In This Section

- Drinking Water Supply
- Surface Water Quantity
- Ground Water Quantity

Section 3

Water Quantity

This section addresses water quantity issues (availability and use) in the Georgia portion of the Tallapoosa basin, whereas water quality is discussed in Section 4. Water use in the basin is measured by estimates of freshwater withdrawn from ground and surface water sources. Water availability is assessed based on annual surface water flows and ground water storage. Saline water is not used in the basin. Uses of water include both consumptive uses (in which the water is no longer available to the basin) and nonconsumptive uses (in which the water is returned to the basin after use). Over 91 percent of total Municipal and Industrial (M&I) water withdrawals in 1990 was not returned to surface or ground water sources, primarily due to evaporative losses and returns to the Chattahoochee River basin.

Surface water is the primary water source in most of the Tallapoosa River basin because surface water supplies are plentiful and ground water yields from crystalline rock aquifers tend to be low. Water use in the Tallapoosa basin is increasing, but at a relatively slow rate. The total water demands are projected to increase from 19.3 MGD in 1995 to 25.3 MGD by 2020.

In the following sections, water availability is discussed from a number of viewpoints. First, the important topic of drinking water is presented, which includes both surface and ground water supplies. Then, general surface water availability is presented, followed by ground water availability.

3.1 Drinking Water Supply

3.1.1 Drinking Water Supplies in the Tallapoosa River Basin

The headwaters area of the Tallapoosa River basin serve a majority of the population of Haralson and Carroll Counties including the cities of Carrollton, Bremen and Villa Rica. Most surface water intakes are located on the Tallapoosa River, Little Tallapoosa River or smaller tributaries of the rivers. Often larger public water systems that treat surface water sell water to neighboring cities and counties. All cities and counties in the Tallapoosa River basin use surface water for drinking water. Smaller subdivisions and

mobile home parks use ground water since they are located too far from a public water system that sells surface water.

The Tallapoosa River basin provides drinking water for about 74,034 people in the state of Georgia through municipal or privately owned public water systems. A public water system pipes water for human consumption and has at least 15 service connections or regularly serves at least 25 individuals 60 or more days out of the year. Public water systems sources include surface water pumped from rivers and creeks or ground water pumped to the surface from wells or naturally flowing from springs. There are three different types of public water systems: community, non-community non-transient, and non-community transient.

Types of Public Water Systems

A community public water system serves at least 15 service connections used by year round residents or regularly serves at least 25 year-round residents. Examples of community water systems are municipalities, such as cities, counties, and authorities, which serve residential homes and businesses located in the areas. Other types of community public water systems include rural subdivisions or mobile home parks which have a large number of homes connected to a private public water system, usually a small number of wells. A non-community non-transient public water system serves at least 25 of the same persons over 6 months per year. Examples of non-community non-transient systems are schools, office buildings, and factories that are served by a well or privately owned surface water plant.

A non-community transient public water system does not meet the definition of a non-community non-transient. A non-community transient public water system provides piped water for human consumption to at least 15 service connections or which regularly serves at least 25 persons at least 60 days a year. Examples of non-community transient systems are highway rest stops, restaurants, motels, and golf courses.

Private domestic wells serving individual houses are not covered by the states public water system regulations. However, the regulations for drilling domestic wells are set by the Water Well Standards Act and the local health department is responsible for ensuring water quality.

In the Tallapoosa River basin there are approximately 11 community public water systems using surface water and serving 73,367 people and 5 community public water systems using ground water and serving 461 people (Table 3-1). The locations of surface water intakes within the Tallapoosa River basin are shown in Figure 3-1.

3.1.2 Drinking Water Demands

Drinking water demands are expected to increase slowly due to low rates of projected population growth in the Tallapoosa Basin. Projections of drinking water demands are discussed in Section 3.2 and 3.3.

3.1.3 Drinking Water Permitting

The Georgia Safe Drinking Water Act of 1977 and the Rules for Safe Drinking Water (391-3-5) adopted under the act require any person who owns and/or operates a public water system to obtain a permit to operate a public water system from the Environmental Protection Division. The permitting process has three phases—Inquiry and Discovery, Technical Review, and Permitting. During these phases the owner must provide detailed description of the project; demonstrate the reliability of the water source; render engineering plans and specifications prepared by a professional engineer demonstrating

Table 3-I. Community Public Water Systems in the Tallapoosa River Basin

Public Water System Name	Water System ID	County	Source
Systems Directly Supplied by Surface Water			
HUC 03150108			
Haralson Co. Water System	1430007	Haralson	Little Tallapoosa River
City of Villa Rica	0450006	Carroll	1. Lake Paradise 2. Cowens Lake
City of Bremen	1430000	Haralson	Beech Creek Tributary
City of Temple	0450005	Carroll	Webster Creek
City of Carrollton	0450002	Carroll	Little Tallapoosa River
City of Bowdon	0450000	Carroll	1. Tisinger Reservoir 2. Turkey Creek
Systems Supplied by Other Sources (arranged by county)			
Carroll County	0450001	Carroll	Purchased Surface Water
Mount Zion	0450003	Carroll	Purchased Surface Water
Memory Springs Mobile Home Pk	0450016	Carroll	Groundwater
Rolling View Homeowners Assoc.	0450017	Carroll	Groundwater
Sunset Village MHP	0450019	Carroll	Groundwater
Del Villa MHP	0450081	Carroll	Groundwater
Timberlake Estates	0450083	Carroll	Groundwater
Buchanan	1430001	Haralson	Purchased Surface Water
Tallapoosa	1430002	Haralson	Purchased Surface Water
Waco	1430010	Haralson	Purchased Surface Water

the construction integrity of wells, treatment, and distribution systems; conduct preliminary water sample testing; and submit legal documentation including an application to operate a public water system. Permits contain specific conditions the owner must meet for different types of public water systems, including a list of approved water sources, filter rates, disinfection and treatment requirements, operator certification, documentation and reporting requirements, compliance with water sample testing schedule, and number of allowed service connections. Permits are issued for 10 years and are renewable. As of this writing, there are 19 active and permitted systems in the Tallapoosa River basin.

3.2 Surface Water Quantity

3.2.1 Surface Water Supply Sources

Surface water supplies in the Tallapoosa basin include water in rivers, ponds, and small reservoirs. Total mean annual flow in the Tallapoosa basin at the Alabama state line is approximately 960 MGD. There are no major impoundments on the Tallapoosa within Georgia, although there are plans to build the West Georgia Regional Reservoir in Haralson County.

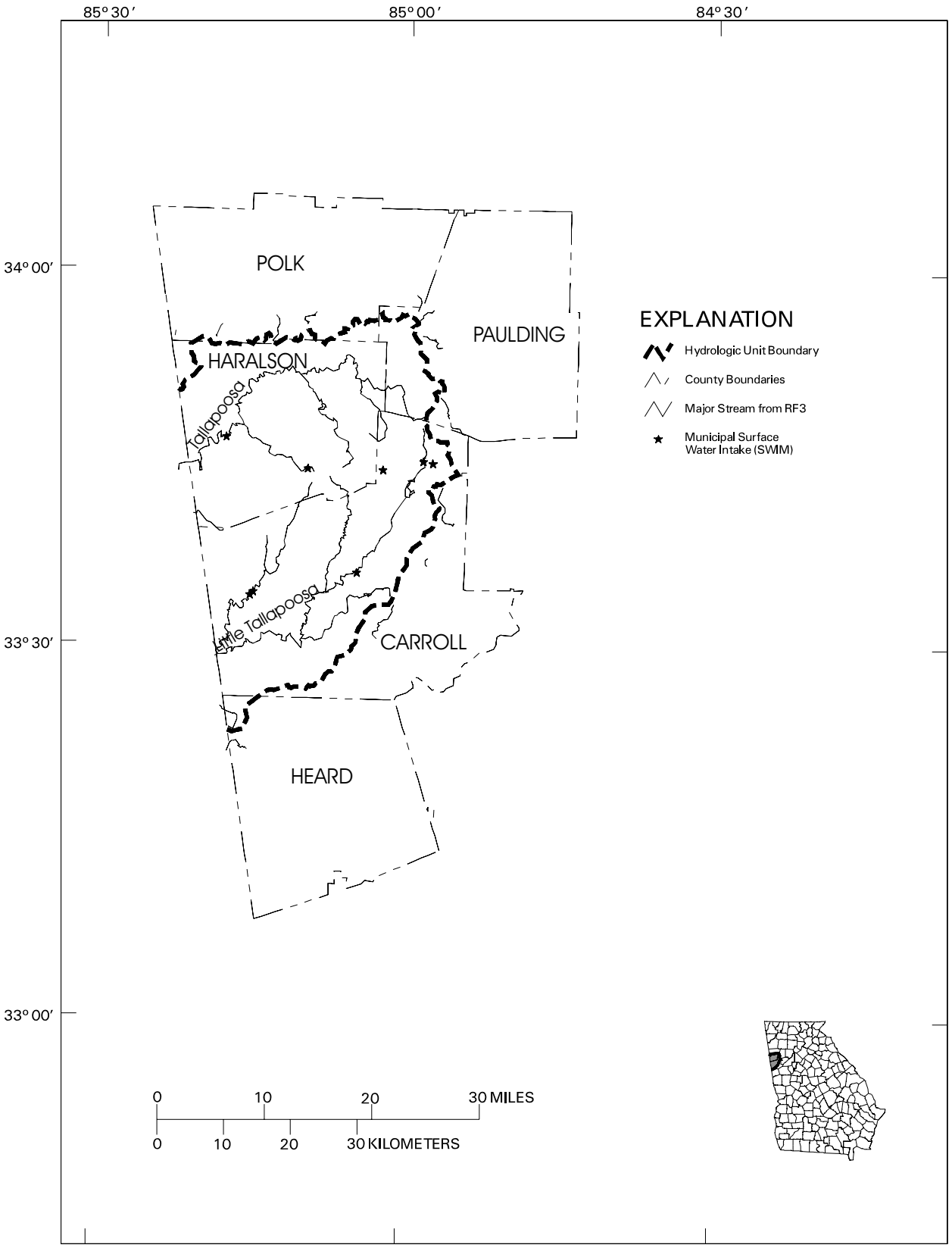

Figure 3-I. Surface Water Intakes, Tallapoosa River Basin

3.2.2 Surface Water Supply Demands and Uses

Municipal and Industrial Demand

Municipal and Industrial (M&I) water demands include public supplied and private supplied residential, commercial, governmental, institutional, industrial, manufacturing, and other demands such as distribution system water losses. Total M&I water demand in the Georgia part of the Tallapoosa basin is expected to increase from 16.7 million gallons per day (MGD) in 1995 to 25.3 MGD in 2020 with passive conservation programs in place. These passive conservation measures include increases in water use efficiency resulting from recently implemented plumbing codes, the natural replacement of water fixtures, and known increases in water and wastewater prices since 1990.

Existing M&I permits for municipal and industrial (nonagricultural) surface water withdrawals in the Tallapoosa River basin are shown in Table 3-2. In 1990, the residential sector of the basin used about 46 percent of the M&I water, compared to 31 percent for the manufacturing sector. By 2050, the residential demand is expected to increase to 50 percent of demand in the Tallapoosa basin, while the demand for water by the manufacturing sector is projected to decline to 24 percent of the 2050 basin total demand.

All of the Tallapoosa basin M&I water withdrawal in 2005 is projected to be supplied by surface water withdrawals.

Much of the M&I demand is consumed or returned to the Chattahoochee River basin. Currently, less than 10 percent of the M&I withdrawal is returned to the Tallapoosa River. In 2005 approximately 9 percent of the total water withdrawn is projected to be returned to the river.

Agricultural Water Demand

Agricultural water demand in the basin are relatively small, and only a limited fraction of agricultural lands are irrigated. In 1992 approximately 17,800 acres in the Georgia portion of the Tallapoosa River basin were devoted to the production of crops, orchards, turf, nursery, and aquaculture. Only 580 of these acres were irrigated. The number of irrigated acres in the Tallapoosa basin is expected to increase to 850 acres by the year 2050.

Table 3-2. Permits for Surface Water Withdrawals from the Tallapoosa River Basin

Facility Name	Source	24 Hour Maximum (MGD)	Monthly Average (MGD)	County
Bowdon, City of - Indian	Indian Creek	0.40	0.36	Carroll
Bowdon, City of - Lake Tysinger	Lake Tysinger	1.00	1.00	Carroll
Bremen, City of	Beach Creek	0.80	0.58	Haralson
Carrollton, City of	Lt. Tallapoosa River	12.00	12.00	Carroll
Haralson County Water Authority	Tallapoosa River	3.75	3.75	Haralson
Southwire Company	Buffalo Creek	2.00	1.00	Carroll
Temple, City of	Webster Creek	0.25	0.17	Carroll
Villa Rica, City of	Lake Paradise & Cowens Lake	1.50	1.50	Carroll

Note: Permits are not required for withdrawals of less than 100,000 gallons per day on a monthly average.

When averaged over a year, the 1992 agricultural water demand for counties in the Georgia part of the Tallapoosa basin was 2.5 MGD (Table 3-3). The agricultural water demand in the basin is expected to increase to 3.2 MGD in 2050.

In the Tallapoosa River basin most agricultural water is used for livestock and poultry operations, and is supplied from surface water. Unlike municipal, industrial, and cooling water withdrawals, practically none of the water withdrawn for agricultural use is returned to streams.

Table 3-3. Agricultural Water Demand for the Tallapoosa River Basin (Georgia Portion)

Year	Total Water Demand (MGD)
1995	2.6
2000	2.6
2010	2.8
2020	2.9
2050	3.2

Note: Demand in MGD, including crops/orchards, turf, nursery, livestock/poultry, and aquaculture demand, from NRCS, 1996, based on Medium Demand projections without water conservation.

Power Generation Water Demand

There are no hydroelectric or thermoelectric power generating systems located in the Georgia portion of the Tallapoosa River Basin.

Navigational Water Demand

The Georgia portion of the Tallapoosa River basin is not used for commercial navigation.

Recreation

Recreational use of the Tallapoosa River Basin includes local fishing activities on the rivers and farm ponds. John Tanner State Park in western Carroll County provides camping, boating, fishing, and picnicking opportunities.

Fish and Wildlife Water Demand

No fish and wildlife management facilities are located in the Georgia portion of the Tallapoosa Basin.

Waste Assimilation Water Demand

Water quantity, wastewater treatment, and wastewater discharge permitting are addressed in Section 4. However, it should be noted that the guidelines for discharge of treated effluent into the rivers and streams of the Tallapoosa River Basin assume that sufficient surface water flow will be available to assimilate waste and ensure that water quality criteria will be met.

Environmental Water Demand

EPD recognizes the importance of maintaining suitable aquatic habitat in Georgia's lakes and streams for support viable communities of fish and other aquatic organisms. Small portions of the mainstem of the Tallapoosa River and Little Tallapoosa River have been altered drastically by human actives. From a water quantity perspective, aquatic

habitat is adversely affected in some locations by unnatural extreme variations in lake levels and river flow. One significant issue which is receiving increasing attention from EPD is that of the minimum stream flow rate which must be maintained below a reservoir. A current state requirement is to maintain the 7Q10 flow (7-day average low flow with a once in ten years recurrence interval), when water is available upstream. Consideration is being given to an increase in this minimum flow requirement under recommendations of the Wildlife Resources Division (Evans and England, 1995).

3.2.3 Surface Water Withdrawal Permitting

The 1977 Surface Water Amendments to the Georgia Water Quality Control Act of 1964 require all nonagricultural users of more than 100,000 GPD on a monthly average (from any Georgia surface water body) to obtain a permit from EPD for this withdrawal. These users include municipalities, industries, military installations, and all other nonagricultural users. The statute stipulates that all pre-1977 users who could establish the quantity of their use prior to 1977 would be "grandfathered" for that amount of withdrawal. Table 3-2 lists the permits in effect in the Tallapoosa River Basin.

Applicants are required to submit details relating to the source of withdrawals, demand projections, water conservation measures, low flow protection measures (for nongrandfathered withdrawals), and raw water storage capacities. An EPD-issued permit identifies the source of withdrawal, the monthly average and maximum 24-hour withdrawal, the standard and special conditions under which the permit is valid, and the expiration date of the permit. The standard conditions section of the permit generally defines the reporting requirements (usually annual submission of monthly average withdrawals); the special conditions section of the permit usually specifies measures the permittee is required to undertake so as to protect downstream users and instream uses (e.g. waste assimilation, aquatic habitat). The objective of these permits is to manage and allocate water resources in a manner that both efficiently and equitably meets the needs of all the users.

Farm Irrigation Permits

The 1988 Amendments to the Water Quality Control Act establish the permitting authority within EPD to issue farm irrigation water use permits. As with the previously mentioned surface water permitting statute, the lower threshold is 100,000 GPD; however, users of less water may apply for and be granted a permit. With two exceptions, farm use is defined as irrigation of any land used for general farming, aquaculture, pasture, turf production, orchards, nurseries, watering for farm animals and poultry, and related farm activities. One relevant exception is that the processing of perishable agricultural products is not considered a farm use.

Applicants for these permits who could establish that their use existed prior to July 1, 1988, and when these applications were received prior to July 1, 1991, were "grandfathered" for the operating capacity in place prior to July 1, 1988. Other applications are reviewed and granted with an eye towards protection of grandfathered users and the integrity of the resource. Generally, agricultural users are not required to submit any water use reports.

3.2.4 Flooding and Floodplain Management

Sometimes the issue is not the lack of water, but too much water. Floods, as well as droughts, can be very damaging natural hazards. Almost all of Georgia is susceptible to the threat of floods. The Georgia Emergency Management Agency (GEMA) ranks floods as the number one natural hazard in Georgia. Over the past nineteen years, 57 Georgians have lost their lives due to flooding. The Flood of 1994 (Tropical Storm Alberto) is

considered the worst flooding event in Georgia since 1841, which is the beginning of the State's recorded flood history. Much of the flooding in 1994 resulted from the overflowing of the Flint River and the Ocmulgee River and, to a much lesser extent, the Tallapoosa River.

Development within the floodplains of these rivers is also a concern, especially when a community has no means of regulating the development. Development within floodplain areas can increase flood levels, thereby increasing the number of people and the amount of property at risk. Although the term "floodplain management" is often used as a synonym for program or agency-specific projects and regulations, it is in fact quite a broad concept. It is a continuous process of making decisions about whether floodplains are to be used for development and how they are to be developed. It encompasses the choices made by owners of floodplain homes and businesses, developers, and officials at all levels of government.

3.3 Ground Water Quantity

3.3.1 Ground Water Sources

As part of the Alabama-Coosa-Tallapoosa and Apalachicola-Tallapoosa-Flint (ACT/ACF) Comprehensive Basin Study, scientists at USGS completed studies of ground water resources in each of eight geographic subareas of the ACT/ACF basins. The Tallapoosa River basin is coincident with Subarea 5 of that study.

Ground water in Subarea 5 is drawn from the fracture-conduit aquifers in crystalline rock, and, to a lesser extent, from porous-media aquifers in the overlying regolith. Journey and Atkins (1996) provide an analysis of the ground-water utilization within the Georgia portion of the Tallapoosa Basin. They estimated that 1990 ground water use was 0.6 percent of mean annual baseflow, 6 percent of average drought baseflow, and 21 percent of minimum drought baseflow, based on observations during the 1954 drought. In general, ground-water resources are underutilized throughout the basin.

3.3.2 Ground Water Supply Demands

Municipal and Industrial Uses

100 percent of the Tallapoosa basin M&I water demand in 2005 is projected to be supplied by surface water withdrawals.

Agricultural Water Demand

Total agricultural water demand for the Tallapoosa River basin is discussed above in Section 3.2.2, and is derived from surface and ground water sources. Most agricultural water in the basin is used for poultry and livestock, and is supplied from surface water.

3.3.3 Ground Water Supply Permitting

The Georgia Ground Water Use Act of 1972 requires permits from EPD for all non-agricultural users of ground water of more than 100,000 GPD. General information required of the applicant includes location (latitude and longitude); past, present, and expected water demand; expected unreasonable adverse effects on other users; the aquifer system from which the water is to be withdrawn; and well construction data. The permits issued by EPD stipulate both the allowable monthly average and annual average withdrawal rates, standard and special conditions under which the permit is valid, and the expiration date of the permit. Ground water use reports are generally required of the

applicant on a semi-annual basis. The objective here is the same as with surface water permits. There are no active Georgia municipal and industrial ground water withdrawal permits in the Tallapoosa basin.

Farm Irrigation Permits

The 1988 Amendments to the Ground Water Use Act establishes the permitting authority within EPD to issue farm irrigation water use permits. As with the previously mentioned ground water permitting statute, the lower threshold is 100,000 GPD; however users of less water may apply and be granted a permit. Agricultural withdrawal permits are too numerous to list in this document.

Applicants for these permits who could establish that their use existed prior to July 1, 1988, and when their applications were received prior to July 1, 1991, were "grandfathered" for the operating capacity in place prior to July 1, 1988. Other applications are reviewed and granted with an eye towards protection of grandfathered users and the integrity of the resource. Generally, agricultural users are not required to submit any water use reports.

Excessive Ground Water Withdrawals

Excessive ground water withdrawal can lead to lowering or drawdown of the water table. Localized groundwater drawdowns are generally discovered only after the fact of permitting has occurred and withdrawal operations begun. To avoid such a possibility, if an application for a very large use of groundwater is received, the Water Resources Management Program of the Georgia EPD can take certain steps to possibly contain drawdowns effects. Modeling the hydrogeologic impact of such a large user may be required of the potential permittee. If this computer analysis indicates no unreasonable impact on existing users, such a water use permit may be approved. Another recommended possibility is a negotiated reduction in permit amounts to a more moderate amount of withdrawal, with lessened impacts. Prior to full scale production of a well field, well pumping tests run at or near actual production rates can be required. These may give the permittee and the EPD some real idea of the amount of water that may pumped safely, without endangering other users nor drawing down the aquifer too greatly. Permit withdrawal limits may then be set at some safer yield which is determined by these pumping tests. These tests may also indicate that proposed pumping amounts may require more wells drilled to spread out the ultimate production impact on the aquifer.

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