

**Figure 1. Drinking Water Source Protection Area and Potential Contaminant Sources, City of Cuyahoga Falls, Public Water System #7701012**

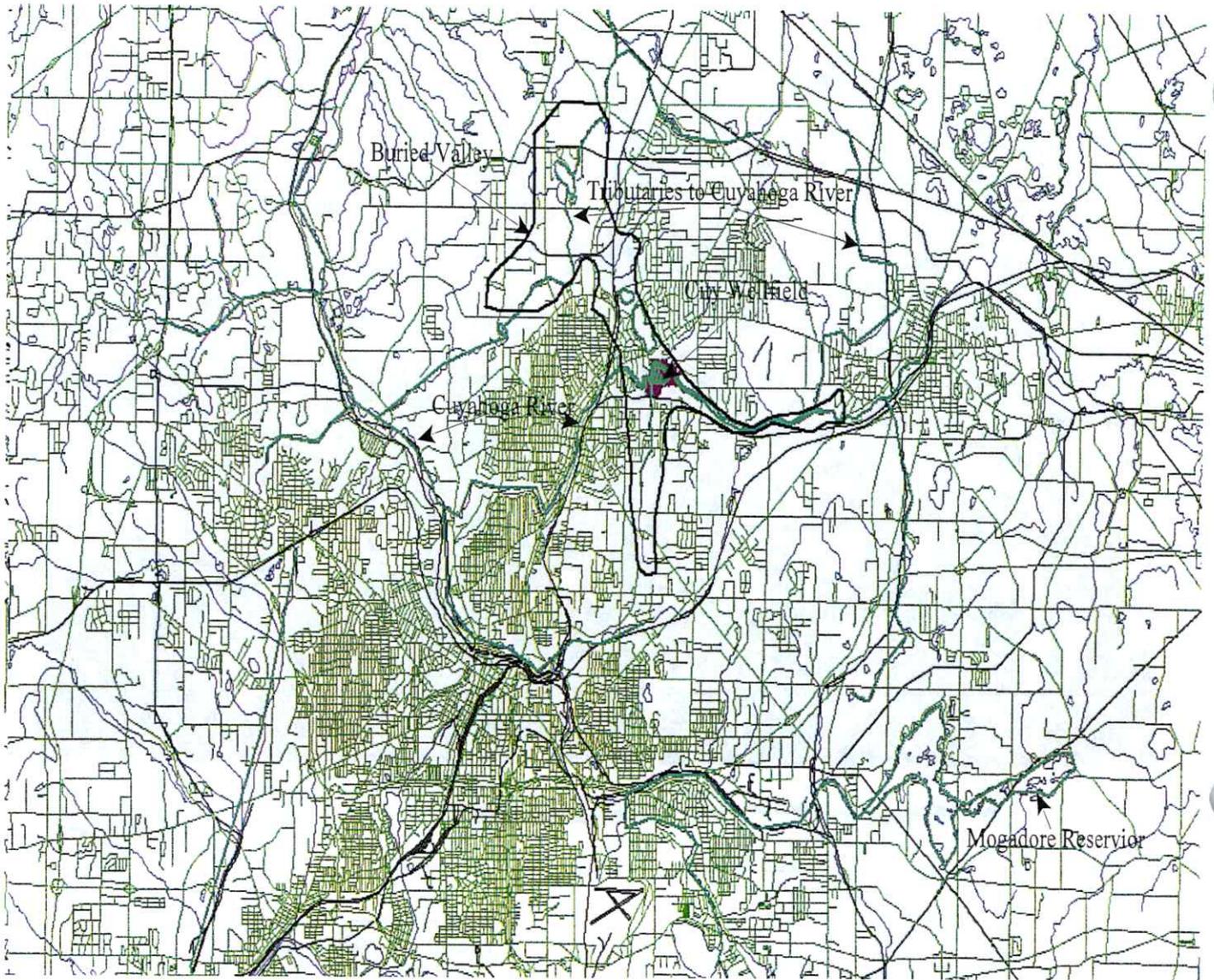
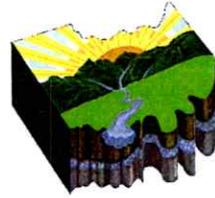


Figure 2. Model Development for the City of Cuyahoga Falls.

# DRINKING WATER SOURCE ASSESSMENT for the City of Cuyahoga Falls (PWS ID #7701012)



Protecting  
Ohio's Drinking  
Water Sources

OhioEPA

July 2002

**INTRODUCTION.** The 1996 Amendments to the Safe Drinking Water Act require all states to assess the drinking water source for all public water systems. Ohio's Source Water Assessment and Protection Program is designed to help public water systems protect their sources of drinking water from becoming contaminated. This assessment:

- ▶ Identifies the drinking water source protection area, based on the area that supplies water to the well(s);
- ▶ Inventories the potential contaminant sources in the area;
- ▶ Evaluates the susceptibility of the drinking water source to contamination; and
- ▶ Recommends protective strategies.

The purpose of the assessment is to provide information that the City of Cuyahoga Falls can use to help protect its source of drinking water from contamination.

**SYSTEM DESCRIPTION & GEOLOGY.** The City of Cuyahoga Falls is a community public water system serving 49,500 people in Cuyahoga Falls, Ohio. This system operates 18 wells installed in a sand and gravel aquifer (water-rich zone) within the Cuyahoga River buried valley aquifer system. The wells are adjacent to and within an inner bend of the Cuyahoga River. These wells pump approximately 6,040,000 gallons of water per day (GPD), on the average, and 9,753,000 GPD on peak days. The depths and lengths of casing and screen are summarized in Table 1. The aquifer is not covered by low-permeability material, which means that there is no protection from contamination. Depth to water in this aquifer is between 4 and 32 feet below the ground surface (bgs). Soils in the area are silty loams. These soils are

located on flood plains and are moderately well-drained, meaning that much of the rainfall and snowmelt will infiltrate into the soil, instead of running off or ponding. The topography is generally flat. Ground water in this area is replenished by subsurface water flowing from upgradient directions, and by infiltration through soils, of approximately 7 inches of water per year (in/yr) from precipitation. At the City of Cuyahoga Falls wellfield, ground water flows generally toward the west, based on a water table elevation map of the area north of the Cuyahoga River, completed by the Ohio EPA.

**PROTECTION AREA.** The drinking water source protection area for the City of Cuyahoga Falls' wells is illustrated in Figure 1. This figure shows two areas, one inside the other. The "inner protection zone" is the area that provides ground water to the City of Cuyahoga Falls' wells within one year of pumping. A chemical spill in this zone poses a greater threat to the drinking water, so this area warrants more stringent protection. The "outer protection zone" is the additional area that contributes water when the well is pumped for five years. Together, they comprise the drinking water source protection area.

### **Method Selection**

An analytic element computer model, called GFLOW, was used to determine the areal extent of the protection area. Protection areas developed by computer modeling can be significantly more reliable than those produced by simpler methods, especially in areas with complex geology. The time and effort required to develop a computer model are warranted when the wellfield is located in a complex hydrogeologic setting, and the hydrogeologic data needed to run the program are available for the area. Both criteria were met for the City of Cuyahoga Falls' source water assessment.

### **Model Set-up**

The GFLOW model for the City of Cuyahoga Falls' wellfield was designed to simulate the sand and gravel aquifer that lies within a sandstone bedrock aquifer. As shown in Figure 2, the sand and gravel aquifer was modeled as an area of different flow properties (called an "inhomogeneity") within the bedrock aquifer. The Cuyahoga River and its tributaries, Silver Lake, and the recharge lagoons were modeled as lines, called "line sinks," along which ground water enters or leaves the aquifer.

### **Model Values**

Information needed to run the model includes, at a minimum, **pumping rate** of the well(s), **hydraulic conductivity** of the aquifer (that is, the ease with which water moves through it), **aquifer thickness**, and **aquifer porosity**. Table 2 shows the model input values used for this drinking water source protection area. The pumping rate was taken from Ohio EPA's files. A hydraulic conductivity value of 200 feet per day (ft/day) was used for the sand and gravel aquifer, based on pump tests conducted at the wellfield in 1959 and 1976. An aquifer thickness of 85 ft was used based on well logs.

For the sandstone aquifer, site specific information on the hydraulic conductivity was not available. The value used in the model, 40 ft/day, was based upon average values for similar aquifers in the county where the City of Cuyahoga Falls' wellfield is located.

Measured porosity values were unavailable for any of the aquifers. However, based on the porosity values typically found in these kinds of rock and sediments, the model used 25% porosity for the sand-and-gravel aquifer and 10% porosity for the sandstone bedrock.

The protection area was determined based on the best information available at the time of the assessment. If you would like to have more information about how this protection area was derived, or if you would like to collect additional information and revise your protection area, please call Ohio EPA staff listed at the end of this report. Also, a more detailed discussion of the technical aspects of modeling drinking water source protection areas, can be found in the Delineation Guidelines and Process Manual (Ohio

EPA, 2000) on Ohio EPA's Source Water Assessment and Protection web page ([www.epa.state.oh.us/ddagw/pdu/swap.html](http://www.epa.state.oh.us/ddagw/pdu/swap.html)).

**INVENTORY.** On April, 9, 2002, an inventory of potential contaminant sources located within the drinking water source protection area was conducted by Ohio EPA with the assistance of City of Cuyahoga Falls personnel. Nineteen potential sources of contamination were identified within the protection area (see Figure 1). Table 3 summarizes information about these potential contaminant sources.

A facility or activity is listed as a potential contaminant source if it has the **potential** to release a contaminant, based on the kinds and amounts of chemicals typically associated with that type of facility or activity. It is beyond the scope of this assessment to determine whether any specific potential source is **actually** releasing (or has released) a contaminant to ground water. Also, the inventory is limited to what staff were able to observe on the day of the site visit. Therefore, the City of Cuyahoga Falls staff should be alert to the possible presence of potential sources of contamination that are not on this list.

**GROUND WATER QUALITY.** A review of the City of Cuyahoga Falls' water quality record currently available in Ohio EPA's drinking water compliance database did not reveal any evidence of chemical contamination at levels of concern in the aquifer. Please note that this water quality evaluation has some limitations:

- ▶ The data evaluated is for treated water - samples only, as Ohio EPA's quality requirements are for the water being provided to the public, not the water before treatment.
- ▶ Sampling results for coliform bacteria and naturally-occurring inorganics were not evaluated for this assessment, because they are not a reliable indicator of aquifer contamination.

Current information on the quality of the water supplied by the City of Cuyahoga Falls' public water system is available in the Consumer Confidence Report (CCR) for the system, which is distributed annually and is available from the water system. The CCR identifies detected

contaminants and any associated health risks from data collected during the past five years.

**SUSCEPTIBILITY ANALYSIS.** This assessment indicates that the City of Cuyahoga Falls' source of drinking water has a high susceptibility to contamination because:

- ▶ The sand and gravel aquifer has a depth to water ranging from 4 to 32 ft bgs;
- ▶ There is no low-permeability protective layer between the aquifer and the ground surface; and
- ▶ Potential significant contaminant sources exist within the protection area.

A high susceptibility rating of the aquifer does not imply that the well(field) will become contaminated. It only means that the existing/known aquifer conditions are such that **ground water within the aquifer** could become impacted if the potential contaminant sources are not appropriately managed. Please see the attached checklist for protective strategies that can be implemented to reduce the risk of contamination caused by potential contaminant sources within the protection area.

**PROTECTIVE STRATEGIES.** Protective strategies are activities that help protect a drinking water source from becoming contaminated. Implementing these activities benefits the community by helping to:

1. Protect the community's investment in its water supply;
2. Protect the health of the community residents by preventing contamination of its drinking water source;
3. Support the continued economic growth of a community by meeting its water supply needs;

4. Preserve the ground water resource for future generations; and
5. Reduce regulatory monitoring costs.

Ohio EPA encourages the City of Cuyahoga Falls to develop and implement an effective Drinking Water Source Protection Plan. The plan can be developed from the information provided in this Drinking Water Source Assessment Report. The potential contaminant source inventory provides a list of facilities or activities to focus on. Table 3 lists protective strategies that are appropriate for the kinds of facilities/activities listed in the inventory. Finally, a document titled "*Developing Local Drinking Water Source Protection Plans in Ohio*" is enclosed. This document offers a comprehensive guidance for developing and implementing a municipal Drinking Water Source Protection Plan. Ongoing implementation of the plan will help protect the City of Cuyahoga Falls' valuable drinking water resources for current and future generations. For further technical assistance on drinking water source protection, please contact the Ohio EPA Northeast District Office at (1-800-686-6330) or visit the Ohio EPA Source Water Assessment and Protection web page at:

<http://www.epa.state.oh.us/ddagw/pdu/swap.html>

#### **BIBLIOGRAPHY**

Ohio Department of Natural Resources, 1979, *The Water Resources of Summit County*.

Ohio Department of Natural Resources, 2000, Glacial Aquifer Map (digital map).

Ohio EPA, 2002, *Drinking Water Source Protection Area Delineation Guidelines & Process Manual*, Draft (February, 2002).

Ohio EPA public drinking water files.

**Table 1. Information on City of Cuyahoga Falls' Public Water System Wells**

| Well # | Total Depth (ft) | Casing Length (ft) | Static Water Level (ft) |
|--------|------------------|--------------------|-------------------------|
| 1      | 120              | 90                 | 23                      |
| 2      | 119              | 79                 | 34                      |
| 3      | 77               | 52                 | 29                      |
| 4      | 82               | 52                 | 17.5                    |
| 5      | 130              | 102                | 16                      |
| 7      | 120              | 100                | 26                      |
| 8      | 120              | 56                 | 11                      |
| 9      | 105              | 66                 | 20                      |
| 12     | 84               | 62                 | 10                      |
| 14     | 124              | 64                 | 31                      |
| 15     | 113              | 73                 | 35.6                    |
| 16     | 130              | 78                 | 42                      |
| 17     | 120              | 75                 | 30                      |
| 18     | 118              | 88                 | 29                      |
| 19     | 130              | 90                 | 35                      |
| 20     | 80               | 63                 | 14                      |
| 21     | 72               | 52                 | 4                       |
| 22     | 81               | 56                 | 7.67                    |

**Table 2. Information Used in the Ground Water Flow Model**

| Type of Information                                   | Value Used              | Source of information                                                |
|-------------------------------------------------------|-------------------------|----------------------------------------------------------------------|
| Pumping rate                                          | 9,753,000 Million GPD   | Ohio EPA public drinking water files                                 |
| Porosity:<br>Bedrock<br>Sand and gravel               | 10%<br>25%              | Ohio EPA's Delineations Guidance<br>Ohio EPA's Delineations Guidance |
| Aquifer thickness                                     | 85 ft                   | Well logs                                                            |
| Hydraulic conductivity:<br>Bedrock<br>Sand and gravel | 40 ft/day<br>200 ft/day | Pumping test conducted at wellfield by City in 1959 and 1976         |
| Recharge from precipitation                           | 7 in/year               | Based on values for similar buried valley settings.                  |

**Table 3. Potential Contaminant Sources Located in the City of Cuyahoga Falls' Drinking Water Source Protection Area.**

| Potential Contaminant Source                            | Number of Sources | Environmental Concerns                                                                                                                                                                                                                                                                                                                      | Protection Zone       |
|---------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Chemical and Diesel Drum Storage                        | 1                 | Potential for leaks and spills.                                                                                                                                                                                                                                                                                                             | Outer Protection Zone |
| Dumps/Landfills                                         | 3                 | Among the potential contaminant sources related to these facilities are deceased animals, improperly disposed equipments, trash, and chemicals. These areas may be associated with animal and human pathogens and chemical and may provide a direct pathway for chemicals, nitrates, and pesticides from the ground surface to the aquifer. | Inner Protection Zone |
| Hazardous Waste Handlers (RCRIS) <sup>1</sup>           | 1                 | Among the potential contaminant sources related to these facilities are: aboveground storage tanks, underground storage tanks, other liquid storage, and bulk material storage. These types of facilities may be associated with the potential for chemical leaks and spills.                                                               | Outer Protection Zone |
| Injection Well (Class III)                              | 1                 | Can pose a threat to underground sources of drinking water and are subject to a permitting requirement through the authorized regulatory agency.                                                                                                                                                                                            | Outer Protection Zone |
| Lagoon (Brine)                                          | 1                 | May provide a direct pathway for salt stored on the surface to enter the aquifer below.                                                                                                                                                                                                                                                     | Outer Protection Zone |
| Leaking Underground Storage Tank                        | 1                 | if not properly addressed, may allow gasoline and chemicals to reach the aquifer.                                                                                                                                                                                                                                                           | Outer Protection Zone |
| NPDES <sup>2</sup> Outfall                              | 1                 | These facilities have a permit from Ohio EPA to discharge effluent to surface water bodies.                                                                                                                                                                                                                                                 | Inner Protection Zone |
| Transportation: RR <sup>3</sup> and Munroe Falls Avenue | 2                 | Have been associated with leaks and spills of gasoline and chemicals.                                                                                                                                                                                                                                                                       | Inner Protection Zone |
| Ohio EPA DERR <sup>4</sup> Sites                        | 1                 | These sites can be associated with the release of Extremely Hazardous Substances (40 CFR; Part 355; Appendix A and B), CERCLA Hazardous Substances (40 CFR Part 302; Table 302.4), and gasoline, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil.                                               | Outer Protection Zone |
| Oil and Gas Wells                                       | 2                 | Potential sources of petroleum and brine, which may leak into an aquifer. Oil, brine, and other fluids may also leak from storage tanks.                                                                                                                                                                                                    | Outer Protection Zone |
| Pond                                                    | 1                 | May provide a direct pathway for spilled chemicals, nitrates, and pesticides from the ground surface to the aquifer.                                                                                                                                                                                                                        | Outer Protection Zone |
| Recreational Areas                                      | 1                 | Improper applications of fertilizers and pesticides can elevate levels of nitrates, ammonia, and pesticides in drinking water sources.                                                                                                                                                                                                      | Outer Protection Zone |

| Potential Contaminant Source | Number of Sources | Environmental Concerns                                                                                                                                                                                                                                                                              | Protection Zone       |
|------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Sewer Line                   | N/A               | If poorly maintained, may be a source of household and business chemicals, viruses, and bacteria.                                                                                                                                                                                                   | Inner Protection Zone |
| Surface Impoundment          | 1                 | Can potentially impact ground water by leaching and/or runoff of contaminants.                                                                                                                                                                                                                      | Outer Protection Zone |
| Water Treatment Plant        | 1                 | Potential contaminant sources in these facilities may include storage areas for laboratory and water treatment chemicals, vehicle storage and maintenance areas, aboveground storage tanks, and underground storage tanks. Water treatment plants may be associated with chemical spills and leaks. | Outer Protection Zone |

<sup>1</sup>RCRIS: Resource Conservation and Recovery Information System

<sup>2</sup>NPDES: National Pollutant Discharge Elimination System

<sup>3</sup>RR: Railroad

<sup>4</sup>DERR: Division of Emergency Remedial Response

**Table 4. Protective Strategies for Consideration by the City of Cuyahoga Falls**

| Potential Contaminant Source                                                   | Protective Strategies To Consider                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>General</b></p>                                                          | <ul style="list-style-type: none"> <li>▶ Purchase additional property or development rights</li> <li>▶ Provide educational material to members of the community on topics regarding the drinking water source protection area.</li> <li>▶ Include drinking water source protection into the local school curriculum.</li> <li>▶ Provide education (material/meetings) to local businesses and industries on topics relating to drinking water source protection.</li> <li>▶ Encourage 'ground water friendly' development.</li> <li>▶ Develop/enact/enforce a local ordinance which may include any of the following: changing zoning; requiring registration of existing facilities; banning certain new types of activities; dictating chemical handling procedures; maintaining/filing a chemical inventory; facility spill/contingency planning; engineering controls for existing/new facilities; paralleling existing federal or state requirements.</li> </ul>                                                      |
| <p><b>Aboveground Storage Tanks and Bulk Liquid Storage (drums, totes)</b></p> | <ul style="list-style-type: none"> <li>▶ Provide education (material/meetings) local businesses on topics such as testing and maintenance requirements.</li> <li>▶ Monitor compliance with existing regulations through inspections and/or contact with regulatory agencies (such as the local fire department or the Ohio EPA).</li> <li>▶ Encourage/arrange hazardous materials training for local businesses and their employees.</li> <li>▶ Develop an early release notification system for spills.</li> <li>▶ Educate emergency responders to be aware of drinking water protection areas.</li> <li>▶ Develop/enact/enforce a local ordinance which may include any of the following: changing zoning; requiring registration of existing facilities; banning certain new types of activities; dictating chemical handling procedures; maintaining/filing a chemical inventory; facility spill/contingency planning; engineering controls for existing/new facilities; paralleling U.S. EPA requirements.</li> </ul> |

| Potential Contaminant Source                       | Protective Strategies To Consider                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Commercial Sources</b>                          | <ul style="list-style-type: none"> <li>▶ Monitor compliance with existing regulations through inspections and/or contact with regulatory agencies.</li> <li>▶ Use routine inspections as an educational opportunity.</li> <li>▶ Encourage compliance with materials handling procedures/requirements.</li> <li>▶ Encourage/arrange hazardous materials training or waste and disposal assessments for local businesses (and their employees).</li> <li>▶ Request installation of engineering controls for existing facilities.</li> <li>▶ Encourage facility spill/contingency planning in conjunction with the fire department.</li> <li>▶ Encourage local businesses to implement pollution prevention strategies.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Hazardous Substances</b>                        | <ul style="list-style-type: none"> <li>▶ Provide education (material/meetings) local industries on appropriate topics.</li> <li>▶ Use routine inspections as an educational opportunity.</li> <li>▶ Monitor compliance with existing regulations through inspections and/or contact with regulatory agencies.</li> <li>▶ Encourage compliance with materials handling procedures/requirements.</li> <li>▶ Encourage/arrange hazardous materials training for local industries and their employees.</li> <li>▶ Encourage/arrange waste and disposal assessments for local businesses.</li> <li>▶ Request installation of engineering controls for existing facilities.</li> <li>▶ Encourage facility spill/contingency planning ( also consider working with fire department).</li> <li>▶ Encourage local businesses to implement pollution prevention strategies.</li> <li>▶ Municipally led emergency planning.</li> <li>▶ Develop/enact/enforce a local ordinance which may include any of the following: changing zoning; requiring registration of existing facilities; banning certain new types of activities; dictating chemical handling procedures; maintaining/filing a chemical inventory; facility spill/contingency planning; engineering controls for existing/new facilities.</li> </ul> |
| <b>Household and Small Business Waste Disposal</b> | <ul style="list-style-type: none"> <li>▶ Develop/enact/enforce a local ordinance on illegal waste disposal.</li> <li>▶ Identify areas used for illegal dumping.</li> <li>▶ Increase public awareness of illegal dumping and drinking water protection.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

**Potential Contaminant Source**

**Protective Strategies To Consider**

**Industrial Sources**

- ▶ Provide education (material/meetings) local industries on appropriate topics.
- ▶ Use routine inspections as an educational opportunity.
- ▶ Monitor compliance with existing regulations through inspections and/or contact with regulatory agencies.
- ▶ Encourage compliance with materials handling procedures/requirements.
- ▶ Encourage/arrange hazardous materials training for local industries and their employees.
- ▶ Encourage/arrange waste and disposal assessments for local businesses.
- ▶ Encourage 'ground water friendly' development.
- ▶ Request installation of engineering controls for existing facilities.
- ▶ Encourage facility spill/contingency planning in conjunction with the fire department.
- ▶ Encourage local businesses to implement pollution prevention strategies.
- ▶ Develop/enact/enforce a local ordinance which may include any of the following: changing zoning; requiring registration of existing facilities; banning certain new types of activities; dictating chemical handling procedures; maintaining/filing a chemical inventory; facility spill/contingency planning; engineering controls for existing/new facilities.

**Municipal Sources**

- ▶ Monitor compliance with existing regulations through inspections and/or contact with regulatory agencies (such as the local fire department, State Fire Marshal, or the Ohio EPA).
- ▶ Encourage/arrange hazardous materials training or waste and disposal assessments for employees.
- ▶ Develop an early release notification system for spills and emergency planning; educate emergency responders to be aware of drinking water protection areas; or coordinate facility spill/contingency planning.
- ▶ Encourage compliance with materials handling procedures/requirements.
- ▶ Install of engineering controls at municipal facilities
- ▶ Implement pollution prevention strategies.
- ▶ Work with the street department and Ohio Department of Transportation (Ohio DOT) to minimize use of road salt.
- ▶ Evaluate and close fire cisterns or other city owned wells.
- ▶ Conduct routine sewer inspections, maintenance and upgrades.

| Potential Contaminant Source               | Protective Strategies To Consider                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Oil and Gas Wells</b></p>            | <ul style="list-style-type: none"> <li>▶ Provide education (material/meetings) to owners and land owners on maintenance.</li> <li>▶ Ensure/monitor proper operation and maintenance.</li> <li>▶ Develop an early release notification system for spills.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p><b>Residential Sources</b></p>          | <ul style="list-style-type: none"> <li>▶ Inventory/remove underground home heating oil tanks in the protection area.</li> <li>▶ Identify areas used for illegal dumping.</li> <li>▶ Provide education (material/meetings) to home owners on: drinking water protection; use/maintenance of septic systems; illegal dumping; proper well abandonment (both the reason and the process).</li> <li>▶ Develop a centralized wastewater collection/treatment system.</li> <li>▶ Encourage/require (and provide incentives) for sealing unused wells.</li> <li>▶ Ensure enforcement of existing requirements for closing unused wells.</li> <li>▶ Ensure the proper construction of new wells.</li> </ul> |
| <p><b>Road Salt and Yard Chemicals</b></p> | <ul style="list-style-type: none"> <li>▶ Work with the street department and Ohio DOT to minimize use.</li> <li>▶ Provide education (material/meetings) on proper storage and handling to users.</li> <li>▶ Store in an enclosed building.</li> <li>▶ Develop/enact/enforce a local ordinance which may include any of the following: changing zoning; requiring registration of existing facilities; banning certain new types of activities; dictating chemical handling procedures.</li> </ul>                                                                                                                                                                                                   |

**Potential Contaminant Source**

**Protective Strategies To Consider**

**Small Businesses**

- ▶ Provide education (material/meetings) local businesses on appropriate topics.
- ▶ Use routine inspections as an educational opportunity.
- ▶ Monitor compliance with existing regulations through inspections and/or contact with regulatory agencies.
- ▶ Encourage compliance with materials handling procedures/requirements.
- ▶ Encourage/arrange hazardous materials training for local businesses and their employees.
- ▶ Encourage/arrange waste and disposal assessments for local businesses.
- ▶ Encourage 'ground water friendly' development.
- ▶ Request installation of engineering controls for existing facilities.
- ▶ Encourage facility spill/contingency planning (also consider working with fire department).
- ▶ Encourage local businesses to implement pollution prevention strategies.
- ▶ Municipally led emergency planning.
- ▶ Develop/enact/enforce a local ordinance which may include any of the following: changing zoning; requiring registration of existing facilities; banning certain new types of activities; dictating chemical handling procedures; maintaining/filing a chemical inventory; facility spill/contingency planning; engineering controls for existing/new facilities.

**Spills**

- ▶ Develop an early release notification system for spills and an emergency response plan.
- ▶ Include drinking water protection in response planning and response personnel training.
- ▶ Conduct routine sewer inspections, maintenance & upgrades.
- ▶ Work with local transporters on protection area awareness.
- ▶ Post signs indicating the extent of the protection area.

**Transportation**

- ▶ Create hazardous materials routes around the protection area and require/encourage transporters to use them.
- ▶ Include drinking water protection in response planning and response personnel training.
- ▶ Work with local transporters on protection area awareness.
- ▶ Encourage road safety with chemicals.
- ▶ Coordinate activities with other public water systems
- ▶ Post signs indicating the extent of the protection area.

| Potential Contaminant Source             | Protective Strategies To Consider                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Underground Storage Tanks</b></p>  | <ul style="list-style-type: none"> <li>▶ Provide education (material/meetings) local businesses on topics such as testing and maintenance requirements.</li> <li>▶ Monitor compliance with existing regulations through inspections and/or contact with regulatory agencies (such as the local fire department or the State Fire Marshal).</li> <li>▶ Encourage/arrange hazardous materials training for local businesses and their employees.</li> <li>▶ Develop an early release notification system for spills.</li> <li>▶ Inventory/remove underground home heating oil tanks in the protection area.</li> <li>▶ Remove all municipally owned underground storage tanks in the protection area.</li> <li>▶ Educate emergency responders to be aware of drinking water protection areas.</li> <li>▶ Develop/enact/enforce a local ordinance which may include any of the following: changing zoning; requiring registration of existing facilities; banning certain new types of activities; dictating chemical handling procedures; maintaining/filing a chemical inventory; facility spill/contingency planning; engineering controls for existing/new facilities; paralleling BUSTR requirements.</li> </ul> |
| <p><b>Vehicle Service Facilities</b></p> | <ul style="list-style-type: none"> <li>▶ Provide education (material/meetings) local industries on appropriate topics.</li> <li>▶ Use routine inspections as an educational opportunity.</li> <li>▶ Monitor compliance with existing regulations through inspections and/or contact with regulatory agencies.</li> <li>▶ Encourage local businesses to implement pollution prevention strategies.</li> <li>▶ Develop/enact/enforce a local ordinance which may include any of the following: changing zoning; requiring registration of existing facilities; banning certain new types of activities; dictating chemical handling procedures; maintaining/filing a chemical inventory; facility spill/contingency planning; engineering controls for existing/new facilities.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p><b>Surface Water Bodies</b></p>       | <ul style="list-style-type: none"> <li>▶ Develop an early release notification system for spills impacting rivers, streams, lakes, and ponds.</li> <li>▶ Increased monitoring if spills are reported.</li> <li>▶ Coordinate activities with other public water systems.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |