



**The Water Works and Sewer Board of the City of
Birmingham**

3600 First Avenue North • Birmingham, AL 35283

Source Water Assessment Program

Mulberry Fork

August 2007



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1. Overview

The 1996 amendments to the federal Safe Drinking Water Act (SDWA) require states to develop source water assessments for all public water supply sources. The Water Works and Sewer Board of the City of Birmingham (BWWSB) and the Alabama Department of Environmental Management (ADEM) have entered into a cooperative agreement to conduct source water assessment activities. The agreement includes the following elements:

- Watershed delineation,
- Contaminant inventory,
- Susceptibility analysis,
- Contingency plans,
- Public awareness, and
- Final reporting.

The BWWSB derives drinking water from four surface water sources that require a source water assessment. These water sources are:

- Inland Lake,
- Sipsey Fork,
- Mulberry Fork, and
- Cahaba River.

The objective of this report is to update the 2002 assessment of Mulberry Fork. All work on this project was performed in accordance with the ADEM Cooperative Agreement, Scope of Services, and ADEM Regulations 335-7-6-.05.

2. Watershed Map

The watershed map for Mulberry Fork is shown on a U.S. Geological Survey (USGS) topographic map at a scale of 1:100,000 (following page). The watershed area was delineated by ADEM using the hydrologic unit codes developed by the U.S. Department of Agriculture - Natural Resource Conservation Service (USDA-NRCS).

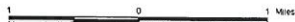
The watershed map shows the watershed boundary, the location of the intake, the SWPA, and the potential sources of contamination identified by ADEM. The potential sources of contamination provided by ADEM include:

- Municipal discharges,
- Semi-Public/Private discharges,
- Industrial discharges,
- Underground storage tanks,
- Mining discharges,
- Landfills,
- Hazardous waste sites, and
- Toxic Release Inventory sites.



Source Water Protection Area
Birmingham Water Works and Sewer Board
PWASID 738
Mulberry Fork

124000



- ★ Major Landmarks
- ▲ USTs
- Municipal Discharges
- Semi-Public/Private Discharges
- Industrial Discharges
- Hazardous Waste Sites
- Landfills
- Mining Discharges
- Intakes
- ▭ Source Water Protection Area (500 foot buffer)
- ▭ Watershed Boundaries



Coordinates: 8535 : 34 119 Quad Sheet
 Projection: UTM Zone 16 North, NAD83
 Alabama Department of Environmental Management
 Water Division 02
 Water Quality Branch/777



3. Source Water Protection Area (SWPA) Map

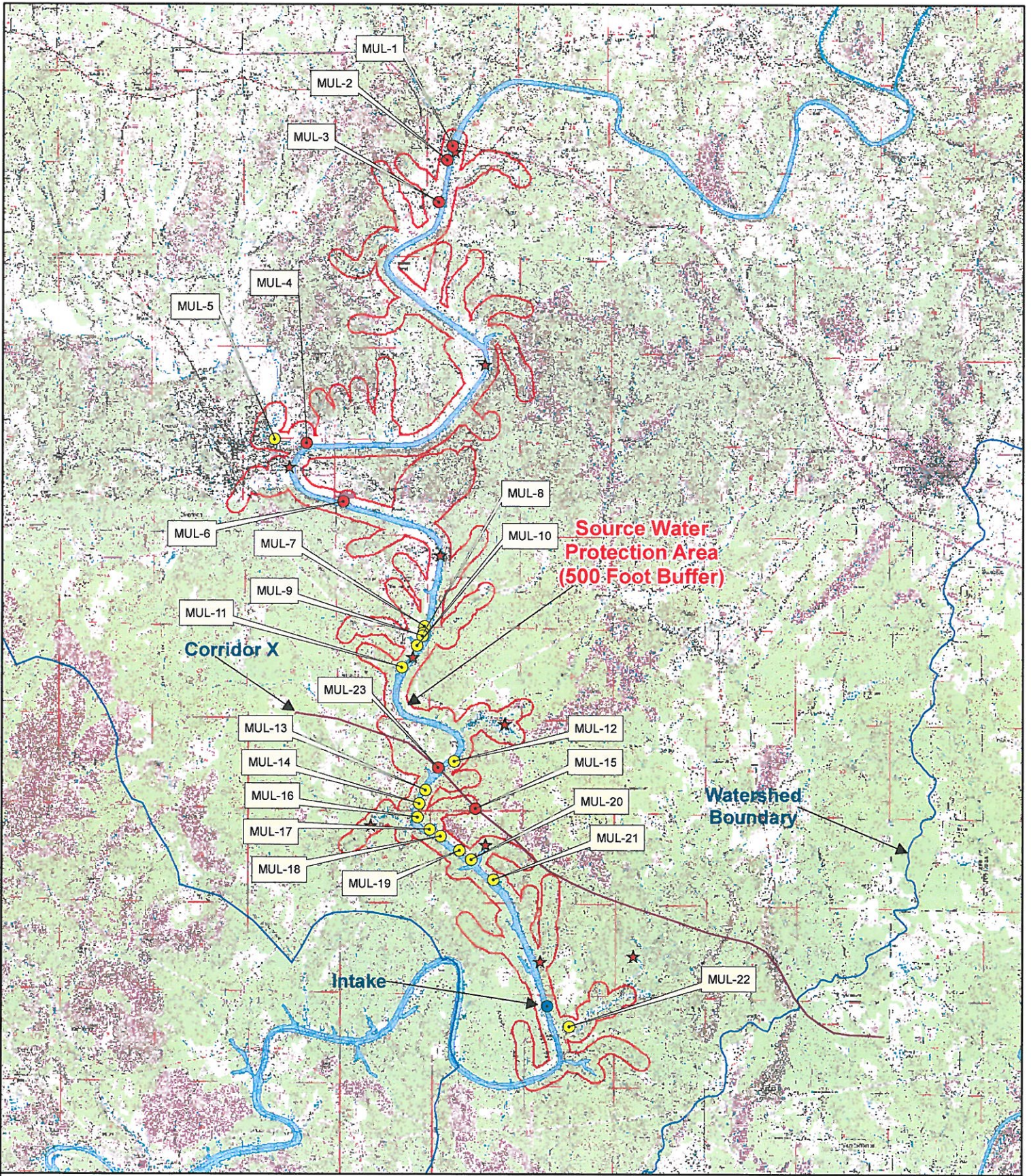
The SWPA map for Mulberry Fork is shown on a USGS topographic map at a scale of 1:24,000 (following page). Based on ADEM regulations 335-7-6-.05, the SWPA for river runs, creeks, and streams extends from a quarter mile downstream of an intake to:

- Fifteen miles upstream of the intake,
- A quarter mile below the next upstream intake,
- The next upstream dam, or
- The state boundary.

ADEM defined the Mulberry Fork SWPA as a buffer zone of 500 feet around the source water that extends ¼ mile downstream of the intake to 15 miles upstream of the intake. The SWPA map includes the following:

- SWPA boundary,
- Location of the intake,
- Major landmarks (time of travel), and
- Contaminant sources identified from the field surveys.

The time of travel results are provided in Section 7. A detailed description of the contaminant source data collected from the field surveys is provided in Section 8.



Source Water Protection Area (500 Foot Buffer)

Corridor X

Watershed Boundary

Intake

Source Water Protection Area
 Birmingham Water Works and Sewer Board
 PWSID 738
 Mulberry Fork

Contaminant Susceptibility

- Low
- Moderate
- High
- Intake
- ★ Major Landmark

- Watershed Boundary
- Source Water Protection Area (500 FT Buffer)

Georeferenced USGS 1:24000 Quad Sheets
 Projection: UTM (Zone 16) West, NAD83
 Alabama Department of Economic Management
 Water Division GIS
 Water Quality Section



4. Description of Watershed and SWPA

The purpose of this section is to provide a description of the geology, soils, vegetation, wildlife, climate, topographic features and water use classification of the Mulberry Fork watershed. For the purpose of this description, unless otherwise noted, the watershed is defined as the drainage area 15 miles upstream from the Mulberry Fork intake and ¼ mile downstream of the intake.

Climate

In the watershed, summers are hot in the valleys and slightly cooler in the hills and winters are moderately cold. Rains are fairly heavy and well distributed throughout the year. Yearly rainfall averages 57 inches. Snow falls almost every winter, but only lasts a few days.

Topography

The Mulberry Fork Watershed is general flat with slight upward sloping towards the northeast. Strip mine areas are located within the watershed. Tributaries of Mulberry Fork include Cane Creek, Barton Creek, Horse Creek, Frog Ague Creek, and Stovatt Bend.

Geology

The Mulberry Fork watershed is located in Walker County and lies within the Appalachian Plateaus physiographic province. Sandstone, shale and coal beds of the Pottsville formation underlie this area. Terrace deposits and alluvium overlie the Pottsville Formation in and adjacent to the Mulberry Fork stream valley (O'Rear, 1972). These areas generally consist of flat to gently sloping valley floors, terraces, and low hills, which may be remnants of older dissected terraces.

Soils

Soils in the Mulberry Fork watershed generally consist of Sunlight-Townley-Sipsey and Sprada-Whitwell-Mooreville soil units. Sunlight-Townley-Sipsey soil unit consists of moderately deep and shallow, gently sloping to very steep, well drained soils that have a loamy clay or clayey subsoil formed in material weathered from shale, siltstone, and sandstone (USDA-NRCS, 1992). The Sprada-Whitwell-Mooreville soil unit consists of

deep, nearly level and gently sloping, well drained and moderately drained soils that have a loamy subsoil, formed in fluvial and alluvial deposits (USDA-NRCS, 1992).

Vegetation

Vegetation in the Mulberry Fork watershed includes loblolly pines, Virginia pines, sweetgums, yellow poplars, water oaks, blackgums, sycamores and willows. Understory vegetation consists of honeysuckle, blackberry, flowering dogwood, bluestem, huckleberry, and sumac.

Wildlife

Forested areas in the watershed provide habitat for gray fox, white-tailed deer, Virginia opossum, turkey and fox squirrel (APC, 2000). Fish that inhabit the waters include spotted bass, largemouth bass and catfish. The red-cockaded woodpecker, bald eagle, and flattened musk turtle are federally listed rare, threatened or endangered terrestrial species that occur in counties surrounding the Mulberry Fork watershed. Two threatened and four endangered mussel species occur in the counties surrounding the Mulberry Fork watershed.

Land Ownership

Land in the Mulberry Fork watershed is owned by corporations such as coal companies, steel industries, and paper company to name a few. Property is also individually owned.

Transportation Corridor

Bankhead Highway (U.S. Route 78) and Highway 22 (Corridor X) cross Mulberry Fork within the study area.

Land Use

Land use in the Mulberry Fork consists of forest (83.86%), water/wetlands, cropland and pasture, transitional, urban, and barren or mining.

Water Use Classification

Section 303 of the Clean Water Act (CWA) requires states to establish designated uses for streams and stream segments, as well as standards by which to measure the extent to which the designated use are being attained. ADEM has assigned portions of Mulberry Fork, located upstream of the study area, the use designation of "Fish and Wildlife". A tributary to Mulberry Fork in the study area, Cane Creek, has a use designation of "Fish and Wildlife and Agriculture and Industry".

The CWA also requires that the state report, biennially, to the U.S. Environmental Protection Agency (USEPA) the water quality conditions and use attainment of navigable waters. This document is commonly referred to as the 305(b) report because its purpose is to comply with this section of the CWA (ADEM, 2006). Streams listed as 303(d) streams in the 305(b) report are determined not to be meeting or are partially meeting their designated uses. Currently, the portions of the Mulberry Fork located upstream of the study area are designated, by ADEM Draft 2006 303(b) list, as not supporting its designated use of “Fish and Wildlife”. The constituents of concern listed on the 303(d) list include: siltation, nutrients and other habitat alterations. Cane Creek is listed as partially supporting its use designation of “Fish and Wildlife and Agricultural and Industry”. The constituents of concern include: metals, nutrients, pH, siltation and organic enrichment/dissolved oxygen.

References

Alabama Department of Environmental Management, 2007. *Alabama's 2006 Integrated Water Quality Monitoring and Assessment Report*. Montgomery, Alabama.

O'Rear, David, M., Wahl, Kenneth, D., and Jefferson, Patrick O. 1972. *Water Availability and Geology of Walker County, Alabama, Map 120*. University, Alabama.

USDA-NRCS. March, 1992. *Soil Survey of Walker County, Alabama*.

5. Topographic Features

The general topography of the watershed is discussed in Section 4. However, to comply with the contract referenced in Section 1, specific information regarding the topography of the watershed is provided in this section.

The majority of the Mulberry Fork watershed is located in Walker County, which is underlain by the nearly level, bedded Pottsville Formation, which is of the Pennsylvanian age (USGS, 1992). Tributaries of Mulberry Fork include Cane Creek, Barton Creek, Horse Creek, Frog Ague Creek, and Stovatt Bend. Bankhead Highway crosses Mulberry Fork within the study area. The ground elevation for Mulberry Fork watershed is approximately 300 feet above sea level. The drainage area, according to the United States Geological Service (USGS) gage datum is approximately 1,916 square miles.

6. Land Use within the SWPA

The land use data was obtained from the EPA's Better Assessment Science Integrating Point and Nonpoint Sources (BASINS) 4.0 model. The USGS provided the land use data for distribution with the BASINS modeling system. The land use data is classified using the Anderson land use classification system that includes six primary (Level I) and 36 detailed (Level II) land covers.

A description of the land use categories in the Mulberry Fork SWPA is provided below. The percentage of the SWPA contained within each of the land use categories is listed in Table 6-1.

- **Barren or Mining:** Barren land is of limited ability to support life with less than on-third of the area has vegetation or other cover. Mining activities remove vegetative cover and overburden.
- **Urban:** Areas of intensive use with much of the land covered by structures.
- **Transitional:** Areas which are in transition from one land use activity to another.
- **Agriculture – Cropland & Pasture:** Land under cultivation for food production purposes or grazed by livestock.
- **Water/Wetlands:** Areas where the water table is at, near, or above the land surface for a significant part of most years.
- **Forest:** Forest lands have a tree-crown areal density of 10% or more, are stocked with trees capable of producing timber or other wood products.

Table 6-1. Mulberry Fork SWPA - Land Use

Land Use Description	% of SWPA
Barren or Mining	0.52%
Urban	1.19%
Transitional	1.27%
Agriculture - Cropland and Pasture	4.04%
Water/Wetlands	9.12%
Forest	83.86%
Total	100%

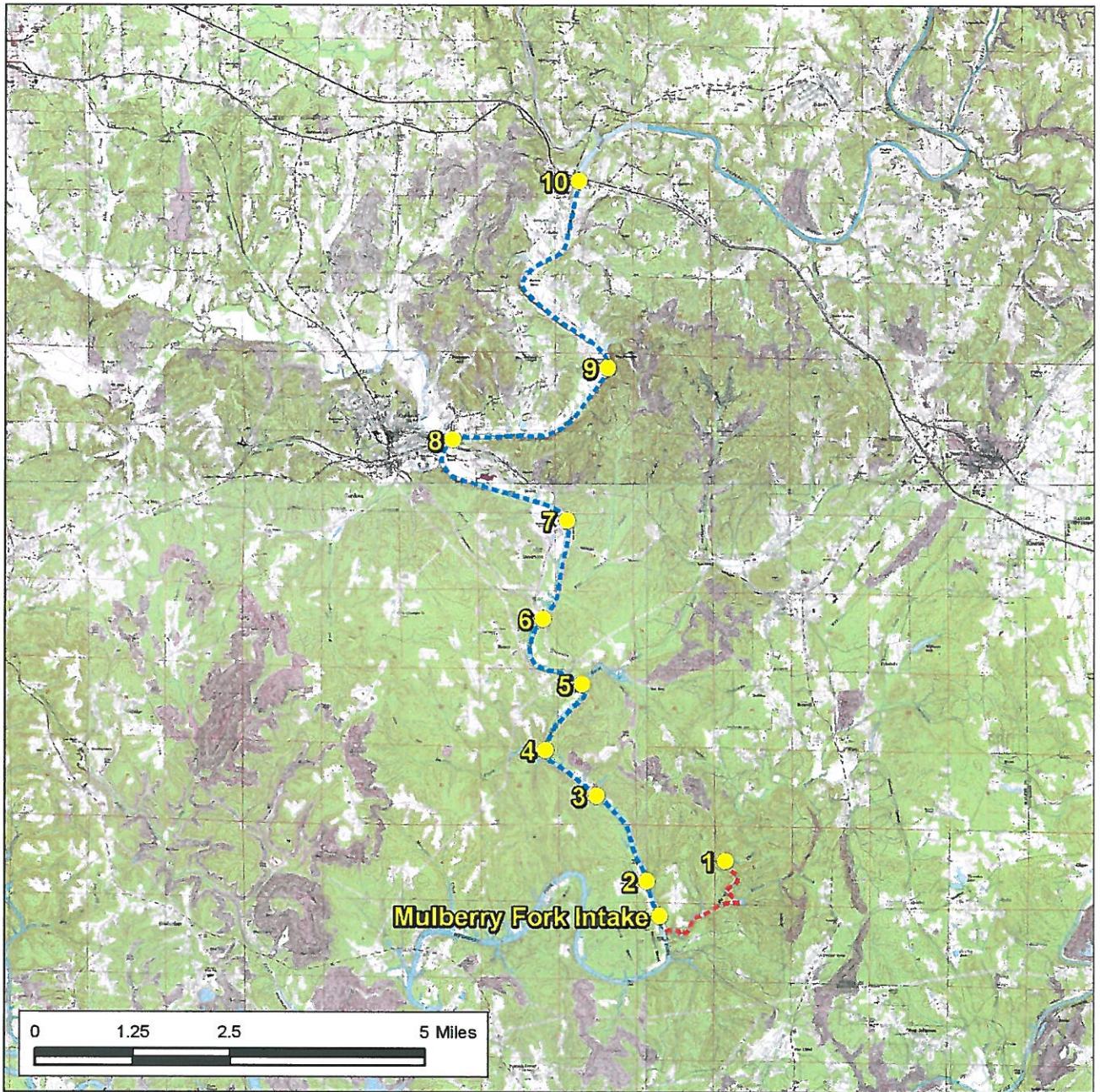


Figure 7-1 Mulberry Fork Points of Interest

8. Results of the Susceptibility Analysis

Contaminant Inventory

Methods

The Mulberry Fork SWPA was inventoried for known and potential contaminant sources as stated in ADEM regulations 335-7-6-.06. ADEM provided contaminant source records from its databases that included the information listed in Section 2. Other federal, state, and local records were reviewed for relevant contaminant source information. Several data sets were reviewed including the Geological Survey of Alabama, Stormwater Management Authority, Walker County, the City of Birmingham, and other sources. Useful data was also gathered from the USEPA, USGS, Environmental Systems Research Institute (ESRI), and field surveys.

Field surveys for the SWPA were completed in July 2007 to confirm existing sites and identify new ones. The field survey data was collected using Global Positioning System (GPS) coordinates and standards specified by ADEM.

Results

The results of the field data collection are summarized in Table 8-1. Table 8-1 includes the potential source of contamination, the GPS coordinates, the contaminant type, the containment structures in place and their condition, contact information for the owner or responsible party, contact information in the case of a spill event, and the owner's emergency procedures. The contaminant source information is plotted on the SWPA map (Section 3) and incorporated into a Geographic Information System (GIS).

Susceptibility Analysis

A susceptibility analysis was conducted for the potential sources located in the BWWSB's Mulberry Fork source water protection area on the basis of the regulations in Chapter 335-7-6-.07. The list of potential contaminant sources developed during the contaminant inventory was used as the basis for the susceptibility analysis.

Table 9-1. Mulberry Fork - Contaminant Source Inventory

ID	Potential Source of Contamination	Latitude	Longitude	Contaminant Type	In-Place Structures/Condition	Contact Information - Owner/Responsible Party	Contact Information - Spill Event	Owner's Emergency Procedures
MUL-1	Highway 78 Bridge	33.809717	-87.140783	Salmon, PCBs, Hexachlorocyclopentadiene, Sodium Chloride	Guardrail/Unknown	Wayne Parker, District Engineer Alabama Department of Transportation 1409 Coliseum Boulevard Montgomery, AL 36110 205-221-9128	Joel Rhayk, Manager of Water and Wastewater Birmingham Water Works and Sewer Board 3600 1st Avenue North Birmingham, AL 35283 205-254-0510	Contact District Engineer to assess the problem and notify ADEM's Field Operations Office in Birmingham (205-942-6168).
MUL-2	Lynn Park Terminal Inc.	33.804435	-87.141806	Arsenic, Acrylamide, Barium, Benzene, Cadmium, Chlorobenzene, Hydrocarbons, Volatiles	None/Not Applicable	John Haro Lynn Park Terminal, Inc. Rt.2 Box 99 River Road Cordova, AL 35550 205-483-7828	Birmingham Water Works and Sewer Board 3600 1st Avenue North Birmingham, AL 35283 205-254-0510	Notify ADEM's Field Operations Office in Birmingham (205-942-6168).
MUL-3	Barge Loading Facility	33.797754	-87.143385	Benzene, Cadmium, Coliform, Cryptosporidium, Dichloromethane, Giardia Lamblia	None/Not Applicable	Mid South Resources Corporation 4808 Highway 265 Parish, AL 36580 Unpublished telephone number	Joel Rhayk, Manager of Water and Wastewater Birmingham Water Works and Sewer Board 3600 1st Avenue North Birmingham, AL 35283 205-254-0510	Notify ADEM's Field Operations Office in Birmingham (205-942-6168).
MUL-4	Petroleum Processing Facility	33.759331	-87.168425	Coliform, Cryptosporidium, Giardia Lamblia, Nitrate, Nitrite, Viruses	None/Not Applicable	Ed Cline Vulcan Refining Company P.O. Box 388 Cordova, AL 35550 205-483-9262	Joel Rhayk, Manager of Water and Wastewater Birmingham Water Works and Sewer Board 3600 1st Avenue North Birmingham, AL 35283 205-254-0510	Contact City Engineer to assess the problem and notify ADEM's Field Operations Office in Birmingham (205-942-6168).
MUL-5	Sanitary Sewer Line	33.759560	-87.174688	Mycetium Fungus or Ductile Iron Bacteria, Benzene, Cadmium, Chromium, Copper, Sulfate	None/Not Applicable	Joey Griffin City of Cordova Water Works & Gas Board 74 Main Street Cordova, AL 35550 205-483-9235	Joel Rhayk, Manager of Water and Wastewater Birmingham Water Works and Sewer Board 3600 1st Avenue North Birmingham, AL 35283 205-254-0510	Contact company's Environmental Department to assess the problem, notify ADEM's Field Operations Office in Birmingham (205-942-6168).
MUL-6	Steel Processing/Fabrication Plant	33.750612	-87.161950	Bacteria, Viruses, Suspended solids, Organic solvents, Nutrients	None/Not Applicable	George H. & Shirley Weaver 110 Cliff Street Cordova, AL 35550 None published telephone number	Joel Rhayk, Manager of Water and Wastewater Birmingham Water Works and Sewer Board 3600 1st Avenue North Birmingham, AL 35283 205-254-0510	Contact the local Health Department for septic tank problems. Notify ADEM's Field Operations Office in Birmingham (205-942-6168).
MUL-7	Residence with propane tank and septic system	33.730190	-87.145773	Bacteria, Viruses, Suspended solids, Organic solvents, Nutrients	None/Not Applicable	Charles E. & Louise U. Hollis 104 Old Ferry Road Cordova, AL 35550 205-483-1822	Joel Rhayk, Manager of Water and Wastewater Birmingham Water Works and Sewer Board 3600 1st Avenue North Birmingham, AL 35283 205-254-0510	Contact the local Health Department for septic tank problems. Notify ADEM's Field Operations Office in Birmingham (205-942-6168).
MUL-8	Residence with propane tank and septic system	33.729161	-87.146029	Bacteria, Viruses, Suspended solids, Organic solvents, Nutrients	None/Not Applicable	Frank G. & Doris J. Homan P.O. Box 209 Cordova, AL 35550 205-483-8406	Joel Rhayk, Manager of Water and Wastewater Birmingham Water Works and Sewer Board 3600 1st Avenue North Birmingham, AL 35283 205-254-0510	Contact the local Health Department for septic tank problems. Notify ADEM's Field Operations Office in Birmingham (205-942-6168).
MUL-9	Residence with propane tank and septic system	33.728689	-87.146181	Bacteria, Viruses, Suspended solids, Organic solvents, Nutrients	None/Not Applicable	Casey or Sandra Pale 2429 Downtown Road Cordova, AL 35550 205-483-6115	Joel Rhayk, Manager of Water and Wastewater Birmingham Water Works and Sewer Board 3600 1st Avenue North Birmingham, AL 35283 205-254-0510	Contact the local Health Department for septic tank problems. Notify ADEM's Field Operations Office in Birmingham (205-942-6168).
MUL-10	Residence with propane tank and septic system	33.727145	-87.147256	Sediments	None/Not Applicable	Albwest-AL, LLC P.O. Box 412 Northport, AL 35476	Joel Rhayk, Manager of Water and Wastewater Birmingham Water Works and Sewer Board 3600 1st Avenue North Birmingham, AL 35283 205-254-0510	Notify ADEM's Field Operations Office in Birmingham (205-942-6168).
MUL-11	Land clearing	33.723712	-87.150123	Bacteria, Viruses, Suspended solids, Organic solvents, Nutrients	None/Not Applicable	Ernest J. Perrin 1312 Charter Circle Jasper, AL 35504 205-384-0224	Joel Rhayk, Manager of Water and Wastewater Birmingham Water Works and Sewer Board 3600 1st Avenue North Birmingham, AL 35283 205-254-0510	Contact the local Health Department for septic tank problems. Notify ADEM's Field Operations Office in Birmingham (205-942-6168).
MUL-12	Residence with propane tank and septic system	33.709767	-87.140150	Bacteria, Viruses, Suspended solids, Organic solvents, Nutrients	None/Not Applicable	Joseph H. & Chantelle Haron P.O. Box 42 Dora, AL 35062 None published telephone number	Joel Rhayk, Manager of Water and Wastewater Birmingham Water Works and Sewer Board 3600 1st Avenue North Birmingham, AL 35283 205-254-0510	Contact the local Health Department for septic tank problems. Notify ADEM's Field Operations Office in Birmingham (205-942-6168).
MUL-13	Residence with propane tank and septic system	33.704185	-87.145514	Bacteria, Viruses, Suspended solids, Organic solvents, Nutrients	None/Not Applicable	May Wills Dean 1287 River Oaks Drive Quinton, AL 35130 None published telephone number	Joel Rhayk, Manager of Water and Wastewater Birmingham Water Works and Sewer Board 3600 1st Avenue North Birmingham, AL 35283 205-254-0510	Contact the local Health Department for septic tank problems. Notify ADEM's Field Operations Office in Birmingham (205-942-6168).
MUL-14	Residence with propane tank and septic system	33.702006	-87.146698	Bacteria, Viruses, Suspended solids, Organic solvents, Nutrients	None/Not Applicable		Joel Rhayk, Manager of Water and Wastewater Birmingham Water Works and Sewer Board 3600 1st Avenue North Birmingham, AL 35283 205-254-0510	Contact the local Health Department for septic tank problems. Notify ADEM's Field Operations Office in Birmingham (205-942-6168).

Figure 8-1

SUSCEPTIBILITY ANALYSIS WORKSHEET

SYSTEM _____

CONTAMINANT SOURCE _____

CONTAMINANT TYPE _____

DISTANCE TO INTAKE _____

CATEGORY	CONDITIONS	RANK
Intake Structure	Constructed on lake or stream bank with no protection	HIGH
	Screen or deflection wall	MODERATE
	Submerged intake line in river channel or main flow area; has floating boom. Protection plan and equipment in place to address spills; multiple intake levels	LOW
Water Flow	Little water movement to wash contaminant past intake; little dilution potential	HIGH
	Moderate flows; some dilution of contaminant	MODERATE
	High flows, rapid movement, dispersion or dilution of contaminant	LOW
Distance to Intake	Close to intake; less than 12 hour TOT	HIGH
	12 to 36 hour TOT	MODERATE
	Greater than 36 hour TOT	LOW
Contaminant Toxicity	Toxic; large quantity may spill or occur in source	HIGH
	Toxic but small quantity on site; non-toxic with large quantity on site	MODERATE
	Non-toxic with small quantity on site	LOW

Figure 8-1

CATEGORY	CONDITIONS	RANK
Site Characteristic	High probability spill or release may occur; little containment, monitoring or notification procedure	HIGH
	Some probability spill or release may occur, some containment structure; monitoring procedures in place	MODERATE
	Low probability spill or release may occur. Good containment structure; monitoring and notification procedures in place	LOW
Site Clean-up/Control	No equipment or procedures available	HIGH
	Clean-up established; possible to contain some or most of contaminant on site	MODERATE
	Facility equipped to control contaminant on-site; physically impossible for contaminant to reach water source	LOW
Water Source Contamination Potential	Total Coliform counts greater than 1,000 or chemical contaminant detected continuously detected	HIGH
	Total Coliform counts greater than or equal to 200 or chemical contamination occasionally detected	MODERATE
	Total Coliform counts less than 200 or chemical contaminant rarely detected	LOW
Existing Raw Water Quality	Raw water quality exceeds one or more MCLs for chemical monitoring more than once during period of last four quarters of sampling	HIGH
	Raw water quality exceeds one or more MCLs for chemical monitoring once during period of last four quarters of sampling	MODERATE
	Raw water quality has not exceeded MCLs for chemical monitoring during the period of last four quarters of sampling	LOW

Figure 8-1

NUMBER OF: HIGH _____
MODERATE _____
LOW _____

Majority of high rankings = Contaminant source is HIGH

Majority of low rankings = Contaminant source is LOW

All other cases, contaminant source is MODERATE

Other information available: Based on the Susceptibility Analysis Meeting on July 25, 2002 with ADEM, it was agreed that that an overall ranking of MODERATE would be based on the number of HIGH and MODERATE rankings in comparison to the number of LOW rankings. This method of ranking was used in the 2007 Source Water Assessment update.

Table 8-2. Mulberry Fork - Susceptibility Analysis Category Ranking Rationale

Category	Ranking	Rationale
Intake Structure	Low	The intake on the Mulberry Fork is submerged and has a floating boom.
Water Flow	Low	All sources were given low rankings due to the large amount of dispersion and dilution that would occur in a river system of that size.
Distance to Intake	High/Moderate	Sources in the SWAP are ranked high based on the time of travel calculated using the stream flow velocities calculated from USGS hydrologic data, dam release records and topographic data.
Contaminant Toxicity	High/Moderate/ Low	Contaminant toxicity was determined by the types of potential contaminants and the threat they would pose to treatment plant operations and human health.
Site Characteristics	High/Moderate/ Low	Ranked for each source based on likelihood that a spill or release would occur.
Site Cleanup/Control	High/Moderate	Ranking of high and moderate were determined for site cleanup and control based on the expected difficulty of the cleanup effort and how long after a spill it would take for a cleanup to begin.
Water Source Contamination Potential	High	Total coliform counts have been greater than 1,000 cfu/100 mL and fecal coliform have been detected in the study area.
Existing Raw Water Quality	High	Ranking of high was based on the exceedance of one or more MCLs more than once for chemical monitoring during the most recent water sample chemical analysis data available in a one year period.

Note:

CFU = Colony forming units

MCL = Maximum contaminant level

Table 8-3. Mulberry Fork - Susceptibility Analysis Matrix

ID	Potential Source of Contamination	Inake Structure	Water Flow	Distance to Intake	Contaminant Toxicity	Site Characteristics	Site Clean-up/Control	Water Source Contamination Potential	Existing Raw Water Quality	# of High	# of Moderate	# of Low	Overall Ranking
MUL-1	Highway 78 Bridge	Low	Low	Moderate	Moderate	High	High	High	High	4	2	2	High
MUL-2	Lynn Park Terminal Inc.	Low	Low	High	Moderate	High	High	High	High	5	1	2	High
MUL-3	Barge Loading Facility	Low	Low	High	High	High	High	High	High	6	0	2	High
MUL-4	Petroleum Processing Facility	Low	Low	High	High	High	High	High	High	6	0	2	High
MUL-5	Sanitary Sewer Line	Low	Low	High	Moderate	Moderate	Moderate	High	High	3	3	2	Moderate
MUL-6	Steel Processing/Fabrication Plant	Low	Low	High	High	High	High	High	High	6	0	2	High
MUL-7	Residence with propane tank and septic system	Low	Low	High	Low	Low	Moderate	High	High	3	1	4	Moderate
MUL-8	Residence with propane tank and septic system	Low	Low	High	Low	Low	Moderate	High	High	3	1	4	Moderate
MUL-9	Residence with propane tank and septic system	Low	Low	High	Low	Low	Moderate	High	High	3	1	4	Moderate
MUL-10	Residence with propane tank and septic system	Low	Low	High	Low	Low	Moderate	High	High	3	1	4	Moderate
MUL-11	Land clearing	Low	Low	High	Low	Moderate	High	High	High	4	1	3	Moderate
MUL-12	Residence with propane tank and septic system	Low	Low	High	Low	Low	Moderate	High	High	3	1	4	Moderate
MUL-13	Residence with propane tank and septic system	Low	Low	High	Low	Low	Moderate	High	High	3	1	4	Moderate
MUL-14	Residence with propane tank and septic system	Low	Low	High	Low	Low	Moderate	High	High	3	1	4	Moderate
MUL-15	Corridor X Highway	Low	Low	High	Moderate	High	High	High	High	5	1	2	High
MUL-16	Residence with propane tank and septic system	Low	Low	High	Low	Low	Moderate	High	High	3	1	4	Moderate
MUL-17	Residence with propane tank and septic system	Low	Low	High	Low	Low	Moderate	High	High	3	1	4	Moderate
MUL-18	Residence with propane tank and septic system	Low	Low	High	Low	Low	Moderate	High	High	3	1	4	Moderate
MUL-19	Residence with propane tank and septic system	Low	Low	High	Low	Low	Moderate	High	High	3	1	4	Moderate
MUL-20	Residence with propane tank and septic system	Low	Low	High	Low	Low	Moderate	High	High	3	1	4	Moderate
MUL-21	Residence with propane tank and septic system	Low	Low	High	Low	Low	Moderate	High	High	3	1	4	Moderate
MUL-22	Residential community with propane tanks and septic systems	Low	Low	High	Low	Low	Moderate	High	High	3	1	4	Moderate
MUL-23	Corridor X (Highway 22) Bridge	Low	Low	High	Moderate	High	High	High	High	5	1	2	High

9. Notification Procedures

This section provides an overview of the notification procedures in the event of source water contamination. Specific contingency measures are addressed in Section 10.

General Responsibilities

The BWWSB's water treatment plant (WTP) emergency operations are under the direction of the Manager of Water and Wastewater Treatment as the emergency response coordinator (ERC). The ERC is the first and key contact for the Emergency Management Agency (EMA). Once contacted by EMA, the ERC will assess the situation to determine if it is deemed an emergency. In determining the status of the situation, the following factors are examined.

- Magnitude of the situation,
- Area affected, and
- Proximity of the BWWSB's watershed.

After evaluating the situation, the ERC is charged with organizing key personnel. The ERC maintains and keeps an updated emergency contact list at all times. This list consists of contacts such as important BWWSB personnel, National Response Center, ADEM, and surrounding County/City Police and Fire Departments. In addition, the ERC maintains an emergency response kit which includes: the National Institute for Occupational Safety and Health (NIOSH) guide and the Department of Transportation's Emergency Response Guidebook.

Emergency Contact Information

Table 9-1 lists the primary individuals that may be contacted in the event of an emergency involving source water contamination. Table 9-2 lists the primary media contacts in the Birmingham area. The contact information for the owner and responsible parties of the contaminant sources is listed in Section 8.

Table 9-1. Emergency Contact List

Agency	Phone Number
Local Police & Fire Department	911
ALDOT	205-221-9128
Local EMA:	
Jefferson County	205-254-2039
Shelby County	205-669-3999
Blount County	205-625-4121
Walker County	205-384-7233
St. Clair County	205-884-6800
FBI	205-326-6166
ADEM Field Office	205-942-6168
ADEM Main Office	205-271-7700
National Response Center	1-800-424-8802

Table 9-2. Media Contact List

Agency	Phone Number
ABC 33/40	205-403-3340
NBC13	205-933-1313
WBRC/FOX 6	205-583-4333
CBS 42	205-322-4200
Alabama Public T.V.	205-328-8756
V 105.9 FM	205-439-9600
WBHM 90.3 FM	205-934-2606
WERC 960 AM	205-439-9600
WMJJ 96 FM	205-439-9600
WZZK 104.7 FM	205-916-1100
WBHJ 95.7	205-741-0957
WBHK 98.7	205-741-0987
Birmingham News	205-325-2222

10. Summary of Approved Contingency Plans

General Responsibilities and Plan Administration

The BWWSB's Water Treatment Plant (WTP) emergency operations are under the direction of the Manager of Water and Wastewater Treatment as the Emergency Response Coordinator (ERC). The ERC is the first and key contact for the Emergency Management Agency (EMA). Once contacted by EMA, the ERC will assess the situation to determine if it is deemed an emergency. In determining the status of the situation, the following factors are examined.

- Magnitude of the situation,
- Area affected, and
- Proximity of the BWWSB's watershed.

After evaluating the situation, the ERC is charged with organizing key personnel. The ERC maintains and keeps an updated emergency contact list at all times. This list consists of contacts such as important BWWSB personnel, National Response Center, Alabama Department of Environmental Management (ADEM), and surrounding County/City Police and Fire Departments. In addition, the ERC maintains an emergency response kit which includes: the National Institute for Occupational Safety and Health (NIOSH) guide and the Department of Transportation's Emergency Response Guidebook. If the situation requires, the BWWSB will bring in contractors to handle the emergency construction activities.

Emergency Response Procedures

The following is a general account of the emergency operating procedure that has been developed for the Mulberry Fork of the Black Warrior River, and coordinated with the local emergency response agencies. This procedure is not exhaustive and will be modified in accordance with the needs of the emergency situation and at the discretion of the ERC. This emergency procedure is shown in Figure 10-1 and described below. Furthermore, the BWWSB will maintain public relations to keep the public informed of on going activities to restore the affected parts of the water system.

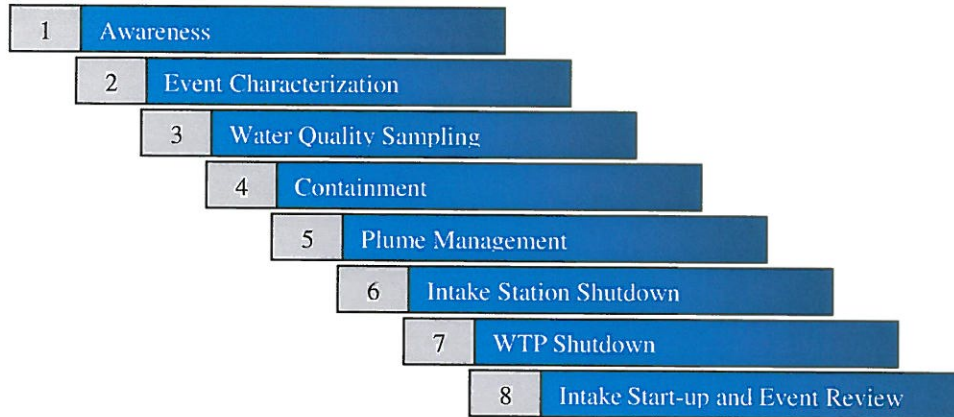


Figure 10-1: Emergency Response Process

1 – Awareness

The ERC becomes aware of the event through internal or external sources (e.g., BWWSB staff, EMA, ADEM). The ERC then contacts the BWWSB General Management, specifically the Assistant General Manager of Technical Services, as well as the appropriate emergency response, intake station, and filtration plant staff. The ADEM Birmingham Field Office will be contacted as well.

2 – Event Characterization

The ERC contacts personnel at the site, if available, for additional information regarding the event and determines, in cooperation with EMA and ADEM, the degree of immediate risk to water filtration operations and public health. If deemed appropriate, water quality sampling and containment efforts are initiated. If on-site personnel are not available, the ERC travels to the event location and sets up an on-site incident command. Upon reaching the event location, the ERC assesses the immediate risk to water filtration and public health. Contaminant specific containment strategies may be developed on-site and/or at the raw water intake station.

3 – Water Quality Sampling

At the discretion of the ERC, water quality sampling is initiated at the event location, intake, and WTP. Sample collection will be prioritized based on chemical(s) of concern. Those samples for parameters that cannot be analyzed at the site are sent to the BWWSB’s Envirolab or another laboratory facility for analysis. Water quality sampling is continued at a determined frequency and duration at the discretion of the ERC.

4 – Containment

Based on event conditions, actions are taken to contain the potential contaminants on land, in a tributary, or in the slough nearest the contaminant source. The containment actions will be developed on site by the ERC in cooperation with the EMA. Booms and skimmers, stored at the intake, may be employed to isolate the impact of the contaminant and expedite clean up efforts.

5 – Plume Management

Booms or skimmers are used at the intake to provide additional barriers to contamination. If the contaminant reaches the intake, the intake is shutdown and potential releases from Lewis Smith Reservoir may be requested from the Alabama Power Company. The releases from the reservoir may serve to move the plume away from or past the intake station so that it may resume operation.

6 – Intake Station Shutdown

In the event of a raw water intake station shutdown at Mulberry Fork, raw water transmission system adjustments are made to serve raw water to the Putnam Station (PFP) and Western Filter Plants (WFP) from alternative sources. If the contaminant is believed to have entered the raw water transmission system, the pipeline will be drained in an environmentally acceptable manner once the intake station is shutdown. Specific system management measures have been developed for alternate raw water delivery scenarios as well as for supplemental finished water from other water filtration facilities to those areas served by PFP and WFP. These measures have been incorporated into the BWWSB's emergency operating procedures (EOP). If system demand is greater than water delivered by the PFP and WFP, the ERC notifies the BWWSB General Management that water conservation measures must be initiated. The BWWSB General Management communicates with the local news agencies to broadcast the emergency water use restrictions to the public. Local law enforcement agencies may provide assistance in enforcing the water use restrictions.

7 – WTP Shutdown

Due to flexibility in the raw water transmission system, WTP shutdown as a result of an intake shutdown is unlikely. The protocol for alternative raw water delivery is documented in the BWWSB's EOP. As dictated by the current overall system demand, other WTPs would serve the WFP service area to the greatest practicable extent. If necessary, local news agencies would be notified of the intake shutdown, demand management practices, and next steps for emergency response. EMA and BWWSB may have to provide alternative sources of drinking water (e.g., shipments via tanker truck) to critical users in the area, such as hospitals or other medical facilities.

8 – Intake Station Start-up and Event Review

The BWWSB will maintain the intake shutdown until the sampling efforts indicate that the contaminant is no longer present or presents a risk to water filtration practices. At this point ADEM provides approval for the start-up of the intake station. The BWWSB General Management notifies the public through the general media that the emergency has expired and of the potential temporary impacts of plant start-up on water quality (e.g., discoloration). The ERC holds an event review meeting with EMA, ADEM, and the BWWSB response team to assess the response measures in place for effectiveness and modification.

11. Informing the Public

There are no significant changes in the conditions of the Source Water Assessment Area of Mulberry Fork as of July 2007. A copy of the letter of transmittal to ADEM stating such will be kept on file at the BWWSB.

12. Summary, Conclusions, and Recommendations

The BWWSB has completed the Source Water Assessment requirements for Mulberry Fork in accordance with the ADEM Cooperative Agreement dated October 10, 2001 and ADEM Regulations 335-7-6.04 through 335-7-6.08. There are no significant changes in the conditions of the Source Water Assessment Area of Mulberry Fork as of July 2007. A copy of the letter of transmittal to ADEM stating such will be kept on file at the BWWSB.

Conclusions

Based on the contaminant inventory and susceptibility analysis conducted for this Source Water Assessment, there are several contaminant sources that could affect the quality of water withdrawn by the BWWSB at the Mulberry Intake Station, and subsequently affect the BWWSB's ability to treat this water to meet the requirements of the SDWA. If such conditions occur, the BWWSB will implement appropriate elements of its Contingency Plan to maintain satisfactory service to its raw and potable water customers. The BWWSB monitors the water quality of this source on a regular basis and will use the results of this monitoring program to provide as early an indication of contamination as possible.

Recommendations

Developments in early warning systems technology should be monitored, and where appropriate, additional devices installed to enhance the ability to detect contamination at the source and in the raw water delivery system, and to implement contingency measures for minimizing the impact of such contamination.

The BWWSB should also continue its role as a steward of the watershed, purchasing land where appropriate to limit development, requiring developers to provide stormwater management facilities and adhere to sediment and erosion control ordinances, where applicable, and participating in stakeholder outreach programs.

This Source Water Assessment will be updated upon renewal of its permit to furnish water, in accordance with ADEM Regulation 334-7-6.10.



13. CD-ROM
