

Drinking Water Source Assessment for the Village of Archbold



SUMMARY

Source Water Assessment and Protection. The following report for the Village of Archbold was compiled as part of the Source Water Assessment and Protection Program for Ohio. This program is intended to identify drinking water protection areas and provide information on how to reduce the risk of contamination of the waters within those areas. The goal of the program is to ensure the long term availability of abundant and safe drinking water for the present and future citizens of Ohio.

The Safe Drinking Water Act Amendments of 1996 established the national Source Water Assessment and Protection Program, targeting drinking water sources for all public water systems in the United States. A public water system is a facility that provides drinking water to 15 or more service connections or that regularly serves at least 25 people a day for at least 60 days a year, whether from an underground well or spring, or from an above ground stream, lake, or reservoir. The requirement does not address residential wells or cisterns. In Ohio there are approximately 5,800 public water systems.

Background. The Village of Archbold operates a community public water system that serves a population of approximately 5,144 people. The source is surface water taken from the Tiffin River and Brush Creek. The system's treatment capacity is approximately 5.184 million gallons per day, but current average production is about 1.93 million gallons per day.

Protection Areas. The drinking water source protection area for the surface water source is shown in the following figure. This report includes the results of an inventory of

all known or identified potential contaminant sources within the drinking water protection area. The inventory was conducted by Ohio EPA with the assistance of Rick Schantz, Superintendent of Water. Possible threats to the surface water source include agricultural runoff, industrial storm water, gas station runoff, home construction, confined and unconfined feedlot runoff, gas line rupture, unsewered areas, recycling facility runoff, wastewater treatment discharges, silage, pasture, farm machinery repair areas, pesticide/fertilizer/ petroleum above ground tank storage, lawn/farm stores, municipal garages, fleet truck area, furniture manufacturing and finishing, inactive and closed landfills, auto repair shops, wood mill, machine and metal working shops, car dealerships, underground storage tanks and combined sewer overflows.

Protective Strategies. The ultimate goal of source water assessment is implementation of protective strategies that will better protect the drinking water source. Strategies for protecting the Tiffin River and Brush Creek should include controlling runoff from agricultural areas, establishment of an early warning and emergency response plan for spills, controlling home and commercial septic system discharges from failing systems, coordination with local emergency response agencies, and evaluation of the potential impacts from wastewater treatment plant sludge application within the protection area.

The Village of Archbold and other jurisdictions comprising the protection areas are encouraged to develop a local protection plan to protect the source of drinking water or to update current emergency management plans as

applicable. Guidance on how to form a Drinking Water Protection Team and protection plan is available from Ohio EPA by calling (614) 644-2752.

Local watershed planning efforts also help protect drinking water sources. The Black Swamp Conservancy is a local watershed group located at 115 West Front Street in Perrysburg, Ohio. Please contact Tim Schetter, Executive Director at 419-872-8197 for additional information.

For More Information. Additional information on protective strategies and how this assessment was completed is included in the detailed Drinking Water Source Assessment Report for the Village of Archbold.

For information on how to obtain a copy of this report, please visit Ohio EPA's Source Water Assessment and Protection Program Web page at <http://www.epa.state.oh.us/ddagw/pdu/swap.html> or contact the Village of Archbold for a copy.

Current information on the quality of the treated water supplied by the Village of Archbold is available in the Consumer Confidence Report (CCR) for the Village of Archbold Public Water System. The CCR is distributed annually and reports the most current detected contaminants and any associated health risks from data collected during the past five years. Consumer Confidence Reports are available from the Village of Archbold.



Summary Figure - Village of Archbold Drinking Water Source Protection Area

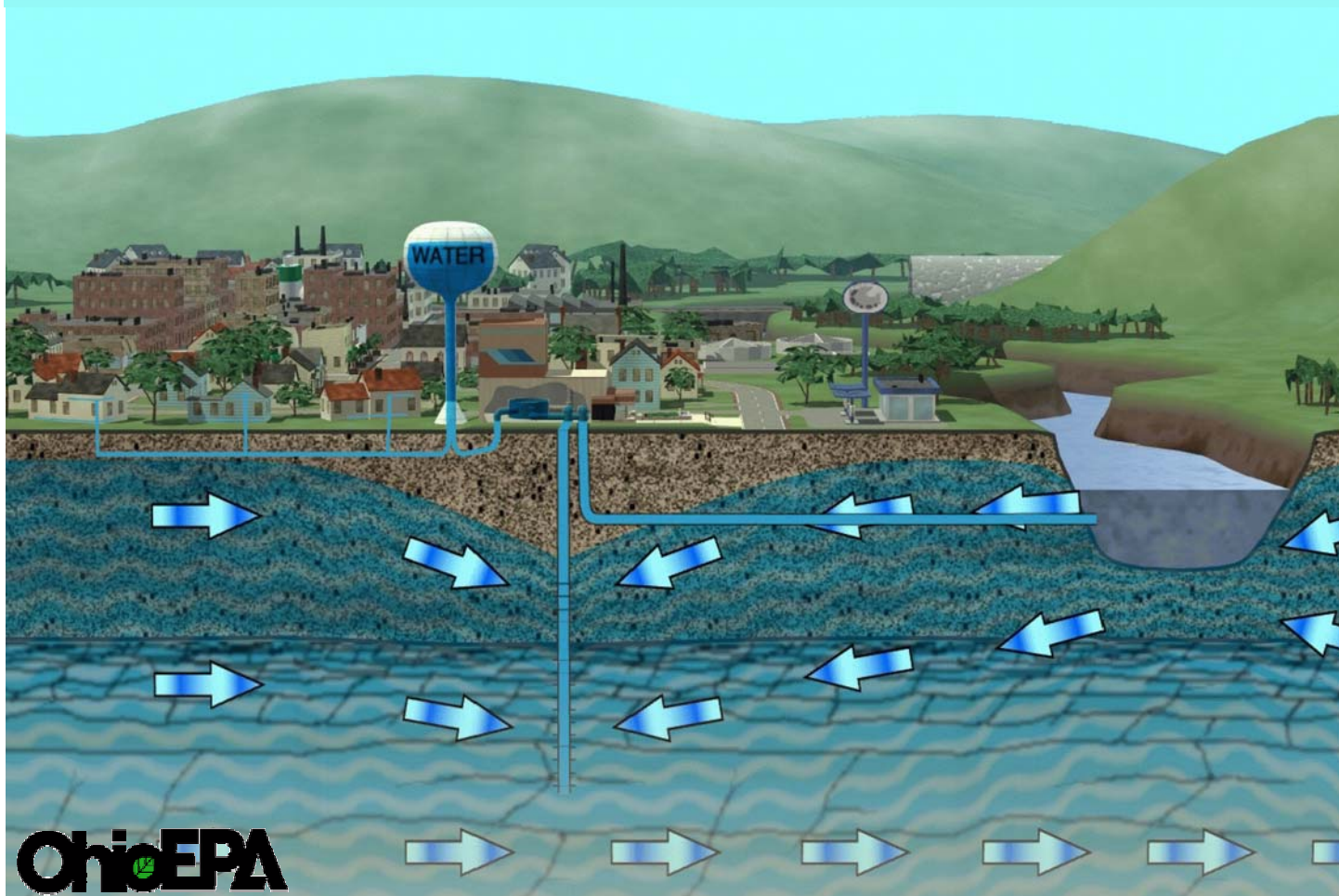
Drinking Water Source Assessment for the Village of Archbold

Public Water System # 2600011

Fulton County

Prepared by:
Ohio Environmental Protection Agency
Division of Surface Water
Division of Drinking and Ground Waters
Northwest District Office

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How to Use this Assessment

Clean and safe drinking water is essential to everyone. Protecting the source of drinking water is a wise and cost effective investment. The purpose of this drinking water source assessment is to provide information your community can use to develop a local Drinking Water Protection Program. The Drinking Water Source Assessment benefits your community by providing the following:

A basis for focusing limited resources within the community to protect the drinking water source(s).

The assessment provides your community with information regarding activities within the Drinking Water Source Protection Area that directly affect your water supply source area. It is within this area that a release of contaminants, from a spill or improper usage, may travel through the watershed and reach the surface water intake. By examining where the source waters are most sensitive to contaminants, and where potential contaminants are located, the assessment identifies the potential risks that should be addressed first.

A basis for informed decision-making regarding land use within the community.

The assessment provides your community with a significant amount of information regarding where your drinking water comes from (the source) and what the risks are to the quality of that source. This information allows your community planning authorities to make informed decisions regarding proposed land uses within the protection area that are compatible with both your drinking water resource and the vision of growth embraced by your community.

A start to a comprehensive plan for the watershed and source water area.

This assessment can be the beginning of a comprehensive plan for the water resource, one that addresses all of the uses the water resource provides. An ecologically healthy lake, stream and watershed will provide a stable, high quality resource for drinking water.

For information about developing a local Drinking Water Source Protection Program, please contact the Ohio EPA Division of Drinking and Ground Waters at (614) 644-2752 or visit the Division's web site at <http://www.epa.state.oh.us/ddagw/pdu/swap.html>.

1.0 INTRODUCTION

The 1996 Amendments to the Safe Drinking Water Act established a program for states to assess the drinking water source for all public water systems. The Source Water Assessment and Protection (SWAP) Program is designed to help Ohio's public water systems protect their sources of drinking water from becoming contaminated.

The purpose of this assessment is to identify where and how the Village of Archbold's source waters are at risk of contamination. The report

- identifies the drinking water source protection area,
- examines the characteristics of the watershed and the water quality,
- inventories the potential contaminant sources within that area, and discusses the susceptibility of the system to contamination.

Finally, the report suggests actions that the public water supplier and local community may take to reduce the risk of contaminating their source of drinking water and ensure the long term availability of abundant and safe drinking water resources.

Results and recommendations presented in this report are based on the information available at the time of publication. Ohio EPA recognizes that additional information may become available in the future that could be used to more accurately determine the drinking water source protection area. Also, changes in land use may occur after Ohio EPA completes the potential contaminant source inventory. This report should be used as a starting point to develop a plan to protect drinking water resources.

This report was prepared by Dana Martin-Hayden and Janet Hageman, Ohio EPA Northwest District Office, Division of Surface Water.

2.0 PUBLIC WATER SYSTEM DESCRIPTION

The Village of Archbold operates a community public water system that serves a population of approximately 5,144 people through 2,212 service connections. A community public water system is a system that regularly supplies drinking water from its own sources to at least 15 service connections used by year-round residents of the area or regularly serves 25 or more people throughout the entire year. The water treatment system obtains its water from Tiffin River and Brush Creek. The system's treatment capacity is approximately 5.184 million gallons per day, but current average production is 1.93 million gallons per day. Water is pumped from the Tiffin River and Brush Creek to upground reservoirs for storage prior to treatment. The Village of Archbold's treatment processes include coagulation, lime softening, flocculation, sedimentation, stabilization, filtration, fluoridation, and disinfection.

3.0 DRINKING WATER SOURCE PROTECTION AREA

The **Drinking Water Source Protection Area** (protection area) for an inland stream is defined as the drainage area upstream of the point where the water is withdrawn from a surface source such as a stream, lake or reservoir. The protection area is subdivided into corridor and emergency management zones. An illustration of the protection areas and corridor management zones for the Village of Archbold Public Water System are shown in Figure 1. The emergency management zones for the northern and southern protection areas are shown in Figures 2 and 3, respectively.

The **Corridor Management Zone, (CMZ)**, is an area along streams and tributaries within the

source water assessment area that warrants delineation, inventory, and management. Typically, this zone runs a total of ten miles upstream from the intake, and includes the tributaries that drain into it. The zone is 1,000 feet wide on each side of the Tiffin River and Brush Creek mainstem and 500 feet wide on each side of any tributaries.

The **Emergency Management Zone, (EMZ)**, is defined as an area in the immediate vicinity of the surface water intake in which the public water system operator has little or no time to respond to a spill. The boundary of the emergency management zone is delineated in cooperation with the water supplier. Figures 2 and 3 show the boundaries of the emergency management zone for the Village of Archbold's north and south protection areas. The Village of Archbold's Emergency Management Zone (EMZ) is an area in the immediate vicinity of the Tiffin River and Brush Creek intake structure and the upland reservoir. This zone is defined as a semi-circle that extends 500 feet upstream and 100 feet downstream of the intake.

The corridor and emergency management zones were the focus of field and windshield surveys to inventory potential contaminant sources. Information was also collected during interviews with water treatment plant personnel.

4.0 HYDROLOGIC SETTING

Tiffin River and Brush Creek serve as the surface water source for the Village of Archbold. The Tiffin River is approximately 59.2 miles in length with a drainage area of 777 square miles, and flows into the Maumee River. Its average fall is 1.2 feet per mile. The protection area for the Tiffin River intake covers approximately 338 square miles.

Brush Creek is a tributary of the Tiffin River. It is about 10 miles in length with a drainage area of 24.8 square miles, and flows into Cutoff Ditch, which then flows into the Tiffin River. Its average fall is 3.4 feet per mile. The protection area for the Brush Creek intake covers approximately 27 square miles. Annual average precipitation for both protection areas is approximately 34-35 inches, of which 10-11 inches become surface runoff.

Figure 4 shows the land use within the Village of Archbold's northern and southern protection areas. The predominant land use is agriculture /urban lawns at 75.77% of the total area. The percentage cover for other land uses include: 21.62% wooded, 1.30% Shrub, 0.55% Nonforested Wetlands, 0.41% Urban/impervious, 0.26% Open Water, and 0.09% Barren.

Drinking Water Quality Monitoring Summary

Available chemical and biological water quality data collected from the streams in the protection area, and sampling results from finished water reported to Ohio EPA by the public water supplier were evaluated to characterize water quality. A review of the Village of Archbold compliance monitoring data from 1991-2002 revealed that the system had no health based or maximum contaminant level (MCLs) violations. Table 1 lists contaminants where at least one result was above the level of detection, and does not include all contaminants tested for by the public water system. The table also includes data from the Village of Archbold's participation in Ohio EPA's Pesticide Special Study (1995-1999). Nitrate and low levels of several pesticides (alachlor, atrazine, metolachlor, metribuzin, simazine and cyanazine) were detected in the finished water, indicating an impact from land use activities within the watershed.

It should be recognized that sampling results presented in this report can only provide information on the quality of the water at the time the sample was collected. Water quality may

change over time due to a number of reasons. Therefore, it is recommended that the reader also consult the most recent Consumer Confidence Report (CCR) for the Village of Archbold public water system. All public water systems are required to annually prepare and distribute the CCR to their customers. The report is a good source of information on health effects associated with detected contaminants and contains information on the community's drinking water, including the source of the water, contaminants detected, the likely sources of detected contaminants, and the potential health effects of contaminants at levels above the drinking water standards.

Biological and Chemical Monitoring in the Tiffin River and Brush Creek and its Tributaries

Water quality sampling at sites within the Village of Archbold's Corridor Management Zone was done as part of Biological and Water Quality surveys of the Tiffin River and its tributaries in 1992 and of the Maumee River and its tributaries in 1997. Results from these samples can be obtained by contacting Ohio EPA's Northwest District Office - Division of Surface Water.

Information on the aquatic life use attainment status is available for five sites. The site on Old Bean Creek and the upstream site on Mill Creek (River Mile 7.92) were in non-attainment of the Warmwater Habitat (WWH) use designation. The downstream Mill Creek site (River Mile 1.85) was in partial attainment of the WWH use. Bean Creek and the Tiffin River site (River Mile 48) were in full attainment.

Most of the few exceedences of Ohio EPA Water Quality Criteria (OAC 3745-1) at these sites are associated with high flow conditions following a rainfall event. These results indicate that agricultural nonpoint runoff has a primary influence on water quality in these streams. There were two exceedences of the Lake Erie drainage basin criterion for nitrate-nitrite in Old Bean Creek (River Mile 1.85). This criterion was established for the protection of drinking water and is only directly applicable to waters within 500 yards of a drinking water intake.

5.0 POTENTIAL CONTAMINANT SOURCES

A review of available regulated facility data bases and a field survey of the corridor management zone indicate that 126 potential contaminant sources are located in the Village of Archbold's northern protection area, 41 of them in the corridor management zone, and none in the emergency management zone. There are 26 potential contaminant sources located in the Village's southern protection area, 22 of them in the corridor management zone, and one in the emergency management zone. Table 2 provides a list of the identified potential contaminant sources in the drinking water source protection areas. The locations of potential contaminant sources in the protection areas are shown in Figures 5 through 8.

It is important to note that this inventory represents *potential* contaminant sources, and includes any source that has the *potential* to release a contaminant to surface or ground waters in the protection area. It is beyond the scope of this study to determine whether any specific potential source is actually releasing a contaminant, or to what extent any potential source(s) may be contributing to the overall pollutant load.

The transportation network is a potential source of contamination through vehicular accidents that release hazardous materials. Within the northern protection area there are approximately 799 miles of roads that cross streams at 441 sites, 107 of these within the corridor management zone. There are 7.6 miles of roads located within 100 feet of the river. There are also 24 miles of rail lines, which cross streams at 12 locations. No rail lines are within 100 feet of

streams or within the corridor management zone or emergency management zone.

In the southern protection area there are 63.9 miles of roads that cross the streams at 54 sites, all of which lie within the corridor management zone. There are 3.74 miles of road located within 100 feet of the streams. There are also 5.5 miles of rail lines, which cross streams at three locations, all of them within the corridor management zone. There are 0.14 miles of rail line located within 100 feet of the streams. Figure 9 shows the locations where road and rail lines cross the Tiffin River and Brush Creek or their tributaries within the Village of Archbold's north and south protection areas.

In the protection areas there is extensive petroleum and natural gas production, which has a potential to contaminate surface and ground waters. In the northern protection area there are 23 oil/gas wells; however, only one of them is within the corridor management zone. In the southern protection area there are 47 oil/gas wells, 20 of them located in the corridor management zone. Additionally, in the southern protection area there are 0.04 miles of gas line located within 100 feet of the streams. Figure 9 shows the locations where gas lines cross the Tiffin River and Brush Creek within the Village of Archbold's north and south protection areas.

Pollution impacts related to documented spills are mostly petroleum related, with other releases resulting from industrial, commercial, or agricultural activities.

6.0 SUSCEPTIBILITY ANALYSIS

For the purposes of source water assessments, all surface waters are considered to be susceptible to contamination. By their nature surface waters are accessible and can be readily contaminated by chemicals and pathogens, with relatively short travel times from source to the intake. Based on the information compiled for this assessment, the Village of Archbold's drinking water source protection area is susceptible to agricultural runoff, industrial storm water, gas station runoff, home construction, confined and unconfined feedlot runoff, gas line rupture, unsewered areas, recycling facility runoff, wastewater treatment discharges, silage, pasture, farm machinery repair areas, pesticide/fertilizer/petroleum above ground tank storage, lawn/farm stores, municipal garages, fleet truck area, furniture manufacturing and finishing, inactive and closed landfills, auto repair shops, wood mill, machine and metal working shops, car dealerships, underground storage tanks and combined sewer overflows.

It is important to note that this assessment is based on available data, and therefore may not reflect current conditions in all cases. Water quality, land uses and other activities that are potential sources of contamination may change with time. While the source water for the Village of Archbold Public Water System is considered susceptible to contamination, historically, the Village of Archbold Public Water System has effectively treated this source water to meet drinking water quality standards.

7.0 PROTECTIVE STRATEGIES

Source water protection efforts for the Village of Archbold should focus on controlling agricultural runoff and runoff from cattle grazing pastures; with particular attention to sources of pesticides, nitrates, phosphorus, and microorganisms such as fecal coliform bacteria. This can be accomplished via educational efforts. County Extension agents are an excellent resource for assisting the agricultural community with controlling agricultural runoff, and staff from local and County health offices can instruct homeowners in proper maintenance of their septic systems.

Other source water protection efforts may include:

Education and Outreach: Informing people who live, work, or own property within the protection area about the benefits of drinking water protection is very important. Although some communities develop their own educational outreach resources, assistance is available at no cost from various agencies. For example, staff from Ohio EPA's Office of Pollution Prevention can visit businesses (free of charge) and provide recommendations on how they can modify their processes, materials and practices to generate less pollution in a cost-effective and technically feasible manner. An effort should be made to educate homeowners and businesses of the potential threat their activities can pose to the water supply. Education could also focus on increasing public awareness of illegal dumping and drinking water protection, particularly in recreational boating areas.

Coordination with Existing Activities: Many local groups are engaged in programs that complement a public water system's drinking water source protection efforts. Working with groups such as the Natural Resources Conservation Service, the Soil and Water Conservation District, the Farm Bureau, or a local watershed planning organization ensures coordination of their respective programs. The Black Swamp Conservancy is a local watershed group located at 115 West Front Street in Perrysburg, Ohio. Please contact Tim Schetter, Executive Director at 419-872-8197 for additional information.

Oil and Gas Production: Provide education (material/meetings) to owners and land owners on proper operation and maintenance. Develop an early warning system for accidental spills and releases.

Agricultural Activities: Provide education to local farmers on the use of best management practices to reduce agricultural and animal feedlot runoff, use of proper manure handling facilities, proper handling and road safety with agricultural chemicals, and other methods to control or reduce impacts to surface waters.

Transportation Routes: There is a potential for spills along roads within the protection area. The Village of Archbold may want to consider contacting the local fire department and local emergency planning agency about the location of the drinking water source protection area, so that strategies can be developed to prevent spilled materials from impacting the Tiffin River and Brush Creek.

Emergency Response Planning: The Village of Archbold should prepare a plan that includes early warning of spills and coordination of response and remediation activities for spills that may enter the Tiffin River and Brush Creek. This plan should include emergency response actions for the Tiffin River and Brush Creek, such as the placement of absorbent booms to control oil spills, or the ability to mechanically add oxygen to oxidize chemicals with a high oxygen demand. Different response plans could be developed for different types of contamination. The emergency response plan may also contain strategies for dealing with unexpected levels of runoff containing chemicals such as fertilizers and pesticides from adjacent land uses. Though it may be less catastrophic than a major spill, this kind of contamination is more prevalent and is harder to detect and contain.

Water Quality Monitoring: Monitoring does not directly prevent contamination, but the protection plan will be more effective if the Village of Archbold conducts periodic monitoring of raw water quality and quantity from the Tiffin River and Brush Creek. For example, monitoring data can be used to (1) estimate time-of-travel for a chemical to reach the water treatment intake from various locations in the Tiffin River and Brush Creek; (2) track water quality trends; and (3) evaluate the effectiveness of selected protective strategies. Sampling locations and

schedules could be modified on an emergency basis to monitor spills or the runoff of contaminants that may enter the reservoir.

Zoning Ordinances: A water protection zoning ordinance is a regulatory control that typically places some restrictions or standards on activities conducted within a specified zone (such as the corridor management zone and/or the emergency management zone). Such ordinances enable the municipality to require people who live or work in this area to avoid contaminating the source of the municipality's drinking water. Ordinances can help ensure best management practices are being employed at local businesses and can help reduce the volume of contaminants stored within the protection area. The Village of Archbold may want to consider working with the counties, townships, and municipalities in the protection area to develop zoning overlays that require specific standards for chemical storage, handling of waste materials, and other source control strategies. Several communities in Ohio have enacted very successful drinking water source protection ordinances. Copies can be obtained by contacting Craig Smith at (614) 644-2752.

Regulatory Compliance: Where possible, the Village of Archbold can monitor the compliance of potential contaminant sources with existing regulations through inspections and/or contact with regulatory agencies. If routine inspections are a regulatory requirement, they provide an excellent opportunity to educate an important segment of the community about the importance of drinking water source protection. Inspections also provide an opportunity to encourage improved materials handling procedures, hazardous materials training, waste and disposal assessments, facility spill/contingency planning, and pollution prevention initiatives.

Ohio EPA encourages the Village of Archbold to incorporate the types of protective strategies listed above into a drinking water source protection plan. Two guidance documents are available from Ohio EPA to assist with development of a Drinking Water Source Protection Plan. *A Guide to Developing Local Watershed Action Plans in Ohio* is available on the internet at www.epa.state.oh.us/dsw/hps/wsguide.pdf and *Developing Local Drinking Water Source Protection Plans in Ohio* at www.epa.state.oh.us/ddagw/pdu/swap_psd.pdf. For more information on drinking water source protection please contact the Drinking Water Protection staff at (614) 644-2752.

References

Handbook of Applied Hydrology, A Compendium of Water-Resources Technology, Chow, Ven Te, et al., 1964. Page 21-10.

Gazetteer of Ohio Streams, Second Edition, Ohio Department of Natural Resources, Division of Water. 2001.

Hydrologic Atlas for Ohio. Water Inventory Report No. 28. State of Ohio Department of Natural Resources, Harstine, Leonard J., 1991

Biological and Water Quality Study of the Tiffin River and Selected Tributaries EAS/1993-12-5, Ohio EPA, 1993

NWDO Division of Surface Water Monitoring Data, Ohio EPA, 1982-1997

Table 1. Water Quality Monitoring Summary of Treated Water Village of Archbold Public Water System Ohio EPA Public Water System Compliance Monitoring Database (1991- 2003) Ohio EPA Pesticide Special Study (May 1995 - March 1999)				
Contaminant (units)	Levels Found	Primary MCL	Exceeds MCL ¹	Typical Source
Inorganic Contaminants				
Arsenic (µg/l)	5	50	No	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Fluoride (mg/l)	0.93 - 1.08	4	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Nitrate (mg/l)	0.06 - 4.17	10	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Sulfate (mg/l)	82	none	NA ²	Erosion of natural deposits; decomposition product of organic matter; discharge from mining and industrial waters; detergents in sewage; component of precipitation in metropolitan areas
Radioactive Contaminants				
Beta/photon emitters (pCi/L)	4.2 - 7.0	AL=50	No	Decay of natural and man-made deposits
Synthetic Organic Contaminants including Pesticides and Herbicides				
Alachlor ³ (µg/l)	0.11 - 0.96	2	No	Herbicide runoff
Atrazine ³ (µg/l)	0.10 - 2.0	3	No	Herbicide runoff
Metolachlor ³ (µg/l)	0.07 - 1.68	none	NA	Pesticide runoff
Metribuzin ³ (µg/l)	0.11	none	NA	Pesticide runoff
Simazine ³ (µg/l)	0.12 - 0.77	4	No	Herbicide runoff
Cyanazine ³ (µg/l)	0.08 - 0.95	none	NA	Pesticide runoff
Volatile Organic Contaminants				
Di(2-ethylhexyl) phthalate (µg/l)	4.83 - 7.45	6	No	Discharge from rubber and chemical factories
TTHMs [Total Trihalomethanes] (µg/l)	57 - 133	80	No ⁴	By-product of drinking water chlorination
Bromodichloromethane (µg/l)	6.28 - 26.2	none	NA ⁴	By-product of drinking water chlorination
Chloroform (µg/l)	10.7 - 97.0	none	NA ⁴	By-product of drinking water chlorination
Bromoform (µg/l)	0.55 - 0.99	none	NA ⁴	By-product of drinking water chlorination
Dibromochloromethane (µg/l)	1.6 - 10.1	none	NA ⁴	By-product of drinking water chlorination
Dibromoacetic Acid (µg/l)	1.1 - 3.64	none	NA ⁴	By-product of drinking water chlorination
Dichloroacetic Acid (µg/l)	5.44 - 44.9	none	NA ⁴	By-product of drinking water chlorination
Trichloroacetic Acid (µg/l)	0.799 - 4.77	none	NA ⁴	By-product of drinking water chlorination
Monochloroacetic Acid (µg/l)	9.61	none	NA ⁴	By-product of drinking water chlorination

MCL = Maximum Contaminant Level (AL = Action Level).

¹ MCL set by federal or state drinking water standards. **A sampling result that exceeds the MCL value does not necessarily indicate a violation by the public water system.** MCL violations for many contaminants are based on a running annual average.

² Secondary Maximum Contaminant Level (SMCL) for this parameter. SMCLs are non-health-related limits.

³ Data includes Ohio EPA Pesticide Special Study results (1995-1999). For the study, samples were analyzed using an immunoassay (IA) method and by USEPA Method 507, a gas chromatograph (GC) method. The immunoassay results are only estimations of the actual concentration values. The IA test kits tend to overestimate concentrations, due to cross reactivity of chemically similar pesticides (e.g. atrazine and simazine).

⁴ Total Trihalomethanes (TTHMs): (MCL = 80 µg/l) calculated as the sum of the concentrations of Bromodichloromethane, Dibromochloromethane, Bromoform, and Chloroform. Five Haloacetic Acids (HAA5): (MCL = 60 µg/l) calculated as the sum of the concentrations of Monochloroacetic acid, Dichloroacetic acid, Trichloroacetic acid, Monobromoacetic acid, and Dibromoacetic acid.

Potential Contaminant Sources located in the Village of Archbold's Drinking Water Source Protection Area (Map ID numbers correspond to Figures 6-9)			
Map ID	Unique ID	Source Description	Data Source
0	OHD004496832	Commercial/Industrial	TRIS RCRIS
0	OHD005044458	Commercial/Industrial	TRIS RCRIS AIRS/AFS
0	OHD986989796	Commercial/Industrial	AIRS/AFS
0	OHD986986180	Commercial	RCRIS
0	OHD982628869	Automotive Services	RCRIS
0	OHD400013868	Commercial/Industrial	RCRIS
0	LUST266065500	Commercial	BUSTR: LUST database
0	LUST267037500	Commercial	BUSTR: LUST database
0	OHD982066524	City Services	RCRIS
0	OHT400012480	Industrial	RCRIS
0	OHD982064057	Commercial/Industrial	RCRIS
0	OH0000108985	Commercial	TRIS
0	OHD038712949	Commercial/Industrial	RCRIS
0	OHD077566628	Commercial	RCRIS
4	CEM0145	Cemetery	USGS Geonames
6	LUST268261200	Leaking Underground Storage Tank	BUSTR: LUST database
6	OHD987022050	Commercial/Industrial	TRIS
8	LAN0375	Inactive/Closed Landfill	Lfnew
11	OH0001638147	Wastewater Treatment	National Pollutant Discharge Elimination
13	LUST268265500	Leaking Underground Storage Tank	BUSTR: LUST database
13	LUST267069100	Leaking Underground Storage Tank	BUSTR: LUST database
14	LUST262258501	Leaking Underground Storage Tank	BUSTR: LUST database
14	OHD987022795	Commercial/Industrial	RCRIS
14	LUST262258500	Leaking Underground Storage Tank	BUSTR: LUST database
19	326-1480	Commercial/Industrial	Ohio EPA DERR site
19	OHD097227110	Commercial/Industrial	TRIS RCRIS
21	SIM0615	Wastewater Treatment	
23	OH0001639384	County Services	National Pollutant Discharge Elimination
24	OH0000009142	Commercial/Industrial	RCRIS
25	OHD986984193	Automotive Services	RCRIS
26	LUST261304800	Leaking Underground Storage Tank	BUSTR: LUST database
29	CEM2128	Cemetery	USGS Geonames
30	CEM2161	Cemetery	USGS Geonames
35	LUST263191800	Leaking Underground Storage Tank	BUSTR: LUST database
36	LUST260314400	Leaking Underground Storage Tank	BUSTR: LUST database
38	D2600011038	Automotive Services	Hazardous Waste Handlers regulated by US
42	LUST265036100	Leaking Underground Storage Tank	BUSTR: LUST database
44	D2600011244	Furniture repair/finishing/ manufacturing	Field Inventory
44	OHD005051255	Commercial/Industrial	AIRS/AFS
44	D2600011344	Commercial/Industrial	Field Survey
44	D2600011344	Commercial/Industrial	Field Survey
44	D2600011144	Septic Systems (discharging)	Septic Systems (discharging)
49	CEM4204	Cemetery	USGS Geonames
51	OHD982617144	Automotive	RCRIS
55	OH0001638113	Village Services	PCS
61	LUST268188800	Leaking Underground Storage Tank	BUSTR: LUST database
61	D2600011161	Wastewater treatment plant	Field Survey
63	D2600011163	Above Ground Storage Tanks	Field Survey

Potential Contaminant Sources located in the Village of Archbold's Drinking Water Source Protection Area (Map ID numbers correspond to Figures 6-9)			
Map ID	Unique ID	Source Description	Data Source
63	D2600011063	Silage storage (bulk)	Field Survey
64	D2600011164	Above Ground Storage Tanks	Field Survey
64	D2600011064	Silage storage (bulk)	Field Survey
66	D2600011266	Garages (municipal)	Field Survey
66	D2600011166	Underground Storage Tanks: Unknown Status	Field Survey
66	D2600011066	Above Ground Storage Tanks	Field Survey
69	D2600011069	Above Ground Storage Tanks	Field Survey
69	D2600011169	Silage storage (bulk)	Field Survey
70	D2600011170	Silage storage (bulk)	Field Survey
70	D2600011070	Above Ground Storage Tanks	Field Survey
71	D2600011071	Confined animal feedlots	Field Survey
72	D2600011072	Pasture	Field Survey
73	D2600011073	Above Ground Storage Tanks	Field Survey
74	D2600011074	Above Ground Storage Tanks	Field Survey
75	D2600011075	Above Ground Storage Tanks	Field Survey
76	D2600011076	Above Ground Storage Tanks	Field Survey
77	D2600011077	Above Ground Storage Tanks	Field Survey
79	D2600011079	Lawn/farm stores	Field Survey
80	D2600011080	Pasture	Field Survey
81	D2600011081	Above Ground Storage Tanks	Field Survey
81	D2600011280	Above Ground Storage Tanks	Field Survey
82	D2600011082	Animal feedlots	Field Survey
83	D2600011183	Animal feedlots	Field Survey
83	D2600011083	Silage storage (bulk)	Field Survey
84	D2600011084	Silage storage (bulk)	Field Survey
85	D2600011085	Pasture	Field Survey
86	D2600011086	Pasture	Field Survey
87	D2600011087	Above Ground Storage Tanks	Field Survey
88	D2600011088	Pasture	Field Survey
89	D2600011189	Above Ground Storage Tanks	Field Survey
89	D2600011289	Animal feedlots	Field Survey
89	D2600011089	Silage storage (bulk)	Field Survey
90	D2600011090	Silage storage (bulk)	Field Survey
90	D2600011190	Pesticide/fertilizer/petroleum storage	Field Survey
90	D2600011390	Pasture	Field Survey
90	D2600011290	Above Ground Storage Tanks	Field Survey
91	D2600011091	Pesticide/fertilizer/petroleum storage &	Field Survey
92	D2600011092	Above Ground Storage Tanks	Field Survey
92	D2600011292	Silage storage (bulk)	Field Survey
92	D2600011192	Pesticide/fertilizer/petroleum storage	Field Survey
93	D2600011093	Above Ground Storage Tanks	Field Survey
94	D2600011094	Silage storage (bulk)	Field Survey
94	D2600011194	Above Ground Storage Tanks	Field Survey
95	D2600011095	Confined animal feedlots	Field Survey
96	D2600011296	Silage storage (bulk)	Field Survey
96	D2600011196	Pasture	Field Survey
96	D2600011096	Underground Storage Tanks: Unknown Status	Field Survey
97	D2600011097	Underground Storage Tanks: Unknown Status	Field Survey
98	D2600011098	Above Ground Storage Tanks	Field Survey
99	D2600011299	Pesticide/fertilizer/petroleum	Field Survey
99	D2600011199	Silage storage (bulk)	Field Survey
99	D2600011099	Above Ground Storage Tanks	Field Survey

Potential Contaminant Sources located in the Village of Archbold's Drinking Water Source Protection Area (Map ID numbers correspond to Figures 6-9)			
Map ID	Unique ID	Source Description	Data Source
100	D26000110100	Above Ground Storage Tanks	Field Survey
101	D26000112101	Silage storage (bulk)	Field Survey
101	D26000111101	Underground Storage Tanks: Unknown Status	Field Survey
101	D26000110101	Above Ground Storage Tanks	Field Survey
102	D26000111102	Silage storage (bulk)	Field Survey
102	D26000110102	Above Ground Storage Tanks	Field Survey
103	D26000110103	Above Ground Storage Tanks	Field Survey
104	D26000110104	Silage storage (bulk)	Field Survey
105	D26000110105	Above Ground Storage Tanks	Field Survey
106	D26000110106	Silage Storage (bulk)	Field Survey
107	D26000110107	Auto repair shops/body shops	Field Survey
108	D26000111108	Confined animal feedlots	Field Survey
108	D26000110108	Silage storage (bulk)	Field Survey
109	D26000111109	Silage storage (bulk)	Field Survey
109	D26000110109	Above Ground Storage Tanks	Field Survey
110	D26000111110	Above Ground Storage Tanks	Field Survey
110	D26000110110	Silage storage (bulk)	Field Survey
110	D26000112110	Confined animal feedlots	Field Survey
111	D26000110111	Above Ground Storage Tanks	Field Survey
111	D26000111111	Pasture	Field Survey
111	D26000112111	Silage storage (bulk)	Field Survey
112	D26000111112	Above Ground Storage Tanks	Field Survey
112	D26000110112	Silage storage (bulk)	Field Survey
112	D26000112112	Underground Storage Tanks: Unknown Status	Field Survey
113	D26000110113	Silage storage (bulk)	Field Survey
114	D26000110114	Confined animal feedlots	Field Survey
115	D26000110115	Gas Lines	Field Survey
118	D26000110118	Silage storage (bulk)	Field Survey
119	D26000111119	Above Ground Storage Tanks	Field Survey
119	D26000110119	Animal feedlots	Field Survey
120	D26000110120	Silage storage (bulk)	Field Survey
121	D26000110121	Silage storage (bulk)	Field Survey
122	D26000111122	Above Ground Storage Tanks	Field Survey
122	D26000110122	Silage storage (bulk)	Field Survey
123	D26000112123	Confined animal feedlots	Field Survey
123	D26000111123	Above Ground Storage Tanks	Field Survey
123	D26000110123	Silage storage (bulk)	Field Survey
124	D26000111124	Pesticide/fertilizer/petroleum	Field Survey
124	D26000110124	Silage storage (bulk)	Field Survey
125	D26000110125	Above Ground Storage Tanks	Field Survey
125	D26000111125	Silage storage (bulk)	Field Survey
126	D26000111126	Animal feedlots	Field Survey
126	D26000110126	Silage storage (bulk)	Field Survey
127	D26000110127	Silage storage (bulk)	Field Survey
130	D26000110130	Gas stations (existing & abandoned)	Field Survey
132	D26000110132	Pesticide/fertilizer/petroleum	Field Survey
133	D26000110133	Garages (municipal)	Field Survey
135	D26000112135	Animal feedlots	Field Survey
135	D26000110135	Silage storage (bulk)	Field Survey
135	D26000111135	Above Ground Storage Tanks	Field Survey
136	D26000111136	Confined animal feedlots	Field Survey

Potential Contaminant Sources located in the Village of Archbold's Drinking Water Source Protection Area (Map ID numbers correspond to Figures 6-9)			
Map ID	Unique ID	Source Description	Data Source
136	D26000110136	Silage storage (bulk)	Field Survey
137	D26000110137	Other Commercial Sources	Field Survey
138	D26000110138	Pasture	Field Survey
139	D26000110139	USGS Geonames	Field Survey
140	D26000110140	Silage storage (bulk)	Field Survey
140	D26000111140	Wood/paper/pulp mills	Field Survey
141	D26000110141	Garages (municipal)	Field Survey
141	D26000111141	Above Ground Storage Tanks	Field Survey
142	D26000110142	Other Commercial Sources	Field Survey
144	D26000110144	Above Ground Storage Tanks	Field Survey
145	D26000110145	Above Ground Storage Tanks	Field Survey
146	D26000110146	Above Ground Storage Tanks	Field Survey
146	D26000112146	Farm machinery repair areas	Field Survey
146	D26000111146	Pasture	Field Survey
147	D26000111147	Pesticide/fertilizer/petroleum storage &	Field Survey
147	D26000110147	Silage storage (bulk)	Field Survey
148	D26000110148	Confined animal feedlots	Field Survey
149	D26000110149	Confined animal feedlots	Field Survey
149	D26000111149	Silage storage (bulk)	Field Survey
151	D26000110151	Pesticide/fertilizer/petroleum storage &	Field Survey
152	D26000110152	Recycling facilities	Field Survey
153	D26000110153	Machine/metalworking shops	Field Survey
154	D26000110154	Machine/metalworking shops	Field Survey
155	D26000110155	Funeral services and crematories	Field Survey
156	D26000110156	Above Ground Storage Tanks	Field Survey
157	D26000110157	Pasture	Field Survey
158	D26000111158	Confined animal feedlots	Field Survey
158	D26000112158	Above Ground Storage Tanks	Field Survey
158	D26000110158	Silage storage (bulk)	Field Survey
159	D26000110159	Gravel pits & Quarries	Field Survey
159	D26000111159	Car/boat/camper dealerships	Field Survey
160	D26000110160	Silage storage (bulk)	Field Survey
161	D26000110161	Silage storage (bulk)	Field Survey
161	D26000111161	Confined animal feedlots	Field Survey
162	D26000110162	Pasture	Field Survey
163	D26000110163	Confined animal feedlots	Field Survey
164	D26000113164	Pesticide/fertilizer/petroleum storage	Field Survey
164	D26000111164	Above Ground Storage Tanks	Field Survey
164	D26000111164	Farm machinery repair areas	Field Survey
164	D26000110164	Silage storage (bulk)	Field Survey
165	D26000111165	Above Ground Storage Tanks	Field Survey
165	D26000110165	Silage storage (bulk)	Field Survey
166	D26000110166	Silage storage (bulk)	Field Survey
166	D26000111166	Fleet/truck/bus terminals	Field Survey
167	D26000110167	Above Ground Storage Tanks	Field Survey
168	D26000111168	Confined animal feedlots	Field Survey
168	D26000110168	Silage storage (bulk)	Field Survey
169	D26000110169	Above Ground Storage Tanks	Field Survey
170	D26000110170	Cemetery	Field Survey
171	D26000110171	Other Municipal Sources	Field Survey
172	D26000110172	Underground Storage Tanks: Unknown Statu	Field Survey
173	D26000110173	Above Ground Storage Tanks	Field Survey

Potential Contaminant Sources located in the Village of Archbold's Drinking Water Source Protection Area (Map ID numbers correspond to Figures 6-9)			
Map ID	Unique ID	Source Description	Data Source
174	D26000110174	Confined animal feedlots	Field Survey
175	D26000110175	Auto repair shops/body shops	Field Survey
176	D26000110176	Other Agricultural Sources	Field Survey
177	D26000110177	Garages (municipal)	Field Survey
179	D26000110179	Machine/metalworking shops	Field Survey
179	D26000111179	Above Ground Storage Tanks	Field Survey
180	D26000110180	Above Ground Storage Tanks	Field Survey
181	D26000110181	Above Ground Storage Tanks	Field Survey
182	D26000111182	Above Ground Storage Tanks	Field Survey
182	D26000110182	Silage storage (bulk)	Field Survey
182	D26000112182	Pesticide/fertilizer/petroleum storage	Field Survey
183	D26000110183	Silage storage (bulk)	Field Survey
184	D26000110184	Fleet/truck/bus terminals	Field Survey
184	D26000111184	Underground Storage Tanks: Unknown Status	Field Survey
185	D26000110185	Furniture repair/finishing/ manufacturing	Field Survey
185	D26000111185	Fleet/truck/bus terminals	Field Survey
189	D26000110189	Combined Sewer overflows	Field Survey
190	D26000110190	Combined Sewer overflows	Field Survey
191	D26000110191	Combined Sewer overflows	Field Survey
192	D26000110192	Combined Sewer overflows	Field Survey
193	D26000110193	Combined Sewer overflows	Field Survey
194	D26000110194	Combined Sewer overflows	Field Survey
195	D26000110195	Combined Sewer overflows	Field Survey
196	D26000110196	Combined Sewer overflows	Field Survey
197	D26000110197	Combined Sewer overflows	Field Survey
198	D26000110198	Combined Sewer overflows	Field Survey
199	D26000110199	Combined Sewer overflows	Field Survey
200	D26000110200	Combined Sewer overflows	Field Survey
201	D26000110201	Combined Sewer overflows	Field Survey
202	D26000110202	Combined Sewer overflows	Field Survey
203	D26000110203	Combined Sewer overflows	Field Survey
204	D26000110204	Septic Systems (discharging) stream	Field Survey
205	D26000110205	National Pollutant Discharge Elimination	Field Survey
206	D26000110206	Underground Storage Tanks: Unknown Status	Field Survey
800	D26000111180	Silage storage (bulk)	Field Survey

Database Explanation

AFS	Airborne Emissions (AIRS) Facilities report releases of pollutants into the air. Airborne pollutants can be deposited in surface waters.
PCS	Facilities that hold a National Pollutant Discharge Elimination System (NPDES) permit. The NPDES permit program controls water pollution by regulating point sources such as pipes or man-made ditches that discharge pollutants into waters of the United States.
RCRIS	Facilities regulated by U.S. EPA under the Resource Conservation and Recovery Act (RCRA) as hazardous waste generators or handlers. These types of facilities may be associated with potential releases of hazardous materials.
TRIS	Toxics Release Inventory (TRI) facilities are industrial facilities that manufacture, process, or import any of over 300 listed toxic chemicals that are released directly into the air, water, or land, or are transported off-site.
Ohio EPA DERR Site	Sites that have been investigated by or are under investigation by Ohio EPA's Division of Emergency and Remedial Response. These types of facilities may be associated with soil, ground water, and surface water contamination from releases of hazardous materials.
LUST	Facilities that have reported a leaking underground storage tank (LUSTs) to Ohio's Bureau of Underground Storage Tank Regulations (BUSTR). Leaking underground storage tanks have been associated soil and water contamination related to leaks and spills of gasoline and other petroleum products. Unused underground storage tanks may be used for the improper disposal of wastes.
Lfnew	Active, proposed, or recently -closed solid waste facilities.

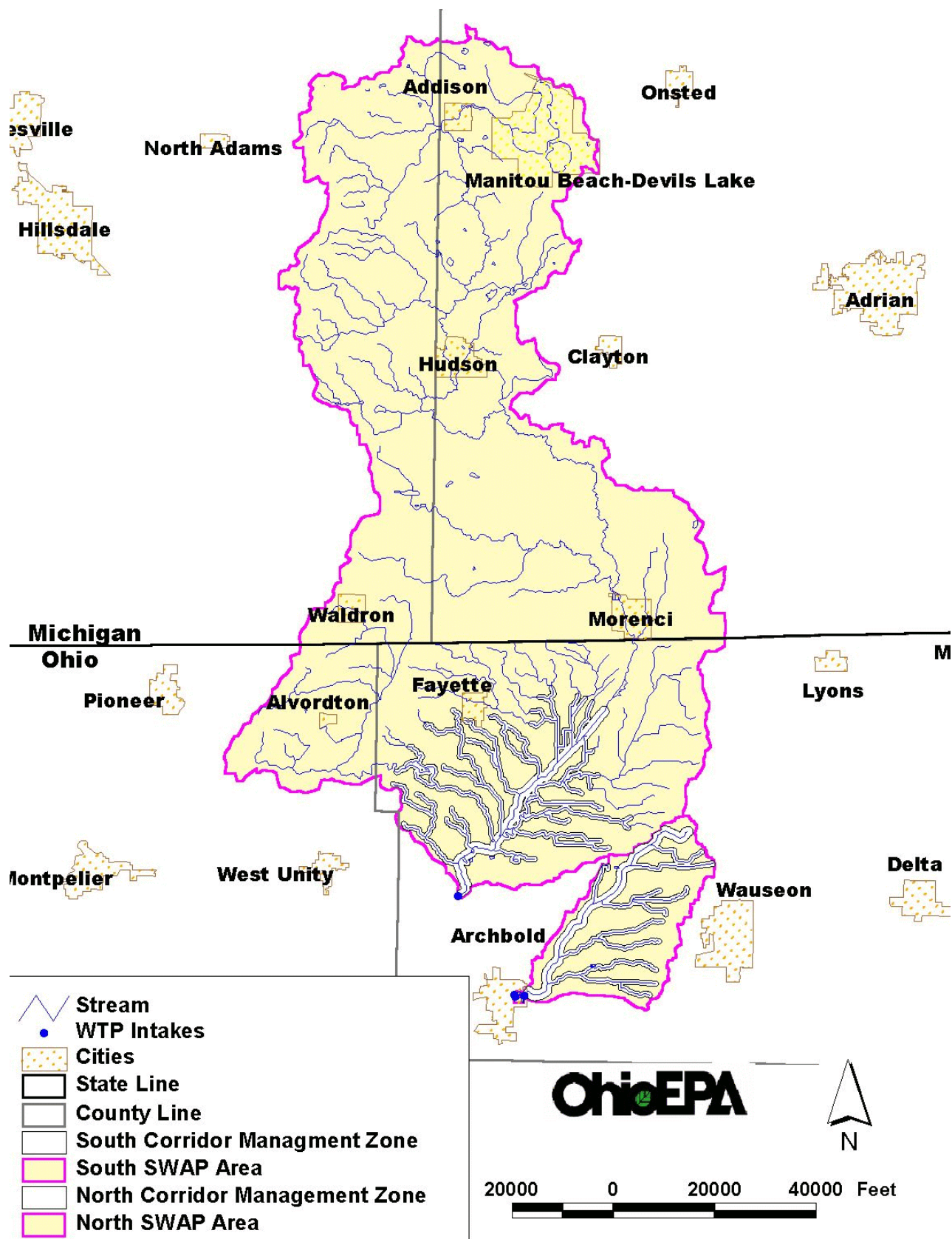


Figure 1 - Village of Archbold Drinking Water Source Protection Areas and Corridor Management Zones

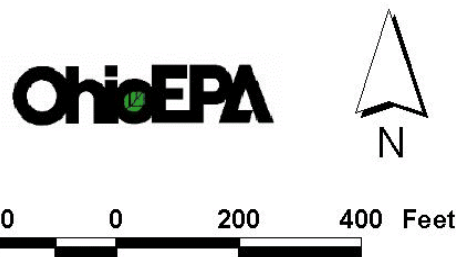
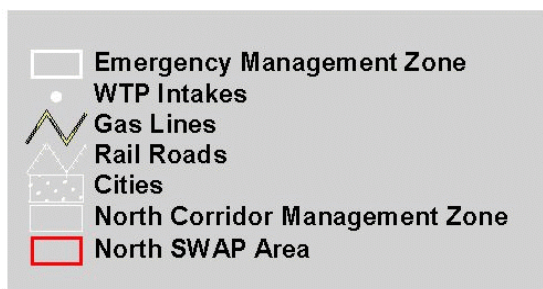


Figure 2 - Emergency Management Zone for the Village of Archbold's Northern Drinking Water Source Protection Area

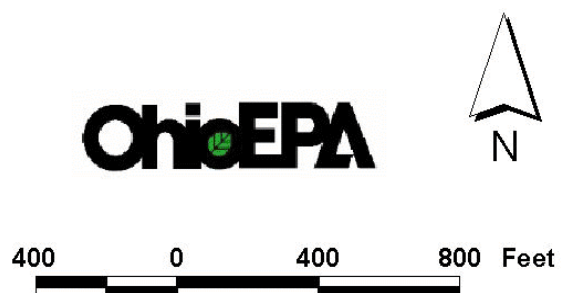
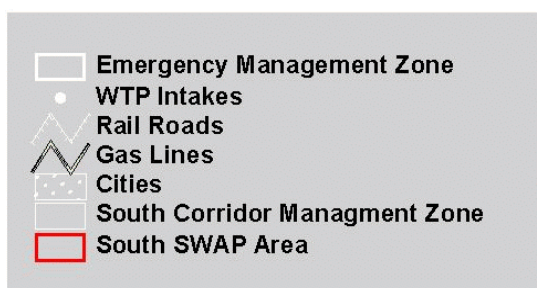


Figure 3 - Emergency Management Zone for the Village of Archbold's Southern Drinking Water Source Protection Area

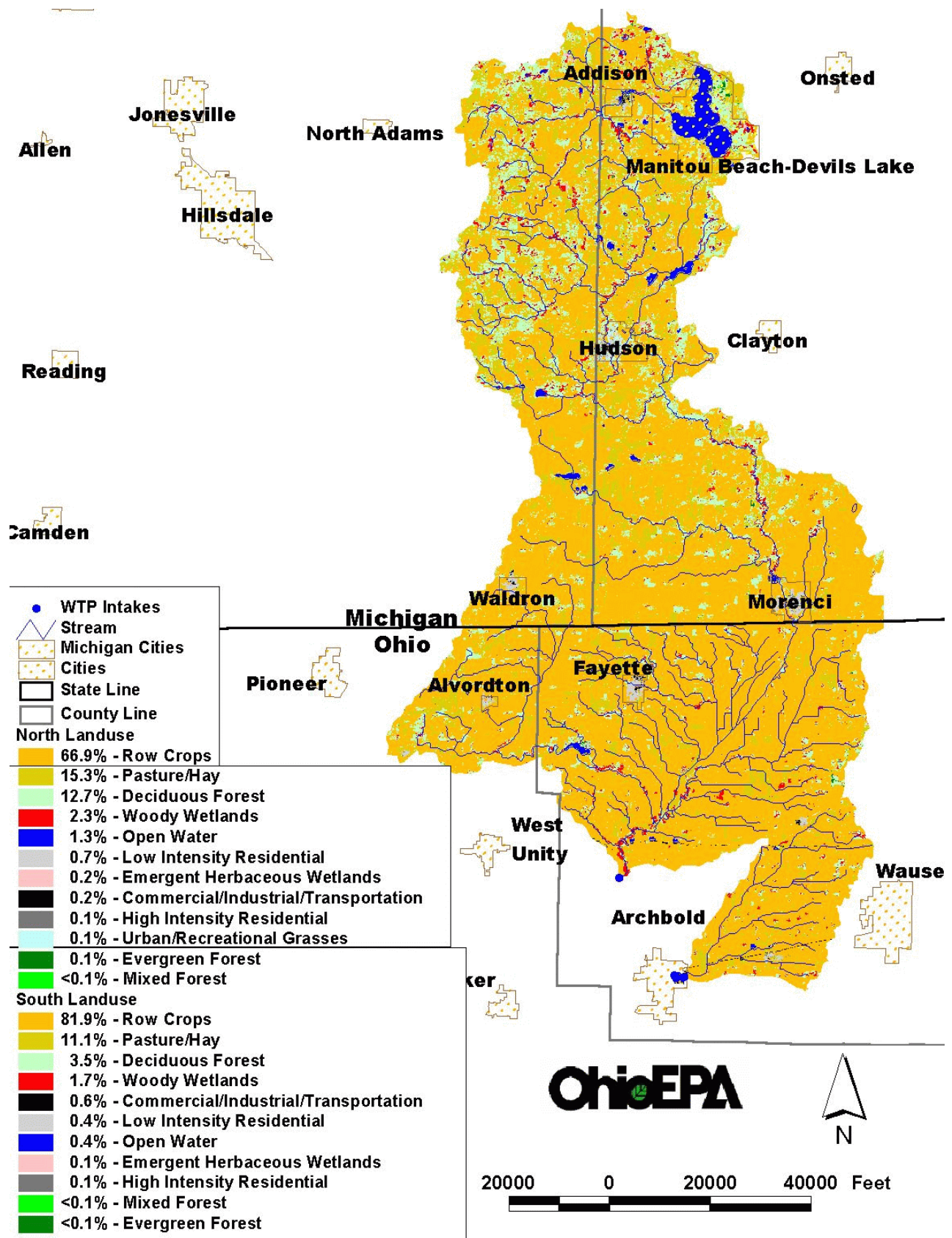


Figure 4 - Land use within the Village of Archbold's Northern and Southern Drinking Water Source Protection Areas

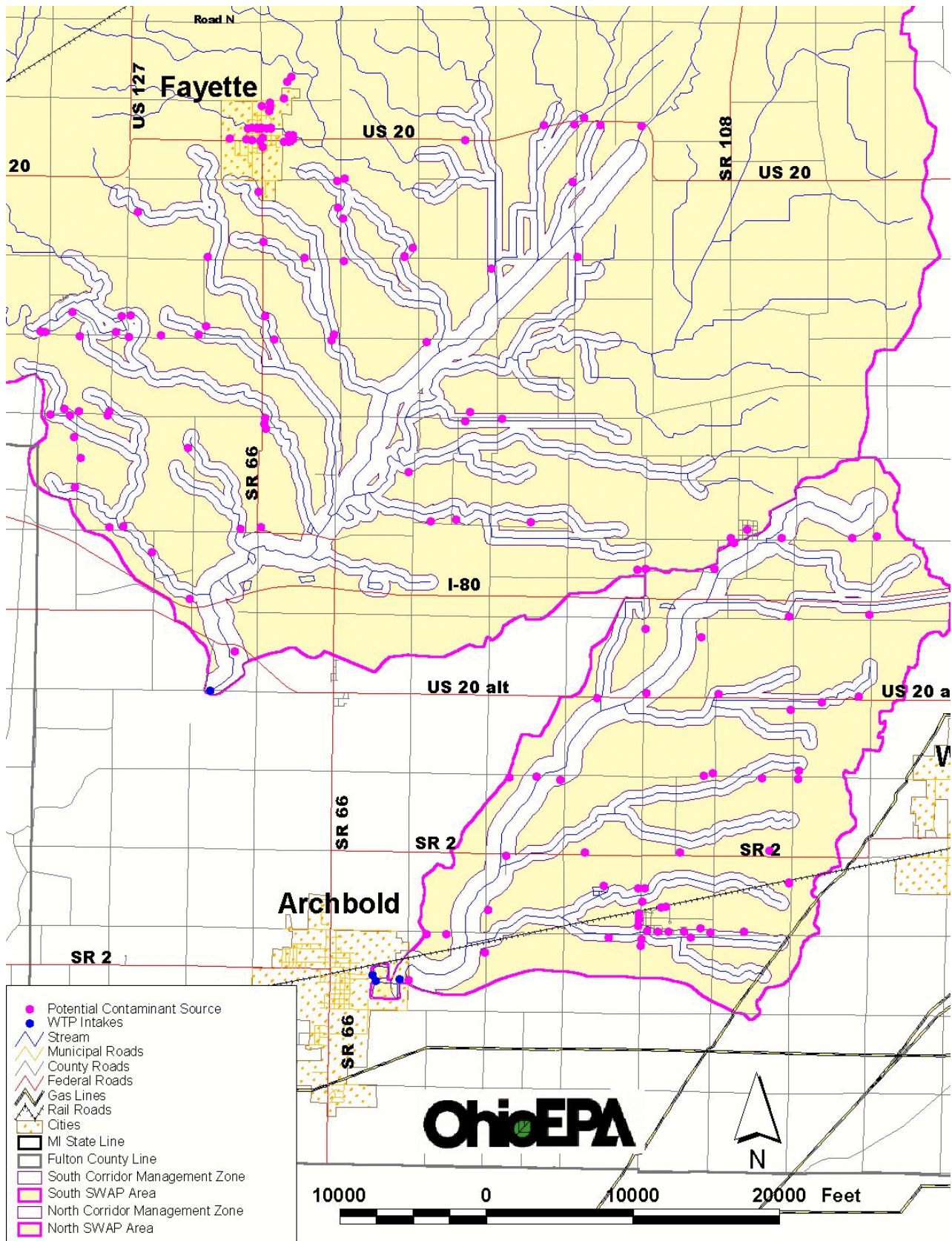


Figure 5 - Potential Contaminant Sources located in the Village of Archbold's North and South Drinking Water Source Protection Areas

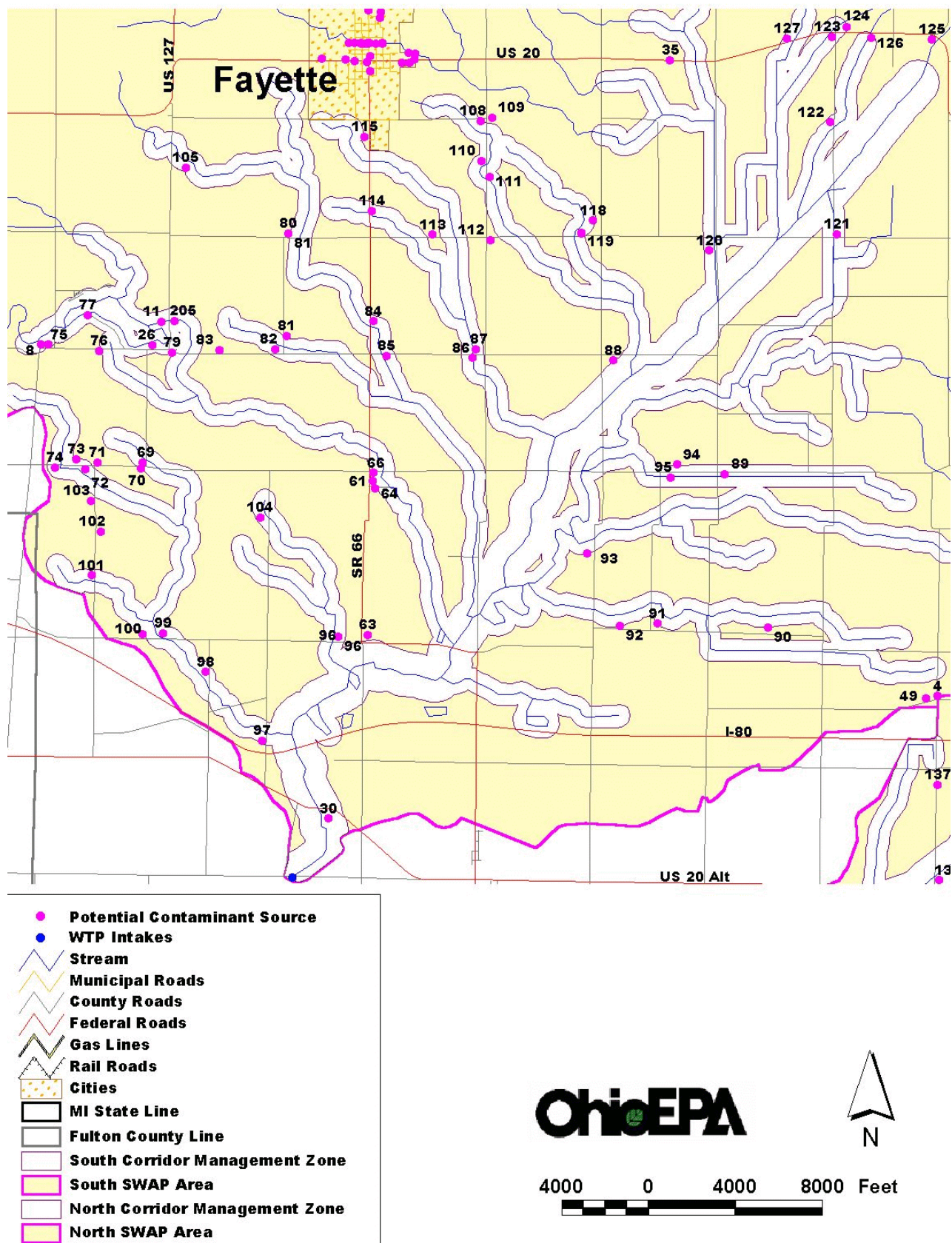


Figure 6 - Potential Contaminant Sources located within the Village of Archbold's Northern Drinking Water Source Protection Area

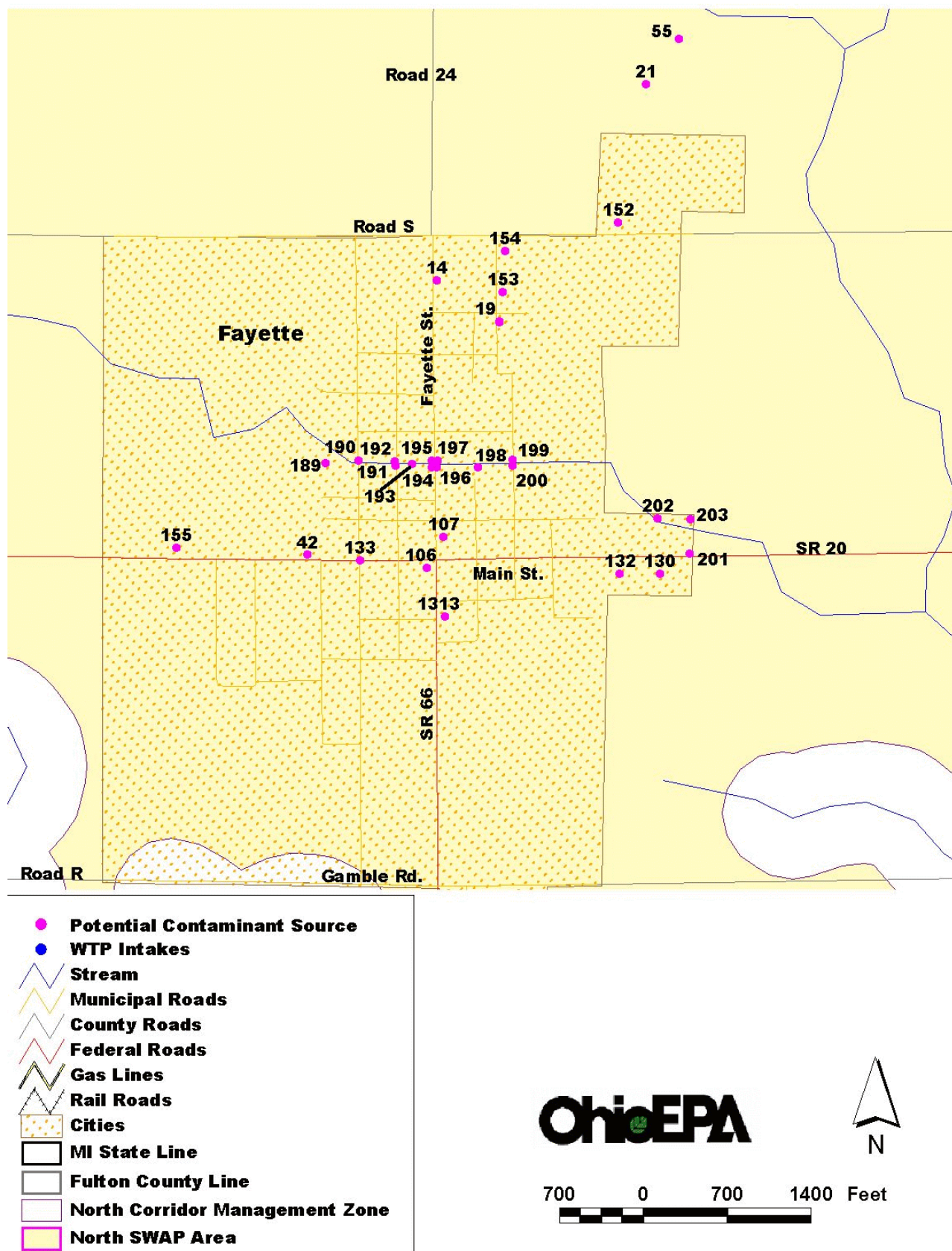


Figure 7 - Potential Contaminant Sources located within the Village of Archbold's Northern Drinking Water Source Protection Area

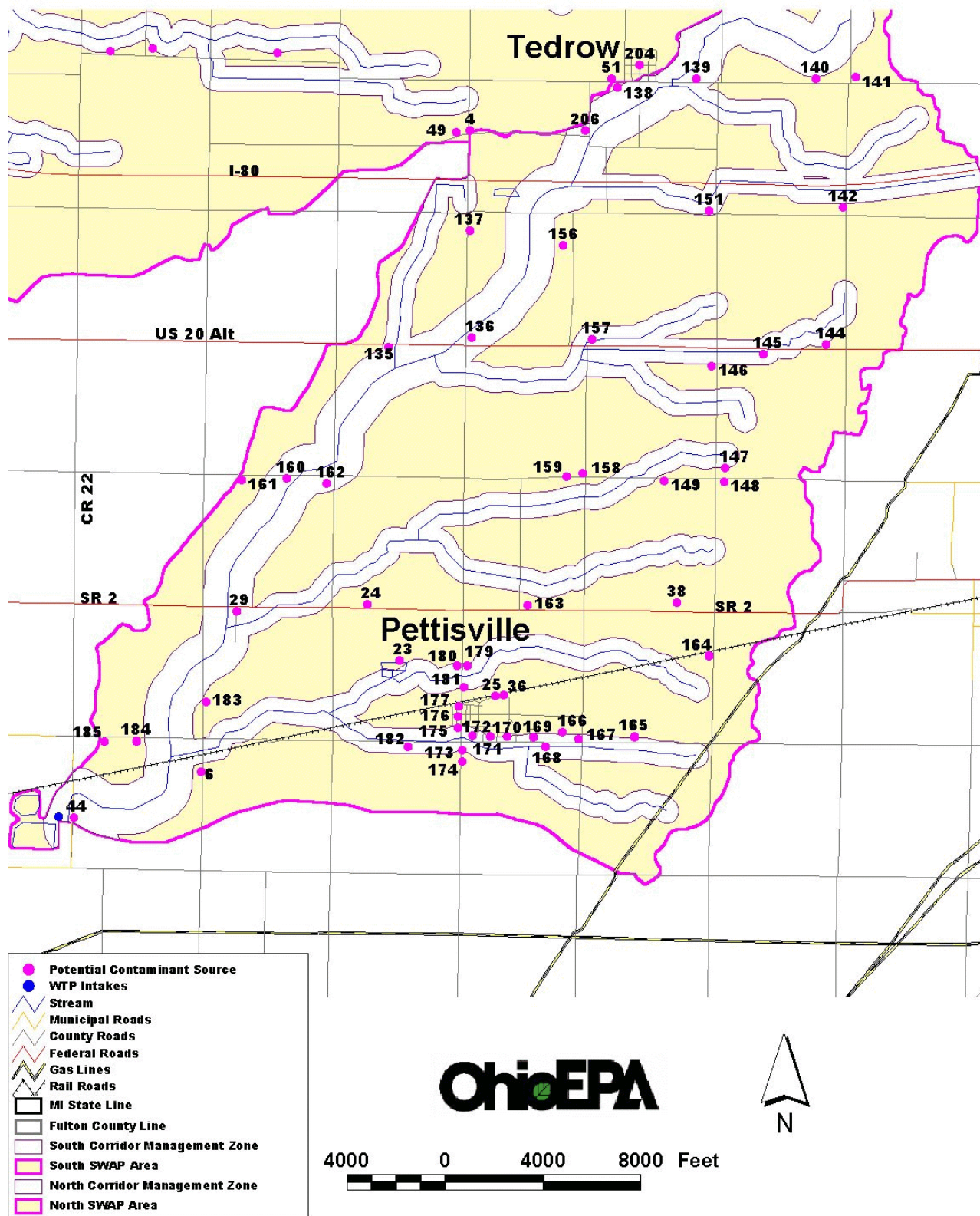


Figure 8 - Potential Contaminant Sources located within the Village of Archbold's Southern Drinking Water Source Protection Area

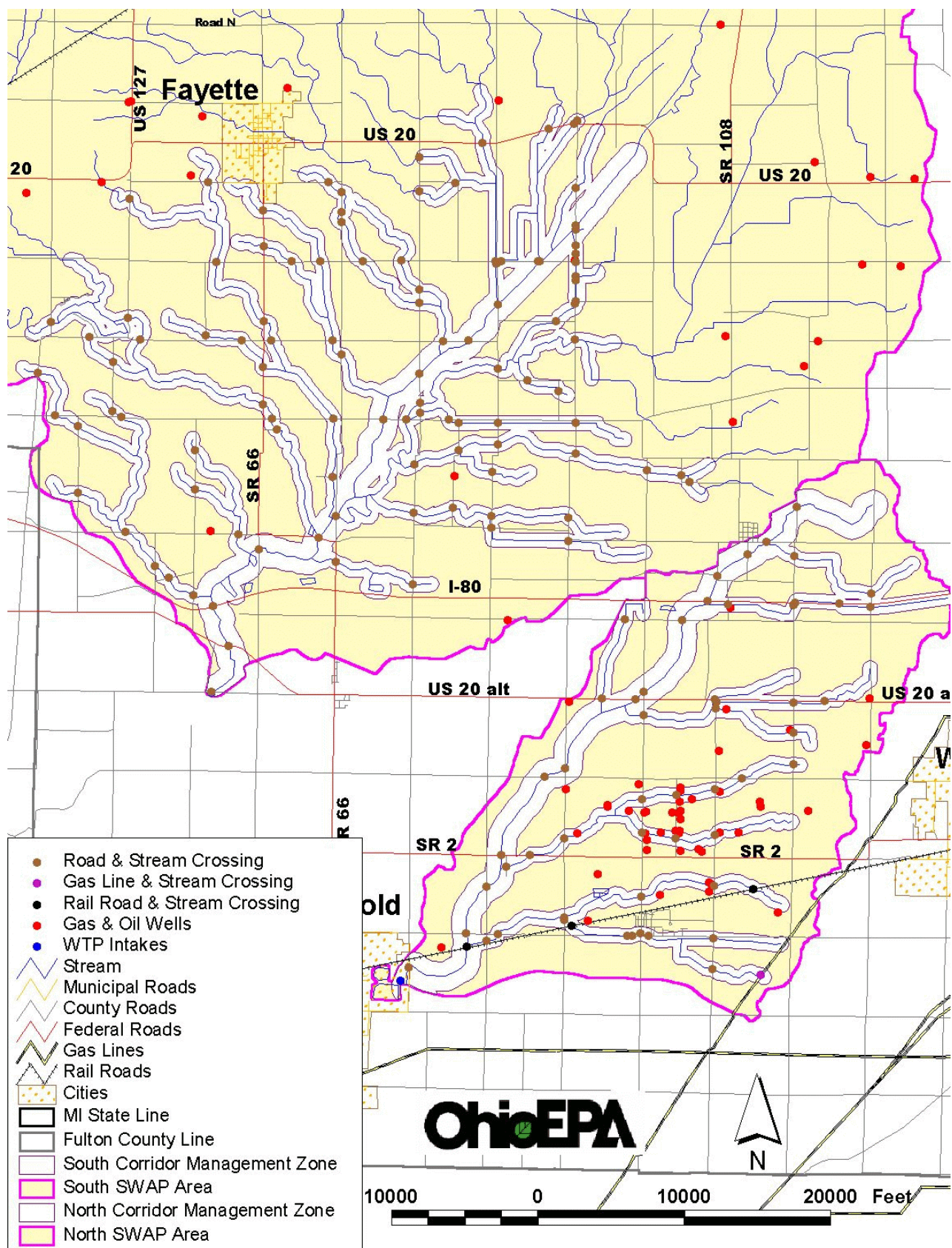


Figure 9 - Road and Rail Line Crossings located within the Village of Archbold's North and South Protection Areas