SOURCE WATER ASSESSMENT PLAN:

Assessment and Risk for Potential Pollution of Surface Drinking Water Supply Sources

Prepared by the Metropolitan North Georgia

Water Planning District for

Cobb County – Marietta Water Authority (CCMWA)

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Source Water Assessment Overview

INTRODUCTION

The 1996 Amendments to the Federal Safe Drinking Water Act (SDWA) brought about new pollution prevention and protection measures to help ensure clean and safe drinking water by assessing potential contamination and promoting protection of States' drinking water sources. These amendments direct states to enact Source Water Protection Programs to protect their drinking water sources from contamination. The initial step in the development of the program was to prepare an inventory and assessment of each water supply watershed in the state. This step was called the Source Water Assessment Plan (SWAP).

In accordance with the Federal SDWA and in response to EPA's national goal, the Atlanta Regional Commission (ARC) submitted the Division's Source Water Assessment and Implementation Plan to the EPA on March 28, 2000. At that time, the Georgia Environmental Protection Division (EPD) contracted with the Atlanta Regional Commission (ARC) to coordinate and complete SWAPs for 28 Metro Atlanta public drinking water systems.

In June 2017, the Metropolitan North Georgia Water Planning District (the District) adopted its integrated Water Resource Management Plan (WRMP) that takes a comprehensive approach to water resources management planning, where water supply and water conservation, wastewater management, watershed management, and public education planning overlap. Georgia EPD enforces the WRMP through an auditing and permitting process for all members of the District. Action Item INTEGRATED-6 of the 2017 WRMP requires local water providers to develop a source water protection plan that delineates raw water sources and identifies the potential sources of contamination to the drinking water supply by January 1, 2020.

In an effort to provide implementation support to its jurisdictions, the District contracted with the Georgia Environmental Finance Authority (GEFA) and EPD to complete the update/creation of SWAPs for 45 public drinking water intakes within the 15-county metropolitan Atlanta region. Specifically, the District will develop a SWAP for each surface water withdrawal location within the region by performing the following tasks:

1. Delineate the watershed area for each public drinking water source
2. Conduct an inventory of potential sources of contamination within that watershed
3. Determine the susceptibility of the water supply to contamination within the watershed assessment area
4. Provide the assessment results to the public water system jurisdiction for development of local SWPPs

Then local water providers are required to:

1. Publish the results of the source water assessment in the Consumer Confidence Report (CCR)

2. Integrate this information into the Local Emergency Water Plan (2017 WRMP, Action Item INTEGRATED-3)
3. Update the SWAP every 10 years thereafter

METHODOLOGY

Determination of Assessment Areas

Watersheds were acquired from EPD or delineated by District staff using geographic information system (GIS) software that referenced USGS National Elevation Datasets and then clipped to relevant Hydrologic unit code (HUC) 10/12 boundaries. Once the watersheds were delineated, the assessment areas or zones were determined using EPD criteria. The Inner Management Zone (IMZ) extends seven miles upstream from the intake. This area requires the most stringent identification and analysis of potential pollutant sources. The Outer Management Zone (OMZ) extends from the IMZ boundary to an additional twenty miles upstream within the watershed. In this area, EPD guidance requires fewer facilities be identified and analyzed. Outside of the OMZ is the Non-Management Zone (NMZ), and includes the remainder of the watershed area beyond the delineated 20-mile OMZ boundary.

Inventory of Potential Pollutant Sources

This assessment focused primarily on updating potential pollutant sources identified from the previous SWAP conducted by the ARC in 2000 and the Source Water Assessment Implementation Plan published by the EPD, with the addition of more potential pollutant sources that were not included in the past SWAP. Table 1 lists potential pollution sources that must be evaluated in each of the three management zones, according to EPD guidance. A more stringent assessment of sources is conducted in the IMZ and OMZ than in the NMZ due to the larger distance from the NMZ to the intake, which is greater than 20 miles upstream. A complete list of the types of facilities characterized by each potential pollutant source is provided in Appendix A.

Table 1. Potential Pollution Sources for Surface Water

IMZ (7-mile Radius)	OMZ (20-mile radius)	NMZ (Non-Management Zone)
Located, Identified, Inventoried, and Assessed	*Located, Identified, Inventoried, and Assessed*	*Located, Identified, and Inventoried*
• Agriculture: -AFOs -CAFOs -Dairy Operations -Manure Handlers -Poultry Operations -Waste Lagoons	• Agriculture: -AFOs -CAFOs -Dairy Operations -Manure Handlers -Poultry Operations -Waste Lagoons	
• Airports		
• Asphalt Plants	• Asphalt Plants	• Asphalt Plants
• Fuel Facilities (Underground Storage Tanks)	• Fuel Facilities (Underground Storage Tanks)	
• Garbage Transfer Stations		
• Hazardous Waste Facilities	• Hazardous Waste Facilities	
• Junk, Scrap, and Salvage Yards	• Junk, Scrap, and Salvage Yards	• Junk, Scrap, and Salvage Yards
• Landfills: -Operating -In closure -Closed	• Landfills: -Operating -In closure -Closed	• Landfills: -Operating -In closure -Closed
• Large Industries w/ Bulk Chemical Storage	• Large Industries w/ Bulk Chemical Storage	
• Large Industries w/ Federal Categorical Standards	• Large Industries w/ Federal Categorical Standards	
• Large Industries w/ Hazardous Chemicals	• Large Industries w/ Hazardous Chemicals	
• LAS Permit Holders	• LAS Permit Holders	• LAS Permit Holders
• Lift Stations	• Lift Stations	
• Marinas		
• Military Bases		
• NPDES Permit Holders	• NPDES Permit Holders	• NPDES Permit Holders
• Power Plants	• Power Plants	
• Recycling	• Recycling	
• Substations		
• Surface Mines	• Surface Mines	• Surface Mines
• Wastewater Treatment Facilities	• Wastewater Treatment Facilities	
• Water Treatment Facilities	• Water Treatment Facilities	

<u>Individual Source</u>

To identify the potential impact of individual sources of pollution, District staff reviewed State and Federal regulatory programs, which issue permits to these facilities. All occurrences of facilities within the watershed were mapped and analyzed. District staff also conducted field surveys, contacted local water providers for data/verification, and identified facilities not listed in the reviewed data sets. The inventory identifies those sources of potential pollution and does not indicate that a problem exists or that contamination is occurring from the site. Data sources from which facility information was obtained may be found in Appendix B.

Non-Point Source

Percent impervious surface and land use/land cover (LULC) estimates were used to identify the potential impact of non-point sources of pollution on the drinking water intake. This data was derived from the USGS National Land Cover Database 2016 (NLCD2016), for which LULC dataset was reclassified from twenty into eight classes: open water, barren land, shrub/scrub, hay/pasture/cultivated crops, wetlands, forest, developed – open space/low intensity, and developed – medium/high intensity. For a description of each land cover class visit: https://www.mrlc.gov/data/legends/national-land-cover-database-2016-nlcd2016-legend. Where data on agricultural and forest best management practices are unavailable, values of impervious areas are used. Other metrics considered included: effective impervious area (EIA), land in transition (Barren land), area sewered vs non-sewered, sewer lines >10' crossing streams, railroads crossing streams, major transportation corridors crossing streams, and impaired streams within the watershed. EIA is defined as the impervious area for which the runoff enters the surface water system. The EIA was determined using a mathematical model developed by Sutherland for EPA, selected for its validity at relatively low levels of impervious area.

Susceptibility Determination

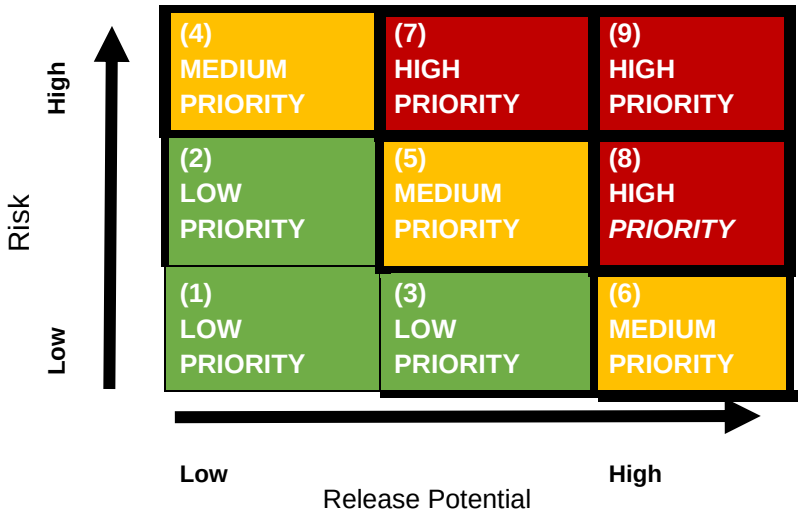
Drinking water intakes are susceptible to two different types of pollution – individual source and non-point source. Individual source pollution involves actual facilities, which have contaminants on site and can pose a potential health risk if humans consume those contaminants. Non-point source pollution is caused by development and everyday activities that take place in residential, commercial, and rural areas and is carried by stormwater runoff to streams and lakes. Non-point source pollutants include sediment, bacteria, heavy metals, oil and grease, herbicides and pesticides, nutrients, and temperature increases.

Individual Source Susceptibility Determination

To determine the potential degree of risk of the potential pollutant sources, EPD criteria for susceptibility ranking was used with adaptations made by the District. First, all facilities were ranked as either high, medium or low for potential individual source of pollution. This ranking is based on the potential of contaminant release and the potential risk to the surface water intake. The factors considered in ranking the potential for release are: distance from surface water, volume of release, duration of release and ease of transport/travel. The factors considered for risk are: distance to intake and toxicity. Detailed methodology for the determination of distance to surface water, distance to intake and ease of transport/travel can be found in Appendix C.

Both potential release and risk are ranked individually and then the two scores are combined to get an overall facility ranking using the EPD designated matrix (Figure 1). Release potential and potential risk were assigned a ranking based on the facility type represented by each potential pollutant source, supplemental information provided by local water providers, and information provided from EPD. More specifically, generalized rankings are assigned for volume of release, duration of release, and toxicity based on the individual source pollution type, and can be found in Appendix D.

Figure 1: Individual Source Susceptibility Determination



The following steps in determining individual source susceptibility were updated from EPD's implementation guidance by the District by removing the percentage thresholds in order to most accurately assess the overall watershed risk and ranking to contamination, made possible through advancements in GIS techniques and available data. After all the sources were charted on the matrix, the overall watershed is a weighted ranking based on the priority of the potential pollution source shown in figure 1: low priority sources appear in grid squares 1,2,3, medium priority sources appear in grid squares 4, 5,6, and high priority sources appear in grid squares 7,8,9 after a weight of low (1), medium (2), high (3) is applied. The value is then divided by the size of the watershed in square miles for individual source susceptibility and can be represented by the following equation:

$$\frac{((\#\ of\ low\ priority \times 1) + (\#\ of\ medium\ priority \times 2) + (\#\ of\ high\ priority \times 3))}{Watershed\ size\ in\ Sq.Mi.}$$

The ranking is then determined based on thresholds of all District region watersheds assessed, and is outlined in Table 2:

Table 2: Threshold Ranking Criteria

Low	**< 3.0**
Medium	**3.0 - 8.0**
High	**8.0 <**

Non-Point Source Susceptibility Determination

To evaluate non-point source pollution in the watersheds, an estimate of impervious surface area was calculated based on land use categories. Impervious surfaces collect and accumulate pollutants deposited from a variety of sources including: dust and dirt form the air, leaks from vehicles, animal wastes, yard pesticides and fertilizers, leaky sewer lines and construction and barren soil areas. During storms, accumulated pollutants can be washed off, and rapidly delivered to rivers and lakes. According to the Center for Watershed Protection, studies have consistently indicated that urban pollutant loads are directly related to the amount of impervious surface in the watershed.

The impervious surface area was estimated in conjunction with the LULC dataset, where the area for each of the eight classes of the LULC was determined. The Zonal statistics tool in ArcGIS Pro was used to obtain the mean Percent Developed Impervious (PDI) associated with each LULC class. Both were multiplied and divided by the area of the watershed.

Overall non-point source susceptibility was determined based on percentage of impervious surface in the watershed. For this assessment, greater than 20% impervious surface area was ranked as high, between 10-20% was ranked as medium and less than 10% was ranked as low susceptibility (Table 3).

Table 3: Non-Point Source Susceptibility Rankings

Impervious Area (%)	Ranking
< 10	**Low**
10 – 20	**Medium**
> 20	**High**

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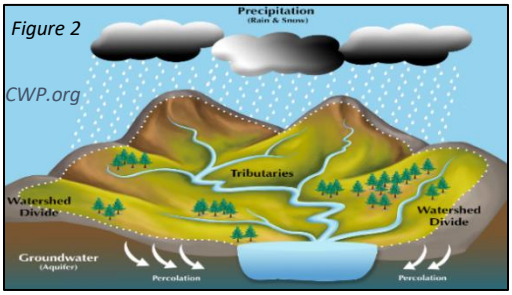
WATER SYSTEM DESCRIPTION

Cobb County – Marietta Water Authority

The Cobb County-Marietta Water Authority (CCMWA) is a regional public utility that provides potable (drinking and fire protection) water on a wholesale basis to 11 retail water suppliers, one industrial customer and one institutional customer and is the second largest supplier of safe drinking water in Georgia. CCMWA maintains two source water withdrawal locations; one from the Chattahoochee River and the second from Allatoona Lake. Lake Allatoona is treated at the Wyckoff Treatment Plant while the Chattahoochee source water is treated at the Quarles Treatment Plant. Both plants transport water throughout the county before it is distributed to Cobb County, Paulding County, the Cities of Austell, Marietta, Powder Springs, Smyrna, and Mountain Park.

Watershed Description



A watershed is the area of land that drains into a river, stream or lake (Figure 2).

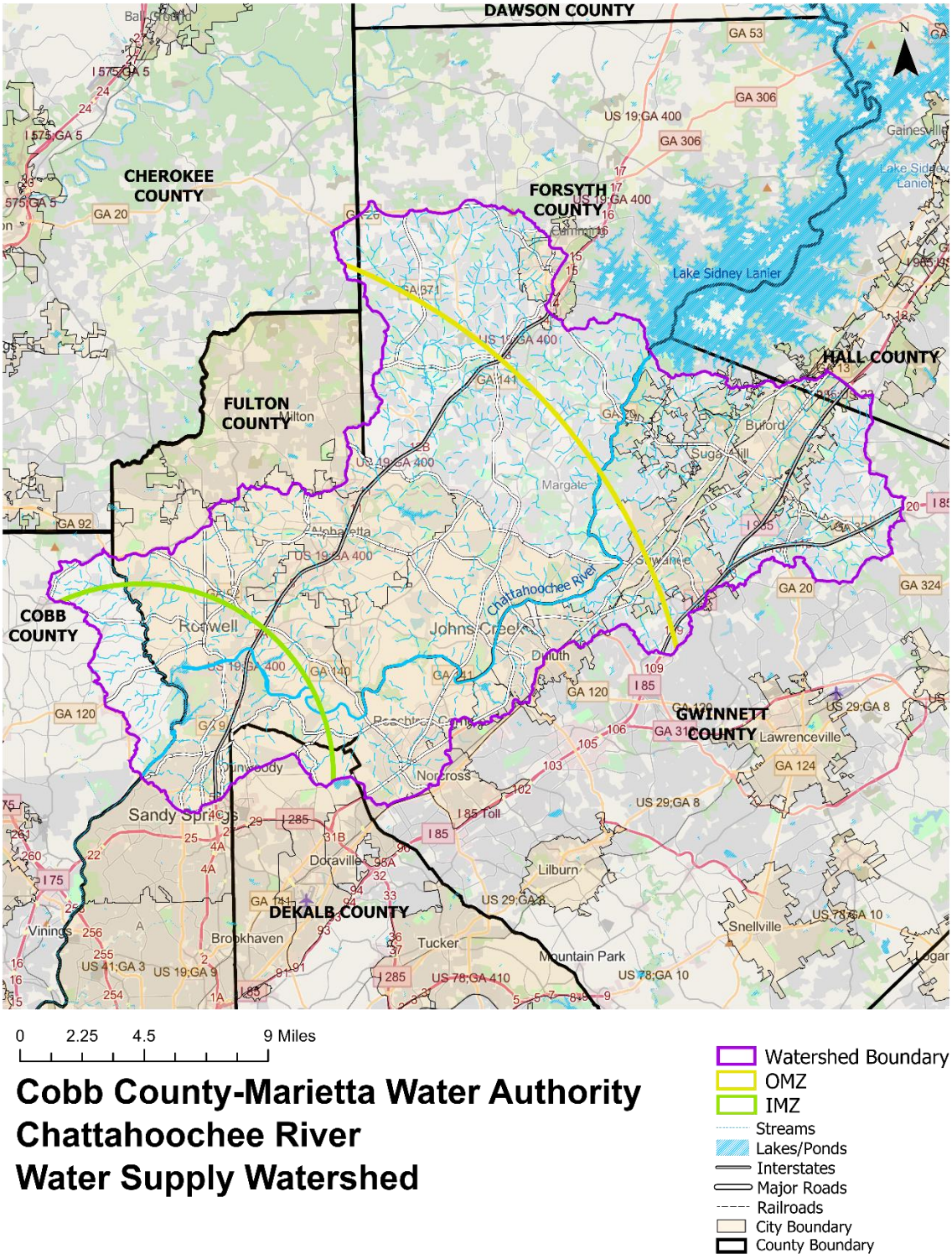
Source water is untreated water from streams, rivers, or lakes, which is used to supply public drinking water.

SOURCE WATER DESCRIPTION - CHATTAHOOCHEE RIVER

The CCMWA Chattahoochee River surface water supply intake is located on the Chattahoochee River near Sandy Springs, GA and downstream of Buford Dam. The source water assessment study area includes the watershed above the intake location up to Buford Dam which has a 336 square mile drainage area. The Chattahoochee River watershed crosses several counties and jurisdictions above the CCMWA intake and the Quarles WTP. These counties include Cobb, Cherokee, Forsyth, Hall, Gwinnett, DeKalb, and Fulton. The watershed also contains portions of the Municipalities of Norcross, Duluth, Suwanee, Sugar Hill, Buford, and Alpharetta (Figure 3).

Quarles Water Supply Pump Station

Figure 3


DAWSON COUNTY
CHEROKEE COUNTY
FORSYTH COUNTY
HALL COUNTY
FULTON COUNTY
COBB COUNTY
GWINNETT COUNTY
DEKALB COUNTY
Lake Sidney Lanier
Chattahoochee River
Roswell
Johns Creek
Alpharetta
Milton
Buford
Gainesville
Lawrenceville
Norcross
Sandy Springs
Doraville
Tucker
Brookhaven
Lilburn
Snellville
Mountain Park
Dunwoody
Vinings
Margate
Suwanee
Duluth
0 2.25 4.5 9 Miles
Cobb County-Marietta Water Authority
Chattahoochee River
Water Supply Watershed
Watershed Boundary
OMZ
IMZ
Streams
Lakes/Ponds
Interstates
Major Roads
Railroads
City Boundary
County Boundary

SOURCE WATER ASSESSMENT RESULTS – CHATTAHOOCHE RIVER

Susceptibility Determination

Individual Sources: The Chattahoochee River Intake watershed has 1002 facilities included in the inventory of potential individual sources of pollution. Table 3 lists the type and number of facilities within the watershed. These Facilities are shown on Figure 4.

Table 3. Inventory of Potential Individual Sources of Pollution

Potential Pollutant Sources	Number of Facilities
Asphalt Plants	8
Fuel Facilities	449
Hazardous Waste Facilities	213
Junk Scrap	8
Landfills – Operating	1
Landfills – In Closure	1
Landfills - Closed	3
Large Industries which Utilize Hazardous Chemicals	165
Land Application System (LAS) Permit Holders	2
Lift Stations	86
National Pollutant Discharge Elimination System (NPDES) Permit Holders	13
Power Plants	4
Recycling Centers	21
Substations	11
Surface Mines	8
Wastewater Treatment Facilities	8
Water Treatment facilities	1
Total	1002

Legend: Potential Pollution Sources

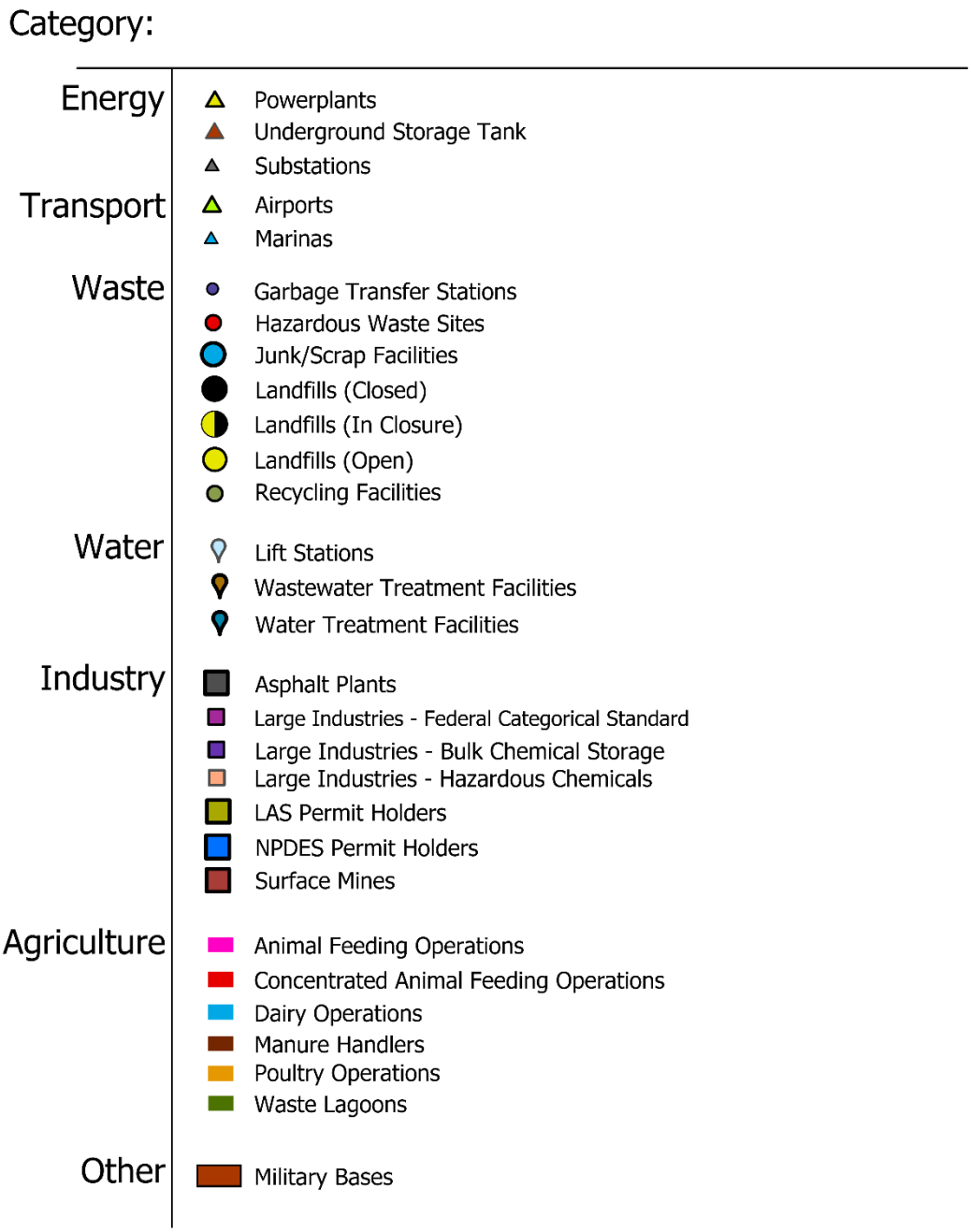
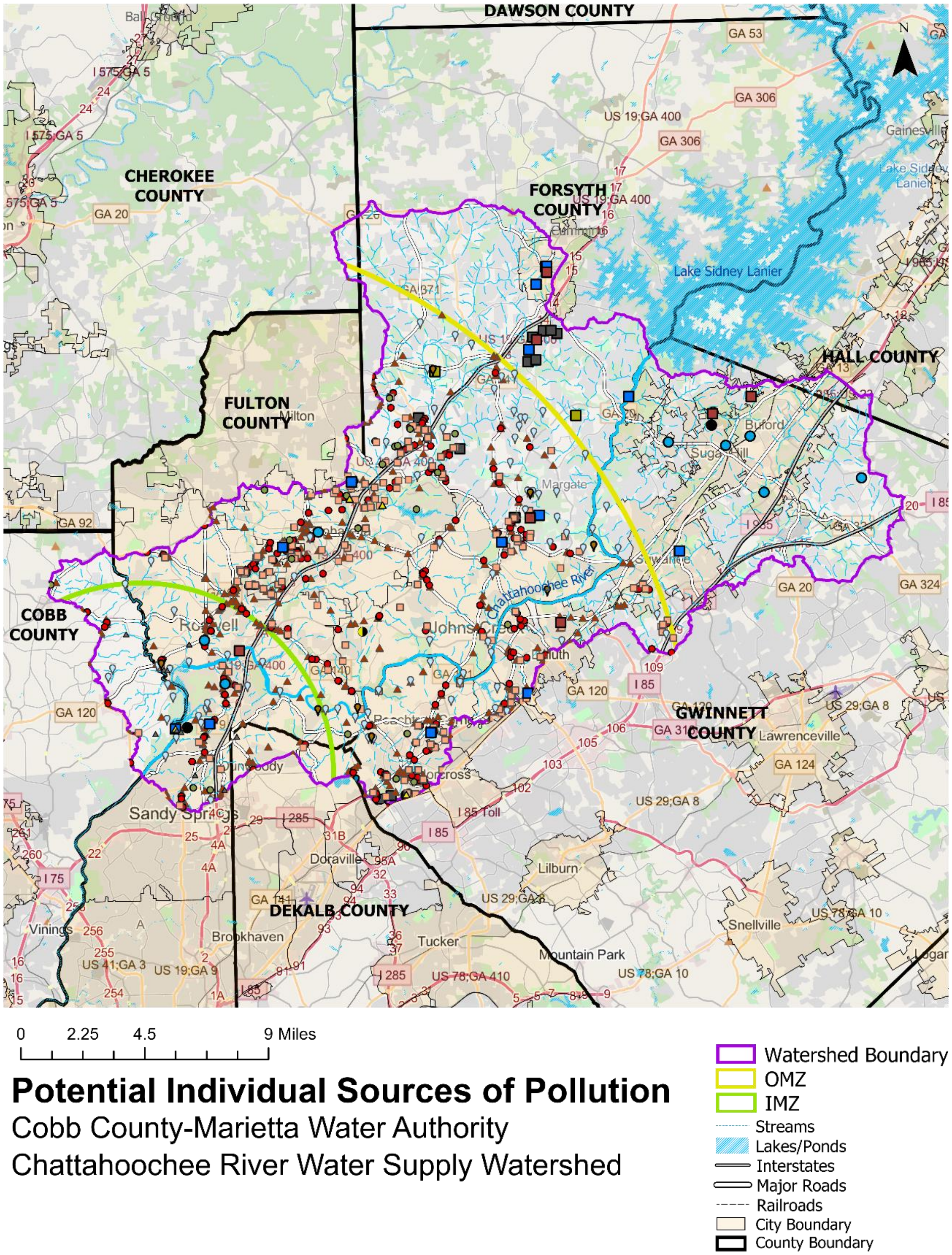


Figure 4



Potential Individual Sources of Pollution
Cobb County-Marietta Water Authority
Chattahoochee River Water Supply Watershed

Potential pollutant source rankings for each facility were assigned based on the EPD criteria. The following chart (Figure 5) summarizes the results of the Individual source ranking.

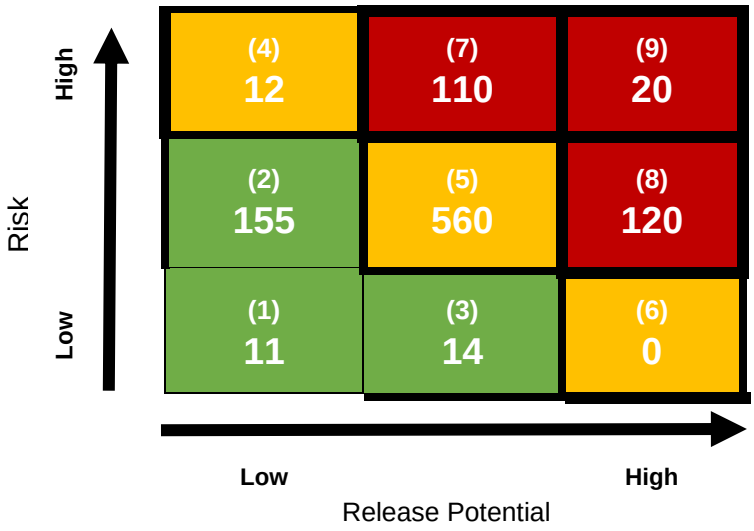


Figure 5: Chattahoochee River Intake Individual Source Susceptibility

$$\frac{((180 \times 1) + (572 \times 2) + (250 \times 3))}{336} = 6.2$$

With a ranking of 6.2, this watershed has a **Medium** individual source susceptibility ranking.

Non-Point Source. Land use in the Chattahoochee River Intake Watershed is predominantly developed, open space/low intensity (Figure 6 & Figure 7). Available data covering the watershed shows a total impervious surface area of 20% and an effective impervious surface area of 9.1% (Table 4 & Figure 8). The watershed has 0.45% of the area "in transition" or exposed soil. Figure 9 highlights developed features throughout the watershed, including road types and core urban areas. Within the management zone (MZ) there are 404 miles of large sewer lines over 10" and approximately 99.6% of the watershed is sewered (Figure 10). A review of the EPD Integrated 305(b)/303(d) list of streams identifies segments of waters that support (305(b)) and do not support their designated uses (303(d)) (e.g. drinking, fishing, recreation). Within the watershed, 117 stream miles were not supporting their designated uses. A list of the 305(b)/303(d) stream segments is included in Appendix E.

Figure 6: Land Use in the Chattahoochee River Intake Watershed

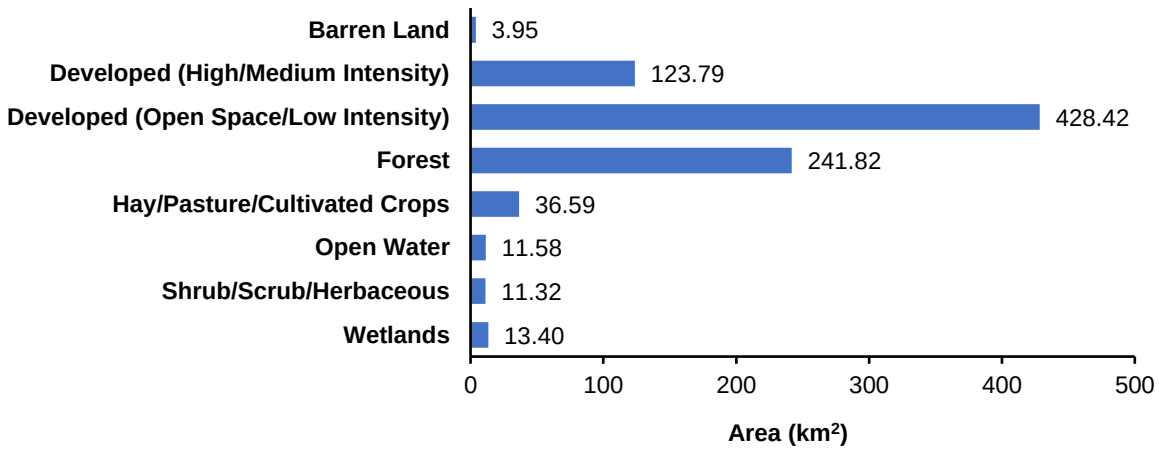


Table 5: Total and Effective Impervious Areas in the Chattahoochee River Intake Watershed

Land Cover	Area		Mean PDI (%)	Area * PDI	Class IA (%)
	km²	%			
Barren Land	3.95	0.45	7.21	28.48	0.03
Developed (High/Medium Intensity)	123.79	14.21	63.17	7819.81	8.98
Developed (Open Space/Low Intensity)	428.42	49.19	21.42	9176.76	10.54
Forest	241.82	27.77	1.86	449.79	0.52
Hay/Pasture/Cultivated Crops	36.59	4.20	1.93	70.62	0.08
Open Water	11.58	1.33	0.92	10.65	0.01
Shrub/Scrub/Herbaceous	11.32	1.30	3.09	34.98	0.04
Wetlands	13.40	1.54	0.79	10.59	0.01
Total	**870.87**	**100**		**17601.67**	

IA = Impervious Area
PDI = Percent Developed Imperviousness

Total Impervious Area (%)	**20**
Effective Impervious Area (%)	**9.1**

Based on the amount of total impervious surface area in the Chattahoochee River Intake watershed, the overall non-point source susceptibility ranking is **High**.

Overall Watershed Susceptibility to Pollution Ranking: Medium-High

Violations in Water Quality (Appendix E): None

Additional Watershed Issues

Accidental Known Spills. Accidental spills were reviewed for each watershed. These spills represent individual source pollution within developed areas. Three sources of data were used to collect information on accidental spills within the watershed. The three sources are the Hazardous Site Inventory (HSI), EPD self-reported monthly accidental spills, and Leaking Underground Storage Tanks. All data sources include spills reported from 1985-2018 to EPD.

Within the District and MZ containing counties, approximately 25,267 accidental spills were reported. Of these spills, approximately 23,832 contained enough information to be geocoded and mapped, with 11,835 spills reported within MZs. Due to the self-reported nature of spill reporting, the quality of each report can vary thus it is difficult to rely on this data for advanced data analysis. 98% of all self-reported accidental spills within District MZs are raw sewage, 1.3% are treated effluent, and the remaining 0.7% include chlorinated effluent, grease washwater, non-contact cooling water, primary/secondary effluent, R-2 water, sludge, and unknown.

The HSI is a list of sites in Georgia, updated yearly, where there has been a known or suspected release of a regulated substance above a reportable quantity and which have yet to show they meet state clean-up standards found in the Hazardous Site Response or in the Voluntary Remediation Program Act. Each site is then assigned a class level (I, II, III, IV, V) based on the state's clean-up standards for regulated substances that are protective of human health and the environment under specific conditions. For more information on HSI classes visit: https://epd.georgia.gov/land-protection-branch/hazardous-waste/hazardous-site-inventory.

An underground storage tank system (UST) is a tank and any underground piping connected to the tank that has at least 10 percent of its combined volume underground. Nearly all USTs regulated by the underground storage tank requirements contain petroleum. Until the mid-1980s, most USTs were made of bare steel, which is likely to corrode over time and allow UST contents to leak into the environment. Faulty installation or inadequate operating and maintenance procedures also can cause USTs to release their contents into the environment. The greatest potential hazard from a leaking UST is that the petroleum or other hazardous substance can seep into the soil and contaminate groundwater, the source of drinking water for nearly half of all Americans. A leaking UST can present other health and environmental risks, including the potential for fire and explosion. For more visit: https://www.epa.gov/ust/learn-about-underground-storage-tanks-usts.

Within this watershed, there are 822 identifiable self-reported accidental spill sites, 11 sites in HSI, and 811 leaking underground storage tanks (Figure 11).

Railroads. Railroads are also a potential source of pollution at stream crossings and near water bodies in the event of a rail container spill. Within the Chattahoochee River Intake watershed, there are 7 areas where railroads cross streams within the inner and outer management zones. Similarly, major roads and thoroughfares used by transport vehicles are a potential source of contamination because of transport spills.

Major Roads. The Chattahoochee River Intake watershed contains portions of Interstate 85, Interstate 985, and various Georgia state routes [GA 400, GA 92, GA 140, GA 141, GA 120, GA 9, GA 371, GA 20, US 19]. Major Roads within the watershed pose a potential threat to drinking water in the event of a tanker spill at a stream crossing or adjacent to the stream.

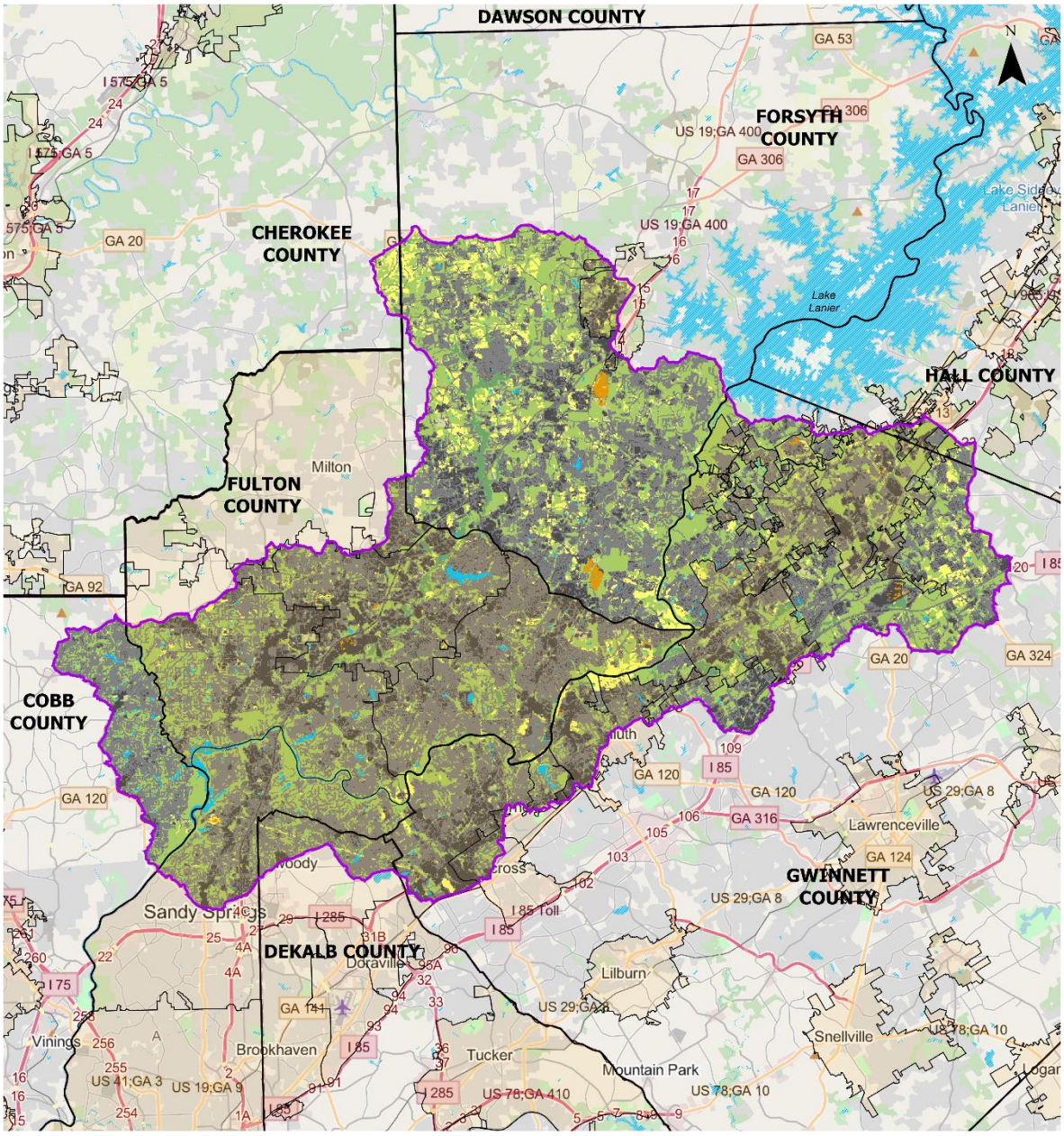
Oil/Liquid Gas Pipelines. Within the Chattahoochee River Intake watershed there are 17 pipelines crossing streams. Large liquid oil/gas pipelines crossing streams pose a potential threat to drinking water in the event of a pipeline failure resulting in a leak or burst.

Sediment and Erosion.
Large amounts of sediment can reach waters during construction or when land has been cleared of vegetation. Consequently, erosion and sediment control on exposed sites is an important area of a watershed management program for water quality protection. A combination of clearing restrictions, erosion prevention, and sediment controls coupled with a diligent plan review and strict construction enforcement are needed to help mitigate these impacts. This can be indicated by areas that have land cover classification as Barren Land.

Impervious Surface Area. The overall impervious surface area for Chattahoochee River Intake watershed is 20%. Watershed research has discovered that urban stream quality begins to sharply decline once impervious cover in a watershed exceeds 10%.

Cryptosporidium. Cryptosporidium is a parasite commonly found in lakes and rivers, especially when the water is contaminated with sewage and animal wastes, and has been identified as a leading cause of waterborne diseases. Cryptosporidium is very resistant to disinfection through chlorination, and even a well-operated water treatment system cannot ensure that drinking water will be completely free of this parasite. Many large water systems voluntarily take actions for control of Cryptosporidium and other microbial contaminants.

Figure 7



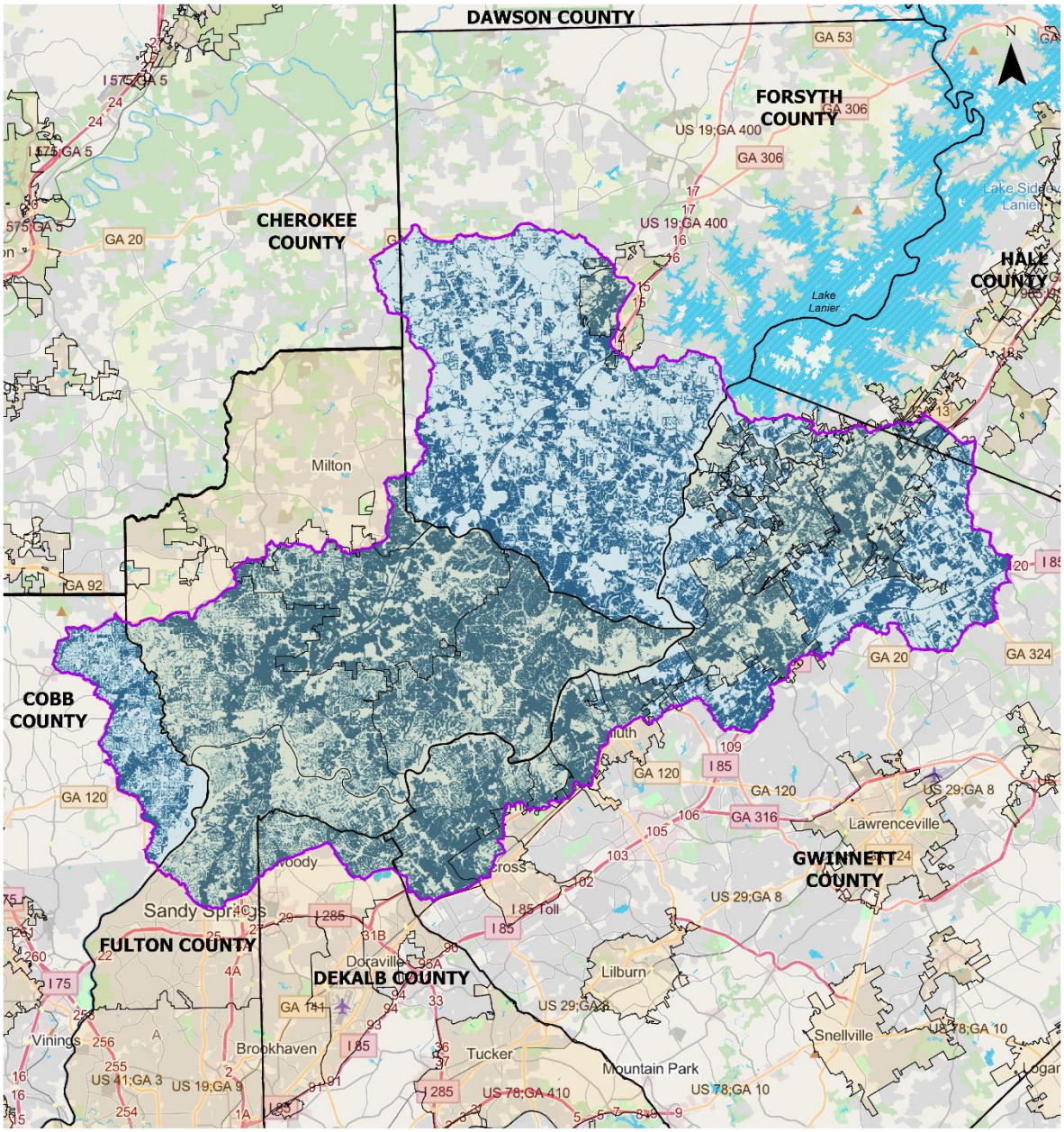
0 2.25 4.5 9 Miles

Landcover

Cobb County-Marietta Water Authority
Chattahoochee River Water Supply Watershed

- Open Water
- Barren Land
- Shrub/Scrub
- Developed, Open Space/Low Intensity
- Developed, Medium/High Intensity
- Hay/Pasture/ Cultivated Crops
- Wetlands
- Forest
- City Boundary
- County Boundary
- Watershed Boundary

Figure 8

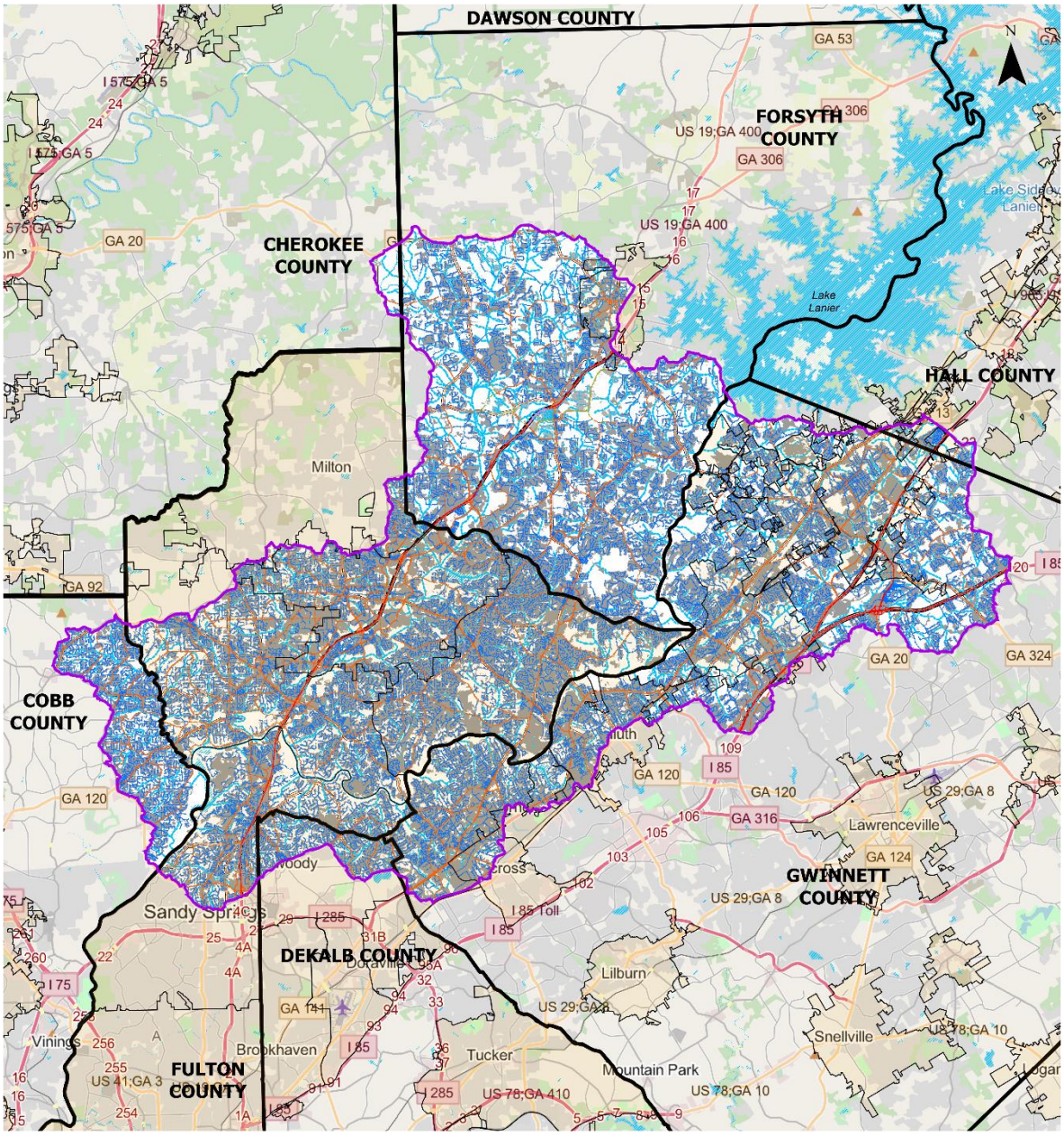


Percent Developed Imperviousness

Cobb County-Marietta Water Authority

Chattahoochee River Water Supply Watershed

Figure 9



Developed Impervious Descriptor

Cobb County-Marietta Water Authority

Chattahoochee River Water Supply Watershed

Figure 10

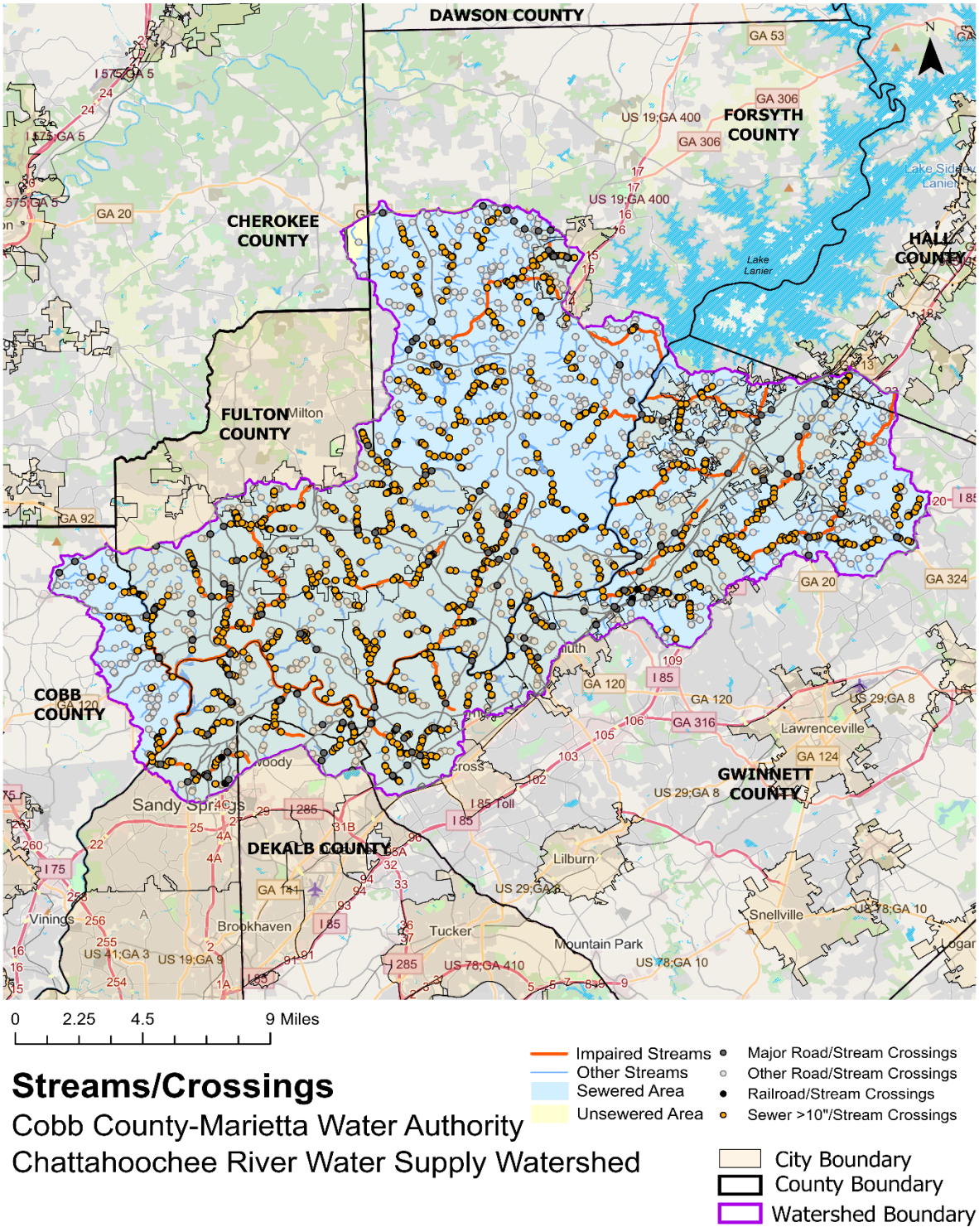
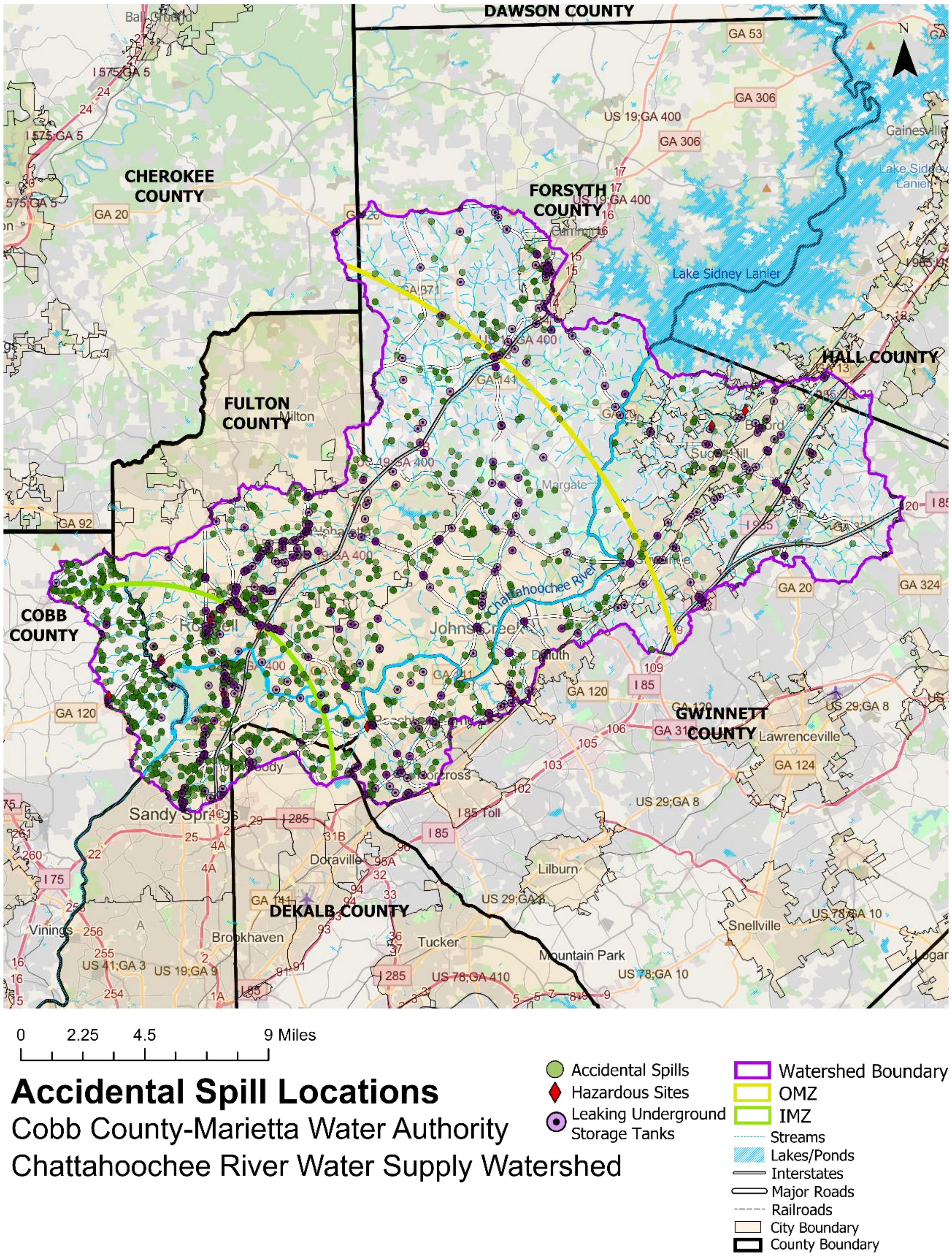

DAWSON COUNTY
CHEROKEE COUNTY
FULTON COUNTY
COBB COUNTY
DEKALB COUNTY
FORSYTH COUNTY
HALL COUNTY
GWINNETT COUNTY
Milton
Sandy Springs
Lilburn
Snellville
Mountain Park
Tucker
Brookhaven
Lawrenceville
Lake Lanier
0 2.25 4.5 9 Miles
Streams/Crossings
Cobb County-Marietta Water Authority
Chattahoochee River Water Supply Watershed
Impaired Streams
Other Streams
Sewered Area
Unsewered Area
Major Road/Stream Crossings
Other Road/Stream Crossings
Railroad/Stream Crossings
Sewer >10"/Stream Crossings
City Boundary
County Boundary
Watershed Boundary

Figure 11


DAWSON COUNTY
CHEROKEE COUNTY
FORSYTH COUNTY
FULTON COUNTY
HALL COUNTY
COBB COUNTY
GWINNETT COUNTY
DEKALB COUNTY
Lake Sidney Lanier
Chattahoochee River
Johns Creek
Duluth
Lawrenceville
Sandy Springs
Doraville
Lilburn
Snellville
Brookhaven
Tucker
Mountain Park
0 2.25 4.5 9 Miles
Accidental Spill Locations
Cobb County-Marietta Water Authority
Chattahoochee River Water Supply Watershed
Accidental Spills
Hazardous Sites
Leaking Underground Storage Tanks
Watershed Boundary
OMZ
IMZ
Streams
Lakes/Ponds
Interstates
Major Roads
Railroads
City Boundary
County Boundary

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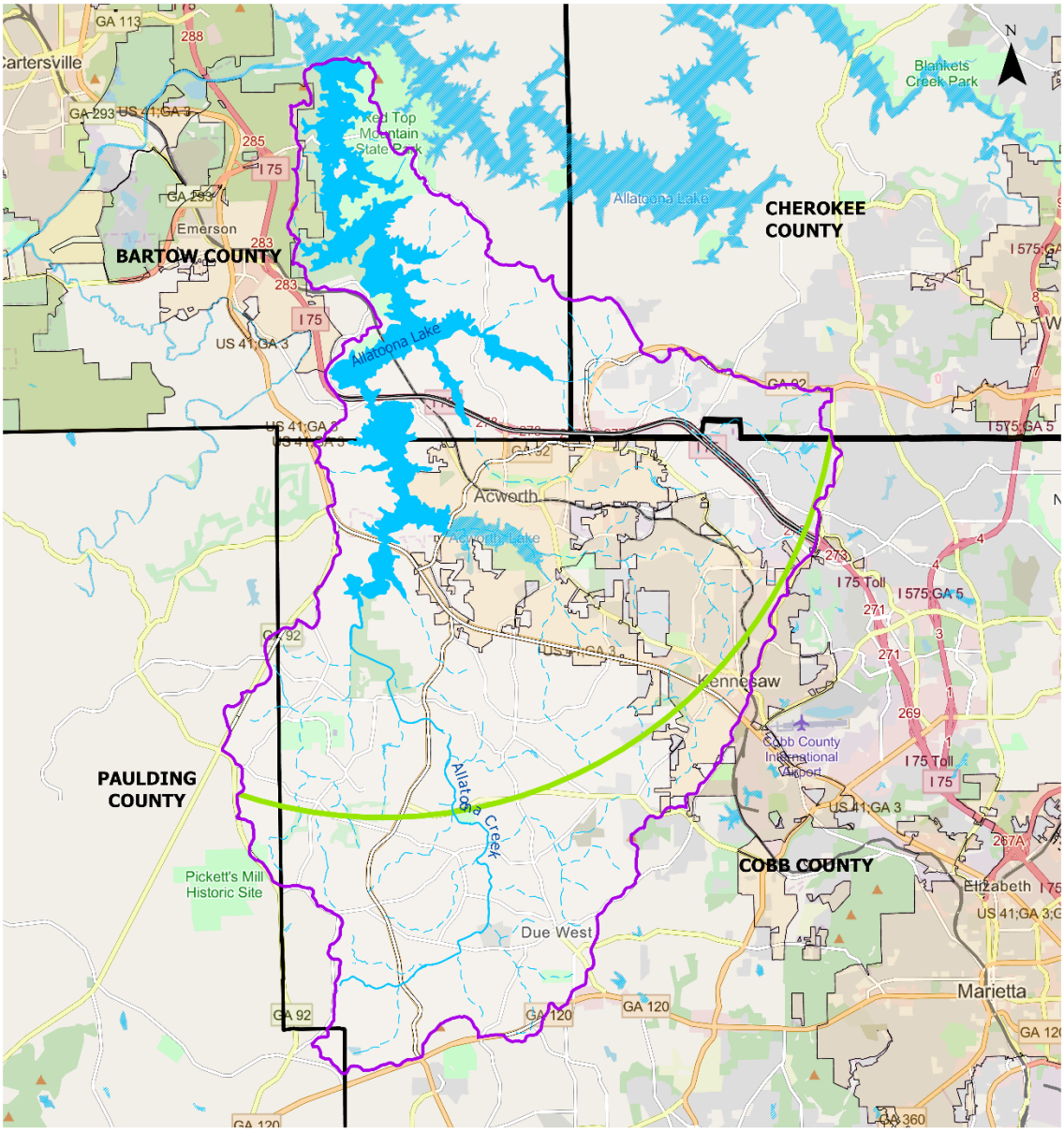
SOURCE WATER DESCRIPTION - ALLATOONA CREEK

Watershed Description

The CCMWA Allatoona Creek surface water supply intake is located on Allatoona Creek, the southern finger of Allatoona Lake. The source water assessment study area includes the watershed above the intake location, which has an 81 square mile drainage area. The Allatoona Creek watershed crosses several counties above the Wyckoff WTP intake. The counties include Cherokee, Bartow, Paulding, and Cobb. The watershed also contains portions of the Municipalities of Acworth and Kennesaw (Figure 3).

Hugh A. Wyckoff Water Supply Pump Station

Figure 3


BARTOW COUNTY
CHEROKEE COUNTY
PAULDING COUNTY
COBB COUNTY
Allatoona Lake
Acworth
Kennesaw
Marietta
Due West
Emerson
Pickett's Mill Historic Site
Red Top Mountain State Park
Blankets Creek Park
Cobb County International Airport
Allatoona Creek
0 1 2 4 Miles
Cobb County-Marietta Water Authority
Allatoona Creek Water Supply Watershed
Watershed Boundary
OMZ
IMZ
Streams
Lakes/Ponds
Interstates
Major Roads
Railroads
City Boundary
County Boundary

SOURCE WATER ASSESSMENT RESULTS – ALLATOONA CREEK

Susceptibility Determination

Individual Sources: The Allatoona Creek Intake watershed has 262 facilities included in the inventory of potential individual sources of pollution. Table 3 lists the type and number of facilities within the watershed. These Facilities are shown on Figure 4.

Table 3. Inventory of Potential Individual Sources of Pollution

Potential Pollutant Sources	Number of Facilities
Agriculture – Poultry Operations	1
Fuel Facilities	138
Garbage Transfer Stations	2
Hazardous Waste Facilities (RCRA)	36
Landfills - Closed	1
Large Industries with Bulk Chemical Storage	2
Large Industries which Utilize Hazardous Chemicals	29
Lift Stations	29
Marinas	4
National Pollutant Discharge Elimination System (NPDES) Permit Holders	3
Recycling Centers	1
Substations	13
Surface Mines	1
Wastewater Treatment Facilities	2
Total	262

Legend: Potential Pollution Sources

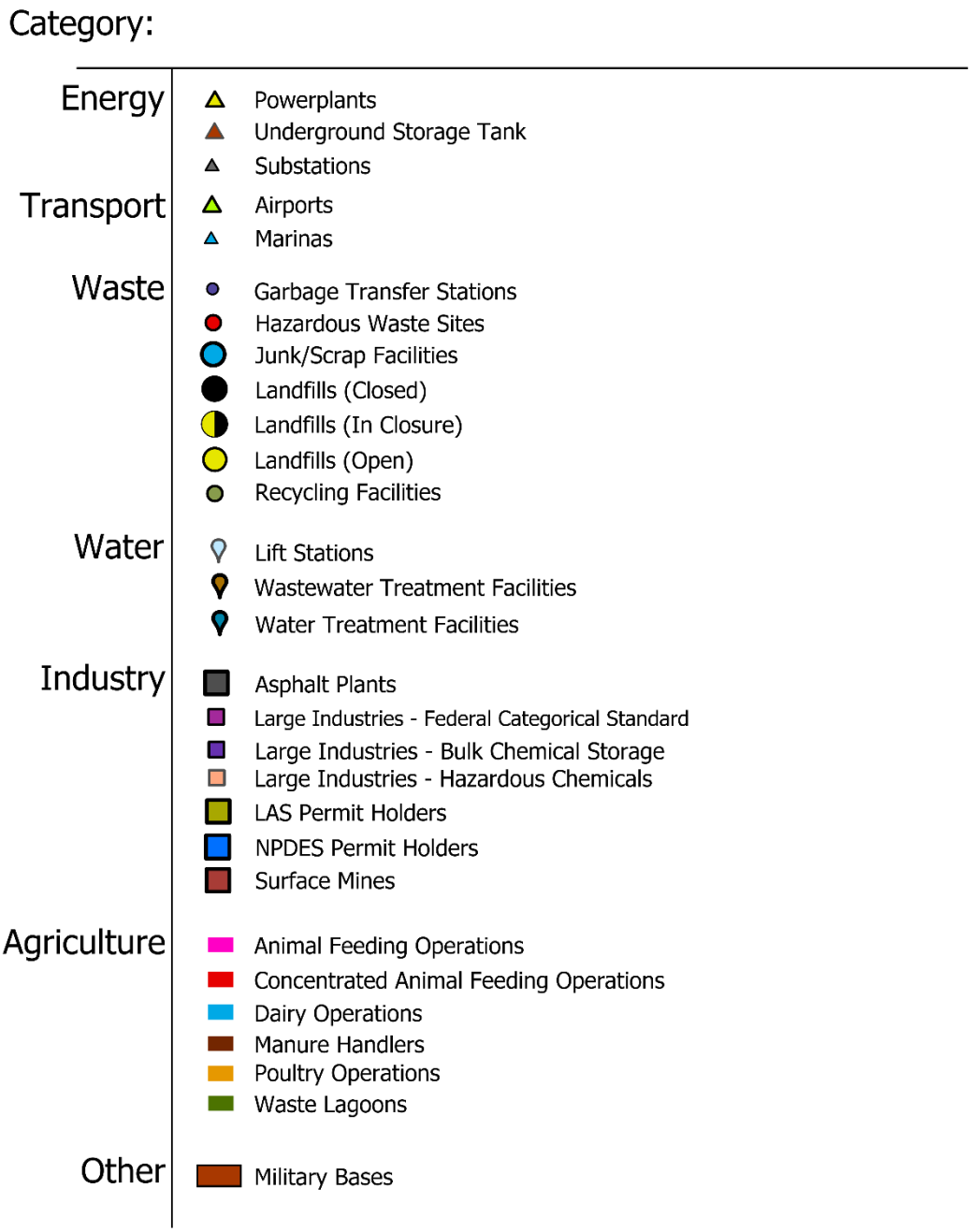
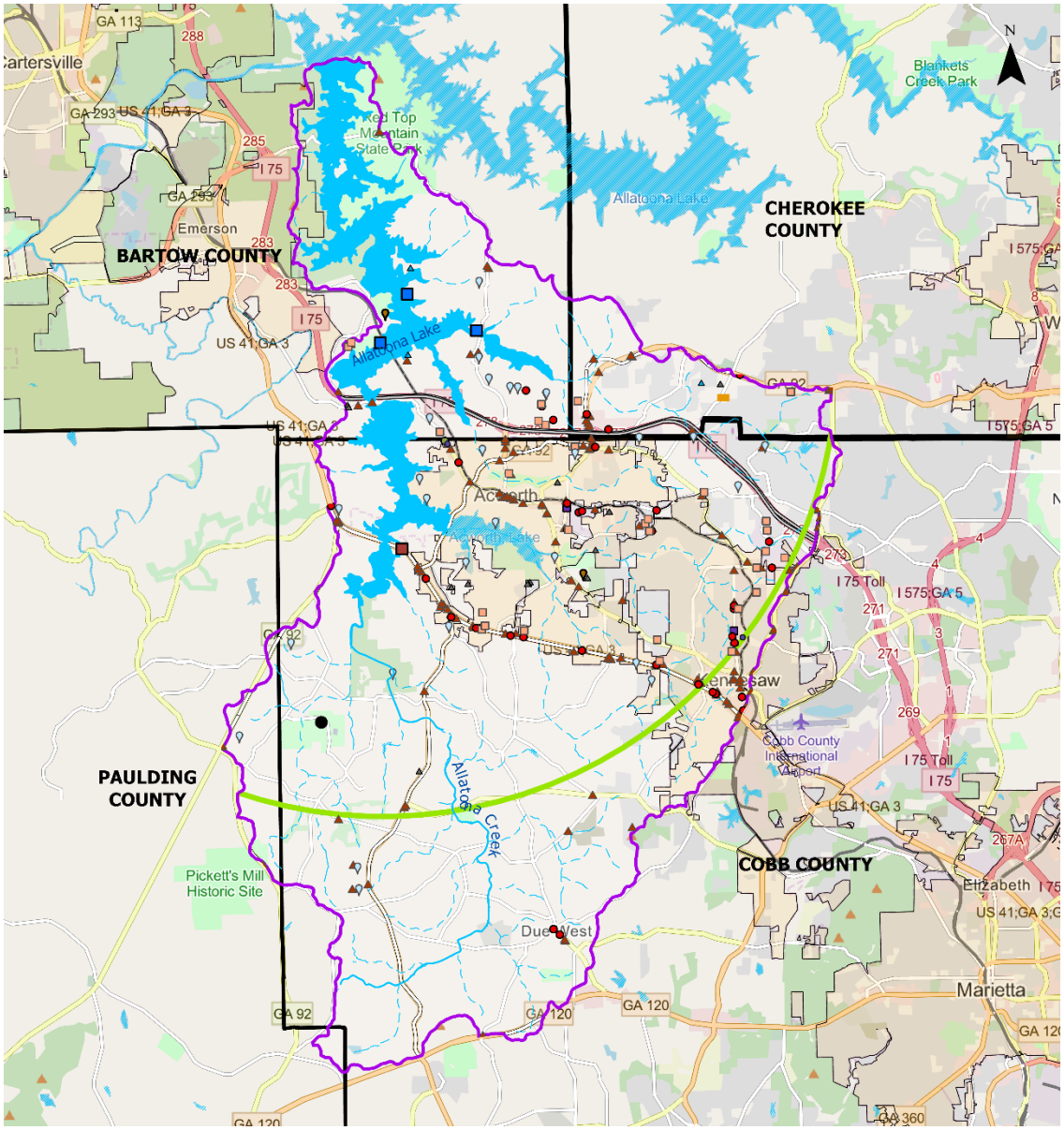


Figure 4


CHEROKEE COUNTY
BARTOW COUNTY
PAULDING COUNTY
COBB COUNTY
Allatoona Lake
Emerson
Acworth
Kennesaw
Marietta
Due West
Pickett's Mill Historic Site
Cobb County International Airport
Blankets Creek Park
Red Top Mountain State Park
Allatoona Creek
I 75
I 75 Toll
I 575
US 41;GA 3
GA 92
GA 120
GA 360
N
0 1 2 4 Miles
Potential Individual Sources of Pollution
Cobb County-Marietta Water Authority
Allatoona Creek Water Supply Watershed
Watershed Boundary
OMZ
IMZ
Streams
Lakes/Ponds
Interstates
Major Roads
Railroads
City Boundary
County Boundary

Potential pollutant source rankings for each facility were assigned based on the EPD criteria. The following chart (Figure 5) summarizes the results of the Individual source ranking.

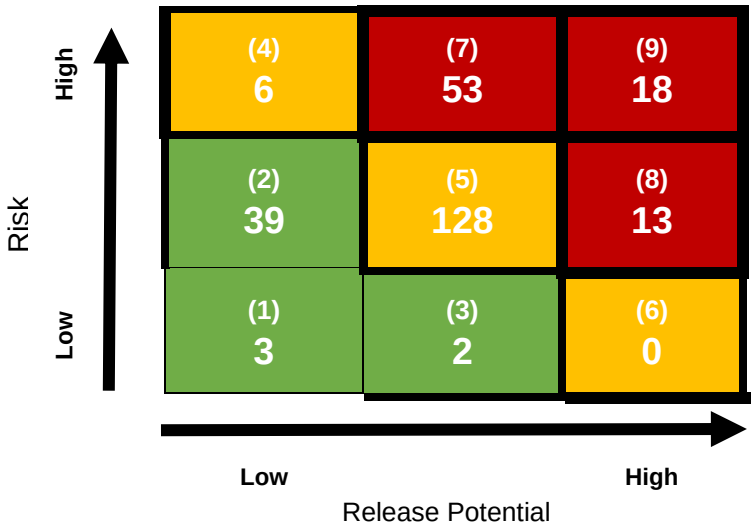


Figure 5: Allatoona Creek Intake Individual Source Susceptibility

$$\frac{((44 \times 1) + (134 \times 2) + (84 \times 3))}{81} = 7.0$$

With a ranking of 7.0, this watershed has a **Medium** individual source susceptibility ranking.

Non-Point Source. Land use in the Allatoona Creek Intake Watershed is predominantly developed, open space/low intensity (Figure 6 & Figure 7). Available data covering the watershed shows a total impervious surface area of 14% and an effective impervious surface area of 5.1% (Table 4 & Figure 8). The watershed has 0.34% of the area "in transition" or exposed soil. Figure 9 highlights developed features throughout the watershed, including road types and core urban areas. Within the management zone (MZ) there are 19 miles of large sewer lines over 10" and approximately 81% of the watershed is sewered (Figure 10). A review of the EPD Integrated 305(b)/303(d) list of streams identifies segments of waters that support (305(b)) and do not support their designated uses (303(d)) (e.g. drinking, fishing, recreation). Within the watershed, 26 stream miles and Acworth Lake were not supporting their designated uses. A list of the 305(b)/303(d) stream segments is included in Appendix E.

Figure 6: Land Use in the Allatoona Creek Intake Watershed

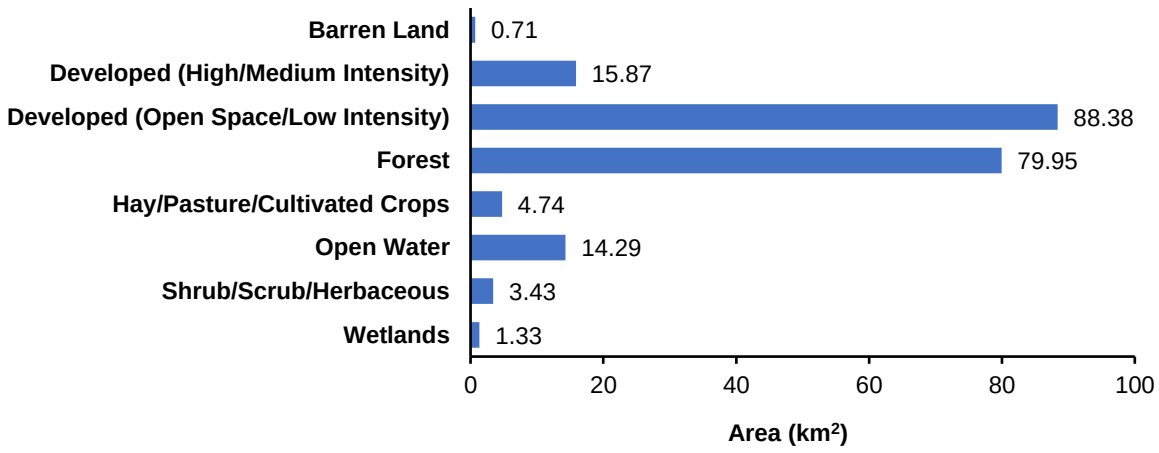


Table 5: Total and Effective Impervious Areas in the Allatoona Lake Intake Watershed

Land Cover	Area		Mean PDI (%)	Area * PDI	Class IA (%)
	km^2	%			
Barren Land	0.71	0.34	5.22	3.71	0.02
Developed (High/Medium Intensity)	15.87	7.60	60.67	962.83	4.61
Developed (Open Space/Low Intensity)	88.38	42.35	19.97	1764.95	8.46
Forest	79.95	38.31	1.25	99.94	0.48
Hay/Pasture/Cultivated Crops	4.74	2.27	2.22	10.52	0.05
Open Water	14.29	6.85	0.40	5.72	0.03
Shrub/Scrub/Herbaceous	3.43	1.64	1.85	6.35	0.03
Wetlands	1.33	0.64	0.36	0.48	0
Total	**208.7**	**100**		**2854.49**	
			Total Impervious Area (%)		**14**
			Effective Impervious Area (%)		**5.1**

IA = Impervious Area
PDI = Percent Developed Imperviousness

Based on the amount of total impervious surface area in the Allatoona Creek Intake watershed, the overall non-point source susceptibility ranking is **Medium**.

Overall Watershed Susceptibility to Pollution Ranking: Medium

Violations in Water Quality (Appendix E): None

Additional Watershed Issues

Accidental Known Spills. Accidental spills were reviewed for each watershed. These spills represent individual source pollution within developed areas. Three sources of data were used to collect information on accidental spills within the watershed. The three sources are the Hazardous Site Inventory (HSI), EPD self-reported monthly accidental spills, and Leaking Underground Storage Tanks. All data sources include spills reported from 1985-2018 to EPD.

Within the District and MZ containing counties, approximately 25,267 accidental spills were reported. Of these spills, approximately 23,832 contained enough information to be geocoded and mapped, with 11,835 spills reported within MZs. Due to the self-reported nature of spill reporting, the quality of each report can vary thus it is difficult to rely on this data for advanced data analysis. 98% of all self-reported accidental spills within District MZs are raw sewage, 1.3% are treated effluent, and the remaining 0.7% include chlorinated effluent, grease washwater, non-contact cooling water, primary/secondary effluent, R-2 water, sludge, and unknown.

The HSI is a list of sites in Georgia, updated yearly, where there has been a known or suspected release of a regulated substance above a reportable quantity and which have yet to show they meet state clean-up standards found in the Hazardous Site Response or in the Voluntary Remediation Program Act. Each site is then assigned a class level (I, II, III, IV, V) based on the state's clean-up standards for regulated substances that are protective of human health and the environment under specific conditions. For more information on HSI classes visit: https://epd.georgia.gov/land-protection-branch/hazardous-waste/hazardous-site-inventory.

An underground storage tank system (UST) is a tank and any underground piping connected to the tank that has at least 10 percent of its combined volume underground. Nearly all USTs regulated by the underground storage tank requirements contain petroleum. Until the mid-1980s, most USTs were made of bare steel, which is likely to corrode over time and allow UST contents to leak into the environment. Faulty installation or inadequate operating and maintenance procedures also can cause USTs to release their contents into the environment. The greatest potential hazard from a leaking UST is that the petroleum or other hazardous substance can seep into the soil and contaminate groundwater, the source of drinking water for nearly half of all Americans. A leaking UST can present other health and environmental risks, including the potential for fire and explosion. For more visit: https://www.epa.gov/ust/learn-about-underground-storage-tanks-usts.

Within this watershed, there are 141 identifiable self-reported accidental spill sites, three sites in HSI, and 138 leaking underground storage tanks (Figure 11).

Railroads. Railroads are also a potential source of pollution at stream crossings and near water bodies in the event of a rail container spill. Within the Allatoona Creek Intake watershed, there are three areas where railroads cross streams within the inner and outer management zones. Similarly, major roads and thoroughfares used by transport vehicles are a potential source of contamination because of transport spills.

Major Roads. The Allatoona Creek watershed contains portions of Interstate 75 and various Georgia state routes [GA 92, GA 3, US 41]. Major Roads within the watershed pose a potential threat to drinking water in the event of a tanker spill at a stream crossing or adjacent to the stream.

Oil/Liquid Gas Pipelines. Within the Allatoona Creek Intake watershed there are 6 pipelines crossing streams. Large liquid oil/gas pipelines crossing streams pose a potential threat to drinking water in the event of a pipeline failure resulting in a leak or burst.

Sediment and Erosion.
Large amounts of sediment can reach waters during construction or when land has been cleared of vegetation. Consequently, erosion and sediment control on exposed sites is an important area of a watershed management program for water quality protection. A combination of clearing restrictions, erosion prevention, and sediment controls coupled with a diligent plan review and strict construction enforcement are needed to help mitigate these impacts. This can be indicated by areas that have land cover classification as Barren Land.

Impervious Surface Area. The overall impervious surface area for Allatoona Creek Intake watershed is 14%. Watershed research has discovered that urban stream quality begins to sharply decline once impervious cover in a watershed exceeds 10%.

Cryptosporidium. Cryptosporidium is a parasite commonly found in lakes and rivers, especially when the water is contaminated with sewage and animal wastes, and has been identified as a leading cause of waterborne diseases. Cryptosporidium is very resistant to disinfection through chlorination, and even a well-operated water treatment system cannot ensure that drinking water will be completely free of this parasite. Many large water systems voluntarily take actions for control of Cryptosporidium and other microbial contaminants.

Figure 7

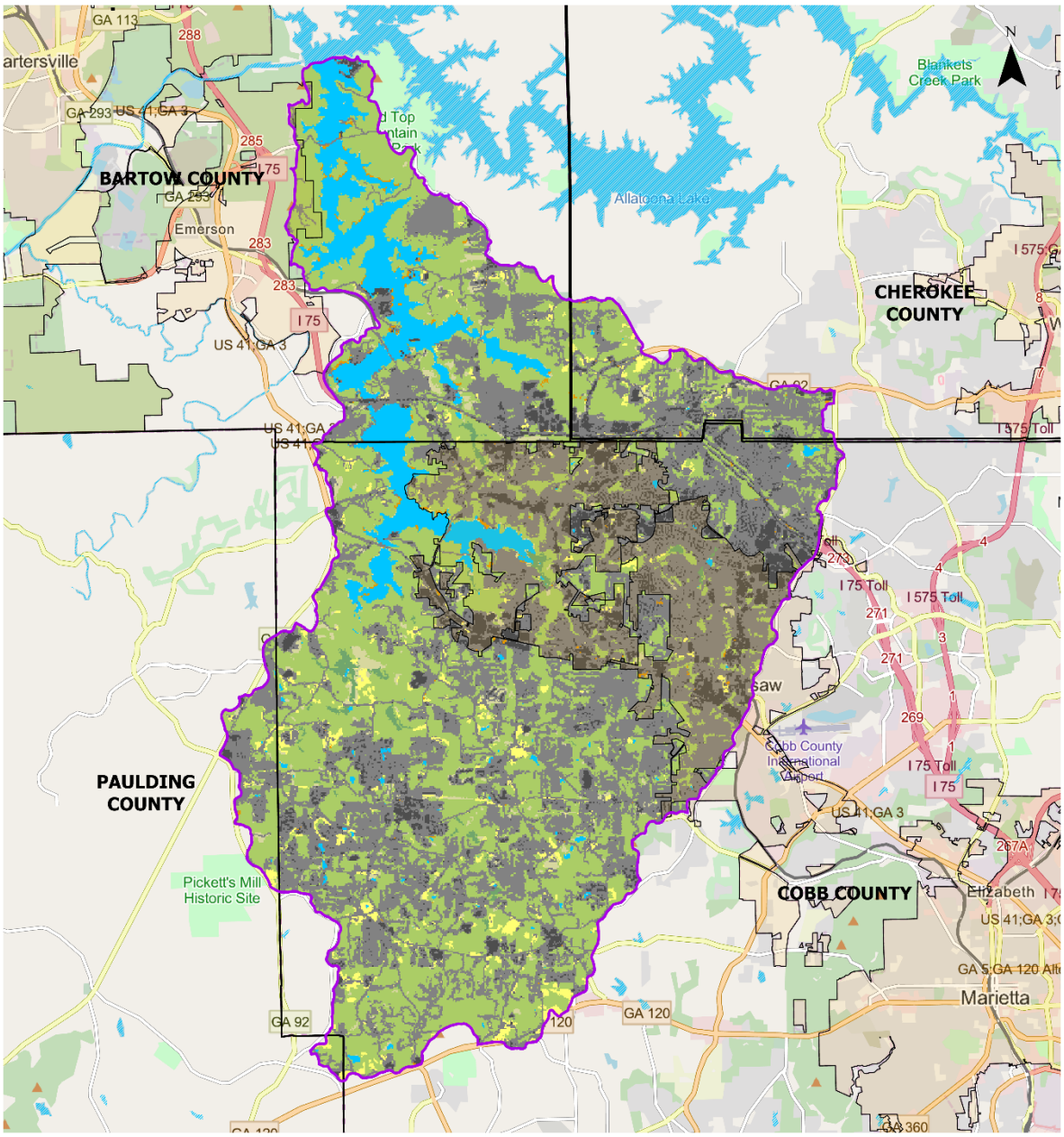
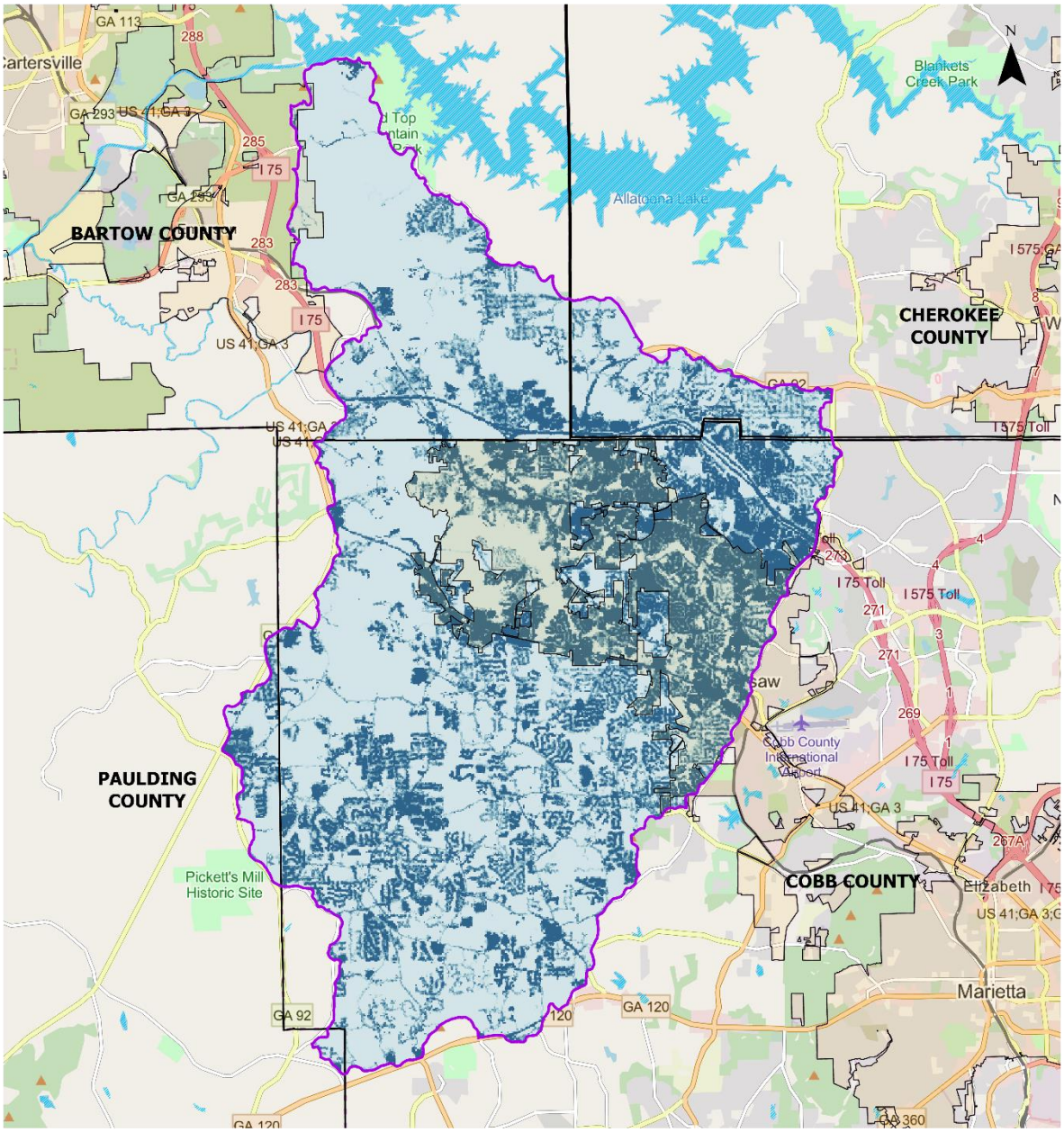

BARTOW COUNTY
PAULDING COUNTY
COBB COUNTY
CHEROKEE COUNTY
Allatoona Lake
Emerson
Marietta
Pickett's Mill Historic Site
Blankets Creek Park
Cobb County International Airport
GA 113
GA 293
US 41;GA 3
GA 92
GA 120
I 75
I 575
I 75 Toll
I 575 Toll
0 1 2 4 Miles
Landcover
Cobb County-Marietta Water Authority
Allatoona Creek Water Supply Watershed
Open Water
Barren Land
Shrub/Scrub
Developed, Open Space/Low Intensity
Developed, Medium/High Intensity
Hay/Pasture/ Cultivated Crops
Wetlands
Forest
City Boundary
County Boundary
Watershed Boundary

Figure 8

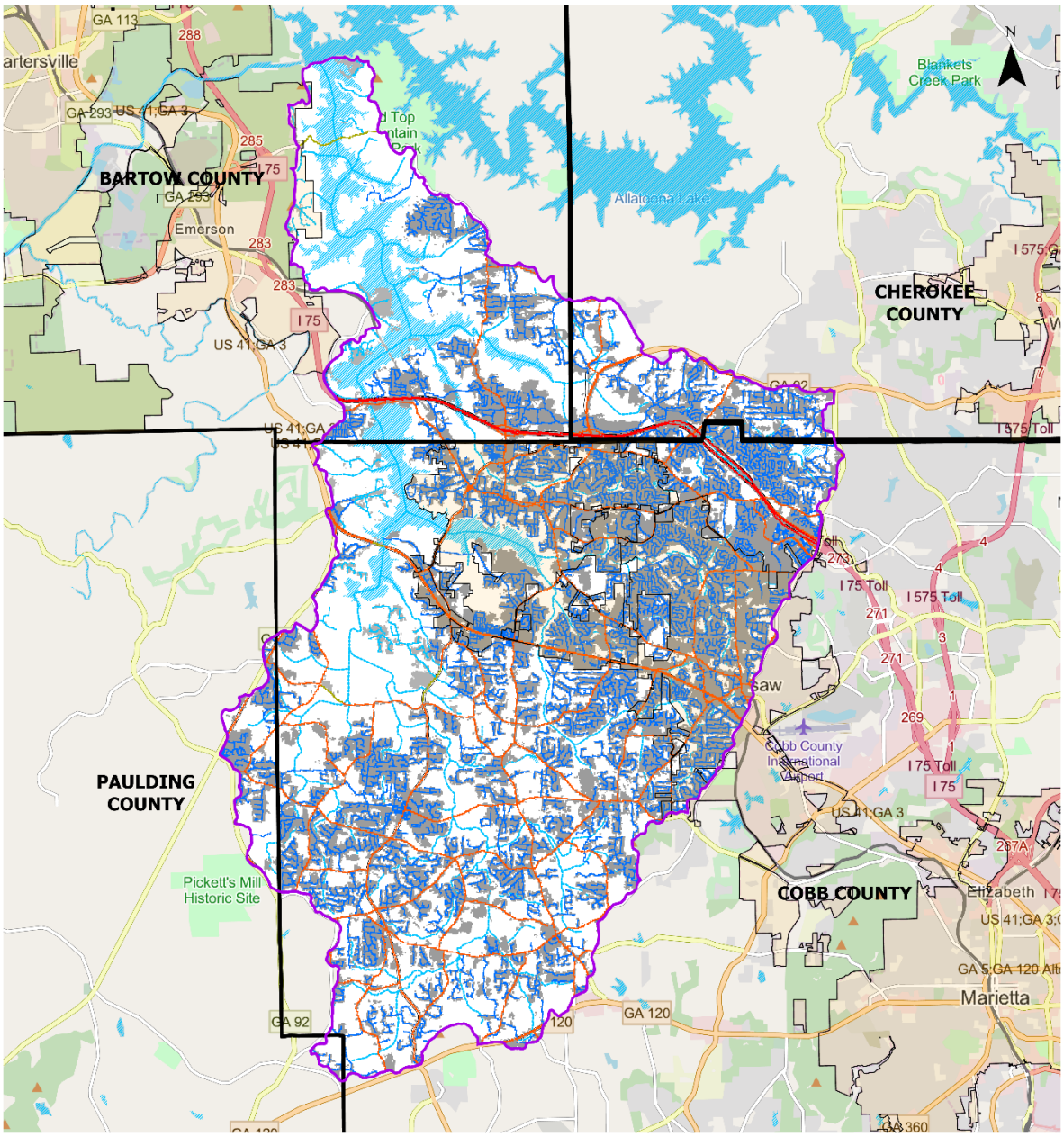


Percent Developed Imperviousness

Cobb County-Marietta Water Authority

Allatoona Creek Water Supply Watershed

Figure 9

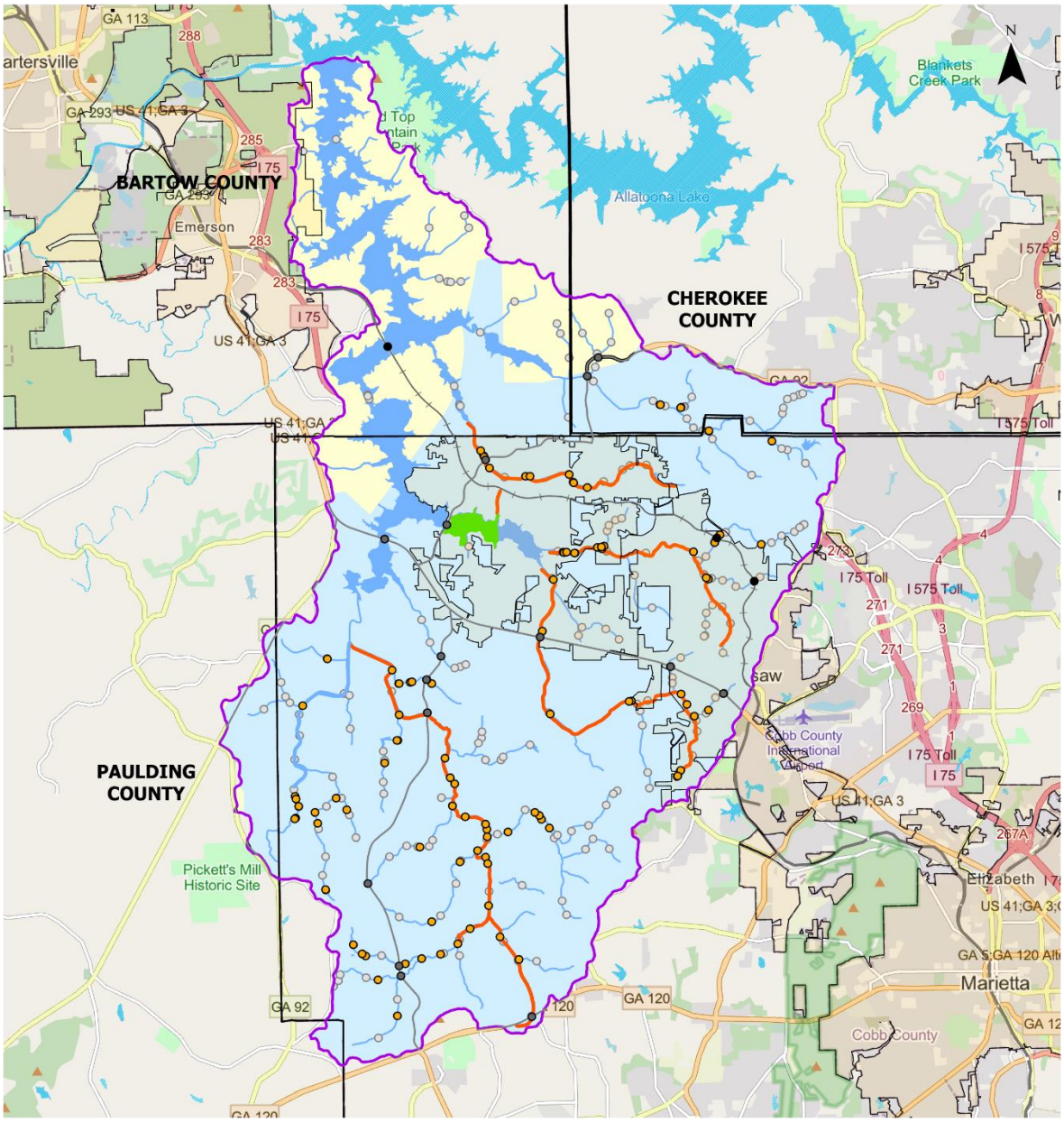


Developed Impervious Descriptor

Cobb County-Marietta Water Authority

Allatoona Creek Water Supply Watershed

Figure 10


BARTOW COUNTY
CHEROKEE COUNTY
PAULDING COUNTY
Allatoona Lake
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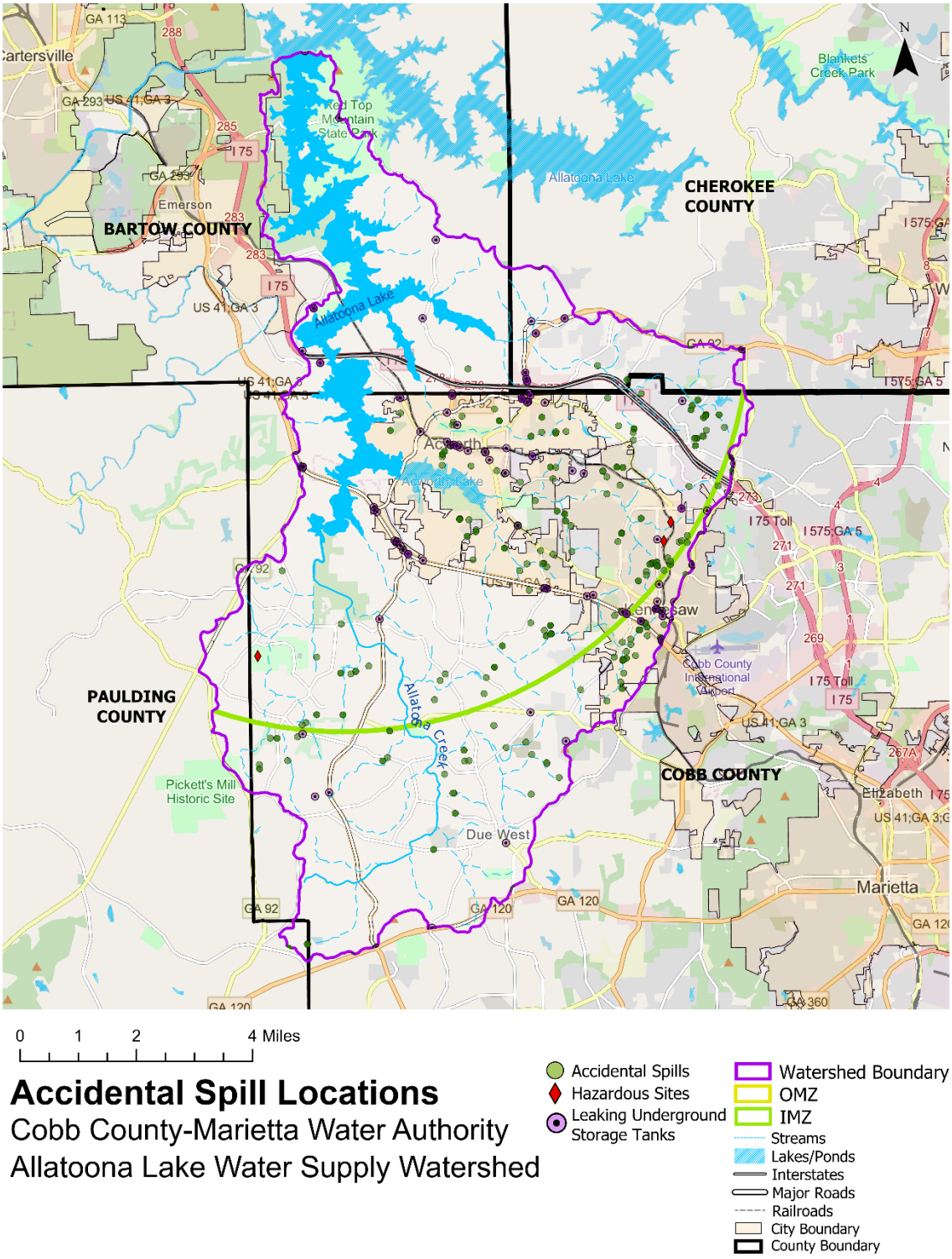
Emerson
Pickett's Mill Historic Site
Cobb County International Airport
Marietta
Cobb County
GA 113
GA 293
US 41;GA 3
I 75
I 575
I 575 Toll
GA 92
GA 120
US 41;GA
US 41
0 1 2 4 Miles
Streams/Crossings
Cobb County-Marietta Water Authority
Allatoona Creek Water Supply Watershed
Impaired Streams
Other Streams
Sewered Area
Unsewered Area
Impaired Lake/Reservoir
Major Road/Stream Crossings
Other Road/Stream Crossings
Railroad/Stream Crossings
Sewer >10"/Stream Crossings
City Boundary
County Boundary
Watershed Boundary

Figure 11



Accidental Spill Locations
Cobb County-Marietta Water Authority
Allatoona Lake Water Supply Watershed

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Appendix A. Potential Pollutant Sources

Accident Spill Locations
Agriculture
- Animal Feeding Operations
- Confined Animal Feeding Operations
- Dairy Operations
- Manure Handlers
- Poultry Operations
- Waste Lagoons

Airports
Asphalt Plants
Electric Substations
Fueling Facilities
Garbage Transfer Stations
Hazardous Waste Facilities
Junk/Scrap/Salvage Yards
Landfills (opened/in closure/closed)
Industries which have Bulk Chemical and Petroleum Storage
- Petroleum Bulk Stations and Terminals
- Chemical Bulk Stations and Terminals
- Paint, Varnish
- Farm Supplies

Large Industries which have Federal Categorical Standards
- Aluminum Forming
- Battery Manufacturing
- Builder's Paper and Board Mills
- Carbon Black Manufacturing
- Coil Coating
- Copper Forming
- Electrical and Electronics Components
- Electroplating
- Feedlots
- Fertilizer Manufacturing
- Glass Manufacturing
- Grain Mills
- Ink Formulating
- Inorganic Chemicals Manufacturing
- Iron and Steel Manufacturing
- Leather Tanning and Finishing
- Metal Finishing
- Metal Moulding and Casting
- Nonferrous Metals Forming and Metal Powders
- Nonferrous Metals Manufacturing
- Organic Chemicals, Plastics, Synthetics, and Fibers
- Paint Formulating
- Paving and Roofing Materials
- Pesticide Chemicals
- Petroleum Refining
- Pharmaceutical Manufacturing
- Porcelain Enameling
- Pulp, Paper and Paperboard
- Rubber Manufacturing
- Soap and Detergent Manufacturing
- Steam Electric Power Generating
- Timber Products Processing

Large Industries which Utilize Hazardous Chemicals
- Auto Supplies
- Food and Kindred Products
- Tobacco Products
- Textile Products
- Lumber and Wood Products
- Furniture and Fixtures
- Paint and Other Coatings
- Paper and Allied Products
- Printing and Publishing
- Chemicals and Allied Products
- Petroleum and Coal Products
- Rubber and Misc. Plastics Production
- Leather and Leather Products
- Stone, Clay and Glass Products
- Primary Metal Industries
- Fabricated Metal Products
- Industrial Machinery and Equipment
- Electronic and Other Electric Equipment
- Transportation Equipment
- Instruments and Related Products
- Misc. Manufacturing Industries

LAS Permit Holders
Lift Stations
Marinas
Military Bases
Mining
National Pollutant Discharge Elimination System (NPDES) Permit Holders
- Municipal
- Industrial
- Private

Oil/Gas Pipelines
Power Plants
Railways Adjacent /Crossing Streams
Recycling Centers
Roads Adjacent /Crossing Streams
Sewer Areas and Non-sewer Areas
Sewer Pipelines Adjacent /Crossing Streams
Transportation Corridors
Wastewater Facilities
Water Treatment Facilities

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Appendix B. Data Sources for Potential Pollutant Source

ACCIDENTAL SPILL LOCATIONS

This dataset was created from three sources of data. The first data source was the Hazardous Site Inventory (HSI) 2019. The HSI is a list of sites in Georgia known or suspected of having had a release of a regulated substance above a reportable quantity and which have yet to demonstrate compliance with the more-restrictive risk reduction standard rules for Hazardous Site Response. The HSI is compiled and published by the Georgia Environmental Protection Division (EPD). This system is self-reporting. The Hazardous Site Response Act of 1992 requires that a property owner who discovers a release of a regulated substance must report the release to the Hazardous Sites Response Program (HSRP) of Georgia EPD. When the release is reported, the HSRP evaluates the severity of the release and determines if the release is above the reportable quantity of that substance. If the site is above the quantity reportable, the site is placed on the HSI list. This data set is a draft in review by GA EPD and was current through July 1, 2019. The Information included in this database includes:

Source:

The second data source was a listing of self-reported accidental spills and sewage spills within the SWAP areas provided by the EPD Water Quality Branch. These data are current through January 2019. Due to the self-reporting nature the information included in this dataset is of low quality and was only used as a basic regional generalization rather than accurate listings.

Source: https://epd.georgia.gov/watershed-protection-branch/sewage-spills-report

Contact: Mr. Jarell Singleton, 404.463.2382
Email: jarell.singleton@dnr.ga.gov

The third data source was a list of leaks provided by the EPD Underground Storage Tank records. The EPD maintains a record of known leaks from underground storage tanks, as collected by the Underground Storage Tank Management Program. The data goes back to 1983. Like the accidental spills data, the UST data is of low quality and provides only partial location data. It should only be used as a basic regional generalization rather than as an accurate listing of locations.

Contact: Mrs. Jarell Singleton, 404.463.2382
Email: jarell.singleton@dnr.ga.gov

AGRICULTURE – Confined Animal Feeding Operations (CAFOs), Waste Lagoons, Manure Handlers, and Poultry Houses

This data set was created from six sources of data. The first two data sets are comprised of Georgia Department of Agriculture lists of all waste lagoons and manure handlers in Georgia. These data were acquired through a Georgia Open Records Access request and contain three waste lagoons and four manure handlers in all of the SWAP counties.

Contact: Laura Frank, GA Dept. of Agriculture
Email: laura.frank@agr.georgia.gov

The third and fourth datasets on Confined Animal Feedlots (CAFOs) within the state were supplied by the Georgia Environmental Protection Division's NPDES database and supplemented by data provided directly from the DNR. These data were developed from regulation currently performed under LAS permitting standards. The NPDES database was filtered by GAG93, the starting classification of CAFOs, to extract only CAFO data.

Contact: Vicki Trent, 404-232-7012
Email: vicki.trent@dnr.ga.gov

The fifth dataset was also provided by the Georgia Department of Agriculture through a Georgia Open Records Access request and lists all dairy operations in the state of Georgia.

Contact: Laura Frank, GA Dept. of Agriculture
Email: laura.frank@agr.georgia.gov

The sixth dataset was compiled by filtering the NPDES database for any permit type containing "AFO" or "Animal Feeding Operation" and extracting them to a spreadsheet before the coordinates could be plotted.

Contact: Vicki Trent, 404-232-7012
Email: vicki.trent@dnr.ga.gov

AIRPORTS

The data for airports came from the Federal Aviation Administration's extensive list of all airfields, both public and private, operating across the nation (https://www.faa.gov/airports/airport_safety/airportdata_5010/). This data was filtered to exclude helicopter pads and other non-airport facilities in the SWAP counties. It is up to date as of January, 2019.

ASPHALT PLANTS

This data set was created from data collected from two sources- the NPDES Industrial Stormwater Permit Notice of Intent (NOI) List and the EPD Air Quality Branch Combustion Unit permit database.

The NOI database is a list of 11 facility types required under NPDES to be regulated for the point discharge of stormwater that has been exposed to any aspect of a defined industrial activity. Filing with the NOI database is the first step towards obtaining a permit. The NOI data set used in the Metro SWAP is current through August 2018.

Contact: Cameron Wolfe, GA EPD NPDES Industrial Storm Water Unit, Email: cameron.wolfe@dnr.ga.gov

The GA EPD Air Quality Branch regulates industries on the basis of discharged airborne pollution. The portion of the Air Quality database used for this project consisted of listings for the two SIC codes representing Asphalt Paving and Roofing Materials Plants (2951 and 2952, respectively). The data set used in the Metro SWAP is current through July 2018.

Contact: Karen Hays, GA EPD Air Protection Branch,
Email: Karen.hays@dnr.ga.gov

Notes about the data set:
• We have removed duplicate facilities listed in both the NOI database and the EPD Air Quality database. These were removed by manual comparison based on facility name and address.

FIELD FACILITIES

A number of facilities were located by field observation. These facilities were found while field-verifying sites that were already mapped in our data sets from other data sources. In general, the recorded facility types were similar to those regulated and/or monitored by local or federal regulation and already included in our mapped dataset. However, it is likely that many of the field-identified facilities were not previously mapped due to rapid growth and development in many metro watersheds. If a facility were seen in the field of which ARC had no record, field personnel recorded its location information and attribute information. Facility types recorded include:

- Agricultural sites
- Airports
- Electrical substations
- Fuel facilities
- Garbage Transfer Stations (GTSs)
- Hazardous waste facilities (Dry cleaners, auto repair, etc)
- Junk/Scrap/Salvage Facilities
- Landfills (Open, Closed, and In-Closure)
- Bulk chemical storage sites
- Industries utilizing hazardous chemicals
- Industries with Federal Categorical Standards (FCSs)
- Marinas
- Military bases
- Mines and quarries
- Oil/Gas pipelines
- Sewage lift stations
- Sewer pipelines crossing streams
- Wastewater Land Application System (LAS) sites
- Wastewater treatment plants
- Drinking water treatment plants
- Other listed potential pollutant source types

Individual SWAP partners, consisting of water departments, authorities, and utilities performed much of the fieldwork. As not all of the partners were able to perform this task, ARC staff completed fieldwork as necessary.

The data in the Metro SWAP is current through September, 2019.

Contact: Alexandra Orrego, Atlanta Regional Commission Natural Resources Group, Metropolitan North Georgia Water Planning District
Email: AOrrego@atlantaregional.org

FUEL FACILITIES

The fuel facilities dataset is made of EPD's maintained list of Underground Storage Tanks (USTs - https://epd.georgia.gov/underground-storage-tanks), specifically the "Underground Storage Tank Facility and Owner Data" Excel spreadsheet. This data is up to date as of March, 2018. The website also includes spreadsheets of facility contact information, corrective action projects and cleanups, and a public record report for the fiscal year (2019 at the time of this report).

GARBAGE TRANSFER STATIONS

Garbage Transfer Stations are defined as “a facility used to transfer solid waste from one vehicle to another for transport to a disposal facility or processing operation.” The majority of these facilities consist of an elevated platform where individuals can drive up and deposit solid waste into a large open truck. Garbage Transfer Stations function as ‘self-serve’ collection points for areas without solid waste collection services, and may be staffed or otherwise monitored to reduce dumping of unacceptable materials. These facilities may be private or owned by local governments.

The data is from the EPD’s list of all garbage transfer stations, available online at https://epd.georgia.gov/permitted-solid-waste-facilities as an Excel spreadsheet titled “Collection Operations and Transfer Stations”. It is up to date as of August, 2018.

HAZARDOUS WASTE FACILITIES

The first hazardous waste facilities data source comes from the EPA. They monitor hazardous waste facilities under the Resource Conservation and Recovery Act (RCRA) and available information can be found on https://enviro.epa.gov/facts/rcrainfo/search.html. These data were separated into different RCRA facility categories: Treatment, Storage, and Disposal Facilities (TSD); Large Quantity Generators (LQG); Small Quantity Generators (SQG); and Conditionally Exempt Small Quantity Generators (CESQ). This data provided little information, including only location data with facility IDs and so a second data source was used to provide more detail.

Contact: Jerry R. Campbell, Emergency Response Manager, EPD
Email: Jerry.campbell@dnr.ga.gov

The second data source is from the ARC's Research and Analytics Group. The data is filtered for requested industry data on hazardous waste treatment and disposal facilities using North American Industry Classification System (NAICS) code 562211 (Hazardous waste treatment and disposal). This data was compared with the EPA's RCRA records and only unique entries were kept. This dataset is up to date as of January, 2019.

Contact: Ryan Barrett, ARC Research and Analytics Division
Email: RBarrett@atlantaregional.org

Contact: Jim Skinner, ARC Research and Analytics Division, Administrator
Email: JSkinner@atlantaregional.org

JUNK, SCRAP, AND SALVAGE YARDS

Junk, scrap, and salvage yard data were provided internally by the ARC's Research and Analytics division. The data is filtered for requested facilities identified by using NAICS code 423140 (Motor Vehicle Parts (Used) Merchant Wholesalers) to extract the salvage yard location data. This dataset is up to date as of January, 2019.

Contact: Ryan Barrett, ARC Research and Analytics Division
Email: RBarrett@atlantaregional.org

Contact: Jim Skinner, ARC Research and Analytics Division, Administrator
Email: JSkinner@atlantaregional.org

LANDFILLS

Landfills are categorized into three groups: operating landfill disposals, landfills in closure, and closed landfills. These datasets are all available on https://epd.georgia.gov/permitted-solid-waste-facilities under the labels Solid Waste Disposal Facilities, Landfills – In Closure, and Landfills- Closed, respectively. The datasets are current as of October, 2018. The landfills in closure dataset was largely unusable as locations were often provided as directions to the site rather than coordinates or an address. However, through extensive aerial verification of landfills in closure we were able to identify a significant amount.

LAND APPLICATION SYSTEM (LAS) PERMIT HOLDERS

This data set contains information on permitted municipal, industrial, and private LAS facilities. The data set was created from geographic information system (GIS) databases collected from the Georgia Environmental Protection Division's (EPD) NPDES list. This list tracks all discharges that enter waterways in Georgia and was filtered by IDs starting with GAG278, GAG92, and GAG94, all of which apply to land application systems (LASs). This dataset is current as of April, 2018.

Contact: Vicki Trent, Data Assessment and Management Unit, Water Protection Branch of DNR.
Phone: 404-651-8482
Email: Vicki.Trent@dnr.ga.gov

LARGE INDUSTRIES WHICH UTILIZE BULK CHEMICAL OR PETROLEUM STORAGE

This dataset was provided by the EPD and includes facilities which intend to discharge stormwater associated with industrial activity. The dataset includes permit holders which was used to provide data covering all industries with bulk chemical storage excluding those related to asphalt production. The SIC codes are provided below and the data is current as of August, 2018.

Contact: John Maddox, EPD Contact Emergency Response Manager
Phone: 770.387.4936

Based on SIC code description, industries engaged in the wholesale distribution of chemicals or petroleum were selected from the EPD data set for inclusion in this category. Industries with the following SIC codes were selected:

SIC	Name	Description
5169	Chemicals and Allied Products, Not Elsewhere Classified	Engaged in wholesale distribution of chemicals and allied product (chemicals, dyes, acids, etc.)
5171	Petroleum and Bulk Stations and Terminals	Engaged in wholesale distribution of crude petroleum and petroleum products
5191	Farm Supplies	Engaged in wholesale distribution of animal feeds, fertilizers, pesticides and other farm supplies (excluding grains)
5198	Paints, Varnishes and Supplies	Engaged in wholesale distribution of paints, varnishes wallpaper and supplies.

LARGE INDUSTRIES WITH FEDERAL CATEGORICAL STANDARDS

This dataset is collected from the EPD's website, https://epd.georgia.gov/watershed-protection-branch-lists, where all industrial water pretreatment systems are listed. The data included the permit holders which was used to provide a list of all of the industries with bulk chemical storage, excluding those related to asphalt production. These data are current as of August, 2018.

LARGE INDUSTRIES WHICH UTILIZE HAZARDOUS CHEMICALS

This data set was created from data collected under the Emergency Planning and Community Right-to-Know Act (EPCRA). EPRCA requires a report to EPA and the state from each manufacturer with 10 or more employees who either use 10,000 pounds or manufactures or processes 25,000 pounds of any "toxic chemical" during the reporting year. EPCRA requires reporting the following data:

- Name and location of facility
- Property owner or contact information
- State permit or ID number
- Identification of toxic chemicals
- Standardized Industrial Classification (SIC).

EPCRA data was obtained for this project from Jerry Campbell, Emergency Planning and Community Right to Know Administrator.
Phone: 770.387.4900

The second data source was obtained from the Toxic Release Inventory (TRI). These data tracked releases from 1996 to the most up to date release in 2016. This dataset tracks locations not associated with the EPCRA dataset.

As a requirement of EPCRA, air, land, and/or water releases, accidental or otherwise, are reported in the Toxic Release Inventory. Both the EPCRA and TRI data sets were compiled to create the ARC SWAP Large Industries Which Utilize Hazardous Chemicals database. EPCRA Data used in the Metro SWAP was current as of July, 2018 and TRI was updated in 2016. Due to some discrepancies between the two data sets, records from TRI not already present in EPCRA were added to supplement the database.

LIFT STATIONS

The information for this data set was acquired by the individual water authorities and/or local governments and can be considered incomplete and unverified due to a lack of response from a handful of utilities. However, the data are what is available and have been plotted appropriately to ensure the data that they are accurate.

City of Cartersville	Sidney Forsyth 09/19	sforsyth@cityofcartersville.org
Bartow County	Charles Fail 09/18	failc@bartowga.org
Butta County Water and Sewer Authority	Marcie R. Seleb 10/17	mseleb@buttswsa.com
City of Ball Ground	Eric Wilmarth 1/22	ewilmarth@cityofballground.com
Cherokee County Water & Sewerage Authority	Jennifer Arp	jennifer.arp@ccwsa.com
City of Canton Water & Sewer Department	David Hatabian 10/12	david.hatabian@cantonga.gov
City of Woodstock	Katy Leggett 09/13	kleggett@woodstockga.gov
Clayton County	Jim Quattlebaum 10/9	jim.quattlebaum@ccwa.us
Cobb County Water System	Jeff Campbell 08/21	Jeff.Campbell@cobbcounty.org
City of Smyrna	Kathe Roper 1/22	kroper@smyrnaga.gov
City of Senoia	Curtis Hindman/Greg Ashworth 10/25	chindman@senoia.com ; gashworth@gbtengineers.com
Coweta County Water & Sewerage Authority	Joe Pelletier 09/19	jpelletier@cowetawater.com
Newnan Utilities	Jeff Pecce 07/26	jeff@newnanutilities.org
DeKalb County	Sandra L. Glenn 08/13	slglenn@dekalbcountyga.gov
Douglasville - Douglas County	Brian Keel 08/22	bkeel@ddcwsa.com
City of Fayetteville	Jonas Lydon 08/08	JLydon@fayetteville-ga.gov

Peachtree City	Internal Data	
Tyrone	Brad Konwick 08/27	bkonwick@tyrone.org
City of Cumming	Mary Lipold 08/27	mary@cecincga.com
Forsyth County	Brandon R. Loggins 07/30	BRLoggins@forsythco.com
Atlanta Fulton County Water Resource Commission	kathy Crews 08/02	kcrews@afcwrc.com
City of East Point	Melissa Echevarria 01/15	mechevarria@EastPointCity.org
City of Palmetto	Diana Chumak 01/29	diana.chumak@greshamsmith.com
South Fulton	Laura Benz 8/2	Laura@lwbenz.com
City of Buford	Lamar Sudderth 10/9	LSudderth@cityofbuford.com
Gwinnett County	Michael Pappas 07/31	Michael.Pappas@gwinnettcounty.com
City of Gainesville	Horace Gee 07/31	hgee@gainesville.org
Hall County	Mark Lane 09/18	mlane@hallcounty.org
City of McDonough Water Department	Cesar Sanchez 08/24	CSanchez@McDonoughGa.org
Hampton	Jaretta Chaffin 8/21	jchaffin@hamptonga.gov
Henry County Water & Sewerage Authority	Allen Rape 09/24	allen.rape@hcwa.com
Paulding County	Corey Coats 07/27	ccoats@paulding.gov
Rockdale County	Deirdre Blackard 07/26	Deirdre.Blackard@RockdaleCountyGA.gov

MARINAS

Industry marina data were requested and provided internally by the ARC's research and analytics division. The data was then filtered by NAICS codes, similar to the methods presented earlier in this report.

Contact: Ryan Barrett, ARC Research and Analytics Division
Email: RBarrett@atlantaregional.org

Contact: Jim Skinner, ARC Research and Analytics Division, Administrator
Email: JSkinner@atlantaregional.org

MILITARY BASES

Military bases were acquired from the Federal Department of Transportation's shape file containing all military bases in the country (http://osav-usdot.opendata.arcgis.com/). These polygons were clipped to their appropriate management zones and are current as of 2017.

MINING OPERATIONS

Mining operation data were obtained from the EPD's website (https://epd.georgia.gov/surface-mining), in the Excel spreadsheet titled Permitted Surface Mining Facilities. The data were imported to ArcGIS Pro before their coordinates were plotted and clipped to the appropriate management zones. The data are current as of November, 2018.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT HOLDERS

The Georgia EPD maintains a database of facilities permitted under the National Pollutant Discharge Elimination System (NPDES) in Georgia. These permits are required by all facilities that discharge pollutants into any waterbody in the United States. While this includes points from other PPS categories, they were removed and only NPDES specific permit holders were kept.

Contact: Vicki Trent, Data Assessment and Management Unit, Water Protection Branch of DNR.
Phone: 404-651-8482
Email: Vicki.Trent@dnr.ga.gov

OIL AND GAS PIPELINES CROSSING STREAMS

The oil and gas pipeline data for Georgia was obtained from the United States Office of Pipeline Safety's National Pipeline Mapping System (NPMS). The NPMS asked that this data not be shared with anyone or even kept on shared drives so the data were kept on hard drives encrypted with password protection. The data are current as of February, 2019.

Contact: Nathaniel Thompson, National Pipeline Mapping System
Email: npms@dot.gov

POWER PLANTS AND SUBSTATIONS

These data came from two sources. For power plants, the EPA's Facility Registry Service database was used. This database includes large, potentially polluting facilities and is slightly outdated with the most current revision being 2013, so it was largely used for power plant identification as they have not changed in the 6-year interim.

The second dataset came from the Department of Homeland Security's list of important facilities for its internal information network. Special clearance was required to handle these data which was obtained through an application on their website.

RAILWAYS CROSSING STREAMS

The sources for railways crossing streams came from both the Atlanta Regional Commission (ARC) and from the Georgia GIS Data Clearinghouse (https://data.georgiaspatial.org/). These datasets were compared and any overlapping roads were removed. The railways polyline file was then intersected with the ARC's rivers and streams of Georgia polyline to determine where they crossed. These data are current as of 2018.

Contact: Ryan Barrett, ARC Research and Analytics Division
Email: RBarrett@atlantaregional.org

RECYCLING CENTERS

Recycling center industry data was requested by the ARC and provided internally by the research and analytics division. This data was then filtered by NAICS codes 423930 (Recyclable Material Merchant Wholesalers) and 562920 (Materials Recovery Facilities). These data are current as of January, 2019.

Contact: Ryan Barrett, ARC Research and Analytics Division
Email: RBarrett@atlantaregional.org

Contact: Jim Skinner, ARC Research and Analytics Division, Administrator
Email: JSkinner@atlantaregional.org

ROADS CROSSING STREAMS

The ARC maintains a feature class containing all major roads in the 20-county radius surrounding Atlanta. These are coupled with 2014 TIGER street line files to obtain more accurate polylines before they are intersected with the rivers and streams polyline shape file to determine where they meet or cross one another.

Contact: Ryan Barrett, ARC Research and Analytics Division
Email: RBarrett@atlantaregional.org

SEWER AREAS AND NON-SEWER AREAS (SEPTIC TANKS)

The sewered and non-sewered areas were provided as polyline shape files to the ARC from the utilities themselves in addition to the ARC's data of septic tanks in the 10-county ARC region. Some assumptions were made that include comparing the sewered areas to septic tank point data as well as using sewer service area data provided by Peachtree City.

The septic (non-sewered) areas were generated by the ARC by dissolving the sewered-areas provided by utilities to the management zone in question, leaving only "non-sewered area" remaining. To the extent of our knowledge, the data are current as of January, 2019.

Data was requested from the utilities involved with the project on 4 separate occasions and a handful of utilities never responded to the requests. Therefore, some sewered area calculations may be inaccurate, though it is unlikely this would have a significant effect on the final results as the utilities who did not respond are fairly small.

City of Cartersville	Sidney Forsyth 09/19	sforsyth@cityofcartersville.org
Bartow County	Charles Fail 09/18	failc@bartowga.org
Butta County Water and Sewer Authority	Marcie R. Seleb 10/17	mseleb@buttswsa.com
City of Ball Ground	Eric Wilmarth 1/22	ewilmarth@cityofballground.com
Cherokee County Water & Sewerage Authority	Jennifer Arp	jennifer.arp@ccwsa.com
City of Canton Water & Sewer Department	David Hatabian 10/12	david.hatabian@cantonga.gov
City of Woodstock	Katy Leggett 09/13	kleggett@woodstockga.gov
Clayton County	Jim Quattlebaum 10/9	jim.quattlebaum@ccwa.us
Cobb County Water System	Jeff Campbell 08/21	Jeff.Campbell@cobbcounty.org
City of Smyrna	Kathe Roper 1/22	kroper@smyrnaga.gov

City of Senoia	Curtis Hindman/Greg Ashworth 10/25	chindman@senoia.com ; gashworth@gbtengineers.com
Coweta County Water & Sewerage Authority	Joe Pelletier 09/19	jpelletier@cowetawater.com
Newnan Utilities	Jeff Pecce 07/26	jeff@newnanutilities.org
DeKalb County	Sandra L. Glenn 08/13	slglenn@dekalbcountyga.gov
Douglasville - Douglas County	Brian Keel 08/22	bkeel@ddcwsa.com
City of Fayetteville	Jonas Lydon 08/08	JLydon@fayetteville-ga.gov
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City of Cumming	Mary Lipold 08/27	mary@cecincga.com
Forsyth County	Brandon R. Loggins 07/30	BRLoggins@forsythco.com
Atlanta Fulton County Water Resource Commission	kathy Crews 08/02	kcrews@afcwrc.com
City of East Point	Melissa Echevarria 01/15	mechevarria@EastPointCity.org
City of Palmetto	Diana Chumak 01/29	diana.chumak@greshamsmith.com
South Fulton	Laura Benz 8/2	Laura@lwbenz.com
City of Buford	Lamar Sudderth 10/9	LSudderth@cityofbuford.com
Gwinnett County	Michael Pappas 07/31	Michael.Pappas@gwinnettcounty.com
City of Gainesville	Horace Gee 07/31	hgee@gainesville.org
Hall County	Mark Lane 09/18	mlane@hallcounty.org
City of McDonough Water Department	Cesar Sanchez 08/24	CSanchez@McDonoughGa.org
Hampton	Jaretta Chaffin 8/21	jchaffin@hamptonga.gov
Henry County Water & Sewerage Authority	Allen Rape 09/24	allen.rape@hcwa.com

Paulding County	Corey Coats 07/27	ccoats@paulding.gov
Rockdale County	Deirdre Blackard 07/26	Deirdre.Blackard@RockdaleCountyGA.gov

SEWER PIPES CROSSING STREAMS

Sewer data has been collected for the ten county region and for each of the additional 14 counties and numerous small cities that fall within the watersheds of concern. Data was obtained directly from each county or city, from various departments including Engineering, Public Works, City Hall, and GIS departments. Data formats include ArcInfo coverages, shape files, CAD drawing files, and paper maps that must be digitized into electronic form for analysis. The nature of the data sought is simply a map of the location of the pipes (geospatial data) and the size of the pipes (when available).

The sewer data is being analyzed for adjacency to and crossing of streams. Emphasis is placed on lines 10 inches in diameter or greater, and lines of diameter 8 inches or less are not included in the analysis. GIS is used to determine the number of miles of pipe 10" or greater within each watershed and within 25 feet of a stream, as well as the location and number of stream crossings. Wherever possible, analysis is done with a hydrology data layer obtained from the county governments to try and ensure consistency and accuracy.

(The above contact table is applicable here as well)

WATER PLANTS

Water plant data were obtained from the NPDES database provided to us by the EPD. This dataset was filtered identically to previously mentioned potential individual source categories to obtain IDs starting with GAG55 and GAG64 which are associated with water treatment plants. The database was also searched manually for any permit with “WTP” or “WTF” in the name field. The data are current as of April, 2018.

WASTEWATER TREATMENT FACILITIES

Wastewater treatment facilities were found similarly as water plants were in that the EPD NPDES database provided to us was filtered to extract private and municipal plants as well as any name fields that contained “WWTP”, “WPCP”, “WSA”, or “WRF”. The data are current as of April, 2018.

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Appendix C. Methodology for Individual Source Susceptibility Determination

The following methodology was used to calculate (1) Distance to Surface Water, (2) Distance to Surface Water Intake, and (3) Ease of Transport for the individual source susceptibility determination. The rankings for each of these measurements were chosen based on the median values calculated across the 25th, 50th, and 75th percentiles.

Distance from Surface Water

Flow paths from each individual source facility to the nearest stream were calculated in ArcGIS Pro using the Flow Distance tool. The Flow Distance outputs the horizontal length of the natural flow path to the nearest stream in decimal degrees. Decimal degrees were converted to feet by multiplication of 335,000. This value was chosen based on an online conversion tool which uses several coordinates from the corresponding study area to produce a conversion value. The difference in conversion values across varying latitudes in the study area was very small, with only a ~2.9% error. The range of median Distance to Surface Water values calculated across the 25th, 50th, and 75th percentiles were 1440 ft., 2339 ft., and 3209 ft. respectively.

Distance from Water Intake

The distance from each individual facility to the surface water intake, more accurately, the mouth of the HUC10 watershed boundary, was calculated utilizing a model in ArcGIS Pro that created Cost Paths. These paths follow the “cheapest cost” path in a given region from a set of raster, or column and row pixel data that follows a reclassified 10 m-resolution National Elevation Dataset (NED) elevation raster as well as a flow direction raster generated from the same NED data using the Flow Direction tool. A path is generated for each potential pollutant source after it has been “snapped” to the stream line using the Near tool and then merged into a final polyline feature class before the original stream points are spatially joined to the lines so that the lengths are associated with their respective potential pollution sources. This can be done for individual points by using the proper tools in correct succession or for entire watersheds when placed in a model.

Ease of Transport

Ease of Transport was calculated by taking the average of the determined ranking values for Distance from Surface Water, Slope, and LULC for each individual source facility.

The elevation difference was calculated by taking the difference between the elevations at the starting and ending points of the flow path calculated using the Flow Distance tool ArcGIS Pro. Slope was then calculated by dividing the elevation difference by the flow path distance for each individual source facility. The range of median Slope values calculated across the 25th, 50th, and 75th percentiles were 0.006, 0.009, and 0.012 respectively.

LULC classes from the NCLD dataset were reclassified from 15 to 8 classes, as many of the original classes were not relevant for this study. The LULC weight was calculated in ArcGIS Pro by taking the average of all pixel classes along the straight-line distance between each individual source facility and the nearest stream.

Table C1: Individual Source Susceptibility Category Rankings and Calculations

Category	Ranking	Calculation
Distance from Surface Water	**High – less than 1440 feet** **Medium – 1440 feet < Distance <3209 feet** **Low – greater than 3209 feet**	**Distance from surface water is calculated based on elevation flow paths from each facility to the nearest stream.**
Distance from Water Intake	**High – within 7 miles upstream** **Medium – between 7 and 15 miles upstream** **Low – between 15 and 20 miles upstream**	**River miles are calculated based on natural flow of pollutants downstream.**
Slope	**High – greater than 0.012** **Medium – between 0.006 and 0.012** **Low – less than 0.006**	**Slope is calculated by dividing the elevation difference by the flow path distance for paths between individual source facilities and the nearest stream.**
LULC Class	**High – Developed-high intensity, Water** **Medium – Developed-low intensity, Barren Land, Hay/Cultivated Crops** **Low – Deciduous/Mixed Forest, Shrub/Herbaceous, Woody/Wetlands**	**LULC weight was calculated by taking the average of all LULC pixels along a straight-line distance from each individual source facility to the nearest stream.**
Ease of Transport *(Average: Dist. from Surface Water + Slope + LULC)*	**High – 3** **Medium-High – 2.33-2.67** **Medium – 2** **Medium-Low – 1.33-1.67** **Low - 1**	**Ease of Transport is calculated by averaging the ranking values of Slope, Dist. from Surface Water, and LULC weight for each individual source facility.**

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Appendix D. General Release and Potential Risk

Source	Volume	Duration	Toxicity	Reasoning
Agriculture				
AFO's	Low-High	Low	High	Unanticipated Occurrence – natural disaster; Pathogens
CAFO's	Medium-High	Low	High	
Dairy Ops	Low-High	Low	High	
Manure Handlers	Medium-High	Low	High	
Poultry	Low	Low	High	Most operations have broiler chickens, which have dry litter; Extensive measures in place for containing waste; Pathogens
Waste Lagoons	High	Low	High	Potentially 10,000 gallon release if dam breaks; Low probability of break occurring
Airports	Medium	Medium	Medium	Emergency Response Spill Data - Spills were >1,000 GAL but <10,000 GAL; Chemicals, Jet fuel leaks
Asphalt Plants	High	Medium	High	Chemicals, mostly risk to air pollution
Fuel Facilities (UST)	Low	Medium	Medium	Emergency Response Spill Data. Spills were <1,000 GAL
Garbage Transfer Stations	Low	Low	Medium	Low potential of haulers polluting; Type of chemicals
Haz. WasteFacilities				
CEQG	Low	Low	High	> 1000 KG per Month
SQG	Medium	Medium	High	1000 KG < SQG> 100 KG per month
LQG	High	High	High	< 100 KG per Month
TSD	High	High	High	
Junk Scrap	Low	Medium	High	Small volume of release; Metals/Chemicals
Landfills				

Operating	Low	High	High	Contained landfills, no groundwater contamination, in compliance
In Closure	Medium	High	High	Open dumps, inert waste, no groundwater contamination
Closed	High	High	High	History of groundwater contamination, uncharacterized waste.
Large Ind. w/Haz Chem	High	High	High	>25,000 lbs/year
Large Ind. FCS	High	High	High	>25,000 lbs/year
Large Ind. Bulk Chem Storage	High	High	High	>25,000 lbs/year
LAS Permit Holders	Low	Low	Low	Pathogens may be present, but treated before release; Based on permit compliance
Lift Stations	Medium	Medium	High	Sanitary sewer overflows
Marinas	Medium	High	High	Chemical types; Contaminants directly enter water system
Military Bases	High	High	High	
NPDES permit holders	Low-High	Low-High	High	Facility dependent (municipal, industrial, private)
Power plants	Low-High	Low-High	Medium	Type of facility dependent; Metal, chemicals
Recycling	Low	Low	Low-High	Facility dependent
Substations	Low	Low	Low	Mostly VOCs, low volume of spill to water
Surface Mines	Low-Medium	Low	Medium	Low probability – storm dependent; Metals
WWTP	High	High	High	Pathogens in untreated water
Water Plants	Low	Low	Medium	Types of chemicals on site

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Appendix E. Water Quality Impaired Streams in the Cobb County – Marietta Water Authority Intake Supply Watersheds

The following is a tabulated year 2018 Georgia 305(b)303(d) integrated report listing impaired streams submitted by the Georgia Department of Natural Resources to the EPA. The table is a summary of extract from the GIS datasets of the report.

Stream	Location	Criterion Violated	Potential Cause(s)	Assessment Result	Action to Reduce Impairment
Acworth Creek	Tributary to Lake Acworth	FC	UR	Not Supporting	TMDL completed FC 2004.
Allatoona Creek	Headwaters to Little Allatoona Creek	FC	UR	Not Supporting	TMDLs completed FC (2004) & Bio F (2009).
Ball Mill Creek	Headwaters to the Chattahoochee River	FC	UR	Not Supporting	TMDL completed FC 2003 (revised 2008).
Richland Creek	Headwaters to Chattahoochee River	FC, Bio F	UR	Not Supporting	TMDL completed FC 2003 (revised 2008); TMDL 2017.
Crooked Creek	Tributary to Chattahoochee River	FC, Bio F	UR	Not Supporting	TMDL completed FC 2003 (revised 2008); TMDL 2017.
Kelly Mill Branch	Headwaters to Orr Creek	FC	UR	Not Supporting	TMDL completed FC 2003 (revised 2008).
Big Creek	Headwaters to Cheatham Creek	FC	UR	Not Supporting	TMDLs completed FC 2003 (revised 2008), Cu 2003.
Big Creek	Hwy 400 to Chattahoochee River	FC	UR	Not Supporting	TMDL completed FC 2003 (revised 2008).
Butler Creek	Headwaters to Lake Acworth	FC, Bio F	UR	Not Supporting	TMDLs completed FC (2004) & Bio F (2009).
Level Creek	Headwaters to Chattahoochee River	FC, Bio F	UR	Not Supporting	TMDL completed FC 2003 (revised 2008); TMDL 2017.
Marsh Creek (aka March Creek)	Headwaters to Chattahoochee River	FC, Bio F	UR	Not Supporting	TMDL completed FC 2003 (revised 2008). EPD to collect more data to determine satifaction of water quality criteria; TMDL 2017.
Johns Creek	Headwaters to Chattahoochee River	FC, Bio F	UR	Not Supporting	TMDL completed FC 2003 (revised 2008); TMDL 2017.

Ivy Creek	Headwaters to Suwannee Creek	Bio F	UR	Not Supporting	TMDL completed Bio F 2008.
Chattahoochee River	Johns Creek to Morgan Falls Dam	FC	UR	Not Supporting	TMDL completed FC 2008.
Chattahoochee River	Morgan Falls Dam to Peachtree Creek	FC, FCG(PCBs)	UR	Not Supporting	TMDLs completed FC 2003 (revised 2008), FCG(PCBs) 2003
Foe Killer Creek	Headwaters to Big Creek	FC, Bio F	UR	Not Supporting	TMDL completed FC 2003 (revised 2008); TMDL 2017.
Haw Creek	Headwaters to Chattahoochee River	Bio F	NP, UR	Not Supporting	TMDL 2017
Hog Waller Creek	Tributary to Big Creek (Roswell)	FC	UR	Not Supporting	TMDL completed FC 2003 (revised 2008).
Orr Creek	U/S Castleberry Rd.(Tyson Foods) to Big Creek	FC	UR	Not Supporting	TMDLs completed FC 2003 (revised 2008) & Cu 2003.
Proctor Creek	Headwaters to Lake Acworth	FC, Bio F	UR	Not Supporting	TMDL completed FC (2004) & Bio F (2009).
Suwanee Creek	Mill Creek to Chattahoochee River	FC	UR	Not Supporting	TMDL completed FC 2003 (revised 2008).
Suwanee Creek	Suwanee Creek Lake (near Buford) to Ivy Creek	Tox, Bio F	M, UR	Not Supporting	TMDL completed Bio F 2008.
Tanyard Creek	White Lake to Lake Allatoona	FC	UR	Not Supporting	TMDL completed FC 2004.
Tributary to Allatoona Creek	Headwaters to Allatoona Creek	FC	UR	Not Supporting	TMDL completed FC 2004.
Brushy Creek	Headwaters to the Chattahoochee River	Bio F	NP, UR	Not Supporting	TMDL 2017
Cauley Creek	Headwaters to Chattahoochee River	FC, Bio F	NP, UR	Not Supporting	TMDL completed FC 2013; TMDL 2017
Long Indian Creek	Headwaters to Big Creek	FC	NP, UR	Not Supporting	TMDL completed FC 2013.

James Creek	Daves Creek to the Chattahoochee River	FC	NP, UR	Not Supporting	TMDL completed FC 1998.
Willeo Creek	Unnamed tributary 250 ft d/s Willeo Road to the Chattahoochee River	FC	UR	Not Supporting	TMDL completed FC 2003 (revised 2008).
Tributary #1 to the Chattahoochee River	Headwaters to the Chattahoochee River	Bio F	UR	Not Supporting	TMDL 2017
Little Allatoona Creek	Tributary to Allatoona Creek			Supporting	TMDL completed FC 2004.
Chattahoochee River	Buford Dam to Dicks Creek			Supporting	
Chattahoochee River	Dicks Creek to Johns Creek			Supporting	
Dick Creek	Headwaters to the Chattahoochee River			Supporting	
Willeo Creek	Gilhams Lake to Unnamed tributary 250 ft d/s Willeo Rd			Supporting	TMDL completed FC 2003 (revised 2008)

Lake/Reservoir	**Location**	**Criterion Violated**	**Potential Causes**	**Assessment Result**	**Actions to Reduce Impairment**
Acworth Lake	Upper/Mid-Lake Cobb County	FC	UR	Not Supporting	TMDL completed FC 2004.

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Appendix F. Potential Sources of Drinking Water Contamination Index

POTENTIAL SOURCE	CONTAMINANT
Commercial / Industrial	
Above-ground storage tanks	Arsenic, Barium, Benzene, Cadmium, 1,4-Dichlorobenzene or P-Dichlorobenzene, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Lead, Trichloroethylene (TCE), Tetrachloroethylene or Perchlorethylene (Perc)
Automobile, Body Shops/Repair Shops	Arsenic, Barium, Benzene, Cadmium, Chlorobenzene, Copper, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, 1,4-Dichlorobenzene or P-Dichlorobenzene, Lead, Fluoride, 1,1,1-Trichloroethane or Methyl Chloroform, Dichloromethane or Methylene Chloride, Tetrachloroethylene or Perchlorethylene (Perc), Trichloroethylene (TCE), Xylene (Mixed Isomers)
Boat Repair/Refinishing/**Marinas**	Benzene, Cadmium, cis 1,2-Dichloroethylene, Coliform, Cryptosporidium, Dichloromethane or Methylene Chloride, *Giardia Lambia*, Lead, Mercury, Nitrate, Nitrite, trans 1,2-Dichloroethylene, Tetrachloroethylene or Perchlorethylene (Perc), Trichloroethylene (TCE), Vinyl Chloride, Viruses
Cement/Concrete Plants	Barium, Benzene, Dichloromethane or Methylene Chloride, Ethylbenzene, Lead, Styrene, Tetrachloroethylene or Perchlorethylene (Perc), Toluene, Xylene (Mixed Isomers)
Chemical/Petroleum Processing	Acrylamide, Arsenic, Atrazine, Alachlor, Aluminum (Fume or Dust), Barium, Benzene, Cadmium, Carbofuran, Carbon Tetrachloride, Chlorobenzene, Copper, Cyanide, 2,4-D, 1,2-Dibromoethane or Ethylene Dibromide (EDB), 1,2-Dichlorobenzene or O-Dichlorobenzene, 1,4-Dichlorobenzene or P-Dichlorobenzene, 1,1-Dichloroethylene or Vinylidene Chloride, cis 1,2 Dichloroethylene, Dichloromethane or Methylene Chloride, Di(2-ethylhexyl) adipate, Di(2-ethylhexyl) phthlate, 1,2-Dichloroethane or Ethylene Dichloride, Dioxin, Endrin, Epichlorohydrin, Ethylbenzene, Hexachlorobenzene, Hexachlorocyclopentadiene, Lead, Mercury, Methoxychlor,Polychlorinated Biphenyls, Selenium, Styrene, Sulfate, Tetrachloroethylene or Perchlorethylene (Perc), Toluene, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane or Methyl Chloroform, Trichloroethylene (TCE), Vinyl Chloride, Xylene (Mixed Isomers), Zinc (Fume or Dust)
Construction/Demolition	Arsenic, Asbestos, Benzene, Cadmium, Chloride, Copper,Cyanide, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Fluorides, Lead, Selenium, Tetrachloroethylene or Perchlorethylene (Perc), 1,1,1-Trichloroethane or Methyl Chloroform, Trichloroethylene (TCE), Turbidity, Xylene (Mixed Isomers), Zinc (Fume or Dust)
Dry Cleaners/Dry Cleaning	Tetrachloroethylene or Perchlorethylene (Perc), 1,1,1-Trichloroethane or Methyl Chloroform, 1,1,2-Trichloroethane
Dry Goods Manufacturing	Barium, Benzene, Cadmium, Copper, Dichloromethane or Methylene Chloride, Di(2-ethylhexyl) phthlate, Lead, 1,1,1-Trichloroethane or Methyl Chloroform, Polychlorinated Biphenyls, Tetrachloroethylene or Perchlorethylene (Perc), Toluene, Trichloroethylene (TCE), Xylene (Mixed Isomers)
Electrical/Electronic Manufacturing	Aluminum (Fume or Dust), Antimony, Arsenic, Barium, Benzene, Cadmium, Chlorobenzene, Copper, Cyanide, Carbon Tetrachloride, 1,2-Dichlorobenzene or O-Dichlorobenzene, 1,2-Dichloroethane or Ethylene Dichloride, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Di(2-ethylhexyl) phthlate, Ethylbenzene, Lead, Mercury, Polychlorinated Biphenyls, Selenium, Styrene, Sulfate, Tetrachloroethylene or Perchlorethylene (Perc), 1,1,1-Trichloroethane or Methyl Chloroform, 1,1,2-Trichloroethane,

	Trichloroethylene (TCE), Thallium, Toluene, Vinyl Chloride, Xylene (Mixed Isomers), Zinc (Fume or Dust)
Fleet/Trucking/ Bus Terminals	Arsenic, Acrylamide, Barium, Benzene, Benzo(a)pyrene, Cadmium, Chlorobenzene, Cyanide, Carbon Tetrachloride, 2,4-D, 1,2-Dichlorobenzene or O-Dichlorobenzene, 1,4-Dichlorobenzene or P-Dichlorobenzene, 1,2-Dichloroethane or Ethylene Dichloride, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Di(2-ethylhexyl) phthlate, Epichlorohydrin, Heptachlor (and Epoxide), Lead, Mercury, Methoxychlor, Pentachlorophenol, Propylene Dichloride or 1,2-Dichloropropane, Selenium, Styrene, Toxaphene, Tetrachloroethylene or Perchlorethylene (Perc), Toluene, 1,1,1-Trichloroethane or Methyl Chloroform, Trichloroethylene (TCE), Vinyl Chloride, Xylene (Mixed Isomers)
Food Processing	Arsenic, Benzene, Cadmium, Copper, Carbon Tetrachloride, Dichloromethane or Methylene Chloride, Lead, Mercury, Picloram, Tetrachloroethylene or Perchlorethylene (Perc), Toluene, 1,1,1-Trichloroethane or Methyl Chloroform, Trichloroethylene (TCE), Xylene (Mixed Isomers)
Funeral Services/Taxidermy	Glyphosate, Dichloromethane or Methylene Chloride, Nitrate, Nitrite, Total Coliforms, Viruses
Furniture Repair/Manufacturing	Barium, 1,2-Dichloroethane or Ethylene Dichloride, Dichloromethane or Methylene Chloride, Ethylbenzene, Lead, Mercury, Selenium, Trichloroethylene (TCE)
Gas Stations (see also above ground/underground storage tanks, motor-vehicle drainage wells)	cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Tetrachloroethylene or Perchlorethylene (Perc), Trichloroethylene (TCE)
Graveyards/Cemetaries	Dalapon, Lindane, Nitrate, Nitrite, Total Coliforms, Viruses.
Hardware/Lumber/Parts Stores	Aluminum (Fume or Dust), Barium, Benzene, Cadmium, Chlorobenzene, Copper, Dichloromethane or Methylene Chloride, Di(2-ethylhexyl)adipate, Di(2-ethylhexyl) phthlate, 1,4-Dichlorobenzene or P-Dichlorobenzene, Ethylbenzene, Lead, Mercury, Tetrachloroethylene or Perchlorethylene (Perc), 1,1,1-Trichloroethane or Methyl Chloroform, Trichloroethylene (TCE), Toluene, Xylene (Mixed Isomers)
Historic Waste Dumps/Landfills	Atrazine, Alachlor, Carbofuran, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Diquat, Dalapon, Glyphosate, Dichloromethane or Methylene Chloride, Nitrate, Nitrite, Oxamyl (Vydate), Sulfate, Simazine, Tetrachloroethylene or Perchlorethylene (Perc), Trichloroethylene(TCE)
Home Manufacturing	Arsenic, Barium, Benzene, Cadmium, Chlorobenzene, Copper, Carbon Tetrachloride, 1,2-Dichlorobenzene or O-Dichlorobenzene, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Di(2-ethylhexyl) phthlate, Ethylbenzene, Lead, Mercury, Selenium, Styrene, Tetrachloroethylene or Perchlorethylene (Perc), 1,1,1-Trichloroethane or Methyl Chloroform, Trichloroethylene (TCE), Toluene, Turbidity, Xylene (Mixed Isomers)
Industrial Waste Disposal Wells (see UIC for more information on concerns, and locations)	Acrylamide, Arsenic, Atrazine, Alachlor, Aluminum (Fume or Dust), Ammonia, Barium, Benzene, Cadmium, Carbofuran, Carbon Tetrachloride, Chlorobenzene, Copper, Cyanide, 2,4-D, 1,2-Dibromoethane or Ethylene Dibromide (EDB), 1,2-Dichlorobenzene or O-Dichlorobenzene, 1,4-Dichlorobenzene or p-Dichlorobenzene, 1,1-Dichloroethylene or Vinylidene Chloride, cis 1,2 Dichloroethylene, Dichloromethane or Methylene Chloride, Di(2-ethylhexyl) adipate, Di(2-ethylhexyl) phthlate, 1,2-Dichloroethane or Ethylene Dichloride, Dioxin, Endrin, Epichlorohydrin, Hexachlorobenzene, Hexachlorocyclopentadiene, Lead, Mercury, Methoxychlor, Oxamyl (Vydate), Polychlorinated Biphenyls, Selenium, Styrene, Sulfate, Tetrachloroethylene or Perchlorethylene (Perc), Toluene, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane or Methyl Chloroform, Trichloroethylene (TCE), Vinyl Chloride, Xylene (Mixed Isomers), Zinc (Fume or Dust)
Junk/Scrap/Salvage Yards	Barium, Benzene, Copper, Dalapon, cis 1,2-Dichloroethylene, Diquat, Glyphosate, Lead, Polychlorinated Biphenyls, Sulfate, Simazine, Trichloroethylene (TCE), Tetrachloroethylene or Perchlorethylene (Perc)

Machine Shops	Arsenic, Aluminum (Fume or Dust), Barium, Benzene, Boric Acid, Cadmium, Chlorobenzene, Copper, Cyanide, Carbon Tetrachloride 2,4-D, 1,4-Dichlorobenzene or P-Dichlorobenzene, 1,2-Dichloroethane or Ethylene Dichloride, 1,1-Dichloroethylene or Vinylidene Chloride, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Di(2-ethylhexyl) phthlate, Ethylbenzene, Fluoride, Hexachlorobenzene, Lead, Mercury, Polychlorinated Biphenyls, Pentachlorophenol, Selenium, Styrene, Tetrachloroethylene or Perchlorethylene (Perc), Toluene, 1,1,1-Trichloroethane or Methyl Chloroform, 1,1,2-Trichloroethane, Trichloroethylene (TCE), Xylene (Mixed Isomers), Zinc (Fume or Dust)
Medical/Vet Offices	Arsenic, Acrylamide, Barium, Benzene, Cadmium, Copper, Cyanide, Carbon Tetrachloride, Dichloromethane or Methylene Chloride, 1,2-Dichloroethane or Ethylene Dichloride, Lead, Mercury, Methoxychlor, 1,1,1-Trichloroethane or Methyl Chloroform, Radionuclides, Selenium, Silver, Tetrachloroethylene or Perchlorethylene (Perc), 2,4,5-TP (Silvex), Thallium, Xylene (Mixed Isomers)
Metal Plating/Finishing/Fabricating	Antimony, Aluminum (Fume or Dust), Arsenic, Barium, Benzene, Cadmium, Carbon Tetrachloride, Chlorobenzene, Chromium, Copper, Cyanide, 1,4-Dichlorobenzene or P-Dichlorobenzene, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Di(2-ethylhexyl) adipate, Ethylbenzene,Lead, Mercury, Polychlorinated Biphenyls, Pentachlorophenol, Selenium, Styrene, Sulfate, Tetrachloroethylene or Perchlorethylene (Perc), , Thallium, Toluene, 1,1,1-Trichloroethane or Methyl Chloroform, 1,1,2-Trichloroethane, Trichloroethylene(TCE), Vinyl Chloride, Xylene (Mixed Isomers), Zinc (Fume or Dust)
Military Installations	Arsenic, Barium, Benzene, Cadmium, Chlorobenzene, 1,2-Dichlorobenzene or O-Dichlorobenzene, 1,2-Dichloroethane or Ethylene Dichloride, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Hexachlorobenzene, Lead, Mercury, Methoxychlor, 1,1,1-Trichloroethane or Methyl Chloroform, Radionuclides, Selenium, Tetrachloroethylene or Perchlorethylene (Perc), , Toluene, Trichloroethylene (TCE)
Mines/Gravel Pits	Lead, Selenium, Sulfate, Tetrachloroethylene or Perchlorethylene (Perc), 1,1,1-Trichloroethane or Methyl Chloroform, Turbidity
Motor Pools	cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride,
Motor Vehicle Waste Disposal Wells (gas stations, repair shops) See UIC for more on concerns for these sources http://www.epa.gov/OGWDW/uic/cv-fs.html	Arsenic, Barium, Benzene, Cadmium, Chlorobenzene, Copper, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, 1,4-Dichlorobenzene or P-Dichlorobenzene, Lead, Fluoride, 1,1,1-Trichloroethane or Methyl Chloroform, Dichloromethane or Methylene Chloride, Tetrachloroethylene or Perchlorethylene (Perc), Trichloroethylene (TCE), Xylene (Mixed Isomers)
Office Building/Complex	Barium, Benzene, Cadmium, Copper, 2,4-D, Diazinon, 1,2-Dichlorobenzene or O-Dichlorobenzene, Dichloromethane or Methylene Chloride, Diquat, 1,2-Dichloroethane or Ethylene Dichloride, Ethylbenzene, Glyphosate, Lead, Mercury, Selenium, Simazine, Tetrachloroethylene or Perchlorethylene (Perc), 1,1,1-Trichloroethane or Methyl Chloroform, Trichloroethylene (TCE), Vinyl Chloride, Xylene (Mixed Isomers)
Photo Processing/Printing	Acrylamide, Aluminum (Fume or Dust), Arsenic, Barium, Benzene, Cadmium, Carbon Tetrachloride, Chlorobenzene, Copper, Cyanide, 1,1-Dichloroethylene or Vinylidene Chloride, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Di(2-ethylhexyl) phthlate, 1,2-Dichlorobenzene or O-Dichlorobenzene, 1,4-Dichlorobenzene or P-Dichlorobenzene, 1,2-Dichloroethane or Ethylene Dichloride, 1,2-Dibromoethane or Ethylene Dibromide (EDB), Heptachlor epoxide, Hexachlorobenzene, Lead, Lindane, Mercury, Methoxychlor, Propylene Dichloride or 1,2-Dichloropropane, Selenium, Styrene, Tetrachloroethylene or Perchlorethylene (Perc), 1,1,1-Trichloroethane or Methyl Chloroform, Toluene, 1,1,2-Trichloroethane, Trichloroethylene(TCE), Vinyl Chloride, Xylene (Mixed Isomers), Zinc (Fume or Dust)

Synthetic / Plastics Production	Antimony, Arsenic, Barium, Benzene, Cadmium, Carbon Tetrachloride, Chlorobenzene, Copper, Cyanide, 1,2-Dichlorobenzene or O-Dichlorobenzene, 1,4-Dichlorobenzene or P-Dichlorobenzene, 1,2-Dichloroethane or Ethylene Dichloride, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Di(2-ethylhexyl) adipate, Di(2-ethylhexyl) phthlate, Ethylbenzene, Hexachlorobenzene, Lead, Mercury, Methyl Chloroform or 1,1,1-Trichloroethane, Pentachlorophenol, Selenium, Styrene, Tetrachloroethylene or Perchlorethylene (Perk), Toluene,, Trichloroethylene (TCE), Vinyl Chloride, Xylene (Mixed Isomers), Zinc (Fume or Dust)
RV/Mini Storage	Arsenic, Barium, Cyanide, 2,4-D, Endrin, Lead, Methoxychlor
Railroad Yards/Maintenance/Fueling Areas	Atrazine, Barium, Benzene, Cadmium, Dalapon, 1,4-Dichlorobenzene or P-Dichlorobenzene, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Lead, Mercury, Tetrachloroethylene or Perchlorethylene (Perc**),** Trichloroethylene (TCE).
Research Laboratories	Arsenic, Barium, Benzene, Beryllium Powder, Cadmium, Carbon Tetrachloride, Chlorobenzene, Cyanide, 1,2-Dichloroethane or Ethylene Dichloride, 1,1-Dichloroethylene or Vinylidene Chloride, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Endrin, Lead, Mercury, Polychlorinated Biphenyls, Selenium, Tetrachloroethylene or Perchlorethylene (Perc), Thallium, Thiosulfates, Toluene, 1,1,1-Trichloroethane or Methyl Chloroform, Trichloroethylene (TCE), Vinyl Chloride, Xylene (Mixed Isomers)
Retail Operations	Arsenic, Barium, Benzene, Cadmium, 2,4-D, 1,2-Dichloroethane or Ethylene Dichloride, Lead, Mercury, Styrene, Tetrachloroethylene or Perchlorethylene (Perc), Toluene, 1,1,1-Trichloroethane, Vinyl Chloride
Underground Storage Tanks	Arsenic, Barium, Benzene, Cadmium, 1,4-Dichlorobenzene or P-Dichlorobenzene, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Lead, Tetrachloroethylene or Perchlorethylene (Perc), Trichloroethylene (TCE).
Wood Preserving/Treating	cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Lead, Sulfate
Wood/Pulp/Paper Processing	Arsenic, Barium, Benzene, Cadmium, Carbon Tetrachloride, Copper, Dichloromethane or Methylene Chloride, Dioxin, 1,2-Dichloroethane or Ethylene Dichloride, Ethylbenzene, Lead, Mercury, Polychlorinated Biphenyls, Selenium, Styrene, Tetrachloroethylene or Perchlorethylene (Perc), Trichloroethylene (TCE), Toluene, 1,1,1-Trichloroethane or Methyl Chloroform, Xylene (Mixed Isomers)
Residential / Municipal	
Airports (Maintenance/Fueling Areas)	Arsenic, Barium, Benzene, Cadmium, Carbon Tetrachloride, cis 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Ethylbenzene, Lead, Mercury, Selenium, Tetrachloroethylene or Perchlorethylene (Perc), 1,1,1-Trichloroethane or Methyl Chloroform, Trichloroethylene (TCE), Xylene (Mixed Isomers)
Apartments and Condominiums	Atrazine, Alachlor, Coliform, Cryptosporidium, Dalapon, Diquat, *Giardia Lambia*, Glyphosate, Nitrate, Nitrite, Picloram,Sulfate,Simazine, Vinyl Chloride, Viruses
Camp Grounds/RV Parks	Benomyl, Coliform, Cryptosporidium, Diquat, Dalapon, *Giardia Lambia*, Glyphosate, Isopropanol, Nitrate, Nitrite, Picloram,Sulfate,Simazine, Turbidity, Vinyl Chloride, Viruses
Cesspools - Large Capacity (see UIC for more information)	Atrazine, Alachlor, Carbofuran, Coliform, Cryptosporidium, Diquat, Dalapon, *Giardia Lambia*, Glyphosate, Nitrate, Nitrite, Oxamyl (Vydate), Picloram,Sulfate,Simazine, Vinyl Chloride, Viruses
Drinking Water Treatment Facilities	Atrazine, Benzene, Cadmium, Cyanide, Fluoride, Lead, Polychlorinated Biphenyls, Toluene, Total Trihalomethanes, 1,1,1-Trichloroethane or Methyl Chloroform
Gas Pipelines	cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Tetrachloroethylene or Perchlorethylene (Perc), Trichloroethylene or TCE
Golf Courses and Urban Parks	Arsenic, Atrazine, Benzene, Chlorobenzene, Carbofuran, 2,4-D, Diquat, Dalapon, Glyphosate, Lead, Methoxychlor, Nitrate, Nitrite, Picloram, Simazine, Turbidity

Housing developments	Atrazine, Alachlor, Coliform, Cryptosporidium, Carbofuran, Diquat, Dalapon, *Giardia Lambia*, Glyphosate, Dichloromethane or Methylene Chloride, Nitrate, Nitrite, Picloram, Simazine, Trichloroethylene (TCE), Turbidity, Vinyl Chloride, Viruses
Landfills/Dumps	Arsenic, Atrazine, Alachlor, Barium, Benzene, Cadmium, Carbofuran, cis 1,2 Dichloroethylene, Diquat, Glyphosate, Lead, Lindane, Mercury, 1,1,1-Trichloroethane or Methyl Chloroform, Dichloromethane or Methylene Chloride, Nitrate, Nitrite, Picloram, Selenium, Simazine, Trichloroethylene (TCE)
Public Buildings (e.g., schools, town halls, fire stations, police stations) and Civic Organizations	Arsenic, Acrylamide, Barium, Benzene, Beryllium Powder, Cadmium, Carbon Tetrachloride, Chlorobenzene, Cyanide, 2,4-D, 1,2-Dichlorobenzene or O-Dichlorobenzene, 1,4-Dichlorobenzene or P-Dichlorobenzene, Dichloromethane or Methylene Chloride, Di(2-ethylhexyl) phthlate, 1,2-Dichloroethane or Ethylene Dichloride, Endothall, Endrin, 1,2-Dibromoethane or Ethylene Dibromide (EDB), Lead, Lindane, Mercury, Methoxychlor, Selenium, Toluene, 1,1,1-Trichloroethane or Methyl Chloroform, Trichloroethylene (TCE), Vinyl Chloride, Xylene (Mixed Isomers)
Septic Systems	Atrazine, Alachlor, Carbofuran, Coliform, Cryptosporidium, Diquat, Dalapon, *Giardia Lambia*, Glyphosate, Nitrate, Nitrite, Oxamyl (Vydate), Picloram, Sulfate, Simazine, Vinyl Chloride, Viruses
Sewer Lines	Coliform, Cryptosporidium, Diquat, Dalapon, *Giardia Lambia*, Glyphosate, Nitrate, Nitrite, Oxamyl (Vydate), Picloram,Sulfate,Simazine, Vinyl Chloride, Viruses
Stormwater infiltration basins/injection into wells (UIC Class V), runoff zones	Atrazine, Alachlor, Coliform, Cryptosporidium, Carbofuran, Chlorine, Diquat, Dalapon, *Giardia Lambia*, Glyphosate, Dichloromethane or Methylene Chloride, Nitrate, Nitrite, Nitrosamine, Oxamyl (Vydate), Phosphates, Picloram, Simazine, Trichloroethylene(TCE), Turbidity, Vinyl Chloride, Viruses
Transportation Corridors (e.g., Roads, railroads)	Dalapon, Picloram, Simazine, Sodium, Sodium Chloride, Turbidity
Utility Stations	Arsenic, Barium, Benzene, Cadmium, Chlorobenzene, Cyanide, 2,4-D, 1,4-Dichlorobenzene or P-Dichlorobenzene, 1,2-Dichloroethane or Ethylene Dichloride, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Lead, Mercury, Picloram, Toluene, 1,1,2,2- Tetrachloroethane, Tetrachloroethylene or Perchlorethylene (Perc), Trichloroethylene (TCE), Xylene (Mixed Isomers)
Waste Transfer /Recycling	Coliform, Cryptosporidium, *Giardia Lambia*, Nitrate, Nitrite, Vinyl Chloride, Viruses
Wastewater Treatment Facilities/Discharge locations (incl. land disposal and underground injection of sludge)	Cadmium, Coliform, Cryptosporidium, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Fluoride, *Giardia Lambia*, Lead, Mercury, Nitrate, Nitrite, Tetrachloroethylene or Perchlorethylene (Perc) Selenium, sulfate,Trichloroethylene (TCE), Vinyl Chloride, Viruses
Agricultural / Rural	
Auction Lots/Boarding Stables	Coliform, Cryptosporidium, *Giardia Lambia*, Nitrate, Nitrite,Sulfate,Viruses
Animal Feeding Operations/ Confined Animal Feeding Operations	Coliform, Cryptosporidium, *Giardia Lambia*, Nitrate, Nitrite, Sulfate, Turbidity, Viruses
Bird Rookeries/Wildlife feeding /migration zones	Coliform, Cryptosporidium, *Giardia Lambia*, Nitrate , Nitrite , Sulfate, Turbidity, Viruses
Crops - Irrigated + Non-irrigated	Benzene, 2,4-D, Dalapon, Dinoseb, Diquat, Glyphosate, Lindane, Lead, Nitrate, Nitrite , Picloram, Simazine, Turbidity
Dairy operations	Coliform, Cryptosporidium, *Giardia Lambia*, Nitrate , Nitrite,Sulfate,Turbidity, Viruses
Drainage Wells, Lagoons and Liquid Waste Disposal - Agricultural	Atrazine, Alachlor, Coliform, Cryptosporidium, Carbofuran, Diquat, Dalapon, *Giardia Lambia*, Glyphosate, Nitrate, Nitrite, Oxamyl (Vydate), Picloram,Sulfate,Simazine, Vinyl Chloride, Viruses
Managed Forests/Grass Lands	Atrazine, Diquat, Glyphosate, Picloram, Simazine, Turbidity
Pesticide/Fertilizer Storage Facilities	Atrazine, Alachlor, Carbofuran, Chlordane, 2,4-D, Diquat, Dalapon, 1,2-Dibromo-3-Chloropropane or DBCP, Glyphosate, Nitrate, Nitrite, Oxamyl (Vydate), Picloram, Simazine, 2,4,5-TP (Silvex)

Rangeland/Grazing lands	Coliform, Cryptosporidium, *Giardia Lambia*, Nitrate, Nitrite, Sulfate, Turbidity, Viruses
Residential Wastewater lagoons	Atrazine, Alachlor, Carbofuran, Coliform, Cryptosporidium, Diquat, Dalapon, *Giardia Lambia*, Glyphosate, Nitrate, Nitrite, Oxamyl (Vydate), Picloram,Sulfate,Simazine, Vinyl Chloride, Viruses
Rural Homesteads	Atrazine, Alachlor, Carbofuran, Coliform, Cryptosporidium, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Diquat, Dalapon, *Giardia Lambia*, Glyphosate, Nitrate, Nitrite,Oxamyl (Vydate), Picloram, Sulfate, Simazine, Vinyl Chloride, Viruses
MISCELLANEOUS SOURCES	
Abandoned drinking water wells (conduits for contamination)	Atrazine, Alachlor, Coliform, Cryptosporidium, Carbofuran, Diquat, Dalapon, *Giardia Lambia*, Glyphosate, Dichloromethane or Methylene Chloride, Nitrate, Nitrite, Oxamyl (Vydate), Picloram, Simazine, Trichloroethylene (TCE), Turbidity, Vinyl Chloride, Viruses
Naturally Occurring	Arsenic, Asbestos, Barium, Cadmium, Chromium, Coliform, Copper, Cryptosporidium, Fluoride, *Giardia Lambia,* Iron, Lead, Manganese, Mercury, Nitrate, Nitrite, Radionuclides, Selenium, Silver, Sulfate, Viruses, Zinc (Fume or Dust)
Underground Injection Control (UIC) Wells CLASS I - deep injection of hazardous and non-hazardous wastes into aquifers separated from underground sources of drinking water	see UIC
UIC Wells CLASS II deep injection wells of fluids associated with oil/gas production (for more detailed list of sites click here)	see UIC
UIC Wells CLASS III re-injection of water/steam into mineral formations for mineral extraction	see UIC
UIC Wells CLASS IV - officially banned. Inject hazardous or radioactive waste into or above underground sources of drinking water	see UIC

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Appendix G. Consumer Confidence Report for the Cobb County – Marietta Water Authority (CCMWA)

https://s3.us-west-2.amazonaws.com/cobbcounty.org.if-us-west-2/prod/2019-05/waterqualityreport2018.pdf