



INTERDEPARTMENTAL COMMUNICATION

Acton Board of Health - Telephone 978-264-9634 - Fax 978-264-9630

December 24, 2008

TO: Steve Ledoux, Town Manager

FROM: Doug Halley, Health Director

SUBJECT: Maynard request for Wellhead Protection Controls

The Health Department has reviewed the Town of Maynard's request for Wellhead Protection Controls in Acton. These controls are recommended by the Massachusetts Department of Environmental Protection and are shown in DEP'S Model Wellhead Protection Bylaw.

In terms of wastewater discharges controls are already in place for land within a Zone II. As shown in the attached the State's Title 5 designates Zone II areas as Nitrogen Sensitive Zones. Both the Colonial Path and the Centennial Lane projects located off south Main Street were impacted by that designation. Each lot was required to be designed to receive no more than 440 gallons per day per acre or provide a facility aggregation plan. Each of these projects had one lot that required an aggregation plan and each plan was approved by DEP.

As shown in the additional attached materials Water Supply Rock Wells #2, #3 and #5 are Maynard's wellheads protected by the Zone II that extends into Acton. Approximately one third of the Zone II that protects these three bedrock wells is in Acton. An additional one third is in Maynard, while the remaining one third is in Stow.

The Zone II for these bedrock wells was defined by conducting a pump test at the bedrock wells and observing elevation effects in private water supply bedrock wells scattered in the area. Unfortunately Acton has very few private water supply bedrock wells in this area due to the Water District's water supply coverage. However, one well at the end of Sylvia Road was identified and helped to define the limits of the Zone II.

During the process of approving facility aggregation plans for Colonial Path and Centennial Lane the Board of Health expressed concern that the Zone II for Maynard reflected what influence might occur within the bedrock layer but it did not define any impacts in the stratified drift layers overlaying the bedrock. Their concern was based on the fact that the septic systems were up high in the stratified drift layer and their potential impact on bedrock water supplies is unknown.

Based on those concerns the Health Department would recommend that this request be reviewed by the Town's consultant, O'Reilly, Talbot and Okun, and that they provide a recommendation regarding the effectiveness of surface controls in Acton on the bedrock water supply for Acton. It would also be recommended that the Town of Maynard fund this study. Without this study it will be difficult to convince Acton residents to restrict uses on their property for an unknown benefit to the citizens of Maynard.

15.213: continued

- (b) there is no increase in design flow from such building or buildings;
- (c) no connection to a public sewer or shared system is available;
- (d) the owner or applicant cannot site the system elsewhere;
- (e) the septic tank or humus/composting toilet is sited outside of the velocity zone or regulatory floodway, either horizontally or vertically;
- (f) the system achieves required separation from high groundwater elevation required by 310 CMR 15.212; and
- (g) any portion of the soil absorption system that is within the velocity zone or regulatory floodway is a leaching bed or trench system or any other system constructed in accordance with the Wetlands Protection Act and 310 CMR 10.00.

15.214: Nitrogen Loading Limitations

- (1) No system serving new construction in Nitrogen Sensitive Areas designated in 310 CMR 15.215 shall be designed to receive or shall receive more than 440 gallons of design flow per day per acre except as set forth at 310 CMR 15.216 (aggregate flows) or 15.217 (enhanced nitrogen removal).
- (2) No system serving new construction in areas where the use of both on-site systems and drinking water supply wells is proposed to serve the facility shall be designed to receive or shall receive more than 440 gallons of design flow per day per acre from residential uses except as set forth at 310 CMR 15.216 (aggregate flows) or 15.217 (enhanced nitrogen removal).
- (3) It shall be the duty of the owner of the system or proposed system to ascertain whether or not the facility to be constructed will be in a nitrogen sensitive area. The Department will prepare and make available at locations generally accessible to the public maps portraying designated nitrogen sensitive areas within the Commonwealth.

15.215: Designation of Nitrogen Sensitive Areas

The following areas have been determined by the Department to be particularly sensitive to the discharge of pollutants from on-site sewage disposal systems and are therefore designated nitrogen sensitive. The necessity of providing increased treatment of pollutants and reduction in nutrients discharged from on-site sewage disposal systems, including nitrogen, nitrogen as nitrate, phosphorous and pathogens in these areas warrants the imposition of the loading restrictions set forth in 310 CMR 15.214.

- (1) Interim Wellhead Protection Areas and Department approved Zone IIs of public water supplies;
- (2) Nitrogen sensitive embayments or other areas which are designated as nitrogen sensitive for purposes of 310 CMR 15.000 shall be mapped based on scientific evaluations of the affected water body and adopted through parallel public processes pursuant to both 310 CMR 15.000 and in the Massachusetts Water Quality Standards - 314 CMR 4.00.

15.216: Aggregate Determinations of Flows and Nitrogen Loadings

- (1) The 440 gallons per day per acre nitrogen loading limitation imposed by 310 CMR 15.214 may be calculated in the aggregate by using nitrogen credit land in accordance with a Department approved Facility Aggregation Plan or Community Aggregation Plan. Applicants proposing systems to be located within a community or region covered by a Community Aggregation Plan approved by the Department shall calculate aggregate determinations of flows and nitrogen loadings in accordance with the Plan and the Department's "Guidelines for Title 5 Aggregation of Flows and Nitrogen Loading." All other applicants seeking aggregate determination of flows and nitrogen loading shall prepare a Facility Aggregation Plan in accordance with 310 CMR 15.216 and the Department's "Guidelines for Title 5 Aggregation of Flows and Nitrogen Loading."

15.216: continued

- (2) To qualify as Nitrogen Credit Land, the land must:
- (a) be within the same Nitrogen Sensitive Area as the facility if the facility is in a Nitrogen Sensitive Area;
 - (b) be within the same subdivision in an area where the use of both on-site systems and drinking water wells are proposed to serve the facility;
 - (c) not have any manmade sources of nitrogen, including, but not limited to, wastewater discharges and nitrogen based fertilizer located thereon;
 - (d) not be used for raising, breeding or keeping of animals;
 - (e) be pervious;
 - (f) be outside of Zone As, Velocity Zones and Regulatory Floodways;
 - (g) not be covered by any surface water body including, but not limited to, a river, stream, lake, pond, or ocean;
 - (h) already not currently designated as nitrogen credit land; and
 - (i) meet the criteria set forth in the Department's "Guidelines for Title 5 Aggregation of Flows and Nitrogen Loading."
- (3) Land located within a Zone I of a public water supply well may be used as nitrogen credit land unless the well is determined to be at risk in accordance with the Department's "Guidelines for Title 5 Aggregation of Flows and Nitrogen Loading" or the proposed design flow is 2,000 gallons per day or greater.
- (4) Community Aggregation Plans.
- (a) A city or town may seek Department approval for aggregate determination of flows and nitrogen loading across a region wide area such as, but not limited to, a Zone II of a public water supply well. Department approval of a Community Aggregation Plan may authorize the local Approving Authority to approve site specific facility aggregation plans in accordance with the approved Community Aggregation Plan.
 - (b) The Department may approve a Community Aggregation Plan provided that the following conditions are met:
 1. the local Approving Authority has approved the Plan;
 2. the Plan contains a mechanism to protect surface and ground water supplies within the community or region from pollutant and nitrogen loading and a proposed mechanism for implementing the Plan;
 3. the Plan meets the criteria in the Department's "Guidelines for Title 5 Aggregation of Flows and Nitrogen Loading;"
 4. for areas that include a Zone II, the Plan includes a nitrate loading analysis and nitrate management plan as specified in 310 CMR 22.21(2)(d); and
 5. any other conditions that the Department deems appropriate.
- (5) Facility Aggregation Plans.
- (a) The local Approving Authority and the Department may approve a Facility Aggregation Plan provided that the following conditions are met:
 1. the proposed facility meets the criteria in the Department's "Guidelines for Title 5 Aggregation of Flows and Nitrogen Loading";
 2. the design flow of 440 gallons per day per acre equivalency across the facility and other land areas for which nitrogen credit is sought, but not necessarily on every individual acre, will be met through recorded land use restrictions that restrict nitrogen loading on facility land and nitrogen credit land. These land use restrictions must be substantially identical to those contained in the Department's "Guidelines for Title 5 Aggregation of Flows and Nitrogen Loading," run in perpetuity, be approved by the respective land owners, run to the benefit of the municipality acting by and through the local Approving Authority and, in the case of nitrogen credit land, also run to the benefit of the facility land. The applicant shall record or register such restrictions and easements in the appropriate Registry of Deeds or Land Registration Office within 30 days of approval of the plan by the Department or the expiration of the Department's 60 day constructive approval period, pursuant to 310 CMR 15.216(5)(b), whichever occurs first; and
 3. any other conditions that the Department deems appropriate.

15.216: continued

(b) A Facility Aggregation Plan shall be deemed to be approved by the Department if, within 60 days from a determination of administrative completeness, the Department has not, in writing:

1. requested additional information from the applicant which may include, but is not limited to, additional measures the Department deems appropriate to protect public health, safety, welfare or the environment; or
2. granted a written approval, which may include any conditions the Department deems appropriate to protect public health, safety, welfare or the environment; or
3. denied approval.

In the event the Department requests additional information from the applicant, a new 60 day constructive approval period shall commence upon receipt of the additional information.

15.217: Systems with Enhanced Nitrogen Removal

(1) The nitrogen loading limitations established in 310 CMR 15.214 shall not apply to discharge of an effluent meeting the federal Safe Drinking Water Act nitrate standard of 10 ppm through either an approved alternative system or a treatment works with a groundwater discharge permit issued pursuant to 314 CMR 5.00 and 6.00 (groundwater discharge program).

(2) An increase in calculated allowable nutrient loading per acre may be allowed with the use of a technology approved for enhanced nutrient removal pursuant to either the piloting, provisional or general use certification provisions in 310 CMR 15.281 through 15.288 as illustrated by the following example:

Recirculating Sand Filter	550 gpd/acre
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In the event that the Department determines that a system approved for enhanced nutrient removal using a technology approved by the Department on a piloting or provisional basis pursuant to 310 CMR 15.285 and 15.286 respectively is not performing in accordance with the Department's approval, the Department may require the system owner to instead use an enhanced nutrient removal technology that has been certified for general use by the Department. The increased design flow allowed reflects the nutrient removal performance of the approved technology compared to a standard system otherwise described in 310 CMR 15.100 through 15.293. A system receiving a design flow credit for enhanced nutrient removal pursuant to 310 CMR 15.217 must still comply with the requirements of 310 CMR 15.100 through 15.293 with respect to system siting and design; the credit does not affect any other siting or design requirement.

15.220: Preparation of Plans and Specifications

The plans and specifications for every on-site system shall be prepared as follows:

(1) Every system shall be designed by a Massachusetts Registered Professional Engineer or a Massachusetts Registered Sanitarian provided that such Sanitarian shall not design a system to discharge more than 2,000 gallons per day pursuant to 310 CMR 15.203. Any other agent of the owner may prepare plans for the repair of a system designed to discharge not more than 2,000 gallons per day pursuant to 310 CMR 15.203 provided they are reviewed by a Massachusetts Registered Sanitarian or Massachusetts Registered Professional Engineer and approved by the Approving Authority;

(2) Every plan submitted for approval must be dated and bear the stamp and signature of the designer. At least one copy submitted shall bear the original stamp and signature of the designer.

(3) Every plan for a new system or plan for the upgrade or expansion of an existing system which requires a variance to a property line setback distance, must also reference a plan which bears the stamp and signature of a Massachusetts Licensed Land Surveyor in accordance with M.G.L. c. 112, § 81D;

310 CMR: DEPARTMENT OF ENVIRONMENTAL PROTECTION

15.220: continued

- (4) Every plan for a system shall be of suitable scale (one inch = 40 feet or fewer for plot plans and one inch = 20 feet or fewer for details of system components) and shall include depiction of:
- (a) the legal boundaries of the facility to be served;
 - (b) the holder and location of any easements appurtenant to or which could impact the system;
 - (c) the location of all dwelling(s) and building(s) existing and proposed on the facility and identification of those to be served by the system;
 - (d) the location of existing or proposed impervious areas, including driveways and parking areas;
 - (e) location and dimensions of the system (including reserve area);
 - (f) system design calculations, including design daily sewage flow, septic tank capacity (required and provided); soil absorption system capacity (required and provided); and whether system is designed for garbage grinder;
 - (g) North arrow and existing and proposed contours;
 - (h) location and log of deep observation hole tests including the date of test, existing grade elevations marked on each test, and the names of the representative of the Approving Authority and soil evaluator;
 - (i) location and results of percolation tests including the date of test and the names of the representative of the Approving Authority and soil evaluator;
 - (j) name and approval date of the Soil Evaluator of record;
 - (k) location of every water supply, public and private,
 - 1. within 400 feet of the proposed system location in the case of surface water supplies and gravel packed public water supply wells,
 - 2. within 250 feet of the proposed system location in the case of tubular public water supply wells, and
 - 3. within 150 feet of the proposed system location in the case of private water supply wells;
 - (l) any surface waters of the Commonwealth, Zone As, rivers, bordering vegetated wetlands, salt marshes, inland or coastal banks, regulatory floodway, velocity zone, surface water supplies, tributaries to surface water supplies, certified vernal pools, private water supplies or suction lines, gravel packed or tubular public water supply wells, and subsurface drains located up to 100 feet beyond the setback distances in 310 CMR 15.211, any leaching catch basins and dry wells located up to 25 feet beyond the setback distances in 310 CMR 15.211; and the location of any nitrogen sensitive area identified in 310 CMR 15.215 within which any portion of the facility or the proposed system is located as well as any nitrogen sensitive area up to 100 feet beyond any property line of the facility.
 - (m) location of water lines and other subsurface utilities on the facility;
 - (n) observed and adjusted ground-water elevation in the vicinity of the system;
 - (o) a complete profile of the system;
 - (p) a note on the plan listing all variances to the provisions of 310 CMR 15.000 sought in conjunction with the plan;
 - (q) the location and elevation of one benchmark within 50 to 75 feet of the system components which is not subject to dislocation or loss during construction on the facility;
 - (r) when pressure distribution or dosing is proposed, complete design and specifications of the distribution system proposed including but not limited to dosing chamber capacity (required and provided), pump curves and specifications, number of dosing cycles and depth per cycle;
 - (s) when a Recirculating Sand Filter or equivalent alternative technology is required or proposed, a complete plan and specifications for the system, including a hydraulic profile;
 - (t) a locus plan to show the location of the facility including the nearest existing street;
 - (u) the street number and lot number, if any, and the tax map number and lot number, if any, of the facility; and
 - (v) the materials of construction and the specifications of the system.

15.221: General Construction Requirements for All System Components

- (1) All tanks, including septic tanks, distribution boxes, pump chambers, dosing chambers and grease traps, shall be either:
- (a) watertight through manufacturer's specification and warranty; or
 - (b) made watertight by the manufacturer, equipment supplier or installer using asphalt or synthetic polymer sealer specified by the concrete or synthetic material manufacturer.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

Maynard DPW Water Division

What is SWAP?

The Source Water Assessment Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

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* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, 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.

Table 1: Public Water System Information

<i>PWS Name</i>	Maynard DPW Water Division
<i>PWS Address</i>	195 Main St
<i>City/Town</i>	Maynard, Massachusetts
<i>PWS ID Number</i>	2174000
<i>Local Contact</i>	Walter Sokolowski
<i>Phone Number</i>	(978) 897-1017

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells 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.

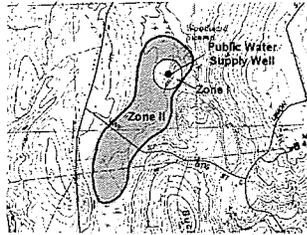
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

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 or IWPA.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists 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 proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

IWPA: A 400 foot to $\frac{1}{2}$ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a Zone II.

Section 1: Description of the Water System

Zone II #: 455

Susceptibility: High

Well Names	Source IDs
GP Well #1 Old Marlboro Road	21740000-01G
GP Well #1A Old Marlboro Road	21740000-02G
GP Well #3 Old Marlboro Road	21740000-03G

Zone II #: 456

Susceptibility: High

Well Names	Source IDs
GP Well #4 Great Road RT 117	21740000-04G

IWPA

Susceptibility: High

Well Names	Source IDs
Rock Well #2	21740000-05G
Rock Well #3	21740000-06G
Rock Well #5	21740000-07G

The seven wells for the Maynard DPW Water Division are located in Zone IIs and IWPA's in the northern portion of the Town of Maynard. Wells 01G, 02G, and 03G are located in a Zone II near the Sudbury town line, Well 04G is located in a Zone II just west of the other Zone II, and Wells 05G, 06G, and 07G are located in overlapping Interim Wellhead Protection Areas (IWPA) on the border with Acton. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II and IWPA's.

Water from all of the wells is disinfected using chlorine and treated for corrosion control. Wells 01G, 02G, and 03G are also filtered for inorganics removal. 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 are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs and IWPA's for Maynard are a mixture of residential, light industrial and forested 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. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system 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. Inappropriate Activities in Zone Is – 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. The seven Zone Is for the wells are largely owned or controlled by the public water system with exceptions below. 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: 1) The Zone Is for Wells 01G, 02G, and 03G contain portions of a local road and a few residential properties that are served by municipal sanitary sewer. 2) The Zone I for Well 04G contains homes on municipal sanitary sewer.

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.

2. Residential Land Uses – Approximately 38% of the Zone IIs and IWPA's consist of residential areas. Most of the areas have public sewers and a few use septic systems. If managed improperly, activities associated with

**Benefits
of Source Protection**

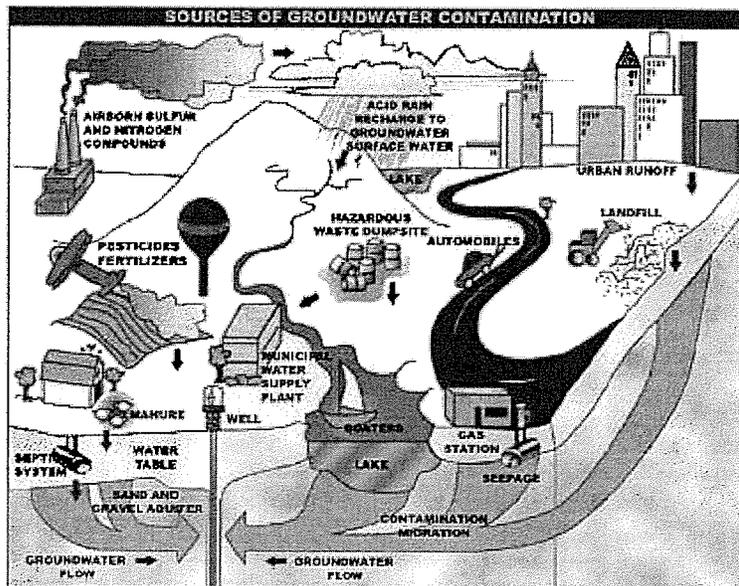
Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

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.



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- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) 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.

3. Transportation Corridors – Route 117 and Route 27 run through the protection areas for the wells. Local roads are common throughout the Zone IIs and IWPA. 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 in to catchbasins.

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 or IWPA.
- ✓ 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 local emergency response teams to ensure that any spills within the Zone II or IWPA 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 town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

4. Hazardous Materials Storage and Use– Five percent of the land area within the Zone IIs and IWPA is commercial or industrial land uses. 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.

(Continued on page 6)

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.

For More Information

Contact Josephine Yemoh-Ndi in DEP's Worcester Office at (508) 849-4030 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

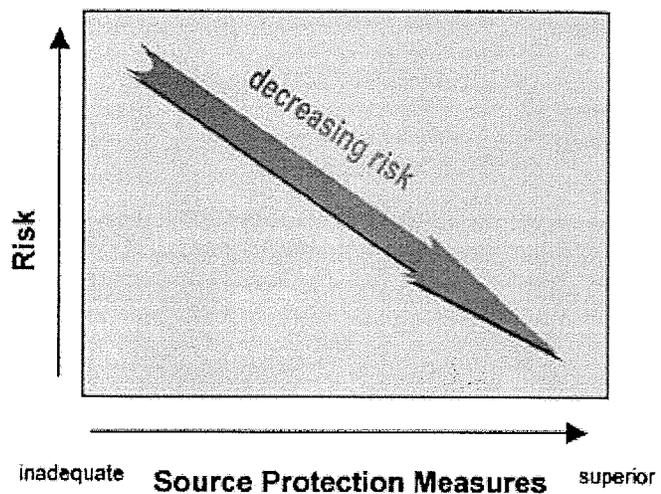


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

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 Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Source ID	Potential Source of Contamination
Agricultural				
Landscaping	1	M	01G, 02G, 03G	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Commercial				
Body Shops	1	H	05G, 06G, 07G	Vehicle paints, solvents, and primer products: improper management
Service Stations/ Auto Repair Shops	1	H	05G, 06G, 07G	Automotive fluids and solvents: spills, leaks, or improper handling
Bus and Truck Terminals	1	H	05G, 06G, 07G	Fuels and maintenance chemicals: spills, leaks, or improper handling
Golf Courses	1	M	05G, 06G, 07G	Fertilizers or pesticides: over-application or improper handling
Residential				
Fuel Oil Storage (at residences)	Several	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Several	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	About 30	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aquatic Wildlife	Some	L	01G, 02G, 03G	Microbial contaminants
Fishing/Boating	Some	L	01G, 02G, 03G	Fuel and other chemical spills, microbial contaminants
Landfills and Dumps	1	H	01G, 02G, 03G	Seepage of leachate. Closed in 1979.
Schools, Colleges, and Universities	3	M	04G	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or

Table 2: Land Use in the Protection Areas (Zones I, II and IWPA)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Source ID	Potential Source of Contamination
Miscellaneous cont'd				
Stormwater Drains/ Retention Basins	7	L	05G, 06G, 7G	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	Several	M	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	12	H	01G, 02G,03G	Stored materials: spills, leaks, or improper handling
Very Small Quantity Generator of Hazardous Waste	6	L	04G, 05G 06G	Spills, leaks, or improper handling or storage of hazardous materials and waste
<p>Notes:</p> <ol style="list-style-type: none"> 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. 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. 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>				

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 floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Protection Planning – Currently, the Town has an Aquifer Protection Bylaw, but it may not cover all of the wells and meet DEP’s current Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead 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:

- ✓ Keep your Wellhead Protection Plan up to date. 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”.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If they do not meet the current regulations, amend the controls to meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).

Other land uses within the water supply protection areas, as seen on the attached map, include some cropland, recreational fields, and wetlands. While the Zone II for Well 04G is shown on the map as partially land designated as superfund site, that portion of the property has not been associated with any contamination. The maps of federal superfund sites are maintained by the US Environmental Protection Agency and represent superfund property boundaries and other criteria, not actual contamination plumes. For more information about the superfund <http://www.epa.gov/superfund/>.

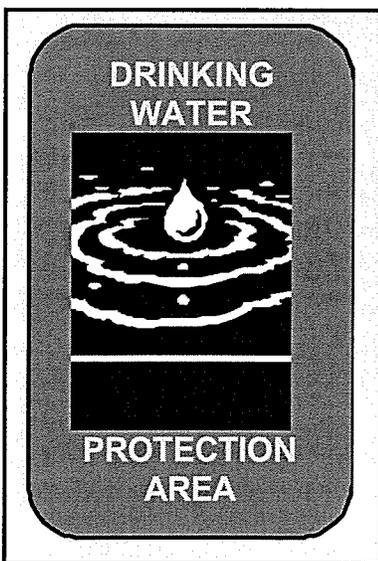
Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in -depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources 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 Zone IIs and IWPA’s 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.



Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I 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 IIs and IWPA’s and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Develop and implement a Wellhead 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.

**Top 5 Reasons to
Develop a Local Wellhead
Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - Increased groundwater monitoring and treatment
 - Water supply clean up and remediation
 - Replacing a water supply
 - Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES 05G-07G NO 01G-04G	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES 05G-07G NO 01G-04G	A few homes and roads in Zone Is for Wells 01G-04G. Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	NO	The Town has a wellhead protection bylaw, but it should be reviewed to ensure that it covers all wells and meets DEP's current requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES	Continue to work with neighboring municipalities to include Zone IIs in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Keep the wellhead protection plan up to date. Follow "Developing a Local Wellhead 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	Augment 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 wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	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 wellhead protection education?	YES	Aim additional efforts at residential, commercial, industrial and municipal uses within the Zone II.

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. Local information should be maintained and updated periodically to reflect land use changes in the Zone II or IWPA. 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. Additional Documents on Source Protection

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

**APPENDIX B:
REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA**

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
305045	SHORETTES AUTOMOTIVE INC	2 BROWN ST	MAYNARD	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
305045	SHORETTES AUTOMOTIVE INC	2 BROWN ST	MAYNARD	Generator of Hazardous Waste	Very Small Quantity Generator of Waste Oil/PCBs
35267	BROWNS BODY AND PAINT	137 ACTON ST	MAYNARD	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
37930	DIGITAL EQUIPMENT CORP	141 PARKER ST	MAYNARD	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
131548	DIGITAL EQUIPMENT CORP	129 PARKER ST	MAYNARD	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
37113	VILLAGE SAAB	30 MAIN ST	MAYNARD	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
133231	NUTTINGS BODY & FRAME CO	130 MAIN ST	MAYNARD	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous waste

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

