Massachusetts Department of Environmental Protection

Source Water Assessment and Protection (SWAP) Report for Lowell Regional Water Utility

What is SWAP?

The Source Water Assessment and 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

PWS Name	Lowell Regional Water Utility
PWS Address	815 Pawtucket Blvd.
City/Town	Lowell, MA 01854
PWS ID Number	3160000
Local Contact	Edmund Tarmey, Executive Director
Phone Number	978-970-4242

Introduction

We are all concerned about the quality of the water we drink. Public wells, reservoirs and rivers may be threatened by potential contaminant sources, including storm runoff, spills, and improper disposal of hazardous materials. Citizens, businesses and local officials can work together to better protect these drinking water sources.

Purpose of this report:

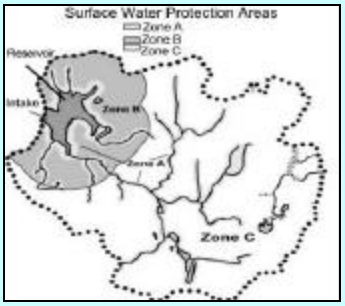
This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

This report includes the following sections:

1. Description of the Water System
2. Land Uses in the Watershed
3. Source Water Protection
4. Emergency Planning Recommendations
5. Additional Resources Available for Source Water Protection
6. Appendices

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.



Section 1: Description of the Water System

Source Name	*Source ID*	*Susceptibility*
Merrimack River	3160000-01S	High

The Lowell Regional Water Utility withdraws water from the Merrimack River to supply drinking water to the communities of Lowell, Dracut, Tyngsboro, Tewksbury, and Chelmsford. The Massachusetts Surface Water Quality Standards classify the Merrimack River as a Class B waterway. That means that the water withdrawn for drinking water purposes must be treated. The intake is located west of the City and is pumped one half mile to the treatment plant. The Lowell Regional Water Utility received a grant of $11.6 million from the Massachusetts Department of Environmental Protection (DEP) to upgrade chemical and filtering equipment and incorporate state of the art computer technology to improve water treatment capability. This work has been completed.

For current information on monitoring results and treatment or for a copy of the most recent Consumer Confidence Report, please contact the public water system contact person listed above in Table 1. Drinking water monitoring data is also available on the web at http://www.epa.gov/safewater/ccr1.html.

Merrimack River Watershed

The Merrimack River flows for 78 miles through New Hampshire and for another 50 miles in Massachusetts, from Lowell to Newburyport and into the Atlantic Ocean. There are 1,200 square miles of watershed in Massachusetts in all or part of 24 communities. Upstream of the Lowell drinking water intake, the following communities are in the Merrimack River watershed: Lowell; Chelmsford; Dracut; Tyngsboro; Westford; Groton; Dunstable; Ayer; Ashby; and Ashburnham.

Eighteen percent (18%) of the watershed in Massachusetts upstream of the Lowell intake is listed in DEP's Geographic Information System (GIS) databases as protected open space. The other 82% contains a mix of land uses such as residential homes, shopping malls, businesses, industrial processes, transportation corridors, agriculture, utility lines and recreation facilities.

Class B Drinking Water Sources

There are twelve Class B drinking water sources on rivers in Massachusetts, eleven in the urbanized northeast and one in the western part of the State. Five of these sources are located on the Merrimack River. The large watersheds and historically urbanized land uses associated with major rivers makes source protection a challenge at the Class B sources.

Class B River Intakes

Class B water sources do not have Zone A , B and C protection areas as the Class A sources do. For the purposes of this report, an "Emergency Planning Zone" has been delineated. The **Emergency Planning Zone** is the land area within 400 feet of both sides of the river including all tributary streams and surface water bodies.

A Class B water body source such as the Merrimack River does not have Zone A, B and C protection areas, as do Class A water body sources. For the purposes of the SWAP assessments, a 400 foot setback area along the river and all feeder streams has been delineated for Class B water body sources that is referred to as an "Emergency Planning Zone". Land uses and activities within this zone are of particular concern for source protection and emergency planning because of their proximity to the water supply.

River drinking water sources are particularly susceptible to spills and accidental releases from public and private discharges; accidents related to vehicles, railroads, airports, boats; utility easements; fixed site releases at industrial and public facilities; inappropriate use of pesticides and fertilizers; improper disposal of hazardous household waste; and illegal dumping of a variety of substances.

This assessment has been conducted on the watershed area upstream of the Lowell Regional Water Utility intake to the state boundary. Potential threats that have been identified in New Hampshire have also been included. In addition, DEP has delineated a 400-foot emergency planning zone (shown on the GIS map that accompanies this report) adjacent to the river and its tributaries, up to the state boundary, for the purpose of this assessment.

This report contains a list of regulated facilities that are located within the watershed. Page 9 of this report contains recommendations for emergency planning.

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.

Section 2: Land Uses in the Protection Areas

The protection area for Lowell is a mixture primarily of residential, commercial, industrial, and forest land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2.

Key Land Uses and Protection Issues Include:

1. Activities in Emergency Planning Zone
2. Agricultural Activities
3. Hazardous Materials Manufacture, Storage and Use
4. Transportation Corridors
5. Stormwater Flows
6. Railroad Tracks
7. Transmission Lines
8. Combined Sewer Overflows
9. Recreation (beaches, campgrounds, boating)
10. Golf Courses
11. Road and Maintenance Depots
12. Federal Superfund Site and Oil or Hazardous Material Contamination Sites
13. Residential

1. Activities in Emergency Planning Zone - The Emergency Planning Zone is a 400 foot setback on either side of river and all tributaries to a Class B river intake. Land use activities within an Emergency Planning Zone may have an impact on surface water sources. Wild animals and domestic pet wastes can carry waterborne diseases such as Giardia, Cryptosporidium, Salmonella, etc. while septic systems and road runoff can carry these as well as other contaminants.

Emergency Planning Zone Recommendations:

Work with communities within the combined watersheds to:

✓ Continue your efforts to protect these areas and to monitor and review activities within the Emergency Planning Zone for the Merrimack River.

2. Agricultural Activities – Agricultural land uses, cropland and pastures, comprise about 7% of the combined watersheds. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If managed improperly, underground and aboveground storage tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills. Agricultural activities can also be a potential source of microbial contamination from improper manure management.

Agricultural Recommendations:

Work with communities within the combined watersheds to:

✓ Work with farmers to make them aware of the water supply and to encourage the use of a U.S. Natural Resources Conservation Service (NRCS) farm plan to protect water supplies.

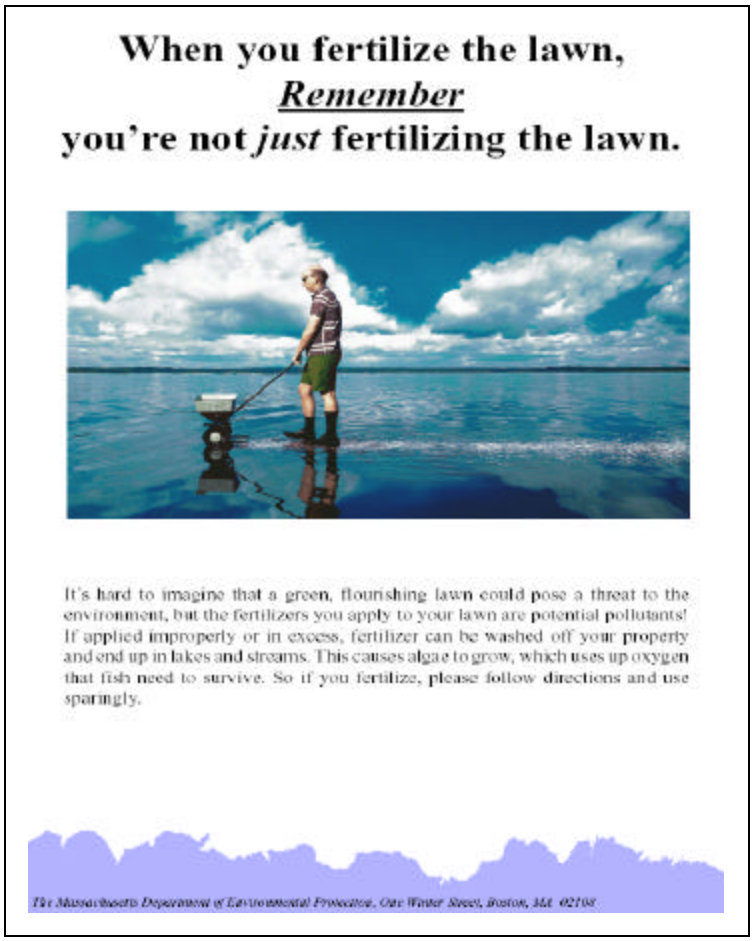
Benefits of Source Protection

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.

- ✓ The Massachusetts Department of Food & Agriculture's booklet titled "On-Farm Strategies to Protect Water Quality - An Assessment & Planning Tool for Best Management Practices" (December 1996) describes technical and financial assistance programs related to the control of erosion and to the management of nutrients, pests, manure, grazing and irrigation.
- ✓ Work with farmers to ensure that pesticides, fertilizers and manure are being stored within a structure designed to prevent runoff.



3. Chemical and Hazardous Materials Manufacture, Storage and Use – Many large and small businesses use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in USTs/ASTs. Although many facilities within the watershed use best management practices (BMPs), hazardous materials and waste can be unexpectedly released through spills, leaks or improper handling or storage, and 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:

Work with communities within the combined watersheds to:

- ✓ Educate local businesses on BMPs for protecting water supplies, and encourage them to use BMPs for handling, storing and disposing of hazardous waste. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs 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.
- ✓ Monitor water quality in the Merrimack River.
- ✓ Continue to plan and prepare for spills by communicating with facilities and conducting drills.

4. Transportation Corridors - Route 3 and other paved and unpaved local roads and highways cross through the watershed. Spills from vehicular accidents are a major concern.

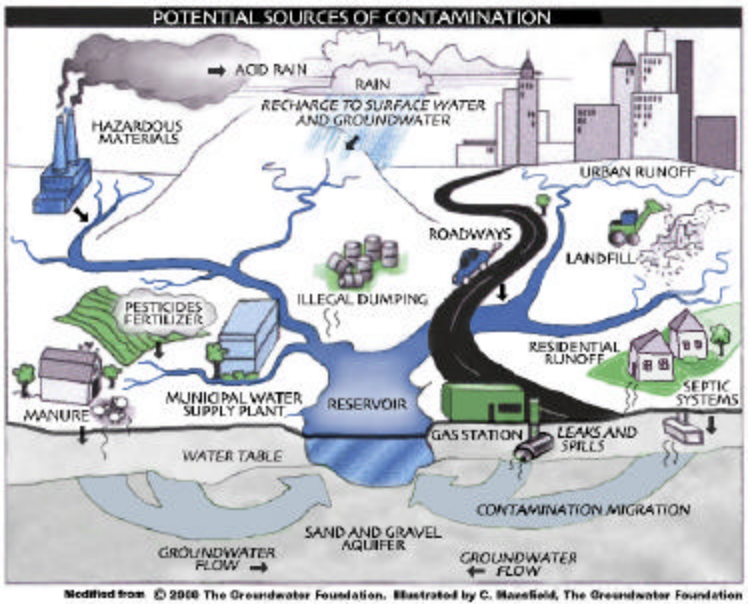


Figure 1: Sample watershed with examples of potential sources of

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 Uses in the Watershed

For more information, refer to Appendix B: Regulated Facilities.

Land Uses	Quantity	Threat	Potential Sources of Contamination*
Agricultural			
Fertilizer Storage or Use	Few	M	Leaks, spills, improper handling, or over-application of fertilizers
Pesticide Storage or Use	Few	H	Leaks, spills, improper handling, or over-application of pesticides
Commercial			
Body Shops	2	H	Improper management of vehicle paints, solvents, and primer products
Gas Stations	6	H	Spills, leaks, or improper handling or storage of automotive fluids and fuels
Service Stations/ Auto Repair Shops	4	H	Spills, leaks, or improper handling of automotive fluids, and solvents
Bus and Truck Terminals	2	H	Spills, leaks, or improper handling of fuels and maintenance chemicals
Cemeteries	Few	M	Leaks, spills, improper handling, or over-application of pesticides; historic embalming fluids (such as arsenic)
Dry Cleaners	1	H	Spills, leaks, or improper handling of solvents and wastes
Furniture Stripping and Refinishing	1	H	Spills, leaks, or improper handling of hazardous chemicals
Golf Courses	3	M	Over-application or improper handling of fertilizers or pesticides
Printer and Blueprint Shops	1	M	Spills, leaks, or improper handling or storage of printing inks and chemicals
Railroad Tracks and Yards	2	H	Over-application or improper handling of herbicides, leaks or spills of transported chemicals and maintenance chemicals; fuel storage
Sand and Gravel Mining/ Washing	Few	M	Spills or leaks from heavy equipment, fuel storage, clandestine dumping
Industrial			
Chemical Storage or Manufacture	Numerous	H	Spills, leaks, or improper handling or storage of chemicals or process waste
Hazardous Materials Storage	Numerous	H	Spills, leaks from improper handling or storage of hazardous waste
Industrial Parks	Few	H	Leaks, spills of chemicals from improper handling or storage

Land Uses	Quantity	Threat	Potential Sources of Contamination
Industrial			
Plastic Manufacturers	1	H	Spills, leaks, or improper handling or storage of solvents, resins and process wastes
Residential			
Fuel Oil Storage (at residences)	100+	M	Spills, leaks, or improper handling of fuel oil
Lawn Care/Gardening	100+	M	Over-application or improper storage and disposal of pesticides
Septic Systems/Cesspools	100+	M	Microbial contaminants, improper disposal of hazardous chemicals
Miscellaneous			
Aboveground Storage Tanks	Few	M	Spills, leaks, or improper handling of materials stored in tanks
Combined Sewer Overflows	In New Hampshire	L	Microbial and non-microbial contaminants including industrial wastewater; improper disposal of hazardous wastes
Composting Facilities	2	L	Storage and improper handling of organic material, animal waste, and runoff
Fishing/Boating	100+	L	Fuel and other chemical spills, microbial contaminants
Landfills and Dumps	7	H	Seepage of leachate
NPDES Locations	In New Hampshire	L	Improper disposal of hazardous material and wastes
Oil or Hazardous Material Sites	8	--	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Road and Maintenance Depots	1	M	Spills, leaks, or improper handling or storage of de-icing materials, automotive fluids, fuel storage, and other chemicals
Schools, Colleges, and Universities	Few	M	Spills, leaks, or improper handling or storage of fuel oil, laboratory, art, photographic, machine shop, and other chemicals
Small Quantity Hazardous Waste Generators	6	M	Spills, leaks, or improper handling or storage of hazardous materials and waste
Stormwater Drains/ Retention Basins	Numerous	L	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Superfund Sites	1	H	Spills, leaks, or improper handling or storage of oil or hazardous materials and waste
Transmission Line Rights-of-Way	3	L	Construction and corridor maintenance, over-application or improper handling of herbicides
Transportation Corridors	2	M	Accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides
Underground Storage Tanks	23	H	Spills, leaks, or improper handling of stored materials
Very Small Quantity Hazardous Waste Generators	17	L	Spills, leaks, or improper handling or storage of hazardous materials and waste

Land Uses	Quantity	Threat	Potential Sources of Contamination
Miscellaneous			
Waste Transfer/Recycling Stations	3	M	Improper management, seepage, and runoff of water contacting waste materials

Notes:
1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities 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.
3. For information about Oil or Hazardous Materials Sites, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

*** THREAT RANKING** - Where there are two rankings, the first is for ground water, the second for surface water. 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.

(Continued from page 4)

In addition, 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. The steep topography of the watershed results in application of de-icing materials to protect public health and safety by keeping the roads passable.

Transportation Corridor Recommendations:

Work with communities within the combined watersheds to:

- ✓ Establish vegetated buffers along roads and parking areas to provide some filtration of contaminants.
- ✓ Encourage regular street sweeping. Appendix A contains a fact sheet titled *DPWs Protect Drinking Water*.
- ✓ Conduct emergency drills to be ready for spills.
- ✓ Regularly inspect the watersheds for illegal dumping and spills.
- ✓ Work with local emergency response teams to ensure that any spills can be effectively contained.
- ✓ Work with the City and State to have catch basins inspected, maintained, and cleaned on a regular schedule.

5. Stormwater Flows - Stormwater from roads and commercial development, such as malls in Nashua, New Hampshire, flows directly into the Merrimack River and its tributaries. Stormwater may contain debris, chemicals, bacteria, and nutrients that can impact water quality in the river. Spills can enter the river through stormwater flows.

Stormwater Flows Recommendations:

Work with communities within the combined watersheds to:

- ✓ Encourage parking lot sweeping in commercial areas.
- ✓ Conduct routine testing for bacteria in the river after storms.
- ✓ Continue to plan and prepare for spills.
- ✓ If storm drainage maps are available, review the maps with emergency response teams.

6. Railroad Rights-of-Way - Railroad tracks are located along the bank of the Merrimack River. Railroad Rights-of-Way are potential sources of contamination because of the possibility of spills of transported materials, chemical releases during track maintenance or the over-application or improper handling of herbicides during rights-of-way maintenance.

The Rights-of-Way Management Regulations (333 CMR 11.00) were designed to minimize any potential harmful effects of herbicides used for vegetation control along Rights-of-Way in Massachusetts. The regulations promote the use of an integrated pest management (IPM) approach to vegetation control and require application setback distances to protect drinking water sources and other environmentally sensitive areas. Utilities must submit a Vegetation Management Plan (VMP) and a Yearly Operating Plan (YOP) to the Mass. Department of Food and Agriculture for approval and to the municipalities within which herbicide application is proposed.

Railroad Rights-of-Way Recommendations:
Work with communities within the combined watersheds to:

- ✓ Review the utility's YOP to ensure that BMPs for herbicide applications are in place.
- ✓ Plan for spills and conduct emergency response drills to test procedures.

7. Transmission (Utility) Lines - Transmission lines run throughout the watershed. These are potential sources of contamination because of the possibility of over-application or improper handling of herbicides during rights-of-way maintenance.

Transmission (Utility) Lines Recommendation:
Work with communities within the combined watersheds to:

- ✓ Monitor the YOP for pesticide applications.

8. Combined Sewer Overflows (CSOs) - Overflows from the Nashua, New Hampshire sewer system have the potential to cause microbial and non-microbial contaminants to enter the river during high stormwater flows.

Combined Sewer Overflows Recommendation:
Work with communities within the combined watersheds to:

- ✓ Continue working with existing committees and legislators on CSOs.

9. Recreation (beaches, campgrounds, boating) - the Merrimack River is a popular regional water resource and is used extensively for boating and fishing. Other recreational uses include beaches and campgrounds along the shoreline.

Recreation Recommendations:
Work with communities within the combined watersheds to:

- ✓ Post water supply awareness signs along the banks of the river, at access points, and at the Lowell Regional Water Utility river intake.
- ✓ Incorporate drinking water protection education into community events.
- ✓ Develop a boater education program that address issues specific to boating and source protection
- ✓ Encourage boaters and other users to report spills.

10. Golf Courses - There are three golf courses within the assessment area. Potential contaminants include the over-application or improper handling of pesticides and fertilizers. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed.

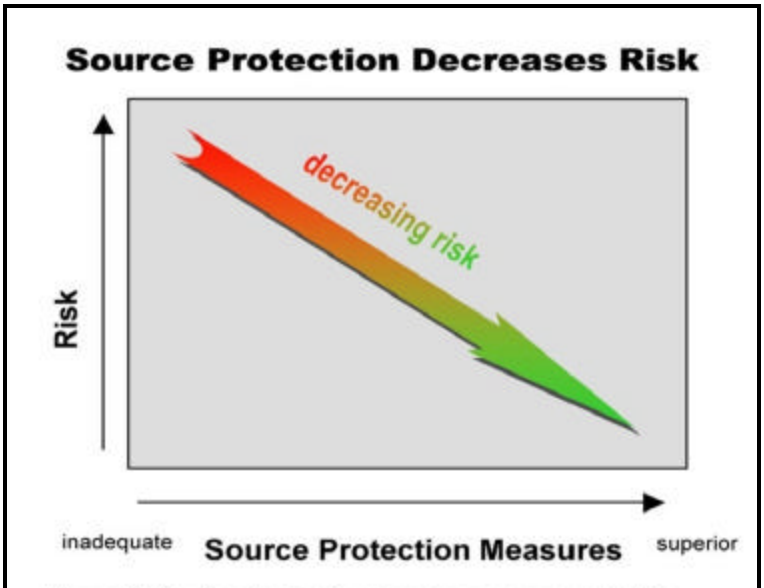


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

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.

Golf Courses Recommendations:

- ✓ Encourage the golf course grounds manager to incorporate an Integrated Pest Management (IPM) approach into their grounds maintenance program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Promote Best Management Practices (BMPs) for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.
- ✓ Contact owners/operators about water supply awareness and protection.

11. Road and Maintenance Depots - Potential sources of contamination in state and municipal facilities can result from accidental dumping, spills, leaks, vehicle washing operations, or from wastewater treatment. Waste management and product storage pose the greatest threats with a wide variety of potentially harmful contaminants.

Road and Maintenance Depots Recommendations:

Work with communities within the combined watersheds to:

- ✓ **Best Management Practices** - The New England Environmental Assistance Team provides municipalities in New England with information on how to comply with environmental requirements, and how to prevent pollution. For more information about this EPA sponsored program visit their website at http://www.epa.gov/region1/steward/neeat/muni/index.html. Encourage road and maintenance depots to develop BMPs to insure proper salt storage, proper maintenance of facilities and good housekeeping practices.
- ✓ Salt pile structures should be adequately sized to allow for the loading and unloading of salt within the structure. Review the Department of Environmental Protection's Drinking Water Program Guidelines On Deicing Chemical (Road Salt) Storage at http://www.state.ma.us/dep/brp/dws/files/saltgui.doc.
- ✓ Encourage proper storage of materials at these facilities. Appendix A contains a fact sheet titled *DPWs Protect Drinking Water.*

Top 5 Reasons to Develop a Local Surface Water Protection Plan

❶ Reduces Risk to Human Health

❷ Cost Effective! Reduces or Eliminates Costs Associated With:

- Increased 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.

12. Presence of Federal Superfund Site and Oil or Hazardous Material Contamination Sites – The watershed for the Merrimack River contains a United States Environmental Protection Agency (USEPA) Superfund Site that is associated with the DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 2-0000136. Refer to the attached maps and Appendix B for more information on these sites, and for information on DEP Tier Classified Oil and/or Hazardous Material Release Sites within the watershed for the Merrimack River.

Federal Superfund Site and Oil or Hazardous Material Contamination Sites Recommendation:

Work with communities within the combined watersheds to:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

13. Residential — Over 16% of the assessment area consists of residential land uses. If managed improperly, household hazardous waste, septic systems, lawn care and pet waste can all contribute to ground and surface water contamination. Household hazardous wastes include automotive wastes, paints, solvents and other substances that should be disposed of properly at a municipal collection site. If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Improperly applied fertilizers and pesticides can wash off lawns and into surface waters. Pet waste may contain bacteria, parasites or viruses that are health risks.

- **Septic Systems** - Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination. 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.

Residential Land Use Recommendations:

- ✓ Work with city officials to control residential growth on undeveloped land.
- ✓ See www.state.ma.us/envir/ to obtain information on the build-out analyses for communities into which the watershed extends.
- ✓ Educate residents on how to protect water supplies. Distribute the fact sheet *Residents Protect Drinking Water* available in Appendix A and at www.mass.gov/dep/brp/dws/protect.htm.
- ✓ Post water supply awareness signs on streets throughout the watershed.
- ✓ Work with city boards and upstream communities to review and provide recommendations on proposed watershed development.

Other land uses and activities within the emergency planning zone and watershed that are potential sources of contamination are included in Table 2. Refer to Appendix B 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.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/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

Section 3: Source Water Protection

Current Land Uses and Source Protection:

As with many water systems, this watershed contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The Lowell Regional Water Utility is commended for taking an active role in protecting its drinking water source. Some examples of the staff's good work include the following:

Emergency Planning and Response - The Utility works with upstream communities in Massachusetts and New Hampshire on emergency response planning. They have an emergency management committee and coordinate activities with the Massachusetts Emergency Management Agency (MEMA) facility in Tewksbury.

Communication with Other Communities - The Utility maintains contact with upstream communities, including those in New Hampshire, on a variety of source protection issues.

Section 4: Emergency Planning Recommendations

Prevention

Public water suppliers with a river source may take preventive measures to protect the source from unexpected releases. Here are some suggestions.

1. Title III (Emergency Planning and Community Right-to-Know) of the Superfund Amendments & Reauthorization Act (SARA) of 1986 required that each community **develop a comprehensive emergency response plan**. Suppliers should review the existing plan to ensure that water supply issues are satisfactorily addressed in the plan, that current response personnel and their correct telephone numbers are listed, and that the entire plan is regularly reviewed and updated by community officials.

   The community plan, or a separate water supplier plan, should include copies of policies in the event of spills or releases; regulatory notification requirements such as what size spills are required to be reported, who to call, telephone numbers, and what information is required to be reported; map of intakes, tributaries, watershed boundaries, adjacent public wells, and locations of sites where spills or accidental releases could occur.

2. **Identify, map and distribute information** to local emergency responders regarding the locations of intakes on the river, tributaries, watershed boundaries, public wells adjacent to river; chemical use at municipal, state, and industrial facilities in watershed (contact Fire Dept., DEP); locations of stormwater drains and the locations of known dams in the event that they can be manipulated by authorized individuals for contaminant control. The Fire Dept., Board of Health, Planning Board, Local Emergency Planning Committee (LEPC), DEP and others may have existing information to help with your work. SARA requires companies to work with the community's LEPC if they handle extremely hazardous chemicals in quantities above established thresholds.

3. **Develop a communication list** of contacts at upstream and downstream facilities, dams, as well as other public water suppliers on, or adjacent to, rivers. Notify owners and operators of these facilities about the location of your intake and request, in writing, that you be notified immediately in the event of a chemical spill or unexpected discharge. Take this opportunity to educate others about water supply protection.

4. **Provide comments** to municipal boards in other cities/towns in the watershed about proposed development, land use controls, Best Management Practices (BMPs) for stormwater flow into tributaries, and other issues to avoid future problems.

5. **Post signs** along major roads in watershed which direct the public to call "911" or another appropriate local number in case of spills. Be aware of accident-prone areas and transport routes of chemicals if possible.

6. **Educate** the public, local officials, Civil Defense, local emergency response team, and others about water supply protection issues. Educate businesses about toxic use reduction.

7. **Conduct household hazardous waste collection days** and establish permanent collection sites, away from sensitive watershed areas, for used batteries, paints, motor oil, etc.

8. **Conduct drills**, in coordination with local/regional response teams, to test policies and procedures and to practice responding to various situations. Including businesses, local officials and staff, Fire Departments, Boards of Health, Civil Defense, school administration, and others in planning and implementing the drills will allow for several town or region-wide concerns to be addressed and tested at the same time, including: issuing health advisories, conducting neighborhood and/or school evacuations, and evaluating the town's communication system (both making responders aware of the emergency and issuing advisories to the public when necessary via television, radio, and other news media), equipment and emergency plan in general.

9. Critique the drills and **modify components** of the emergency response system as needed.

Responding to Emergencies

Drinking water supply professionals responding to local emergencies need to be adequately prepared and trained, and know their roles and responsibilities. Here are some suggestions.

1. **Know regulatory reporting requirements** of state and federal agencies. Know who to call, telephone numbers and what information to report.

2. **Know your role & responsibilities**. Have access to, and be familiar with, the emergency communication list, policies and procedures for emergency response; know when, and how, to safely handle spills or other events until first responders arrive on scene; know what steps to take to avoid drawing contaminants into the water supply system; be familiar enough with local watershed characteristics to provide incident commander with information and advice.

3. **Provide training and materials to responding staff**. Water supply staff, including new employees, should be adequately trained, have access to appropriate materials (storm drain covers, absorbent pads, booms, etc.), up-to-date policies, procedures, and communication lists to perform tasks for which they are responsible.

Follow-up

Steps can be taken to ensure better preparedness in the event of future emergency situations. Here are some suggestions.

1. **Provide follow-up reports** to the public on the resolution of the situation.
2. **Share** the **information** learned from drills and real situations with others in order to better protect all public drinking water sources.

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in the Key Issues above and Appendix A.

Section 5: Additional Resources Available for Source Water Protection

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 Source Protection Grant Program provides 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 (RFR) for the grant program. 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 watershed. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Information about DEP Tier Classified Oil or Hazardous Material Release Sites can be obtained at DEP's Bureau of Waste Site Cleanup's web site, www.state.ma.us/dep/bwsc. Sites are identified on the attached GIS map and site specific information is available in Appendix C.

Section 6: Appendices

A. Protection Recommendations
B. List of Regulated Facilities (in Massachusetts)
C. Table of Tier Classified Oil and/or Hazardous Material Sites
D. Additional Documents on Source Protection

For More Information

Contact Anita Wolovick in DEP's Wilmington office at (978) 661-7768 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.

APPENDIX A: DEP PERMITTED FACILITIES WITHIN LOWELL'S WATER SUPPLY PROTECTION AREAS

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
38043	NEW ENGLAND HYDRO TRANS ELECTRIC	RADISSON RD	AYER	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
39155	CHELMSFORD LANDFILL	SWAIN RD	CHELMSFORD	SLF	CHARGEABLE CLOSED LANDFILL
366769	MERRIMACK VALLEY SCREEN PRINTING INC	6 ADAMS ST	CHELMSFORD	DISCH	NON-NOTIFIER IWW FAC THAT IS SUBJ TO REGS BUT NOT PERMITTED
298511	DUMONT ENTERPRISES INC	41 LOWELL ST	DUNSTABLE	HANDLR	VERY SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
298511	DUMONT ENTERPRISES INC	41 LOWELL ST	DUNSTABLE	HANDLR	SMALL QUANTITY GENERATOR WASTE OIL/PCBS
366857	DUNSTABLE GAS INC	238 PLEASANT ST	DUNSTABLE	FULDSP	FUEL DISPENSER STAGEII
32187	WEST AUTO REPAIR	30 PLEASANT ST	DUNSTABLE	HANDLR	VERY SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
136387	GROTON AL PRIME	619 BOSTON RD	GROTON	FULDSP	FUEL DISPENSER STAGEII
136387	GROTON AL PRIME	619 BOSTON RD	GROTON	HANDLR	VERY SMALL QUANTITY GENERATOR WASTE OIL/PCBS
136387	GROTON AL PRIME	619 BOSTON RD	GROTON	HANDLR	VERY SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
39315	GROTON LANDFILL	600 COW POND BROOK RD	GROTON	SLF	CHARGEABLE LANDFILL
363409	GROTON TRANSFER STATION	600 COW POND BROOK RD	GROTON	TRSTN	SMALL HANDLING FACILITY
377537	AGGREGATE INDUSTRIES	80 AYER RD	LITTLETON	TURRPT	LARGE QUANTITY TOXICS USER

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
368778	HEWLETT PACKARD CORP	550 KING ST	LITTLETON	GROUND	GROUNDWATER DISCHARGE
229723	MIDDLESEX CONCRETE	80 AYER RD	LITTLETON	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
363549	WAKEFIELD MATERIALS CORPORATION LITTLETON	80 AYER RD	LITTLETON	TURRPT	LARGE QUANTITY TOXICS USER
370388	3A GAS	257 MIDDLESEX RD	TYNGSBORO	FULDSP	FUEL DISPENSER
322941	ANDYS AUTO BODY	339 WESTFORD ST	TYNGSBORO	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
348617	BARR ASSOC INC	300 POTASH HILL RD	TYNGSBORO	PLANT	AIR QUALITY PERMIT
320025	BELCASTRO FURNITURE RESTORATION	77 WESTECH DR	TYNGSBORO	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
132303	BFI WASTE SYSTEMS OF NORTH AMERICA	385 DUNSTABLE RD	TYNGSBORO	HANDLR	SMALL QUANTITY GENERATOR OF HAZ WASTE
132303	BFI WASTE SYSTEMS OF NORTH AMERICA	385 DUNSTABLE RD	TYNGSBORO	DISCH	INDUSTRIAL WASTE WATER SURFACE WATER DISCHARGE
298585	BRITE KLEEN CLEANERS	26 WESTFORD RD	TYNGSBORO	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
32160	COLONIAL AUTO BODY	121 LAKEVIEW AVE	TYNGSBORO	HANDLR	SMALL QUANTITY GENERATOR OF HAZ WASTE
110594	DANA WALLBOARD SUPPLY INC	6 CUMMINGS RD	TYNGSBORO	HANDLR	VERY SMALL QUANTITY GENERATOR OF WASTE OIL OR PCBS
302562	DUFFS GARAGE	92 KENDALL RD	TYNGSBORO	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
291199	DUNBAR BUS CO	33 MIDDLESEX RD	TYNGSBORO	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
132214	HUSSEY PLASTICS INC	65 MIDDLESEX RD	TYNGSBORO	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
307332	INDEPENDENT SPRAY	26R WOODLAWN ST	TYNGSBORO	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
368183	MOBIL 12369	95-97 WESTFORD RD	TYNGSBORO	FULDSP	FUEL DISPENSER
324984	MUTUAL OIL	397 MIDDLESEX RD	TYNGSBORO	FULDSP	FUEL DISPENSER
321837	MUTUAL OIL CO INC	397 MIDDLESEX RD	TYNGSBORO	HANDLR	VERY SMALL QUANTITY GENERATOR OF WASTE OIL OR PCBS
368441	NEW ENGLAND TRANSIT SALES INC	30 PROGRESS AV	TYNGSBORO	HANDLR	SMALL QUANTITY GENERATOR OF WASTE OIL OR PCBS
132833	PICONICS INC	26 CUMMINGS RD	TYNGSBORO	HANDLR	SMALL QUANTITY GENERATOR OF HAZ WASTE
853	THUNDERBIRD PLAZA	MIDDLESEX RD	TYNGSBORO	GROUND	GROUNDWATER DISCHARGE
209890	TJ MAXX PLAZA	440 MIDDLESEX RD	TYNGSBORO	GROUND	GROUNDWATER DISCHARGE
230673	TOWN AND COUNTRY GARAGE	54 PAWTUCKET BLVD	TYNGSBORO	FULDSP	FUEL DISPENSER
37104	TYNGSBORO AUTO WORKS	33 MIDDLESEX RD	TYNGSBORO	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
310633	TYNGSBORO HIGHWAY DEPT	89 KENDELL RD	TYNGSBORO	FULDSP	FUEL DISPENSER

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
130848	WESTFORD ANODIZING CORP	12 NORTH MAIN ST	WESTFORD	TURRPT	LARGE QUANTITY TOXICS USER
356377	WESTFORD MIDDLE SCHOOL AT STONY BROOK	OFF GROTON RD	WESTFORD	GROUND	GROUNDWATER DISCHARGE

UNDERGROUND STORAGE TANKS WITHIN LOWELL'S WATER SUPPLY PROTECTION AREAS

FACILITY NAME	ADDRESS	TOWN	DESCRIPTION	NUMBER OF TANKS
DUNSTABLE GENERAL STORE INC	238 PLEASANT ST	DUNSTABLE	GAS STATION	3
A L PRIME ENERGY	619 BOSTON RD	GROTON	GAS STATION	3
TOWN OF GROTON HIGHWAY DEPT	500 COW POND BROOK RD	GROTON	MUNICIPAL	2
BROWNING-FERRIS IND OF MASS INC	385 DUNSTABLE RD	TYNGSBORO	TRUCK/TRANSPORT	2
EXXONMOBIL OIL CORPORATION	95-97 WESTFORD RD	TYNGSBORO	GAS STATION	2
MIDDLESEX TEXACO	397 MIDDLESEX RD	TYNGSBORO	GAS STATION	2
RT-3 GAS INC	257 MIDDLESEX RD	TYNGSBORO	GAS STATION	4
STATELINE TOWN & COUNTRY	54 PAWTUCKET BLVD	TYNGSBORO	GAS STATION	2
TOWN OF TYNGSBORO HIGHWAY DEPT	89 KENDALL RD	TYNGSBORO	MUNICIPAL	2

For More Information On Underground Storage Tanks, Visit The Massachusetts Department Of Fire Services Web Site: Http://Www.State.Ma.Us/Dfs/Ust/Usthome.Htm
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 Located Within The Water Supply Protection Area(S) Should Be Considered In Local Drinking Water Source Protection Planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within Lowell Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at http://www.state.ma.us/dep/bwsc. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at http://:www.state.ma.us/dep/bwsc/sitellst.htm, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Status
2-0000136	475-530 Dunstable Road	Tyngsboro	Tier 1a
2-0000392	292 Middlesex Road	Tyngsboro	Deferred Tier 1b
2-0012727	54 Pawtucket Blvd	Tyngsboro	Tier 1c
2-0010348	11 12 Waterway Pl	Tyngsboro	Tier 1c
2-0011257	95 97 Westford Rd	Tyngsboro	Tier 2
2-0013702	95 97 Westford Rd	Tyngsboro	Tier 2

For more location information, please see the attached map. The map lists the release sites by Release Tracking Number (RTN).