marino
John Mulveyhill
Bill Woodward