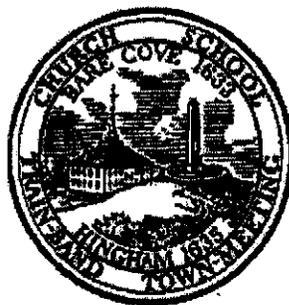


Town of Hingham, Massachusetts

**Comprehensive Wastewater
Management Plan (CWMP)**

Needs Analysis - Phase I

March 2007



Appendix A

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- Appendix B* Intermunicipal Agreements between Cohasset, Hull, and Hingham
- Appendix C* MassDEP Chapter 21E Sites in Hingham
- Appendix D* Aquarion Water Quality Reports from 2004 and 2005
- Appendix E* Board of Health Meeting Notes
- Appendix F* Phase I Public Presentation (November 16, 2006)

Executive Summary

ES-1 Introduction

Hingham's Comprehensive Wastewater Management Plan is conducted to be consistent with Massachusetts Department of Environmental Protection (MassDEP) planning efforts. The purpose of this project is to:

- Provide a comprehensive review of current wastewater management practices in the Town of Hingham.
- Assess the future wastewater disposal needs of the Town, using existing available information and projections,
- Develop alternatives to address those needs and evaluate each alternative for effectiveness, implementability, and cost.

This Phase I report presents the findings of the needs analysis portion of the project. A Final "Recommended Plan", or course of action, will be developed after careful consideration and evaluation of alternatives.

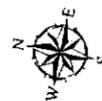
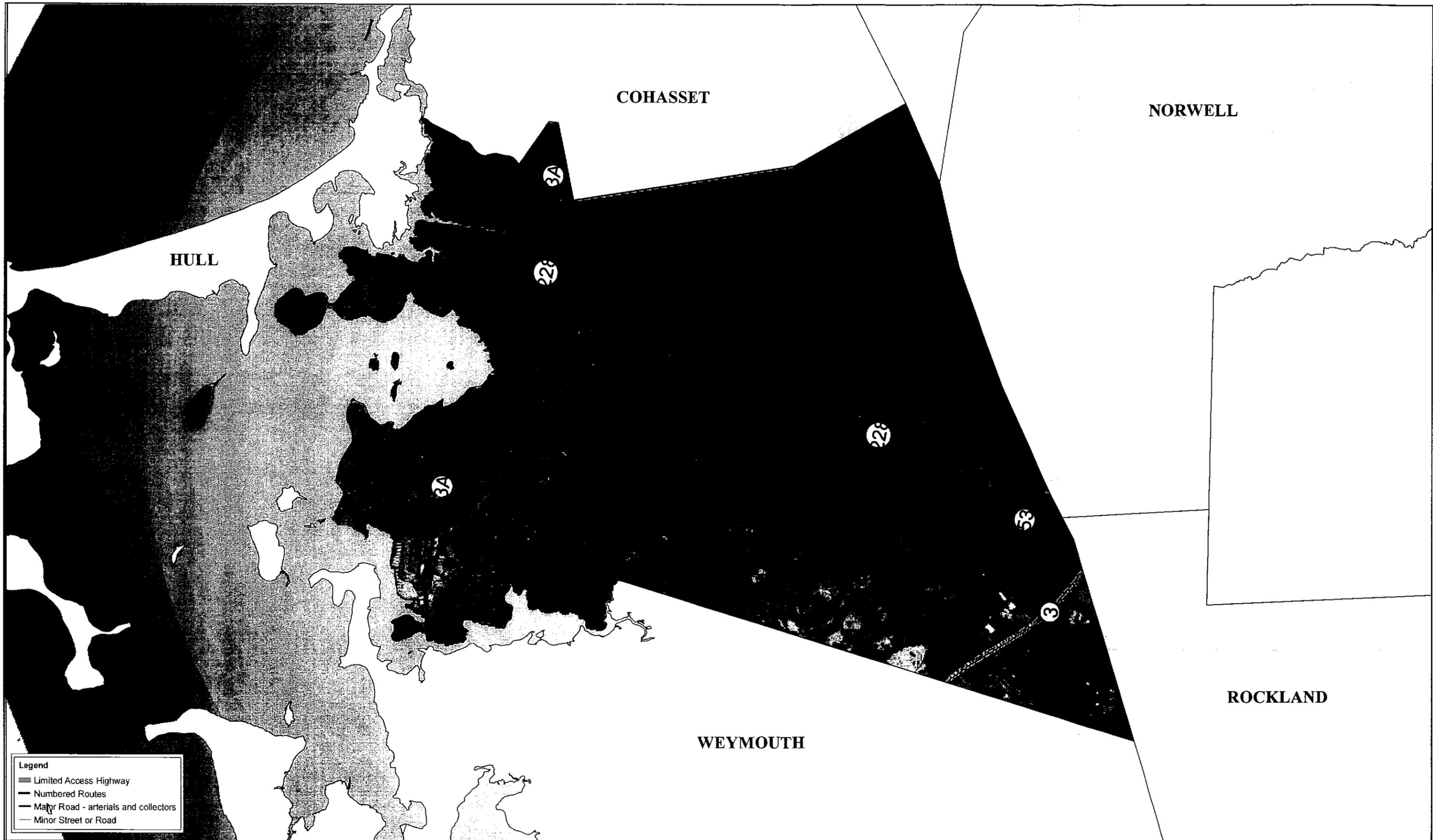
ES-2 Existing Conditions

The Town of Hingham is a suburban coastal community located approximately 15 miles southeast of Boston, MA and covers an area of approximately 22.5 square miles. Hingham is considered to be residential in nature but does have a vibrant commercial and economic zone centered around the downtown area and the harbor front. With 21 miles of coastal shoreline, the town actively maintains its seaside character and is proud of its history. Hingham is bordered by the communities of Weymouth, Rockland, Norwell, Scituate, Hull, and Cohasset. An area map of Hingham is shown on Figure ES-1.

Hingham's 2001 Master Plan was used as a source of information during the preparation of this portion of the report. The Master Plan was prepared by John Brown Associates Inc. and was presented to the Town in December, 2001. The Master Plan is a statement of public policy to guide decision-making for future development of the town, and represents a shared vision for the town's future.

ES-2.1 Population

The 2000 census lists Hingham's population at 19,882. The official Hingham website shows that the population in 2004 was listed as 20,720 persons. Population growth is expected throughout the planning period of this study, and it is important to establish this baseline population as a starting point for comparison with later parts of this study.



ES-2.2 Existing Wastewater Treatment and Disposal Methods

The Master Plan identifies wastewater disposal as an issue to be resolved especially in South Hingham. Northern Hingham, including much of the downtown area, is connected to wastewater collection systems operated by the Massachusetts Water Resources Authority (MWRA), or the Town of Hull. The MWRA connection serves the majority of properties within the North Sewer District (NSD) located in the northwest portion of Hingham. The wastewater from properties within the Weir River Sewer District (WRSD) is conveyed to Hull.

The developed areas within the remainder of Hingham rely on individual on-site sanitary disposal systems (SDSs) for wastewater treatment and disposal. A large portion of this area also serves as water recharge areas for Hingham and for neighboring communities of Weymouth, Abington, and Rockland.

The existing conditions for the Baseline flows are summarized in Table ES-1:

**Table ES-1
Summary of Existing Conditions and Baseline Wastewater Flows**

<i>Component of Wastewater Flow</i>	<i>Total Flow (gpcd rounded)</i>
Total North Sewer District flow (existing):	614,000
Total Weir River Sewer District flow (existing):	30,000
Total flow for unsewered Hingham (existing):	1,211,500
Total Town of Hingham flow (existing):	1,855,000

ES-2.3 Existing Water Supply

The Hingham public water supply comes from two major sources; groundwater wells and surface supplies. There are six groundwater wells identified as Free Street Wells #2 through #5, Scotland Street, Downing Street, and Prospect Street wells. The three surface water sources are the Accord Pond, Accord Brook, and Fulling Mill Basin.

A discussion about the existing water supply is relevant to the wastewater planning study because Hingham's water supply situation is relatively unique. Unlike many of the neighboring municipalities, Hingham is served by a private water company, namely, the Aquarion Water Company. Aquarion provides water service and operates and manages the public water system for all of Hingham and portions of Hull, North Cohasset and Norwell. The aquifer that serves as the source of this public water supply is located largely within Hingham and within the Weir River Basin. Water that leaves the Weir River Basin (through MWRA or Hull sewer collection systems) does not return to replenish the aquifer. It is important therefore, to determine baseline conditions of Hingham's water supply for comparison to future conditions. The average daily demand for the entire service area (including Hingham, Hull, North Cohasset, and Norwell) was 3.4 million gallons per day (mgd) in 2004 and was 3.2 mgd in 2005 as reported by Aquarion in their Annual Water Quality Report.

A significant portion of Hingham is located within the Weir River Basin as defined in 310 CMR 4.00 Massachusetts Surface Water Quality Standards. The Weir River and Accord Brook are both included in this designation. The Weir River is classified as a High Stressed Basin by the Massachusetts Water Resources Commission.

Figure ES-2 shows the two sewer districts in Hingham, the aquifer and water supply sources, and the boundary of the Weir River Basin.

ES-2.4 Surficial Geology

Areas with sands and gravels exist in central and southern Hingham within the Weir River basin. These subsoils allow the aquifer to recharge quickly. A significant portion of the remainder of Hingham is underlain by till and bedrock. Till and bedrock deposits are poor soils that limit long-term use of on-site disposal systems.

The November 2002 MassDEP Source Water Assessment and Protection Report (SWAP) indicates the aquifer has a high vulnerability to contamination due to the absence of a hydrogeologic barrier. Although glacial till and bedrock are common subsoils in Hingham, existing subsoils in the Weir River basin are mostly sand and gravel that allow for rapid contaminant migration.

ES-3 Water Balance

Water Balance refers to how closely the volume of water entering a basin resembles the discharge from the basin. The Water Balance will be an important factor when considering wastewater treatment and disposal options during the evaluation stage of this project (Phase II). The High Stress Basin designation of the Weir River Basin will have an effect on how wastewater (and stormwater) management alternatives will be evaluated during Phase II of this Project since a majority of Hingham is located within the Basin.

The following formula is used to determine water balance within the watershed:

$$\text{Water Balance} = -\text{Amount Withdrawn} + \text{Amount Distributed} - \text{Amount Collected} + \text{Amount Discharged.}$$

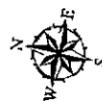
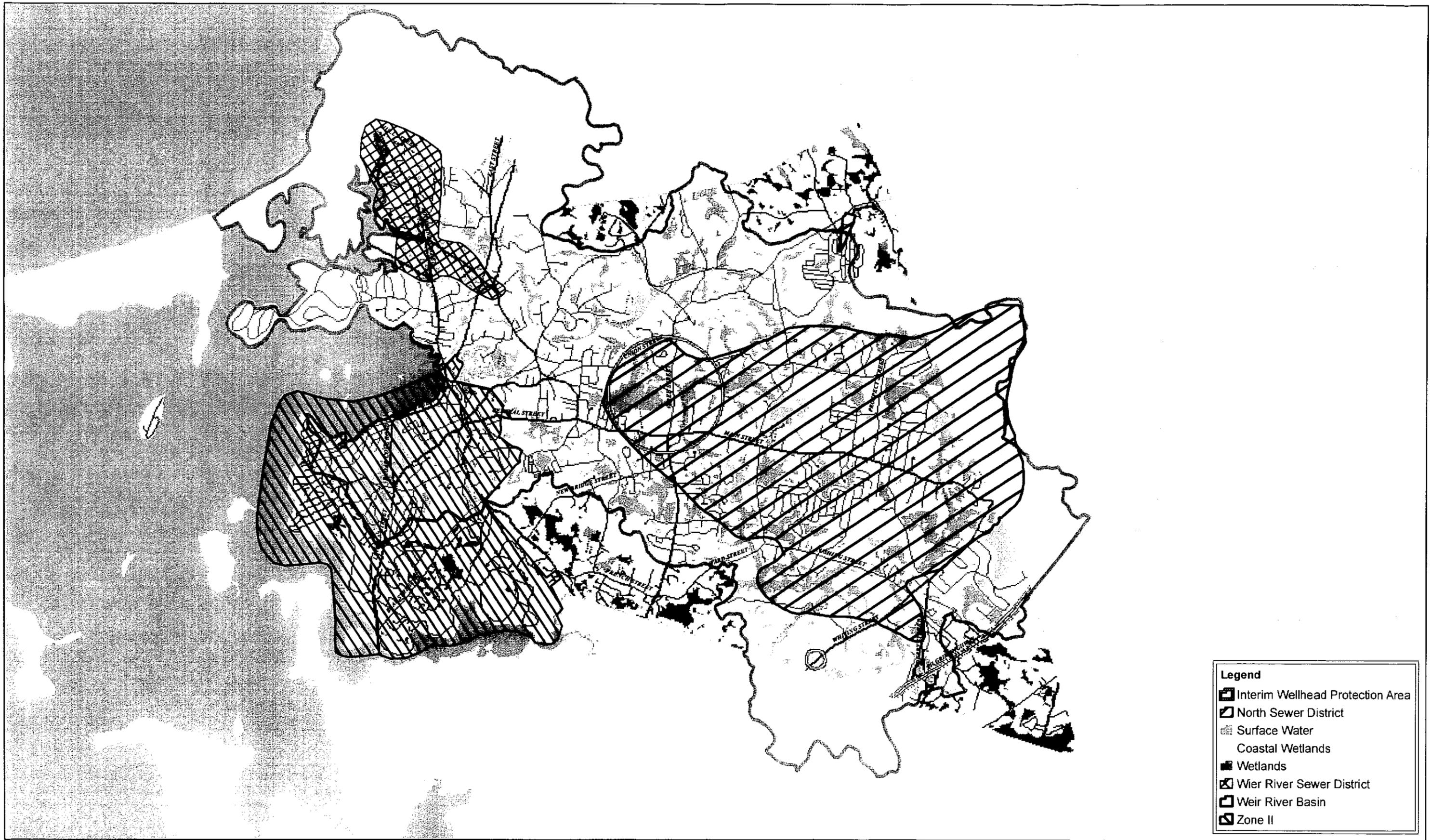
Where:

Amount Withdrawn = The amount withdrawn from wells and surface water supplies, public and private.

Amount Distributed = The amount of water distributed for public and private use.

Amount Collected = The amount of sewerage collected through the sewer system, including infiltration, and conveyed out of the watershed.

Amount Discharged = The amount of wastewater discharged back into the watershed by various SDSs.



ES-4 Future Conditions

ES-4.1 Population Projections

The population growth rate for Hingham, as estimated by the Metropolitan Area Planning Council (MAPC), averages at approximately 0.8% per year. Table ES-2 shows the population projections for Hingham up to year 2025.

**Table ES-2
Residential Population Projection to the Year 2025**

<i>Residential Population Projections</i>						
Year	1990 ¹	2000 ¹	2004 ²	2010 ³	2020 ³	2025 ⁴
Population	19,821	19,882	20,720	24,692	25,228	25,432
Increase % (from previous)		0.3	4.2	19.2	2.2	0.8

1. Source: 1990 and 2000 data from US Census.
2. Source: 2004 data from Town of Hingham Website
3. Source: 2010 and 2020 data from MAPC projection data released Jan. 31, 2006
4. Source: 2025 data derived from MAPC projections of 2020 and 2030.

ES-4.2 Projected Wastewater Flows

CDM has projected town-wide wastewater flow volume for the year 2025. The total volume determined below represents wastewater flow from all sources, including development, projected to the year 2025. The summary of Town-wide wastewater flows (2.36 mgd) at the end of the planning period is shown in Table ES-3 below:

**Table ES-3
Town-wide Projected Wastewater Flow (2025)**

<i>Study Year Projection Entire Town of Hingham</i>	<i>Source</i>	<i>Population</i>	<i>Total Flow (gpd)</i>
Residential (Single and Multi-family)	MAPC Population	25,432	1,664,000
Institutional	Master Plan	5,900	62,100
Industrial	Master Plan		105,774
Commercial	Master Plan		455,465
Total Estimated Town of Hingham Wastewater Flow Projection (2025)			2,300,000

1. Residential contribution based on MAPC population projections and 2.96 people per single-family housing unit, and 1.7 people per multi-family unit.
2. Institutional includes schools and municipal structures. School growth based on 15 percent increase in school aged children. Allowance made for municipal structures with 24 percent growth.
3. Industrial and Commercial growth based on 1 percent per year for 24 years.

ES-5 Needs Analysis

ES-5.1 Introduction

The purpose of this section is to identify and prioritize areas of need in the Town of Hingham for wastewater management solutions. The analysis divided the town into smaller study areas based on geography, topography, soil characteristics, groundwater conditions and other criteria. An evaluation and ranking of each study area was then performed based on a set of criteria developed to assess the need for wastewater management. The results of this needs analysis will be used to develop recommendations to address these wastewater management needs in Phase II of this study.

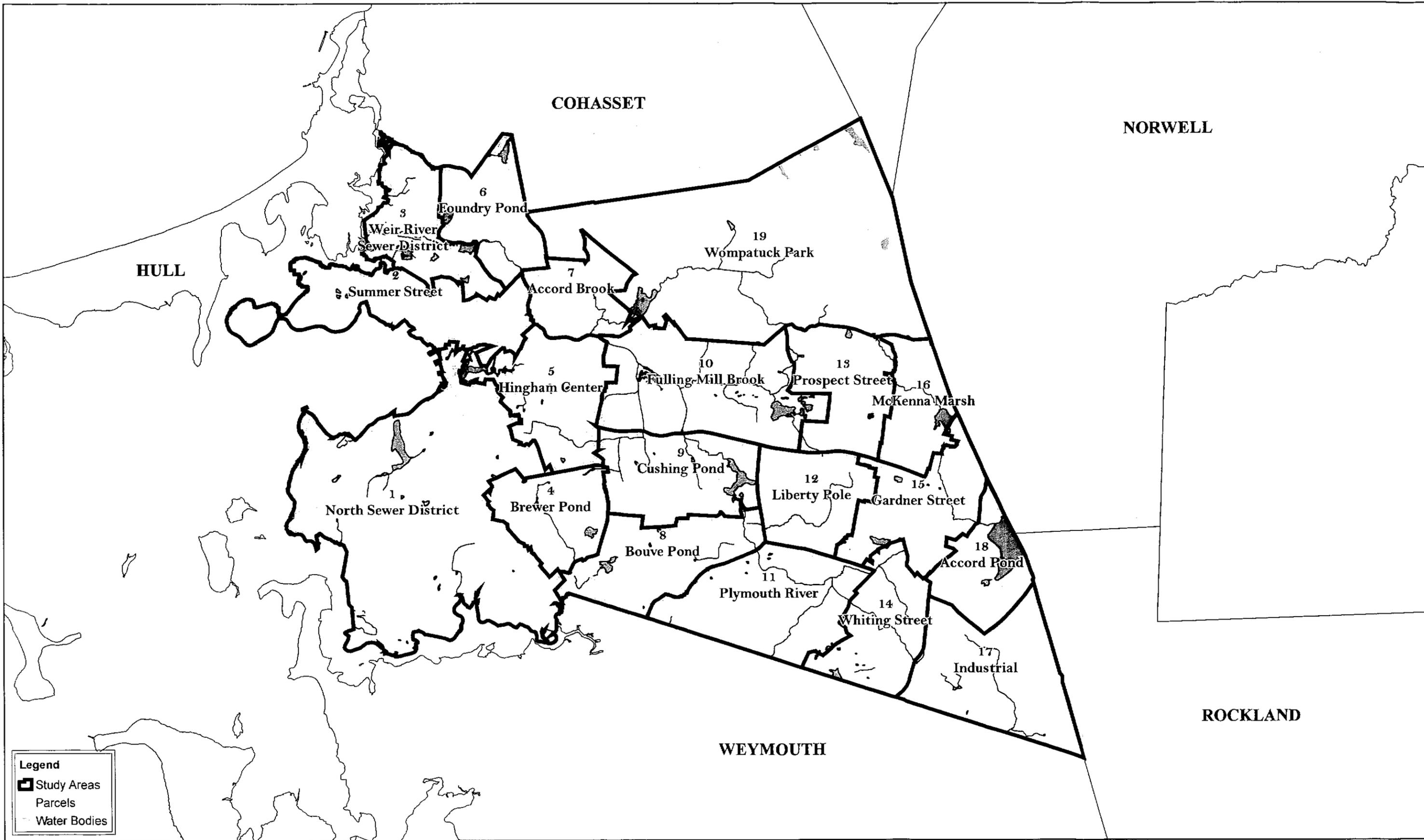
ES-5.2 Study Areas

Delineation of the Study Areas was intended to create manageable sections of Hingham, with relatively homogenous characteristics, to be assessed against criteria for determining wastewater management need.

The Study Area boundaries follow property boundaries or include developed portions of lots so these areas may be analyzed with the goal of formulating a long-term wastewater solution for those properties. In this way, roadways generally do not form study area boundaries. The division into study areas was the result of visual review of information already accumulated, and no detailed analysis was used to complete this step. The North Sewer District, Weir River Sewer District, and Wompatuck State Park were assigned their own Study Areas for consistency with the remainder of the community as part of a comprehensive wastewater management solution. Table ES-4 shows the list of Study Areas, and Figure ES-3 shows the boundaries of the Study Areas in Hingham.

**Table ES-4
Hingham Study Areas**

Study Area #	Study Area Name
1	North Sewer District
2	Summer Street
3	Weir River Sewer District
4	Brewer Pond
5	Hingham Center
6	Foundry Pond
7	Accord Brook
8	Bouve Pond
9	Cushing Pond
10	Fulling Mill Brook
11	Plymouth River
12	Liberty Pole
13	Prospect Street
14	Whiting Street
15	Gardner Street
16	McKenna Marsh
17	Industrial
18	Accord Pond
19	Wompatuck State Park



Legend

- Study Areas
- Parcels
- Water Bodies

**Town of Hingham
Comprehensive Wastewater Management Plan**

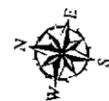


Figure ES-3

Study Area Map

ES-5.3 Needs Analysis Criteria

Specific criterion was developed to evaluate individual study areas within the town. The assessment included the preparation of a "Needs Evaluation Matrix" including a score for each criterion. The fourteen criterion chosen to evaluate each study area are presented below:

- Distribution and prevalence of small lot size
- Nitrogen Loading
- Zone I of public water supply
- Zone II/Aquifer Protection Zone of public water supply
- Interim Wellhead Protection Areas (IWPA)
- Within 200' Buffer zone of surface water supply
- Prevalence of wetlands
- Prevalence of 100-Year Floodplain
- Area of Critical Environmental Concern (ACEC)
- Stressed Basin
- Prevalence of Sand & Gravel
- Prevalence of Fine Silty Material
- Prevalence of Till/Bedrock
- Prevalence of Title 5 repairs/inspection failures

Small lot size and nitrogen loading were chosen for review as small lot size can restrict or limit the ability of a parcel to allow design and construction (or repair) of an on-site system in full compliance with state and local regulations. Further, the density of development is also a function of lot size. Densely developed areas, with large numbers of on-site systems, are a potential threat to groundwater supplies. Even when performing correctly, increased nitrogen loads from on-site systems in densely developed areas can degrade groundwater quality. High nitrate levels in drinking water can have serious health affects in infants less than 6 months of age if they ingest the water. Therefore, extra protections are built into regulations governing areas surrounding drinking water wells and aquifer protection zones.

Using the Hingham Zoning By-Law as a starting point, five lot size ranges were selected for this part of the needs analysis.

<i>Conditions for Grouping Existing Lots by Size</i>
Study Area Condition
Up to and including 10,000 sf
Between 10,001 sf and 20,000 sf
Between 20,001 sf and 30,000 sf
Between 30,001 sf and 40,000 sf
40,001 sf or greater

A goal of this CWMP is to protect and preserve environmental resources and public health. Degradation of these resources can be minimized by protecting the following areas related to public water supply:

- Public water supply Zone I Areas
- Public water supply Zone II Areas
- Interim Wellhead Protection Areas
- Private Well Areas
- Town Aquifer Protection Zones

Prevalence of these environmental resources within each of the study areas can serve to measure the relative importance of these areas to the protection of the water supply.

Other sensitive environmental receptors are categorized as follows:

- Surface Waters
- Wetlands and Swamps
- Floodplains
- Areas of Critical Environmental Concern (ACEC)
- Stressed Basins

Each resource and associated protective buffer zones have been mapped town-wide and overlaid with Study Area boundaries. The prevalence of these receptors will indicate higher levels of protection needed through the use of an overall wastewater management program.

Determinations of wastewater needs cannot be made without understanding the subsurface conditions within those Study Areas. Subsurface conditions that were

assessed include general soil permeability and depth to groundwater based on soil type; and prevalence of On-Site system repairs. After mapping the subsurface conditions in Hingham that limit the successful long-term function of an on-site disposal system, the percentage distribution coverage of each condition was scored for each Study Area. Higher scores for these criteria indicate higher limitations due to subsurface conditions.

The assessment of on-site systems with poor performance is also a measurable criterion. While many repairs to on-site systems are driven by property sales, and some neighborhoods experience this transition faster than others, this criteria is an indicator of subsurface conditions. Conversely, areas lacking significant numbers of repairs cannot be assumed to possess favorable conditions for continued reliance on on-site systems. Property owners may be simply unaware of the condition of their system.

To categorize the Study Areas for the prevalence of system repairs, Board of Health records were used to determine the type and location of on-site system repairs. Poor system performance was measured by dividing the number of reported repairs by the total number of systems (or existing developed properties).

ES-5.4 Needs Assessment Matrix

The total point score for each Study Area is the sum of the Category Scores and will determine the “priority of need” for wastewater management in Hingham. Determination of wastewater need is assessed by assigning a point value to the individual criteria in each of the Study Areas. Points are assigned based on the applicability of the criteria on a scale from one (1) to four (4). A score of one indicates a slight limitation or problem. A score of four indicates severe limitations or problems. A score of zero (0) is used to indicate no problems in a particular category.

The individual criterion scores from this needs evaluation are entered into the Needs Assessment Matrix, Table ES-5, and these scores have been tabulated to obtain a sum for each Study Area.

These Study Area scores are then evaluated in the matrix to determine the areas with the greatest need for wastewater management by overall score and ranking. It is also useful to review the criteria scores individually to identify the regulatory and environmental conditions requiring wastewater management protections. The overall Study Area scores and their corresponding priority ranking are shown in Table ES-6.

**Table ES-5
Needs Assessment Matrix**

Hingham Comprehensive Wastewater Management Plan

Study Area #	Study Area Name	Lot Size Score	Nitrogen Loading Score	IWPA Score	Zone I Score	Zone II/Town Aquifer Protection Zone Score	Surface Water Supplies (200' buffer) Score	Wetlands (100' buffer) Score	100-Year Flood Plains Score	AGEC Score	Stressed Basins Score	Prevalence of Sand & Gravel Score	Prevalence of Fine/Silty Material Score	Prevalence of Till/Bedrock Score	Prevalence of System Repairs Score	Total Score
1	North Sewer District	4	3	0	0	0	2	1	2	2	2	2	1	2	2	0
2	Summer Street	2	2	0	0	0	1	2	3	1	4	2	1	2	2	0
3	Weir River Sewer District	3	3	0	0	0	4	4	4	4	4	4	0	4	1	0
4	Brewer Pond	2	1	0	0	0	3	2	2	4	2	0	1	0	1	0
5	Hingham Center	4	3	1	1	1	4	2	3	0	4	2	4	0	2	0
6	Foundry Pond	2	2	0	0	0	3	1	2	1	4	4	1	4	1	0
7	Accord Brook	1	1	0	0	0	1	2	2	0	4	4	1	3	2	0
8	Bouve Pond	3	2	0	0	1	2	2	3	1	2	0	1	0	2	0
9	Cushing Pond	2	4	1	0	3	3	2	4	0	4	0	1	0	2	0
10	Fulling Mill Brook	2	4	4	4	4	3	1	4	0	4	2	1	2	1	0
11	Plymouth River	2	1	1	1	2	2	4	4	0	3	0	1	0	1	0
12	Liberty Pole	3	4	0	0	4	1	2	3	0	4	0	1	0	2	0
13	Prospect Street	2	4	0	3	4	2	1	2	0	4	2	1	2	2	0
14	Whiting Street	2	1	1	2	2	3	1	1	0	4	3	0	2	3	0
15	Gardner Street	2	4	0	0	4	4	2	4	0	4	3	1	3	1	0
16	McKenna Marsh	2	3	0	4	4	2	3	4	0	4	0	1	0	2	0
17	Industrial	2	1	0	0	1	1	1	3	0	1	4	1	3	4	0
18	Accord Pond	2	2	0	3	1	3	2	4	0	4	4	1	3	2	0
19	Wompatuck State Park	0	0	0	1	1	1	2	1	0	3	4	1	4	0	0

**Table ES-6
Study Area Score and Priority Ranking**

<i>Study Area Name</i>	<i>Final Score</i>	<i>Priority Ranking</i>
Fulling Mill Brook	36	1
Weir River Sewer District	35	2
Gardner Street	32	3
Hingham Center	31	T4
Accord Pond	31	T4
Prospect Street	29	T5
McKenna Marsh	29	T5
Cushing Pond	26	6
Whiting Street	25	T7
Foundry Pond	25	T7
Liberty Pole	24	8
North Sewer District	23	9
Summer Street	22	T10
Industrial	22	T10
Plymouth River	22	T10
Accord Brook	21	11
Bouve Pond	19	12
Brewer Pond	18	13
Wompatuck State Park	18	14

These Study Area scores and the priority ranking will be used in subsequent evaluations and assessments of alternatives to formulate an overall wastewater management program for the Town of Hingham. (A "T" in the needs ranking indicates a tie in priority).

Next Steps

A Public Meeting will be held on November 16, 2006 to present the findings of the Phase I Needs Assessment and to solicit input and comments from the citizens of Hingham. The needs assessment will then be finalized based on testimony received from the public meeting and the report will be submitted to the Massachusetts Department of Environmental Protection for review and comment.

CDM will develop a preliminary list of potential alternatives to address the wastewater needs identified in the Phase I portion of the study. The most feasible alternatives will then be chosen for a detailed review in Phase II of the CWMP. Phase II will develop and evaluate specific alternatives to address the wastewater disposal needs of Hingham. Alternatives may include expansion of the North Sewer District

and Weir River Sewer District, decentralized wastewater treatment and disposal, or continued use of on-site septic systems. Each alternative will be thoroughly reviewed to assess the potential impacts including environmental protection, growth management, and similar issues.

A recommended plan will be developed to present the findings of the CWMP. The plan will then be subject to additional review and comment from the citizens of Hingham in the form of an additional public meeting. A comprehensive statewide environmental review and public hearing will also be held prior to finalizing the recommended plan.

Section 1

Existing Conditions

1.1 Town of Hingham Overview

The Town of Hingham is a suburban coastal community located approximately 15 miles southeast of Boston, Massachusetts and covers an area of approximately 22.5 square miles. Hingham is considered to be residential in nature but does have a vibrant commercial and economic zone centered around the downtown area and the harborfront. With 21 miles of coastal shoreline, the town actively maintains its seaside character and is proud of its history. Historic districts have been created in the town dedicated to preserve and maintain the historical character. Figure 1-1 is an Area Map that shows the Town of Hingham and its surroundings.

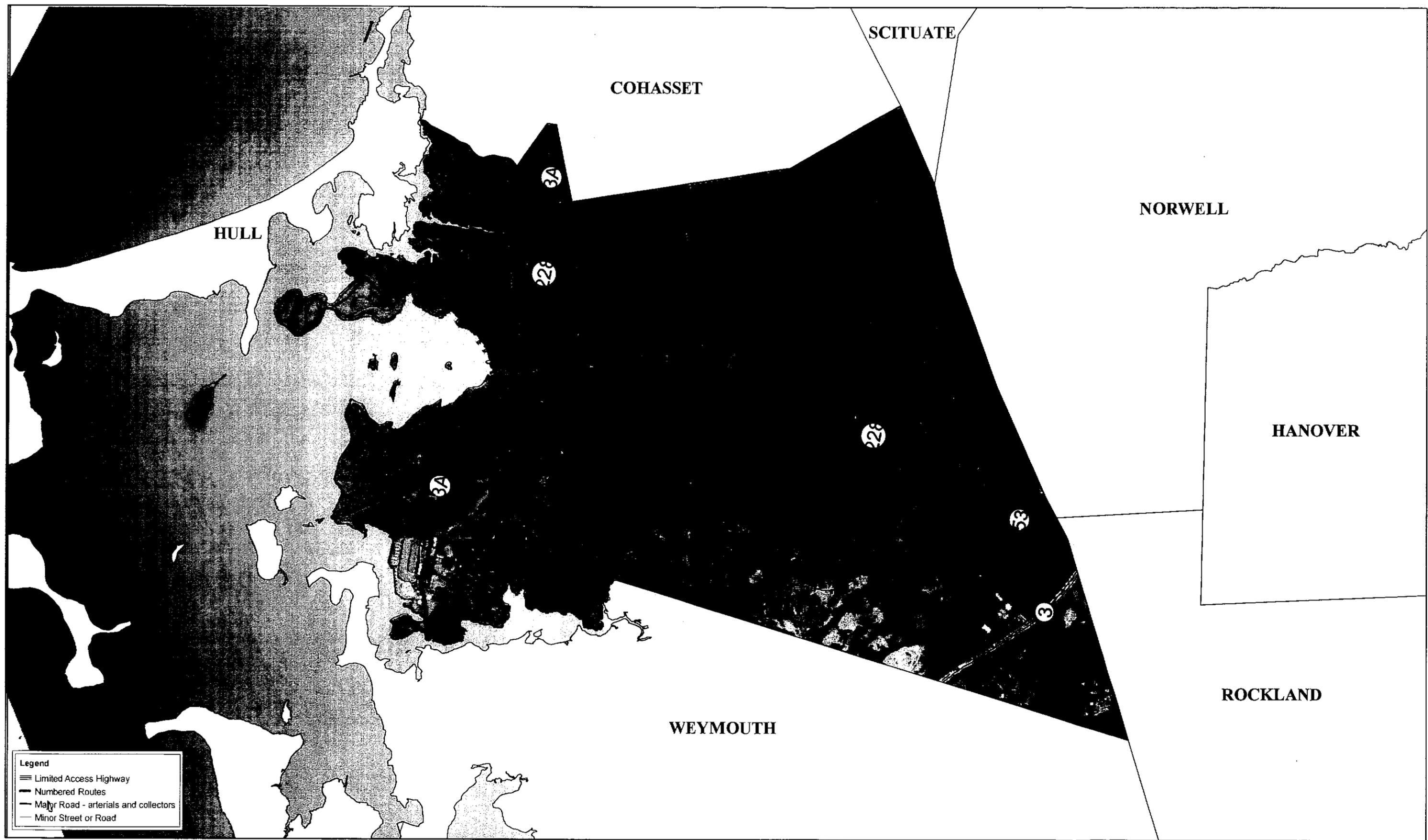
Hingham is bordered by the communities of Weymouth, Rockland, Norwell, Scituate, Hull, and Cohasset. The town shares many environmental resources with these neighboring communities.

Following its historic roots, Hingham's form of local government is by Open Town Meeting and the Board of Selectmen.

Hingham's 2001 Master Plan was used as a significant source of information during the preparation of this report section. The Master Plan was prepared by John Brown Associates Inc. and was presented to the Town in December, 2001. The Master Plan is a statement of public policy to guide decision-making for future development of the town, and represents a shared vision for the town's future.

The Master Plan identifies wastewater disposal as an issue to be resolved especially in South Hingham. Northern Hingham including much of the downtown area is connected to wastewater collection systems operated by the Massachusetts Water Resources Authority (MWRA), or the Town of Hull. The developed areas within south Hingham rely on individual on-site sanitary disposal systems for wastewater treatment and disposal. This area also serves as water recharge areas for Hingham and for neighboring communities of Weymouth, Abington, and Rockland.

Approximately 20 percent of Hingham's land area is preserved as protected open space (i.e. state parks) and the majority of the remaining property is already developed. Current land uses in Hingham are presented in Table 1-1 below which is reproduced from the Master Plan prepared by John Brown Associates Inc. Discussions with local officials have yielded no significant changes since the Master Plan was prepared.



Legend

- ≡ Limited Access Highway
- Numbered Routes
- Major Road - arterials and collectors
- Minor Street or Road

**Town of Hingham
Comprehensive Wastewater Management Plan**

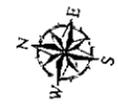


Figure 1-1

Hingham Area Map

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**Table 1-1
Existing Land Uses (2000)¹**

<i>Land Use</i>	<i>Acres</i>	<i>% of Total Town Area (2000)</i>	<i>% of Developed Land Area</i>
Residential	3,761.9	26.7%	57.7%
multi-family	(117.2)	(.8%)	(1.8%)
single-family	(3,644.7)	(25.9%)	(55.9%)
Commercial	318.2	2.3%	4.9%
Industrial	223.8	1.6%	3.4%
Public/Semi-Public	756.5	5.4%	11.6%
recreation	(394.2)	(2.8%)	(6.1%)
other public/semi-public	(362.3)	(2.6%)	(5.6%)
Transportation	1,454.3	10.3%	22.3%
Total Developed	6,514.7	46.3%	
Protected Open Space	3,162.7	22.4%	
Agriculture	381.7	2.7%	
Other Vacant Land	3,843.7	27.3%	
Total Undeveloped	4,225.4	30.0%	
Total Land Area	13,902.8	98.7%	
Surficial Water Bodies	189.5	1.3%	
Total Town Area	14,092.3	100%	

1. From December 2001 "Hingham Master Plan" – John Brown Associates, Inc.
2. Parentheses indicate a subtotal of the category/value shown above it.

1.1.1 North Sewer District

The North Sewer District (NSD) is shown on Figure 1-2 and as the name implies is located in the northern portion of Hingham. Specifically, the NSD is located in the northwestern corner of the town; roughly bordered by Hingham Harbor, up to the Hingham Rotary, and including properties within the downtown area, and back to the point where Fort Hill Street enters the Town of Weymouth, and thence along Weymouth Back River. The boundary is more accurately described in Chapter 591 of the 1945 Acts of the Legislature. This enabling act added the NSD to the Metropolitan Sewerage District now more commonly known as the Massachusetts Water Resource Authority (MWRA). A copy of this legislation is included in Appendix A. A majority of the developed properties within this district convey wastewater flows to the MWRA system in Weymouth. According to the Hingham Board of health,

approximately 75 homes within the NSD are not connected to the MWRA system and use individual on-site septic systems for wastewater disposal.

The NSD area is served by a conventional gravity sewer system along with pumping stations and forcemains. The system consists of approximately 660 manholes, and 11 pumping stations with an additional two submersible stations at Hingham High School and Town Hall. The sewer collection system consists of approximately 121,754-feet of gravity sewer piping ranging in size from 6-inches to 24-inches and approximately 11,126-feet of forcemain piping up to 15-inches in diameter. Sewer flow is discharged to the MWRA Hingham Pump Station at "Stodder's Neck", where it is pumped under the Weymouth Back River to its point of discharge in the Braintree-Weymouth MWRA Extension Sewer.

The estimated breakdown of current wastewater flows from NSD appear in Table 1-2. Total average daily flow is taken from available records, and individual flows are estimated using typical flow rates from existing land uses published in the Master Plan and GIS. No allowance for I/I is used in this estimate.

**Table 1-2
Existing Wastewater Flows
North Sewer District**

<i>North Sewer District (NSD) Wastewater Flows - Current</i>	
<i>Land Use</i>	<i>Average Wastewater Flow (gpcd)</i>
Residential	261,900
Multi-Family Residential	74,100
Institutional	23,000
Industrial	34,100
Commercial	220,400
Total	614,000

1.1.2 Weir River Sewer District

The Weir River Sewer District (WRSD) includes properties along the shared border with the Towns of Hull and Cohasset. The WRSD boundary is not defined by a specific territory, rather it is described by streets and roadways included within the sewer district. Included streets (or portions thereof) are identified as follows:

- Rockland Street
- Bonnie Brier Circle
- Canterbury Street
- Chestnut Road
- Cliff Road
- Hull Street

- Meadow Road, and
- Oak Road
- Kilby Street
- Roc-fall Road
- Justice Cushing Highway (Hingham Courthouse)
- Ringbolt Farm, and
- Weir Street Extension

The WRSD is shown on Figure 1-2. For the purpose of this report, CDM has drawn the WRSD boundary around the properties on the streets included within the district.

Wastewater from the WRSD is collected by both a conventional gravity sewer system and a pressure sewer system. All flow is pumped to Hull via the Weir River Pumping Station on Rockland Street. The Bonnie Brier Circle and Meadow Road neighborhoods are serviced by a low pressure force main system which discharges the flow to the point on Rockland Street where gravity conveys wastewater flows to the Weir River Pump Station on Rockland Street. The pressure sewer main within these neighborhoods is approximately 4,400 feet in length. Pipe diameters in the pressure sewer main system range in size from 2-inches to 4-inches in diameter.

Gravity sewer collection pipes serve portions of Rockland Street, Canterbury Street and Hull Street. All wastewater flow from this collection system is conveyed by gravity to the Weir River Pumping Station where it is pumped via a forcemain to the Hull Wastewater Treatment Facility.

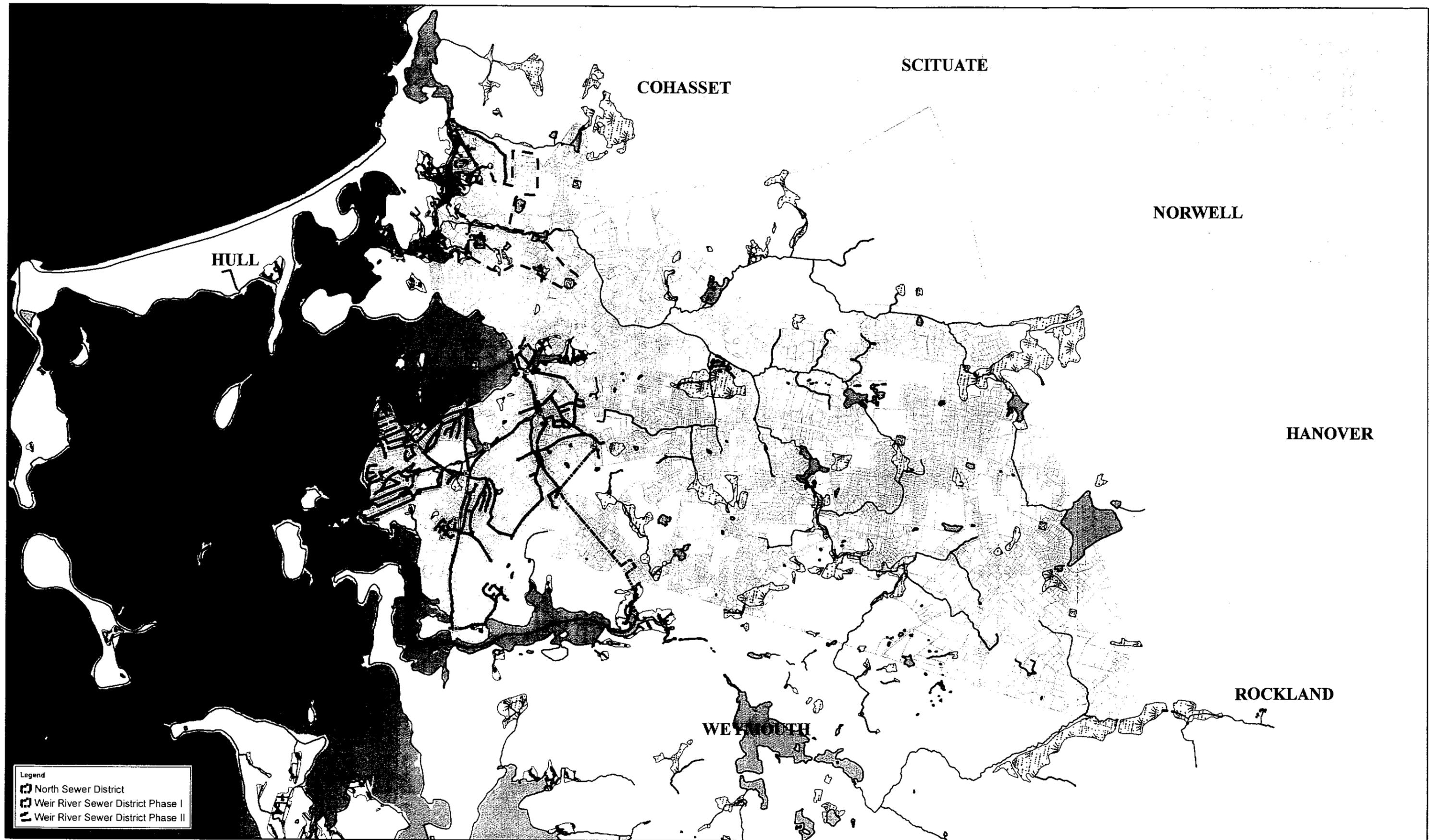
The Kilby Street and Lower Canterbury Street Area is also served by a pressure sewer system that discharges to the gravity sewer that begins at the high point on Canterbury Street.

Contractual limits for Hingham's flow to Hull is defined in an Inter-Municipal Agreement (IMA) dated October 8, 1996 between the two communities. These flow limits are as follows:

Average Daily Flow:	65,000 gallons per day (gpd)
Peak Flow Rate:	173,000 gpd

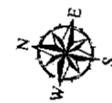
Wastewater generated from a portion of Cohasset is also conveyed through the WRSD to the Hull sewer collection system. Cohasset has similar contractual limits on wastewater flow as described below:

Average Daily Flow:	80,000 gpd
Peak Flow Rate:	213,000 gpd



**Town of Hingham
Comprehensive Wastewater Management Plan**

CDM



0 2,000 4,000 8,000 12,000 Feet

Figure 1-2

Hingham Sewer Districts

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A copy of the IMAs for Water Pollution Control between the communities of Hingham, Hull and Cohasset are attached to this report as Appendix B.

The breakdown of current wastewater flows from WRSD appear in Table 1-3. Total average daily flow is taken from available records, and individual flows are estimated using typical flow rates from existing land uses published in the Master Plan and GIS. No allowance for I/I is used in this estimate.

**Table 1-3
Existing Wastewater Flows
Weir River Sewer District**

<i>Weir River Sewer District (WRSD) Wastewater Flows - Current</i>	
<i>Land Use</i>	<i>Average Wastewater Flow (gpcd)</i>
Residential	25,608
Institutional	0
Multi-Family Residential	2,200
Commercial	1,700
Industrial	0
Total (rounded)	30,000

1.2 Existing Water Supply

The Hingham public water supply comes from two major sources; groundwater wells and surface supplies. There are six groundwater wells identified as Free Street Wells #2 through #5, Scotland Street, Downing Street, and Prospect Street wells. The three surface water sources are the Accord Pond, Accord Brook, and Fulling Mill Basin. These water resources are shown on Figure 1-3. Unlike many of the neighboring municipalities, Hingham is served by a private water company, namely the Aquarion Water Company. Aquarion provides water service and operates and manages the public water system for all of Hingham and portions of Hull, North Cohasset and Norwell. The average daily demand for the entire service area is 3.4 million gallons per day (mgd) as reported by Aquarion in their 2004 Water Quality Report, and was 3.2 mgd in 2005. Water demand has been reported as high as 3.74 mgd in 1998. Characteristics of these water sources are presented in the tables below. Groundwater Well data is shown in Table 1-4 and surface water source characteristics are presented in Table 1-5 below.

**Table 1-4
Groundwater Well Sources**

Source Name	Source ID#	Year Built	Safe Yield (gpm)	Max. Monthly Pumping Rate (gpm)	Well Depth (ft)	Static Water Level (ft below grade)
Free Street Well #2	3131000-01G	1951	1,200	1,379 (Jan. 98)	73	1
Free Street Well #3	3131000-02G	1967	160	351 (July 87)	88.5	7.5
Free Street Well #4	3206000-05G	1982	500	563 (Sept. 90)	86	14-15
Free Street Well #5	3131000-02G	Satellite well that recharges Free Street Well #3				
Scotland St. Well	3206000-03G	1955	670	1,078 (Sept. 96)	45	2-4
Downing St. Well	3206000-04G	1965	215	284 (Nov. 89)	67	15
Prospect St. Well	3206000-06G	1971	165	269 (Dec. 96)	58	12-16

**Table 1-5
Surface Water Sources**

Source Name	Source ID#	Year Built	Safe Yield (gpm)	Max. Monthly Pumping Rate (gpm)	Well Depth (ft)	Static Water Level (ft below grade)
Accord Pond	3206000-01S	Circa 1912	300	unknown	NA	Surface
Accord Brook	3206000-02S	Source that recharges Fulling Mill Basin				
Fulling Mill Basin	3206000-03S	1903	550	unknown	22	Surface

Free Street Well #4 is registered as an "emergency" source. This source is used to supplement the active supplies when a sufficient quantity of water is unavailable. Withdrawal rates from this source have varied during recent years. Use of this well is an indicator of the current state of recharge from Hingham's aquifer. In 2002, this well was not activated. In 2003, it was activated for 53 days; and in 2004, it was activated for 238 days. Population increases in the entire Aquarion service area during the summer also increase demand, placing additional burden on the active sources. There is a possible change to the current emergency status of this well pending approval by The Massachusetts Water Resources Commission. This potential upgrade in status is discussed further in Section 1.2.6 of this report.

The Massachusetts Department of Housing and Community Development reported, in November 2000, that private water supply wells in Hingham account for 0.03 mgd average daily demand (and 0.06 mgd maximum daily demand). This accounts for

approximately 1 to 2 percent of the domestic water use. Table 1-6 shows the withdrawal amounts from all sources for the 2003 calendar year. Data from 2003 was selected to best represent demand from the various water sources, since the Free Street Well #4 (emergency source) was only in use for 53 days out of that year.

**Table 1-6
Demand Comparison of all Water Supply Sources in Hingham, by Source**

<i>Source Category</i>	<i>Withdrawal (mg)</i>	<i>% of Total Withdrawal</i>
Total Withdrawal (all sources)	1,277.448	100%
Groundwater Wells	740.090	58%
Surface Body Wells	537.358	41%
Private Wells	10.950	1%

1.2.1 Well Water Sources

The six wells for the Hingham/Hull water supply are located within a single aquifer protection area, part of which extends into the Town of Norwell. Each of the wells has a Zone I radius of 400 feet (the area immediately surrounding the well).

The primary recharge area for the aquifer (Zone II) consists of a mixture of forest, residential, wetlands and open land, with a small portion of the protection area being commercial and waste disposal land uses. Potential threats to the water quality of the aquifer will be analyzed and rated in Section 2.2 of this report. Recommendations for minimizing these threats will also be provided.

Massachusetts state law (310 CMR 22.00) requires public water suppliers to own or control sufficient land around drinking water wells to protect the groundwater from contamination. This area should be limited to water use activities. However, this law was written after the development of many public water supplies and therefore, private residences and public roads overlap the Zone I area surrounding water supply wells. In Hingham, there are currently on-site septic systems within the Zone I area for 5 of 6 wells. Free Street Well #2, Free Street Well #4, and the Prospect Street well each have several on-site septic systems within the Zone I area.

With private homes existing within the Zone I areas for most of the wells, unregulated use of pesticides and fertilizers is also a concern.

The Downing Street well has recreational activities occurring in the Zone I area.

1.2.2 Local Watersheds

A significant portion of Hingham is located within the Weir River Basin as defined in 310 CMR 4.00 Massachusetts Surface Water Quality Standards. The Weir River and Accord Brook are both included in this designation. The Weir River is classified as a High Stressed Basin by the Massachusetts Water Resources Commission (WRC).

Recently, Aquarion commenced the environmental review process through MEPA (Massachusetts Environmental Policy Act) in order to increase allowable pumping rates at one drinking water well (Free Street #4). This well is currently used during emergencies (when demand is maximized at other remaining production wells) from up to 0.8 mgd (million gallons per day). Approval of Aquarion's plans would allow a permanent daily withdrawal of up to 1.3 mgd (representing an increase of 500,000 gpd).

1.2.3 Surface Body Water Sources

Each of the three surface water sources are included within their own protection areas. Part of the Accord Pond water supply protection area extends into Holbrook and Norwell. Part of the Accord Brook water supply protection area extends into Norwell. The protection area for the Fulling Mill Collection Basin is entirely within Hingham.

Accord Pond is the largest body of surface water and the only natural pond in Hingham. The surface area of Accord Pond is approximately 100 acres and has a normal storage volume of 845 acre-ft. The Aquarion Water Supply Update reported the pond was 94 percent full on January 6, 2006. Approximately one half of the pond is in Hingham, and the remainder of surface water body is in the town of Norwell.

Fulling Mill Pond was created by damming the Fulling Mill Brook. The pond has a surface area of 12.7 acres. Other surface water bodies in Hingham that remain untapped as a supply of public water would include Cushing Pond, Triphammer Pond, Foundry Pond, Bouve Pond and Brewer Pond. Each of these ponds is dammed at their source.

The protection areas surrounding the surface water sources extend 400 ft. landward of reservoirs and 200 ft. landward from tributaries. Massachusetts Department of Environmental Protection (MassDEP) defines this protection area as Zone A. Among the common threats to Zone A areas, recreational activities, untreated stormwater runoff, domestic animals, new construction, spills along roadways, above and below ground storage tanks, erosion and winter use of salt on roadways are the most common.

The Zone A protective areas surrounding Accord Pond, Accord Brook and Fulling Mill Collection Basin include:

- Numerous homes served by on-site septic systems.
- Roadways (both state and local).
- Commercial activity with underground storage tanks.

MassDEP defines the area ½ mile from the edge of a reservoir, without extending beyond the outer edge of the watershed, as Zone B. The entire area contained within a

watershed surrounding a reservoir (not already defined as Zone A or B) is referred to, by MassDEP, as Zone C. Zone Cs can be very large land areas where development, industry and roadways can adversely affect water protection efforts.

1.2.4 Flowing Water bodies

Aside from Hingham Harbor, the Weir River is the most significant hydrological feature in Hingham. The Weir River is formed by the juncture of Crooked Meadow Brook and Fulling Mill Brook, both in Hingham. Other tributaries to the river are Accord Brook, Turkey Hill Run, Rattlesnake Run, Eel River and Tower Brook. The river runs through central Hingham and flows into Foundry Pond, created by damming the river. The river is tidal below this dam. The Weir River and the Weir River Estuary discharge to Hull Bay between the World's End Reservation in Hingham and Sunset Point in Hull and eventually into Hingham Harbor.

The WRC designated the Weir River Basin as "highly stressed" in July 2005. This designation was based on their findings outlined in a report entitled "Stress Level Reclassification for the Weir River Sub-basin of Boston Harbor" published July 14, 2005. The Massachusetts Secretary of Environmental Affairs designated the Weir River as an Area of Critical Environmental Concern (ACEC) in 1986. Relevant findings of these designations pertaining to this study can be summarized as follows:

- Diverted water to recharge public wells has resulted in dry reaches of tributaries and chronic low flows in smelt spawning habitat.
- Herring runs on the river have been impacted by low flows and dams without fish passage.
- Weir River Basin includes one of the largest, most productive salt marsh ecosystems in Boston Harbor, as designated by the Massachusetts Secretary of Environmental Affairs.
- Environmental consequences resulting from densely settled population include pesticide applications, toxins in underlying sediment, fecal pathogens, organic pollutants from stormwater connections and failing septic systems.
- Contaminants remain in slow moving groundwater and will likely impact the ACEC in years to come.
- Over half the homes in the Weir River Estuary, in Hingham, are still not sewered.
- Increased loading of suspended sediment, heavy metals, hydrocarbons, and bacterial and viral contaminants carried by stormwater runoff will add environmental stress to the shellfish beds already suffering the ill-effects of development pressures.
- The tidal portion of the river is encompassed by the ACEC.

- Low flow of the river limits the fresh water input to the estuary. Increased withdrawals will worsen this existing condition.
- The ACEC is a region of reduced flushing, despite the relatively large tidal exchange rate of Hingham Bay. The removal of pollutants over time, therefore, is likely due to age and settlement more so than flushing.

1.2.5 Water Demand

The service area population for the Hingham/Hull system is 33,368 in the winter months. This population increases to 45,605 during the summer months. The change in population is due to increased demand by seasonal residential housing in Hull. Aquarion has reported that average daily demand can fluctuate during any given year due to weather patterns, population growth or inconsistent volume of water unaccounted for. Analysis indicates recent system-wide demand ranged from 3.74 mgd in 1998 to 3.4 mgd in 2005. Demand for the past five years is shown in Table 1-7 below.

**Table 1-7
Historical Water Demand for Hingham/Hull Service Area**

<i>Water Demand for Entire Service Area</i>	
<i>Year</i>	<i>Demand (in mgd)</i>
2001	3.80
2002	3.47
2003	3.49
2004	3.44
2005	3.40

1. Water pumped from Free Street Well #4 has not been incorporated into this determination. Free Street Well #4 is registered as an "Emergency Source".

As shown in Table 1-7 above, there has been a fairly steady water demand over the past five years as reported by Aquarion. Fluctuations in water use will always vary the total volumes over any given period, but the relatively slight decline in water demand could also be influenced by a steady decrease in unaccounted for water. Aquarion reported the volume of unaccounted for water has decreased steadily from 23.1 percent to 12.91 percent between the years 2001 and 2004, with the data for 2005 yet to be determined at the time this report was written.

The total permitted withdrawal from the Hingham groundwater wells and surface water sources is 3.51 mgd. This rate of withdrawal supplies Hingham, portions of Hull, North Cohasset and Norwell. Therefore, the volume of demand dedicated to Hingham will be extrapolated from the population data as shown below.

Recent Aquarion Water Quality Reports indicate that the average Hingham/Hull household used 70,900 gallons of water in 2004 and in 2005. The average household in

Hingham, as reported by the Massachusetts Department of Housing and Community Development, is 2.96. Dividing the average household demand (in gpd) by the average number of residents per household yields an average demand of 65.5 gallons per capita per day (gpcd) in Hingham.

Using an average residential per capita water demand of 65.5 gpcd, we are able to apply this volume of water demand to current populations and projected future populations as shown in Table 1-8 below:

**Table 1-8
Town of Hingham Population Data and Residential Water Use Projections**

<i>Residential Population and Water Use Projections</i>						
Year	1990	2000	2004	2010	2020	2025
Population	19,821	19,882	20,720	24,692	25,228	25,432
Water Use	1,298,276	1,302,271	1,357,160	1,617,326	1,652,434	1,665,796

- Notes:
1. Source: Population data and projections taken from Metropolitan Area Planning Council (MAPC) dated Tuesday January 31, 2006.
 2. 2004 figure published on Town of Hingham website.
 3. 2025 figure derived from average yearly growth between 2020 and 2030 MAPC projections (0.16 percent).
 4. Volume of 65.5 gpcd used as constant value in projections.

Population projections were attempted using Massachusetts Institute for Social and Economic Research (MISER) methods. However, results indicated a trend of declining population through the planning period.

The MAPC projections are more consistent with historical trends and other indicators of economic and residential growth.

Based on the MAPC population statistics, and the value of 65.5 gpcd use volume, the current (2004) Hingham residential water demand from public sources is 1.36 mgd. Study period growth in Hingham is anticipated to reach 25,432 people by the year 2025. Hingham's residential water demand from public sources is expected to be approximately 1.67 mgd in 2025.

The remaining demand by land use component is shown in Table 1-9 below, with a total demand of 2.32 mgd for the Town of Hingham. These calculations are based on the 2004 Aquarion Water Company Annual Report for the Hingham/Hull System. The basis for separating the Hingham use from the entire service area use is derived from the Hingham residential use of 67 percent of the total residential demand as reported by Aquarion.

**Table 1-9
Hingham Water Use by Component**

<i>2004 Water Use Data Hingham Use = 67% of Total 3.45 mgd in Service Area</i>	<i>Town of Hingham</i>	
	<i>Rate of Use (gpd)</i>	<i>% of Use (Aqarion)</i>
Residential	1,461,123	63%
Institutional	46,385	2%
Industrial	23,192	1%
Commercial	231,924	10%
Unaccounted for	255,117	11%
Exterior Use (Loss)	301,502	13%
Totals:	2,319,243	100%

As shown in the above table, Hingham water demand, using year 2004 data, totals 2.3 mgd.

Aqarion reported in the 2004 Water Quality Report that 14.1 percent of daily demand is unaccounted for water due to cleaning of the mains, fire protection, leaks and unauthorized use.

1.2.6 Water Management Act Registration and Future Improvements

Aqarion Water Company is currently registered and permitted to withdraw 3.51 mgd on a yearly basis, from the above specified water sources in Hingham, as reported by the November 2000 report by The Massachusetts Department of Housing and Community Development.

The permitted withdrawal volume of 3.51 mgd has been exceeded, at times, in recent years due to development and other factors. Further, there are several major developments planned in the service area which would further increase demand. Aqarion Water Company currently has a pending Environmental Notification Form (ENF) which requests permitting of an additional 1.3 mgd from Massachusetts Water Resource Commission (MWRC), to be withdrawn from the Free Street #4 well. Preparation for a draft Environmental Impact Report is being conducted. Approval of this request would also include the change in status of Free Street Well #4 from "Emergency" well to "Active" well.

1.2.7 Water Use by Component

Water use by component volumes and percentages have varied over recent years as well as the overall demand. The below tables show the volumes reported by Aqarion for the years 1998 and 2002, for the entire service region. Figures for other years were either unavailable or were not provided.

Aquarion Water Company Data (1998) For Entire Service Area		
User Group	Total Volume (mg)	Est. Percent
Residential	737.101	53.8%
Agricultural	0.000	0.0%
Commercial	152.440	11.6%
Industrial	11.532	0.8%
Municipal	35.506	2.6%
Non-Revenue & Other	73.451	5.4%
Unaccounted for	354.580	25.8%
Total	1,364.610	100.0%
Average Daily Demand (mgd)	3.74	

Aquarion Water Company Data (2002) For Entire Service Area		
User Group	Total Volume (mg)	Est. Percent
Residential	858.226	67.7%
Institution	30.395	2.4%
Industrial/Agricultural	8.485	0.7%
Commercial	116.020	9.1%
Non-Revenue & Other	42.371	3.3%
Unaccounted for	212.885	16.8%
Total	1,268.382	100.0%
Average Daily Demand (mgd)	3.475	

1.2.8 Water Distribution System

All of the water from the previously specified sources (with the exception of the Downing Street well, which is used seasonally), is pumped to and treated at the Hingham Water Treatment Facility. The treatment includes granular activated filtration, chemical addition to remove impurities through coagulation and settling and is treated with chlorine, fluoride, sodium carbonate and/or a phosphate before being pumped to the public water distribution system.

The Downing Street well water is treated at the well station and pumped into the distribution system. This well is operated seasonally to offset higher demand during the summer months as the Hull population increases by approximately 12,200 persons.

Two water storage tanks exist in Hingham. The Turkey Hill standpipe tank, built in 1963, is 70 ft in diameter and 70 ft in height with a capacity of 2.00 million gallons. The Accord Pond elevated tank, built in 1967, is 58 ft in diameter and 40 ft in height with a capacity of 0.75 million gallons.

The distribution system is composed of approximately 183 miles of various pipe materials ranging in size from ¾ in. diameter to 20 in. diameter, which deliver water to the various points of the service area. Aquarion conducts regular maintenance of the water mains. The entire Town of Hingham is included in the distribution area with the only other source of water being private wells at individual residences.

Pipe materials in the distribution system include cast iron, cement lined cast iron, copper, ductile, galvanized, plastic, steel and transite. The larger diameter pipe (above 6-in. diameter) is mostly cast iron, cement lined cast iron and ductile. The smaller diameter pipe is made up of all the above materials.

1.2.9 Surficial Geology and Interim Wellhead Protection Areas

Productive aquifers generally exist in areas underlain with sands and gravels. These subsoils allow the aquifer to recharge quickly. Areas with sands and gravels exist in central and southern Hingham within the Weir River basin. A significant portion of the remainder of Hingham is underlain by till and bedrock. Surficial geology for Hingham is shown in Figure 1-4.

The November 2002 MassDEP Source Water Assessment and Protection Report (SWAP) indicates the aquifer has a high vulnerability to contamination due to the absence of a hydrogeologic barrier. This SWAP Report is included as Appendix C. Although glacial till and bedrock are common subsoils in Hingham, existing subsoils in the Weir River basin, surrounding the aquifer, are mostly sand and gravel which easily allows contaminant migration into the aquifer.

The surficial geology of areas in Hingham with high density housing and on-site septic is an important factor. Identified areas with poor soil conditions for on-site septic systems are identified below.

- World's End waterfront is a high density area with soils consisting of ledge and shallow bedrock. High ground water has also been observed.
- Lazell Street between Wompatuck State Park and Route 228 has poor soils consisting mainly of till and/or bedrock. This area is within the Zone 2 of the Free Street wells, which produce 50 percent of the town water supply.
- The Research Road area of south Hingham is an industrial area with high ground water and ledge being common.



Legend
 ■ Interim Wellhead Protection Area
Zone II
 ■
Surficial Geology
 Sand and Gravel Deposits
 ■
 Till or Bedrock
 ■
 Floodplain Alluvium

Town of Hingham
Comprehensive Wastewater Management Plan

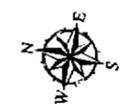


Figure 1-4

Surficial Geology Map

The surficial geology of the entire watershed breaks down as shown in Table 1-10 below:

**Table 1-10
General Surficial Geology within Watershed**

<i>Soil Types</i>	<i>Area in sq. mi.</i>	<i>Coverage (%)</i>
Sand and Gravel	10.76	46%
Till and Bedrock	11.23	48%
Floodplain Alluvium	1.17	5%
Open Water	0.23	1%

Interim Wellhead Protection Areas (IWPA), identified by the MassDEP Division of Water Supply are located in the Weir River Basin in central Hingham around the Free Street wells, the Whiting Street well and the Union Street well in Wompatuck State Park. These locations can be seen in Figure 1-3.

The Accord Pond watershed is another area of concern due to very permeable soils consisting mostly of coarse gravel and sand soils with moderate lot size with high density housing. The Hingham Executive Health Officer placed high priority for this area to be sewerred as Accord Pond is a surface water source for the town supply.

1.2.10 Water Quality

Quality of drinking water supply is regulated under the Federal Safe Drinking Water Act (SDWA). The Aquarion Water Company 2004 Water Quality Report provides information on testing procedure and results. Water quality testing is performed by Aquarion and results are submitted to MassDEP. There are 108 regulated compounds that are tested for as well as non-regulated substances for which Aquarion is required to test. Monitoring for some compounds is done less than once per year based on state regulation. The 2004 Aquarion Water Quality Report indicates the detection of 8 inorganic compounds, 3 organic compounds, 1 microbial and 1 disinfectant. These various compounds were measured at levels in accordance with the parameters set forth in SDWA. The only MassDEP record of violation shows that 2 specific tests were not submitted to MassDEP; one in 1996 and one in 1999. This violation does not indicate high or dangerous levels of contaminants, only that MassDEP did not receive the test result data.

A Metcalf and Eddy engineering report entitled "Facilities Plan and Environmental Assessment for Wastewater Management", dated September 1983, indicates the fecal coliform standard was violated by the fact that over 10 percent of the samples taken exceeded the 100ml maximum concentration during a single monthly sampling period. The water quality sampling period which yielded these results was between September and November 1979. The study area targeted various parts of Hingham where there existed "potential localized septic tank failures".

Aquarion's historical records for water quality testing were provided by the Boston office of MassDEP for the years 2001 through 2005. This data was reviewed to get a historical background on Hingham's public water supply, search for patterns in test

results and determine if any particular contaminants have been continually present over a span of years. In general, this data supports Aquarion's assertion in the annual reports that "Your water meets, or is better than, the quality required by state and federal standards."

Many contaminants registered by MassDEP have been detected in the "finished" or treated water supply during the five year span of test results. However, there were zero cases identified, during the review of this data, which exceeded the Maximum Containment Level, (MCL) for any given contaminant in the "finished" drinking water.

Of the many contaminants tested for, detected levels of Nitrate (measured as Nitrogen) is very important because this can serve as an indicator of fertilizer run-off and leachate from septic tanks entering the water supply. August 2005 test results performed on treated water at Downing Street Well and Main Street Water Treatment Plant, indicate 0.05 milligram per liter (mg/l) concentration at both locations. This concentration is well below the MassDEP MCL of 10 mg/l. The highest level of Nitrate (measured as Nitrogen) detected in our study was in August 2001, in treated water at the Downing Street Well. This concentration was 2.53 mg/l, well below the primary standard MCL.

Test results provided by MassDEP, for finished water, have been summarized in an effort to create a representative picture of the water quality over this span of five years. Table 1-11 shows the high values of many of the contaminants tested for over the five year span, the date and location of the sample and the corresponding MCL. This table represents an overall view of the historical results of the water quality testing with the focus on the higher contaminant levels. The MassDEP water quality standards will govern over federal water quality standards for purposes of this study.

**Table 1-11
Contaminants Found in Finished Water (MassDEP Records)**

Contaminant	Source	Date	Detected Level	MCL
Disinfection Byproducts				
Haloacetic Acids	South Fire Station	12/10/2003	0.0442 mg/l	0.06 mg/l
Haloacetic Acids	South Shore C.C.	12/10/2003	0.0531 mg/l	0.06 mg/l
Haloacetic Acids	Derby Street Offices	12/7/2004	0.0411 mg/l	0.06 mg/l
Inorganic Chemicals				
Chromium	Main Street WTP	8/13/2002	0.05 mg/l	0.1 mg/l
Thallium	Downing Street Well	1/29/2003	0.001 mg/l	0.002 mg/l
Nitrate	Downing Street Well	8/8/2001	2.53 mg/l	10 mg/l
Organic Chemicals				
Perchlorate	Downing Street Well	4/21/2004	1 ug/l	NA
Radon	Main Street WTP	5/13/2003	19 pci/l	NA
Aldrin	Main Street WTP	8/13/2002	0.1 ug/l	NA

- Notes:
1. Radon is measured in pico Curies per liter (pci/l).
 2. The unit ug/l is micrograms per liter, equivalent to 1 part per billion.
 3. The unit mg/l is milligrams per liter, equivalent to 1 part per million.

Based on the summarized results in Table 1-8, there were seven contaminants present at levels approaching the corresponding MCL, or where no MCL standard is given, during at least one sampling period. These contaminants are discussed further below.

- **Haloacetic Acids:** ("HAAs") This is a family of compounds based on the acetic acid molecule. These are colorless, have low volatility, are fairly stable and dissolve easily in water. A byproduct of the water disinfectant process.
- **Chromium:** This is a hard, brittle multivalent metallic element. Chromium's compounds are used for dyeing and calico printing. It enters the aquifers through discharge of pulp mills and erosion of natural deposits.
- **Thallium:** A soft, gray metallic element. Highly toxic, it is used in rodent and insect poisons. It is well preserved when under water. It leaches from ore-processing sites and discharges from electronics, glass and drug factories.
- **Nitrate:** Discussed further above, it is the radical $-NO_3$ or any compound containing it, such as salt, ester or nitric acid. Sources include run-off from fertilizer, leachate from septic systems or sewerage and erosion of natural deposits.
- **Perchlorate:** An ester or salt of perchlorate acid. Run-off sources include solid rocket fuel, fireworks, air bags and some fertilizers among other things. State and federal agencies are working to establish a MCL for this compound. Interim guidance published by MassDEP suggests provisional clean-up range of 4-18 ppb.
- **Radon:** A radioactive gaseous element formed by the disintegration of radium, occurring naturally and widely believed to be a carcinogen. Most common in areas where granite deposits exist below grade. No MCL has been established and guidelines vary. MassDEP recommends a maximum concentration of 30 pci/l.
- **Aldrin:** A compound in organochlorine insecticide. Classified as a persistent organic pollutant, it degrades very slowly and is no longer manufactured or used in the USA. Aldrin is known to be a carcinogen and mutagen.

Bacterial testing provided by MassDEP covered the same time span of 5 years. Results were summarized into 59 data entries, each of which is made up of a number of samples ranging from 40 to 106 in number. Only 3 of these entries indicated a presence of bacteria but none indicated a MCL violation.

Testing results data, provided by MassDEP, is less abundant for raw or un-treated water, with results from 282 specific water analysis tests to reference. Each of the tests was for specific inorganic chemicals. In some cases, the test results neared the State MCL, but in zero cases were MCLs exceeded. A representative sample of the test result data can be seen in Table 1-12 below. The highest values, for each of the tested chemicals, were selected for this table.

**Table 1-12
Contaminants Found in Raw Water (MassDEP Records)**

<i>Contaminant</i>	<i>Source</i>	<i>Date</i>	<i>Detected Level</i>	<i>MCL</i>
Chromium	Main Street WTP	8/13/2002	0.05 mg/l	0.1 mg/l
Thallium	Main Street WTP	1/29/2003	0.001 mg/l	0.002 mg/l
Fluoride	Free Street #3	1/1/2001	2.76 mg/l	4.0 mg/l

As indicated in Table 1-12 above, there are three inorganic chemicals detected in the raw water, whose concentrations equal or exceed half the MCL for the corresponding contaminant. They are:

- **Chromium:** Discussed in the language concerning finished water.
- **Thallium:** Discussed in the language concerning finished water.
- **Fluoride:** Any of a number of naturally occurring compounds of the element fluorine. Fluorides have been found to be effective in preventing tooth decay and are routinely added to drinking water in most jurisdictions. Fluorine can be toxic in high concentrations.

Section 2

Identification of Basin-wide Water Issues

2.1 Introduction

This section examines water issues throughout the Town of Hingham and the Weir River basin. These issues include rainfall and stormwater recharge to determine inflow to the basin; and identification of nutrient sources and potential contaminated sites. Future Issues to be examined as the analysis moves forward include impacts to streamflow and habitats as wastewater management solutions are evaluated. An input-output water balance will be produced and discussed at a later date during the alternatives evaluation stage.

2.2 Rainfall

Average yearly rainfall in the Town of Hingham is shown to be 47.8 inches by the Massachusetts Department of Housing and Community Development. After establishing a square foot area for each sub-basin, this value is multiplied by 144 (to convert to square inches) and again by the annual rainfall to determine cubic inches of water. Water, in cubic inches, is converted to gallons by the conversion factor of 231 cubic inches per gallon. By this method we will establish the volume of naturally occurring rainfall recharge for the watershed and its sub-basins, on a yearly basis.

2.3 Stormwater Recharge

Central Hingham's aquifer system and related Zone II area is significant in size, spread over approximately 30-percent of the town surface area. The surficial geology of the Zone II area is almost entirely sand and gravel sub-soils, permitting rapid recharge of the aquifer. However, the "Highly Stressed" classification of the Weir River Sub-Basin indicates levels of groundwater and stream flow volume that are below normal.

In this section, the entire watershed and its sub-basins will be analyzed to determine where it may be practical to collect and convey stormwater in an effort to assist the natural process of recharge. The basin has been categorized as stressed, primarily due to inter-basin discharge of the region's groundwater (through wastewater collection systems). This condition could be neutralized or minimized by this application.

Contaminated sites (MassDEP 21E sites) will be identified as areas not suitable for this process. Ideally, stormwater collection should be conducted in undisturbed areas to prevent contaminants from entering the aquifer.

2.3.1 MassDEP 21E Contaminated Sites

In determining sites that may be suitable for the channeling of stormwater to recharge groundwater, we must also identify the sites that are unsuited for this process. Because contaminated soils present threats to groundwater resources, such sites are

recorded in the MassDEP database for contaminated sites and reportable spills. These sites are referred to as 21E contaminated sites.

A search of the MassDEP database for sites located in the Town of Hingham turned up 141 results. Response actions have been completed at many of these sites in Hingham. Numerous entries indicate "No Further Action", or that a "Waiver Completion Statement Has Been Completed". In many cases the site clean up effort and results are being reviewed. The compliance status for most of the sites is "Response Action Outcome" or RAO. A RAO is the classification applied to a disposal site at which there is No Significant Risk, as further defined by 310 CMR 40.1000. A RAO statement is an opinion of the Licensed Site Professional (LSP) submitted to the MassDEP in accordance with 310 CMR 40.1000.

MassDEP records show a total of eight (8) locations currently listed with an Activity & Use Limitation (AUL). Sites with a Class A1 RAO are disposal sites where a Permanent Solution has been achieved and the level of oil & hazardous material in the environment has been reduced to background levels; or sites where response actions have eliminated all threats of release and no release of oil and/or hazardous material to the environment has occurred. Sites listed with a Compliance Status of "No Further Action" (DEPNFA, LSPNFA), "Waiver Completion Statement has been submitted to MassDEP", "DEP Not a Disposal Site (DEPNDS), and a Class A1 RAO's are not included in the attached table that lists sites located in Hingham.

The intent of an AUL is to narrow the scope of exposure assumptions used to characterize risks to human health from a release by specifying activities and uses that are prohibited and allowed at the disposal site in the future. These sites will be identified, plotted and discussed in further detail below. Any of the AUL sites which fall within Zone II areas or in close proximity to environmental resources will be discussed in more detail. Table 2-1 below shows the eight (8) current AUL designations in Hingham. A complete listing of sites under MassDEP review is included as Appendix C.

**Table 2-1
Current MassDEP 21E Sites with Activity & Use Limitations in Hingham**

Address	RTN	Site Name	Compliance Status	Date	Phase	RAO Class
128 Derby St.	4-3000755	Best Chevrolet	AUL terminated 11/18/05	11/18/2005	III	
101 Hersey St.	4-3017403	DPW Building	RAO	10/8/1999	II	A3
101 Hersey St.	4-3017537	DPW Building	RAO	10/8/1999	II	A3
100 Industrial Park Rd.	4-3000331	Litton Merriman	RAO	5/2/2005		C1
Leavitt St. Hingham Annex	4-3003833	US Army/Navy	RAO	8/30/2004		A3
100 Research Rd.	4-3017307	US Repeating Arms	RAO	11/12/2002	II	A3
100 Research Rd.	4-3017359	No Location Aid	RAO	11/12/2002	II	A3
97 Ward St.	4-3000330	Margetts & Sons	RAO	2/28/2003	II	A3

Phase and RAO Class designations shown above indicate the following:

Phases of Site Cleanup:

- II: Comprehensive Site Assessment. During Phase II, information is collected to adequately characterize the disposal site to evaluate the risk of harm posed by the disposal site posed to public health, safety, welfare, the environment, and the need to conduct remedial action.
- III: Remedial Action Plan. The identification and evaluation of remedial action alternatives which are reasonably likely to achieve a level of No Significant Risk and the recommendation of a remedial action alternative that is a Permanent or Temporary Solution.

RAO Class:

- A3: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and Use Limitation (AUL) has been implemented.
- C1: A Temporary Solution. Although the site does not present a "Substantial Hazard", it has not reached a level of No Significant Risk and the response actions to achieve a Permanent Solution are not currently feasible. The site must be evaluated every five years to determine whether a Class A, Class B, or Class C-2 R40 is submitted is possible. All sites are expected eventually to receive a Class A or B.

2.4 Water Balance Parameters

2.4.1 Introduction

This section presents parameters and preliminary procedures that will be used to perform a water balance in the Town of Hingham. The actual water balance will be performed at a later date during the alternatives analysis phase of the project. The following formula is used to determine water balance within the watershed:

$$\text{Water Balance} = - \text{Amount Withdrawn} + \text{Amount Distributed} - \text{Amount Collected} + \text{Amount Discharged.}$$

Where:

Amount Withdrawn = The amount withdrawn from wells and surfacewater supplies, public and private.

Amount Distributed = The amount of water distributed for public and private use.

Amount Collected = The amount of sewerage collected through the sewer system, including infiltration, and conveyed out of the watershed.

Amount Discharged = The amount of wastewater discharged back into the watershed by various Sanitary Distribution Systems (SDSs).

Four separate analyses shall be performed and discussed as follows:

1. A water balance using 2004 annual flows.
2. A water balance using 2004 summer flows.

3. A water balance using projected 2025 annual flows.
4. A water balance using projected 2025 summer flows.

Each of the water balance tables will indicate a positive or negative balance value in the last column. The unit for this balance is Million Gallons (mg). The primary factor in reaching this balance is the amount of "Water Collected" (negative value) compared to the amount of "Water Discharged" (positive value). The "Water Withdrawn" (negative value) is almost entirely neutralized in this equation by the "Water Distributed" (positive value). The only difference between the two is the private well withdrawals, which is not included in "Water Distributed".

Information relative to water withdrawals and the amount distributed to the water supply system will come from the Annual Statistical Reports submitted to MassDEP by Aquarion. For the purposes of this study it shall be assumed that the reported volume of water withdrawn by Aquarion is equal to the "Amount Distributed" and no allowance has been made for "Unaccounted for Water". Private well sources are estimated and added to the Aquarion value for a total "Amount Withdrawn". It has been previously established that approximately one (1) percent of Hingham's water use is drawn from private sources.

Wastewater flow volumes will be quantified using existing flow data and metering data from the North Sewer District, and the Weir River Sewer District (WRSD). For the unsewered portions of Hingham, wastewater flow volume will be calculated based on Title 5 design guide criteria for industrial, commercial and institutional flows and water use data.

Summertime flow volume will be based on the estimated seasonal residential population increase in Hingham. The source of data for this seasonal increase is the Town of Hingham Profiles of General Demographics Characteristics, Census 2000, dated July 2001. This report indicates 61 housing units are used for seasonal, recreational or occasional use. Multiplying 61 housing units by the average 2.96 people per housing unit, we reach the seasonal population increase of 181 residents. For the purposes of this study, it will be assumed that the months of July and August are affected by this seasonal population increase and that the rise and decrease of summer populations are consistent.

Year 2004 data was used in this analysis because it is the most recent MassDEP record of Statistical Reporting and this year provided the most complete set of data. The Accord Brook well, a recharge well for Fulling Mill Basin, was not activated in 2004.

Communities within the Weir River Watershed, but outside of Hingham, will be considered only when these areas proved to be upgradient of Hingham's water resources, contained within one of the sub-basins or otherwise having effect upon the watershed.

There are four (4) areas of Hingham outside of the Weir River watershed as follows:

- Segments of Wompatuck State Park along Hingham's east and southeast borders with Cohasset, Scituate and Norwell.
- The south-westernmost point of Hingham, in the industrial zoning district, where Hingham borders Rockland and Weymouth.
- The north-west edge of Hingham along the Weymouth border, inclusive of the Hingham Shipyard area. This region is tributary to the Back River.

2.4.2 Assumptions Made in Present Day Analysis

The "Amount Withdrawn" equals the amount of public (Aquarion) and private water pumped from the wells or surface water supplies located in the Weir River Watershed during the year 2004. This study is restricted to withdrawals within the Town of Hingham. No consideration is given to withdrawals from the watershed where its boundaries overlap parts of Weymouth, Norwell and north Cohasset.

The "Amount Distributed" is equivalent to the volume, reported by Aquarion to MassDEP, for water withdrawals. This total does not include the limited volume that is pumped by private wells as private well water is technically not distributed.

The "Amount Collected" is the amount of sewerage collected through the sewer systems that exist in Hingham, which is conveyed out of the watershed for treatment and discharge. In the case of both Hingham Sewer Districts, water from the Weir River Watershed is transferred out of the watershed for wastewater treatment and does not return. Estimates will include infiltration and actual water use for those structures serviced by the sewer districts.

The "Amount Discharged" is the amount of wastewater discharged by the various on-site SDSs for the year 2004. Wastewater output of these systems is assumed to be equal to the wastewater design guide value dictated by Title 5. A thorough analysis of the volume of wastewater distributed by Hingham's on-site systems is performed in Section 3.3 of this report.

This analysis however, will focus on the water use and wastewater generation within the boundaries of the Weir River Watershed, not the Town of Hingham's geographical borders. Therefore, parts of the surrounding towns, within the watershed, will be considered when determining the water balance of the watershed.

There are seven (7) sub-basins in the Weir River Watershed as identified in WRC Stress Level Reclassification Report July, 2005.

2.4.3 Assumptions Made in the 2025 Analysis

The following assumptions have been made for the projected water use determinations:

- The percent of use by component is assumed to remain the same between now and the year 2025.
- The volume of private well use is assumed to remain the same between now and the year 2025.
- The number of seasonal residences (61) is assumed to remain the same until 2025.
- 25-percent of seasonal homes are assumed to be sewerred, 75-percent unsewerred.

2.4.4 Next Steps

Future work included in this task includes:

- Evaluation of streamflow impacts as part of alternatives analysis to assess changes to stream base flows.
- Identify nutrient sources within Weir River watershed.
- Discuss the relationship between sanitary disposal system contaminants and environmental/habitat issues.
- Identify areas that may be suitable for treated effluent re-use, or land application. Also, identify and discuss potential areas for stormwater recharge.
- During alternatives evaluation phase, adjust water balance factors to identify impacts to watershed sub-basins.

Section 3

Projected Future Conditions

3.1 Land Use, Demographic and Population Data

3.1.1 Land Use

Hingham's Master Plan Data indicates 6,515 acres are currently developed, making up 46.2 percent of the total land area. An overview of the remaining land in town is shown in Table 3-1 below. Figure 3-1 shows the development constraints town-wide.

Table 3-1
Year 2000 Total Town Area, Developable and Undevelopable Land

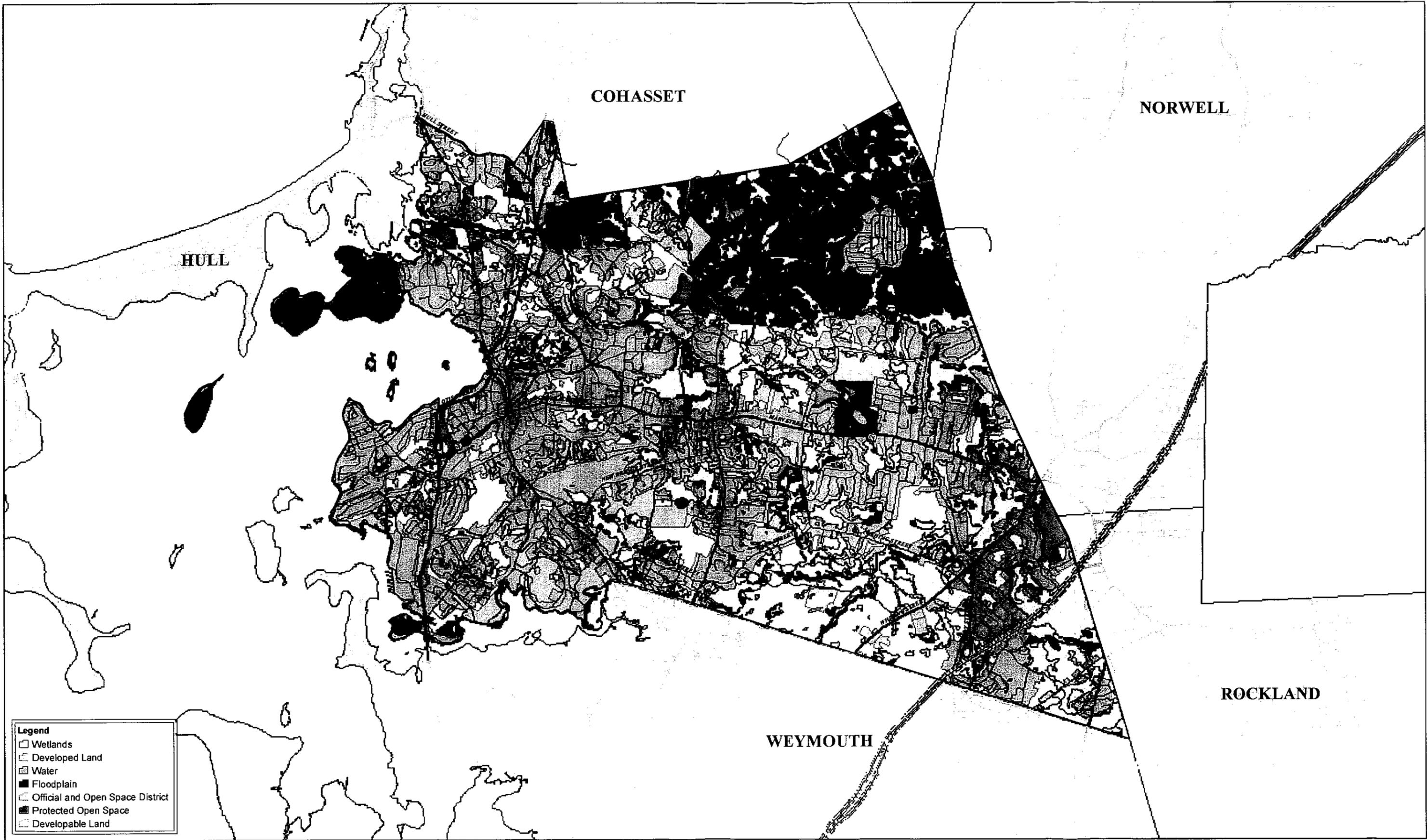
<i>Total Town Area in Acres</i>	14,092	100%
(less) Developed Land	6,515	46.2%
(less) Wetlands and Water	2,208	15.7%
(less) Protected Open Space	2,566	18.2%
(less) Flood Plain Overlay District	229	1.6%
(less) Other Official and Open Space District Land	152	1.1%
Developable Land Remaining (2000)	2,423	17.2%

1. Some areas reported as "wetlands" overlap with land already developed. Where this occurs, the area was included under "developed land", not "wetlands".
2. An additional 596.6 acres of protected open space are listed under "wetlands".
3. Land listed under "other official open space district land" only includes areas not constrained by other factors.

The combination of wetlands, open water and protected open space comprises 4,774 acres or 33.9 percent of the total land in Hingham. As shown above, only 2,423 acres or 17.2 percent of the remaining town land is considered "developable". Figure 3-2 shows the developable land in Hingham.

3.1.2 Residential Land Use Projections to Year 2025

Residential land is the largest of the land-use categories, accounting for 57.7 percent of all developed land in town. Residential makes up 88 percent of remaining development capacity under current zoning, as reported by John Brown Associates Inc. in the 2001 Hingham Master Plan. Using current zoning, Table 3-2 shows the breakdown of potential residential development from the Master Plan. Figure 3-3 shows the current Zoning Map of Hingham.



Legend

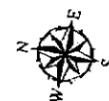
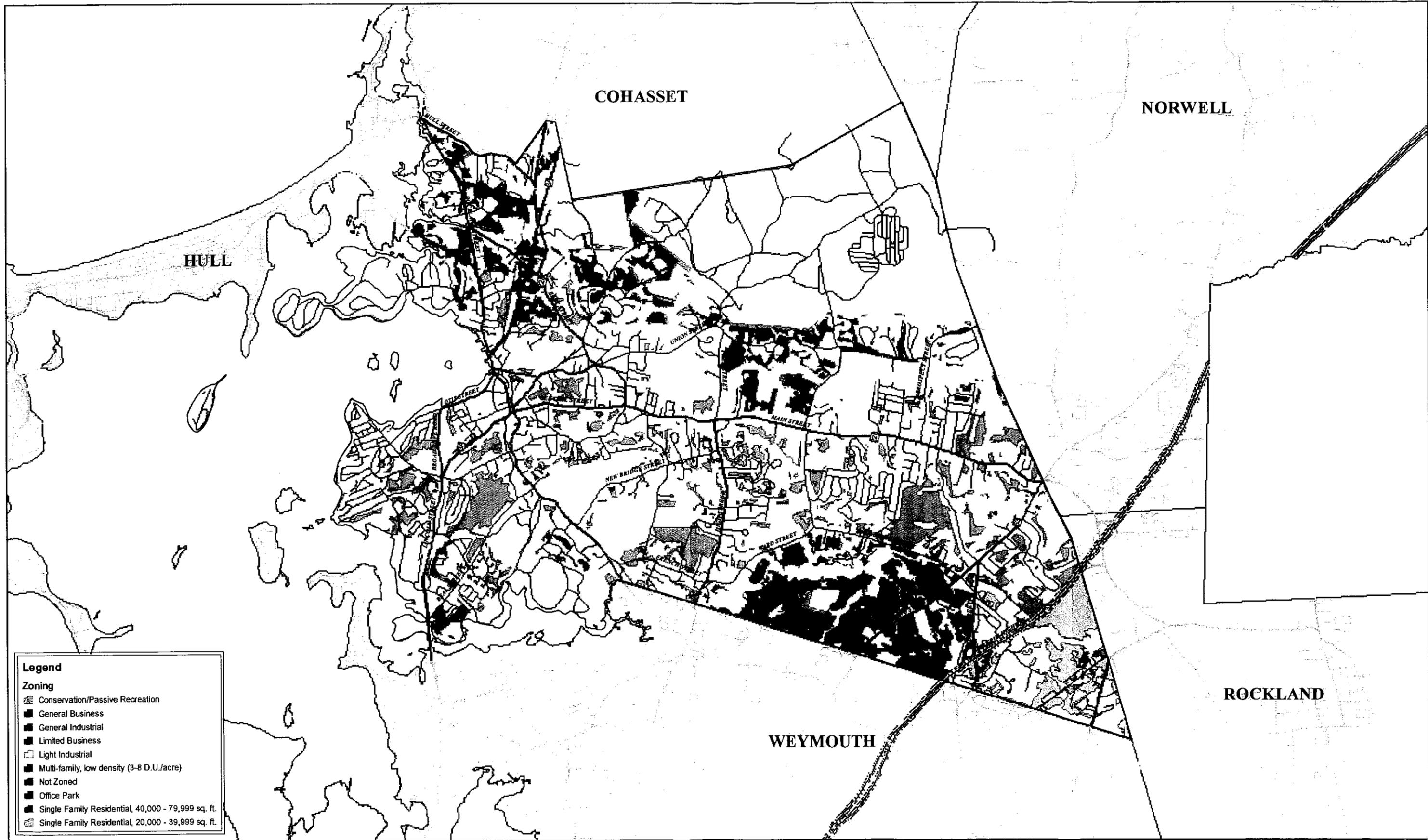
- Wetlands
- Developed Land
- Water
- Floodplain
- Official and Open Space District
- Protected Open Space
- Developable Land

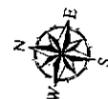
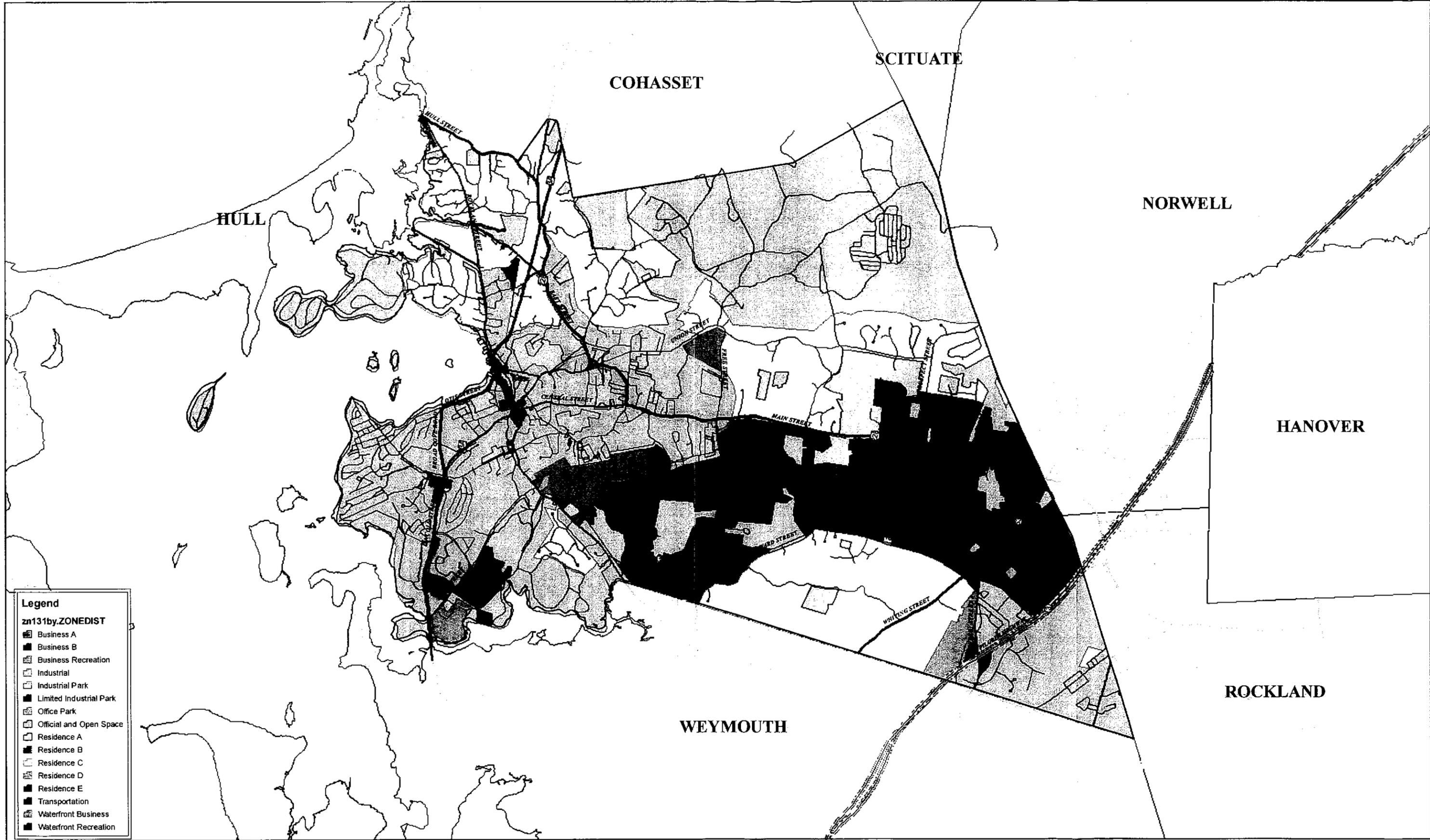
**Town of Hingham
Comprehensive Wastewater Management Plan**



Figure 3-1

Development Constraints





**Table 3-2
 Residential Zoning District Development Capacity (Year 2000 Data)**

<i>Zoning District</i>	<i>Minimum Lot Size (sq. ft.)</i>	<i>Minimum Frontage (ft.)</i>	<i>Acres</i>	<i>% of Developable Area</i>	<i>Buildout Capacity (dwelling units – d.u.)</i>
Residential A	20,000	125	285.1	12.0	497 d.u.
Residential B	30,000	150	482.5	20.0	560 d.u.
Residential C	40,000	150	1,295.4	54.0	1,129 d.u.
Residential D	5,000*	30	9.5	1.0	66 d.u.
Residential E	30,000	150	4.7	1.0	5 d.u.
Totals:			2,077.2	88.0	2,257 d.u.

* Per dwelling unit of one bedroom. For each additional bedroom, an additional 1,000 square feet of lot area is required.

The total remaining acreage for Residential A through Residential E, yields a total of 2,077 acres (Master Plan data). This land area could support a maximum of 2,257 residential dwelling units as determined by the Master Plan analysis. Using the year 2000 population of 19,882, at full buildout, the population of Hingham could increase by up to 33.8 percent to 26,602 with current zoning by-laws.

The Hingham Master Plan reports that under current zoning, the number of housing units could increase by 31.3 percent. This projection represents maximum build-out without any form of additional growth control beyond the current zoning bylaws and is relatively consistent with the residential population increase value as determined above (33.8 percent). The population growth rate for Hingham, as estimated by the MAPC, is averaged at 0.8 percent per year, or 8 percent per decade (between the years 1990 and 2020). If this rate was assumed to be constant, and applied to future residential home development in Hingham, full build-out (of the available 2,077 acres) would not be reached until well beyond this study period. However, fluctuations in population growth trends could alter this rate and MAPC projections do not maintain this high rate of population growth into the future.

Based on the MAPC population projections, it is expected that the overall residential population increase between the years 2004 and 2025 will be 22.7 percent. Table 3-3 shows the projected residential population in Hingham to the year 2025.

**Table 3-3
 Residential Population Projection to the Year 2025**

Residential Population Projections						
Year	1990 ¹	2000 ¹	2004 ²	2010 ³	2020 ³	2025 ⁴
Population	19,821	19,882	20,720	24,692	25,228	25,432
Increase % (from previous)		0.3	4.2	19.2	2.2	0.8

1. Source: 1990 and 2000 data from US Census.
2. Source: 2004 data from Town of Hingham Website
3. Source: 2010 and 2020 data from MAPC projection data released Jan. 31, 2006
4. Source: 2025 data derived from MAPC projections of 2020 and 2030.

Current zoning bylaws in Hingham would permit residential development of approximately 2,257 dwelling units or 2,077 acres to reach maximum buildout (using 2000 data). By far, the most significant acreage is in the Residential C District, primarily permitting single family homes and professional office/studios of resident professionals on 40,000 square foot lots.

Residential A and Residential B Districts also currently permit significant future development, including hundreds of acres of developable land and requiring smaller minimum lot sizes of 20,000 square feet and 30,000 square feet respectively. These two residential zoning classifications are primarily restricted to the down-town and coastal parts of the town.

3.1.3 Commercial and Industrial Land Use Projections

Commercial land use in Hingham currently makes up 318 acres, or 2.3 percent of the developed land area. The center of downtown Hingham, Hingham Harbor, the shipyard area, South Hingham and Queen Anne's Corner are the primary commercial centers.

Industrial land use in Hingham currently makes up 224 acres or 1.6 percent of the developed land area. Equally as much undeveloped land is currently zoned for industrial use.

Hingham's commercial and industrial land use is likely to increase in future years as considerable acreage is available for these uses under current zoning bylaws. Table 3-4 shows the developable land (per Hingham Master Plan) for these uses.

**Table 3-4
 Commercial and Industrial Zoning Development
 Capacity (Year 2000 Data)**

<i>Zoning District</i>	<i>Acres</i>	<i>% of Developable Area</i>	<i>Buildout Capacity (sf)</i>
Business District A	-	-	-
Business District B	3.0	1.0	64,500
Office Park District	42.0	2.0	365,800
Industrial District	6.1	<1.0	120,700
Industrial Park District	221.7	9.0	4,297,600
Limited Industrial Park District	1.6	<1.0	25,200
Totals:	274.4		4,873,800

As shown above, zoning districts which allow commercial and industrial use provides 274 acres of developable land which could potentially allow 4.8 million square feet of floor space. The Industrial Park District provides the greatest buildout potential, with 222 developable acres and is located in south Hingham along Route 3. The primary uses for this district would include industrial, office, Research & Development (R&D), and retail use.

The Office Park District provides 42 acres of developable land is also located along Route 3 in southern Hingham. This zoning district permits office space and R&D.

The potential intensity of commercial and industrial development is greatest in areas such as the Hingham Shipyard and Hingham Plaza where development proposals have been completed. Constant industrial and commercial growth is expected in Hingham. However, future trends will dictate the rate of such growth and therefore, it is difficult to estimate when maximum buildout will be reached.

3.1.4 Development Density and Lot Size

Hingham is an historic town with coastal areas that were developed long before any modern zoning bylaws were established to regulate housing density. As a result, there are several areas in town where high-density residential housing, constructed prior to the development of current zoning, fall under the "Exempted Lots" section of the General Intensity Provisions section IV-5a of the Zoning Bylaw. Such exemptions are commonly referred to as non-conforming lots or lots subject to the "Grandfather Clause". Housing density is greater than permitted by current zoning in parts of downtown Hingham and the coastal residential areas.

High housing density without municipal sewer service exists in isolated areas such as in downtown Hingham, along Route 228, the Accord Pond watershed, the World's End waterfront, and in some of the historic districts. The surficial geology in some of these areas consists of till or bedrock, unfavorable conditions for on-site septic (or sanitary disposal systems, "SDSs"). With stricter standards for on-site SDSs since the promulgation of Title 5, it is conceivable that specific high density areas in Hingham may be subject to environmental concerns and will require wastewater treatment solutions, as existing cesspools and leach fields approach the end of their useful life.

Although further overdevelopment will be minimized by current zoning, special permitting, "unrestricted dwelling units", "Flexible Residential Development" and Overlay Districts provide case-by-case opportunity for future high density development under current local zoning bylaws. The vast majority of remaining developable land for residential construction requires a 40,000 square foot minimum land area under Residential C District zoning.

3.1.5 Transportation

The Massachusetts Bureau of Transportation, Planning and Development (BTPD) has defined Hingham as an urbanized area. Regionally, Hingham is accessed by Route 53, Route 3, Route 3A and Route 228. The Greenbush commuter rail service will soon be re-activated and daily service brought into Hingham for commuters into and out of Greater Boston. The Hingham Master Plan reported that 88 percent of all Hingham residents drive to work and 22-percent work in Boston with other work destinations including other suburbs of Boston. It is expected that many Hingham commuters to the Greater Boston area will take advantage of the commuter rail in the future.

According to the 1990 Census, 96-percent of all jobs in Hingham were accessed by automobile and Hingham residents filled approximately 20-percent of those jobs. The total number of Hingham jobs and residents has increased since this census data was taken and major changes since that time include increased use of the ferry to Boston as well as the creation of the HOV lanes on I-93 Northbound.

Route 228 is currently scheduled to be improved in two phases which include the processes of widening the road, geometric changes at intersections and realignment. This process will also include stormwater drainage and sidewalk improvements along the corridor. Route 228 is the main north-south corridor in Hingham and is a main access route from Downtown Hingham to Route 3 and Route 53.

3.1.6 Infrastructure at Sites of Future Development

The North Sewer District and the Weir River Sewer District provide wastewater service to specific parts of coastal and downtown Hingham. Although on-site SDSs are presently in operation in areas within the boundaries of the North Sewer District, collection system piping may be expanded to service current land use and future development sites.

Commercial and Industrial growth is likely to occur at sites such as the Hingham Shipyard and Hingham Plaza. Hingham Shipyard is within the boundaries of the North Sewer District and all indicators point toward the feasibility of connecting wastewater pipe from such future development into the existing sewer system. Water supply is provided to this area by Aquarion Water Company.

The estimated impacts of the proposed Hingham Shipyard Project would include 552 multi-family units (considered Market Rate Housing), 250,000 square feet of retail/office space, 30,000 square feet of office space and a 60 room hotel.

Hingham Plaza is zoned for Industrial Park District and Office Park District use and is located in the southernmost corner of Hingham by the Route 3 ramp system and interchange with Derby Street. This area is currently served by on-site SDSs and water supply is provided by Aquarion.

Potential residential development is scattered about Hingham in pockets that are spread over approximately 65-percent of the Town's area. Approximately one-half of the developable Residential A District zoned land is contained within the North Sewer District. This district has Massachusetts Water Resources Authority (MWRA) sewer service and water is supplied by Aquarion.

The remaining Residential A District zoning is spread out in the center of Hingham, on both sides of Central Street, Main Street and East Street in the downtown area. Water is supplied to these areas by Aquarion and on-site SDSs are relied upon for wastewater disposal.

The vast majority of residential land available for future development is made up of various parcels, spread throughout the majority of central, southern, north-eastern and western Hingham, zoned as Residential C District. Some of these areas, particularly along the Weymouth border, are large tracts of land without local streets. This current condition will slow the rate of development in these areas. All remaining developable land zoned as Residential C is in areas where water is supplied by Aquarion and on-site SDSs are used for wastewater treatment and disposal. The North Sewer District is without any Residential C zoning.

Further anticipated development includes mixed income housing complexes in various parts of Hingham. Pending a Comprehensive Permit, the Lincoln Hill - 16 unit complex, will be serviced by the North Sewer District.

Outside the boundaries of the North Sewer District, the "Brewer Meadows" - 27 unit complex will be located on Route 3A, Chief Justice Cushing Way. In southern Hingham, the "Erickson Hingham" - 2,000 unit complex will be located just north of Route 53 toward the Weymouth border; and the "Scotland Green" - 42 unit complex will be located in south Hingham by the Norwell town line.

3.2 Future Wastewater Flows and Loads

3.2.1 Wastewater Flow Projections

3.2.1.1 Baseline Wastewater Flow Volumes

The existing, or baseline, wastewater flow volume in Hingham will be estimated based on data provided by the Town of Hingham, the 2001 Hingham Master Plan, internet research and typical design guidelines for generation of wastewater flow. Other relevant information is provided in the 2000 census. (This census data does not appear to have been available during the preparation of the Master Plan). The baseline flows will be estimated for each of the sewer districts, the unsewered region of town and the entire town of Hingham. This process is detailed below.

Entire Town of Hingham

Hingham is largely a residential community, and as such, domestic residential wastewater is expected to be the single largest component of the total wastewater generated. Other components consist of institutional (schools), commercial properties and industrial uses. These sources, and typical design flows based on known data is used to categorize the baseline wastewater flows in Hingham. Population data and average housing unit density is used to estimate residential flows of wastewater.

The town web page publishes the most recent Hingham population as 20,720 (from 2004). The average number of people per housing unit is listed as 2.96 in the Hingham Master Plan and is also reported by the Metropolitan Area Planning Council (MAPC). The Master Plan offers conflicting data for total number of housing units, however, the larger number presented exceeds the 2000 census data, allows for growth between 2000 and the present, and is supported by reviews of town building permit data. The number of year-round housing units presented in the 2001 Master Plan is 7,522. This number of housing units (single and multi-family; occupied, or not) will form the baseline for current conditions. The Hingham Master Plan breaks down the 7,522 housing units to 1,353 multi-family units (two, or more), and 6,169 single-family units (single, or "other"). To estimate town-wide residential wastewater flow, 110 gpcd is used for each multi-family unit; and flows attributed to unit single-family housing are 194 gpcd (per capita flows multiplied by average household residency of 1.7; and 2.96, respectively). These flows will be used to establish the baseline residential wastewater flow. This baseline wastewater flow shall be used to estimate future projections based on study period population projections and anticipated residential housing and commercial/industrial development.

To determine the town-wide baseline flow, current average wastewater flow rates from known sources are used and typical per capita and per land use flows are used to show components of those known flows and for the unsewered portion of Hingham. Three separate discharges of wastewater occur in Hingham. These three sources are: the MWRA system to Deer Island (NSD), the Weir River Pumping Station to the Hull WWTF (WRSD), and the numerous on-site SDSs throughout the remainder of Hingham.

To establish one segment of wastewater flows in Hingham, the current town-wide institutional wastewater flow is estimated based on typical average design flow rates. Using Title 5 wastewater generation rates, schools with cafeteria service and showers typically use a peak flow rate of 20 gpd to estimate wastewater flows. Typically, this flow rate is applied to high school and middle school levels. To approximate average daily flows on a per capita basis, 70-percent of Title 5 rates (or 14 gpcd for schools with showers, 7 gpcd without) will be used. There are no boarding schools in Hingham. The lower flow generation rate will be applied to the elementary schools as a whole; with the exception of Notre Dame Academy as this private girls institutional facility has students of middle school and high school age as well as an athletic program.

Table 3-5 shows the relevant data to determine current institutional wastewater flow in Hingham, and will be used later to estimate study year projections.

**Table 3-5
Current Wastewater Flow Volumes for Public and Private School Facilities**

<i>Public School Facility</i>	<i>Current Sanitary System</i>	<i>Students</i>	<i>Faculty</i>	<i>Typical Flow Rate (gpcd)</i>	<i>Waste water Flow (gpcd)</i>
Foster Elementary School	North Sewer District	572	41	7	4,290
Plymouth River Elementary	On-Site Sanitary Disposal	584	40	7	4,370
South Elementary School	On-Site Sanitary Disposal	529	41	7	4,000
Hingham Middle School	Bio-Clere Decentralized	873	75	14	13,270
Hingham High School	North Sewer District	937	75	14	14,170
<i>Private School Facility</i>	<i>Current Sanitary System</i>	<i>Students</i>	<i>Faculty</i>	<i>Typical Flow Rate (gpcd)</i>	<i>Waste water Flow (gpcd)</i>
Notre Dame Academy	Tight Tank Installed 2005	560	51	14	8,550
Derby Academy	North Sewer District	304	54	7	2,510
St. Paul School	North Sewer District	265	18	7	1,980
Old Colony Montessori	On-Site Sanitary Disposal	105	4	7	760
Total Baseline Hingham Institutional Flow: (rounded)					54,000

1. Population statistics for faculty and students of private schools taken from individual websites of school facilities.
2. Population statistics for faculty and students of public schools taken from Town of Hingham web site and discussion with Town of Hingham Superintendent of Schools office personnel.

Town-wide commercial wastewater flows are estimated using the Master Plan data for "Existing Land Use", a Floor Area Ratio (FAR), and typical wastewater generation rates for commercial uses. The Hingham Master Plan indicates that 318 acres are used for commercial purposes. Because many of these commercial uses are situated on

non-conforming lots, particularly in the downtown area, CDM has used a higher Floor Area Ratio (FAR) of 0.5 to compensate for pre-existing non-conforming development density (current zoning dictates a maximum of 0.25) to convert land use area to building area, and then estimate average commercial wastewater flows based on 70-percent of Title 5 rates (75 gpd/1,000 sf), or 53 gpcd/1000 sf of building area. These estimates are based on single story structures.

The town-wide industrial flow volume is determined in the same way. The Master Plan data indicates 224 acres of Hingham are currently utilized for industrial purposes. By applying an estimated FAR of 0.35 and converting to square footage, we estimate average industrial wastewater flows using 70-percent of 35 gpd/1,000 sf (or, 25 gpcd/1000 sf). The results of this estimate are shown in Table 3-6 below.

**Table 3-6
Town-wide Baseline Wastewater Flow**

<i>Existing Conditions Entire Town of Hingham</i>	<i>Source</i>	<i>SF</i>	<i>Housing Units (h. u.)</i>	<i>Population</i>	<i>Typical Flow Rate (gcpd)</i>	<i>Total Flow (gpcd)</i>
Residential (Single-family)	Master Plan		6,169	18,260	194 per h.u.	1,197,000
Residential (Multi-family)	Master Plan		1,353	2,300	110 per h.u.	149,000
Institutional	Web Sites			5,128	varies	54,000
Industrial	Master Plan	3,412,055			25 per 1,000 sf	85,300
Commercial	Master Plan	6,930,396			53 per 1,000 sf	367,300
Total Baseline Town of Hingham Wastewater Flow (rounded):						1,855,000

1. Institutional includes schools and municipal structures. Population shown indicates faculty, staff and student population of schools.
2. Single family residential units average 2.96 persons per unit. Multi-family residential units taken from Master Plan data (Table 1-5), with average of 1.7 persons per unit.
3. Industrial FAR of existing structures estimated to be 0.35. Commercial FAR of existing structures estimated to be 0.50.

To further define and to better estimate the growth impacts throughout the planning period, component baseline flows for the two sewer districts in Hingham are tabulated. For these sewer districts (NSD and WRSD), wastewater flows are estimated based on the total number of parcels, and their related percentage of land uses existing within the sewer districts.

North Sewer District

It should be understood that not all of the sewered parcels in the North Sewer District (NSD) are developed and therefore, an estimate of the existing sewered housing units has been made based on site visits, GIS imaging and Master Plan data. The NSD is

comprised of residential, industrial and commercially zoned areas. Wastewater flow for each of these land use categories is estimated separately based on average per capita generation rates for each use. These flows are then tabulated to estimate a baseline wastewater flow for the district.

The NSD currently has approximately seventy-five housing units served by on-site SDSs, as estimated by the Hingham Board of Health Director. Wastewater flow from these structures is incorporated into the current wastewater flow baseline for the district. Future projections of wastewater flow volume for the NSD will also include these lots currently served by on-site systems, as it is assumed that future on-site system failures will lead to these structures connected into the existing NSD wastewater collection system.

There is a significant land area in the NSD where multi-family structures exist. The Hingham Master Plan reports 1,353 multi-family structures exist in Hingham. In the NSD, they exist along Beal Street and east of the Hingham Shipyard, among other places. According to Hingham Sewer Commission documents, 5 multi-family units exist within the Weir River Sewer District. Approximately half the zoning area, for multi-family housing, is in the NSD. Therefore, approximately one-half of the remaining multi-family units (674) are estimated to be within the NSD. An average of 1.7 people per multi-family housing unit (from Hingham Master Plan) is used with approximately 110 gpd (1.7 times 65.5 gpcd) to estimate wastewater flow for each of these housing units.

Institutional wastewater flows within the NSD have been separated from the total baseline institutional volumes shown in Table 3-5 above. There are currently three elementary schools (Foster Elementary School, Derby Academy, and St. Paul School) located in the NSD. Each of these three schools is sewered by the MWRA system. The design wastewater flow of 7 gpcd is used for each of these schools. Hingham High School is also within the NSD. The design flow rate of 14 gpcd is applied to the High School. The population of students and staff in schools serviced by the NSD is 2,226.

There is significant land area in the NSD that is currently zoned for industrial and commercial use. Analysis of the current land use conditions indicate approximately 90 acres of land in the NSD is used for industry and approximately 160 acres for commercial businesses. An estimated average FAR of the existing structures for each of these land use categories is used to account for the non-conforming and the densely developed commercial area of downtown Hingham as described in the methodology described above.

This tabulation is summarized in Table 3-7 below. No allowance is included for Inflow/Infiltration (I/I).

**Table 3-7
North Sewer District Baseline Wastewater Flow**

Existing Conditions North Sewer District	Source	SF	Housing Units (h. u.)	Population	Typical Flow Rate (gpcd)	Total Flow (gpcd)
Residential (Single-family)	CDM GIS Figure		1,350	3,996	194 per h.u.	261,900
Residential (Multi-family)	Master Plan		674	1,146	110 per h.u.	74,100
Institutional	Web Sites			2,226	varies	23,000
Industrial	Master Plan	1,364,822			25 per 1,000 sf	34,100
Commercial	Master Plan	4,158,238			53 per 1,000 sf	220,400
Total Baseline North Sewer District Flow (rounded):						614,000

1. Institutional includes school uses. Population shown indicates faculty, staff and student population (from Table 3-5).
2. Industrial FAR estimated to be 0.35 for existing structures. Commercial FAR estimated to be 0.60 for existing structures.

Weir River Sewer District

The Weir River Sewer District (WRSD) is a much smaller sewer district with the majority of the properties consist of residential house lots. Only 8 commercially zoned parcels exist within the current boundaries of the WRSD. An average area of 4,000 square feet has been used to represent each of the 8 commercial parcels in this district. There are no industrial properties or zones in the WRSD. Residential flow is estimated using typical flow rates as described above. Average daily wastewater flows (Baseline) for WRSD is shown in Table 3-8 below.

**Table 3-8
Weir River Sewer District Baseline Flow**

Existing Conditions WRSD	Source	SF	Housing Units (h. u.)	Population	Typical Flow Rate (gpcd)	Total Flow (gpcd)
Residential (Single-family)	Hingham Sewer Commission & website		132	391	194 per h.u.	25,608
Residential (Multi-family)	Hingham Sewer Commission & website		5	34	110 per h.u.	2,200
Commercial	CDM GIS Data	32,000			53 per 1,000 sf	1,700
Total Baseline Weir River Sewer District Flow (rounded):						30,000

1. All sewered lots assumed developed.
2. No industrial zoning exists within the WRSD limits.
3. Multi-family units in WRSD consist of 4 units per lot.
4. Commercial structures assumed 2 story 40' X 50' average.

Cohasset Wastewater Flow

Wastewater from north Cohasset flows into the WRSD collection system in Hull Street, merging with the WRSD flow from Hingham. The converging flow is fed by gravity to the Weir River Pumping Station (operated and maintained by Hingham) and together it is pumped to the Hull Wastewater Treatment Facility (WWTF). The Cohasset Sewer Commission reports average daily flow to be as high as 68,000 gpd. This volume is relatively constant as the Cohasset collection system pipe is a low pressure system with minimal I/I. Streets in north Cohasset served by the collection system are primarily along the coast and Straits Pond. They include:

- Hull Street
- Jerusalem Road
- Windy Hill Road
- Howe Road
- Deep Run Drive
- Black Rock Road
- Forest Avenue

The Cohasset Sewer Commission has reported plans to upgrade their collection system to include additional streets in north Cohasset beginning in 2008. The scope of this upgrade would be to install service to additional structures without exceeding the permitted 80,000 gpd permitted limit. A flow meter is also going to be installed before or at the confluence of flows on Hull Street, at the request of the Hull WWTF.

Remaining Areas of Hingham

There are approximately 4,687 housing units in the remainder of Hingham (not within a sewer district). This largely unsewered region relies entirely upon on-site SDSs and makes up approximately 75 percent of the land mass of Hingham. Housing units are distinguished by their characterization as single-family or multi-family and the appropriate design flow volume is applied accordingly. Industrial and commercial flows are estimated using the methodology described in the previous section. Institutional flows, attributed to schools, consist of the following:

- Plymouth River Elementary School @ 7 gpcd
- South Elementary School @ 7 gpcd
- Hingham Middle School @ 14 gpd/person
- Notre Dame Academy @ 14 gpd/person
- Old Colony Montessori @ 7 gpcd

For estimates of wastewater flow, 7 gpcd is used for elementary schools and 14 gpcd is used for middle and high schools.

Table 3-9 summarizes existing flows for the remainder of Hingham.

**Table 3-9
Unsewered Hingham Baseline Flow Volume**

<i>Existing Conditions Unsewered Hingham</i>	<i>Source</i>	<i>SF</i>	<i>Housing Units (h. u.)</i>	<i>Population</i>	<i>Typical Flow Rate (gpcd)</i>	<i>Total Flow (gpcd)</i>
Residential (Single-family)	Master Plan		4,687	13,874	194 per h.u.	909,300
Residential (Multi-family)	Master Plan		674	1,146	110 per h.u.	74,140
Schools	Current Web Sites			2,651	varies	30,954
Industrial	Master Plan	2,047,233			25 per 1,000 sf	51,180
Commercial	Master Plan	2,740,158			53 per 1,000 sf	145,228
Total Baseline Wastewater Flow for "Unsewered" Hingham (rounded):						1,211,000

1. Industrial FAR average estimated at 0.35, commercial FAR estimated at 0.50.

The existing conditions for components of Hingham's wastewater flows are summarized in Table 3-10:

**Table 3-10
Summary of Existing Conditions and Baseline Flow Volume**

<i>Component of Wastewater Flow</i>	<i>Total Flow (gpcd)</i>
Total North Sewer District flow (existing):	614,000
Total Weir River Sewer District flow (existing):	30,000
Total wastewater flow for remainder of Hingham (existing):	1,211,000
Total Town of Hingham Wastewater Flow (rounded):	1,855,000

3.2.2 Wastewater Flow Projections for Year 2025

Wastewater flow projections are largely based on population estimates for a given area. Two methods of estimating population were reviewed for their applicability to Hingham. Metropolitan Area Planning Council (MAPC) estimates show population by community for each decade. A linear interpolation (or average, in this case) of the projected population estimates for 2020 and 2030 results in the population estimate for the end of the planning period (to 2025). Using this method, population is estimated to reach 25,452. Massachusetts Institute for Social and Economic Research (MISER) estimates resulted in a decrease in population over the planning period. Hingham's desirability, location, and restoration of train service makes this scenario

unlikely. Therefore MAPC data is used for population estimates for the planning period.

Commercial and Industrial growth estimates are based on a report published by the Massachusetts Department of Workforce Development for Plymouth County.

Institutional population growth is projected and the corresponding average wastewater flow rates are applied to project future conditions. In the same format as shown in the previous section, design year wastewater flows are estimated for the two sewer districts and the remaining portion of Hingham. The process is described in the following sections below.

Entire Town of Hingham

January 2006 MAPC population projections have been used to establish the year 2025 Hingham population at 25,452. This increase in population, between 2001 and 2025, represents 47 percent of the total remaining residential development permitted under current zoning bylaws before full buildout is reached, using the remaining acreage reported by the Hingham Master Plan. Although the Master Plan indicates the trend is for the number of people per household to decline slightly in the future, this prediction is countered by a much lower population projection than MAPC has recently published. Therefore, Master Plan data for both population trend and number of people per household will not be used for the remainder of the projections. MAPC population projections and the current persons per household will be used to estimate flow projections made in this report.

A local commercial real estate firm report reviewed during this study indicates that consistent growth can be expected to continue in the suburban Boston region. Regional industrial development has been concentrated in the suburbs south of Boston as buildout is reached in communities closer to the city, while office and R&D development has primarily occurred in the suburbs north of the city. The report states "All indicators point toward a modest but steady gain in the nation's economy." Local growth in the Greater Boston suburbs is likely to realize an increase in industrial processes as companies in the highly developed communities closer to Boston continue to shed space or relocate to modern facilities in locations with better access to highways.

Overall availability of commercial and industrial space continues to increase in highly developed areas (Greater Boston), as older facilities without adequate space, loading capacity, parking and highway access become less desirable. In this environment, a trend toward locating large specialized facilities along the 495 beltway and beyond has become apparent, particularly in the region south of Boston. Larger companies seek built-to-suit structures in newly developed industrial areas where land is abundant and can be developed cost effectively. This established trend, indicates a likelihood for industrial development in south Hingham, where developable land and highway access make this area prime for such development. It is anticipated that growth will be relatively constant during the study period.

Mass Stats is a series of reports published by the Massachusetts Department of Workforce Development (MA DWD). The MA DWD has reported projections in industrial employment up to the year 2010 specific to Plymouth County. These projections show an average annual growth rate of 0.83 percent. For the purposes of this study, a 1 percent annual increase will be assumed for the entire study period. The application of this rate increase to existing commercial and industrial wastewater flow volume is summarized below in Table 3-11.

**Table 3-11
Remaining Industrial & Commercial Land in Hingham**

<i>Zoning District</i>	<i>Acres</i>	<i>% of Developable Area</i>	<i>Buildout Capacity (sf)</i>
Business District A	-	-	-
Business District B	3.0	1.0	64,500
Office Park District	42.0	2.0	365,800
Industrial District	6.1	<1.0	120,700
Industrial Park District	221.7	9.0	4,297,600
Limited Industrial Park District	1.6	<1.0	25,200
Totals:	274.4		4,873,800

1. Data from Hingham Master Plan 2001.

In 2006, The Hingham School Superintendent's office reported an anticipated increase of students (3,700 to 4,200) in public schools from over the next ten years (a 13.5-percent increase). Hingham is currently undergoing middle school renovations and plans to build an additional elementary school to offset this anticipated increase in attendance in public schools. MAPC projections indicate a possible decline in children beginning in the year 2010 and continuing to the year 2030. A reasonable increase of 15-percent is used to estimate school populations based on these sources to develop a projection of institutional (public and private school systems) wastewater flows for the end of the study period.

By combining the current wastewater flows with the anticipated increase in flow volume, CDM has projected town-wide wastewater flow volume for the year 2025. The total volume determined below represents wastewater flow from all sources, including development, projected to the year 2025. The summary of Town-wide wastewater flows (2.3 mgd) at the end of the planning period is shown in Table 3-12 below.

**Table 3-12
 Town-wide Projected Wastewater Flow (2025)**

Study Year Projection Entire Town of Hingham	Source	SF	Housing Units (h. u.)	Population	Typical Flow Rate (gpcd)	Total Flow (gpcd)
Residential (Single-family)	MAPC Population		7,384	21,857	194 per h.u.	1,432,496
Residential (Multi-family)	Master Plan		2,103	3,575	110 per h.u.	231,330
Institutional	Master Plan			5,900	varies	62,100
Industrial	Master Plan	4,230,948			25 per 1,000 sf	105,774
Commercial	Master Plan	8,593,691			53 per 1,000 sf	455,465
Total Projected Town Of Hingham Wastewater Flow (2025)						2,300,000

1. Residential growth based on MAPC population projections and 2.96 people per single-family housing unit, and 1.7 people per multi-family unit.
2. Multi-family residential projected at 10 percent increase due to limited appropriately zoned land.
3. Institutional includes schools and municipal structures. School growth based on 15 percent increase in school aged children.
4. Industrial and Commercial growth based on 1 percent per year for 24 years.
5. Entire town of Hingham included in this flow projection summary.

North Sewer District

Although the NSD currently has medium to high density residential housing in much of the district, with limited residential development potential, there currently exists a limited number of undeveloped parcels serviced by the existing collection system piping. The largest tract of undeveloped land in the district is zoned Residential A and lies between Bradley Park Drive and Beal Street. This tract of land will likely be subject to development pressure during the study period. Although this area is currently unsewered, the current MWRA municipal agreement permits supplemental collection system piping to be installed for the purpose of sewerage areas such as this, within the NSD boundaries.

Additional undeveloped Residential A land exists in the NSD along Broad Cove Road and Downer Avenue. Although these areas are currently sewerage, the potential for residential development is very limited by the size of the available land space and existing zoning requirements such as the road frontage minimum of 125 feet.

The projected number of single family homes in the NSD could be increased by the development of the area north of Beal Street. This development could result in as many as 40 potential Residential A lots. For purposes of estimating wastewater flow in the NSD, we consider that 20 of these lots will be developed during the study period. Combined with the connections to the NSD collection system of currently un-

connected properties, the total number of developed single family residential lots are estimated to be 1,425 at the end of the planning period.

Multi-family residential housing is also expected to increase in the NSD during the planning period. As previously discussed, approximately 50 percent of the multi-family residential land use in Hingham is within the NSD. Applying this same percentage to future development and assuming the same growth rate as the MAPC population projection (28 percent between 2000 and 2025), we derive the possible multi-family development growth rate of 16 percent. Due to the relatively limited land area available in the permitted zones this multi-family growth projection is reduced to 10 percent.

The NSD also currently has room for commercial and industrial development. There are plans for the redevelopment of the Hingham Shipyard, an area of special mixed zoning within the NSD. The Master Plan outlines the land use of the redevelopment. Table 3-13 below shows the potential growth of this redevelopment and related wastewater flow.

**Table 3-13
North Sewer District Projected Wastewater Flow Volume (2025)**

Study Year Projection North Sewer District	Source	SF	Housing Units (h. u.)	Population	Typical Flow Rate (gpcd)	Total Flow (gpcd)
Residential (Single-family)	Master Plan		1,425	4,218	194 per h.u.	276,450
Residential (Multi-family)	Mass GIS Data		744	1,265	110 per h.u.	81,840
Institutional	Master Plan			2,610	varies	26,388
Industrial	Master Plan	1,555,897			25 per 1,000 sf	38,897
Commercial	Master Plan	4,740,391			53 per 1,000 sf	251,240
Shipyard Re-development	Master Plan	280,000			53 per 1,000 sf	14,840
Shipyard Re-development	Master Plan		60		110 per h.u.	6,600
Shipyard Re-development	Master Plan		552		110 per h.u.	60,720
Total Projected North Sewer District Wastewater Flow (Year 2025)						757,000

1. Shipyard re-development based on 280,000 sf of retail and office space, 60 room hotel and 552 multi family housing units as described in Hingham Master Plan.
2. Multi-family residential growth is independent of shipyard re-development.
3. Industrial and commercial growth estimated to be 14 percent in study period, independent of the shipyard development.
4. Institutional includes School system growth based on 15 percent increase during the study period.
5. Residential housing assumes all sewered lots developed. Multi-family residential assumes 10 percent growth.
6. Future industrial and commercial determination based on economic projections from MASS STATS: 1 percent per year for 24 years.

Future institutional wastewater flow volume is again estimated based on the anticipated 15 percent growth in school children during the study period. It is expected the NSD will continue to service the High School and three elementary schools.

Weir River Sewer District

Unlike the NSD, the WRSD has limited available wastewater capacity without the installation of additional collection system piping. Phase two of the Weir River Sewer District has recently been completed. This construction will upgrade the existing collection system to include sewer service for parcels on Kilby Street, Roc fall Road, Justice Cushing Highway, Rockland Street, Ringbolt Road, Pine Street and Weir Street Extension. Private development has led to the installation of sewer piping at the intersection of Justice Cushing Highway and Kilby Street, extended the existing pipe on Rockland Street and pipe from the court house on Washington Boulevard to Rockland Street. This scope of work adds approximately 118 parcels to the service area of the WRSD. The potential for change in wastewater flow volume, brought about by this upgrade, is summarized in Table 3-14.

**Table 3-14
Weir River Sewer District Projected Wastewater Flow Volume (2025)**

<i>Study Year Projection Weir River Sewer District</i>	<i>Source</i>	<i>SF</i>	<i>Housing Units (h. u.)</i>	<i>Population</i>	<i>Typical Flow Rate (gpcd)</i>	<i>Total Flow (gpcd)</i>
Residential (Single-family)	Hingham Sewer Commission & website		237	702	194 per h.u.	45,978
Residential (Multi-family)	Hingham Sewer Commission & website		36	61	110 per h. u.	3,960
Commercial	CDM GIS Data	48,000			53 per 1,000 sf	2,544
Total Projected Weir River Sewer District Wastewater Flow (2025):						52,500

1. All homes assumed to be single family based on current zoning bylaws. All sewer lots assumed to be developed.
2. No industrial zoning exists in the WRSD.
3. Phase 2 will add one, large commercial parcel, assumed to have the potential for 16,000 sf.
4. Future industrial and commercial determination based on economic projections from MASS STATS: 1 percent per year for 24 years.

The wastewater flows at the end of the planning period (2025) are summarized below in Table 3-15.

**Table 3-15
 Summary of Future Wastewater Flow Volume**

<i>Component of Wastewater Flow</i>	<i>Total Flow (gpcd)</i>
Total North Sewer District wastewater flow projection (year 2025)	757,000
Total Weir River District wastewater flow projection (year 2025)	53,000
Total wastewater flow for remainder of Hingham (year 2025)	1,490,000
Total Projected Town of Hingham Wastewater Flow (Year 2025):	2,300,000

3.3 Water Supply Records

The average per capita water use in the Hingham/Hull service area is 65.5 gpcd using the methodology in Section 1.2.3. Aquarion reported that in 2004, the average Hingham/Hull household used 70,900 gallons. This use rate is equivalent to 194 gpd per household.

It is commonly accepted that 10 percent to 15 percent of the water used in residential homes does not directly enter the sanitary discharge pipe of residential homes. This volume consists of water used for irrigation, human consumption and other exterior uses such as washing cars. Because water used for consumption and other uses sometimes does eventually end up in the wastewater collection system, either directly or indirectly, the value of 13 percent will be used for loss in the following calculations.

Water use statistics provided by Aquarion's 2004 Water Quality Report will be used to estimate the water use of Hingham, independent from the remaining parts of the service area. Aquarion has reported an overall service area demand of 3.45 mgd and percentages of use by component for the year 2004. This information was reported by MassDEP and the values can be seen in Table 3-16 below.

To separate the water use of Hingham from the entire service area, we used the published rate of 194 gpd per household and the established 2004 number of housing units in Hingham (7,522) to reach the value of 1.46 mgd. The volume of use by component in Hingham is determined from this residential value by applying the percentages supplied by Aquarion in the 2004 report. This data and the results can be seen in Table 3-16 below.

Table 3-16
Service Area and Town of Hingham Water Use by Component

<i>Entire Service Area by Component (2004) 3.45 mgd Total Use</i>	<i>Entire Aquarion Service Area</i>		<i>Town of Hingham</i>	
	<i>Rate of Use (gpd)</i>	<i>% of Use (Aquarion)</i>	<i>Rate of Use (gpd)</i>	<i>% of Use (Aquarion)</i>
Residential	2,171,893	63%	1,461,123	63%
Institutional	68,949	2%	46,385	2%
Industrial	34,474	1%	23,192	1%
Commercial	344,745	10%	231,924	10%
Unaccounted for	379,219	11%	255,117	11%
Exterior Use (Loss)	448,168	13%	301,502	13%
Totals:	3,447,449	100%	2,319,242	100%

The total volume of drinking water used by Hingham is 2.32 mgd. When compared to the volume used within Aquarion's entire service area, we find Hingham accounts for 67 percent of the total demand in the service area. This determination is supported by the much smaller off-season populations of Hull (11,050) and Cohasset (7,261). Only a portion of Cohasset is within the service area, estimated to be 10 percent of the town population, in the northern part of town. As summer populations increase in Hull and possibly in north Cohasset, the combined populations would still not reach the reported 2004 population of Hingham, 20,720 year round residents.

We have previously determined a town-wide current baseline wastewater flow volume for Hingham as 3.2 mgd in section 3.3.1.1 of this report. This value is determined by the Title 5 design flow volumes for each of the water use categories. Based on water use determinations, the town-wide use volume shown in Table 3-16 above is 2.3 mgd. This value includes the exterior use or "Loss" volume of 13 percent of the total demand. Subtracting this "Loss" value, we reach the volume of 2.02 mgd, which represents the average bare minimum daily wastewater flow volume for Hingham.

3.4 Pollutant Loads

The development of wastewater loads, specifically: Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), Total Kjeldahl Nitrogen (TKN) and Phosphorus (P), is performed by applying typical per capita wastewater loads to the existing conditions. The wastewater sources contributing load to the wastewater treatment systems include residential, industrial, commercial, and institutional. Residential loading is the most significant component of the wastewater sources in Hingham as the majority of wastewater flow in Hingham is produced by residential sources.

3.4.1 Existing Treatment Plant Loads

Average monthly load data for the Hull Wastewater Treatment Facility from January 2003 to December 2005 are presented below in Table 3-17. The treatment plant was unable to provide data on Phosphorus and Total Kjeldahl Nitrogen.

**Table 3-17
 Hull Wastewater Treatment Facility Load Data (lbs/day)**

<i>Hull Wastewater Treatment Facility</i>		
<i>Year</i>	<i>BOD</i>	<i>TSS</i>
2003	122.65	132.03
2004	188.78	231.45
2005	184.58	215.17
Average:	165.34	192.88

3.4.2 Town of Hingham Loads

Residential loading from the Town of Hingham has been estimated using the following typical per capita wastewater loads:

- BOD: 0.20 lb/capita/day
- TSS: 0.22 lb/capita/day
- TKN: 0.04 lb/capita/day
- P: 0.006 lb/capita/day

Residential loads received by the treatment facilities were calculated by multiplying the residential population contributing flow by the assumed loading rate for each constituent. The population contributing wastewater flow in the North Sewer District is 5,348 persons at present and is expected to be 6,601 in the year 2025. Similarly, the present and future loading for the Weir River Sewer District and the unsewered region of Hingham was performed and is shown below. Although flow from the unsewered region of Hingham is independent of the sewer districts and served by on-site systems, unsewered Hingham and the entire town's population and extended loading is shown in the Table 3-18 below. This process will be repeated for industrial, commercial and Institutional loading, then summarized for the entire town.

**Table 3-18
Residential Loading Determinations**

<i>North Sewer District Residential Loading Determination</i>					
Year	Population	BOD (lbs/day)	TSS (lbs/day)	TKN (lbs/day)	P (lbs/day)
2001	5,348	1,069.6	1,176.6	213.9	32.1
2025	5,601	1,120.2	1,232.2	224.0	33.6
<i>Weir River Sewer District Residential Loading Determination</i>					
Year	Population	BOD (lbs/day)	TSS (lbs/day)	TKN (lbs/day)	P (lbs/day)
2001	406	81.2	89.3	16.2	2.4
2025	876	175.2	192.7	35.0	5.3
<i>Unsewered Region of Hingham Residential Loading Determination</i>					
Year	Population	BOD (lbs/day)	TSS (lbs/day)	TKN (lbs/day)	P (lbs/day)
2001	15,213	3,042.6	3,346.9	608.5	91.3
2025	18,955	3,791.0	4,170.1	758.2	113.7
<i>Town of Hingham Residential Loading Determination</i>					
Year	Population	BOD (lbs/day)	TSS (lbs/day)	TKN (lbs/day)	P (lbs/day)
2001	20,967	4,193.4	4,612.7	838.7	125.8
2025	25,432	5,086.4	5,595.0	1,017.3	152.6

Institutional wastewater flow has been assumed to be of similar strength as domestic (residential wastewater). Therefore, institutional loadings were calculated based on the same per capita wastewater loads as residential wastewater, as given above.

**Table 3-19
Institutional Loading Determinations**

<i>North Sewer District Institutional Loading Determination</i>					
Year	Population	BOD (lbs/day)	TSS (lbs/day)	TKN (lbs/day)	P (lbs/day)
2001	2,266	453.2	498.5	90.6	13.6
2025	2,610	522.0	574.2	104.4	15.7
<i>Weir River Sewer District Institutional Loading Determination</i>					
Year	Population	BOD (lbs/day)	TSS (lbs/day)	TKN (lbs/day)	P (lbs/day)
2001	0	0.0	0.0	0.0	0.0
2025	0	0.0	0.0	0.0	0.0
<i>Unsewered Region of Hingham Institutional Loading Determination</i>					
Year	Population	BOD (lbs/day)	TSS (lbs/day)	TKN (lbs/day)	P (lbs/day)
2001	2,862	572.4	629.6	114.5	17.2
2025	3,290	658.0	723.8	131.6	19.7
<i>Town of Hingham Institutional Loading Determination</i>					
Year	Population	BOD (lbs/day)	TSS (lbs/day)	TKN (lbs/day)	P (lbs/day)
2001	5,128	1,025.6	1,128.2	205.1	30.8
2025	5,900	1,180.0	1,298.0	236.0	35.4

In the absence of flow monitoring, commercial and industrial loading must be estimated. This is done based on the EPA's Pollutant Loading Estimates for their Design Guide, published in September 2004. Although there is a limited number of Significant Industrial Users (SIU) in Hingham, the design guide value is intended to represent an average. It is believed the limited number of SIUs in Hingham is not significant enough to offset the value given by EPA. Commercial and Industrial design values for pollutant yields, as published by EPA, are shown in Table 3-20 below:

**Table 3-20
EPA Design Guide Values**

<i>EPA Urban Area Design Guide Pollutant Yields Published September 2004</i>				
	TSS (lb/acre/yr)	P (lb/acre/yr)	TKN (lb/acre/yr)	BOD (lb/acre/yr)
Industrial	500	1.3	3.4	NA
Commercial	1,000	1.5	6.7	62

As discussed above, commercial and industrial growth is expected to reflect a 24 percent increase at the end of the study period (2025). The corresponding EPA Design Guide Value is applied to determine the expected loadings at the end of the study period. Tables 3-21 and 3-22 show the current estimated commercial and industrial loadings as well as the projected study year loadings.

**Table 3-21
Commercial Loading Determinations**

<i>North Sewer District Commercial Loading Determination</i>					
Year	Acres	BOD (lbs/day)	TSS (lbs/day)	TKN (lbs/day)	P (lbs/day)
2001	160	27.2	438.4	2.9	0.7
2025	198	33.7	543.6	3.6	0.8
<i>Weir River Sewer District Commercial Loading Determination</i>					
Year	Acres	BOD (lbs/day)	TSS (lbs/day)	TKN (lbs/day)	P (lbs/day)
2001	3	0.5	8.2	0.1	0.01
2025	4	0.6	10.2	0.1	0.0
<i>Unsewered Region of Hingham Commercial Loading Determination</i>					
Year	Acres	BOD (lbs/day)	TSS (lbs/day)	TKN (lbs/day)	P (lbs/day)
2001	155	26.3	424.7	2.8	0.6
2025	192	32.6	526.6	3.5	0.8
<i>Town of Hingham Commercial Loading Determination</i>					
Year	Acres	BOD (lbs/day)	TSS (lbs/day)	TKN (lbs/day)	P (lbs/day)
2001	318	54.0	871.2	5.8	1.3
2025	394	67.0	1,080.3	7.2	1.6

1. EPA Design Guide Values are given in lbs/acre/year. This unit is converted to lbs/acre/day by dividing by 365, thus representing a daily average. No allowance has been made for days of operation or downtime in this conversion.

**Table 3-22
Industrial Loading Determinations**

North Sewer District Industrial Loading Determination					
Year	Acres	BOD (lbs/day)	TSS (lbs/day)	TKN (lbs/day)	P (lbs/day)
2001	90	NA	123.3	0.8	0.3
2025	112	NA	152.9	1.0	0.4
Weir River Sewer District Industrial Loading Determination					
Year	Acres	BOD (lbs/day)	TSS (lbs/day)	TKN (lbs/day)	P (lbs/day)
2001	0	NA	0.0	0.0	0.0
2025	0	NA	0.0	0.0	0.0
Unsewered Region of Hingham Industrial Loading Determination					
Year	Acres	BOD (lbs/day)	TSS (lbs/day)	TKN (lbs/day)	P (lbs/day)
2001	134	NA	183.6	1.2	0.5
2025	166	NA	227.6	1.5	0.6
Town of Hingham Industrial Loading Determination					
Year	Acres	BOD (lbs/day)	TSS (lbs/day)	TKN (lbs/day)	P (lbs/day)
2001	224	NA	306.8	2.1	0.8
2025	278	NA	380.5	2.6	1.0

1. Biochemical Oxygen Demand (BOD) value is given as "NA" in the EPA Design Guide for industrial loading.
2. Conversion from lbs/acre/year to lbs/acre/day does not account for days of operation or "downtime".

A summary of the current and projected conventional pollutant loads generated by the town of Hingham is presented in Table 3-23 below. This summary combines flow from the WRSD, the NSD and the unsewered region of Hingham to give a representative view of the present and projected wastewater loading throughout Hingham.

**Table 3-23
Wastewater Pollutant Loading for Hingham, Present and Future**

Entire Town Of Hingham Constituent	Current Loading (2001)			Projected Loading (2025)		
	Flow (mgd)	Load (lbs/day)	Conc. (mg/l)	Flow (mgd)	Load (lbs/day)	Conc. (mg/l)
Biochemical Oxygen Demand						
Residential	2.33	4,193	215.7	2.83	5,086	215.4
Commercial	0.52	54	12.4	0.64	67	12.5
Industrial	0.12	NA		0.15	NA	
Schools	0.08	1,026	1,536.2	0.09	1,180	1,767.4
Total:	3.05	5,273	207.2	3.70	6,333	205.1
Total Suspended Solids						
Residential	2.33	4,613	237.2	2.83	5,595	236.9
Commercial	0.52	871	200.8	0.64	1,080	202.3
Industrial	0.12	307	306.4	0.15	380	304.0
Schools	0.08	1,128	1,689.8	0.09	1,298	1,944.2
Total:	3.05	6,919	271.8	3.70	8,354	270.5

Entire Town Of Hingham Constituent	Current Loading (2001)			Projected Loading (2025)		
	Flow (mgd)	Load (lbs/day)	Conc. (mg/l)	Flow (mgd)	Load (lbs/day)	Conc. (mg/l)
Total Kjeldahl Nitrogen						
Residential	2.33	839	43.1	2.83	1,017	43.1
Commercial	0.52	6	1.3	0.64	7	1.4
Industrial	0.12	2	2.1	0.15	3	2.1
Schools	0.08	205	307.2	0.09	236	353.5
Total:	3.05	1,052	41.3	3.70	1,263	40.9
Phosphorus						
Residential	2.33	126	6.5	2.83	153	6.5
Commercial	0.52	1	0.3	0.64	2	0.3
Industrial	0.12	1	0.8	0.15	1	0.8
Schools	0.08	31	46.1	0.09	35	47.1
Total:	3.05	159	6.2	3.71	191	6.2

1. The concentrations of wastewater loading constituents are assumed to be constant in the projected wastewater flows. Any variance is due to mathematical rounding during conversion.

3.4.3 Needs Projections

Current water demand for the Town of Hingham has been reported to be 2.32 mgd from data provided by Aquarion Water Company for the year 2004.

Residential Projection

Study of the water supply data from recent years indicates an increase in residential demand more so than any other land use category. This trend is expected to continue as the population of Hingham continues to increase. MAPC projections anticipate a population of 24,692 by the year 2010 and 25,228 by the year 2020. Future residential demand can be estimated by multiplying the established per capita water demand (65.5 gpcd) by the anticipated population. Projected water use is shown in Table 3-24 below:

**Table 3-24:
Projected Residential Hingham Water Use (gpd)**

	2010	2020	2025
Hingham Population	24,692	25,228	25,432
Projected Water Use Based on 65.5 gpcd	1,617,326	1,652,434	1,665,796

Unaccounted For Water

However, as residential water demand has consistently increased over recent years, the volume of "unaccounted for" water has been in steady decline during the same time period. Although leaks, illegal use and the required practice of flushing hydrants will prevent "unaccounted for" water from being eliminated, Aquarion Water

Company has significantly reduced this volume in recent years. Table 3-25 below shows the steady decline of "Unaccounted For" water since 2001.

**Table 3-25
Percentage of "Unaccounted For" Water In Relation to Total Demand**

<i>"Unaccounted For" Water - Aquarion Data</i>	
Year	% of Total Volume
2001	23.1%
2002	18.3%
2003	17.1%
2004	12.9%
2005	TBD

The reduction of "unaccounted for" water by 10.2 percent since 2001 translates to approximately 126 million gallons over the course of a year. The increase in residential use during this same time period is equivalent to approximately 20 million gallons over the course of one year. Therefore, recent efforts by Aquarion Water Company, to minimize inefficiency, have reduced overall water use even in light of the constant increase in residential demand. In fact, overall water use has declined from 3.8 mgd in 2001 to 3.4 mgd in 2005.

3.5 Hingham Water Use Projections, In Summary

Commercial and industrial demand is expected to increase at a rate of 1 percent each year during the study period. Municipal demand will increase moderately while institutional demand is expected to increase as much as 12.5 percent over the next ten years. These growth expectations and the sources of data are described in more detail in section 3.3.1 of this report. Projections of future water demand, based on these growth expectations, are summarized in Table 3-26 below:

**Table 3-26
Future Water Use Projections**

<i>Hingham Land Use</i>	<i>2010 Projected Growth</i>	<i>2010 Hingham Projected Use (gpd)</i>	<i>2025 Projected Growth</i>	<i>2025 Hingham Projected Use (gpd)</i>
Residential	19.0%	1,738,736	23%	1,797,181
Institutional	6.3%	49,284	15%	53,343
Municipal	5.0%	2,435	21%	2,801
Industrial	6.0%	24,584	24%	28,758
Commercial	6.0%	245,839	24%	287,586
Unaccounted for	3.5%	264,046	14%	290,833
Exterior Use (Loss)	3.5%	312,055	14%	343,712
Totals:		2,636,979	21%	2,804,215

As indicated in the above table, Hingham water use is projected to reach 2.64 mgd by the year 2010 and 2.80 mgd by the year 2025. These projections indicate the increase of water use by 0.32 mgd in 2010 and by 0.48 mgd in 2025.

Section 4

Wastewater Needs/Problem Identification

4.1 Introduction

The purpose of this section is to identify and prioritize areas of need in the Town of Hingham for wastewater management solutions. The analysis divided the town into smaller study areas based on geography, topography, soil characteristics, groundwater conditions and other criteria. An evaluation and ranking of each study area was then performed based on a set of criteria developed to assess the need for wastewater management. The results of this needs analysis will be used to develop recommendations to address these wastewater management needs.

4.2 On-Site Wastewater Disposal

An interview was conducted with Mr. Bruce Capman, the Executive Health Officer (EHO) for the Town of Hingham in February 2006. The purpose of the discussion was to characterize and inventory existing on-site sanitary disposal systems (SDSs) in Hingham, identify problem areas, and assess reasons for SDS Title 5 inspection failures and repairs. A separate discussion was held with Mr. Michael McDonald, Hingham Board of Health (BOH) Agent, during June 2006 to discuss soil and groundwater conditions throughout the town. The following list highlights the topics of discussion during these two meetings:

- Based on experience, approximately 20 percent of existing on-site SDSs consist of Cesspools. (Cesspools are not allowed by regulation and are not considered a viable long-term option for wastewater management).
- Local BOH regulations require a system pumpout, a soil observation, and a groundwater determination with every Title 5 Inspection Report.
- Soil and groundwater conditions in town can present challenges to SDS repairs and upgrades. Groundwater depths generally correspond to soil type. Groundwater depths in sands and gravels are typically five to seven feet below the ground surface (bgs). Groundwater depths in Till and Bedrock areas are typically three to five feet bgs.
- High groundwater conditions are responsible for approximately 90 percent of the Innovative/Alternative (I/A) systems in town.
- The EHO suggests that the overall Title 5 System Inspection Failure Rate is approximately 30 percent.
- Both representatives were asked about specific area(s) of town requiring a wastewater management solution. During separate meetings, both officials replied that the World's End area would be on their priority list.

Meeting Notes from these sessions are attached in Appendix E.

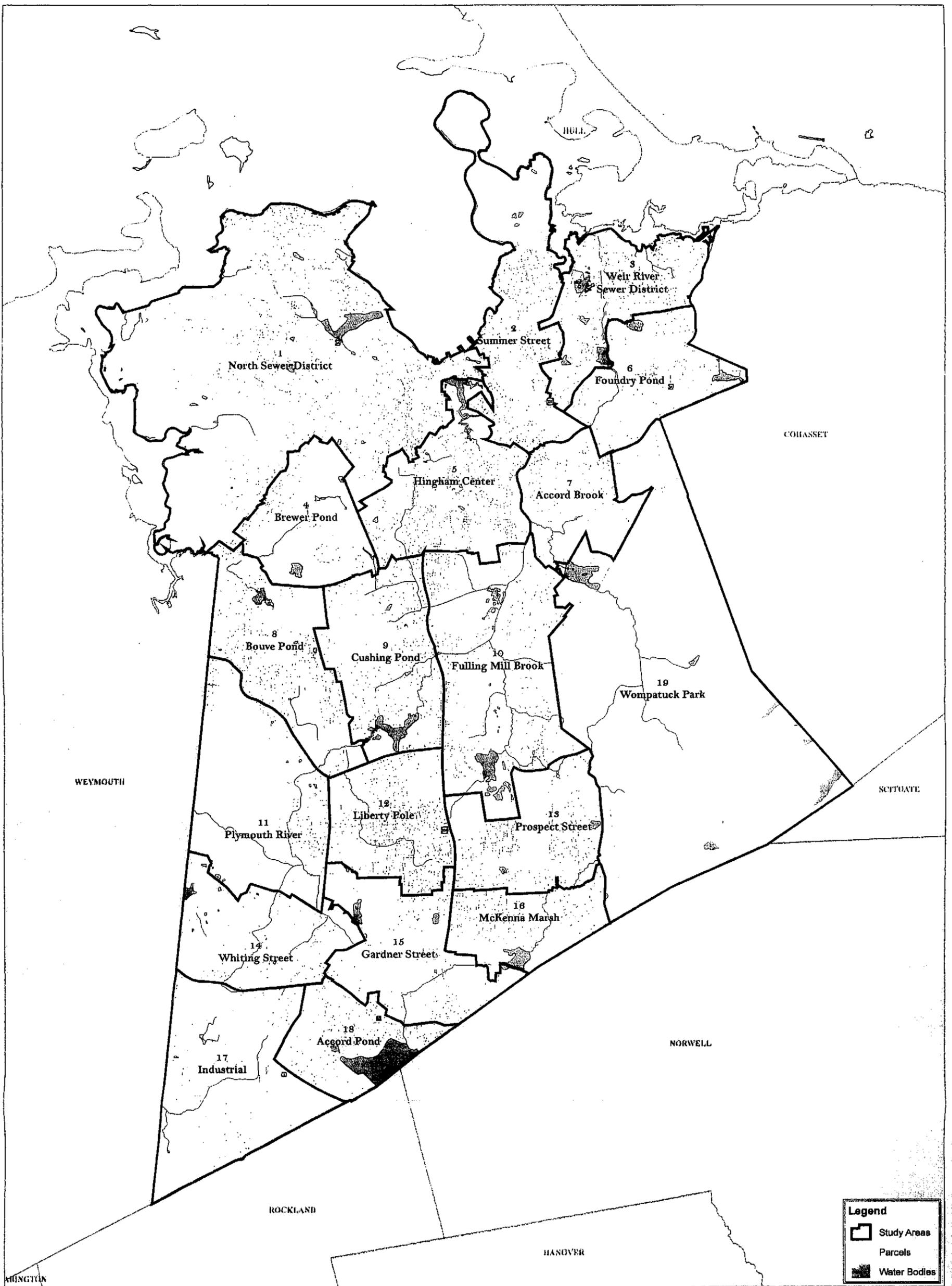
4.3 Delineation of Study Areas

The entire Town of Hingham was divided into areas with similar land uses, lot sizes, and by topography. Delineation of the Study Areas was intended to create manageable sections of Hingham, with relatively homogenous characteristics, to be assessed against criteria for determining wastewater management need.

The Study Area boundaries follow property boundaries or include developed portions of lots so these areas may be analyzed with the goal of formulating a long-term wastewater solution for those properties. In this way, roadways generally do not form study area boundaries. The division into study areas was the result of visual review of information already accumulated, and no detailed analysis was used to complete this step. The North Sewer District, Weir River Sewer District, and Wompatuck State Park were assigned their own Study Areas for consistency with the remainder of the community as part of a comprehensive wastewater management solution. Table 4-1 shows the list of Study Areas, and Figure 4-1 shows the boundaries of the Study Areas in Hingham.

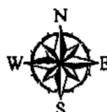
**Table 4-1
Hingham Study Areas**

Study Area #	Study Area Name
1	North Sewer District
2	Worlds End
3	Weir River Sewer District
4	Brewer Pond
5	Home Meadows
6	Foundry Pond
7	Accord Brook
8	Bouve Pond
9	Cushing Pond
10	Fulling Mill Brook
11	Plymouth River
12	Liberty Pole
13	Prospect Street
14	Whiting Street
15	Gardner Street
16	McKenna Marsh
17	Industrial
18	Accord Pond
19	Wompatuck State Park



**Town of Hingham
Comprehensive Wastewater
Management Plan**

CDM



0 750 1,500 3,000 4,500 6,000 Feet

Figure 4-1

Study Areas

Through the course of the Needs Analysis, these Study Areas will be evaluated and scored to determine the priority of need. It is expected that the North Sewer District and Wompatuck State Park study areas will score relatively low compared to the others for priority of need. The significant majority of the North Sewer District is seweraged through the MWRA, and Wompatuck is also seweraged and is not, nor will it be developed. The Weir River Sewer District Study Area will likely score high on the priority list justifying the need for recently installed sewers.

4.4 Evaluation/Assessment of Study Areas

Using reference guidance documents as a guideline, specific categories were defined to assess the need for wastewater management within the Town of Hingham. Within these categories, specific criterion were used to evaluate individual study areas within the town. The assessment included the preparation of a "Needs Evaluation Matrix" with a scoring system for each category. Three main categories are as follows:

1. Lot Size and Density
2. Suitability of Subsurface Conditions for On-Site Disposal Systems
3. Proximity to Environmental Resources

Criterion to be considered under each main category is as follows:

1. Lot Size and Density
 - Distribution and prevalence of small lot size
 - Nitrogen Loading
2. Suitability of Subsurface Conditions for On-Site Disposal Systems
 - Percolation Rate
 - Depth to Groundwater
 - Prevalence of Title 5 repairs/inspection failures
 - Depth to bedrock
3. Proximity to Environmental Resources
 - Zone I of public water supply
 - Zone II/Aquifer Protection Zone of public water supply
 - Interim Wellhead Protection Areas (IWPA)
 - Within 200' Buffer zone of surface water supply
 - Prevalence of wetlands
 - Prevalence of 100-Year Floodplain
 - Area of Critical Environmental Concern (ACEC)
 - Stressed Basin

Determination of wastewater need is assessed by assigning a point value to the individual criteria in each of the Study Areas. Points are assigned based on the

applicability of the criteria on a scale from one (1) to four (4). A score of one indicates a slight limitation or problem. A score of four indicates severe limitations or problems. A score of zero (0) is used to indicate no problems in a particular category.

After discussions with the Steering Committee, the distinctions between categories were found to be inconsequential. All criteria were found to be equally important in the rating scale as another. A "flat" or unweighted scoring system was adopted for this assessment. For discussion purposes, it is convenient to discuss related criterion together due to the manner in which the criterion are analyzed. Therefore, the scoring of individual categories is described in the following sections.

4.5 Lot Size and Lot Density

Small lot size can restrict or limit the ability of a parcel to allow design and construction (or repair) of an on-site system in full compliance with state and local regulations. Further, the density of development is also a function of lot size. Densely developed areas, with large numbers of on-site systems, are a potential threat to groundwater supplies. Even when performing correctly, increased nitrogen loads from on-site systems in densely developed areas can degrade groundwater quality.

Using the Hingham Zoning By-Law as a starting point, five lot size ranges were selected for this part of the needs analysis. These ranges are shown in Table 4-2 below:

**Table 4-2
Thresholds for Grouping Existing Lots by Size**

<i>Study Area Condition</i>
Up to and including 10,000 sf
Between 10,001 sf and 20,000 sf
Between 20,001 sf and 30,000 sf
Between 30,001 sf and 40,000 sf
40,001 sf or greater

The lot size thresholds were chosen for consistency with local zoning requirements, to identify denser areas that may have been developed prior to zoning, and the ability of a parcel to adequately contain sufficient area to site a structure with an SDS (with room for replacement) when considering minimum setback distances between structures, site features and the SDS. The parcels within each lot size range were tabulated for each of the Study Areas. The percentage distribution of lot sizes were then determined and assigned a point score based on this distribution.

Table 4-3 shows the percentage distribution of the lot sizes within each Study Area.

Table 4-3
Percentage Distribution of Lot Size per Study Area

Study Area	Area Name	Parcels > 40,000 ft ²	Parcels 30,001 to 40,000 ft ²	Parcels 20,001 to 30,000 ft ²	Parcels 10,001 to 20,000 ft ²	Parcels < or = 10,000 ft ²	Parcels < or = 20,000 ft ² (2)
1	North Sewer District	14.4%	6.2%	14.6%	32.7%	32.1%	64.7%
2	Worlds End	44.8%	9.8%	22.9%	11.6%	10.8%	22.4%
3	Weir River Sewer District	30.5%	10.5%	13.8%	24.1%	21.0%	45.1%
4	Brewer Pond	30.6%	12.2%	37.4%	16.3%	3.4%	19.7%
5	Home Meadows	17.9%	8.3%	18.5%	35.4%	19.9%	55.3%
6	Foundry Pond	35.6%	8.0%	32.8%	23.0%	0.6%	23.6%
7	Accord Brook	79.2%	11.3%	4.4%	4.4%	0.6%	5.0%
8	Bouve Pond	16.8%	15.8%	36.1%	22.9%	8.4%	31.3%
9	Cushing Pond	28.2%	20.2%	31.3%	18.6%	1.6%	20.2%
10	Fulling Mill Brook	56.5%	8.6%	12.8%	8.9%	13.3%	22.1%
11	Plymouth River	48.9%	17.3%	20.1%	11.5%	2.2%	13.7%
12	Liberty Pole	14.4%	9.5%	32.7%	42.8%	0.5%	43.3%
13	Prospect Street	50.5%	13.7%	12.7%	21.0%	2.2%	23.2%
14	Whiting Street	66.1%	11.0%	12.8%	7.3%	2.8%	10.1%
15	Gardner Street	46.9%	11.5%	28.1%	12.0%	1.6%	13.5%
16	McKenna Marsh	43.6%	14.8%	20.0%	17.2%	4.4%	21.6%
17	Industrial	73.9%	2.2%	10.1%	7.2%	6.5%	13.8%
18	Accord Pond	25.2%	16.1%	32.2%	25.2%	1.3%	26.5%
19	Wompatuck State Park ¹	0	0	0	0	0	0

1 – The Wompatuck State Park Study Area is protected from the threat of development and consists of a relatively small number of parcels. The small number of parcels and large lot size yield low lot density results and will be treated as one large parcel for this portion of the assessment.

2 – Percentages shown in right column represent the total (rounded) of the percentages listed in the preceding two columns.

A lot size of 20,000 sf is used as a limiting guideline due to the difficulties in siting SDSs and structures on parcels of this size (and smaller). Also, this lot size represents the minimum lot size based on Residence District A in the Hingham Zoning By-Laws.

The varying percentage distributions for lot size is expected, and based upon experience in other communities, the lot density criteria values are based on the percentage distribution of lots in each range are as follows in Table 4-4:

Table 4-4
Conditions for Assigning Small Lot Size Criterion Values to Study Areas

<i>Criteria Value</i>	<i>Study Area Condition</i>
4	50% - 100% of the lots are < 20,000 sf
3	30% - 50% of the lots are < 20,000 sf
2	10% - 30% of the lots are < 20,000 sf OR 0% - 10% of lots are < 20,000 sf AND 0% - 40% of lots are > 30,000 sf.
1	0% - 10% of the lots are < 20,000 sf AND 40% - 100% of lots are > 30,000 sf
0	N/A

Each of the Study Areas is scored using the criterion values shown above in relation to the lot size distribution. Scores for Study Areas containing a majority of properties with limiting lot size received a score of four (4). Study Areas containing a majority of properties with larger lot size receive a score of one (1).

The lot size criterion score attributed to each Study Area is shown in Table 4-5 below:

Table 4-5
Small Lot Size/ Density Criterion Scores per Study Area

<i>Area</i>	<i>Area Name</i>	<i>Lot Size Score</i>
1	North Sewer District	4
2	Worlds End	2
3	Weir River Sewer District	3
4	Brewer Pond	2
5	Home Meadows	4
6	Foundry Pond	2
7	Accord Brook	1
8	Bouve Pond	3
9	Cushing Pond	2
10	Fulling Mill Brook	2
11	Plymouth River	2
12	Liberty Pole	3
13	Prospect Street	2
14	Whiting Street	2
15	Gardner Street	2
16	McKenna Marsh	2
17	Industrial	2
18	Accord Pond	2
19	Wompatuck State Park	0

These Lot Size/Density Scores are entered in Table 4-17, "Needs Assessment Matrix" to determine the overall score for each Study Area. High overall scores show the highest level of wastewater "need".

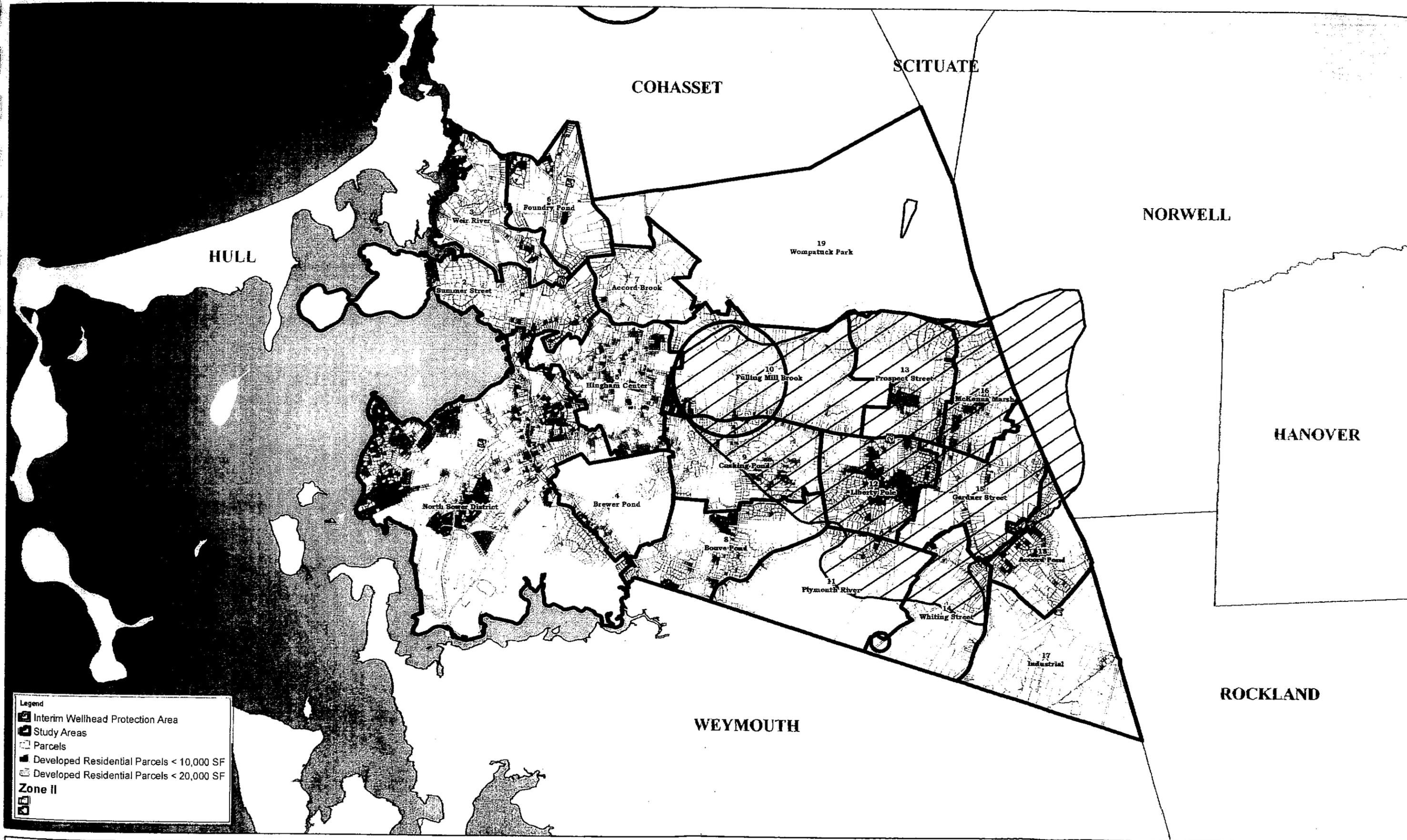
4.6 Nitrogen Loading Criteria

Small lot sizes were screened against Mass GIS mapping of Zone II areas, Interim Wellhead Protection Areas (IWPA's) and private wells to determine the locations of dense development within nitrogen sensitive areas. To obtain scores for the "Excessive Nitrogen Loading" criterion, the percent area of excessive nitrogen loading was determined for each Study Area. Similar to the Lot Size/Density analysis described above, criteria values were assigned such that Study Areas with the highest potential for nitrogen loading received a score of four (4), down to Study Areas without any area of excessive nitrogen loading receiving a score of zero (0).

**Table 4-6
Conditions for Assigning Nitrogen Loading
Criterion Values to Study Areas**

<i>Criteria Value</i>	<i>Study Area Condition</i>
4	30% - 100% of residential area has lots < 10,000 sf in size OR multifamily located in a nitrogen sensitive area
3	15% - 30% of residential area has lots < 10,000 sf in size OR multifamily located in a nitrogen sensitive area
2	5% - 15% of residential area has lots < 10,000 sf in size OR multifamily located in a nitrogen sensitive area OR 20% - 100% of residential area has lots 10,001 - 20,000 sf located within a nitrogen sensitive area
1	0% - 20% of residential area has lots < 20,000 sf OR multifamily located in a nitrogen sensitive area
0	No residential area has lots < 10,000 acre in size OR multifamily located in a nitrogen sensitive area

Excessive nitrogen loading is considered to occur in conditions where wastewater flow exceeds 440 gallons per day (gpd) per acre (Per Title 5 definition). Developed residential lots with less than ½-acre (and multi-family) meet the standard of dense development. This condition generally exists in areas of town developed prior to zoning regulations. Commercial and Industrial properties tend to be larger in area, and discharge less wastewater on a per acre basis. GIS mapping was used to identify nitrogen sensitive areas and developed residential properties with less than 10,000 s.f., and between 10,000 to 20,000 s.f., and multi-family properties. The mapped results of this analysis are shown in Figure 4-2, and the percentages of the area meeting the above criteria (in each Study Area) are shown in Table 4-7.



Legend

- Interim Wellhead Protection Area
- Study Areas
- Parcels
- Developed Residential Parcels < 10,000 SF
- Developed Residential Parcels < 20,000 SF

Zone II

-

Town of Hingham
Comprehensive Wastewater Management Plan

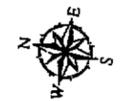


Figure 4-2

Nitrogen Sensitive Areas

**Table 4-7
Percentage of Residential Land Area within Nitrogen Sensitive Zones**

Study Area	Area Name	< or = 10,000 ft²	> 10,000 ft² and < or = 20,000 ft²	Multi-Family In Nitrogen Sensitive Area
1	North Sewer District	29.6%	32.2%	No
2	Worlds End	9.9%	10.7%	No
3	Weir River Sewer District	20.4%	22.7%	No
4	Brewer Pond	2.7%	12.3%	No
5	Home Meadows	16.4%	33.4%	No
6	Foundry Pond	0.6%	21.3%	No
7	Accord Brook	0.7%	5.0%	No
8	Bouve Pond	8.6%	22.1%	No
9	Cushing Pond	1.4%	17.4%	No
10	Fulling Mill Brook	13.7%	9.1%	Yes
11	Plymouth River	0.6%	9.5%	No
12	Liberty Pole	0.5%	40.7%	Yes
13	Prospect Street	2.1%	18.1%	Yes
14	Whiting Street	2.4%	6.0%	No
15	Gardner Street	1.4%	9.6%	Yes
16	McKenna Marsh	4.4%	16.7%	Yes
17	Industrial	0.0%	19.2%	No
18	Accord Pond	0.3%	20.9%	No
19	Wompatuck State Park	0.0%	0.0%	No

Each of the Study Areas is scored using the criterion values shown above. Scores for Study Areas containing the highest relative percentage of excessive nitrogen loading conditions received a score of four (4). Study Areas containing a lesser percentage of properties with nitrogen sensitive conditions receive a score of one (1).

The nitrogen loading score attributed to each Study Area is shown in Table 4-8 below:

**Table 4-8
Excessive Nitrogen Loading Scores per Study Area**

Area	Area Name	Nitrogen Loading Score
1	North Sewer District	3
2	Worlds End	2
3	Weir River Sewer District	3
4	Brewer Pond	1
5	Home Meadows	3
6	Foundry Pond	2
7	Accord Brook	1
8	Bouve Pond	2
9	Cushing Pond	4
10	Fulling Mill Brook	4
11	Plymouth River	1
12	Liberty Pole	4
13	Prospect Street	4
14	Whiting Street	1
15	Gardner Street	4
16	McKenna Marsh	3
17	Industrial	1
18	Accord Pond	2
19	Wompatuck State Park	0

The Nitrogen Loading score is then entered into the Needs Assessment Matrix, Table 4-17.

4.7 Suitability of Subsurface Conditions for On-Site SDSs

Determinations of wastewater needs cannot be made without understanding the subsurface conditions within those Study Areas. Subsurface conditions that were assessed include general soil permeability and depth to groundwater based on soil type; and prevalence of On-Site system repairs. After mapping the subsurface conditions in Hingham that limit the successful long-term function of an on-site system, the percentage distribution coverage of each condition was scored for each Study Area.

For each subsurface limitation evaluated, the value four (4) is scored to the Study Area with the highest percentage of that particular limiting condition. Any other Study Area with a value of 75 percent – 100 percent of the highest percentage will also receive a score of four. Study Areas with a percentage of 50 percent - 75 percent of the highest percentage will be assigned a score of three (3). Study Areas with a percentage of 25 percent - 50 percent of the highest percentage will be assigned a score of two (2).

Study areas with a distribution less than 25 percent of the maximum will be scored with one (1) point. Any Study Areas with none of a particular limiting condition will be scored a zero (0). A relative scale of zero to four was used to score these conditions as shown in Table 4-9.

**Table 4-9
Conditions for Assigning Subsurface Condition Values to Study Areas**

<i>Criteria Value</i>	<i>Study Area Condition</i>
4	Criterion percentage value within 75% – 100% of the highest percentage in all Study Areas
3	Criterion percentage value within 50% – 75% of the highest percentage in all Study Areas
2	Criterion percentage value within 25% – 50% of the highest percentage in all Study Areas
1	Criterion percentage value less than 25% of the highest percentage in all Study Areas
0	No limiting condition

The assessment of On-Site Sanitary Disposal Systems (SDSs) with poor performance is a measurable criterion. While many repairs to on-site SDSs are driven by property sales, and some neighborhoods experience this transition faster than others, this criteria is an indicator of subsurface conditions or relative age of systems indicating neighborhoods where wastewater solutions are required. Conversely, areas lacking significant numbers of repairs cannot be assumed to possess favorable conditions for continued reliance on on-site SDSs. Property owners may be simply unaware of the condition of their system.

To categorize the Study Areas for the prevalence of system repairs, Board of Health records were used to determine the type and location of on-site SDS repairs. These records have been maintained by the Board of Health for the past 5 years. System Inspections prior to property transfer have been required for approximately ten years. Even with this limited period of record, measurable results are revealed. Figure 4-3 shows those properties in Hingham identified with a permitted SDS repair, along with the general soil conditions available from MassGIS. Poor system performance is measured by dividing the number of SDS repair permits issued by the Hingham Board of Health (and/or MassDEP) by the total number of systems (or existing developed properties) within each Study Area.

Criterion scores for System Repairs or Replacements are scored as described above, where the percentages are scored in relation to the highest percentage of SDS repairs within the Study Areas in Hingham. Study Areas with 75 percent - 100 percent of the highest percentage is scored four (4) points, areas with 50 percent - 75 percent of the highest percentage is scored with three (3) points. This pattern is followed as above, down to zero (0).

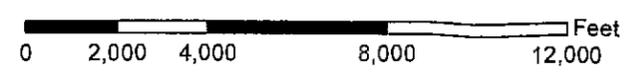
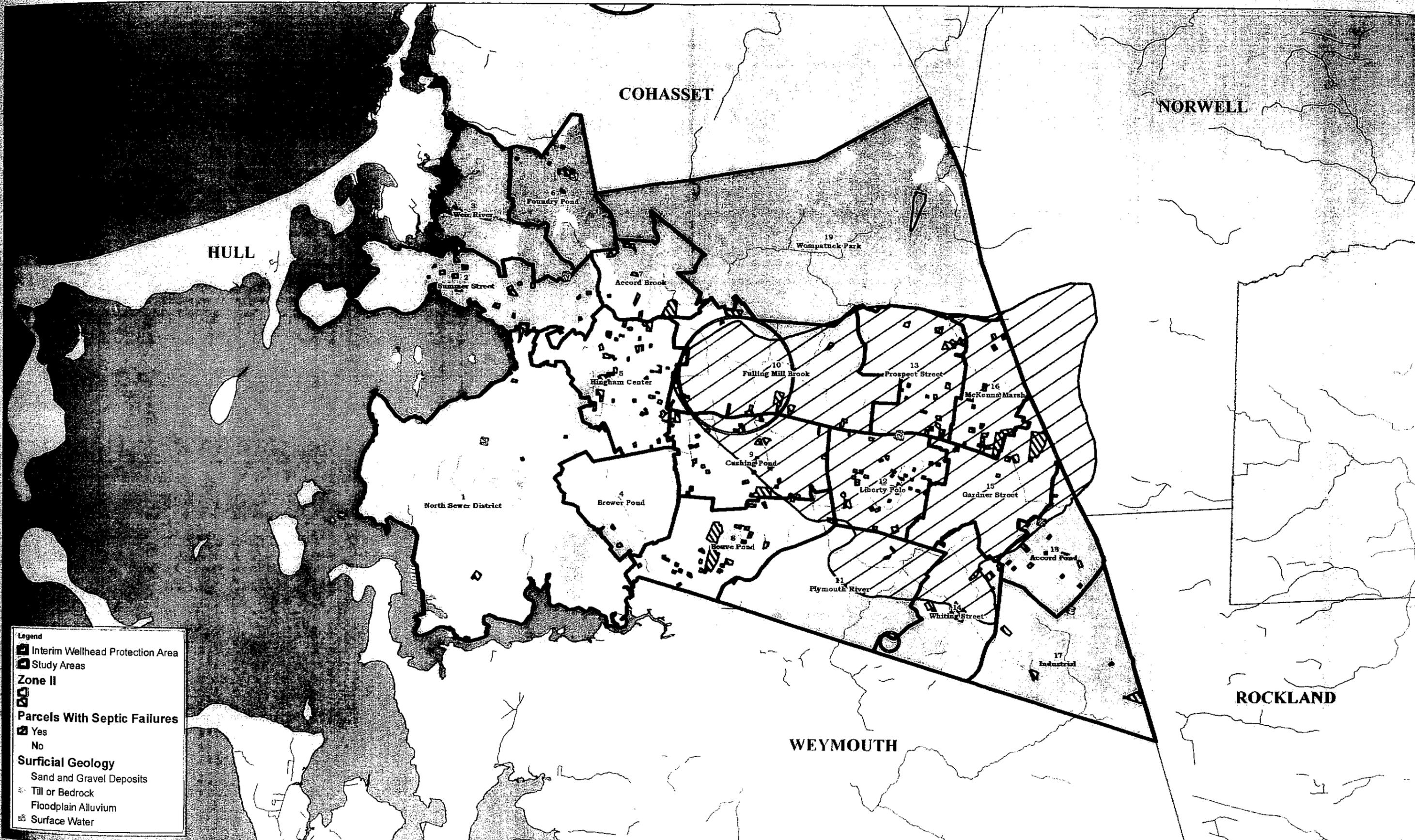


Figure 4-3

The results of the SDS repair assessment are shown in Table 4-10.

**Table 4-10
Percentage of Developed Properties with SDS Repairs**

<i>Area</i>	<i>Area Name</i>	<i>No. of SDS Repairs</i>	<i>Unsewered Developed Properties</i>	<i>Percentage of Repaired SDSs (5 Year Span)</i>
1	North Sewer District	5	75	6.7%
2	Worlds End	17	394	4.3%
3	Weir River Sewer District	1	200	0.5%
4	Brewer Pond	4	187	2.1%
5	Home Meadows	41	664	6.2%
6	Foundry Pond	6	169	3.6%
7	Accord Brook	6	139	4.3%
8	Bouve Pond	23	467	4.9%
9	Cushing Pond	27	505	5.3%
10	Fulling Mill Brook	12	373	3.2%
11	Plymouth River	3	158	1.9%
12	Liberty Pole	36	590	6.1%
13	Prospect Street	18	331	5.4%
14	Whiting Street	7	84	8.3%
15	Gardner Street	8	218	3.7%
16	McKenna Marsh	16	252	6.3%
17	Industrial	4	26	15.4%
18	Accord Pond	12	287	4.2%
19	Wompatuck State Park	0	5	0.0%

The Prevalence of SDS Repairs score attributed to each Study Area is shown in Table 4-11 below:

**Table 4-11
Prevalence of SDS Repairs Scores per Study Area**

Area	Area Name	Prevalence of SDS Repairs Score
1	North Sewer District	2
2	Worlds End	2
3	Weir River Sewer District	1
4	Brewer Pond	1
5	Home Meadows	2
6	Foundry Pond	1
7	Accord Brook	2
8	Bouve Pond	2
9	Cushing Pond	2
10	Fulling Mill Brook	1
11	Plymouth River	1
12	Liberty Pole	2
13	Prospect Street	2
14	Whiting Street	3
15	Gardner Street	1
16	McKenna Marsh	2
17	Industrial	4
18	Accord Pond	2
19	Wompatuck State Park	0

The Prevalence of SDS Repairs score is then entered into the Needs Assessment Matrix, Table 4-17.

4.8 Subsurface Conditions

MassGIS soil mapping shows three main soil types in Hingham; Sand and Gravel; Till and Bedrock; and Floodplain Alluvium. The soil map for Hingham is shown on Figure 4-3 (on page 13 of this report section). Soil type and groundwater conditions are critical elements when considering on-site SDSs for long-term wastewater disposal.

Sand and gravel soils are relatively porous and pass wastewater fairly well. However, the rapid infiltration rates associated with sands and gravels, cause this material to be considered a poor filter. This condition is exacerbated when there is inadequate separation from the groundwater system, potentially threatening groundwater

quality and the public health. For this reason, on-site SDSs in soils with rapid infiltration rates are required to add to the vertical separation above groundwater to increase filtration. The Hingham Board of Health reports that groundwater levels are approximately five to seven feet below the ground surface (bgs) in these soils. For the purpose of assessing the ability of an area to provide for continued reliance on SDSs, this condition is seen as limiting, especially where Hingham relies on the quality of surface and groundwater supplies for its drinking water.

Till and Bedrock soils also have limitations. These soils have slow infiltration rates, and tend to cause back-ups or surface breakouts. The impermeable soils tend to "perch" groundwater on top of these dense subsurface layers and are subject to "seasonal" high water tables where the ground surface remains saturated during the spring. SDSs in these soils require more land area than sand and gravel systems to dissipate wastewater flows. The Hingham Board of Health reports that groundwater levels are approximately three to five feet bgs in these soils. Shallow groundwater conditions require the land to be "mounded" to satisfy the minimum vertical separation between the leaching system and the maximum groundwater level. For the purpose of assessing the ability of an area to provide for continued reliance on SDSs, this condition is seen as limiting. Study areas with high percentages of till and bedrock soils will score relatively high on a "needs" scale.

Floodplain Alluvium soils are materials with very fine particles that tend to be compact and do not infiltrate wastewater very well when used for effluent disposal. These soils tend to be deposited along waterways and water bodies and from a visual review of the map, are not the predominant soil type. Areas with large deposits of floodplain alluvium soils are considered limiting, and study areas with the largest area percentages are scored accordingly.

Criterion scores for subsurface conditions are scored as described in Table 4-12.

Table 4-12
Conditions for Assigning Limiting Subsurface Conditions Scores

<i>Criteria Value</i>	<i>Study Area Condition</i>
4	Highest percentage of coverage for a particular resource, plus any Study Area with 75-100% of the maximum coverage
3	50% - 75% of the maximum coverage
2	25% - 50% of the maximum coverage
1	Less than 25% of the maximum coverage
0	Study Area has none of a particular limiting subsurface condition within its boundaries

Table 4-13
Percentage of Limiting Subsurface Conditions per Study Area

<i>Study Area</i>	<i>Study Area Name</i>	<i>Prevalence of Sand & Gravel Score</i>	<i>Prevalence of Fine/Silty (Floodplain Alluvium) Material Score</i>	<i>Prevalence of Till/Bedrock Score</i>
1	North Sewer District	2	1	2
2	Worlds End	2	1	2
3	Weir River Sewer District	4	0	4
4	Brewer Pond	0	1	0
5	Home Meadows	2	4	0
6	Foundry Pond	4	1	4
7	Accord Brook	4	1	3
8	Bouve Pond	0	1	0
9	Cushing Pond	0	1	0
10	Fulling Mill Brook	2	1	2
11	Plymouth River	0	1	0
12	Liberty Pole	0	1	0
13	Prospect Street	2	1	2
14	Whiting Street	3	0	2
15	Gardner Street	3	1	3
16	McKenna Marsh	0	1	0
17	Industrial	4	1	3
18	Accord Pond	4	1	3
19	Wompatuck State Park	4	1	4

The Prevalence of Limiting Subsurface Conditions score is then entered into the appropriate column(s) in the Needs Assessment Matrix, Table 4-17.

4.9 Proximity to Environmental Resources

A goal of this CWMP is to protect and preserve environmental resources and public health. Degradation of these resources can be minimized by protecting the following areas related to public water supply:

- Public water supply Zone I Areas
- Public water supply Zone II Areas
- Interim Wellhead Protection Areas
- Private Well Areas

- Town Aquifer Protection Zones

Other sensitive environmental receptors are categorized as follows:

- Surface Waters
- Wetlands and Swamps
- Floodplains
- Areas of Critical Environmental Concern (ACEC)
- Stressed Basins

Each resource and associated protective buffer zones has been mapped town-wide and overlaid with Study Area boundaries. This process allows the percentage coverage of each resource within each of the Study Areas to be determined. Results of this process are tabulated in the following format:

Table 4-14
Conditions for Assigning Prevalence of Environmental Resources Scores

<i>Criteria Value</i>	<i>Study Area Condition</i>
4	Highest percentage of coverage for a particular resource, plus any Study Area with 75-100% of the maximum coverage
3	50% - 75% of the maximum coverage
2	25% - 50% of the maximum coverage
1	Less than 25% of the maximum coverage
0	Study Area has none of a particular environmental resource area within its boundaries

The percent coverage of environmental resources, are calculated for each Study Area and is scored on a scale from zero to four. Similar to previous assessments, the maximum value of four (4) was assigned to the Study Area with the highest percentage of coverage of a particular resource. Any Study Area with 75 percent - 100 percent of the value of that category's maximum coverage is also scored a four (4). Any Study Area with 50 percent - 75 percent of the value of maximum coverage is scored a three (3). Any Study Area with 25 percent - 50 percent of the maximum coverage value is scored a two (2). Study Areas with less than 25 percent of the maximum coverage are scored a one (1). Any Study area with none of a particular resource area within its boundaries is assigned a zero (0).

**Table 4-15
Prevalence of Environmental Resources per Study Area**

Study Area	Study Area Name	IWPA	Zone I	Zone III/ Aquifer Zone	Surface Water (includes 200' Buffer)	Wetlands (includes 100' Buffer)	100 Year Flood Plain	ACEC	Stressed Basin
1	North Sewer District	0.0%	0.0%	0.0%	8.7%	4.2%	11.6%	16.4%	44.6%
2	Worlds End	0.0%	0.0%	0.0%	3.3%	6.2%	14.1%	8.1%	96.7%
3	Weir River Sewer District	0.0%	0.0%	0.0%	18.6%	18.8%	27.2%	29.2%	95.3%
4	Brewer Pond	0.0%	0.0%	0.0%	4.5%	11.7%	12.7%	33.0%	26.1%
5	Home Meadows	0.6%	0.0%	0.4%	14.0%	9.6%	20.1%	0.0%	100.0%
6	Foundry Pond	0.0%	0.0%	0.0%	12.4%	0.9%	12.4%	0.1%	100.0%
7	Accord Brook	0.0%	0.0%	0.0%	1.6%	6.4%	10.9%	0.0%	97.6%
8	Bouve Pond	0.0%	0.0%	6.1%	7.1%	8.6%	15.8%	4.7%	43.4%
9	Cushing Pond	8.7%	0.0%	58.6%	12.5%	11.2%	22.3%	0.0%	99.5%
10	Fulling Mill Brook	45.7%	5.1%	83.4%	13.5%	9.3%	25.8%	0.0%	100.0%
11	Plymouth River	0.3%	0.2%	29.6%	4.3%	22.6%	23.1%	0.0%	73.1%
12	Liberty Pole	0.0%	0.0%	99.0%	1.5%	11.1%	16.6%	0.0%	100.0%
13	Prospect Street	0.0%	3.6%	99.7%	7.1%	2.5%	13.5%	0.0%	100.0%
14	Whiting Street	2.1%	1.9%	40.2%	10.9%	1.2%	5.4%	0.0%	100.0%
15	Gardner Street	0.0%	0.0%	99.4%	15.4%	5.6%	25.6%	0.0%	100.0%
16	McKenna Marsh	0.0%	5.0%	100.0%	9.2%	21.0%	27.1%	0.0%	100.0%
17	Industrial	0.0%	0.0%	0.8%	2.5%	6.2%	16.2%	0.0%	24.3%
18	Accord Pond	0.0%	3.0%	16.2%	24.2%	6.1%	26.5%	0.0%	99.5%
19	Wompatuck State Park	0.0%	0.7%	1.2%	5.2%	7.2%	4.7%	0.0%	58.6%

The resulting criteria scores are tabulated in a category table as shown below (Table 4-16).

When these conditions are applied to the scoring system similar to previous assessments, the individual scores for each resource area result in Table 4-16.

Table 4-16
Prevalence of Environmental Resources Scores per Study Area

Study Area	Study Area Name	I/WPA	Zone I	Zone II/ Aquifer Zone	Surface Water (Includes 200' Buffer)	Wetlands (Includes 100' Buffer)	100 Year Flood Plain	ACEC	Stressed Basin
1	North Sewer District	0	0	0	2	1	2	2	2
2	Worlds End	0	0	0	1	2	3	1	4
3	Weir River Sewer District	0	0	0	4	4	4	4	4
4	Brewer Pond	0	0	0	1	3	2	4	2
5	Home Meadows	1	1	1	3	2	3	0	4
6	Foundry Pond	0	0	0	3	1	2	2	4
7	Accord Brook	0	0	0	1	2	2	0	4
8	Bouve Pond	0	0	1	2	2	3	1	2
9	Cushing Pond	1	0	3	3	2	4	0	4
10	Fulling Mill Brook	4	4	4	3	2	4	0	4
11	Plymouth River	1	1	2	1	4	4	0	3
12	Liberty Pole	0	0	4	1	2	3	0	4
13	Prospect Street	0	3	4	2	1	2	0	4
14	Whiting Street	1	2	2	2	1	1	0	4
15	Gardner Street	0	0	4	3	1	4	0	4
16	McKenna Marsh	0	4	4	2	4	4	0	4
17	Industrial	0	0	1	1	2	3	0	1
18	Accord Pond	0	3	1	4	2	4	0	4
19	Wompatuck State Park	0	1	1	1	2	1	0	3

The Prevalence of Environmental Resources score is then entered into the appropriate column(s) in the Needs Assessment Matrix, Table 4-17.

4.10 Needs Assessment Matrix

The total point score for each Study Area is the sum of the Category Scores and will determine the "priority of need" for wastewater management in Hingham.

The individual criterion scores from this needs evaluation have been entered into the Needs Assessment Matrix, Table 4-17, and these scores have been tabulated to obtain a sum for each Study Area.

**Table 4-18
Needs Assessment Matrix**

Hingham Comprehensive Wastewater Management Plan

Study Area #	Study Area Name	Lot Size Score	Nitrogen Loading Score	IWPA Score	Zone I Score	Zone II/ Town Aquifer Protection Zone Score	Surface Water Supplies (200' buffer) Score	Wetlands (100' buffer) Score	100- Year Flood Plains Score	ACEC Score	Stressed Basins Score	Prevalence of Sand & Gravel Score	Prevalence of Fine/Silty Material Score	Prevalence of Till/Bedrock Score	Prevalence of System Repairs Score	Total Score
1	North Sewer District	4	3	0	0	0	2	1	2	2	2	2	1	2	2	23
2	Summer Street	2	2	0	0	0	1	2	3	1	4	2	1	2	2	22
3	Weir River Sewer District	3	3	0	0	0	4	4	4	4	4	4	0	4	1	35
4	Brewer Pond	2	1	0	0	0	3	2	2	4	2	0	1	0	1	18
5	Hingham Center	4	3	1	1	1	4	2	3	0	4	2	4	0	2	31
6	Foundry Pond	2	2	0	0	0	3	1	2	1	4	4	1	4	1	25
7	Accord Brook	1	1	0	0	0	1	2	2	0	4	4	1	3	2	21
8	Bouve Pond	3	2	0	0	1	2	2	3	1	2	0	1	0	2	19
9	Cushing Pond	2	4	1	0	3	3	2	4	0	4	0	1	0	2	26
10	Fulling Mill Brook	2	4	4	4	4	3	1	4	0	4	2	1	2	1	36
11	Plymouth River	2	1	1	1	2	2	4	4	0	3	0	1	0	1	22
12	Liberty Pole	3	4	0	0	4	1	2	3	0	4	0	1	0	2	24
13	Prospect Street	2	4	0	3	4	2	1	2	0	4	2	1	2	2	29
14	Whiting Street	2	1	1	2	2	3	1	1	0	4	3	0	2	3	25
15	Gardner Street	2	4	0	0	4	4	2	4	0	4	3	1	3	1	32
16	McKenna Marsh	2	3	0	4	4	2	3	4	0	4	0	1	0	2	29
17	Industrial	2	1	0	0	1	1	1	3	0	1	4	1	3	4	22
18	Accord Pond	2	2	0	3	1	3	2	4	0	4	4	1	3	2	31
19	Wompatuck State Park	0	0	0	1	1	1	2	1	0	3	4	1	4	0	18

These Study Area scores can now be evaluated in the matrix to determine the "Needs Areas" by overall score and ranking. It is also useful to review the criteria scores individually to identify the regulatory and environmental conditions requiring wastewater management protections. The overall Study Area scores and their corresponding priority ranking are shown in Table 4-18.

**Table 4-18
Study Area Score and Priority Ranking**

<i>Study Area Name</i>	<i>Final Score</i>	<i>Priority Ranking</i>
Fulling Mill Brook	36	1
Weir River Sewer District	35	2
Gardner Street	32	3
Home Meadows	31	T4
Accord Pond	31	T4
Prospect Street	29	T5
McKenna Marsh	29	T5
Cushing Pond	26	6
Whiting Street	25	T7
Foundry Pond	25	T7
Liberty Pole	24	8
North Sewer District	23	9
Worlds End	22	T10
Industrial	22	T10
Plymouth River	22	T10
Accord Brook	21	11
Bouve Pond	19	12
Brewer Pond	18	13
Wompatuck State Park	18	14

These Study Area scores and the priority ranking will be used in subsequent evaluations and assessments of alternatives to formulate an overall wastewater management program for the Town of Hingham.

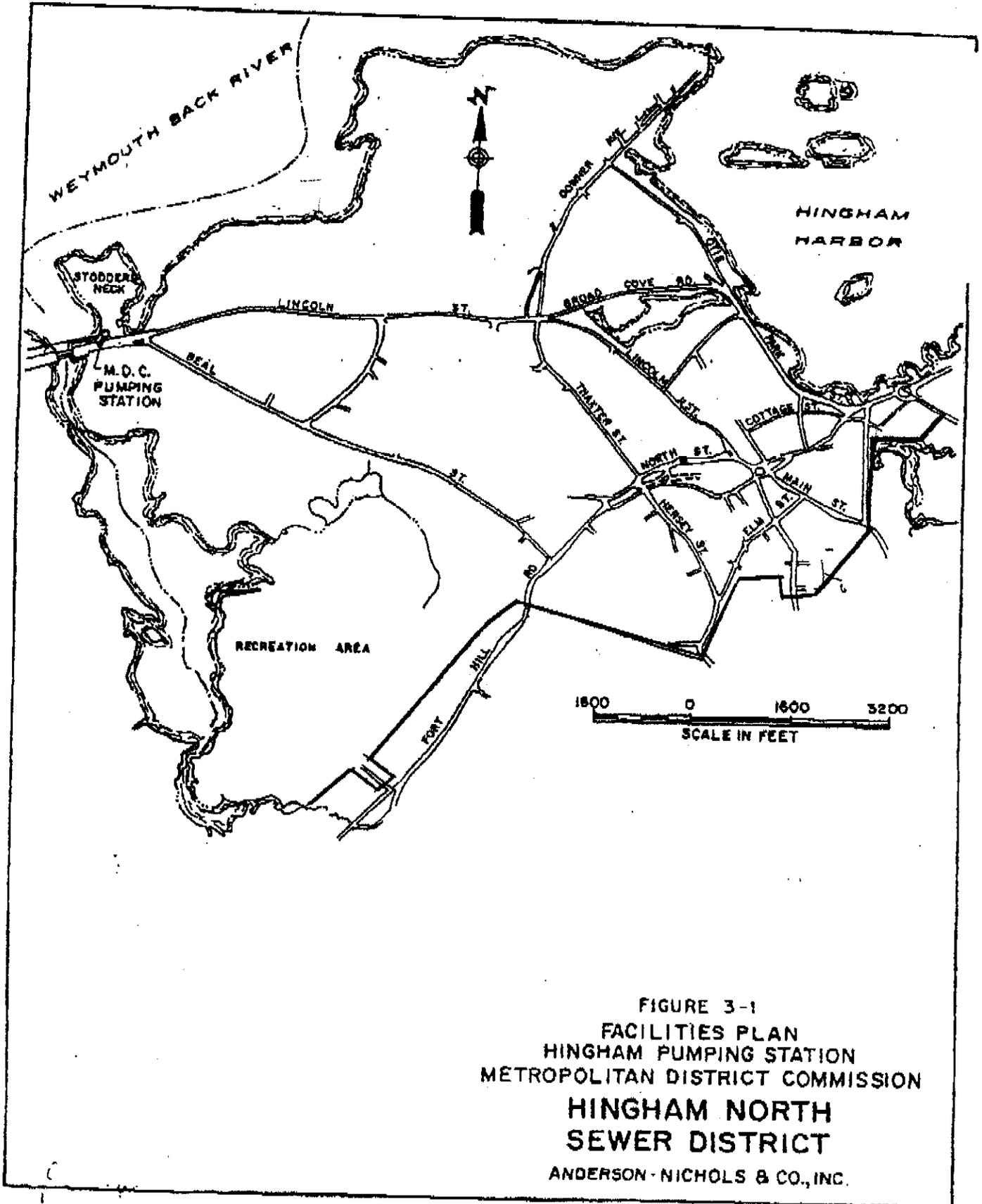


FIGURE 3-1
 FACILITIES PLAN
 HINGHAM PUMPING STATION
 METROPOLITAN DISTRICT COMMISSION
 HINGHAM NORTH
 SEWER DISTRICT
 ANDERSON-NICHOLS & CO., INC.

person, and, subject to such limits as respects injury to or death of one person, of not more than ten thousand dollars on account of any one accident resulting in injury to or death of more than one person, or of not more than one thousand dollars for damage to property. If said motion is filed before the return day of the writ, the writ shall be entered with the motion, and the court shall issue an order of notice to the defendant, to be served in like manner as any process against such non-residents, which shall be returnable within a reasonable time, and, if service of the writ has not been made upon the defendant or upon the registrar under section three A, the court shall issue a further order of notice for such service. The court shall accept as sufficient security, except for damages to property, a certificate as defined in section thirty-four A, or other satisfactory proof that the liability, if any, for damages resulting from such accident is insured or secured, to the amounts or limits herein set forth, by an insurance company authorized to do business in this commonwealth.

The motion shall state the facts, and, if the court finds that such accident was probably due to the negligence of the defendant or his agent, the court may order the defendant to furnish forthwith such security as aforesaid and may order that until such security is furnished the right of the defendant or of any one employed or authorized by him to operate a motor vehicle on his behalf in this commonwealth be suspended. Such an order for security shall be subject to modification at the discretion of the court as justice may require.

SECTION 2. This act shall take effect on November first in the current year. *Approved July 12, 1946.*

Effective date.

Chap. 591 AN ACT TO PROVIDE FOR THE ADMISSION OF THE TOWN OF HINGHAM TO THE SOUTH METROPOLITAN SEWERAGE DISTRICT FOR THE BENEFIT OF A PART OF THE TOWN.

Be it enacted, etc., as follows:

SECTION 1. The territory comprising the north sewer district of the town of Hingham as described in section two is hereby added to the south metropolitan sewerage district referred to in chapter ninety-two of the General Laws, and the town of Hingham, for the benefit of the north sewer district thereof, is hereby admitted to the south metropolitan sewerage system. In becoming a part of the south metropolitan sewerage system the town of Hingham shall conform to the provisions of chapter ninety-two of the General Laws, as amended, relative to the south metropolitan sewerage system and shall be subject to those provisions except as otherwise provided herein. Any general authority granted to other municipalities by chapter ninety-two shall also be vested in the town of Hingham in common with such other municipalities but limited in application to the territory comprising the Hingham north sewer district.

SECTION 2. The north sewer district of the town of Hingham shall consist of all that part of the town which is situated westerly of Hingham harbor and northerly of a line drawn as follows: Commencing at the junction of Weymouth Back river, the United States Naval reservation and Lincoln street; thence running easterly, southeasterly, southerly and easterly along the northerly and northeasterly and easterly boundary of said United States Naval reservation (which in large part is coincident with or near to the southerly line of Beal street and part of West street and in other part divides the reservation from private property) to Fort Hill street at the northeasterly corner of the reservation near the entrance thereto on Fort Hill street; thence on a straight line crossing Fort Hill street and running southeasterly to the westerly end of the southerly line of Lewis court; thence easterly on the southerly line of Lewis court to Hersey street; thence crossing Hersey street and running northerly on the easterly line of Hersey street to Elm street; thence running on the easterly line of Elm street to its junction with Emerald street; thence running easterly on the southerly line of Emerald street to its junction with Central street; thence running southerly on the westerly line of Central street to Weston road; thence crossing Central street and running northeasterly and easterly on the southeasterly line of Weston road and on the southerly line of Bradford road to the end of Bradford road; thence northeasterly on a straight line through private property to the intersection of Main and Water streets; thence running northerly on the easterly line of Water street to Green street; thence running easterly on the southerly line of Green street and Eldridge court, to the end of Eldridge court; thence on a straight line northeasterly to the intersection of the southwesterly line of Chief Justice Cushing way with the northerly line of property of the Old Colony Railroad Company; thence running northwesterly on the southwesterly line of Chief Justice Cushing way through the traffic circle at Summer street and continuing on the same line to Hingham harbor; provided, that all properties on this boundary line other than the United States Naval reservation shall to a depth of two hundred feet be included in the Hingham north sewer district.

SECTION 3. The metropolitan district commission, in this act called the commission, shall provide an outlet, together with a pump house and pumping machinery, at, or on the shore or upland near, the Hingham-Weymouth town line for the sewage of the Hingham north sewer district and acting on behalf of the commonwealth shall construct a trunk sewer from the point of such outlet to a point in the trunk sewer of the south metropolitan sewerage district in the town of Weymouth to be determined by the commission; provided, that in lieu of such construction the commission may for the commonwealth acquire from the federal government the force main now extending from the plant in Hingham of the Beth-

lehem-Hingham Shipbuilding Company to the trunk sewer in Weymouth, and in such event may provide the outlet for the sewage of the Hingham north sewer district, together with a pump house and pumping machinery, at such point in such force main within the town as the commission shall deem advisable.

SECTION 4. For the purpose of constructing, acquiring, maintaining and operating such additional trunk sewer and otherwise carrying out the purposes of this act the commission, acting on behalf of the commonwealth, shall have and exercise all the authority conferred upon it by chapter ninety-two of the General Laws and all provisions thereof are made applicable to the additional construction, acquisition, maintenance and operation hereby authorized except as otherwise provided herein.

SECTION 5. To meet the expenditures necessary in carrying out the provisions of this act the state treasurer shall from time to time, on request of the commission and subject to the approval of governor and council, issue bonds of the commonwealth to an amount not exceeding two hundred and fifty thousand dollars in addition to the amount of such bonds heretofore authorized for the construction of the south metropolitan sewerage system. Such bonds shall be issued as coupon or registered bonds for such term of years as may be recommended by the governor in accordance with section 3 of Article LXII of the amendments to the constitution and shall bear interest at such rate as shall be fixed by the state treasurer with the approval of the governor and council.

SECTION 6. The town of Hingham, in addition to the yearly payment of assessments under sections five to eight, inclusive, of chapter ninety-two of the General Laws, shall pay into the state treasury for the sinking fund of the south metropolitan district an entrance charge equal to that proportion of the total amount of said sinking fund as existing on the first day of April in the year of the acceptance of this act and of all sinking fund bonds and serial bonds paid prior to said date which the taxable valuation of the north sewer district of said town for said year shall bear to the total amount of the valuation of the cities and towns in said south metropolitan district as determined for the apportionment of assessments; provided that no amount shall be included in the computation, in any event, on account of property which is owned by the United States. Such proportion shall be determined by the commission and shall be certified by said commission to the state treasurer. The state treasurer shall determine the total amount of the entrance charge. The entrance charge shall be paid in ten equal successive annual installments, the due dates of which shall be the date in each year following acceptance of this act by the town on which payments under section five of chapter ninety-two of the General Laws are due from members of the south metropolitan sewerage district. Provided, however, that prior

to the date when sewage is first discharged from the Hingham north district sewer system into the south metropolitan sewerage system no payment shall be required from the town of Hingham under sections five to eight, inclusive, of chapter ninety-two of the General Laws, and prior to such date no payment shall be made on account of the entrance charge which shall cause the total of all such entrance charge payments to exceed the total sum theretofore expended by the commission under section three of this act. Any portion of the entrance charge which, because of the operation of this proviso, remains unpaid on the date hereinbefore specified for the tenth and final installment shall be paid by adding one tenth of the entrance charge, or the balance due if less than such one tenth, to each payment thereafter coming due under section five of chapter ninety-two of the General Laws.

SECTION 7. The town may contract with the federal government or any department or agency thereof to furnish a connection with the Hingham north district sewer system for sewage originating on or collected on any property of the federal government in or adjacent to the area herein defined as the north sewer district of Hingham, on such terms as it shall deem reasonable.

SECTION 8. The commission pending construction or purchase of a trunk sewer to connect the Hingham north district sewer system with the south metropolitan sewerage system may, for any period not in excess of five years contract that such sewage shall be moved through the force main now owned by the federal government, described in section three of this act.

SECTION 9. If after the acceptance of this act by the town it shall by vote of its inhabitants at any town meeting request that additional territory, accurately described in the vote, be included in the north sewer district of the town the commission may, by its determination, cause such addition to be made. An entrance fee shall be computed for such territory in accordance with the substance of section six, using for the computation the total amount of the sinking fund of the south metropolitan sewerage district on the first day of April in the year of such determination and of all sinking fund bonds and serial bonds paid prior to such date, and the respective taxable valuations on said date of the territory added to the district by such determination and of all the cities and towns in said south metropolitan sewerage district. Such entrance charge shall be payable in ten equal successive installments beginning with the date for the next payment by the town under sections five to eight, inclusive, of chapter ninety-two of the General Laws, but may be anticipated at the option of the town.

SECTION 10. This act shall take full effect upon its acceptance by the town of Hingham at any annual or special town meeting, but not otherwise. *Approved July 12, 1945.*

as such and for which he was entitled to compensation from the town; provided, that payments on account of any annuity payable under authority of this act shall not be made for any period prior to January first, nineteen hundred and forty-six.

SECTION 2. This act shall take full effect upon its acceptance by the town of Hingham at any town meeting called for the purpose, but not otherwise.

Approved February 27, 1946.

Chap. 82 AN ACT AUTHORIZING THE TOWN OF HINGHAM TO CONSTRUCT AND OPERATE A SYSTEM OF SEWERS FOR THE NORTH SEWER DISTRICT OF THE TOWN.

Be it enacted, etc., as follows:

SECTION 1. The town of Hingham may lay out, construct, maintain and operate a system or systems of main drains and common sewers for the north sewer district of the town as defined in section two of chapter five hundred and ninety-one of the acts of nineteen hundred and forty-five, with such connections, pumping stations and other works as may be required for a system of sewage disposal, and may construct such sewers or drains over and under land or tide water in the town as may be necessary to conduct the sewage of said district to the south metropolitan sewerage system, and, for the purpose of providing better surface or other drainage, may make, lay and maintain such drains as it deems best. And for the purposes aforesaid, the town may, within the limits of said district, make and maintain sub-drains, and, with the approval of the department of public health, discharge the water from such sub-drains into any brook, stream or water course within the town.

SECTION 2. Said town upon acquiring the necessary easements or other rights, under section six or otherwise, may make and maintain main drains or common sewers and sub-drains in any private way in said district for the purpose of serving abutting estates or for other purposes of the sewer system; provided, that as to any private way in which such construction and maintenance would, except for this act, be barred by the provisions of section seventy-seven of chapter forty-one of the General Laws or other general law, the town shall have voted prior to the beginning of construction therein that the sewer system shall be extended to such private way.

SECTION 3. Said town may make and maintain in any way in said district where main drains or common sewers are constructed, such connecting drains, under-drains and sewers within the limits of such way as may be necessary to connect any estate which abuts upon the way.

SECTION 4. Said town may, at the meeting at which this act is accepted, vote that the selectmen shall act as a board of sewer commissioners. If the town does not so vote, the

town shall elect by ballot at any town meeting not later than the second annual meeting after the commencement of the work of construction authorized hereby a board of three sewer commissioners, who shall be registered voters of the town, to hold office, if elected at an annual town meeting, one until the expiration of one year, one until the expiration of two years, and one until the expiration of three years, from such annual town meeting, and until their successors are qualified, or if elected at a special town meeting, one until the expiration of one year, one until the expiration of two years, and one until the expiration of three years, from the next succeeding annual town meeting, and until their successors are qualified; and thereafter, at each annual town meeting, the town shall elect one member of the board to serve for three years and until his successor is qualified. In either case, whether the town votes that its selectmen shall act as a board of sewer commissioners or elects a board of sewer commissioners, the town may, at any time thereafter, by any and all the methods permitted by general law, provide for the election of a board of three sewer commissioners, or that the selectmen may act as a board of sewer commissioners, as the case may be.

SECTION 5. Until the board of sewer commissioners has first been elected, as provided in this act, or the selectmen have first been authorized by vote to act as such board, as the case may be, but not, in any event later than the second annual town meeting after the commencement of the work of construction authorized hereby, the town may carry on such work by a committee of the town authorized so to act at any town meeting. The committee shall serve without pay and shall have all the powers and authority given to the board of sewer commissioners in this act or by general law. Whenever the phrase "board of sewer commissioners" hereinafter occurs it shall mean and include the board of sewer commissioners, the selectmen acting as such or the committee of the town provided for in this section, as the case may be.

SECTION 6. The board of sewer commissioners, acting for and on behalf of said town, may take by eminent domain under chapter seventy-nine of the General Laws, or acquire by purchase or otherwise, any lands, water rights, rights of way or easements, public or private, in the town, necessary for accomplishing any purpose mentioned in this act, and may construct such main drains and sewers, sub-drains and under-drains under or over any bridge, railroad, railway, boulevard or other public way, or within the location of any railroad, and may enter upon and dig up any private land, public land, including park land, or railroad location, for the purpose of laying such drains and sewers or installing such pumping stations or other works and of maintaining and repairing the same, and may do any other thing if necessary for the purposes of this act; provided, that shall not take in fee any land of a railroad corporation, and

that they shall not enter upon or construct any drain or sewer, or instal any pumping station or other works, within the location of any railroad corporation except at such time and in such manner as they may agree upon with such corporation, or, in case of failure to agree, as may be approved by the department of public utilities. No taking shall be necessary for the use of any park land, bathing beach or playground for any of the purposes of this act to any extent approved by the board in charge of or holding title to such land, including the trustees under chapter seventy-five of the acts of nineteen hundred and thirty-four, or by the town at any town meeting.

SECTION 7. Any person injured in his property by any action of the board of sewer commissioners under this act may recover damages from the town under said chapter seventy-nine.

SECTION 8. Said town shall, by vote, determine what proportion of the cost of the system or systems of sewerage and sewage disposal the town shall pay; provided, that it shall pay not less than one fourth nor more than two thirds of the whole cost. In providing for the payment of the remaining portion of the cost of the system or systems or for the use of the system or systems, the town may avail itself of any or all of the methods permitted by general laws, and the provisions of the general laws relative to the assessment, apportionment, division, re-assessment, abatement and collection of sewer assessments, to liens therefor and to interest thereon, shall apply to assessments made under this act. At the same meeting at which it determines the proportion of the cost which is to be borne by the town, it may by vote determine by which of such methods the remaining portion of the cost shall be provided for. The collector of taxes of said town shall certify the payment or payments of such assessments or apportionments thereof to the board of sewer commissioners who shall preserve a record thereof.

SECTION 9. For the purpose of paying the necessary expenses and liabilities incurred under this act, the town of Hingham may borrow such sums as may be necessary, not exceeding, in the aggregate, eight hundred and fifty thousand dollars, and may issue bonds or notes therefor, which shall bear on their face the words, Hingham Sewerage Loan, Act of 1946. Each authorized issue shall constitute a separate loan. Indebtedness incurred under this act shall be in excess of the statutory limit, but shall, except as provided herein, be subject to chapter forty-four of the General Laws, inclusive of the limitation contained in the first paragraph of section seven thereof.

SECTION 10. The receipts from sewer assessments and from payments made in lieu thereof shall be appropriated for and applied to the payment of charges and expenses incident to the maintenance and operation of the system of sewerage and sewage disposal or to the extension thereof, the payment of interest upon bonds or notes issued for

sewer purposes or to the payment or redemption of such bonds or notes.

SECTION 11. The board of sewer commissioners may annually appoint a clerk and may appoint a superintendent of sewers who shall not be a member of the board. It may remove the clerk or superintendent at its pleasure and shall define their duties. The board may, at its discretion, prescribe for the users of the sewer system or systems such annual rentals or charges based upon the benefits derived therefrom as it may deem proper, subject, however, to such rules and regulations as shall be adopted by vote of the town.

SECTION 12. All contracts made by the board of sewer commissioners shall be made in the name of the town and shall be signed by the board, but no contracts shall be made or obligation incurred by the board for any purpose in excess of the amount of money appropriated by the town therefor.

SECTION 13. The board of sewer commissioners may, from time to time, prescribe rules and regulations for the connection of estates and buildings with main drains and sewers, and for the inspection of the materials, the construction, alteration and use of all connections and drains entering into such main drains or sewers, and may prescribe penalties, not exceeding twenty dollars, for each violation of any such rule or regulation. Such rules and regulations shall be published at least once a week for three successive weeks in some newspaper published in the town of Hingham, if there be any, and if not, then in some newspaper published in the county of Plymouth, and shall not take effect until such publications have been made.

SECTION 14. The town of Hingham, through the board of sewer commissioners, may, upon the application of the owner of any estate abutting on any public or private way where a main drain or common sewer is constructed, lay in such sewer way and in the private land of such owner such particular sewer or connecting drain as may be necessary to connect any building on such estate with such main drain or sewer, and said board may make all necessary contracts in the name and behalf of the town for such purpose. The expenses thereof shall be paid out of any appropriation that may be made by the town therefor. The cost of constructing each particular sewer or connecting drain shall be assessed by the board of sewer commissioners upon the estate benefited thereby. Such assessment shall be made by filing with the board of assessors of the town a certificate, designating the way and the private land in which such particular sewer or connecting drain has been constructed, and giving the name or names of the owners of the estate for which such connection has been made and the amount of the assessment to be paid by such owner or owners. A copy or duplicate of this certificate shall, within ten days after the filing of the same with the board of assessors, be recorded in

the registry of deeds for the county of Plymouth, or, in the case of registered land, filed in the office of the assistant recorder for Plymouth county registry district. The board of assessors shall, upon receipt of such certificate, forthwith commit such assessments or charges with their warrant to the collector of taxes, who shall forthwith make a demand in writing for the payment of such assessments or charges, and every owner shall, within three months after such demand is served upon him or on the occupant of such estate, or sent by mail to the last address of the owner known to the collector of taxes, pay to the collector of taxes the sum so assessed or charged. Except as herein provided, the provisions of general law relative to the assessment, apportionment, division, re-assessment, abatement and collection of sewer assessments, to liens therefor and to interest thereon shall apply to assessments made under this section. In applying said provisions to assessments made under this section, the notice referred to therein shall be deemed to be the demand of the tax collector required hereby. The lien for any assessment made under this section shall attach upon the recording or filing for registration of the copy or duplicate of the certificate of assessment. In the apportionment of assessments made under this section no instalment shall be less than five dollars.

SECTION 15. The provisions of this section shall be operative only if the town of Hingham at the meeting at which this act is accepted shall vote, separately, to accept said provisions. Each owner of a building upon land abutting a public or private way in the Hingham north sewer district in which there is a common sewer shall within a reasonable time, to be fixed by the board of sewer commissioners, after construction of such sewer in such way connect such building therewith, unless on application of the owner the board of health shall find that the non-connection of such building with the common sewer does not in reasonable likelihood endanger the public health.

SECTION 16. No act shall be done under authority of the preceding sections, except in the making of surveys and other preliminary investigations, until the plans of the system of sewerage and sewage disposal have been approved by the department of public health. Upon application to the department for its approval, it shall give a hearing, after due notice to the public. At such hearing, plans showing in detail all the work to be done in constructing the system of sewerage and sewage disposal shall be submitted for approval by the department.

SECTION 17. Subject to the provisions of section fifteen, this act shall take full effect upon its acceptance by vote of a majority of the voters of the town voting thereon at any annual or special town meeting called for the purpose at which the town shall vote to accept chapter five hundred and ninety-one of the acts of nineteen hundred and forty-five, or which is held within five years after such vote. No

expenditure shall be made and no liability incurred hereunder until such acceptance of this act.

Approved February 27, 1946.

AN ACT AUTHORIZING THE TOWN OF SOUTHBRIDGE TO PAY A CERTAIN SUM OF MONEY TO JOSEPH BENOIT DOING BUSINESS AS BENOIT BROTHERS. Chap. 83

Be it enacted, etc., as follows:

SECTION 1. The town of Southbridge is hereby authorized to appropriate a sum of money not exceeding eight hundred and sixty-nine dollars and fifty-three cents and to expend said sum in payment and discharge of a certain claim of Joseph Benoit, doing business as Benoit Brothers, in full settlement of his claim against said town for reimbursement on account of money expended by him in the construction of one hundred and forty feet of sewer line on Columbia street, a public way in said town; said claim being legally unenforceable against said town by reason of its failure to comply with the provision of its by-laws requiring advertising prior to the awarding of a contract involving the expenditure of five hundred dollars or more.

SECTION 2. This act shall take effect upon its passage.

Approved February 27, 1946.

AN ACT AUTHORIZING THE TOWN OF SOUTHBRIDGE TO PAY A CERTAIN SUM OF MONEY TO A. V. TAURASI CO., INC. Chap. 84

Be it enacted, etc., as follows:

SECTION 1. The town of Southbridge is hereby authorized to appropriate the sum of five thousand two hundred and eighty-seven dollars and forty-five cents and to pay the same to A. V. Taurasi Co., Inc., in connection with the construction of sewers in Meadowbrook road, Laurel Hill road and Lebanon street, private ways in said town which have since been accepted as public ways, and through "Cole Forest", so called; provided, that no payment shall be made hereunder unless and until said A. V. Taurasi Co., Inc., shall have released to said town, by proper instrument or instruments, all its right, title and interest in and to said sewers.

SECTION 2. This act shall take effect upon its passage.

Approved February 27, 1946.

AN ACT AUTHORIZING THE TOWN OF SOUTHBRIDGE TO PAY A CERTAIN SUM OF MONEY TO FRANK J. SHIELDS, INCORPORATED. Chap. 85

Be it enacted, etc., as follows:

SECTION 1. The town of Southbridge is hereby authorized to appropriate the sum of four hundred and fifty dollars and to pay the same to Frank J. Shields, Incorporated

COPY

INTERMUNICIPAL AGREEMENT FOR WATER POLLUTION CONTROL
BETWEEN THE TOWNS OF COHASSET AND HULL, MASSACHUSETTS

Agreement made this 26th day of NOVEMBER 1996, by and between the Town of Hull (hereinafter "Hull"), a municipal corporation within the County of Plymouth, Massachusetts, acting through its Permanent Sewer Commission with the approval of its Board of Selectmen, and the Town of Cohasset (hereinafter "Cohasset"), a municipal corporation within the County of Norfolk, Massachusetts, acting through its Sewer Commission, after approval and funding by their respective Town Meetings.

WITNESSETH

WHEREAS, Hull and Cohasset are authorized pursuant to Massachusetts General Laws, to enter into contracts and agreements with one another for the purpose of aiding in the prevention or abatement of water pollution, and

WHEREAS, Hull and Cohasset deem it to be in the public interest to enter into this Agreement, whereby Hull would receive, treat, and dispose of certain of Cohasset's wastewater through Hull's sewerage system, and

WHEREAS, Hull and Cohasset desire to comply with all Federal and State requirements dealing with water pollution control,

NOW, THEREFORE, in consideration of the mutual promises and covenants herein-contained and for other good and valuable consideration the receipt of which is hereby acknowledged, it is agreed as follows:

ARTICLE 1. DEFINITIONS

1.1 For the purpose of this Agreement, the following terms are defined:

1.1.1 Average Daily Flow shall mean the total annual flow expressed in millions of gallons (MG) divided by the number of days in the year.

- 1.1.2 BOD (Biochemical Oxygen Demand) shall mean the quantity, expressed in pounds per day (lbs/day), of dissolved oxygen, utilized in the biochemical oxidation of organic matter under standard laboratory procedure in five (5) days at 20 degrees centigrade (68 degrees Fahrenheit) as described in the most recent edition of "Standard Methods For the Examination of Water and Wastewater".
- 1.1.3 Cohasset's Wastewater shall mean Wastewater generated in Cohasset which is or, is to be under this agreement, conveyed to Hull.
- 1.1.4 Cohasset Pumping Station shall refer to a wastewater pumping station constructed by Cohasset, in Cohasset in the vicinity of West Corner to serve the Cohasset Sewer Service Area, with wastewater conveyed to the Hull Wastewater Works.
- 1.1.5 Cohasset's Wastewater Pipeline shall mean the force main designed by Cohasset and constructed, owned, operated and maintained by Cohasset in Hull for the purpose of conveying wastewater along Nantasket Avenue from the Hull/Cohasset Town line at West Corner to the Hull gravity main at the intersection of Nantasket Avenue and Atlantic Avenue.
- 1.1.6 DO (Dissolved Oxygen) shall mean the oxygen level that is found in wastewater as measured by an approved technique described in the 16th or most recent subsequent edition of "Standard Methods For the Examination of Water and Wastewater".
- 1.1.7 Dwelling Unit shall refer to a residential home, apartment, condominium unit or similar facility. A business, commercial facility or restaurant shall be considered an average dwelling unit consisting of 4 bedrooms generating 250 GPD of

wastewater based on metered water consumption. If water consumption for the facility exceeds an average of 250 GPD, the facility shall be upgraded by one bedroom for each additional 62 GPD or portion thereof of metered water consumption.

- 1.1.8 GPD is the abbreviation for gallons per day.
- 1.1.9 Hull Sewer Use Rules and Regulations shall mean the most recent edition of the rules and regulations adopted and amended from time to time by the Hull Permanent Sewer Commission that govern the use of the municipal sewer system. A copy of the current Hull Sewer Use Rules and Regulations is appended to this Agreement.
- 1.1.10 Hull Wastewater Works shall mean the entire Hull sewerage system including collector sewers, pumping stations, force mains, the Hull Wastewater Treatment Plant, and ocean outfall.
- 1.1.11 Industrial Waste shall mean the liquid wastes from industrial manufacturing processes, industrial trades, or industrial businesses.
- 1.1.12 Leachate shall mean the liquid that is collected, pumped and/or removed from a lined or unlined solid waste landfill. Under the terms of this Agreement, no leachate, whether treated or untreated, shall be a part of the any quantity of wastewater flow that Cohasset is allowed to discharge to the Hull Wastewater Works disposal facility.
- 1.1.13 MGD is the abbreviation for million gallons per day
- 1.1.14 Peak Flow Rate shall mean the maximum pumping rate for the Cohasset pumping station expressed in gallons per minute (gpm) or gallons per day (gpd).
- 1.1.15 Septage shall mean the liquid and solid wastes that are removed from a cesspool, septic tank, or other on-site wastewater

disposal system serving a building or structure, including, but not limited to a residential housing unit or a building or structure utilized for commercial or business purposes.

1.1.16 SS (Suspended Solids) shall mean the quantity, expressed in pounds per day (lbs/day) by weight or milligrams per liter, of solids that either float on the surface of, or are in suspension in, water, wastewater, or other liquids, and which are removable by laboratory filtering, and are referred to as nonfilterable residue in laboratory tests prescribed in the 16th or most recent subsequent edition of "Standard Methods for the Examination of Water and Wastewater".

1.1.17 Wastewater shall mean the Sewage, Industrial Waste, Infiltration, Inflow, or other wastes discharged to a municipal wastewater system, or any combination of such materials. This definition shall not include Septage or Leachate from any source. Wastewater shall be defined as sewage having an average BOD of not more than 300 mg/l and an average total suspended solids concentration of not more than 300 mg/l based on a twenty-four (24) hour composite sample. Leachate will not be accepted from any source.

ARTICLE 2. SCOPE

2.1 Hull shall receive, treat, and dispose of Cohasset's Wastewater in accordance with the provisions of this Agreement and in compliance with all existing or future laws, regulations, ordinances, water quality standards, orders, and decrees of any governmental authority having jurisdiction over the treatment and disposal of said Wastewater. Cohasset's Wastewater shall conform to the terms of this Agreement and to the Hull Sewer Use Rules and Regulations, provided that Wastewater requirements of said Sewer Use Rules and Regulations must apply uniformly to Cohasset's Wastewater and Hull's

Wastewater.

- 2.2 The Hull Wastewater Treatment Plant has the capacity to accept and shall accept Cohasset's Wastewater in volumes up to the quantities set forth below:

Average Daily Flow 80,000 GPD

Peak Flow Rate 148 (GPM) or 213,000 GPD

Cohasset's Wastewater shall not include leachate, septage, sewage sludge or industrial waste from a facility that is or should be regulated by an Industrial Pretreatment program required by the U.S. Environmental Protection Agency (EPA) or the Massachusetts Department of Environmental Protection.

- 2.3 Cohasset's Wastewater shall connect to the Atlantic Avenue interceptor sewer in Hull at the intersection of Nantasket Avenue and Atlantic Avenue. Cohasset shall be responsible for all study, design, engineering, permitting and construction costs associated with the connection to the Hull Wastewater Works. All plans, designs, and work shall be subject to the review and prior approval of Hull officials, including the Permanent Sewer Commission, which approval shall be granted in a timely manner and not unreasonably withheld.

ARTICLE 3. MONITORING, SAMPLING AND MEASUREMENT OF WASTEWATER

- 3.1 All sampling and measurement of the constituents of Cohasset's Wastewater shall be made at or just before the Cohasset Pumping Station. Cohasset is responsible for the study, engineering, design, permitting and construction of the Cohasset Pumping Station and Cohasset's Wastewater Pipeline, including sampling and measurement components. Hull shall have the right to review and approve of the design of Cohasset's pumping station and force main as it relates to capacity, flow metering and wastewater sampling, which approval shall be granted in a timely manner and not unreasonably withheld. Hull shall also have access to the Cohasset Pumping Station during normal business hours for the purpose of monitoring compliance with the terms of this Agreement. Cohasset shall be responsible for the construction, operation, and maintenance, necessary for Cohasset's wastewater to enter Hull's system

including any modifications which may be required by Federal or State law or regulation, including that which may be required by this Agreement or subsequent amendments thereto.

- 3.2 The sampling and determination of the constituents in Cohasset's Wastewater shall be performed on a semi-annual basis in accordance with the most recent edition of "Standard Methods for the Examination of Water and Wastewater." Said samplings shall include twenty-four (24) hour composite proportional samples. The sampling and analytical analyses shall be conducted to ensure that Cohasset's wastewater is in compliance with the Hull Sewer Use Regulations. The Cohasset Pump Station shall include adequate facilities for the sampling and metering of Wastewater.
- 3.3 Cohasset shall be responsible for the costs associated with semi-annual sampling. The costs for any additional tests required by Hull beyond the semi-annual tests, will be borne by Hull. However, if State or other regulatory requirements, are revised to require additional or more frequent testing, those costs will be borne by Cohasset. Hull shall receive test results of all tests performed. Hull shall have the right to perform at its expense random testing and shall have access to Cohasset's facilities to perform same, which access shall not be unreasonably delayed.
- 3.4 Any samplings conducted by Hull for the purpose of monitoring compliance with the terms of this agreement and the Hull Sewer Use Rules and Regulations in addition to the semi-annual samplings need not be announced in advance, but Cohasset shall be given the opportunity to take duplicate, simultaneous samples at the time of such sampling for independent analysis. The results of any sampling by Hull shall be made available to the Cohasset Sewer Commission, forthwith.
- 3.5 Twenty-four (24) hour composite, flow proportional samples of Cohasset's Wastewater shall be taken at least semi-annually for the purpose of monitoring compliance with the terms of this Agreement. Additional sampling may also be conducted by the Town of Hull. Such sampling may not be

announced in advance, as determined by the Hull Permanent Sewer Commission for the purpose of monitoring compliance with the terms of this Agreement and to ensure compliance with the Hull Sewer Use Rules and Regulations.

3.6 Average daily flow and the peak flow rate of Cohasset Wastewater shall be determined by metering equipment furnished and installed in the Cohasset Pumping Station. Said metering equipment shall consist of indicating, totalizing, recording equipment and transmitting equipment capable of accurately measuring the range of flows of Cohasset's Wastewater. The design and specifications of flow metering equipment shall be submitted to Hull for review and approval prior to installation by Cohasset, which approval shall be granted in a timely manner and not unreasonably withheld. Flow shall be electronically transmitted and connected to the Supervisory Control And Data Acquisition (SCADA) system at the Hull Wastewater Treatment Plant. Equipment needed at the Hull Wastewater Treatment Plant to receive, record and integrate the Cohasset pump station signal into the SCADA system shall be provided by Cohasset at no cost to Hull. Flow metering equipment shall be calibrated by Cohasset on an annual basis or as reasonably requested by the Hull Permanent Sewer Commission with a calibration certification submitted to the Hull Permanent Sewer Commission. Additional calibration certifications may be conducted on a more frequent basis by Hull during normal business hours at Hull's expense.

3.7 Within thirty (30) days after the end of a month, Hull shall provide Cohasset with copies of all analyses of samples of Cohasset's Wastewater collected at or upstream of the pumping station. Similarly within thirty (30) days, Cohasset shall provide Hull with analyses of said samples collected at the pumping station.

ARTICLE 4. PRETREATMENT OF WASTEWATER

4.1 Cohasset reserves the right at any time to pretreat and/or to reduce the BOD

and/or the SS in its Wastewater, or to otherwise provide preliminary treatment to its Wastewater prior to discharge to the Hull Wastewater Works. However, any such preliminary treatment shall not result in a reduction of Cohasset's obligation to pay capital costs in accordance with the provisions of Article 6 of this Agreement or costs of operations and maintenance covered by Article 9 of this Agreement.

- 4.2 In the event that any pretreatment of Cohasset's Wastewater is required by any Federal or State authority or to meet the terms of this Agreement, Cohasset shall implement and pay the cost of providing such pretreatment.
- 4.3 Cohasset's Wastewater shall have a minimum average dissolved oxygen concentration of 1 mg/l as measured at the pumping station. Cohasset shall install and maintain a continuous monitoring dissolved oxygen probe in the pumping station that shall be used to monitor and record dissolved oxygen levels in Cohasset's Wastewater. Cohasset shall pretreat its Wastewater if necessary to meet the 1 mg/l dissolved oxygen average daily requirement and shall pay the cost of any such pretreatment.

ARTICLE 5. TERM OF AGREEMENT

- 5.1 The initial term of this Agreement shall be a period of thirty (30) years from April 29, 1998, unless terminated hereunder sooner.
- 5.2 The discharge of Cohasset's Wastewater to the Hull Wastewater Works pursuant to this Agreement may be commenced only after all construction work required for the discharge of such Wastewater is substantially complete, accepted by Hull and Cohasset's full capital costs as set forth in Article 6 of this Agreement have been paid to Hull in full. Such acceptance by Hull shall not be unreasonably withheld.
- 5.3 At or before the termination of the initial thirty (30) year term, this Agreement may be extended or renewed at the mutual consent of both parties under such terms or conditions as are mutually agreeable to the parties.

ARTICLE 6. PAYMENT OF CAPITAL COSTS

- 6.1 Cohasset shall pay \$685,520 to Hull as a capital cost for 80,000 GPD of wastewater capacity in the Hull Wastewater Works based on a Cohasset connection point to the Hull Wastewater Works on the Atlantic Avenue interceptor sewer at the intersection of Nantasket Avenue and Atlantic Avenue. Upon execution of this Agreement and payment of the entire capital cost, Cohasset shall become a user under this Agreement of the Hull Wastewater Works and be subject to all rules, requirements and operating costs associated with the Hull Wastewater Works, with all the rights of a Hull user, except as provided for under this agreement.

ARTICLE 7. TERMS OF PAYMENT OF CAPITAL COSTS

- 7.1 Within ten (10) business days following the execution of this Agreement by all of the parties thereto and receipt by Cohasset of two fully executed copies, Cohasset shall pay to Hull 15% of the capital cost or \$102,828. Within six (6) months of the effective date of this Agreement Cohasset shall pay to Hull 45% of the capital cost or \$308,484. Cohasset shall pay Hull the remaining 40% of the capital cost or \$274,208 upon completion of construction activities and prior to commencing discharge to the Hull system or by April 29, 1998, whichever is the sooner. If Cohasset fails to make payment within thirty (30) calendar days of the payment schedule indicated, all payments made prior to the termination date shall be forfeited to Hull, and Cohasset, with respect to work done within Hull pursuant to this Agreement, shall forthwith remove all above-ground structures and also take such steps as are reasonably necessary to assure that sub-surface structures, including any pipeline constructed hereunder in Hull, will not interfere with the functioning of the Hull Wastewater Works or otherwise endanger the health or safety of the residents of Hull. Any manholes, support structures and similarly constituted below surface devices shall be filled in and capped. Said work is to be completed within ninety (90) days, including the restoration of the work area to its prior

condition, whereupon this agreement shall be terminated.

- 7.2 So long as Cohasset shall make the payments stated herein, Cohasset shall have reserved the capacity stipulated in this agreement until April 27, 2008. By said date, a minimum of 25,000 GPD annual flow must be flowing to the Hull Wastewater Works. If this level of flow is not substantially achieved by April 29, 2008, all monies paid by Cohasset to the Town of Hull shall be forfeited to Hull and Cohasset shall forthwith cease maintaining flow to Hull and with respect to work done within Hull pursuant to this Agreement, shall forthwith remove all above-ground structures and also take such steps as are reasonably necessary to assure that sub-surface structures, including any pipeline constructed hereunder in Hull, will not interfere with the functioning of the Hull Wastewater Works or otherwise endanger the health or safety of the residents of Hull. Any manholes, support structures and similarly constituted below surface devices shall be filled in and capped. Said work is to be completed within ninety (90) days, including the restoration of the work area to its prior condition, whereupon this agreement shall be terminated.

ARTICLE 8. COMMUNITY RESPONSIBILITIES

- 8.1 Cohasset is responsible for the study, engineering, design, permitting and construction of all facilities in Cohasset and Hull required to convey Cohasset wastewater to the Hull Wastewater Works including, but not limited to collector and interceptor sewers in Cohasset, the Cohasset pump station that will be located in the West Corner area of Cohasset and the force main between the Cohasset pump station and the Atlantic Avenue interceptor sewer in Hull. For all Cohasset wastewater facilities constructed in Hull, Hull shall have the right to review and approve the design in a timely manner, and shall require that all Cohasset construction in Hull, including the pump station and force main piping, be continuously monitored and constructed in accordance with all applicable local, State and Federal Standards.
- 8.2 Cohasset shall furnish Hull a copy of the Record Plans for sewer construction

in Cohasset and Hull that conveys wastewater to the Hull Wastewater Works within two months of construction completion.

- 8.3 This Agreement is part of a regional effort to address the existing water pollution problems in the Straits Pond area of Cohasset. A purpose of this Agreement is to abate the pollution caused from sub-surface sewage wastewater systems in Cohasset. The parties acknowledge that, initially, not all of the capacity reserved to Cohasset hereunder may be utilized. Cohasset shall take all necessary steps to ensure that properties causing said pollution or having a system not in compliance with Title V will be connected to the system within five (5) years after the date Cohasset wastewater is first discharged into the Hull system. It is recognized by all parties that the capacity provided hereunder shall be first utilized by Cohasset for that purpose.
- 8.4 Hull shall maintain an adequate cost accounting system which shall be the basis for the determination and allocation of costs for the operation and maintenance of the Hull Wastewater Works. The cost accounting records shall be available for review by the Cohasset Sewer Commission or its authorized agent during regular business hours.
- 8.5 Hull shall properly operate and maintain the Hull Wastewater Works in accordance with State and Federal regulations as well as in accordance with the requirements of its National Pollutant Discharge Elimination System (NPDES) Permit.
- 8.6 Hull shall address the on-site sewage disposal concerns associated with the Straits Pond area in Hull as part of a regional effort to improve water quality in the Pond.
- 8.7 The parties agree to mutually pursue appropriate State and Federal funding opportunities for Hull wastewater works improvements in a timely manner to help reduce overall costs to both communities.
- 8.8 The parties agree to act in good faith regarding all matters set forth in this Agreement.

**ARTICLE 9. PAYMENT OF COSTS OF OPERATION,
MAINTENANCE. AND REPAIR**

- 9.1 Cohasset's portion of the costs of operation and maintenance of the Hull Wastewater Works shall be calculated according to the rate structure imposed by the Hull Permanent Sewer Commission on the Hull users. For homes, businesses, etc. that are served by private wells, the owner of the home or business shall be required to install an individual water meter. The Cohasset Sewer Commission shall read said meter and periodically provide data to the Hull Permanent Sewer Commission timely enough for Hull to use same for sewer use billing purposes.
- 9.2 At least ninety (90) days prior to Cohasset's regular Annual Town Meeting, Hull shall submit to Cohasset a statement which shall set forth an estimate of Cohasset's portion of the costs for the operation and maintenance of the Hull Wastewater Works for the succeeding fiscal year. Hull shall periodically (in accordance with the Hull billing cycle) submit to Cohasset a sewer use bill which shall cover such periods of time as may be determined by the Hull Permanent Sewer Commission. Cohasset shall pay Hull within forty-five (45) days after receipt of Hull's billing statement.
- Any sewer use payment by Cohasset that is not made within the forty-five (45) day payment period shall be subject to a surcharge calculated on the outstanding balance at the prime interest rate (or such successor rate) as set forth in the Wall Street Journal (or such other financial publication mutually agreed upon or if no agreement, as designated by Hull) as set forth on the first business day of the fiscal year in question, plus one and one-half percent.
- 9.3 Periodically, the Hull Wastewater Works will require capital improvements to upgrade, expand and repair facilities and to comply with water pollution control requirements of State and Federal regulatory agencies. Hull capital improvement projects shall be funded by Town appropriations that shall, in turn, be funded by users of the Hull Wastewater Works system through sewer

use fees, general debt and/or by financial assistance provided by State and Federal regulatory agencies. As users of the Hull Wastewater Works, Cohasset sewer users that convey wastewater to the Hull Wastewater Works shall participate in the capital improvements through Hull sewer use charges and/or alternate financing arrangements authorized by Hull Town Meeting. These charges shall be equally assessed pro rata to all sewer users.

ARTICLE 10. OTHER RESPONSIBILITIES OF COHASSET

- 10.1 Cohasset's Wastewater shall meet the requirements of this Agreement and the qualitative requirements of the Hull Sewer Use Rules and Regulations, provided that said Sewer Use Rules and Regulations apply uniformly to Cohasset's Wastewater and Hull's Wastewater.
- 10.2 Changes to Cohasset's Rules and Regulations concerning sewer use shall be made to conform with Hull and State/Federal regulations as applicable. Both Hull and Cohasset shall make periodic changes to their respective sewer use regulations to safeguard collection, pumping and treatment components as may be appropriate or as to otherwise comply with State/Federal regulations.
- 10.3 Cohasset shall be responsible for all administrative work including permits, easements, legislative approval, etc. that may be necessary for Cohasset to construct wastewater facilities in Hull and Cohasset. Specifically, but not by way of limitation, Cohasset shall indemnify, defend and hold harmless Hull from and against any and all claims or costs arising out of actual or threatened litigation related to the reservation of capacity under this Agreement as provided in Section 8.3 hereof. Hull shall cooperate and provide active support of Cohasset's efforts during the Hull permitting process, but shall not be responsible for any administrative activity that deals with Cohasset's wastewater plans.
- 10.4 Cohasset shall provide Hull with timely copies of all administrative documents relating to work and permits and approvals Cohasset pursues dealing with Cohasset wastewater facilities in Hull and Cohasset as relates to flow going

to Hull.

- 10.5 Cohasset shall construct, own, operate, maintain and repair the force main in Hull required to convey Cohasset's wastewater to the Atlantic Avenue interceptor and shall have the right to conduct repairs, emergency or otherwise, on such components within Hull upon notifying and receiving approval, if necessary, from the Hull Permanent Sewer Commission, Highway Department, Police and Fire Departments, and any other appropriate official board or department or utility. Any damage to property in Hull caused by Cohasset, its contractors or those acting on their behalf or to nearby utilities shall be the responsibility of Cohasset. For any work done in Hull, Cohasset shall include language in the contract requiring that the contractor or supplier of services shall indemnify, defend and hold harmless Hull for any and all claims arising out of said work, and that Hull shall be listed as an additional insured on the insurance for said work, in such amounts and under such terms and conditions as are approved by Hull. All insurance shall be with companies authorized to do business in Massachusetts. Copies of said contracts and evidence of said insurance shall be submitted to Hull.
- 10.6 Cohasset shall promptly furnish the most recent water consumption data for all Cohasset sewer users connected to the Hull Wastewater Works to coincide with the sewer billing cycle of the Hull Sewer Permanent Commission. The data shall be subject to independent review and verification by the Hull Permanent Sewer Commission.
- 10.7 Cohasset shall indemnify, defend and hold harmless the Town of Hull relative to any and all activities done by or on behalf of Cohasset or required to be done by Cohasset under this Agreement or in furtherance of this Agreement. Furthermore, Hull shall be included as an additional insured on insurance policies covering Cohasset's wastewater systems and operations, which policies shall reference Cohasset's work and operations within Hull, in such amounts and under such terms and conditions as are approved by Hull. All insurance shall be with companies authorized to do business in Massachusetts. Copies

of said contracts and evidence of said insurance shall be submitted to Hull.

ARTICLE 11. OTHER RESPONSIBILITIES OF HULL

- 11.1 Hull has no study, engineering, design or construction responsibilities that are necessary to implement the terms of this Agreement. Hull is responsible to operate, maintain and repair the Hull Wastewater Works in accordance with all state and federal water pollution control requirements.
- 11.2 Hull shall periodically modify its sewer use regulations to comply with local, state and federal requirements. Modifications to the Hull sewer use regulations shall be forwarded to the Cohasset Sewer Commission so that changes or modifications to the Cohasset regulations can be implemented.
- 11.3 Hull shall indemnify, defend and hold harmless the Town of Cohasset relative to any damage done by Hull to, or destruction done by Hull of, the structure or function of the Cohasset Wastewater Pipeline and related structures which are located within Hull, including all costs for repair or replacement of such property. Hull assumes no responsibility or liability for damage or destruction of any structures or functions attributable to Hingham and/or others. Specifically, and not by way of any limitation, Hull assumes no responsibility or liability for the marking out of Cohasset's system located in Hull.

ARTICLE 12. BREACHES AND REMEDIES

- 12.1 The Hull Permanent Sewer Commission and the Cohasset Sewer Commission shall have access during regular business hours to all information gathered at the Cohasset pumping station concerning the flow of and constituents in Cohasset's wastewater, and Cohasset shall ensure that all limitations and requirements applicable to Cohasset's Wastewater under this Agreement are complied with.
- 12.2 The Cohasset Sewer Commission shall notify the Hull Permanent Sewer Commission within twenty-four (24) hours after becoming aware of any respect in which Hull or Cohasset is not complying with the terms of this

Agreement. The Hull Permanent Sewer Commission shall notify the Cohasset Sewer Commission within twenty-four (24) hours after becoming aware of any respect in which Cohasset or Hull is not complying with the terms of this Agreement.

- 12.3 In the event that Cohasset is notified or otherwise becomes aware that it is not in compliance with the provisions of this Agreement, Cohasset shall immediately commence corrective action and shall immediately notify Hull, State and Federal regulatory agencies of the action commenced and a reasonable timetable for correction of the non-compliance. Said timetable shall provide for prompt action and shall be approved by the Hull Permanent Sewer Commission, which approval shall not be unreasonably withheld or delayed. Notwithstanding any provisions of this Agreement to the contrary, the provisions of this Agreement and any timetables established pursuant hereto shall be specifically enforceable by any court of competent jurisdiction. Repeated, willful, or substantial violations of the provisions of this Agreement or action taken which adversely affects the integrity of the system or public health shall be subject to an action for appropriate prohibitory and/or mandatory injunctive relief, or other relief, including but not limited to cease and desist orders regarding use of the Hull Wastewater Works until such violations have been corrected, in a court of competent jurisdiction, notwithstanding any provision in the Agreement to the contrary.
- 12.4 In the event that Hull or Cohasset provides the other party with notice of the existence of a material breach of the Agreement and the parties are unable to resolve such breach within ninety (90) calendar days after receipt of such notice by the recipient, both parties may agree to submit the dispute to arbitration by the American Arbitration Association, or a similar service mutually selected by the Parties. An expert, with appropriate professional credentials in the subject matter in dispute, shall be appointed as arbitrator. The arbitrator shall hear the dispute and render a decision within ninety (90) days of the date of submission of the dispute. Such decision shall be final and

binding on both parties. If the parties do not elect arbitration, either party may seek a declaratory judgment or other legal remedy in a court of competent jurisdiction to determine the rights, duties and obligations of the parties under this Agreement with regard to any such breach or disagreement, and/or to resolve any such breach or disagreement.

12.5 Service to Cohasset and Hull pursuant to this Agreement shall not be interrupted, except as provided for in this agreement.

12.6 In the event that Cohasset fails to comply with any sewage limitation referred to in this agreement, Hull shall provide a written notice of the violation to Cohasset stipulating the limitation exceedence, the period of exceedence, the associated penalty calculation, and all support material to document the violation. Such notice will be given as soon as practical after any violation or period of exceedence(s). Cohasset shall have ninety (90) days to correct such failure to comply. If such failure to comply is not corrected within this time frame or reoccurs within twelve months of the original notice, (excluding the ninety (90) day initial corrective action response time), Cohasset shall pay to Hull penalties or liquidated damages as hereinafter set forth. For average daily flow, Cohasset shall pay Hull a penalty or liquidated damages of \$500 per month for each 1,000 gallons or part thereof that the annual average daily flow exceeds 80,000 GPD. The annual average daily flow shall be calculated each month using the previous twelve (12) month period of flow data as measured at the Cohasset Pumping Station. For peak flow, Cohasset shall pay to Hull a penalty or liquidated damages of \$500 for each day that peak flow exceeds 213,000 GPD based on flow data as measured at the Cohasset Pumping Station. On peak flow, Hull recognizes that all Cohasset wastewater must be pumped to the Hull wastewater works. Cohasset's peak flow (pumping rate) shall not be based on an instantaneous peak flow, but on the average pumping rate during the station pumping cycle. Hull shall invoice Cohasset for all penalty or liquidated damages assessments in accordance with the billing and payment procedures detailed in Article 9.

In addition to the penalty or liquidated damages assessment discussed above, Cohasset shall also pay sewer user fees for all excess flow as detailed elsewhere in this Agreement.

- 12.7 All wastewater flow monitoring and sampling costs incurred by Hull confirming that there are Agreement violations will be a Cohasset expense over and above the constituent penalty or liquidated damages.

ARTICLE 13. GENERAL PROVISIONS

- 13.1 Cohasset shall have no ownership rights in or rights of control over the Hull Wastewater Works beyond those of a sewer user or as otherwise provided in this Agreement. Any entitlement of Cohasset to make use of the Hull Wastewater Works shall be as set forth in this Agreement. For the purpose of all applicable laws, rules, regulations, and policies, Cohasset shall be deemed to be a user of the Hull Wastewater Works except where said law, rule, regulation or policy provides otherwise.
- 13.2 This Agreement contains the entire agreement between the parties hereto with respect to the subject matter hereof, and supersedes any and all agreements, oral or written, with respect to the subject matter of this Agreement.
- 13.3 This Agreement may be executed simultaneously in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.
- 13.4 All remedies provided in this Agreement are distinct and cumulative to any other right or remedy under this Agreement or afforded by law or equity, and may be exercised concurrently, independently, or successively.
- 13.5 The provisions, terms, and conditions of this Agreement shall be modified only by written amendments to this Agreement. Any such amendments shall be approved by the Town Meetings of Hull and Cohasset in accordance with applicable provisions of state law, shall be approved by the Hull Board of Selectmen and Permanent Sewer Commission and the Cohasset Sewer

Commission, shall be approved for form by the Town Counsel for Hull and the Town Counsel for Cohasset, and shall be approved as to funds by the Town Accountant for Hull and the Town Accountant for Cohasset; provided, however, that such an amendment shall not require the approval of the Town Meeting of Hull or Cohasset if such amendment is within the scope of any approval and authorization which has previously been granted by said Town Meeting and which has not been withdrawn.

- 13.6 Notices, communications and correspondence pertaining to this Agreement shall be mailed by certified mail, return receipt requested to the Hull Permanent Sewer Commission and/or the Cohasset Sewer Commission or served by Constable at the following addresses:

Hull Permanent Sewer Commission
1111 Nantasket Avenue
Hull, MA 02045-1310

Cohasset Sewer Commission
Cohasset Town Hall
41 Highland Avenue
Cohasset, MA 02025

or such other addresses, which must include a street address, the parties may notify each other of.

- 13.7 This Agreement is subject to the lawful rules, regulations, decisions, orders or directives of the U.S. Environmental Protection Agency (EPA) and of any agency of the State and Federal government with jurisdiction over the parties or subject matter of the Agreement. Any and all conditions, rules, regulations, orders or other requirements heretofore or hereafter placed upon Hull or Cohasset by the EPA or by the Massachusetts Department of Environmental Protection or any other agency, division, office or department of the United States or the Commonwealth of Massachusetts or by any court of competent jurisdiction and by any other applicable Federal, State or County agency, shall be construed to become a part of this Agreement unless the Agreement is terminated hereunder. Further, any additional costs placed upon Hull as a result of any orders of the above referenced court or agencies

in connection with the supplying of sewage disposal to Cohasset by Hull shall be borne by Cohasset.

- 13.8 Cohasset shall not have any rights to participate in the management and operation of the Hull Wastewater Works or representation on any board or Commission overseeing the maintenance and operation of the Hull Wastewater Works by reason of its participation under this Agreement.
- 13.9 Cohasset may not assign its rights and obligations under this Agreement without the written permission of Hull. Cohasset will be informed of any plans of Hull to assign this Agreement and given an opportunity to present its views to the Hull Board of Selectmen and the Hull Permanent Sewer Commission. Notwithstanding the foregoing, this Agreement shall be binding upon and shall inure to the benefit of the respective successors and assigns of the parties hereto.
- 13.10 The failure of either party to this Agreement to insist upon compliance of any provision of this Agreement shall not constitute a waiver by said party of its right to enforce such provision.
- 13.11 Any provision of this Agreement which refers to a Federal, State or local law, regulation, standard, or industry guideline, shall be considered to refer to the most current applicable version of same so as to insure that the requirements of this Agreement are consistent at all times with currently applicable requirements and standards.
- 13.12 It is agreed and understood that the remedies contained herein are distinct and are cumulative and that the failure to exercise one is not deemed a waiver of any.
- 13.13 Upon reaching the expiration date of this Agreement, unless renewed or extended, Cohasset shall forthwith cease maintaining flow to Hull and with respect to work done within Hull pursuant to this Agreement, shall forthwith remove all above-ground structures and also take such steps as are reasonably necessary to assure that sub-surface structures, including any pipeline constructed hereunder in Hull, will not interfere with the functioning of the

Hull Wastewater Works or otherwise endanger the health or safety of the residents of Hull. Any manholes, support structures and similarly constituted below surface devices shall be filled in and capped. Said work is to be completed within ninety (90) days, including the restoration of the work area to its prior condition, whereupon this agreement shall be terminated.

ARTICLE 14. SEVERABILITY AND HEADINGS

14.1 If any provision of this Agreement, or its application to any person or circumstance, is found to be illegal, unenforceable or void, then the remainder of the Agreement, or the application of said provision to other persons or circumstances shall not be affected thereby; provided further that if any provision or its application is invalid or unenforceable, then a suitable and equitable provision shall be substituted therefor in order to carry out so far as may be valid and enforceable the intended purpose of the invalid or unenforceable provision. The headings and sections are used for reference and convenience only and shall not be a factor in the interpretation of the Agreement.

ARTICLE 15. EFFECTIVE DATE

15.1 It is acknowledged that this Agreement has been approved by affirmative Town Meeting votes in both Hull and Cohasset as required by Massachusetts General Laws Chapter 40 Section 4. The effective date shall be the date of signing by the majority of the Hull Board of Selectmen, a majority of the Hull Permanent Sewer Commission, and a majority of the Cohasset Sewer Commission.

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IN WITNESS whereof the parties hereto have executed this Agreement as of the day and year first above written.

ATTEST:

Marion L. Douglas

TOWN OF COHASSET,
SEWER COMMISSION

Edward M. Guild

Thomas R. Pattenberg

Ed Vandereit, Jr

APPROVED FOR FORM:

[Signature]
Cohasset Town Counsel

CERTIFIED AS TO THE
AVAILABILITY OF COHASSET'S
SHARE OF FUNDS:

[Signature]
Cohasset Town Accountant

ATTEST:

[Signature]

TOWN OF HULL,
TOWN MANAGER

[Signature]
Hull Town Manager

TOWN OF HULL
PERMANENT SEWER COMMISSION

[Signature]

Robert F. McCreedy

James A Burns

[Signature]

[Signature]

TOWN OF HULL,
BOARD OF SELECTMEN

Carl P. Kato

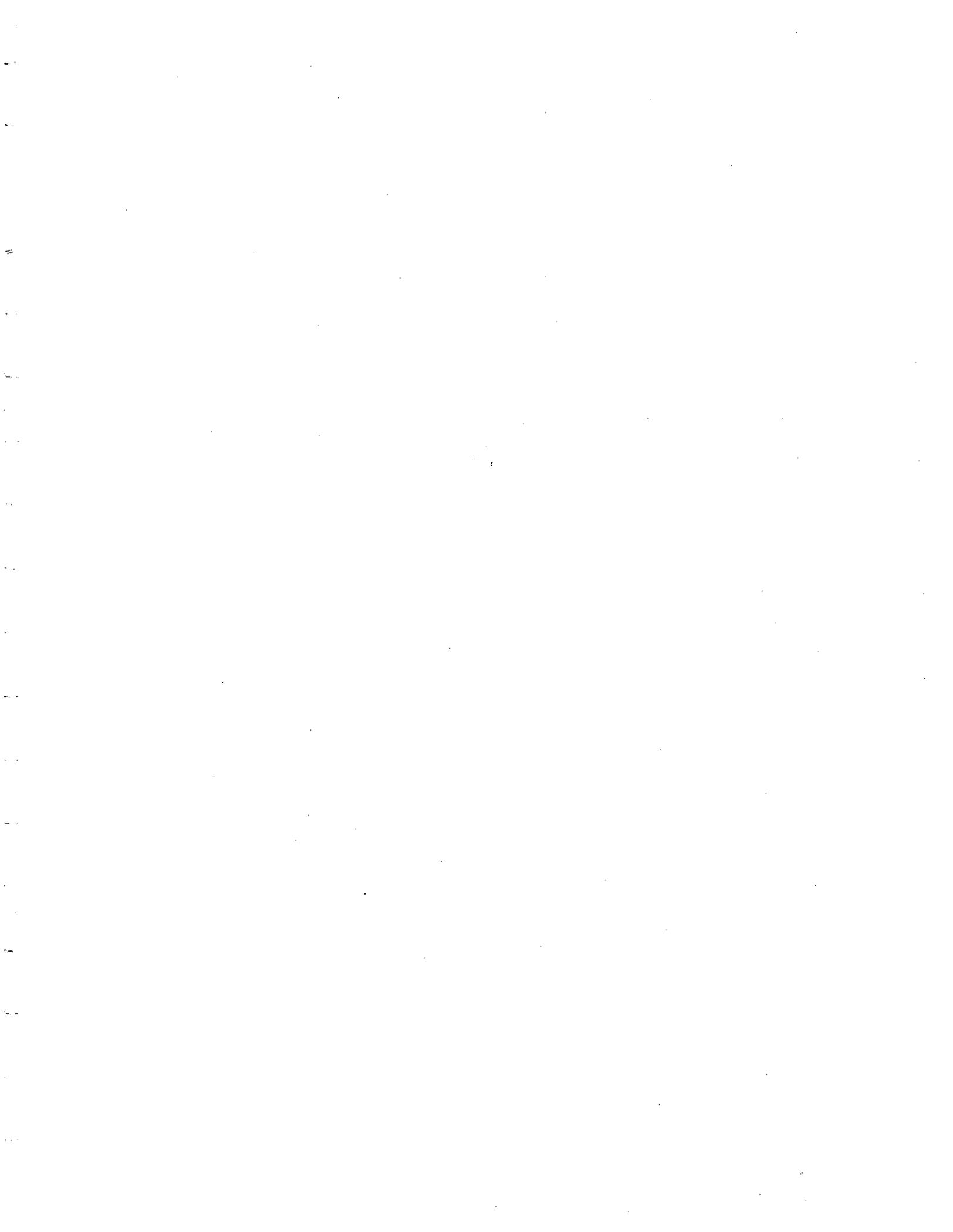
[Signature]

Mario F. Quinn

APPROVED FOR FORM:

[Signature]
Hull Town Counsel

cima.4



COPY

INTERMUNICIPAL AGREEMENT FOR WATER POLLUTION CONTROL
BETWEEN THE TOWNS OF COHASSET AND HINGHAM, MASSACHUSETTS

AGREEMENT made this 19 day of August, 1997, by and between the Town of Cohasset (hereinafter "Cohasset"), a municipal corporation within the County of Norfolk, Massachusetts, acting through its Sewer Commission and the Town of Hingham (hereinafter "Hingham"), a municipal corporation within the County of Plymouth, Massachusetts, acting through its Sewer Commission and its Board of Selectmen, after approval and funding by their respective Town Meetings.

WITNESSETH

WHEREAS, Cohasset and Hingham are authorized pursuant to the second paragraph of Massachusetts General Laws Chapter 40, Section 4 and Chapter 83, Section 4, to enter into contracts and agreements with one another for the purpose of aiding in the prevention or abatement of water pollution, and

WHEREAS, Cohasset and Hingham deem it to be in the public interest to enter into this Agreement, whereby Hingham would receive, and pump Cohasset's wastewater through Hingham's sewerage system, to the Town of Hull's wastewater system, and

WHEREAS, Hingham and Cohasset and the Town of Hull ("Hull") have entered into agreements whereby Hull has agreed to accept Hingham's and Cohasset's wastewater which will be conveyed to Hull through Hingham's pump station (the "Hull IMAs"), and

WHEREAS, Cohasset and Hingham desire to comply with all Federal and State requirements dealing with water pollution control,

NOW, THEREFORE, in consideration of the mutual promises and covenants herein contained and for other good and valuable consideration the receipt of which is hereby acknowledged, it is agreed as follows:

REVISED 3/21/97

ARTICLE 1. DEFINITIONS

- 1.1 For the purpose of this Agreement, the following terms are defined:
- 1.1.1 Average Daily Flow for any calendar year shall mean the total annual flow expressed in millions of gallons (MG) divided by the number of days in the year.
 - 1.1.2 BOD (Biochemical Oxygen Demand) shall mean the quantity, expressed in pounds per day (lbs/day), of dissolved oxygen, utilized in the biochemical oxidation of organic matter under standard laboratory procedure in five (5) days at 20 degrees centigrade (68 degrees Fahrenheit) as described in the most recent edition of "Standard Methods for the Examination of Water and Wastewater".
 - 1.1.3 Hingham's Wastewater shall mean wastewater generated in Hingham which is conveyed to Hull.
 - 1.1.4 Cohasset's Wastewater shall mean wastewater generated in Cohasset which is conveyed to Hingham.
 - 1.1.5 Hingham's Hull Street Gravity Main shall refer to the gravity main constructed on Hull Street located in part in Hingham and in part Cohasset.
 - 1.1.6 Hingham's Pump Station shall refer to a wastewater pump station constructed by Hingham in Hingham to serve the Weir River Sewer District of Hingham, and the North Cohasset Wastewater District, which shall pump wastewater to the Hull Wastewater Works.
 - 1.1.7 Hingham's Wastewater Pipeline shall mean the force main designed by Hingham and constructed, owned, operated and maintained by Hingham in Hingham and/or Hull and as otherwise agreed to with the Town of Hull for the purpose of conveying wastewater along Nantasket Avenue from Hingham's Pump Station to the Hull gravity main at the intersection of Nantasket Avenue and Atlantic Avenue in Hull.
 - 1.1.8 DO (Dissolved Oxygen) shall mean the oxygen level that is found in wastewater as measured by an approved technique described in the most recent edition of "Standard Methods For the Examination of Water and Wastewater".
 - 1.1.9 Dwelling Unit shall refer to a residential home, apartment, condominium unit or similar facility.

- 1.1.10 GPD is the abbreviation for gallons per day.
- 1.1.11 Sewer Use Rules and Regulations shall mean the most recent edition of the rules and regulations adopted and amended from time to time by the respective towns that govern the use of the municipal sewer system.
- 1.1.12 Hull Wastewater Works shall mean the entire Hull sewerage system including collector sewers, pump stations, force mains, the Hull Wastewater Treatment Plant, and ocean outfall.
- 1.1.13 Industrial Waste shall mean the liquid wastes from industrial manufacturing processes, trade, or business, other than sanitary or kitchen flows.
- 1.1.14 Leachate shall mean the liquid that is collected, pumped and/or removed from a lined or unlined solid waste landfill. Under the terms of the Agreement, no leachate, whether treated or untreated, shall be a part of Cohasset's Wastewater.
- 1.1.15 MGD is the abbreviation for million gallons per day.
- 1.1.16 Peak Flow Rate shall mean the maximum pumping rate for the Hingham pump station expressed in gallons per minute or gallons per day (GPD).
- 1.1.17 Septage shall mean the liquid and solid wastes that are removed from a cesspool, septic tank, or other on-site wastewater disposal system serving a building or structure, including, but not limited to a residential housing unit or a building or structure utilized for commercial or business purposes.
- 1.1.18 SS (Suspended Solids) shall mean the quantity, expressed in pounds per day (lbs/day) or milligrams per liter, of solids that either float on the surface of, or are in suspension in, water, wastewater, or other liquids, and which are removable by laboratory filtering, and are referred to as nonfilterable residue in laboratory tests prescribed in the or most recent of "Standard Methods for the Examination of Water and Wastewater".
- 1.1.19 Wastewater shall mean the sanitary and kitchen flows generated from Dwelling Units, Industrial Waste, Infiltration, Inflow, or other wastes discharged to a municipal wastewater system, or any combination of such material. This definition shall not include Septage or Leachate from any source. Wastewater shall be defined as sewage having an average BOD of not more than 300 mg/l

an average total suspended solids concentrations of not more than 300 mg/l based on a twenty-four (24) hour composite sample.

ARTICLE 2. SCOPE

2.1 Hingham shall receive and pump Cohasset's wastewater to the Hull Wastewater Works in accordance with the provisions of this Agreement and in compliance with all existing or future laws, regulations, ordinances, water quality standards, orders, and decrees of any governmental authority having jurisdiction over the treatment and disposal of said wastewater including, without limitation, the Hull Sewer Use Rules and Regulations. Cohasset's wastewater must conform to the terms of this Agreement and to Hingham's and Hull's Sewer Use Rules and Regulations, provided that wastewater requirements of said Hingham Sewer Use Rules and Regulations must apply uniformly to Hingham's Wastewater and Cohasset's Wastewater. The Town of Cohasset has a separate agreement with the Town of Hull for the conveyance of Cohasset's wastewater through Hingham to Hull. Cohasset's Agreement with Hull must be in effect throughout the entire term of Cohasset's Agreement with Hingham, otherwise this agreement shall become null and void with all previous payments by Cohasset to Hingham forfeited to Hingham.

2.2 The Hingham Wastewater Pump Station shall have the capacity to accept and pump Cohasset's wastewater in volumes up to the quantities set forth below in addition to the volume reserved for use by Hingham:

Average Daily Flow 80,000 GPD

Peak Flow Rate 213,000 GPD

7167-68,000 gpd average

Cohasset's wastewater shall not include leachate, septage, sewage sludge or industrial waste from a facility that is or should be regulated by an Industrial Pretreatment program required by the U.S. Environmental Protection Agency (EPA) or the Massachusetts Department of Environmental Protection.

2.3 Cohasset shall be responsible for all study, design, engineering, permitting and construction costs associated with its pipeline connections to the Hingham facilities.

2.4 Cohasset agrees to use Hingham's Hull Street Gravity Main and shall coordinate design efforts between the parties hereof.

- 2.5 Hingham shall be responsible for the study, design and construction of the proposed pump station, to be located at West Corner, and the force main and ancillary facilities for the connection to the Hull Wastewater Works. Cohasset agrees to share with Hingham the cost of all such work as set forth in Attachment A hereof.
- 2.6 The pump station shall include the following minimum facilities housed in a structure architecturally designed to preserve any aesthetic and historic aspects of West Corner: two centrifugal wastewater pumps, wetwell, bubbler type level and pump control system, effluent flow meter, wastewater sampling station, stand-by electrical generator, intrusion and alarm telemetry system, influent aeration device, odor control facilities, ventilation and SCADA interface at the Hull Wastewater Treatment Plant.

ARTICLE 3. MONITORING, SAMPLING AND MEASUREMENT OF WASTEWATER

- 3.1 All sampling and measurement of the constituents of Hingham's and Cohasset's Wastewater shall be made at or before the Hingham pump station. Cohasset shall also have access to the Hingham Pump Station during normal business hours for the purpose of monitoring compliance with the terms of this Agreement and other agreements.
- 3.2 The sampling and determination of the constituents in Cohasset's and Hingham's Wastewater may be performed on a semi-annual basis in accordance with the most recent edition of "Standard Methods for the Examination of Water and Wastewater". Said samplings shall include the collection of twenty-four (24) hour composite, flow proportional samples. This sampling and analysis shall be conducted to ensure that the wastewater is in compliance with the Hull Sewer Use Regulations. The costs of all sampling and testing shall be shared equally by both parties.
- 3.3 For the purpose of monitoring compliance with the terms of this Agreement and to ensure compliance with Hull's Sewer Use Rules and Regulations, sampling shall not be announced in advance and may be supplemented by additional sampling as determined by the Hingham Sewer Commission. Cohasset shall be given the opportunity to take duplicate, simultaneous samples at the time of such samplings for independent analysis.

- 3.4 Within thirty (30) days of the date of sample collection, Cohasset shall provide Hingham with copies of all analyses of samples collected at or before the pump station. Similarly, Hingham shall provide Cohasset with sampling analyses or flow calibration data conducted by Hingham within thirty (30) days of sample collection.

ARTICLE 4. PRETREATMENT OF WASTEWATER AND SEPTAGE

- 4.1 Cohasset reserves the right at any time to pretreat and/or to reduce the BOD and/or the SS in its Wastewater, or to otherwise provide preliminary treatment to its Wastewater prior to discharge to the Hingham Pump Station. However, any such preliminary treatment shall not result in a reduction of Cohasset's obligation to pay capital costs in accordance with the provisions of Article 6 of this Agreement or costs of operation and maintenance in accordance with Article 9 of this Agreement.
- 4.2 In the event that any pretreatment of Cohasset's wastewater is required by any Federal or State authority or to meet the terms of this Agreement, Cohasset shall implement and pay the costs of providing such pretreatment. However, any such preliminary treatment shall not result in a reduction of Cohasset's obligation to pay capital costs in accordance with the provisions of Article 6 of this Agreement or costs of operation and maintenance covered by Article 9 of this Agreement.
- 4.3 Cohasset's wastewater shall have a minimum average daily dissolved oxygen concentration of 1 mg/l as measured at the pump station. Hingham shall install and maintain a continuous monitoring dissolved oxygen probe at Hingham's Pump Station that shall be used to monitor and record dissolved oxygen levels in Hingham's and Cohasset's wastewater. Cohasset shall pretreat its wastewater if necessary to meet the 1 mg/l average daily dissolved oxygen requirement and/or shall pay the costs of any such pretreatment.

ARTICLE 5. TERM OF AGREEMENT

- 5.1 The initial term of this Agreement shall be a period from the effective date of this Agreement until April 29, 2028.

- 5.2 The discharge of Cohasset's wastewater to the proposed Hingham's Pump Station pursuant to this Agreement may be commenced only after all construction required for the discharge of such Wastewater is substantially complete and ready for use and Cohasset's capital costs as set forth in Article 6 of this Agreement have been paid in full to Hingham.
- 5.3 At or before the termination of the initial term of this Agreement, the Agreement may be extended or renewed by the mutual consent of the parties under such terms and conditions as are mutually agreeable to the parties. Future terms or conditions shall reasonably reflect those terms and/or conditions incorporated into the then current revisions of Hull IMAs.

ARTICLE 6. PAYMENT OF CAPITAL COSTS

- 6.1 Cohasset shall be responsible for its share of the costs of construction and associated engineering during construction and startup associated with the proposed pump station; force main, gravity main and ancillary work required for the connection to the Hull Wastewater Collection System as set forth in Attachment A. The terms of such payments shall be as set forth in Article 7.

ARTICLE 7. TERMS OF PAYMENT OF CAPITAL COSTS

- 7.1 Cohasset shall make the following payments according to the schedule as set forth below:
- 7.1.1 Cohasset shall make a payment of \$20,000 within 60 working days of its approval and signing of this agreement which payment shall be later included as construction and/or engineering cost payments. This amount shall be credited against the first payment due under Section 7.1.2, below.
- 7.1.2 Cohasset shall make payment of one-fifth of the total fixed fee for construction and engineering costs as set forth in Attachment A within 60 working days of receipt of each invoice from Hingham. Hingham shall invoice Cohasset for construction and/or engineering costs at approximately 20, 40, 60, 80 and 100 percent of construction payments to the Contractor.

- 7.2 Upon execution of this Agreement and payment of their share of the capital costs, Cohasset shall become a 55% user of Hingham's Pump Station and Hingham's Wastewater Pipeline and a 20% user of Hingham's Hull Street Gravity Main.
- 7.3 If Cohasset fails to make payments in accordance with the requirements of Articles 6 and 7, hereof, Hingham may at its sole discretion to terminate this agreement and retain all payments made to date by Cohasset.
- 7.4 It is understood that both Hingham and Cohasset wish to pursue funding through the Massachusetts Water Pollution Abatement Trust for the jointly shared portions of their projects. Both communities will work together to structure loan agreements and payment requests so that this intent and agreement conditions can be satisfied. Hingham agrees to furnish support materials in a timely fashion to ensure disbursement from the Trust so as to satisfy periodic payment requests provided by this agreement.

ARTICLE 8. COMMUNITY RESPONSIBILITIES

- 8.1 Hingham is responsible for the study, engineering, design, permitting and construction of all facilities in Hingham and in Hull required to convey wastewater from Hingham's Pump Station to the Hull Wastewater Works including collector and interceptor sewers in Hingham, Hingham's Pump Station and Hingham's Wastewater Pipeline between the pumping station and the Atlantic Avenue interceptor sewer in Hull and Hingham's Hull Street Gravity Main.
- 8.2 Hingham shall also provide minimums of 80,000 GPD of average daily flow capacity and 213,000 GPD of peak flow capacity in the Hingham pump station for Cohasset to be used by Cohasset to provide sewer service to the North Cohasset Wastewater System.
- 8.3 Within two months of completion of construction, Cohasset shall furnish Hingham a copy of the Record Plans of the collection system components in Cohasset that will convey wastewater to Hingham's Pump Station. Hingham agrees to furnish similar plans to Cohasset for all construction in Hull Street adjacent to the Cohasset town line.
- 8.4 Hingham shall have the right of review and timely approval of all sewer designs and specifications for the construction of collection system components connected to the proposed Pump Station, specifically in terms of their physical connection to the Hingham Pump Station, any interconnections or relief sewers at siphon or stream crossings or

relative to construction controls and requirements for the control and reduction of Infiltration/Inflow (I/I).

Cohasset shall continuously monitor all sewer construction under their responsibility to verify compliance with design plans, specifications, and all applicable local, State and Federal standards. Demonstration of such compliance shall be given to Hingham prior to discharge of any wastewater flows to Hingham's Pump Station by Cohasset.

- 8.5 Hingham shall maintain an adequate cost accounting system which shall be the basis for the determination and allocation of cost for the operation and maintenance of Hingham's Pump Station and Hingham's wastewater pipeline as proposed. The cost accounting records shall be available for review and study by the Cohasset Sewer Commission or its authorized agents during regular business hours.
- 8.6 Hingham shall properly operate and maintain the Pump Station in accordance with State and Federal regulations.
- 8.7 The parties agree to mutually pursue appropriate State and Federal funding opportunities for any system improvements relating to Hingham's Pump Station and Hingham's Wastewater Pipeline, in a timely manner, to help reduce overall costs to both communities.
- 8.8 The parties agree to act in good faith regarding all matters set forth in this Agreement.

ARTICLE 9. PAYMENT OF COSTS OF OPERATION,

MAINTENANCE AND REPAIR

- 9.1 By joining the Hingham Weir River Sewer District, Cohasset sewer users so connected assume responsibilities identical to those of Hingham sewer users in the district and Cohasset shall enforce such responsibilities with regards to Cohasset sewer users.
- 9.2 Cohasset's share of the costs of operation and maintenance of Hingham's Pump Station and Wastewater Pipeline shall be calculated based upon their respective annual metered water consumption reported to Hull. The percentage to be paid by Cohasset shall be equal to a fraction, the numerator of which is the total water consumption of the North Cohasset Sewer District and the denominator of which is the total water consumption of the North Cohasset Sewer District plus the total water consumption of Hingham's Weir River Sewer District.

- 9.3 At least ninety (90) days prior to the Cohasset Annual Town Meeting, Hingham shall submit to Cohasset a statement which shall set forth an estimate of Cohasset's portion of the costs for the operation and maintenance of Hingham's Pump Station for the succeeding fiscal year. Not more often than quarterly, Hingham shall submit to Cohasset a sewer use bill which shall cover such periods of time as may be determined by the Hingham Sewer Commission. Cohasset shall pay Hingham within forty-five (45) days of receipt of a Hingham billing statement. Any sewer use payment owed by Cohasset that is not made within the forty-five (45) day payment period shall be subject to a surcharge at the interest rate of (12%) twelve percent per annum.
- 9.4 Periodically, Hingham's Pump Station, Hingham's Hull Street Gravity Main and/or Hingham's Wastewater Pipeline may require capital improvements to upgrade, expand and/or repair its facilities and to comply with the water pollution control requirements of Hull, and State and Federal regulatory agencies. Cohasset agrees to share in the costs of such improvements utilizing the basis defined in this agreement and to make payment of its share of such costs within sixty (60) days of Hingham's billing. Cohasset however shall have the option not to participate in an expansion in which case added capacity would not be available to Cohasset.

ARTICLE 10. OTHER RESPONSIBILITIES OF COHASSET

- 10.1 Cohasset's wastewater shall meet the requirements of this Agreement and the qualitative requirements of the Hingham Sewer Use Rules and Regulations which shall apply uniformly to Hingham's wastewater and Cohasset's wastewater.
- 10.2 Changes to Cohasset's Sewer Use Rules and Regulations shall be made from time to time as appropriate to conform with applicable Hingham and State/Federal regulations. Both Cohasset and Hingham shall make periodic changes to their respective sewer use regulations to safeguard collection and pumping components as may be appropriate or as to otherwise comply with State/Federal regulations and the Hull Sewer Use Rules and Regulations.
- 10.3 Cohasset shall be responsible for all administrative requirements including permits, easements, legislative approval, etc. that may be necessary for Cohasset to construct wastewater facilities in Cohasset. Hingham shall cooperate with and provide active

support of Cohasset's efforts with respect to permitting in Hingham but shall not be responsible for any administrative activity that deals with Cohasset's wastewater plans.

- 10.4 Cohasset shall provide Hingham, in a timely manner, copies of all permit applications and written requests as set forth in paragraph 10.3, in connection with the Cohasset wastewater facilities in Hingham.
- 10.5 Cohasset shall grant to Hingham and Hingham shall grant to Cohasset any required easements for sewer construction within Hull Street as may be required to maintain construction within said roadway limits.
- 10.6 When requested by the Hingham Sewer Commission, but, no more frequently than once per quarter, Cohasset shall promptly furnish the most recent water consumption data for all Cohasset sewer users connected to Hingham's Pump Station. The data shall be subject to independent review and verification by the Hingham Sewer Commission upon reasonable notice and during normal business hours.

ARTICLE 11. OTHER RESPONSIBILITIES OF HINGHAM

- 11.1 Hingham shall operate, maintain and repair Hingham's Pump Station in accordance with all State and Federal water pollution control requirements.
- 11.2 Hingham shall periodically modify its Sewer Use Regulations to comply with local, State and Federal requirements. Modifications to the Hingham Sewer Use Regulations shall be forwarded to the Cohasset Sewer Commission from time to time to facilitate corresponding changes or modifications to the Cohasset regulations.

ARTICLE 12. BREACHES AND REMEDIES

- 12.1 The Hingham Sewer Commission and the Cohasset Sewer Commission shall have access during regular business hours to all information gathered at Hingham's Pump Station concerning the flow and the constituents in Hingham's Pump Station wastewater.
- 12.2 The Hingham Sewer Commission shall notify the Cohasset Sewer Commission within twenty-four (24) hours after becoming aware that Hingham or Cohasset is not complying with the terms of this Agreement. The Cohasset Sewer Commission shall notify the Hingham Sewer Commission within twenty-four (24) hours after becoming aware that Cohasset or Hingham is not complying with the terms of this Agreement.

- 12.3 In the event that Cohasset is notified or otherwise becomes aware that it is not in compliance with the provisions of this Agreement, Cohasset shall immediately commence corrective action and shall immediately notify Hingham, and State and Federal regulatory agencies of the action commenced and a reasonable timetable for correction of the non-compliance. Said timetable shall provide for prompt action and shall be approved by the Hingham Sewer Commission, which approval shall not be unreasonably withheld or delayed. Notwithstanding any provisions of this Agreement to the contrary, the provisions of this Agreement and any timetables established pursuant hereto shall be specifically enforceable by any court of competent jurisdiction. Repeated, willful, and substantial violations of the provisions of this Agreement shall be subject to an action for appropriate injunctive or other relief, including but not limited to cease and desist orders regarding use of the proposed Hingham Pump Station until such violations have been corrected, in a court of competent jurisdiction. Cohasset shall indemnify Hingham for any and all losses, damages and costs incurred, including reasonable attorney's fees, arising from any violation by Cohasset of the provisions of this Agreement, including but not limited to any violation which causes Hingham to be in violation of its Inter-Municipal Agreement for Water Pollution Control with the Town of Hull.
- 12.4 In the event that Hingham or Cohasset provides the other party with notice of the existence of a material breach of the Agreement regarding any matter under this Agreement and the parties are unable to resolve such breach within ninety (90) calendar days after receipt of such notice by the recipient, both parties may agree to submit the dispute to arbitration by the American Arbitration Association. An expert with appropriate professional credentials in the subject matter of the dispute shall be appointed as arbitrator. The arbitrator shall hear the dispute and render a decision within ninety days of the date of submission of the dispute. Such decision shall be final and binding on the parties and shall be enforceable in a court of competent jurisdiction. If the parties do not elect arbitration, either party may seek a declaratory judgement or other legal remedy in a court of competent jurisdiction to determine the rights, duties, and obligations of the parties under this Agreement.
- 12.5 Service to Cohasset pursuant to this Agreement shall not be interrupted unless otherwise provided in this agreement.

- 12.6 The costs for appropriate wastewater flow monitoring and sampling which confirm that Agreement violations by Cohasset exist, shall be paid by Cohasset.

ARTICLE 13. GENERAL PROVISIONS

- 13.1 Cohasset shall have no ownership rights in or rights of control over Hingham's Pump Station. Any entitlement of Cohasset to make use of Hingham's Pump Station shall be as set forth in this Agreement. For the purpose of all applicable laws, rules, regulations, and policies, Cohasset shall be deemed to be a user of Hingham Pump Station except where said law, rule, regulation or policy provides otherwise.
- 13.2 This Agreement contains the entire agreement between the parties hereto with respect to the subject matter hereof, and supersedes any and all agreements, oral or written, with respect to the subject matter of this Agreement.
- 13.3 This Agreement may be executed simultaneously in two or more counterpart copies, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.
- 13.4 All remedies provided in this Agreement are distinct and cumulative to any other right or remedy under this Agreement or afforded by law or equity, and may be exercised concurrently, independently, or successively.
- 13.5 The provisions, terms, and conditions of this Agreement may be modified only by written amendments. Any such amendments shall be approved by the Town Meetings of Cohasset and Hingham in accordance with applicable provisions of State law, shall be approved by the Cohasset Sewer Commission and the Hingham Board of Selectmen and the Hingham Sewer Commission, shall be approved for form by the Town Counsel of Cohasset and the Town Counsel of Hingham, and shall be approved as to availability of funds by the Town Accountant of Cohasset and the Town Accountant of Hingham; provided, however, that such an amendment shall not require the approval of the Town Meetings of Cohasset and/or Hingham if such amendment is within the scope of any approval or authorization which has previously been granted by the respective Town Meetings and which has not been withdrawn.

13.6 Notices, communications and correspondence pertaining to this Agreement shall be mailed by certified mail, return receipt requested to the Cohasset Sewer Commission or the Hingham Sewer Commission at the following respective addresses:

Town of Hingham
Sewer Commissioners
7 East Street
Hingham, MA 02043

Cohasset Sewer Commission
Cohasset Town Hall
41 Highland Ave
Cohasset, MA 02045

Notice shall be deemed to have been given on the date of mailing.

13.7 This Agreement is subject to the rules, regulations, decisions, orders and/or directives of the U.S. Environmental Protection Agency (EPA) and of any agency of the State and Federal government with jurisdiction over the parties or subject matter of this Agreement. Any and all conditions, rules, regulations, orders or other requirements heretofore or hereafter placed upon Cohasset or Hingham by the EPA or by the Massachusetts Department of Environmental Protection (DEP) or any other agency, division, office or department of the United States or the Commonwealth of Massachusetts or by any court of competent jurisdiction or by any other applicable Federal, State or County agency, shall be construed to be a part of this Agreement.

ARTICLE 14. EFFECTIVE DATE

14.1 This Agreement shall become effective upon the Agreement's signing by the majority of the Cohasset Sewer Commission and by the majority of the Hingham Sewer Commission, but in no case later than July 1, 1997.

IN WITNESS whereof the parties hereto have executed this Agreement as of the day and year first above written.

ATTEST:

TOWN OF COHASSET,
SEWER COMMISSION

Marion K. Douglas
Town Clerk

Edward M. Gulev
Henry A. Rottenberg
Al Wanders

APPROVED FOR FORM; *except as to lack of termination for compliance provision*
[Signature]
Town Counsel

CERTIFIED AS TO THE
AVAILABILITY OF COHASSET'S
SHARE OF FUNDS

[Signature]
Town Accountant

ATTEST:

TOWN OF HINGHAM,
SEWER COMMISSION

William A. McCracken

Charles J. Hirschoff
John J. [Signature]
[Signature]

APPROVED FOR FORM

TOWN OF HINGHAM,
BOARD OF SELECTMEN

James A. [Signature]
Town Counsel

[Signature]
[Signature]
[Signature]

**ATTACHMENT A
HINGHAM/COHASSET IMA**

- COHASSET'S SHARE OF ENGINEERING AND CONSTRUCTION COSTS FOR WEIR RIVER SEWER DISTRICT.

- 1) HINGHAM/COHASSET PUMPING STATION & STORAGE
(INCLUDING PUMPING STATION FORCE MAIN IN HINGHAM)
- 2) HINGHAM/COHASSET GRAVITY SEWER HULL STREET

FIXED COST SUBTOTAL \$377,000.00

- COHASSET'S SHARE OF ENGINEERING AND CONSTRUCTION COSTS FOR INSTALLATION OF PUMP STATION FORCE MAIN IN THE TOWN OF HULL

COST TO HINGHAM (ESTIMATED) \$296,000.00

COHASSET'S SHARE (55%)

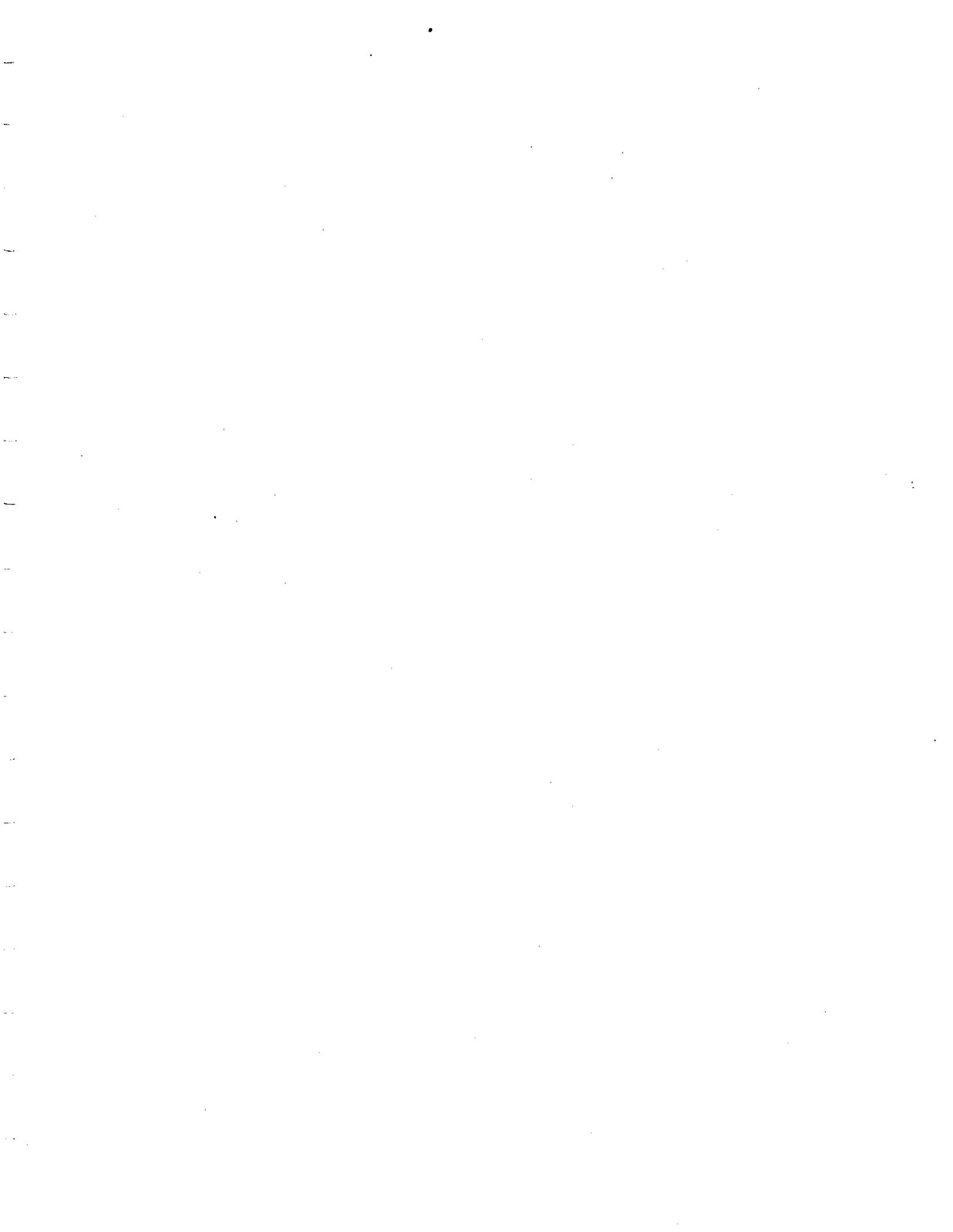
FIXED COST SUBTOTAL \$162,800.00

COHASSET'S TOTAL FIXED COST .. \$539,800.00

- In addition to the above, Cohasset will pay for 100% of the sewer/service connection costs for Cohasset users to the Hull Street gravity sewer line as delineated on drawings (sheets 3, 4 and 5 of 22) and details (sheet 1 and 2 of 2) transferred to Hingham's consultant Camp, Dresser & McKee, Inc. from Cohasset's consultant Tutela Engineering Associates, Inc. on April 30, 1997. The construction will be performed by Albanese Brothers, Inc. pursuant to a change order to the Construction Contract for the Weir River Sewer District between Hingham and Albanese Brothers, Inc. dated December 12, 1996 which shall provide that the work is to be paid for on a "time and materials" basis and shall otherwise be subject to the terms and conditions of the contract and the governing Massachusetts Department of Environmental Protection policies, procedures and memoranda.

Smg
Cyft

REVISED 7/8/97



COPY

**INTERMUNICIPAL AGREEMENT FOR WATER POLLUTION CONTROL
BETWEEN THE TOWNS OF HINGHAM AND HULL, MASSACHUSETTS**

Agreement made this 8 day of July, 1996, by and between the Town of Hull (hereinafter "Hull"), a municipal corporation within the County of Plymouth, Massachusetts, acting through its Permanent Sewer Commission with the approval of its Board of Selectmen, and the Town of Hingham (hereinafter "Hingham"), a municipal corporation within the County of Plymouth, Massachusetts, acting through its Sewer Commission, after approval and funding by their respective Town Meetings.

WITNESSETH

WHEREAS, Hull and Hingham are authorized pursuant to Massachusetts General Laws, to enter into contracts and agreements with one another for the purpose of aiding in the prevention or abatement of water pollution, and

WHEREAS, Hull and Hingham deem it to be in the public interest to enter into this Agreement, whereby Hull would receive, treat, and dispose of certain of Hingham's wastewater through Hull's sewerage system, and

WHEREAS, Hull and Hingham desire to comply with all Federal and State requirements dealing with water pollution control,

NOW, THEREFORE, in consideration of the mutual promises and covenants herein contained and for other good and valuable consideration the receipt of which is hereby acknowledged, it is agreed as follows:

ARTICLE 1. DEFINITIONS

- 1.1 For the purpose of this Agreement, the following terms are defined:
 - 1.1.1 Average Daily Flow shall mean the total annual flow expressed in millions of gallons (MG) divided by the number of days in the year.
 - 1.1.2 BOD (Biochemical Oxygen Demand) shall mean the quantity, expressed in pounds per day (lbs/day), of dissolved oxygen,

utilized in the biochemical oxidation of organic matter under standard laboratory procedure in five (5) days at 20 degrees centigrade (68 degrees Fahrenheit) as described in the most recent edition of "Standard Methods For the Examination of Water and Wastewater".

1.1.3 Hingham's Wastewater shall mean Wastewater generated in Hingham which is or, is to be under this agreement, conveyed to Hull.

1.1.4 Hingham Pumping Station shall refer to a wastewater pumping station constructed by Hingham, in Hingham in the vicinity of West Corner to serve the Hingham Sewer Service Area, with wastewater conveyed to the Hull Wastewater Works.

1.1.5 Hingham's Wastewater Pipeline shall mean the force main designed by Hingham and constructed, owned, operated and maintained by Hingham in Hull for the purpose of conveying wastewater along Nantasket Avenue from the Hull/Hingham Town line at West Corner to the Hull gravity main at the intersection of Nantasket Avenue and Atlantic Avenue.

1.1.6 DO (Dissolved Oxygen) shall mean the oxygen level that is found in wastewater as measured by an approved technique described in the 16th or most recent subsequent edition of "Standard Methods For the Examination of Water and Wastewater".

1.1.7 Dwelling Unit shall refer to a residential home, apartment, condominium unit or similar facility. A business, commercial facility or restaurant shall be considered an average dwelling unit consisting of 4 bedrooms generating 250 GPD of wastewater based on metered water consumption. If water consumption for the facility exceeds an average of 250 GPD,

the facility shall be upgraded by one bedroom for each additional 62 GPD or portion thereof of metered water consumption.

- 1.1.8 GPD is the abbreviation for gallons per day.
- 1.1.9 Hull Sewer Use Rules and Regulations shall mean the most recent edition of the rules and regulations adopted and amended from time to time by the Hull Permanent Sewer Commission that govern the use of the municipal sewer system. A copy of the current Hull Sewer Use Rules and Regulations is appended to this Agreement.
- 1.1.10 Hull Wastewater Works shall mean the entire Hull sewerage system including collector sewers, pumping stations, force mains, the Hull Wastewater Treatment Plant, and ocean outfall.
- 1.1.11 Industrial Waste shall mean the liquid wastes from industrial manufacturing processes, industrial trades, or industrial businesses.
- 1.1.12 Leachate shall mean the liquid that is collected, pumped and/or removed from a lined or unlined solid waste landfill. Under the terms of this Agreement, no leachate, whether treated or untreated, shall be a part of the any quantity of wastewater flow that Hingham is allowed to discharge to the Hull Wastewater Works disposal facility.
- 1.1.13 MGD is the abbreviation for million gallons per day
- 1.1.14 Peak Flow Rate shall mean the maximum pumping rate for the Hingham pumping station expressed in gallons per minute (gpm) or gallons per day (gpd).
- 1.1.15 Septage shall mean the liquid and solid wastes that are removed from a cesspool, septic tank, or other on-site wastewater disposal system serving a building or structure, including, but not limited to a residential housing unit or a building or

structure utilized for commercial or business purposes.

1.1.16 SS (Suspended Solids) shall mean the quantity, expressed in pounds per day (lbs/day) by weight or milligrams per liter, of solids that either float on the surface of, or are in suspension in, water, wastewater, or other liquids, and which are removable by laboratory filtering, and are referred to as nonfilterable residue in laboratory tests prescribed in the 16th or most recent subsequent edition of "Standard Methods for the Examination of Water and Wastewater".

1.1.17 Wastewater shall mean the Sewage, Industrial Waste, Infiltration, Inflow, or other wastes discharged to a municipal wastewater system, or any combination of such materials. This definition shall not include Septage or Leachate from any source. Wastewater shall be defined as sewage having an average BOD of not more than 300 mg/l and an average total suspended solids concentration of not more than 300 mg/l based on a twenty-four (24) hour composite sample. Leachate will not be accepted from any source.

ARTICLE 2. SCOPE

2.1 Hull shall receive, treat, and dispose of Hingham's Wastewater in accordance with the provisions of this Agreement and in compliance with all existing or future laws, regulations, ordinances, water quality standards, orders, and decrees of any governmental authority having jurisdiction over the treatment and disposal of said Wastewater. Hingham's Wastewater shall conform to the terms of this Agreement and to the Hull Sewer Use Rules and Regulations, provided that Wastewater requirements of said Sewer Use Rules and Regulations must apply uniformly to Hingham's Wastewater and Hull's Wastewater.

2.2 The Hull Wastewater Treatment Plant has the capacity to accept and shall

accept Hingham's Wastewater in volumes up to the quantities set forth below:

Average Daily Flow 65,000 GPD

Peak Flow Rate 120 (GPM) or 173,000 GPD

Hingham's Wastewater shall not include leachate, septage, sewage sludge or industrial waste from a facility that is or should be regulated by an Industrial Pretreatment program required by the U.S. Environmental Protection Agency (EPA) or the Massachusetts Department of Environmental Protection.

- 2.3 Hingham's Wastewater shall connect to the Atlantic Avenue interceptor sewer in Hull at the intersection of Nantasket Avenue and Atlantic Avenue. Hingham shall be responsible for all study, design, engineering, permitting and construction costs associated with the connection to the Hull Wastewater Works. All plans, designs, and work shall be subject to the review and prior approval of Hull officials, including the Permanent Sewer Commission, which approval shall be granted in a timely manner and not unreasonably withheld.

ARTICLE 3. MONITORING, SAMPLING AND MEASUREMENT OF WASTEWATER

- 3.1 All sampling and measurement of the constituents of Hingham's Wastewater shall be made at or just before the Hingham Pumping Station. Hingham is responsible for the study, engineering, design, permitting and construction of the Hingham Pumping Station and Hingham's Wastewater Pipeline, including sampling and measurement components. Hull shall have the right to review and approve of the design of Hingham's pumping station and force main as it relates to capacity, flow metering and wastewater sampling, which approval shall be granted in a timely manner and not unreasonably withheld. Hull shall also have access to the Hingham Pumping Station during normal business hours for the purpose of monitoring compliance with the terms of this Agreement. Hingham shall be responsible for the construction, operation, and maintenance, necessary for Hingham's wastewater to enter Hull's system including any modifications which may be required by Federal or State law or regulation, including that which may be required by this Agreement or

subsequent amendments thereto.

- 3.2 The sampling and determination of the constituents in Hingham's Wastewater shall be performed on a semi-annual basis in accordance with the most recent edition of "Standard Methods for the Examination of Water and Wastewater." Said samplings shall include twenty-four (24) hour composite proportional samples. The sampling and analytical analyses shall be conducted to ensure that Hingham's wastewater is in compliance with the Hull Sewer Use Regulations. The Hingham Pump Station shall include adequate facilities for the sampling and metering of Wastewater.
- 3.3 Hingham shall be responsible for the costs associated with semi-annual sampling. The costs for any additional tests required by Hull beyond the semi-annual tests, will be borne by Hull. However, if State or other regulatory requirements, are revised to require additional or more frequent testing, those costs will be borne by Hingham. Hull shall receive test results of all tests performed. Hull shall have the right to perform at its expense random testing and shall have access to Hingham's facilities to perform same, which access shall not be unreasonably delayed.
- 3.4 Any samplings conducted by Hull for the purpose of monitoring compliance with the terms of this agreement and the Hull Sewer Use Rules and Regulations in addition to the semi-annual samplings need not be announced in advance, but Hingham shall be given the opportunity to take duplicate, simultaneous samples at the time of such sampling for independent analysis. The results of any sampling by Hull shall be made available to the Hingham Sewer Commission, forthwith.
- 3.5 Twenty-four (24) hour composite, flow proportional samples of Hingham's Wastewater shall be taken at least semi-annually for the purpose of monitoring compliance with the terms of this Agreement. Additional sampling may also be conducted by the Town of Hull. Such sampling may not be announced in advance as determined by the Hull Permanent Sewer Commission for the purpose of monitoring compliance with the terms of this

Agreement and to ensure compliance with the Hull Sewer Use Rules and Regulations.

- 3.6 Average daily flow and the peak flow rate of Hingham Wastewater shall be determined by metering equipment furnished and installed in the Hingham Pumping Station. Said metering equipment shall consist of indicating, totalizing, recording equipment and transmitting equipment capable of accurately measuring the range of flows of Hingham's Wastewater. The design and specifications of flow metering equipment shall be submitted to Hull for review and approval prior to installation by Hingham, which approval shall be granted in a timely manner and not unreasonably withheld. Flow shall be electronically transmitted and connected to the Supervisory Control And Data Acquisition (SCADA) system at the Hull Wastewater Treatment Plant. Equipment needed at the Hull Wastewater Treatment Plant to receive, record and integrate the Hingham pump station signal into the SCADA system shall be provided by Hingham at no cost to Hull. Flow metering equipment shall be calibrated by Hingham on an annual basis or as reasonably requested by the Hull Permanent Sewer Commission with a calibration certification submitted to the Hull Permanent Sewer Commission. Additional calibration certifications may be conducted on a more frequent basis by Hull during normal business hours at Hull's expense.
- 3.7 Within thirty (30) days after the end of a month, Hull shall provide Hingham with copies of all analyses of samples of Hingham's Wastewater collected at or upstream of the pumping station. Similarly within thirty (30) days, Hingham shall provide Hull with analyses of said samples collected at the pumping station.

ARTICLE 4. PRETREATMENT OF WASTEWATER

- 4.1 Hingham reserves the right at any time to pretreat and/or to reduce the BOD and/or the SS in its Wastewater, or to otherwise provide preliminary treatment to its Wastewater prior to discharge to the Hull Wastewater Works. However,

any such preliminary treatment shall not result in a reduction of Hingham's obligation to pay capital costs in accordance with the provisions of Article 6 of this Agreement or costs of operations and maintenance covered by Article 9 of this Agreement.

- 4.2 In the event that any pretreatment of Hingham's Wastewater is required by any Federal or State authority or to meet the terms of this Agreement, Hingham shall implement and pay the cost of providing such pretreatment.
- 4.3 Hingham's Wastewater shall have a minimum average dissolved oxygen concentration of 1 mg/l as measured at the pumping station. Hingham shall install and maintain a continuous monitoring dissolved oxygen probe in the pumping station that shall be used to monitor and record dissolved oxygen levels in Hingham's Wastewater. Hingham shall pretreat its Wastewater if necessary to meet the 1 mg/l dissolved oxygen average daily requirement and shall pay the cost of any such pretreatment.

ARTICLE 5. TERM OF AGREEMENT

- 5.1 The initial term of this Agreement shall be a period of thirty (30) years from April 29, 1998, unless terminated hereunder sooner.
- 5.2 The discharge of Hingham's Wastewater to the Hull Wastewater Works pursuant to this Agreement may be commenced only after all construction work required for the discharge of such Wastewater is substantially complete, accepted by Hull, and Hingham's capital costs as set forth in Article 6 of this Agreement have been paid to Hull in full. Such acceptance by Hull shall not be unreasonably withheld.
- 5.3 At or before the termination of the initial thirty (30) year term, this Agreement may be extended or renewed at the mutual consent of both parties under such terms or conditions as are mutually agreeable to the parties.

ARTICLE 6. PAYMENT OF CAPITAL COSTS

- 6.1 Hingham shall pay \$469,040 to Hull as a capital cost for 65,000 GPD of

wastewater capacity in the Hull Wastewater Works based on a Hingham connection point to the Hull Wastewater Works on the Atlantic Avenue interceptor sewer at the intersection of Nantasket Avenue and Atlantic Avenue. Upon execution of this Agreement and payment of the entire capital cost, Hingham shall become a user under this Agreement of the Hull Wastewater Works and be subject to all rules, requirements and operating costs associated with the Hull Wastewater Works, with all the rights of a Hull user, except as provided for under this Agreement.

ARTICLE 7. TERMS OF PAYMENT OF CAPITAL COSTS

- 7.1 Within ten (10) business days following the execution of this Agreement by all of the parties thereto and receipt by Hingham of two fully executed copies, Hingham shall pay to Hull 15% of the capital cost or \$70,356. Within six (6) months of the effective date of this Agreement Hingham shall pay to Hull 45% of the capital cost or \$211,068. Hingham shall pay Hull the remaining 40% of the capital cost or \$187,616 upon completion of construction activities and prior to commencing discharge to the Hull system or by April 29, 1998, whichever is the sooner. If Hingham fails to make payment within thirty (30) calendar days of the payment schedule indicated, all payments made prior to the termination date shall be forfeited to Hull and Hingham, with respect to work done within Hull pursuant to this Agreement, shall forthwith remove all above-ground structures and also take such steps as are reasonably necessary to assure that sub-surface structures, including any pipeline constructed hereunder in Hull, will not interfere with the functioning of the Hull Wastewater Works or otherwise endanger the health or safety of the residents of Hull. Any manholes, support structures and similarly constituted below surface devices shall be filled in and capped. Said work is to be completed within ninety (90) days, including the restoration of the work area to its prior condition, whereupon this agreement shall be terminated.
- 7.2 So long as Hingham shall make the payments stated herein, Hingham shall have reserved the capacity stipulated in this agreement until April 27, 2008.

C. H. H.
Rec'd 10/9/97
10/23/96
4/8/97

By said date, a minimum of 25,000 GPD annual flow must be flowing to the Hull Wastewater Works. If this level of flow is not substantially achieved by April 29, 2008, all monies paid by Hingham to the Town of Hull shall be forfeited to Hull and Hingham shall forthwith cease maintaining flow to Hull and shall with respect to work done within Hull pursuant to this Agreement, shall forthwith remove all above-ground structures and also take such steps as are reasonably necessary to assure that sub-surface structures, including any pipeline constructed hereunder in Hull, will not interfere with the functioning of the Hull Wastewater Works or otherwise endanger the health or safety of the residents of Hull. Any manholes, support structures and similarly constituted below surface devices shall be filled in and capped. Said work is to be completed within ninety (90) days, including the restoration of the work area to its prior condition, whereupon this agreement shall be terminated.

ARTICLE 8. COMMUNITY RESPONSIBILITIES

- 8.1 Hingham is responsible for the study, engineering, design, permitting and construction of all facilities in Hingham and Hull required to convey Hingham wastewater to the Hull Wastewater Works including, but not limited to collector and interceptor sewers in Hingham, the Hingham pump station that will be located in the West Corner area of Hingham and the force main between the Hingham pump station and the Atlantic Avenue interceptor sewer in Hull. For all Hingham wastewater facilities constructed in Hull, Hull shall have the right to review and approve the design in a timely manner, and shall require that all Hingham construction in Hull, including the pump station and force main piping, be continuously monitored and constructed in accordance with all applicable local, State and Federal Standards.
- 8.2 Hingham shall furnish Hull a copy of the Record Plans for sewer construction in Hingham and Hull that conveys wastewater to the Hull Wastewater Works within two months of construction completion. *Done.
JEM.*
- 8.3 This Agreement is part of a regional effort to address the existing water

pollution problems in the Weir River Watershed area of Hingham. A purpose of this Agreement is to abate the pollution caused from sub-surface sewage wastewater systems in Hingham. The parties acknowledge that, initially, not all of the capacity reserved to Hingham hereunder may be utilized. Hingham shall take all necessary steps to ensure that properties causing said pollution or having a system not in compliance with Title V located adjacent to the sewer lines shown in the area marked Phase I of the attached plan of Proposed Wastewater Collection System will be connected to the system within five (5) years after the date Hingham wastewater is first discharged into the Hull system and that such properties located adjacent to the sewer lines shown in the area marked Phase II of said plan will be connected within eight (8) years of said date. It is recognized by all parties that the capacity provided hereunder shall be first utilized by Hingham for that purpose.

- 8.4 Hull shall maintain an adequate cost accounting system which shall be the basis for the determination and allocation of costs for the operation and maintenance of the Hull Wastewater Works. The cost accounting records shall be available for review by the Hingham Sewer Commission or its authorized agent during regular business hours.
- 8.5 Hull shall properly operate and maintain the Hull Wastewater Works in accordance with State and Federal regulations as well as in accordance with the requirements of its National Pollutant Discharge Elimination System (NPDES) Permit.
- 8.6 Hull shall address the on-site sewage disposal concerns associated with the Weir River Estuary area in Hull as part of a regional effort to improve water quality in the Estuary area.
- 8.7 The parties agree to mutually pursue appropriate State and Federal funding opportunities for Hull wastewater works improvements in a timely manner to help reduce overall costs to both communities.
- 8.8 The parties agree to act in good faith regarding all matters set forth in this

Agreement.

**ARTICLE 9. PAYMENT OF COSTS OF OPERATION,
MAINTENANCE, AND REPAIR**

- 9.1 Hingham's portion of the costs of operation and maintenance of the Hull Wastewater Works shall be calculated according to the rate structure imposed by the Hull Permanent Sewer Commission on the Hull users. For homes, businesses, etc. that are served by private wells, the owner of the home or business shall be required to install an individual water meter. The Hingham Sewer Commission shall read said meter and periodically provide data to the Hull Permanent Sewer Commission timely enough for Hull to use same for sewer use billing purposes.
- 9.2 At least ninety (90) days prior to Hingham's regular Annual Town Meeting, Hull shall submit to Hingham a statement which shall set forth an estimate of Hingham's portion of the costs for the operation and maintenance of the Hull Wastewater Works for the succeeding fiscal year. Hull shall periodically (in accordance with the Hull billing cycle) submit to Hingham a sewer use bill which shall cover such periods of time as may be determined by the Hull Permanent Sewer Commission. Hingham shall pay Hull within forty-five (45) days after receipt of Hull's billing statement.
- Any sewer use payment by Hingham that is not made within the forty-five (45) day payment period shall be subject to a surcharge calculated on the outstanding balance at the prime interest rate (or such successor rate) as set forth in the Wall Street Journal (or such other financial publication mutually agreed upon or if no agreement, as designated by Hull) as set forth on the first business day of the fiscal year in question, plus one and one-half percent.
- 9.3 Periodically, the Hull Wastewater Works will require capital improvements to upgrade, expand and repair facilities and to comply with water pollution control requirements of State and Federal regulatory agencies. Hull capital improvement projects shall be funded by Town appropriations that shall, in

turn, be funded by users of the Hull Wastewater Works system through sewer use fees, general debt and/or by financial assistance provided by State and Federal regulatory agencies. As users of the Hull Wastewater Works, Hingham sewer users that convey wastewater to the Hull Wastewater Works shall participate in the capital improvements through Hull sewer use charges and/or alternate financing arrangements authorized by Hull Town Meeting. These charges shall be equally assessed pro rata to all sewer users.

ARTICLE 10. OTHER RESPONSIBILITIES OF HINGHAM

- 10.1 Hingham's Wastewater shall meet the requirements of this Agreement and the qualitative requirements of the Hull Sewer Use Rules and Regulations, provided that said Sewer Use Rules and Regulations apply uniformly to Hingham's Wastewater and Hull's Wastewater.
- 10.2 Changes to Hingham's Rules and Regulations concerning sewer use shall be made to conform with Hull and State/Federal regulations as applicable. Both Hull and Hingham shall make periodic changes to their respective sewer use regulations to safeguard collection, pumping and treatment components as may be appropriate or as to otherwise comply with State/Federal regulations.
- 10.3 Hingham shall be responsible for all administrative work including permits, easements, legislative approval, etc. that may be necessary for Hingham to construct wastewater facilities in Hull and Hingham. Specifically, but not by way of limitation, Hingham shall indemnify, defend and hold harmless Hull from and against any and all claims or costs arising out of actual or threatened litigation related to the reservation of capacity under this Agreement as provided in Section 8.3 hereof. Hull shall cooperate and provide active support of Hingham's efforts during the Hull permitting process, but shall not be responsible for any administrative activity that deals with Hingham's wastewater plans.
- 10.4 Hingham shall provide Hull with timely copies of all administrative documents relating to work and permits and approvals Hingham pursues dealing with

Hingham wastewater facilities in Hull and Hingham as relates to flow going to Hull.

- 10.5 Hingham shall construct, own, operate, maintain and repair the force main in Hull required to convey Hingham's wastewater to the Atlantic Avenue interceptor and shall have the right to conduct repairs, emergency or otherwise, on such components within Hull upon notifying and receiving approval, if necessary, from the Hull Permanent Sewer Commission, Highway Department, Police and Fire Departments, and any other appropriate official board or department or utility. Any damage to property in Hull caused by Hingham, its contractors or those acting on their behalf or to nearby utilities shall be the responsibility of Hingham. For any work done in Hull, Hingham shall include language in the contract requiring that the contractor or supplier of services shall indemnify, defend and hold harmless Hull for any and all claims arising out of said work, and that Hull shall be listed as an additional insured on the insurance for said work, in such amounts and under such terms and conditions as are approved by Hull. All insurance shall be with companies authorized to do business in Massachusetts. Copies of said contracts and evidence of said insurance shall be submitted to Hull.
- 10.6 Hingham shall promptly furnish the most recent water consumption data for all Hingham sewer users connected to the Hull Wastewater Works to coincide with the sewer billing cycle of the Hull Permanent Sewer Commission. The data shall be subject to independent review and verification by the Hull Permanent Sewer Commission.
- 10.7 Hingham shall indemnify, defend and hold harmless the Town of Hull relative to any and all activities done by or on behalf of Hingham or required to be done by Hingham under this Agreement or in furtherance of this Agreement. Furthermore, Hull shall be included as an additional insured on insurance policies covering Hingham's wastewater systems and operations, which policies shall reference Hingham's work and operations within Hull, in such amounts and under such terms and conditions as are approved by Hull. All

insurance shall be with companies authorized to do business in Massachusetts. Copies of said contracts and evidence of said insurance shall be submitted to Hull.

ARTICLE 11. OTHER RESPONSIBILITIES OF HULL

- 11.1 Hull has no study, engineering, design or construction responsibilities that are necessary to implement the terms of this Agreement. Hull is responsible to operate, maintain and repair the Hull Wastewater Works in accordance with all state and federal water pollution control requirements.
- 11.2 Hull shall periodically modify its sewer use regulations to comply with local, state and federal requirements. Modifications to the Hull sewer use regulations shall be forwarded to the Hingham Sewer Commission so that changes or modifications to the Hingham regulations can be implemented.
- 11.3 Hull shall indemnify, defend and hold harmless the Town of Hingham relative to any damage done by Hull to, or destruction done by Hull of, the structure or function of the Hingham Wastewater Pipeline and related structures which are located within Hull, including all costs for repair or replacement of such property. Hull assumes no responsibility or liability for damage or destruction of any structures or functions attributable to Hingham and/or others. Specifically, and not by way of any limitation, Hull assumes no responsibility or liability for the marking out of Hingham's system located in Hull.

ARTICLE 12. BREACHES AND REMEDIES

- 12.1 The Hull Permanent Sewer Commission and the Hingham Sewer Commission shall have access during regular business hours to all information gathered at the Hingham pumping station concerning the flow of and constituents in Hingham's wastewater, and Hingham shall ensure that all limitations and requirements applicable to Hingham's Wastewater under this Agreement are complied with.
- 12.2 The Hingham Sewer Commission shall notify the Hull Permanent Sewer Commission within twenty-four (24) hours after becoming aware of any

respect in which Hull or Hingham is not complying with the terms of this Agreement. The Hull Permanent Sewer Commission shall notify the Hingham Sewer Commission within twenty-four (24) hours after becoming aware of any respect in which Hingham or Hull is not complying with the terms of this Agreement.

12.3 In the event that Hingham is notified or otherwise becomes aware that it is not in compliance with the provisions of this Agreement, Hingham shall immediately commence corrective action and shall immediately notify Hull, State and Federal regulatory agencies of the action commenced and a reasonable timetable for correction of the non-compliance. Said timetable shall provide for prompt action and shall be approved by the Hull Permanent Sewer Commission, which approval shall not be unreasonably withheld or delayed. Notwithstanding any provisions of this Agreement to the contrary, the provisions of this Agreement and any timetables established pursuant hereto shall be specifically enforceable by any court of competent jurisdiction. Repeated, willful, or substantial violations of the provisions of this Agreement or action taken which adversely affects the integrity of the system or public health shall be subject to an action for appropriate prohibitory and/or mandatory injunctive relief, or other relief, including but not limited to cease and desist orders regarding use of the Hull Wastewater Works until such violations have been corrected, in a court of competent jurisdiction, notwithstanding any provision in the Agreement to the contrary.

12.4 In the event that Hull or Hingham provides the other party with notice of the existence of a material breach of the Agreement and the parties are unable to resolve such breach within ninety (90) calendar days after receipt of such notice by the recipient, both parties may agree to submit the dispute to arbitration by the American Arbitration Association, or a similar service mutually selected by the Parties. An expert, with appropriate professional credentials in the subject matter in dispute, shall be appointed as arbitrator. The arbitrator shall hear the dispute and render a decision within ninety (90)

days of the date of submission of the dispute. Such decision shall be final and binding on both parties. If the parties do not elect arbitration, either party may seek a declaratory judgment or other legal remedy in a court of competent jurisdiction to determine the rights, duties and obligations of the parties under this Agreement with regard to any such breach or disagreement, and/or to resolve any such breach or disagreement.

- 12.5 Service to Hingham and Hull pursuant to this Agreement shall not be interrupted, except as provided for in this agreement.
- 12.6 In the event that Hingham fails to comply with any sewage limitation referred to in this agreement, Hull shall provide a written notice of the violation to Hingham stipulating the limitation exceedence, the period of exceedence, the associated penalty calculation, and all support material to document the violation. Such notice will be given as soon as practical after any violation or period of exceedence(s). Hingham shall have ninety (90) days to correct such failure to comply. If such failure to comply is not corrected within this time frame or reoccurs within twelve months of the original notice, (excluding the ninety (90) day initial corrective action response time), Hingham shall pay to Hull penalties or liquidated damages as hereinafter set forth. For average daily flow, Hingham shall pay Hull a penalty or liquidated damages of \$500 per month for each 1,000 gallons or part thereof that the annual average daily flow exceeds 65,000 GPD. The annual average daily flow shall be calculated each month using the previous twelve (12) month period of flow data as measured at the Hingham Pumping Station. For peak flow, Hingham shall pay to Hull a penalty or liquidated damages of \$500 for each day that peak flow exceeds 173,000 GPD based on flow data as measured at the Hingham Pumping Station. On peak flow, Hull recognizes that all Hingham wastewater must be pumped to the Hull wastewater works. Hingham's peak flow (pumping rate) shall not be based on an instantaneous peak flow, but on the average pumping rate during the station pumping cycle. Hull shall invoice Hingham for all penalty or liquidated damages assessments

in accordance with the billing and payment procedures detailed in Article 9. In addition to the penalty or liquidated damages assessment discussed above, Hingham shall also pay sewer user fees for all excess flow as detailed elsewhere in this Agreement.

- 12.7 All wastewater flow monitoring and sampling costs incurred by Hull confirming that there are Agreement violations will be a Hingham expense over and above the constituent penalty or liquidated damages.

ARTICLE 13. GENERAL PROVISIONS

- 13.1 Hingham shall have no ownership rights in or rights of control over the Hull Wastewater Works beyond those of a sewer user or as otherwise provided in this Agreement. Any entitlement of Hingham to make use of the Hull Wastewater Works shall be as set forth in this Agreement. For the purpose of all applicable laws, rules, regulations, and policies, Hingham shall be deemed to be a user of the Hull Wastewater Works except where said law, rule, regulation or policy provides otherwise.
- 13.2 This Agreement contains the entire agreement between the parties hereto with respect to the subject matter hereof, and supersedes any and all agreements, oral or written, with respect to the subject matter of this Agreement.
- 13.3 This Agreement may be executed simultaneously in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.
- 13.4 All remedies provided in this Agreement are distinct and cumulative to any other right or remedy under this Agreement or afforded by law or equity, and may be exercised concurrently, independently, or successively.
- 13.5 The provisions, terms, and conditions of this Agreement shall be modified only by written amendments to this Agreement. Any such amendments shall be approved by the Town Meetings of Hull and Hingham in accordance with applicable provisions of state law, shall be approved by the Hull Board of

Selectmen and Permanent Sewer Commission and the Hingham Board of Selectmen and Sewer Commission, shall be approved for form by the Town Counsel for Hull and the Town Counsel for Hingham, and shall be approved as to funds by the Town Accountant for Hull and the Town Accountant for Hingham; provided, however, that such an amendment shall not require the approval of the Town Meeting of Hull or Hingham if such amendment is within the scope of any approval and authorization which has previously been granted by said Town Meeting and which has not been withdrawn.

- 13.6 Notices, communications and correspondence pertaining to this Agreement shall be mailed by certified mail, return receipt requested to the Hull Permanent Sewer Commission and/or the Hingham Sewer Commission or served by Constable at the following addresses:

Hull Permanent Sewer Commission
1111 Nantasket Avenue
Hull, MA 02045-1310

Hingham Sewer Commission
Hingham Town Hall
7 East Street
Hingham, MA 02043

or such other addresses, which must include a street address, the parties may notify each other of.

- 13.7 This Agreement is subject to the lawful rules, regulations, decisions, orders or directives of the U.S. Environmental Protection Agency (EPA) and of any agency of the State and Federal government with jurisdiction over the parties or subject matter of the Agreement. Any and all conditions, rules, regulations, orders or other requirements heretofore or hereafter placed upon Hull or Hingham by the EPA or by the Massachusetts Department of Environmental Protection or any other agency, division, office or department of the United States or the Commonwealth of Massachusetts or by any court of competent jurisdiction and by any other applicable Federal, State or County agency, shall be construed to become a part of this Agreement unless the Agreement is terminated hereunder. Further, any additional costs placed upon Hull as a

result of any orders of the above referenced court or agencies in connection with the supplying of sewage disposal to Hingham by Hull shall be borne by Hingham.

- 13.8 Hingham shall not have any rights to participate in the management and operation of the Hull Wastewater Works or representation on any board or Commission overseeing the maintenance and operation of the Hull Wastewater Works by reason of its participation under this Agreement.
- 13.9 Hingham may not assign its rights and obligations under this Agreement without the written permission of Hull. Hingham will be informed of any plans of Hull to assign this Agreement and given an opportunity to present its views to the Hull Board of Selectmen and the Hull Permanent Sewer Commission. Notwithstanding the foregoing, this Agreement shall be binding upon and shall inure to the benefit of the respective successors and assigns of the parties hereto.
- 13.10 The failure of either party to this Agreement to insist upon compliance of any provision of this Agreement shall not constitute a waiver by said party of its right to enforce such provision.
- 13.11 Any provision of this Agreement which refers to a Federal, State or local law, regulation, standard, or industry guideline, shall be considered to refer to the most current applicable version of same so as to insure that the requirements of this Agreement are consistent at all times with currently applicable requirements and standards.
- 13.12 It is agreed and understood that the remedies contained herein are distinct and are cumulative and that the failure to exercise one is not deemed a waiver of any.
- 13.13 Upon reaching the expiration date of this Agreement, unless renewed or extended, Hingham shall forthwith cease maintaining flow to Hull and with respect to work done within Hull pursuant to this Agreement, shall forthwith remove all above-ground structures and also take such steps as are reasonably necessary to assure that sub-surface structures, including any pipeline

constructed hereunder in Hull, will not interfere with the functioning of the Hull Wastewater Works or otherwise endanger the health or safety of the residents of Hull. Any manholes, support structures and similarly constituted below surface devices shall be filled in and capped. Said work is to be completed within ninety (90) days, including the restoration of the work area to its prior condition, whereupon this agreement shall be terminated.

ARTICLE 14. SEVERABILITY AND HEADINGS

- 14.1 If any provision of this Agreement, or its application to any person or circumstance, is found to be illegal, unenforceable or void, then the remainder of the Agreement, or the application of said provision to other persons or circumstances shall not be affected thereby; provided further that if any provision or its application is invalid or unenforceable, then a suitable and equitable provision shall be substituted therefor in order to carry out so far as may be valid and enforceable the intended purpose of the invalid or unenforceable provision. The headings and sections are used for reference and convenience only and shall not be a factor in the interpretation of the Agreement.

ARTICLE 15. EFFECTIVE DATE

- 15.1 It is acknowledged that this Agreement has been approved by affirmative Town Meeting votes in both Hull and Hingham as required by Massachusetts General Laws Chapter 40 Section 4. The effective date shall be the date of signing by the majority of the Hull Board of Selectmen, a majority of the Hull Permanent Sewer Commission, a majority of the Hingham Board of Selectmen and a majority of the Hingham Sewer Commission.

[balance of page intentionally left blank]

IN WITNESS whereof the parties hereto have executed this Agreement as of the day and year first above written.

ATTEST:

Thomas P. Hall

TOWN OF HINGHAM,
SEWER COMMISSION

WEMAC

John M. Brandt

Charles G. Hitchcock

APPROVED FOR FORM:

Ann McBooney
Hingham Town Counsel

TOWN OF HINGHAM,
BOARD OF SELECTMEN

William

Katharine W. Beach

CERTIFIED AS TO THE
AVAILABILITY OF HINGHAM'S SHARE OF FUNDS:

L. D. O'Leary
Town Accountant

TOWN OF HULL
PERMANENT SEWER COMMISSION

John J. Strang

Thomas A. Burns

Robert T. McReady

ATTEST:

Maia Regan

TOWN OF HULL,
TOWN MANAGER

Ally E. J. J. J.
Hull Town Manager

TOWN OF HULL,
BOARD OF SELECTMEN

Carl R. Kato

APPROVED FOR FORM:

Jane Blampfe
Hull Town Counsel

John P. Kelly

William McLean

James P. J.

hima.4

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ADDENDUM TO

INTERMUNICIPAL AGREEMENT FOR WATER POLLUTION CONTROL
BETWEEN THE TOWNS OF HINGHAM AND HULL, MASSACHUSETTS

The Towns of Hingham and Hull (the "Towns") herewith agree as follows:

WHEREAS, the Towns entered into an "Intermunicipal Agreement (the "IMA") for Water Pollution Control Between the Towns of Hingham and Hull, Massachusetts", and

WHEREAS, Article 5 of said Agreement sets forth a Term of thirty (30) years for said Agreement commencing April 29, 1998, and

WHEREAS, uncertainty has developed concerning whether under General Laws Chapter 40, Section 4A a term in excess of twenty-five (25) years is permissible, and

WHEREAS, the Towns are desirous of implementing the Agreement in accordance with its terms,

NOW THEREFORE, they agree as follows:

1. The Towns will cooperate in seeking legislation to approve the thirty (30) year term as provided in the

Agreement.

- 2. The Towns, will, pending the legislation referenced in paragraph 1, give full effect to the Agreement and treat the Agreement as having a minimum term of twenty-five (25) years.
- 3. In the event that such legislation is not enacted by November 1, 1997, then the Agreement shall be treated as having a term of twenty-five (25) years.
- 4. All other provisions of the Agreement shall continue in full force and effect.

IN WITNESS whereof the parties hereto have executed this Addendum as of the day and year first above written.

ATTEST:

Thomas P. Hall

TOWN OF HINGHAM,
SEWER COMMISSION

Charles J. ...
John ...
Thomas ...

APPROVED FOR FORM:

James P. ...
Hingham Town Counsel

TOWN OF HINGHAM,
BOARD OF SELECTMEN

...
...
Katharine W. ...

CERTIFIED AS TO THE AVAILABILITY OF HINGHAM'S SHARE OF FUNDS:

[Signature]
Town Accountant

TOWN OF HULL
PERMANENT SEWER COMMISSION

[Signature]
[Signature]

ATTEST:

[Signature]

Thomas A Burns
Robert T McCready

TOWN OF HULL,
TOWN MANAGER

[Signature]
Hull Town Manager

TOWN OF HULL,
BOARD OF SELECTMEN

[Signature]
[Signature]
[Signature]
[Signature]

APPROVED FOR FORM:

[Signature]
Hull Town Counsel

COPY

ADDENDUM TO
AMENDMENT NUMBER 2

INTERMUNICIPAL AGREEMENT FOR WATER POLLUTION CONTROL
BETWEEN THE TOWNS OF HINGHAM AND HULL, MASSACHUSETTS

Notwithstanding the provisions of paragraph 5 of the Amendment Number 2 to the Intermunicipal Agreement For Water Pollution Control Between the Towns of Hingham and Hull, the Towns herewith agree as follows:

1. The ownership, maintenance, repair and replacement obligations for the respective mains being constructed under Amendment No. 2 shall be as follows:
 - a) the twelve inch sewer main shall be owned by Hull and Hull shall be completely responsible for the cost of maintenance, repair and replacement of same as part of the overall Hull sewer system.
 - b) the six inch force main shall be owned by Hingham and Hingham shall be completely responsible for the cost of maintenance, repair and replacement of same.

IN WITNESS whereof the parties hereto have executed this Addendum as of this 8 day of May, 1997.

ATTEST:

TOWN OF HINGHAM,
SEWER COMMISSION

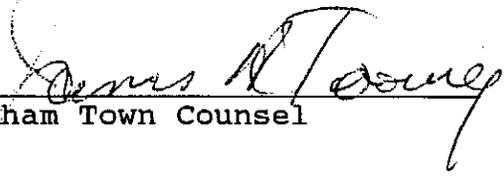
Thomas P. Hall

Charles J. Hitercode
MEMORANDUM

John M. Brandy

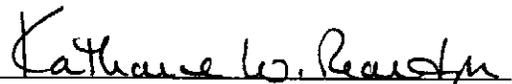
APPROVED FOR FORM:

TOWN OF HINGHAM,
BOARD OF SELECTMEN



Hingham Town Counsel







CERTIFIED AS TO THE
AVAILABILITY OF HINGHAM'S SHARE OF FUNDS:

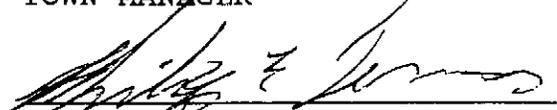


Hingham Town Accountant

TOWN OF HULL
PERMANENT SEWER COMMISSION



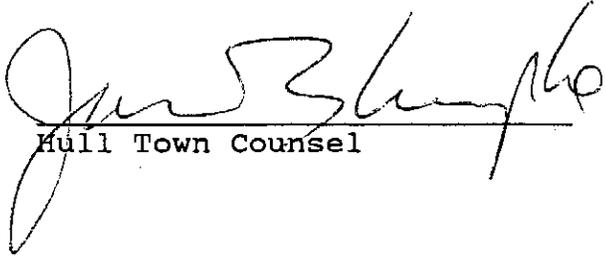
TOWN OF HULL,
TOWN MANAGER

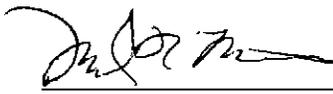

Hull Town Manager

TOWN OF HULL,
BOARD OF SELECTMEN



APPROVED FOR FORM:


Hull Town Counsel





Town of Hull



PERMANENT SEWER COMMISSION

TEL: 617-925-1207

FAX: 617-925-3771

May 2, 1997

1111 NANTASKET AVENUE
HULL, MASSACHUSETTS 02045-1310

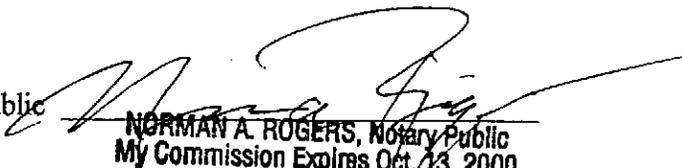
John J. Struzziery, Chairman of the Hull Permanent Sewer Commission is authorized to sign the Addendum to Amendment Number 2 of the Intermunicipal Agreement for Water Pollution Control Between the Towns of Hingham and Hull, Massachusetts on behalf of the Hull Permanent Sewer Commission.


Linda J Harmon
Clerk to the Commission

Signed this 2nd day of May, 1997

Then personally appeared the above named Linda J Harmon and acknowledged the foregoing to be her free act and deed. Before me,

Notary Public


NORMAN A. ROGERS, Notary Public
My Commission Expires Oct. 23, 2000

AMENDMENT NUMBER 2

INTERMUNICIPAL AGREEMENT FOR WATER POLLUTION CONTROL
BETWEEN THE TOWNS OF HINGHAM AND HULL, MASSACHUSETTS

The Towns of Hingham and Hull (the "Towns") herewith agree as follows:

WHEREAS, the Towns are desirous to further the implementation of the IMA wherein Hull will treat the sewage of Hingham's Weir River Sewer District and additionally the sewage from Cohasset's North Sewer District,

NOW THEREFORE, they agree as follows:

1. Hull will construct for Hingham's use a force main and sewer in Nantasket Avenue from a point approximately one hundred feet north of the Hingham/Hull Town line to the beginning of Hull's sewer system in Nantasket Avenue. The force main will be six inches in diameter and the sewer twelve inches in diameter. Hull will construct a force main of varying diameters in the same trench as Hingham's force main for Hull's use. Hull will also use the twelve inch sewer.
2. The necessary additional design and construction services for the above described main and sewer will be provided by Hull's professional engineering firm. There will also be certain Hull town administrative charges assessed for this work.
3. The six inch force main for Hingham will be composed of two sections; the first about one hundred feet wherein the force main will be in the trench alone and the second about 1400 feet, wherein the six inch force main will be in the same trench as the Hull force main. The twelve inch sewer will be composed of two parts; the first about 350 feet of sewer to be used almost exclusively by Hingham and the second about six hundred fifty feet to be used by both towns. Said work is more specifically described on the plan sheets attached hereto as Exhibit "A".
4. Payment by Hingham to Hull for this work shall be as follows:
 - a. For all town administration, added engineering

design, and engineering during the bid period Hingham will pay Hull the sum of Thirty-three thousand dollars (\$33,000) payable within ten working days of the signing of this addendum.

- b. For 100 feet of 6 inch force main adjacent to the Hull/Hingham Town line and 350 feet of 12 inch sewer in Nantasket Avenue, Hingham will pay Hull 100% of the construction costs. For 1400 feet of two force mains in the same trench and for 650 feet of 12 inch sewer in Nantasket Avenue, Hingham will pay Hull 65% of the construction costs. Hingham's estimated construction cost for this project is approximately \$263,000.
- c. Construction costs shall include the basic items of pipe and trench plus such other items as pavement replacement, special refill, rock excavation, police details and resident engineering, etc.
- d. Payment for the construction costs of \$263,000 shall be made by Hingham at the signing of a construction contract between Hull and the selected contractor.
- e. The project in Nantasket Avenue for Hingham's use, namely the six (6) inch force main and the twelve (12) inch sewer shall be given priority and expedited in the Hull construction schedule such that this work be scheduled for completion no later than October 30, 1997, unless said date is adjusted by a change order approved by Hull and Hingham, which approval will not be unreasonably withheld or delayed. Hull shall include in the construction contract a provision providing for the payment of liquidated damages of \$200 per day to Hingham in the event that this work is not completed by October 30, 1997, or a date extended as provided in the preceding sentence, and this shall be Hingham's sole remedy if said deadline is not met.
- f. Copies of monthly estimates to the contractor shall be furnished Hingham in a timely fashion for Hingham's information and internal fiscal guidance. At the completion of the project, the actual costs of the work shall be allocated by percentages in "4b" above, and Hingham will pay or be paid the difference in the estimated and actual costs within 30 days of the final estimate to the contractor. In the event changes in the estimated costs of the work arise due to unforeseen circumstances and change orders are required which would increase

Hingham's proportionate share above the amount of \$263,000, then Hingham shall pay its proportionate share of any additional costs within ten (10) days of execution of the change order or other approval of the additional costs.

- 5. Hingham shall own the six inch force main and shall have ownership in the twelve inch sewer in proportion to the percentages set forth in "4-b". The cost of maintenance of the six inch force main shall be completely Hingham's responsibility and the cost of maintenance of the twelve inch sewer shall be completely Hull's responsibility.
- 6. To the extent that this Amendment is inconsistent with the IMA, including but not limited to Articles 1.1.5, 2.3.8.1, 10.3, 10.5, 11.1 and 11.3, this Amendment shall supersede the IMA and shall control the respective obligations and responsibilities of the parties hereto.
- 7. Hull shall indemnify, defend and hold harmless the Town of Hingham relative to any and all activities for which Hingham is making payments hereunder, and shall to the extent possible cause any and all professional liability insurance and general liability insurance, payment and performance bonds to include Hingham as an additional insured.

IN WITNESS whereof the parties hereto have executed this Addendum as of this 7th day of MAY, 1997.

ATTEST:

TOWN OF HINGHAM,
SEWER COMMISSION

Thomas P. Hall

Charles H. [unclear]

John [unclear]

William [unclear]

APPROVED FOR FORM:

TOWN OF HINGHAM,
BOARD OF SELECTMEN

James T. Conner
Hingham Town Counsel

John M. Dudge

Matthew M.

Katherine W. Reardon

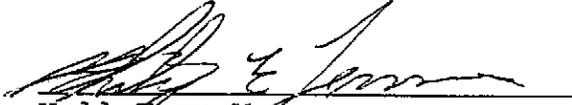
CERTIFIED AS TO THE
AVAILABILITY OF HINGHAM'S SHARE OF FUNDS:

Bill Reardon
Hingham Town Accountant

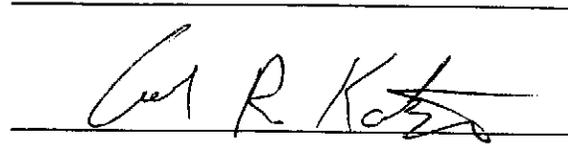
TOWN OF HULL
PERMANENT SEWER COMMISSION

John F. Huggins

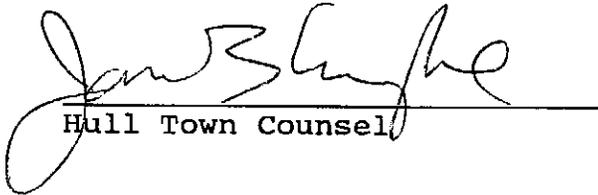
TOWN OF HULL,
TOWN MANAGER

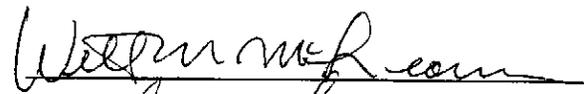

Hull Town Manager

TOWN OF HULL,
BOARD OF SELECTMEN



APPROVED FOR FORM:


Hull Town Counsel









Town of Hull



PERMANENT SEWER COMMISSION

TEL: 617-925-1207

FAX: 617-925-3771

May 2, 1997

1111 NANTASKET AVENUE
HULL, MASSACHUSETTS 02045-1310

John J. Struzziery, Chairman of the Hull Permanent Sewer Commission is authorized to sign Amendment Number 2 of the Intermunicipal Agreement for Water Pollution Control Between the Towns of Hingham and Hull, Massachusetts on behalf of the Hull Permanent Sewer Commission.


Linda J Harmon
Clerk to the Commission

Signed this 2nd day of May, 1997

Then personally appeared the above named Linda J Harmon and acknowledged the foregoing to be her free act and deed. Before me,

Notary Public


NORMAN A. ROGERS, Notary Public
My Commission Expires Oct. 13, 2000

HULL SEWER USE RULES AND REGULATIONS

In accordance with Article 1. (Definitions)

Section 1, Paragraph 9. (1.1.9)

The current Hull Sewer Use Rules and Regulations are attached to this
document

SEWERS

Chapter 149

SEWERS¹

ARTICLE I

Sewer Use

- § 149-1. Definitions and word usage.
- § 149-2. Permit required for connection; notice of changes in discharge.
- § 149-3. Building sewer permit classes; applications and fees.
- § 149-4. Responsibility of owner.
- § 149-5. Separate building sewers required; exception.
- § 149-6. Use of old building sewers.
- § 149-7. Conformance required.
- § 149-8. Underground connections.
- § 149-9. Prohibited connections.
- § 149-10. Notice to inspect and connect.
- § 149-11. Guarding of excavations.
- § 149-12. Time limit for connection.
- § 149-13. Licensing of persons making connections.
- § 149-14. Connections required.
- § 149-15. Authority of Permanent Sewer Commission.
- § 149-16. Prohibited discharge to sanitary sewer.
- § 149-17. Discharge of stormwater and drainage.
- § 149-18. Prohibited discharge to any public sewer.
- § 149-19. Restricted discharges.

¹ Editor's Note: The Permanent Sewer Commission was created 10-23-67 STM, Art. 5, and extended under Art. 38 of the 1969 Annual Town Meeting. Provisions concerning said Commission are on file in the Town Hall.

§ 149-1

SEWERS

§ 149-1

ARTICLE IV
Sewer Rehabilitation Fund

- § 149-38. Preamble.
- § 149-39. Creation; purpose.
- § 149-40. Payments; exceptions.
- § 149-41. Equal dwelling unit system; charge per unit.
- § 149-42. When payment due.
- § 149-43. Rules and regulations.

[HISTORY: Adopted: Art. I, 4-7-75 Annual Town Meeting; Art. II, 4-8-85 Annual Town Meeting, Art. 26; Art. III, 1-27-86 Special Town Meeting, Art. 16, and 10-26-87 Special Town Meeting, Art. 21; Art. IV, 10-26-87 Special Town Meeting, Art. 32. Amendments noted where applicable.]

GENERAL REFERENCES

Housing standards -- See Ch. 113.
Streets and sidewalks -- See Ch. 155.

ARTICLE I
Sewer Use
[Adopted 4-7-75 ATM]

- § 149-1. Definitions and word usage.
 - A. Unless the context specifically indicates otherwise, the meaning of terms used in these rules and regulations shall be as follows:
 - BOD (denoting "biochemical oxygen demand") -- The quantity of oxygen utilities in the biochemical oxidation of organic matter under standard laboratory procedure in five (5) days at twenty degrees Celsius (20° C.), expressed in milligrams per liter.

SANITARY SEWER — A sewer which carries sewage and to which storm-, surface and ground waters are not intentionally admitted.

SEWAGE — A combination of the watercarried wastes from residences, business buildings, institutions and industrial establishments, together with such ground-, surface and storm waters as may be present.

SEWAGE TREATMENT PLANT — Any arrangement of devices and structures used for treating sewage.

SEWAGE WORKS — All facilities for collecting, pumping, treating and disposing of sewage.

SEWER — A pipe or conduit for carrying sewage.

SLUG — Any discharge of water, sewage or industrial waste which in concentration of any given constituent or in quantity of flow exceeds for any period of duration longer than fifteen (15) minutes, more than five (5) times the average twenty-four-hour concentration or flows during normal operation.

STORM DRAIN (sometimes termed "storm sewer") — A sewer which carries storm- and surface waters and drainage, but excludes sewage and industrial wastes, other than unpolluted cooling water.

SUPERINTENDENT — The Superintendent of Sewers acting for and on the behalf of the Permanent Sewer Commission of the Town of Hull, his authorized deputy, agent or representative.

SUSPENDED SOLIDS — Solids that either float on the surface of or are in suspension in water, sewage or other liquids, and which are removable by laboratory filtering.

WATERCOURSE — A channel in which a flow of water occurs, either continuously or intermittently.

B. "Shall" is mandatory; "may" is permissive.

§ 149-5. Separate building sewers required; exception.

A separate and independent building sewer shall be provided for every building, except where one building stands at the rear of another on an interior lot and no private sewer is available or can be constructed to the rear building through an adjoining alley, court, yard or driveway, the building sewer from the front building may be extended to the rear building and the whole considered as one (1) building sewer.

§ 149-6. Use of old building sewers.

Old building sewers may be used in connection with new buildings only when they are found, on examination and test by the Superintendent, to meet all requirements of these rules and regulations.

§ 149-7. Conformance required.

- A. The size, slope, alignment, materials of construction of a building sewer and the methods to be used in excavating, placing of the pipe, jointing testing and backfilling the trench, shall all conform to the requirements of the Building and Plumbing Code or other applicable rules and regulations of the town. In the absence of code provisions or in amplification thereof, the materials and procedures set forth in appropriate specifications of the American Society for Testing and Materials and the Water Pollution Control Federation Manual of Practice No. 9 shall apply.
- B. The connection of the building sewer into the public sewer shall conform to the requirements of the Building and Plumbing Code or other applicable rules and regulations of the town or the procedures set forth in appropriate specifications of the American Society for Testing and Materials and the Water Pollution Control Federation Manual of Practice No. 9. All such connections shall be made gastight and watertight. Any deviation from the prescribed procedures and materials must be approved by the Superintendent before installation.

§ 149-13. Licensing of persons making connections. [Added 5-12-80 ATM, Art. 21]

The Commission shall license competent persons to make connections to the town sewer system. No connection shall be made unless the contractor and/or individual has received such a license.

§ 149-14. Connections required. [Added 4-12-82 STM, Art. 14]

Any property owner whose property is accessible to the town sewerage system shall connect said property to the same in accordance with the Sewer Use Regulations.

§ 149-15. Authority of Permanent Sewer Commission. [Added 4-12-82 STM, Art. 12]

The Permanent Sewer Commission, through its agent(s) or by itself, may require any property owner whose property is accessible to the town sewerage system to be connected to the same within a reasonable amount of time.

§ 149-16. Prohibited discharge to sanitary sewer.

No person shall discharge or cause to be discharged any stormwater, surface water, groundwater, roof runoff, subsurface drainage, uncontaminated cooling water or unpolluted industrial process waters to any sanitary sewer.

§ 149-17. Discharge of stormwater and drainage.

Stormwater and all other unpolluted drainage shall be discharged to such sewers as are specifically designated as combined sewers or storm sewers or to a natural outlet approved by the Superintendent. Industrial cooling water or unpolluted process waters may be discharged, on approval of the Superintendent, to a storm sewer, combined sewer or natural outlet.

process, capacity of the sewage treatment plant, degree of treatability of wastes in the sewage treatment plant and other pertinent factors. The substances prohibited are:

- (1) Any liquid or vapor having a temperature higher than one hundred fifty degrees Fahrenheit (150° F.) [sixty-five degrees Celsius (65° C.)].
- (2) Any water or waste containing fats, wax, grease or oils, whether emulsified or not, in excess of one hundred (100) milligrams per liter or containing substances which may solidify or become viscous at temperatures between thirty-two degrees and one hundred fifty degrees Fahrenheit (32° and 150° F.) [zero degrees and sixty-five degrees Celsius (0° and 65° C.)].
- (3) Any garbage that has not been properly shredded. The installation and operation of any garbage grinder equipped with a motor of three-fourths ($\frac{3}{4}$) horsepower [seventy-six hundredths (0.76) hp metric] or greater shall be subject to the review and approval of the Superintendent.
- (4) Any water or wastes containing strong acid iron pickling wastes or concentrated plating solutions whether neutralized or not.
- (5) Any waters or wastes containing iron, chromium, copper, zinc and similar objectionable or toxic substances; or wastes exerting an excessive chlorine requirement, to such degree that any such material received in the composite sewage at the sewage treatment works exceeds the limits established by the Superintendent for such materials.
- (6) Any waters or wastes containing phenols or other taste or odor producing substances, in such concentrations exceeding limits which may be established by the Superintendent as necessary, after treatment of the composite sewage to meet the requirements of the state, federal or other public agencies or jurisdiction for such discharge to the receiving waters.

- (a) Reject the wastes;
 - (b) Require pretreatment to an acceptable condition for discharge to the public sewers;
 - (c) Require control over the quantities and rates of discharge; and/or
 - (d) Require payment to cover the added cost of handling and treating the wastes not covered by existing taxes or sewer charges under the provisions of § 149-24 of this Article.
- (2) If the Superintendent permits the pretreatment or equalization of waste flows, the design and installation of the plants and equipment shall be subject to the review and approval of the Superintendent, and subject to the requirements of all applicable codes, ordinances and laws.

§ 149-20. Interceptors.

Grease, oil and sand interceptors shall be provided when, in the opinion of the Superintendent, they are necessary for the proper handling of liquid wastes containing grease in excessive amounts or any flammable wastes, sand or other harmful ingredients, except that such interceptors shall not be required for private living quarters or dwelling units. All interceptors shall be of a type and capacity approved by the Superintendent and shall be located as to be readily and easily accessible for cleaning and inspection.

§ 149-21. Maintenance of facilities by owner.

Where preliminary treatment or flow-equalizing facilities are provided for any waters or wastes, they shall be maintained continuously in satisfactory and effective operation by the owner at his expense.

records shall be made available upon request by the Superintendent to other agencies having jurisdiction over discharges to the receiving waters.

§ 149-24. Special agreements.

No statement contained in this Article shall be construed as preventing any special agreement or arrangement between the town and any industrial concern whereby an industrial waste of unusual strength or character may be accepted by the town for treatment, subject to payment therefor, by the industrial concern.

§ 149-25. Damage to system.

No unauthorized person shall maliciously, willfully or negligently break, damage, destroy, uncover, deface, or tamper with any structure, appurtenance or equipment which is a part of the sewage works. Any person violating this provision shall be subject to immediate arrest under charge of disorderly conduct and/or damage to property of the Town of Hull.

§ 149-26. Powers and authority of inspectors.

- A. The Superintendent and other duly authorized employees of the town bearing proper credentials and identification shall be permitted to enter all properties for the purposes of inspection, observation, measurement, sampling and testing in accordance with the provisions of these rules and regulations. The Superintendent or his representative shall have no authority to inquire into any processes including metallurgical, chemical, oil, refining, ceramic, paper or other industries beyond that point having a direct bearing on the kind and source of discharge to the sewers or waterways or facilities for wastes treatment.
- B. While performing the necessary work on private properties referred to in Subsection A above, the Superintendent or duly authorized employees of the town shall observe all safety rules applicable to the premises established by the occupant or

fined in the amount not exceeding twenty dollars (\$20.) for each violation. Each day in which any such violation shall continue shall be deemed a separate offense.

- C. Any person violating any of the provisions of these rules and regulations shall become liable to the town for any expense, loss or damage occasioned the town, by reason of such violation.

§ 149-29. Exemptions. [Added 11-15-84 STM, Art. 7]

The town shall exempt low-income persons seventy (70) years of age or older from tying into the town's sewer system.

**ARTICLE II
Connections to Building Sewer
[Adopted 4-8-85 ATM, Art. 26²]**

§ 149-30. Definitions.

As used in this Article, the following terms shall have the meanings indicated:

HABITABLE STRUCTURE — Includes any building or edifice used for habitation or employment, amusement purposes and other facilities requiring a portable water supply for sanitary or culinary purposes.

§ 149-31. Connection required.

- A. All habitable structures having access to sewers of the Town of Hull shall connect to such sewer.
- B. All habitable structures constructed after the effective date of this Article and having access to sewers of the Town of Hull shall connect to such sewer before any use or occupancy is made thereof.

² Editor's Note: This bylaw was also designated as Art. XXXI of the Town Bylaws.

ARTICLE III
Additional Charges

[Adopted 1-27-86 STM, Art. 16,³ and 10-26-87 STM, Art. 21⁴]

§ 149-36. Interest.

Any sewer user charge not paid within the required time period shall be subject to an interest charge at the same rate as permitted for late tax payments, until paid. The provision shall not affect or limit any collection methods or abatement procedure.

§ 149-37. Demand charge.

The Treasurer/Collector or any other board, department, officer or official may, to offset the additional costs incurred, add to delinquent sewer user bills or demands for payment, being sent to any person or entity who has not paid said bill within the required time period after said bill was originally issued, an additional billing charge not to exceed the maximum demand charge allowed under MGL C. 60, § 16, as the same may be amended from time to time. Nothing contained herein shall limit any legal recourse available to said Treasurer/Collector, board, department, officer or official.

ARTICLE IV
Sewer Rehabilitation Fund
[Adopted 10-26-87 STM, Art. 32⁵]

§ 149-38. Preamble.

Whereas the increased development in the Town of Hull is creating greater demands on the municipal sewerage system due to a greater number of properties connecting into the system than the different parts of the system will be able to handle and resulting in the need to perform sewer improvements, rehabilitation work, replacement work, updating work and repairs, there is hereby established a Sewerage Rehabilitation Fund.

³ Editor's Note: This bylaw was also designated as Art. XXXII-A of the Town Bylaws.

⁴ Editor's Note: This bylaw was also designated as Art. XXXII-B of the Town Bylaws.

⁵ Editor's Note: This bylaw was also designated as Art. XXXII-B of the Town Bylaws.

§ 149-42

SEWERS

§ 149-43

§ 149-42. When payment due.

Payments/contributions made hereunder shall be made prior to issuance of a sewer extension or sewer connection permit or if said permit has been issued, prior to the Permanent Sewer Commission signing off on the occupancy certificate.

§ 149-43. Rules and regulations.

The Permanent Sewer Commission may make and issue rules and regulations concerning the implementation of this Article.

Massachusetts Department of Environmental Protection
Sites where the Levels of Oil and Hazardous Material in the Environment has not been Reduced to Background
for the Town of Hingham

RTN	Address	Site Name	Category	Notification Date	Status	Date	Phase	RAO Class	Chemical Type
4-3002115	15 25 INDUSTRIAL PARK RD	INDUSTRIAL PROPERTY	NONE	4/15/1989	RAO	8/9/1999	PHASE IV	C1	
4-3012334	11 BAYBERRY RD	NO LOCATION AID	TWO HR	4/1/1995	TIER 1D	4/8/1996			Oil
4-3018851	56 BURDITT AVE	NO LOCATION AID	72 HR	10/15/1999	RAO	11/9/2000		B1	Oil
4-3012582	60 COLONIAL RD	NO LOCATION AID	72 HR	6/16/1995	RAO	9/13/1996		A2	Oil
4-3021726	CROW POINT LN	FORMER SUBSTATION	TWO HR	5/2/2002	RAO	2/5/2003		A2	Oil and Hazardous Material
4-3010001	DERBY ST	BRADLEES PLAZA/HINGHAM PLAZA	TWO HR	10/1/1993	RAO	7/19/1994			Oil
4-3003129	87 DERBY ST	SUNOCO SERVICE STATION	NONE	1/17/1992	REMOPS	10/31/2003	PHASE V		Oil
4-3025190	87 DERBY ST	SUNOCO STATION	120 DY	9/12/2005	UNCLASSIFIED	9/12/2005			Oil and Hazardous Material
4-3000123	100 DERBY ST	GAS COUNTRY SERVICE STATION	NONE	1/15/1987	RAO	3/15/2000	PHASE IV	A2	Oil
4-3000755	128 DERBY ST	BEST CHEVROLET	NONE	3/30/1994	STMRET	11/18/2005	PHASE III		
4-3010108	173-203 DERBY ST	6 VACANT LOTS	72 HR	10/26/1993	TIER ID	3/3/1995			Oil
4-3022852	211 DOWNER AVE	HINGHAM YACHT CLUB	72 HR	5/13/2003	RAO	9/12/2003		A2	Oil
4-3004600	19 FORT HILL ST	HINGHAM BUS DEPOT	NONE	11/3/1992	TIER 1D	8/11/1997			
4-3012675	FREE ST	WELL #3	TWO HR	7/12/1995	RAO	7/12/1996		A2	Hazardous Material
4-3015928	60 GEORGE WASHINGTON BLVD	NO LOCATION AID	120 DY	1/7/1998	TIER 2	1/8/1999	PHASE IV		Oil and Hazardous Material
4-3017811	24 GILFORD RD	NO LOCATION AID	TWO HR	12/31/1998	RAO	12/1/1999		A2	Oil

Massachusetts Department of Environmental Protection
Sites where the Levels of Oil and Hazardous Material in the Environment has not been Reduced to Background
for the Town of Hingham

RTN	Address	Site Name	Category	Notification Date	Status	Date	Phase	RAO Class	Chemical Type
4-3014405	33 GREEN ST	NYNEX CENTRAL OFFICE	72 HR	10/24/1996	RAO	2/21/1997		A2	Oil
4-3013225	29 GROVE ST	NO LOCATION AID	TWO HR	12/5/1995	RAO	6/14/1996		A2	Oil
4-3025357	HERSEY ST	HINGHAM DPW STOCKYARD	120 DY	10/25/2005	UNCLAS SIFIED	10/25/2005			Oil and Hazardous Material
4-3025423	HERSEY ST	TOWN DPW YARD	72 HR	11/23/2005	UNCLAS SIFIED	11/23/2005			Hazardous Material
4-3017403	101 HERSEY ST	TOWN OF HINGHAM FRONT OF DPW BLDG	72 HR	10/9/1998	RAO	10/8/1999	PHASE II	A3	Oil
4-3017404	101 HERSEY ST	TOWN OF HINGHAM DPW BLDG REAR	72 HR	10/9/1998	RAO	10/8/1999	PHASE II	A2	Oil
4-3017537	101 HERSEY ST	DPW BLDG	120 DY	11/2/1998	RAO	10/8/1999	PHASE II	A3	Oil
4-3011983	15 HOWARD RD	NO LOCATION AID	72 HR	12/20/1994	RAO	3/24/1995		A2	Oil
4-3002116	10 INDUSTRIAL PARK RD	INDUSTRIAL PROPERTY	NONE	4/15/1989	RAO	8/9/1999	PHASE IV	C1	
4-3013664	75 INDUSTRIAL PARK RD	NO LOCATION AID	120 DY	4/12/1996	RAO	8/7/1996		B1	Hazardous Material
4-3000926	90 INDUSTRIAL PARK RD	SPENCER PRESS INC	NONE	4/21/1987	RAO	8/2/1996		A2	
4-3000331	100 INDUSTRIAL PARK RD	LITTON MERRIMAN DIVISION	NONE	12/13/1985	RAO	5/2/2005		C1	Oil
4-3014712	100 INDUSTRIAL PARK RD	NO LOCATION AID	120 DY	1/15/1997	RTN CLOSED	1/16/1998			Hazardous Material
4-3001220	120 INDUSTRIAL PARK RD	NE SEAL COATING	NONE	1/15/1990	DPS	8/9/1996			
4-3017839	120 INDUSTRIAL PARK RD	NO LOCATION AID	120 DY	1/8/1999	RAO	3/1/1999		A2	Oil
4-3021919	KILBY ST	FORMER SUBSTATION	120 DY	7/3/2002	RAO	2/5/2003		A2	Hazardous Material

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RTN	Address	Site Name	Category	Notification Date	Status	Date	Phase	RAO Class	Chemical Type
4-3003833	LEAVITT ST-HINGHAM ANX	US ARMY NAVY RESERVE	NONE	7/15/1993	RAO	8/30/2004		A3	Oil and Hazardous Material
4-3025693	179 LINCOLN CTR	CUMBERLAND FARM	72 HR	2/25/2006	UNCLAS SIFIED	2/25/2006			Oil
4-3015921	169 LINCOLN ST	POLICE STATION	72 HR	1/15/1998	RAO	7/12/1999	PHASE II	A2	Oil
4-3003627	179 LINCOLN ST	EXXON SERVICE STATION	NONE	7/15/1991	RAO	8/2/1995		A2	Oil
4-3024959	193 LINCOLN ST	CROW POINT VILLAGE	TWO HR	6/17/2005	RAO	2/14/2006		A2	Oil
4-3003320	207-225 LINCOLN ST	ANCHOR PLAZA	NONE	10/15/1990	RTN CLOSED	8/23/1996			
4-3001310	223 LINCOLN ST	SUNOCO STATION FMR	NONE	1/15/1990	RAO	8/15/2002	PHASE III	A2	Oil
4-3017382	295 LINCOLN ST	NO LOCATION AID	72 HR	10/6/1998	RAO	12/11/1998		A2	Oil
4-3021058	300-349 LINCOLN ST	PKG LOT AT OCEANKAI RESTAURANT	120 DY	5/2/2001	URAM	5/2/2001			Oil
4-3002489	349 LINCOLN ST	HEWITTS COVE MARINA	NONE	7/13/1989	RAO	11/24/2004	PHASE II		
4-3014281	349 LINCOLN ST	SHIPYARD INDUSTRIAL PK/BOAT STORAGE AREA	120 DY	9/30/1996	RAO	8/14/1997		A2	Oil and Hazardous Material
4-3014452	349 LINCOLN ST	HINGHAM SHIPYARD EAST SIDE	120 DY	10/25/1996	TIER 2	12/11/1997	PHASE II		Hazardous Material
4-3014612	349 LINCOLN ST	HINGHAM SHIPYARD	120 DY	10/25/1996	RAO	8/8/1997		B1	Hazardous Material
4-3014730	349 LINCOLN ST	HINGHAM SHIPYARD EAST SIDE SITE	TWO HR	1/14/1997	RTN CLOSED	12/11/1997			Hazardous Material
4-3020590	349 LINCOLN ST	BOAT STORAGE AREA	TWO HR	4/11/2001	RAO	12/6/2001		A2	Hazardous Material
4-3021703	349 LINCOLN ST	UST AREA	TWO HR	4/23/2002	RAO	11/24/2004	PHASE II	A2	Oil

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4-3023722	349 LINCOLN ST	HEWITTS COVE MARINA	120 DY	3/31/2004	TIER 1C	3/31/2005	PHASE II		Hazardous Material
4-3024664	349 LINCOLN ST	HEWITT'S COVE MARINA	TWO HR	2/25/2005	RTN CLOSED	3/31/2005			Hazardous Material
4-3025441	349 LINCOLN ST	GZ-101-SI	120 DY	11/25/2005	UNCLAS SIFIED	11/25/2005			Hazardous Material
4-3001513	425 LINCOLN ST	SHAW SAAB	NONE	10/15/1988	PENNFA	8/1/1995			
4-3023230	433 LINCOLN ST	LANDFILL MARINA	TWO HR	10/2/2003	RAO	11/28/2003		A2	Oil
4-3011957	489 MAIN ST	NO LOCATION AID	72 HR	12/13/1994	RAO	1/30/1995		A2	Oil
4-3002042	1217 MAIN ST	WHITON HOUSE RESTAURANT	NONE	4/15/1989	DPS	8/9/1996			
4-3023963	282-292 MAIN STREET AND 11-15	NO LOCATION AID	120 DY	2/24/2004	DPS	2/24/2004			Oil
4-3024913	47 MANATEE RD	NO LOCATION AID	TWO HR	6/1/2005	TIER 2	6/1/2006	PHASE II		Oil
4-3022553	MBTA GREENBUSH LINE SURVEY STA	3 42 193 ME 46 76 409 MN 812 67 822 68	120 DY	2/7/2003	SPECPR	4/23/2004			Oil and Hazardous Material
4-3022554	MBTA GREENBUSH LINE SURVEY STA	3 40 872 M E 46 75 947 M N 757 24 771 13	120 DY	2/7/2003	SPECPR	4/23/2004			Hazardous Material
4-3022555	MBTA GREENBUSH LINE SURVEY STA	3 43 600 ME 46 78 121 M N 892- 92 898 61	120 DY	2/7/2003	SPECPR	4/23/2004			Oil and Hazardous Material
4-3022556	MBTA GREENBUSH LINE SURVEY STA	3 41 710 E 46 75 906 M N 791-61 799-47	120 DY	2/7/2003	SPECPR	4/23/2004			Hazardous Material
4-3022578	MBTA GREENBUSH LINE SURVEY STA	3 46 612ME 46 78 43MN 997 52 998 53	120 DY	2/19/2003	SPECPR	4/23/2004			Hazardous Material

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RTN	Address	Site Name	Category	Notification Date	Status	Date	Phase	RAO Class	Chemical Type
4-3022579	MBTA GREENBUSH LINE SURVEY STA	3 46 0669ME 46 78 248 MN 979 81 980 81	120 DY	2/19/2003	SPECPR	4/23/2004			Hazardous Material
4-3022580	MBTA GREENBUSH LINE SURVEY STA	3 45 414 ME 46 78 436MN 949 19 964 39	120 DY	2/19/2003	SPECPR	4/23/2004			Oil and Hazardous Material
4-3022581	MBTA GREENBUSH LINE SURVEY STA	3 45 002ME 46 78 456MN 938 68 943 99	120 DY	2/19/2003	SPECPR	4/23/2004			Oil and Hazardous Material
4-3022582	MBTA GREENBUSH LINE SURVEY STA	3 44 093ME 46 78 162MN 907 38 930 58	120 DY	2/19/2003	TCLASS	9/7/2005			Oil and Hazardous Material
4-3022583	MBTA GREENBUSH LINE SURVEY STA	3 47 456ME 46 78 426MN 1014 73 1028 11	120 DY	2/19/2003	SPECPR	4/23/2004			Oil and Hazardous Material
4-3022584	MBTA GREENBUSH LINE SURVEY STA	3 47 969ME 46 78 370MN 1040 83 1045 39	120 DY	2/19/2003	SPECPR	4/23/2004			Oil and Hazardous Material
4-3022586	MBTA GREENBUSH LINE SURVEY STA	3 42 645ME 46 76 856MN 824 36 851 4	120 DY	2/19/2003	SPECPR	4/23/2004			Hazardous Material
4-3022604	MBTA GREENBUSH LINE SURVEY STA	3 43 747ME 46 78 136MN 899 55 904 95	120 DY	2/19/2003	TIER 1D	2/26/2004			Oil and Hazardous Material
4-3012377	OFF 97 WARD ST	OFF WARD ST- MINELLI QUARRY	TWO HR	4/11/1995	RAO	6/12/1995		A2	Oil
4-3000820	OFF RTE 3A COHASSET LINE	WOMPATUCK STATE PARK	NONE	1/15/1987	RAO	6/2/2000		NC	Oil
4-3025453	OTIS ST	NEAR GOVERNOR LONG ST	TWO HR	12/2/2005	RAO	1/26/2006		A2	Oil
4-3011904	139 OTIS ST	ROUTE 3A AND OTIS ST	120 DY	11/28/1994	RAO	2/5/1996	PHASE II	A2	Oil and Hazardous Material

Massachusetts Department of Environmental Protection
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4-3002041	30 PARK POND RD	INDUSTRIAL PROPERTY	NONE	4/15/1989	RAO	8/8/2000	PHASE III	B1	
4-3010976	10 PINE GROVE RD	NO LOCATION AID	72 HR	5/10/1994	RAO	9/12/1994		A2	Oil
4-3020079	PLEASANT ST	PLEASANT ST DUMP WOMPATUCK STATE PARK	120 DY	9/28/2000	TIER 1A	5/28/2002			
4-3018170	155 REAR WARD ST	OFF OLD WARD ST ESTATE OF R MARGETTS	TWO HR	4/8/1999	RAO	8/13/1999		B1	Oil
4-3010883	60 RESEARCH DR	SAGER ELECTRICAL SUPPLIES	72 HR	4/20/1994	RAO	7/29/1994		A2	Oil
4-3013354	60 RESEARCH RD	NO LOCATION AID	120 DY	1/12/1996	DPS	1/10/1997			Hazardous Material
4-3012102	100 RESEARCH RD	NO LOCATION AID	TWO HR	1/26/1995	RAO	3/20/1995		A2	Oil
4-3017243	100 RESEARCH RD	NO LOCATION AID	TWO HR	9/1/1998	RAO	1/20/1999		A2	Oil
4-3017307	100 RESEARCH RD	US REPEATING ARMS	TWO HR	9/16/1998	RAO	11/12/2002	PHASE II	A3	Oil
4-3017313	100 RESEARCH RD	US REPEATING ARMS	72 HR	9/18/1998	RAO	11/16/1998		A2	Oil
4-3017359	100 RESEARCH RD	NO LOCATION AID	120 DY	9/29/1998	RAO	11/12/2002	PHASE II	A3	Oil
4-3017532	5 RICHARD RD	MICHAEL RD	72 HR	11/5/1998	RAO	2/1/1999		A2	Oil
4-3018375	RTE 3	MEDIAN AT MILE MARKER 36	TWO HR	6/4/1999	RAO	8/10/1999		A2	Oil
4-3002333	SHIPYARD DR	MARINE SERVICE BUILDING	NONE	1/15/1990	RAO	11/18/1997	PHASE II	A2	
4-3015007	9 SHORT ST	LEAVITT ST	120 DY	4/14/1997	REMOPS	11/4/2004	PHASE V		Oil and Hazardous Material

Massachusetts Department of Environmental Protection
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RTN	Address	Site Name	Category	Notification Date	Status	Date	Phase	RAO Class	Chemical Type
4-3020822	9 SHORT ST	NO LOCATION AID	72 HR	6/21/2001	RTN CLOSED	8/27/2001			
4-3012528	93 SOUTH PLEASANT ST	OFF RTE 228	72 HR	5/31/1995	RAO	5/10/1996		A2	Oil
4-3015498	93 SOUTH PLEASANT ST	FULLING MILL POND	TWO HR	9/5/1997	RAO	10/22/1997		A2	Oil
4-3003524	6 STATION ST	COMMERCIAL PROPERTY	NONE	4/15/1991	RAO	11/16/1995		A2	
4-3014600	5 STUDLEY RD	NO LOCATION AID	120 DY	12/5/1996	RAO	12/13/1996		A2	Oil
4-3012441	7 STUDLEY RD	RESIDENCE	72 HR	5/3/1995	RAO	7/10/1995		A2	Oil
4-3002788	24 SUMMER ST	MOBIL STATION 01 253	NONE	1/15/1990	RAO	1/18/1995		A2	
4-3011301	29 SUMMER ST	SW SIDE OF ROTARY/RTE 3A & CUSHING WAY	120 DY	7/27/1994	RAO	7/1/1997	PHASE III	B1	Oil and Hazardous Material
4-3023048	29 SUMMER ST	NO LOCATION AID	72 HR	7/30/2003	TIER 2	8/2/2004	PHASE II		Oil
4-3016623	207 TO 225 LINCOLN ST	NO LOCATION AID	TWO HR	3/24/1998	RAO	5/3/1999		A2	Hazardous Material
4-3023083	19 TO 25 SUMMER ST	HINGHAM CAR WASH	72 HR	8/12/2003	TIER 2	8/18/2004	PHASE II		Oil
4-3021725	TOWER BROOK RD	FORMER SUBSTATION	TWO HR	5/2/2002	RAO	2/5/2003		A2	Hazardous Material
4-3020682	UNION ST WOMPATUCK STATE PARK	FORMER BURNING GROUND	120 DY	4/27/2001	TIER 1A	9/13/2002			Hazardous Material
4-3000330	97 WARD ST	MARGETTS & SONS SEPTIC LAGOONS	NONE	1/15/1987	RAO	2/28/2003	PHASE II	A3	
4-3001554	1 WHITING ST	QUEEN ANNES CORNER	NONE	1/15/1990	DPS	9/11/1998	PHASE II		
4-3017333	4 WHITING ST	NORWELL TOWN LINE	120 DY	9/22/1998	RAO	9/22/1998		A2	Oil

Massachusetts Department of Environmental Protection

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RTN	Address	Site Name	Category	Notification Date	Status	Date	Phase	RAO Class	Chemical Type
4-3022981	22 WHITING ST	RTE 53 RTE 228	120 DY	6/18/2003	RAO	10/6/2003		B1	Oil
4-3000187	193 WHITING ST	WEEKS SERVICE STATION	NONE	10/23/1986	RAO	4/1/2005		C1	Oil
4-3010130	193 WHITING ST	MOBIL STATION	TWO HR	10/26/1993	RTN CLOSED	4/10/2004			Oil
4-3000188	194 WHITING ST	MUTUAL OIL COMPANY	NONE	1/15/1987	RAO	7/24/1997	PHASE II	A2	
4-3012737	194 WHITING ST	NO LOCATION AID	72 HR	7/27/1995	RAO	7/24/1997	PHASE II	A2	Oil
4-3022866	194 WHITING ST	SERVICE STATION	72 HR	5/16/2003	RAO	9/20/2005	PHASE IV	C1	Oil
4-3023446	194 WHITING ST	FORMER TEXACO	120 DY	12/9/2003	RTN CLOSED	11/5/2004			Hazardous Material
4-3022415	210 WHITING ST	ROUTE 53	120 DY	12/18/2002	RAO	1/13/2003		A2	
4-3023690	411 WHITING ST	NO LOCATION AID	120 DY	3/18/2004	RAO	4/27/2004		B1	Hazardous Material



2004
Water Quality Report

*For Customers in the
Hingham/Hull System*



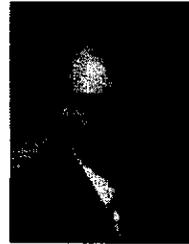
PWS ID#: MA3131000

Water Quality Report

Cover photo:

Michelle Desorcy, Aquarion Water Company's Administrative Services Manager, is pictured (left to right) with Millbury's Elmwood Street School student Ryan Iwaniuk, and Meaghan O'Leary, Audrey Schmidt, Brian Bott and Evan Iwaniuk of Raymond Shaw Elementary School.

Dear Valued Customer:



Aquarion Water Company is committed to providing you and your family with high-quality drinking water, because it is vital for your good health and well being.

To keep you informed of our progress, we are delighted to send you our Third Annual Water Quality Report. In 2004 your water quality data, provided in an inside table, was extracted from more than 1,900 tests on some 970 samples of our water at various locations in our service areas.

We are pleased to inform you that your water meets, or is better than, the quality required by state and federal standards.

To further assure the quality of our product, the state Department of Environmental Protection checks our test results and examines our treatment facilities and testing laboratories to ensure sustained compliance with state and federal water quality regulations

We value the opportunity to be your water service provider, and will continue to devote all of our talents and expertise to provide you with high-quality water and excellent service.

Sincerely,

Larry L. Bingaman, Sr. Vice President, Operations

Where does your water come from?

Your water is drawn from Accord Pond, Accord Brook, and seven wells in Hingham in the Weir River Watershed. These sources accounted for 100% of the water supply delivered to customers in Hingham, Hull, North Cohasset and Norwell. All of the water, except for that of the Downing Street Well, which is used seasonally, is treated at the Hingham Water Treatment Facility. The distribution system is interconnected for emergency use with the Weymouth and Cohasset public water supply systems.

The Hingham/Hull District supply, which serves about 33,368 people in Hingham, Hull, North Cohasset and Norwell during the winter and 45,600 during the summer, is delivered to you through an extensive underground piping system. The average daily demand is 3.4 million gallons. An average of 14.1% of this daily demand is unaccounted for water due to cleaning of our mains, fire protection, leaks, and unauthorized use.

For immune-compromised persons

Persons with weakened immune systems, such as those undergoing chemotherapy for cancer treatment, individuals who have undergone organ transplants, persons with HIV/AIDS or other immune system disorders, some elderly, and infants, can be particularly at risk of infection. They may also be more vulnerable to contaminants in drinking water than the general population.

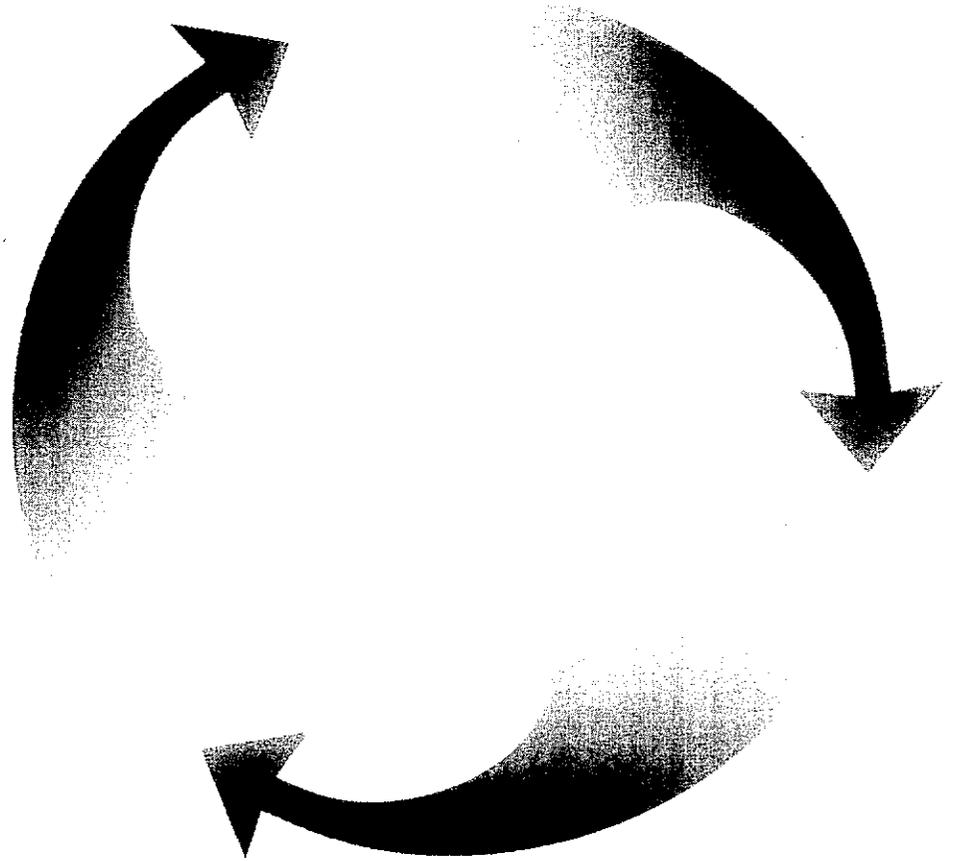
These people should seek advice from their health care providers about drinking water. The Environmental Protection Agency (EPA) Safe Drinking Water Hotline at **800-426-4791** offers guidelines from the EPA and Centers for Disease Control (CDC) on ways to lessen the risk of infection by Cryptosporidium and other microbial contaminants.

What are we doing to improve your service and water quality?

Aquarion Water Company's comprehensive capital improvement campaign to upgrade and replace all aging infrastructures ensures the high quality of the water we deliver to you. In 2004, Aquarion Water Company's capital budget for distribution system and water supply improvements, reservoir improvements, as well as long-range water supply planning in its Hingham/Hull, Millbury and Oxford Districts, exceeded \$1.3 million. In 2005, the capital budget will be about \$2.5 million.

How much did your water cost?

The average Hingham/Hull household used 70,900 gallons of water in 2004, and received an annual bill of \$572. The average daily use was 194 gallons at cost of \$1.57 per day.



**Conservation smarts:
Use water wisely**

Above normal precipitation in 2004 allowed Aquarion Water Company's reservoirs and ground waters to reach and sustain high capacities. Nevertheless, full-time residents and summertime visitors should continue to protect and conserve precious water resources, especially while using lawn irrigation systems.

Also, please remember that overwatering can actually weaken your lawn by encouraging shallow roots that are less tolerant of dry periods and more likely to be damaged by insects.

We recommend the use of sensors that are designed to override irrigation system watering schedules and automatically shut off if it's raining, too windy, or if adequate rainfall has provided enough moisture for the lawn. Such sensors reset to come back on when conditions are favorable.

**To help prevent waste,
Aquarion Water Company offers
the following water-saving tips:**

Indoors:

- Turn the water off while shaving, brushing teeth and washing one's face to save up to three gallons a minute.
- Have faucet and toilet leaks repaired, as a steady one-eighth-inch diameter drip can waste more than 20 gallons a day.
- Take shorter showers and turn the water off while lathering to save 20 percent of water used. Install low-flow showerheads to save at least 2.5 gallons a minute.
- Do not overfill the bathtub. Filling a tub to two-thirds of its capacity saves nearly 20 gallons of water.
- Avoid using the toilet to flush cigarette butts, facial tissue or other small pieces of trash and save five-to-seven gallons per flush.
- Use the washing machine for full loads only and shorten the cycle to save up to 33 gallons.

- Wash only full loads of dishes in the dishwasher and use the short cycle to save 13 gallons.
- Do not run water while rinsing dishes and save three-to-five gallons a minute.
- Keep a container of cold water in the refrigerator, instead of allowing it to run to get chilled, and save three-to-five gallons a minute.

Outdoors:

- Water your lawn and other landscaping in the early morning to avoid evaporation.
- Be sure sprinklers water only your lawn, not the pavement.
- Never water on a windy or rainy day.
- Never use the hose to clean debris from your driveway or sidewalk. Use a broom or blower.
- Apply mulch around flowers to reduce evaporation, promote plant growth, and control weeds.
- Plant drought-tolerant foliage and use rocks, mulch and creative landscaping instead of planting new flowerbeds.

Concerns about radon

Radon is a radioactive gas that is found naturally underground. It rises through the ground to the air above and may enter into homes through the foundation. Drinking water from a well source can also add radon to the home air. The U.S. Environmental Protection Agency (EPA) reports that "compared to radon entering the home through soil, radon entering the home through water will in most cases be a small source of risk."

The EPA is in the process of setting a health standard for radon in public drinking water, which will likely be in the range of 300 to 4,000 picocuries per liter (pCi/L). Aquarion Water Company has been monitoring radon levels in all of our supplies for several years.

The radon detected in the Hingham/Hull System water supplies was in the range of 240 to 374 pCi/L. At these levels the water would contribute approximately 0.02 to 0.03 pCi/L of radon to the home air, compared to the EPA's health guideline of 4.0 pCi/L for home air. The EPA and Aquarion Water Company recommend that all homes be tested for radon in air.

For more information about radon, please call the EPA's Safe Drinking Water Hotline

at **800-426-4791**. You may also visit the EPA's website at www.epa.gov/safewater/radon.html.

What you should know about MTBE

Oil companies in 2003 added the compound MTBE (methyl-tertiary-butyl-ether) to gasoline to reduce air pollution in compliance with the Federal Clean Air Act. Unfortunately, gasoline spills and leaks from underground fuel tanks have caused MTBE to seep into drinking water supplies across the country.

Aquarion Water Company routinely monitors for MTBE in all of our water supplies, and we inspect the areas around our reservoirs and wells to prevent contamination. Our tests show that MTBE was not detected in the Hingham/Hull System.

The Massachusetts Office of Research and Standards has adopted a guideline of 70 parts per billion. This action level may be lowered in the future.

Lead and copper information

Copper is an essential nutrient. However, persons who drink water containing excess copper due to such sources as corroded plumbing, erosion of natural deposits and discharges from wood preservatives could experience stomach problems over a few

years of ingestion, and liver and kidney damage over several years of ingestion. Persons with Wilson's Disease should consult with their personal doctors.

Infants and children who drink water containing excess lead due to corroded plumbing and erosion of natural deposits could experience delays in their physical or mental development, affecting attention span and learning abilities. Infants and young children are typically more vulnerable to lead in drinking water than the general population. Adults who drink water with excess lead over many years could develop kidney problems or high blood pressure.

It's possible that lead levels in your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your drinking water, you may wish to have your water tested and run your tap for 30 seconds to 2 minutes before using for consumption. This water can be used for other household purposes, such as watering plants. The system is in compliance with the Lead and Copper Action Levels. Additional information is available from the Safe Drinking Water Hot Line at **800-426-4791**.

Cryptosporidium and Giardia

Drinking water contaminated with the potentially harmful *Cryptosporidium* and *Giardia* parasites has been associated with waterborne disease outbreaks detected in other parts of the U.S.

While persons with weakened immune systems may need to take extra precautions, health experts say water that meets state and federal treatment and water quality requirements is safe to drink. Our water meets, or is better than, state and federal health standards.

These parasites can get into drinking water reservoirs and wells via the feces of infected domestic or wild animals or humans. Aquarion Water Company's source protection, testing and treatment programs protect your drinking water from these organisms. Because these organisms have had severe effects, elsewhere in the U.S., on some individuals with weakened immune systems (including persons with Acquired Immune Deficiency Syndrome), state health officials recommend, and Aquarion Water Company scientists agree, that these persons should consult a physician for advice concerning anything they eat or drink.

Disinfection by-products

Disinfection by-products (DBPs) are chemicals that are formed during the disinfection process when naturally occurring organic matter reacts with the chlorine that we add to the water to eliminate bacteria and other microorganisms. Currently, there are limits on two types of DBPs known as Trihalomethanes and Haloacetic Acids.

The EPA limit for Total Trihalomethanes is 80 parts per billion or ppb, and the limit for Haloacetic Acids is 60 parts per billion or ppb, based on an annual running average. Compliance is calculated on a quarterly basis. The highest running annual average in 2004 was 69 ppb for Total Trihalomethanes and 32 ppb for Haloacetic Acids. The system is in compliance with the limits.

Aquarion involved in industry research

The American Water Works Association Research Foundation (AWWARF) is the central research organization for the U.S. public water supply industry. It focuses on finding ways to protect your drinking water from disease-causing bacteria, other organisms and harmful chemicals; exploring ways to improve water companies' infrastructure; and finding ways to conserve resources.

This is why Aquarion Water Company has supported AWWARF for several years. You benefit from this research because you are better protected from waterborne disease and contamination. For more information about the AWWARF, visit its website at www.awwarf.com.

Source water assessment report

Your water is drawn from Accord Pond, Accord Brook, and seven wells in Hingham. The Massachusetts Department of Environmental Protection has prepared a Source Water Assessment Program (SWAP) Report for the supplies serving our drinking water system. The SWAP Report notes the key issues of present and future land use activities near the water supplies including: use and/or storage of hazardous materials, potential contamination from road use, construction and maintenance, residential land uses, presence of oil and/or hazardous material contamination sites, and protection planning. The SWAP Report recommends many source protection efforts because the sources are highly susceptible to potential contamination.

Aquarion Water Company currently performs or is developing plans to address the recom-

recommendations from the SWAP. They include public education, emergency response planning, regular inspections, partnering with local businesses to ensure proper storage, handling and disposal of hazardous materials, and the development and implementation of a wellhead and surface water protection plan. Please read on for information on how you can help protect water sources. For more information on the SWAP Report and source water protection, please call Aquarion Water Company at **800-832-2373**.

Source water protection

Water that flows above ground or underground may pick up pollutants as it comes in contact with contaminants from activities that occur on land. Even small quantities of some of these pollutants may be enough to contaminate a drinking water supply.

Some of the pollutants that may wash into surface water or seep into groundwater include: disease-causing organisms from a poorly functioning septic system or improperly stored animal manure, oil that drips onto roads and driveways, gasoline compounds (including MTBE) from leaking underground fuel storage tanks, and chemicals from acci-

dental spills, improper disposal of household hazardous wastes, and overused fertilizers and pesticides.

Cross-connection control program

The company's Cross-Connection Control Program ensures the water in our distribution system is protected from possible contamination sources. A cross-connection, as defined by the Massachusetts Department of Environmental Protection (MA DEP), "is any actual or potential connection between a distribution pipe of potable water from a public water system and any waste pipe, sewer, drain or other unapproved source that has the potential, through backpressure or backsiphonage, to create a health hazard to the public water supply and the water system within the premises."

AWC's MA DEP-state certified cross-connection surveyors and testers routinely conduct surveys and test backflow prevention devices at our customers' facilities for compliance with the regulations. If unprotected cross-connections are discovered, backflow prevention devices are required to be installed. These devices prevent water from being reintroduced into the water distribution system as a result of backpressure or backsiphonage, commonly

known as backflow. Backpressure or backsiphonage may occur if a facility's water pressure is higher than the distribution system pressure due to a water main break, fire hydrant use or a pump installed to the system.

The best protection against a cross-connection is to eliminate the link. The garden hose is one of the leading causes. At your home, you can protect your family and the distribution system from potential contaminants by installing a simple, inexpensive backflow device called a Hose Bibb Vacuum Breaker (HBVB). This can be purchased at a hardware store. It threads directly to the spigot, and the hose threads directly to the HBVB.

What is Aquarion doing to protect your drinking water?

Aquarion Water Company is committed to protect your drinking water supplies, prevent contaminants from entering reservoirs and aquifers, and ensure high quality by treating and filtering the water. We regularly inspect homes, businesses, farms, and other sites that could pollute water supplies. As well, we review plans for new land development projects, such as housing subdivisions, for any possible impact on water quality.

If we find any pollution problems, we work with property owners and state and local agencies to correct them. Massachusetts has some of the toughest laws and regulations in the U.S. to help water utilities protect public drinking water resources.

In accordance with the nation's alert status, Aquarion Water Company continues to work diligently to ensure the continued safety and quality of your water. We use the best water treatment and filtration technology and have also increased our capital equipment investment to improve security.

How can you help?

Persons who live in water supply watershed and aquifer areas can help us protect drinking water supplies by making sure that your septic systems are working properly, using chemicals such as pesticides and cleaning products wisely, and disposing of waste chemicals and used motor oil properly. Residents can also help by reporting illegal dumping, chemical spills, or other polluting activities to the Massachusetts Department of Environmental Protection at **617-654-6500**, to Aquarion Water Company at **800-832-2373**, or to your local police.

Risks to tap and bottled water

Tap and bottled drinking water sources include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over land or underground, it dissolves naturally occurring minerals—and in some cases radioactive material—and can pick up substances that are left by animals or humans.

To improve the quality of tap water, the EPA regulations place limits on the amounts of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same level of protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least some amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water is not safe to drink. For more information about contaminants and their potential health effects, call the EPA's Safe Drinking Water Hotline at **800-426-4791**.

- **Organic chemical contaminants, including synthetic and volatile organic chemicals, such as MTBE, that are by-products of industrial processes and can also come from gas stations, urban storm water runoff and septic systems.**
- **Radioactive contaminants that can be naturally occurring.**

TREATED WATER TESTS

Your water has been tested for 108 regulated compounds, as well as those non-regulated substances for which we are required to test. Only 13 compounds were detected, all of which were below the amounts allowed by state and federal law. The state allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of our data, though representative, are more than one year old.

SUBSTANCE	HIGHEST ALLOWED BY LAW		COMPLIANCE	TEST DATE	DOWNING ST. WELL DETECTED LEVEL		TEST DATE	HINGHAM WTF DETECTED LEVEL	
	MCLG	MCL			AVERAGE	RANGE		AVERAGE	RANGE
	INORGANIC COMPOUNDS								
BARIUM	2 ppm	2 ppm	YES	2004	0.103	0.103	2004	ND < 0.050	ND < 0.050
COPPER	1.3 ppm	AL = 1.3 ppm	YES	2003	0.60*		2003	0.60*	
FLUORIDE	4 ppm	4 ppm	YES	2004	0.98	0.30-1.30	2004	0.98	0.30 - 1.30
LEAD	0	AL = 15 ppb	YES	2003	1**		2003	1**	
NITRATE	10 ppm	10 ppm	YES	2004	1.60	1.60	2004	0.840	0.840
MICROBIALS									
TURBIDITY	N/A	TT = 1ntu max	YES	2004	N/A		2004	0.10^	0.04 - 0.40
		TT = 95% of samples < 0.3 ntu	YES	2004	N/A		2004	100%	
ORGANIC COMPOUNDS									
TOTAL ORGANIC CARBON (TOC)	N/A	TT = Removal Ratio > 1 #	YES	2004	N/A		2004	1.23	1.00 - 1.45
TOTAL TRIHALOMETHANES	0	80 ppb	YES	2004	69+	15 - 87	2004	69+	15 - 87
HALOACETIC ACIDS	N/A	60 ppb	YES	2004	32+	ND < 1.0 - 46	2004	32+	ND < 1.0 - 46
DISINFECTANT									
FREE CHLORINE	MRDLG 4	MRDL 4 ppm	YES	2004	0.36	0.01 - 2.20	2004	0.36	0.01 - 2.20
UNREGULATED CONTAMINANT									
INORGANIC COMPOUNDS									
CHLORIDE	N/A	SMCL 250 ppm	N/A	2004	44.7	44.7	2004	63.1	63.1
SODIUM	N/A	ORSG 20 ppm	N/A	2004	25.0	25.0	2004	37.0	37.0
SULFATE	N/A	SMCL 250 ppm	N/A	2004	36.0	36.0	2004	51.0	51.0

SOURCES

Erosion of natural deposits; Discharge from drilling wastes; Discharge from metal refineries.
Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives.
Water additive which promotes strong teeth.
Corrosion of household plumbing systems; Erosion of natural deposits.
Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.

Soil runoff.

Naturally present in the environment.
By - Product of drinking water chlorination.
By-product of drinking water chlorination.

Water additive used to control microbes.

Naturally present in the environment.
Water treatment processes, use of road salt, naturally present in the environment.
Naturally present in the environment.

FOOTNOTES

AL	Action Level
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MRDLG	Maximum Residual Disinfectant Level Goal
MRDL	Maximum Residual Disinfectant Level
mrem/yr	Millirems per year (measure of radiation absorbed by the body)
N/A	Not applicable or test not required
NTU	Nephelometric Turbidity Units, a measure of the presence of particles. Low NTUs is an indicator of high-quality water.
pCi/L	Picocuries per liter (measure of radioactivity)
ppm	Parts per million, or milligrams per liter (mg/L)
ppb	Parts per billion, or micrograms per liter (ug/L)
TT	Treatment Technique
SMCL	Secondary Maximum Contaminant Level
ORSG	Office of Research and Standards Guideline—State of Massachusetts
*	90th percentile value in copper monitoring. Result is representative of customer sampling stagnant water. No locations exceeded the action level.
**	90th percentile value in lead monitoring. Result is representative of customer sampling stagnant water. No locations exceeded the action level. Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels in your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and run your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline (800-426-4791).
^	Reported value is the highest monthly average turbidity reported from surface water treatment plant effluent; values in the range are individual measurements.
^^	50pCi/L is a level of concern set by the EPA. Any results over this level are converted to mrem/year which is the unit of measure for the MCL of 4 mrem/yr.

- +** Reported value is the highest running annual average of samples in the distribution system; values in the range are individual measurements.
- #** The monthly TOC removal ratio is calculated as the ratio between the actual TOC removal and the TOC rule removal requirements

DEFINITIONS

Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

MCL: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

MCLG: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

SMCL: These standards are developed to protect the aesthetic qualities of drinking water and are not health based.

ORSG: This is a concentration of a chemical in drinking water, at or below which, adverse health effects are unlikely to occur after chronic (lifetime) exposure. If exceeded, it serves as an indicator of the potential need for further action.

MRDL: The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG: The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectant to control microbial contamination.

HEALTH EFFECTS

Sodium: Sodium sensitive individuals such as those experiencing hypertension, kidney failure, or congestive heart failure, who drink water containing sodium should be aware of levels where exposures are being carefully controlled.

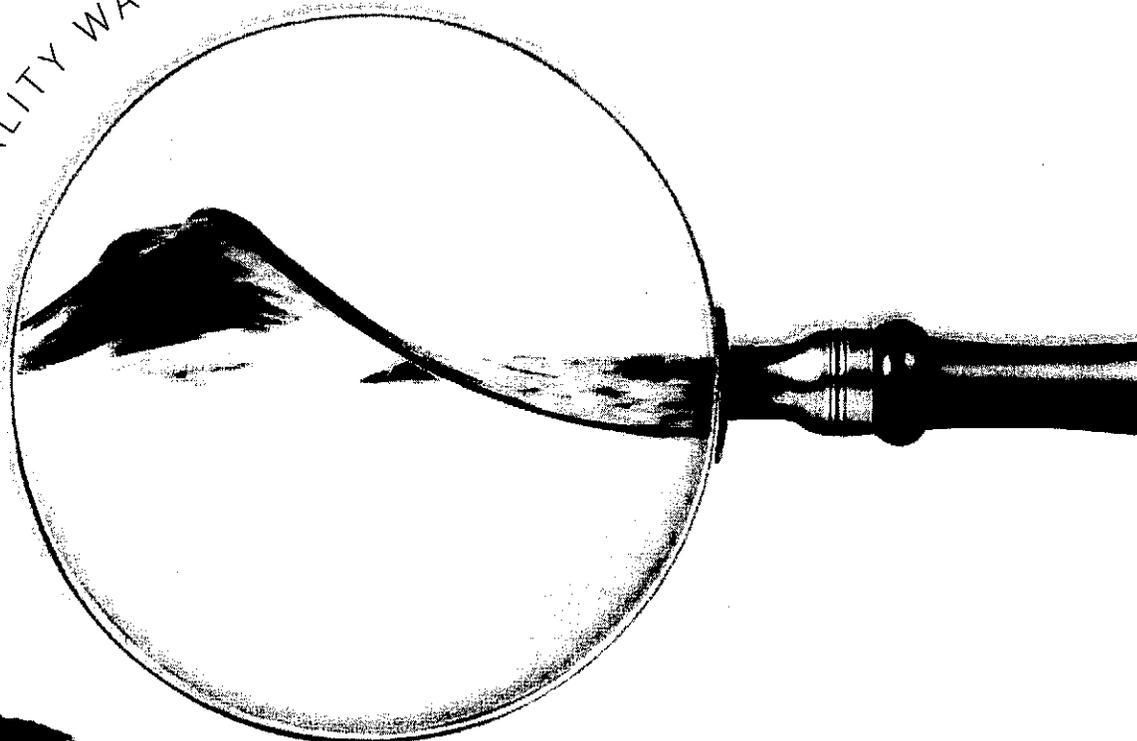


AQUARION
Water Company

**2005
WATER
QUALITY
REPORT**

*For Customers in the
Hingham/Hull System*

▶▶ QUALITY WATER FOR LIFE



INSIDE:

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Aquarion's Community Connection

Aquarion Water Company, an Aquarion subsidiary, is the public water supply company for approximately 221,000 homes and businesses or more than 714,000 people in 53 cities and towns throughout Connecticut, New York, Massachusetts, and New Hampshire.

Our primary responsibility is to provide you and your family with high-quality drinking water. We are also committed to supporting the communities that we serve. Over the past five years, Aquarion has donated more than \$1 million in sponsorships and in-kind assistance for educational programs and scholarships, the enhancement of our neighborhoods and environment, and health and safety initiatives.



At the annual Nantasket Beach Road Race in Hull, Massachusetts, our Massachusetts team members give refreshing water to runners.

Our employees spend thousands of hours volunteering to assist community and civic organizations each year. Over the past 12 years they have completed about 40 Earth Day Programs, which include the refurbishment of a Revolutionary War park site and the completion of two nature trails for persons who use wheelchairs.

Cover Photo: Sam attends the Jacobs School in Hull. He's an avid reader, an honors student, a sports enthusiast, and a saxophone player in the Jacobs Band.

Dear Aquarion Customer,

We are committed to providing you and your family with high-quality drinking water, because it is vital for your good health and well being. To keep you updated on our progress, we are sending you our Fourth Annual Water Quality Report.

We are pleased to inform you that your water continues to meet, or is better than, the quality required by state and federal standards.

In 2005 your water quality data, provided on page six, was extracted from more than 1,600 tests on some 800 samples of our water at various locations in our service areas.

To further assure the quality of our water, the state Department of Environmental Protection routinely reviews our test results and examines our treatment facilities and testing laboratories to ensure sustained compliance with state and federal water quality regulations.

We appreciate the opportunity to be your water service provider, and will continue to devote all of our talents and expertise to provide you with high-quality water and excellent service.

Sincerely,

Larry L. Bingaman

Senior Vice President, Operations





Aquarion Water Company owns, protects, and preserves several reservoirs and watersheds in New England.

The Hingham/Hull System



Residents receive water from:

- ① Hingham Wells
- ② Accord Pond

Where does your water come from?

Your water is collected in reservoirs and wells, treated, and delivered to you through an extensive underground piping system consisting of approximately 180 miles of pipe. The Hingham/Hull System supply, which serves about 88,400 people during the winter and 45,600 people in the summer, consists of surface water drawn from Accord Pond, Accord Brook, and seven wells in Hingham, all of which are located in the Weir River Watershed. These sources accounted for 99.99% of the water supply delivered to customers in Hingham, Hull, North Cohasset, and a portion of Norwell. In November of 2005, the Cohasset interconnection and pump station were placed in service and by year-end delivered 500,000 gallons of treated water from Cohasset Water into the Aquarion distribution system. This interconnection and pump station were approved by the Massachusetts Department of Environmental Protection (MA DEP) for Cohasset Water to provide up to 306,000 gallons per day (gpd) into the Aquarion system to offset the water usage at the Linden Ponds development in South Hingham. The maximum volume of 306,000 gpd, or <10% of the daily volume in the Aquarion system, is not expected until build-out of the development in 2013.

The distribution system is also interconnected with Weymouth's water supply system for use in emergency

A family of four uses between 74,000 and 134,000 gallons of water per year.



situations. The average amount of water delivered during 2005 was 3.2 million gallons per day. Company-wide an average 15% of the system demand is unaccounted for water due to cleaning our mains, fire protection, leaks, and unauthorized use.

How is your water treated?

All of the ground and surface water, except the water from the Downing Street Well, receives filtration at the Hingham Water Treatment Facility. The Downing Street Well water is filtered naturally underground. All of the water is disinfected, fluoridated, and further treated to protect the water supply piping system.

Improving your service and water quality

Aquarion Water Company continues its comprehensive capital improvement campaign to upgrade and replace all aging infrastructure, which ensures the high quality of the water that we deliver to you. In 2005 the Massachusetts capital budget for replacement of water mains, improvements at treatment plants and reservoirs, and long-range water supply planning totaled \$2 million. In 2006 the Massachusetts capital budget is estimated to exceed \$1.2 million.

How much did your water cost in 2005?

Water used per household: 70,900 Gallons
 Average daily use: 194 Gallons
 Annual bill: \$572
 Average cost: **\$1.57 per day**

The Trip to the Tap

Aquarion Water Company ensures that the water we deliver to you is of high quality via a four-step process:



▶▶ Protect

We vigilantly monitor the water and activity on the surrounding land, continuously watching for potential contamination of our supplies. We take immediate and decisive action whenever those sources are threatened. You can help protect our precious water resources by reporting any activity that could contaminate our drinking water supply. Report any unusual activity to Aquarion Water Company or your local police department.

Treat ◀◀

Well water is naturally filtered underground. Reservoir water is filtered at our treatment plants before being delivered to the distribution system. The water receives additional treatment to further improve its quality.



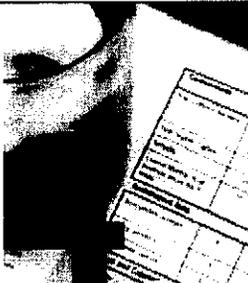
▶▶ Distribute

Clean water is distributed via a system of pipes that is cleaned periodically to remove naturally occurring sediments, which helps to maintain high quality as water is pumped or fed by gravity to your tap.



Monitor ◀◀

In 2005 we tested samples of our water at various locations in our service areas. Those results indicate to state and federal health agencies and us that you are receiving high-quality water.



▶▶ Protecting water at the source

Even small quantities of pollutants may be enough to contaminate a drinking water supply. Examples of pollutants that may wash into surface water or seep into groundwater include:

- Microbial contaminants from septic systems, agriculture and livestock operations, and wildlife;
- Inorganic contaminants such as salts and metals that can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, or farming;
- Pesticides and herbicides from sources such as agriculture, urban storm water runoff, and residential uses;
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes; and
- Radioactive contaminants that can be naturally occurring.

▶▶ You can help

- Ensure that your septic system is working correctly.
- Use chemicals and pesticides wisely.
- Dispose of waste chemicals and used motor oil properly.
- Report illegal dumping, chemical spills, or other polluting activities to the MA DEP (**617-654-6500**), Aquarion Water Company (**800-832-2373**), or your local police.

Did you know?

Aquarion offers fun water lessons for school and home! Check them out at www.aquarionwater.com

We are seeking individuals for the Customer Advisory Board to provide feedback on water service and quality. If interested, please call us at 1-781-749-0064.

Your Health, Our Priority

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the **EPA's Safe Drinking Water Hotline** at **800-426-4791**.

Radon is a radioactive gas that is found naturally underground and can enter buildings and well water. Water from a well source can also add radon to the home air. Most of the water we deliver is from reservoirs, which contain little or no radon. The EPA is in the process of setting a health standard in public drinking water, which will likely be in the range of 300 to 4,000 picocuries per liter (pCi/L).

The radon detected in the Hingham/Hull System water supplies was in the range of 240 to 374 pCi/L. At these levels the water would contribute approximately 0.02 to 0.03 pCi/L of radon to the home air, compared to the EPA's health guideline of 4.0 pCi/L for home air. The EPA and Aquarion Water Company recommend that all homes be tested for radon in the air.

For more information about radon, call the EPA's Safe Drinking Water Hotline or visit the **EPA web site at www.epa.gov/safewater/radon.html**.

Lead and Copper Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor. Major sources of copper in drinking water include corrosion of household plumbing systems, erosion of natural deposits, and leaching from wood preservatives.

Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure. Major sources of lead in drinking water include corrosion of household plumbing systems and erosion of natural deposits.

The Hingham/Hull System is in compliance with the Lead and Copper Action Levels. For more information, call the EPA's Safe Drinking Water Hotline.

Disinfection By-Products Disinfection by-products (DBPs) are chemicals formed during the disinfection process when naturally occurring organic matter reacts with chlorine that is added to the water to eliminate bacteria and other microorganisms. Currently there are limits on two types of DBPs known as Total Trihalomethanes (TTHM) and Total

Haloacetic Acids (THAA). Aquarion Water Company's drinking water meets the EPA standards of 80 parts per billion (ppb) for TTHMs and 60 ppb for THAAs.

Cryptosporidium and Giardia Drinking water contaminated with these parasites can cause gastrointestinal illness and has been associated with waterborne disease outbreaks. Our water meets or exceeds state and federal health and treatment standards. Also, there are no reported cases of waterborne disease due to Cryptosporidium or Giardia in Aquarion Water Company's drinking water.

For immune-compromised persons

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to reduce the risk of infection by Cryptosporidium and other microbial contaminants are available from the **Safe Drinking Water Hotline (800-426-4791)**.

Industry research Aquarion Water Company supports the American Water Works Association Research Foundation (AWWARF). The AWWARF, which focuses on finding ways to protect individuals from waterborne disease and contamination, is the central research organization for the U.S. public water supply industry. For more information, visit the AWWARF web site at **www.awwarf.org**.

Aquarion Water Company is also involved with an ongoing research project at the University of Massachusetts that is currently focusing on the assessment of the occurrence, treatment, and control of disinfection by-products.

Source water assessment report

The Massachusetts Department of Environmental Protection (MA DEP) has completed a Source Water Assessment Plan (SWAP) for the water resources that supply our drinking water facilities. The purpose of the assessment program is to evaluate each source of water to identify potential contamination that might affect the source water quality. These public drinking water sources have a high susceptibility to potential sources of contamination. The SWAP Report is available on the MA DEP web site at www.ma.us/dep/brp/dos.

Cross-Connection Control Program

Our Cross-Connection Control Program helps to ensure the water is protected from possible contamination. A cross-connection, as defined by the Massachusetts Department of Environmental Protection (MA DEP), "is any actual or potential connection between a distribution pipe of potable water from a public water system and any waste pipe, sewer, drain, or other unapproved source that has the potential, through backpressure or back-siphonage, to create a health hazard to the public water supply and the water system within the premises."

AWC's MA DEP-state certified cross-connection surveyors and testers routinely conduct surveys and test backflow prevention devices at our customers' facilities for regulatory compliance. If unprotected cross-connections are discovered, backflow prevention devices are required to be installed. These devices prevent water from being reintroduced into the water distribution system.

The best protection against a cross-connection is to eliminate the link. The garden hose is one of the leading causes. At your home, you can protect your family and the distribution system from potential contaminants by installing a simple, inexpensive backflow device called a Hose Bibb Vacuum Breaker (HBVB).



How Does Your Water Measure Up? The Results are In

>	Greater than		
<	Less than		
AL	Action Level		
MCL	Maximum Contaminant Level		
MCLG	Maximum Contaminant Level Goal		
MRDL	Maximum Residual Disinfectant Level		
MRDLG	Maximum Residual Disinfectant Level Goal		
N/A	Not applicable or test not required		
NTU	Nephelometric Turbidity Units, a measure of the presence of particles. Low NTUs is an indicator of high-quality water.		
ppm	Parts per million, or milligrams per liter (mg/L)		
ppb	Parts per billion, or micrograms per liter (ug/L)		
TT	Treatment Technique		
SMLC	Secondary Maximum Contaminant Level		
ORSG	Office of Research and Standards Guideline – State of Massachusetts		
*	90th percentile value in copper monitoring. Result is representative of customer sampling stagnant water. No locations exceeded the action level.		
**	90th percentile value in lead monitoring. Result is representative of customer sampling stagnant water. No locations exceeded the action level for lead. Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels in your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and run your tap for 30 seconds to 2 minutes before using your water. Additional information is available from the Safe Drinking Water Hotline (800-426-4791).		
+	Reported value is the highest average of quarterly measurements for disinfection by-products in the distribution system; values in the range are individual measurements.		
#	The monthly TOC removal ratio is calculated as the ratio between the actual TOC removal and the TOC rule removal requirements. This number should be greater than 1.0.		
	Action Level: The concentration of a contaminant that, if exceeded, triggers treatment or other requirements which a water system must follow.		
	MCL: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.		
	MCLG: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.		
	Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.		
	SMLC: These standards are developed to protect the aesthetic qualities of drinking water and are not health-based.		
	ORSG: This is a concentration of a chemical in drinking water at or below which adverse health effects are unlikely to occur after chronic (lifetime) exposure. If exceeded, it serves as an indicator of the potential need for further action.		
	MRDL: The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.		
	MRDLG: The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectant to control microbial contamination.		
	HEALTH EFFECTS		
	Sodium: Sodium sensitive individuals such as those experiencing hypertension, kidney failure, or congestive heart failure, who drink water containing sodium should be aware of levels where exposures are being carefully controlled.		

Treated Water Table

Your water has been tested for 90 regulated compounds, as well as those non-regulated substances for which we are required to test. Only 13 compounds were detected, all of which were below the amounts allowed by state and federal law. The state allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of our data, though representative, are more than one year old.

SUBSTANCE	HIGHEST ALLOWED BY LAW		COMPLIANCE	TEST DATE	HINGHAM/HULL SYSTEM DETECTED LEVEL	
	MCLG	MCL			AVERAGE	RANGE
INORGANIC COMPOUNDS						
BARIUM	2 ppm	2 ppm	YES	2005	0.013	0.011 – 0.101
COPPER	1.3 ppm	AL = 1.3 ppm	YES	2003	0.60*	
FLUORIDE	4.0 ppm	4.0 ppm	YES	2005	0.94	0.50 – 1.20
LEAD	0	AL = 15 ppb	YES	2003	1**	
NITRATE	10 ppm	10 ppm	YES	2005	0.634	0.620 – 1.40
MICROBIALS						
TURBIDITY	N/A	TT = 1ntu max	YES	2005	0.06	0.03 – 0.09
TURBIDITY		TT = 95% of samples < 0.3 ntu	YES	2005	100%	
ORGANIC COMPOUNDS						
TOTAL ORGANIC CARBON (TOC)	N/A	TT = Removal Ratio > 1#	YES	2005	1.22	0.95 – 1.41
TOTAL TRIHALOMETHANES	N/A	80 ppb	YES	2005	50.7+	ND < 0.5 – 75
TOTAL HALOACETIC ACIDS	N/A	60 ppb	YES	2005	25.3+	2.0 – 36.3
DISINFECTANT						
CHLORINE	MRDLG	MRDL	YES	2005	0.46	0.01 – 1.99
UNREGULATED CONTAMINANT						
INORGANIC COMPOUNDS						
CHLORIDE	N/A	SMCL 250 ppm	N/A	2005	69.5	43.0 – 70.0
SODIUM	N/A	ORSG 20 ppm	N/A	2005	49.6	26.0 – 50.0
SULFATE	N/A	SMCL 250 ppm	N/A	2005	40.8	31.0 – 41.0

SOURCES OF CONTAMINANTS

Barium: Erosion of natural deposits; Discharge from drilling wastes; Discharge from metal refineries.

Copper: Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives.

Fluoride: Water additive which promotes strong teeth.

Lead: Corrosion of household plumbing systems; Erosion of natural deposits.

Nitrate: Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.

Turbidity: Soil runoff.

Total Organic Carbon: Naturally present in the environment.

Total Trihalomethanes: By-product of drinking water chlorination.

Total Haloacetic Acids: By-product of drinking water chlorination.

Chlorine: Water additive used to control microbes.

Chloride: Naturally present in the environment.

Sodium: Water treatment processes; Use of road salt; Naturally present in the environment.

Sulfate: Naturally present in the environment.

Do Your Part

Use water wisely and prevent waste with these conservation tips:

Indoors:

- Turn the water off while shaving, brushing teeth, and face washing to save up to three gallons a minute.
- Repair faucet and toilet leaks, as a steady one-eighth-inch diameter drip can waste more than 20 gallons a day.
- Take shorter showers and turn the water off while lathering to save 20 percent of water used. Install low-flow showerheads to save at least 2.5 gallons a minute.
- Do not overfill the bathtub. Filling a tub to two-thirds of its capacity saves nearly 20 gallons of water.
- Avoid using the toilet to flush cigarette butts, facial tissue, or other small pieces of trash and save five-to-seven gallons per flush.
- Use the washing machine for full loads only and shorten the cycle to save up to 33 gallons.
- Wash only full loads of dishes in the dishwasher and use the short cycle to save 13 gallons.
- Keep a container of cold water in the refrigerator, instead of allowing it to run to get chilled, and save three-to-five gallons a minute.

Outdoors:

- Water your lawn (and other landscaping) in the early morning to avoid evaporation.
- Be sure sprinklers water only your lawn, not the pavement, and do not water on a windy or rainy day.
- Do not use the hose to clean debris from your driveway or sidewalk. Use a broom.
- Apply mulch around flowers to reduce evaporation, promote plant growth, and control weeds.
- Plant drought-tolerant foliage and use rocks, mulch, and creative landscaping instead of planting new flower beds.

For more information:

Citizens who wish to comment on water quality matters may attend a Community Water Quality Meeting. If interested, please call us at **800-832-2373**.

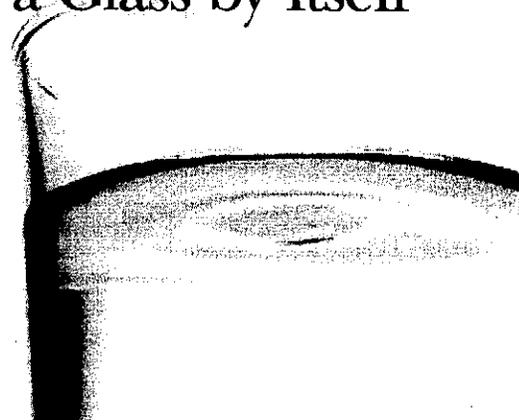
Water Quality Management Department
800-832-2373

Massachusetts Department of
Environmental Protection
800-462-8914

U.S. Environmental Protection Agency's
Safe Drinking Water Hotline:
800-426-4791

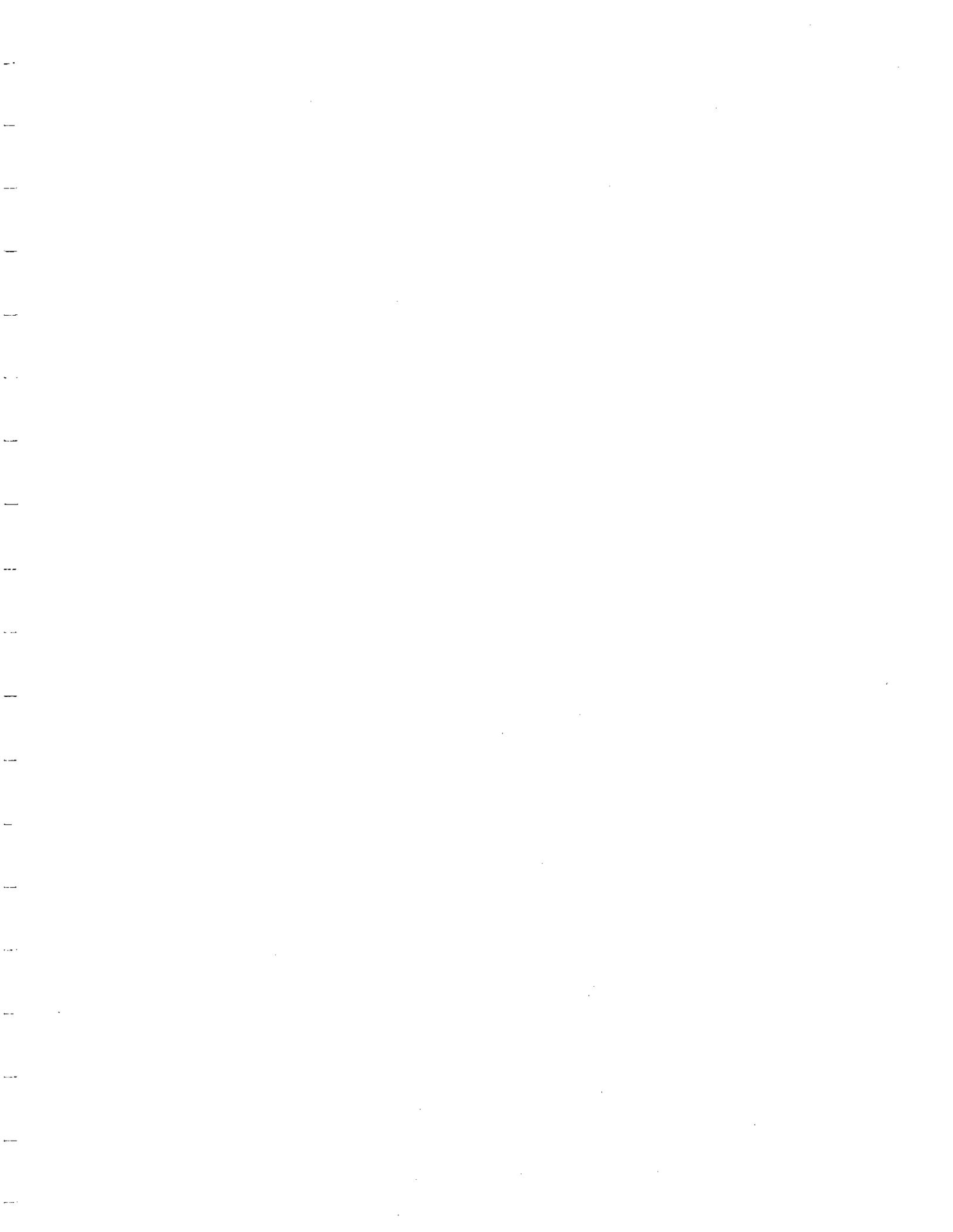
PWS ID#: MA3131000

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**Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Hingham/Hull Water Supply**

WHAT IS SWAP?

The Source Water Assessment Program (SWAP) was created under the Federal Safe Drinking Water Act, requires every state to:

- identify local areas within the recharge areas of all public water supply systems
- assess the susceptibility of drinking water sources to contamination from their land uses and
- publish the results to provide a basis for improved protection.

Table 1: Public Water System Information

<i>PWS Name</i>	Aquarion Water Company of Massachusetts
<i>PWS Address</i>	P.O. Box 336
<i>City/Town</i>	Accord, Massachusetts 02061-0336
<i>PWS ID Number</i>	3131000
<i>Local Contact</i>	Eileen Commane
<i>Phone Number</i>	(781) 740-6633

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does not directly affect water quality.

Water suppliers protect drinking water by monitoring for more than 150 potential contaminants, filtering or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

Section 1: Description of the Water System

Glossary

Aquifer: An underground water-bearing layer of permeable materials that will yield water in a substantial quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable materials (i.e. clay) that restricts penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well, a 100 to 400-foot radius depending on the well's pumping rate. This area should be worked or controlled by the water supplier and located to avoid other activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic analysis that must be approved by the water supplier. This area may be defined by delineating the land within your Zone II.

Zone A: is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the impounded intake water collection structure.

Zone B: is the area 200 feet from the edge of the reservoir but does not go beyond the upper edge of the reservoir.

Zone C: is the remaining area of the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

Groundwater Sources

Zone II #: 394

Source Name	Source ID#	Susceptibility
Free St. Well #1	3131000-01G	High
Free St. Well #2	3131000-02G	High
Scotland St. Well	3206000-03G	High
Downing St. Well	3206000-04G	High
Free St. Well #3	3206000-05G	High
Prospect Well	3206000-06G	High

Surface Water Sources

Source Name	Source ID#	Susceptibility
Accord Pond	3206000-01S	High
Accord Brook	3206000-02S	High
Fulling Mill Collection Basins	3206000-03S	High

The wells for the Hingham/Hull water supply are located within a single water supply protection area, with a portion extending into the Town of Norwell. Each well has a Zone I radius of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barrier (i.e. confining clay layer) that can prevent contaminant migration. Please refer to the attached map of the Zone II.

The reservoirs for Hingham and Hull are located within three separate water supply protection areas, with a portion of the Accord Pond water supply protection area extending into the towns of Norwell and Holbrook, and a portion of the Accord Brook water supply protection area extending into the town of Norwell.

For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web at <http://www.epa.gov/safewater/ccr1.html>

Section 2: Land Uses in the Protection Areas

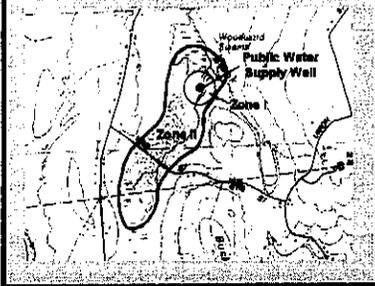
The Zone II and Zone Cs for Hingham and Hull's sources are primarily a mixture of forest, residential, and wetlands, and open land, with a small portion consisting of commercial and waste disposal land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Activities in Zone I
2. Activities in Zone A
3. Hazardous Materials Storage and Use
4. Transportation Corridor
5. Residential Land Uses
6. Oil or Hazardous Material Contamination Sites
7. Comprehensive Wellhead Protection Planning

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



The ranking of susceptibility to contamination for the Zone II of the Free St. Well #1, Free St. Well #2, Scotland St. Well, Downing St. Well, Free St. Well #3, and Prospect Well is high, based on the presence of at least one high threat land use within the water supply protection area, as seen in Table 2; the ranking of susceptibility to contamination for Accord Pond, Accord Brook, and Fulling Mill Collection Basin Zone Cs is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Activities in Zone I – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. The following non-water supply activities occur in the Zone Is of the system wells:

Free Street Well #1 - There are several homes served by on-site septic systems in the Zone I.

Free Street Well #2 - There is one home served by an on-site septic system in the Zone I.

Free Street Well #3 - There are four homes served by on-site septic systems, and local roads in the Zone I.

Scotland Street Well - There is one home served by an on-site septic system and local roads in the Zone I.

Downing Street Well - There are recreational activities occurring in the Zone I.

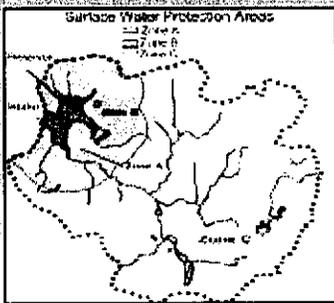
Prospect Well - There are four homes served by an on-site septic system, and local roads in the Zone I.

Zone I Recommendations:

- ✓ To the extent possible, remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Agreement Options - Until land is available, attempt to obtain a *Memorandum of Understanding* and *Right of First Refusal*.

What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



Memorandum of Understanding (MOU) is an agreement between the landowner and public water supplier in which the landowner agrees not to engage in specific threatening activities. The MOU should be specific to the land use or activity. For instance, if the land is residential with a septic system the owner could agree not to place chemicals, petroleum products, or other hazardous or toxic substances, including septic system cleaners into the septic system, and that the system will be pumped at a specific frequency. The application of lawn care chemicals could also be restricted. Understanding how an activity threatens drinking water quality is an important component of developing an effective MOU.

Right of First Refusal is a legal document that gives the water supplier first chance to purchase land when it becomes available. See *Right of First Refusal* in Appendices.

2. Activities in Zone A - Existing and future land use activities which may have an impact on surface water sources include: public and private recreational activities; untreated stormwater runoff; domestic animals; new construction; spills along roads; above ground and underground storage tanks; erosion; and unpermitted and unauthorized activities. Wild animals and domestic pets can be carriers of waterborne diseases such as Giardia, Cryptosporidium, Salmonella, etc. The following activities occur in the Zone A of the system's reservoirs:

Accord Pond - There are numerous homes throughout the Zone A of the reservoir and its tributary, some of which are served by on-site septic systems;

local roads run throughout the Zone A of the reservoir and its tributaries, with a portion of Route 3 crossing a small section of a tributary; numerous commercial activities occur throughout the reservoir's Zone A and its tributary, some of which have underground storage tanks.

Accord Brook - There are numerous homes throughout the Zone A, some of which are served by on-site septic systems; local roads cross Accord Brook in several locations, with Route 53 crossing near the intake of Accord Pond.

Zone A Recommendations:

- ✓ To the extent possible, remove all activities from the Zone As to comply with DEP's Zone A requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Storage of pesticides, fertilizers or road salt within the Zone A should be covered and contained.
- ✓ Keep any new prohibited activities out of the Zone A.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

3. Hazardous Materials Storage and Use – Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

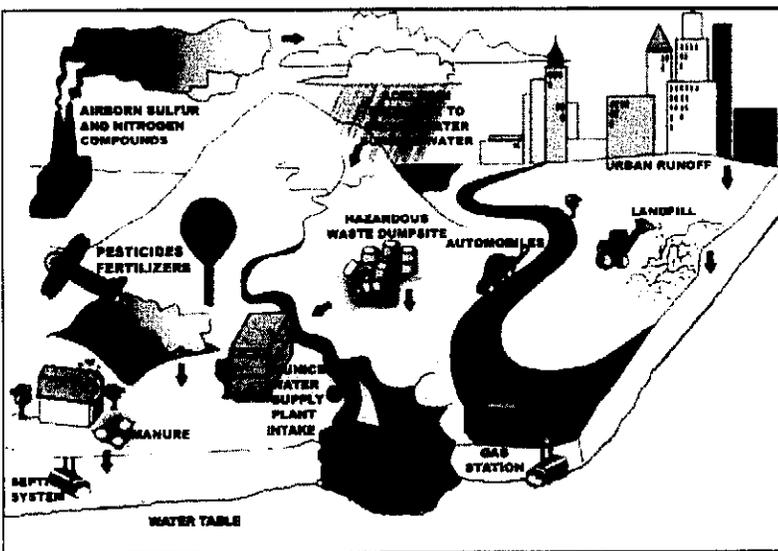
Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floor drain requirements. See brochure "Industrial Floor Drains" for more information.

4. Transportation Corridors - Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II and Zone Cs.



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Figure 1: Sample watershed with examples of potential sources of contamination

- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with Town and State emergency response teams to ensure that any spills within the Zone II, Zone A and Zone C can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with city officials to investigate mapping options such as those in the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC)

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Watershed

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone II Number	Zone C Source ID	Potential Contaminant Sources
Commercial					
Gas Stations	2	H	394		Spills, leaks, or improper handling or storage of automotive fluids and fuels
Service Stations/ Auto Repair Shops	12	H	394	01S, 03S	Spills, leaks, or improper handling of automotive fluids, and solvents
Bus and Truck Terminals	2	H	394	03S	Spills, leaks, or improper handling of fuels and maintenance chemicals
Cemeteries	3	M	394	03S	Leaks, spills, improper handling, or over-application of pesticides; historic embalming fluids (such as arsenic)
Dry Cleaners	3	H	394	01S, 03S	Spills, leaks, or improper handling of solvents and wastes
Medical Facilities	1	M	394		Spills, leaks, or improper handling or storage of biological, chemical, and radioactive wastes
Paint Shops	2	H	394	03S	Spills, leaks, or improper handling or storage of paints, solvents, other chemicals
Repair Shops (Engine, Appliances, Etc.)	3	H	394	03S	Spills, leaks, or improper handling or storage of engine fluids, lubricants, and solvents
Residential					
Fuel Oil Storage (at residences)	Numerous	M	394	01S, 02S, 03S	Spills, leaks, or improper handling of fuel oil
Lawn Care/ Gardening	Numerous	M	394	01S, 02S, 03S	Over-application or improper storage and disposal of pesticides
Septic Systems/ Cesspools	Numerous	M	394	01S, 02S, 03S	Microbial contaminants, and improper disposal of hazardous chemicals
Miscellaneous					
Large Quantity Hazardous Waste Generators	1	H	394	02S	Spills, leaks, or improper handling or storage of hazardous materials and waste

Land Uses	Quantity	Threat	Zone II Number	Zone C Source ID	Potential Contaminant Sources
Oil or Hazardous Material Sites	2	--	394	02S	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Schools, Colleges, and Universities	5	M	394	03S	Spills, leaks, or improper handling or storage of fuel oil, laboratory, art, photographic, machine shop, and other chemicals
Small quantity hazardous waste generators	5	M	394	01S, 02S	Spills, leaks, or improper handling or storage of hazardous materials and waste
Stormwater Drains/ Retention Basins	Numerous/ several	L	394	01S, 02S, 03S	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	6	M	394	01S, 03S	Accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides
Underground Storage Tanks	26	H	394	02S	Spills, leaks, or improper handling of stored materials
Very Small Quantity Hazardous Waste Generator	8	L	394	01S, 02S	Spills, leaks, or improper handling or storage of hazardous materials and waste
Wastewater Treatment Plant/ Collection Facility/ Lagoon	7	M	394	01S, 03S	Improper handling or storage of treatment chemicals or equipment maintenance materials; improper management of wastewater
<p>Notes:</p> <ol style="list-style-type: none"> 1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies. 2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination. 3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites. <p>* THREAT RANKING - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>					

5. Residential Land Uses – Approximately 35% of the combined Zone II and Zone Cs consist of residential areas. A portion of the Zone II for the wellfield is served by municipal sewerage, with the remaining homes having on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

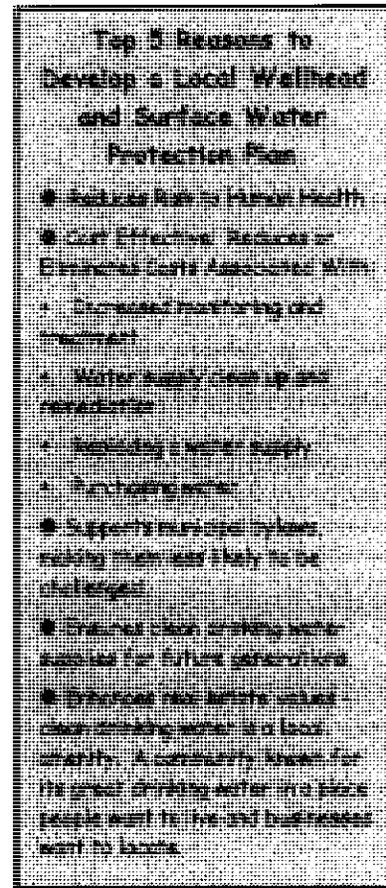
- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

6. Presence of Oil or Hazardous Material Contamination Sites – The Zone II and Zone Cs contain DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the maps as Release Tracking Numbers 4-0000134, and 4-0015314. Refer to the attached map and Appendix 3 for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

7. Protection Planning – Currently, the Town of Hingham does not have water supply protection controls. Protection planning protects drinking water by managing the land area that supplies water to a well or reservoir. A Water Resource Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.



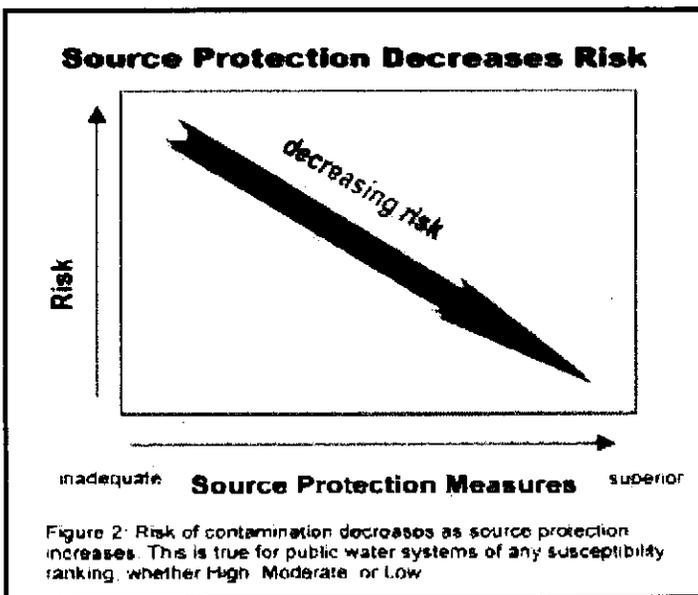
Protection Planning Recommendations:

- ✓ Develop a Wellhead and Surface Water Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan” and “Developing A Local Surface Water Supply Protection Plan”.
- ✓ Coordinate efforts with local officials to compare local wellhead and surface water protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2) and Surface Water Supply Protection Regulations 310 CMR 22.20B and 310 CMR 22.20C. If there are no local controls or they do not meet the current regulations,

- adopt controls that meet 310 CMR 22.21(2), 310 CMR 22.20B and 310 CMR 22.20C. For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floor drains, be sure to include floor drain controls that meet 310 CMR 22.21(2).

Other land uses and activities within the Zone I and Zone Cs that are potential sources of contamination are included in Table 2. Refer to Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination.



Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

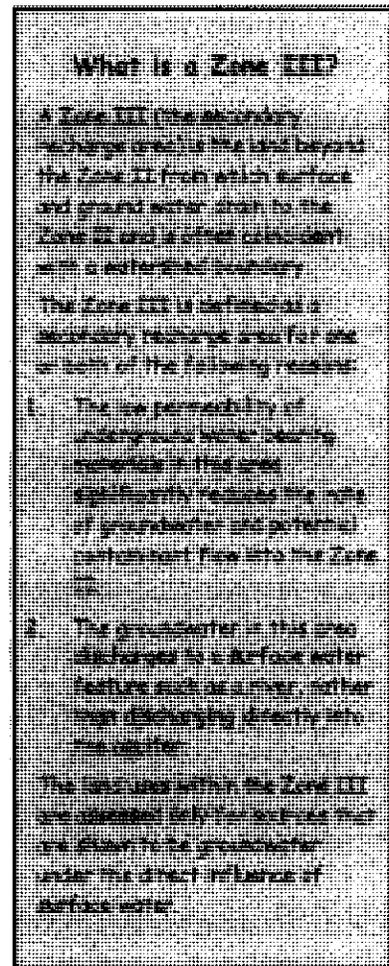
As with many water supply protection areas, the system's Zone II and Zone Cs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Having an Emergency Response Plan that deals with spills or other emergencies
- Working with Conservation Commission, Board of Health, Selectmen, and other local officials on source protection issues

Source Protection Recommendations:

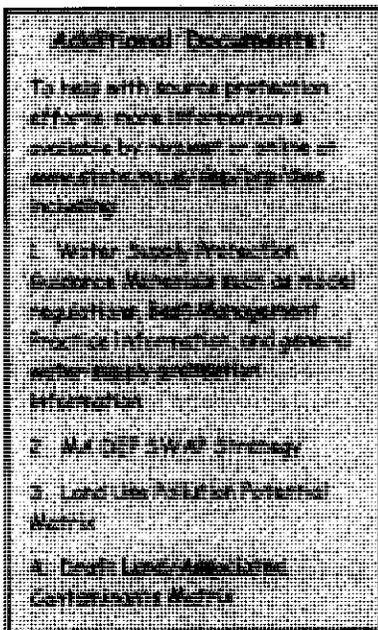
To better protect the sources for the future:

- ✓ Inspect the Zone I and Zone A regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and Zone C and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Develop and implement a Wellhead and Surface Water Protection Plan.



Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A. DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community.



The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

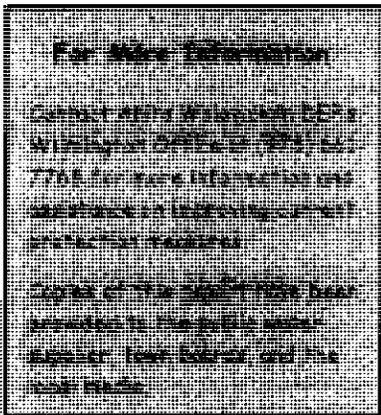
Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone A		
Does the Public Water Supplier (PWS) own or control the entire Zone I and/or Zone A?	NO	To the extent possible, remove prohibited activities in Zone A to comply with DEP's Zone I and Zone A requirements. Investigate options for gaining ownership or control of the Zone A.
Are the Zone I and Zone A posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Are the Zone I and Zone A regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I and Zone A?	NO	Monitor prohibited activities in Zone A, and investigate options for removing these activities.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C and Wellhead Protection Controls that meet 310 CMR 22.21(2)?	UNKNOWN	Work with the Planning Board and the Selectmen to develop bylaws that meet land use controls required by 310 CMR 22.21(2) and 310 CMR 22.20B & C. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	UNKNOWN	Request that municipal officials in Rockland and Norwell develop land use restrictions that meet 310 CMR 22.21(2) and 310 CMR 22.20C, and to incorporate Hingham's source protection areas.
Planning		
Does the PWS have a local surface water and wellhead protection plan?	NO	Develop a wellhead and surface water supply protection plan to include all sources. Follow "Developing a Local Wellhead Protection Plan" and "Developing a Local Surface Water Supply Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Supplement plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed and wellhead protection committee?	NO	A committee exists for the Weir River Watershed. To have a well rounded committee, include representatives from local government, citizens' groups, neighboring communities, and the business community, and expand interests to all sources.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	Floor drain inspection was conducted in conjunction with DEP. For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide watershed protection education?	SOME	Currently, the outreach is through the annual Consumer Confidence Report, and through the water department website. Increase residential outreach through bill stuffers, school programs, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial, industrial and municipal uses within the Zone II and Zone C.

Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.



Section 4: Appendices

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

Meeting Notes

Town of Hingham Comprehensive Wastewater Management Plan

Meeting with Bruce Capman, Hingham Board of Health Executive Health Officer

February 13, 2006 – 10:30 a.m.

Attendees: Hingham BOH - Bruce Capman (BC)
CDM - Alan D. Roscoe (AR)
PEER Consultants, LLC - Timothy Shea (TS)

PURPOSE:

The purpose of the meeting is to discuss current and potential problem areas for continued use of on-site septic systems; obtain inventory of existing on-site systems; obtain data for system inspection failures, and typical upgrades, for inclusion in the CWMP. Meet other town officials for assistance in obtaining necessary information for preparation of the CWMP.

DISCUSSION:

High priority area to be sewered would be World's End/waterfront area of Hingham. Area soils consist of ledge shallow bedrock and high groundwater. (Summer Street and Martin's Lane area)

Another priority area to be sewered is the Accord Pond watershed to protect the water supply. This area is typified by permeable soils, and densely populated neighborhoods. Drainage patterns within area all tributary to reservoir. (Industrial areas on Rockland side) Residential in Hingham.

A secondary area to be sewered exists within the area of Lazell Street between Wompatuck State Park and Rte. 228. Large lots but with tough soils. Wompatuck is sewered into North District (MWRA). Act of legislature to revise to allow expansion of use of this line to MWRA.

Research Road area may also benefit from sewerage (Industrial Area) as a means of water supply protection.

Large Systems located at Middle School and Nursing home (among others). BOH maintains a listing of all I/A systems with maintenance records in Town Hall. I/A systems generally consist of Jet and Singlair systems (together ~ 90%), with a mixture of small percentage of FAST, Bioclere, and Amphidrome making up the remainder. Nursing Home is on a FAST system that came from a cruise ship. Middle School uses a Bioclere system.

200-300 system repairs per year (approximate figure from EHO). Cesspools are evaluated on listed Title 5 Inspection standards. Every inspection also requires pumpout, a soil observation and groundwater determination with report.

30% failure rate (Approx. figure from EHO) Approximately 20% of on-site systems are cesspools (non-scientific percentage - based on experience, no supporting data)

Briefly discussed Septage disposal and system pumpouts and relative resident compliance with suggested pumping schedule in Title 5. Residents are reported to do very well according to the EHO. Managed by the Sewer Commission. Interestingly, when discussing the septage management facility (MWRA) it was revealed that only the residents within the North Sewer District are allowed to use the receiving facility (Majority are on MWRA sewer system and have no need to use such a facility. But there are approximately 75 unsewered homes within the District that have the ability to use the septage facility.

Town participated in DEP Septic System Management program some years ago. Used approximately \$250,000 allotment, all monies paid back to state. Residents were referred to local banks to provide low-interest loans, rather than having the town "be the bank" as difficult to administer and keep up the paperwork.

ACTION ITEMS

- No on-site system inventory or record of Title 5 inspections is available. However, the BOH provided a list of all repaired systems for the past 5 years, and the Assessors Office provided a list of transactions over the past year. From this we can determine the number and location of systems that passed the Title 5 inspection. A request was made of the Assessors office to provide the remainder of transactions from 2000 through 2004 to complete this subtask.
- Stopped at Sewer Commission Office and met briefly with Kate Lathrop who will provide a copy of the Hull and Cohasset Inter-Municipal Agreements for our use in the Phase I report.
- Also stopped at Conservation Commission Office to meet Cliff Prentiss and

discuss Conservation Lands in Hingham. AR left a business card, and asked that Mr. Prentiss contact.

Meeting Notes

Town of Hingham Comprehensive Wastewater Management Plan

Meeting with Michael McDonald, Hingham Board of Health Agent

June 28, 2006 – 10:00 a.m.

Attendees: Hingham BOH – Michael McDonald (MM)
CDM – Alan D. Roscoe (AR)

PURPOSE:

The purpose of the meeting is to discuss current and potential problem areas for continued use of on-site septic systems; discuss subsurface (soil and groundwater) conditions; discuss system inspection failures, and typical upgrades, for inclusion in the CWMP.

DISCUSSION:

World's End area needs to be sewerred. Ledge is prevalent throughout the area.

High groundwater conditions are the reason behind Innovative/ Alternative (I/A) systems in town. High Groundwater conditions are responsible for probably 90% of systems.

Soils in town are either sandy, or till. Till soils generally have groundwater within 3 to 5 feet below the ground surface (bgs), and groundwater conditions within sandy soils are generally 5 to 7 feet bgs. MM sketched the transition line between till and sandy soils on a map from his experience in town. This sketch was almost identical to the soil map published in the Hingham Master Plan and available on GIS.

MM discussed one of the features of the local BOH regulations where the leaching system "reserve area" is actually *prepared* during construction and not simply set aside until such time as the leaching field is required to be replaced. In this way, if and when the leaching field is replaced, the leaching sand bed is already prepared to the size and elevation in required for the replacement leaching system.

ACTION ITEMS

- None



Hingham, Massachusetts



Comprehensive Wastewater Management Plan

Phase I: Needs Assessment
November 19, 2010

What is a CWMP??

- Comprehensive Wastewater Management Plan
- Wastewater Needs Evaluation
- Wastewater Management Alternatives developed to meet those needs
- Final Plan is selected following careful consideration and evaluation of alternatives and impacts

Why are we doing a CWMP ?

- Develop a formal plan for wastewater treatment and disposal
- Required for any expansion of MWRA service area
- DEP requirement for large projects

Study Overview

- **Phase I**
- Task 1 – Assessment of Existing Conditions
- Task 2 – Identification of Basin-wide Issues
- Task 3 – Projected Future Conditions
- Task 4 – Wastewater Needs/Problem Identification
- Task 7 – Public Participation

DEP Review

Existing and Future Conditions

	Existing	Future (2025 Projection)
Population	20,720 (2004)	25,432
Wastewater Generation	2.02 mgd	2.36 mgd

Current Wastewater Management Practices in Hingham

Areas with Sewer Collection Systems

- North Sewer District (MWRA)
- West River Sewer District (Holl)

On-Site Disposal

- Individual On-site Sanitary Disposal Systems (SDSs)
- Large Systems (greater than 10,000 gpd)

Map of Hingham, MA showing sewer collection systems and on-site disposal systems.

Preliminary Study Areas

- Existing Sewer Districts and permanent open space have their own Study Areas (North Weir River and Wompatuck State Park)
- Used similar land uses, topography as guide to divide town into a total of 19 Study Areas.
- Used prominent feature or local identifier to name the Study Areas

Needs Assessment

- Develop program into manageable "Study Areas"
- Analyze Study Areas using 3 Main Categories
 1. Lot Size and Density
 2. Suitability of Subsurface Conditions
 3. Proximity to Environmental Resources
- These Criteria and are "scored" with points according to the severity or limitation of the condition within each Study Area.

The Scoring Process

- Each Criteria is assessed for each individual Study Area and scored with points based on specific conditions.
- Highest Point Totals are Highest Priority Needs Areas.
- Priority Ranking is an "indicator" of the relative need. Ranking does NOT mean that Management solutions are required in order.

Scoring System

- Each Criteria will be scored on a scale ranging between 0 and 4 points (depending upon criteria under evaluation)
- Sum of Criteria Scores will determine the point total for each Study Area

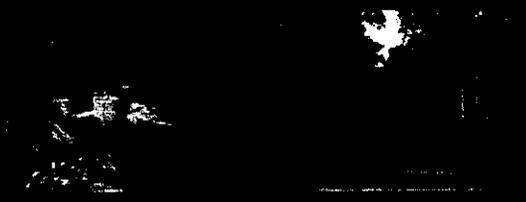
Category 1- Lot Density

Small Lot Size and density of built environment contribute to reduced ability for long-term function of individual on-site sanitary disposal systems.

- Densely built/populated areas impact nitrogen loading (Excessive Nitrogen adversely affects water supply i.e. more expensive treatment and health affects)

Category 2- Subsurface Conditions

- Prevalence of Sand & Gravel/Till & Bedrock/Silty Alluvium Soils
- Depth to Groundwater
- Prevalence of On-Site System Repairs



Category 3 - Proximity to Environmental Receptors

- Protection of Environmental Resources is HIGH priority in Hingham
- Proximity to environmental resources of Study Areas will be assessed

Category 3 - Criteria

- Adjacent to Wetland Zone, Aquifer Zone
- Within 200-ft Buffer from Surface water supply
- Within 100 ft Wetland Buffer
- 100-Year Floodplain
- Area of Critical Environmental Concern (ACEC)
- Stressed Basin

Needs Assessment Results



Next Steps

Phase II

- Alternatives Analysis/Impacts
(w. Public Meeting February 2007)
- ENE EIR
- Public Input and Comment
(w. Public Meeting March 2007)

Wastewater Management Alternatives

- No-action
- On-site disposal with management program
- De-Centralized in-Town wastewater treatment and disposal facilities
- Regional solutions (e.g. Hull, MWRA expansion)

Questions and Discussion
